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Architecture as a Living Process

Lecture by

Douglas J. Cardinal

IDB CULTURAL CENTER

Director: Ana María Coronel de Rodríguez
Visual Arts: Félix Angel
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ARCHITECTURE AS A LIVING PROCESS

Douglas J. Cardinal

It's nice to be here in Washington and share with you my current project, the National Museum of the American Indian; but before I do that, I'm going to show some of our work, and describe to you how I relate it to my native background. My native heritage is the backbone of my work and a foundation for my practice.

When I graduated from the University of Texas, I had this idea that I wanted to help and serve my people, my native people in Canada, but I soon discovered by spending a great deal of time with the elders, that I still had a lot to learn; it was just a very different learning process. The first thing they said to me was, *you know we don't want to have one of our own people tell us what to do, we've heard too much of that. We want you to listen to us, to have you bring our own dreams and visions to reality; we really want you to understand us more.* So I went through quite another kind of education with the elders; I went through all the rituals and the Sundance ceremonies of the Plains Indians of the prairies, and in a sense I learned to live more in harmony with the land, with myself, and with my own people.

That led me to a whole different way of applying my university training. The elders said to me, *you have to understand the creative process, that we human beings are marvelous, magical creatures with this power of creativity; no other species on the planet can create in this way.* Because my people are also medicine people and shamans, this idea of living in a magical world was very much a part of my own culture, my own being. They said, *if you want to bring your visions into the world, you declare them very powerfully like a sacred oath, and once you declare your visions, all you have to do is keep your word and those visions will occur.*

The problem with human beings is that we do not keep our word, and that's why our visions do not come into reality. The *word* is power, and if you are trying to create a different world, a better place to live in, you have to understand what creativity is all about. Creativity is creating something from nothing, so there's a great

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deal of power in the vacuum, in the nothingness. To explain this to me, the elders said, *if the Great Spirit is all knowing, and can take man's knowledge and just place it in the palm of his hand, that's what we know, that's what we are, that knowledge is definable, you can put it in books and computer chips. But from the tips of your fingers to the edge of the universe, that's what we don't know, that's what we have no idea about. Now, which domain do you want to play in? Do you want to play in the small domain of what is known, or do you want to play in that domain out there where true power exists?*

Creativity and new ideas are not derived from the domain of what is known, they come from out there, from the land of the eagle, where true power exists. There are very small possibilities in a small domain, but out there, that is where everything is possible. So, if you always come from *not knowing*, you have an opportunity to be much more creative; if you come from *knowing*, you have fewer possibilities. So always be willing to stand on the foundation of what you know and just leap out there, leap off the edge into the land of the eagle, where the true power of creativity occurs. So in taking that advice from the elders, I followed through and can show you some examples of my work.

First of all, as an architect studying the architecture of Washington around the Mall and surrounding monuments, you see rather marvelous examples of architecture from Europe, and some with their inspiration from the Middle East, or Greece and Rome. For the National Museum of the American Indian building, I wanted to look here in the Americas for inspiration, and see the beauty in the flora and fauna from here. After all, the Greeks developed their architecture from **their** environment, and they related their buildings to their plants, and to the proportions of male and female. I wanted the challenge of relating the buildings I did to our particular environment here in the Americas. The forms in the hills where I grew up, or the canyons and rock formations I saw when driving down from Alberta to Texas, these areas are much more inspirational to me than our cities in North America; I found them to be awesome places, and as an architect, Mother Nature is a great inspiration for me.

My first commission was a Catholic Church in Red Deer, Alberta. The priest wanted me to design a church around the new liturgy, without a crucifix or a cross. The church had to say, "I'm a Catholic Church with my roots in the past, looking to the future." I spent a great deal of time with the priest to bring his vision into reality. I studied the new liturgy very intently with him, and then I wrapped the building around the function, like a seashell around a sea creature, I evolved it from the inside out. It was very challenging because I only had a budget of $360,000 at the time, and I was to build this building completely furnished. Rather than build a wood building faced with brick, I used brick as a form and filled it with concrete like the Romans did, and as the brick layers went around, the concrete went around, and as we built the walls we completed it both inside and out. It was very economical and I treated it like a piece of sculpture (Fig. 1).

The biggest problem was that I had to build a roof to span 120 feet, and I could not solve the roof by having it all in concrete, that would blow the budget. So I thought I would use reinforcing as a form. As I was trying to figure out how to do that, because it was a totally amorphous roof, my elders said to me, *there's an infinite variety of solutions in nature; just go out and see how the Great Spirit has built all these wonderful forms and marvelous structures.* I saw a spider's web and thought that might be a solution for the roof, because a spider creates a form that spans an amorphous shape, and I had a 120 foot span out there. It had to be resolved rationally, so we looked at the mathematics and divided it all up into integrals and found out all the deflections. We had to resolve 81,000 simultaneous equations; you try to solve *x, y* and *z*, and that's three unknowns; try solving 81,000 unknowns; the mathematician said it would take 7,100 years to do it. I was told it was impossible at the time, and that was 1965.

It did seem logical and reasonable because we did it in the model, so what was the problem? Well, since we could not solve it mathematically, we could not solve it in terms of engineering. So, you know, my elders said to me, *when you want to do something, you declare that you are going to do it no matter what, and when you make a declaration, the universe shifts to it, because you create the possibility it could occur; if you don't declare it, there's no possibility.* We made certain that we were going to do it, so we kept building the walls. We knew we were going to come up with a solution for the roof because all our power of thinking was that we were going to have a solution, no matter what. The priest was very concerned and said, "Doug, this doesn't seem reasonable at all," and I said, "Well Father, you must have faith, this is a spiritual act."

All of a sudden we found an engineer with a solution, it was Swedish cables (Fig. 2); so we got a computer in Chicago, and people from the Cement Association showed up and all put their heads together and came up with a solution. Because we realized it was exciting to go out of the known universe and explore the possibilities, we were able to solve the roof. I wanted to solve it with a shell, so I used the steel cables to serve as a form and put the insulation on the under side, and then poured concrete in a spiral motion. When the concrete was set, I post-tensioned the concrete and lifted 250 tons of concrete in space, and it's still there. The roof closed the space like a tabernacle and made the church resonate like a cathedral, so when the priest says *Dominus Vobiscum*, I wanted it to sound like the acoustics in a seashell, in a spiral form. So anyway, that was my first major project and from then on I have had these amazing clients with amazing visions, and I have had the wonderful task of bringing their visions into reality, that's my job.

I had a college president in Grande Prairie, Alberta ask me to create an environment for learning; he had this vision for a college, so I went back to my elders for their advice on the project. It was OK to design a church to be a spiritual place, but what about a college? They said, *you have to understand that everything is a*

spiritual act. If you work with integrity, every project can be a sacred lodge. When we build a sacred lodge we make sure to offer tobacco to the willow spirit before we kill the willow, because we want to honor the willow that gives us its life to build the lodge. If you do everything with integrity, and honor everything that is, the building can have as much power as a sacred lodge. If you remember to consider the needs of the people in the space, the building can be a living being for these people in Northern Alberta.

When I started designing the college, I looked at it as an organism. Each room had its own genetic code, a certain function; light and acoustics, all of these things determine the shape of a room, and are important to consider to make a room function. We human beings are not just biological creatures with physical functions, we also have emotional needs, and are concerned with finishes, aesthetics and the environment of a space; it has to have a feeling, some beauty to it. So we determined each one of these rooms like cells and linked them together, and started seeing the building as a living organism. Working with the community, and the teachers, and the students, we evolved this form, this college on the river in Northern Alberta.

We used brick and fired it in a very warm texture because sometimes, you know, it's all white with snow up there, and we wanted the building to feel warm, warm as a blanket in the snow. In the north there are many months spent inside because it's so cold, so why shouldn't the insides of buildings be exciting places, rather than dull boxes. People should be put in boxes **after** they die. It's much more exciting to get the acoustical engineer and the theater people together in the room and evolve a design from their needs rather than create a box and then try to solve problems afterwards; it's like designing a violin and then tuning it, much more exciting (Fig. 3).

When a community in St. Albert, near Edmonton was told they were going to be taken over because the city nearby was going to extend its city limits to include them, they said, forget it!, we have our own identity. So then they wanted to build their own city hall, a cultural center, an arts and crafts building, a museum and performing arts center, all that stuff. Since the budget was to come out of their taxes, they all had a stake in the process. The whole community got together, and I had to work with each committee until there was a consensus for the designs. Building close to the river was a particular challenge because there is an underground river right under the building, a river outside and a river underneath, so we had to drive a bunch of steel piles all over the place and then build a big concrete raft over that, and then build the building on top so it wouldn't sink into the ground. I kept changing all the structural forms because I am always interested in seeing how different materials come together, and because I have a very short attention span.

At the time I was very much involved with Indian control of Indian education, for my own people, you know. They used to take our children and put them in residential schools and missions, it was just

a horrible place; we call the children of that generation a "lost tribe," because they were all shoved in where they couldn't speak the language and the culture was foreign. It was just another way, in those days, for the Canadian government to take over not only our lands and our rights, but even our own children, and our own future. However, I'd fought for Indian control of Indian education and self-government in the 1960s, and was able to assist the Indian Association, the Metis Association and the National Indian Brotherhood, as it was called at that time, to get recognition and government policy changed so we could take control of our own education.

I had worked with the reserves and was able to do quite a few programs for them, but at that time the Department of Indian Affairs of course wouldn't allow me to play architect in the reserve because they were too threatened by me politically. So what I did was I accepted a commission from a local bureaucrat in Alberta, who is not a friend of the Indian people, and I built him a headquarters for his opportunity company, so his bureaucrats could work in a beautiful environment, and might thereby become more sensitive to their constituents, and better serve the needs of the people there.

It was very strange what happened in my career after that; first of all, I had by then developed a process of working with people in which I listened and wrote down their needs, and then developed consensus, which is our approach in all our councils, the way we work. We always gather in circles and discuss things together, we don't operate by the dictatorship of the majority, we operate by consensus, and I used that same model in serving my own people. What happened was that the governments and its institutions began asking me if I would also work with them using the same model. I ended up getting larger and larger commissions, because I was able to do these buildings and gain consensus from people, rather than, you know, creating a lot of adversity.

When the young people of Alberta wanted a space sciences center to celebrate the future, we put one together for them (Fig. 4). It was all out of white metal and we used components from all over the world; actually we went to East Germany (as it used to be called) and got the optics for the star protector, and we got the seats in Paris; we pulled components in from all over the world. It was our seventh building on the computer. The more I started working with these very organic shapes, the more of a problem it became to define these shapes for building purposes; it was like trying to define the human body dimensionally, you can't dimension it with rulers, you know, it's a series of dots and spaces, so how do you define them? When we did the Grande Prairie College we had to be mathematicians to figure out all the curves and everything, because we had to build the steel to the curves, etc., so we were always doing descriptive geometry, and sines and cosines; it was such a lot of work, it took about six guys just to do all the layouts for the contractors.

So in 1978, I had this dream where I thought, my goodness, you know with computers we could have this building totally visualized and automatically

dimensioned, because it's just logic, why can't we have the computers do it? I went everywhere and everybody said it couldn't be done, so I went back to Texas where everything is possible, and of course the Texans said sure, if anybody can do it, we can do it. They all got together and developed the software for me to layer all the different engineering components, and automatically dimension all the curves; it was an amazing tool at the time, and cost $250,000 for 512K, you know how much less it costs today. I brought all this equipment back to Canada and totally computerized my office, which was probably the first architect's office in North America to be computerized.

I really needed to do that because the more I petitioned for my own people, the more people started looking at me like I had a bone in my nose or something, like who is this stone age character trying to play architect. People would say, who is this Indian, are we going to give him millions of dollars of our own money and have him play with it? So I had to create another image to really bend their heads. I thought, why not become the most advanced technical office in North America? Then they would come into my office and find all this space age equipment. If I can have eagle wings at times, why can't I have computers too? Society demands you turn your back on your own people, on your own culture, your own drums and songs to be civilized. Give me a break, like who is civilized?

I did not find this concept hard to accept, but my office did. What was I doing with computers, they would say, architects are artists. Nobody saw the possibilities, they wanted to stick to their known universe of drafting boards and pencils, T squares and triangles, all that stuff. They were comfortable there. But I wasn't going to spend all this money on computers and have them not used. I thought, well, if Hernán Cortés succeeded in driving his men forward because he burned his ships, I would burn the ships in my office. So I just threw out all the drawing boards and pencils, and put in computer terminals. I said, there's one way to go, we have a deadline, here are the computers, let's go for it. Our first building created on the computer was St. Albert Place, and in no time, our staff was singing along, and we have never looked back.

When I was building all these other things, I lived in a one bedroom apartment, so when I had the money to build my own house, I sort of overreacted (Fig. 5). This house out west is underneath a hill, so it's heated by the earth and by the sun. It turns its back on the north cold, it is minus sixty degrees there sometimes, and it has a large atrium that looks out to the south. We were about 75% finished with this dream when we ended up winning the competition for the Canadian Museum of Civilization in Hull, Quebec, on the Ottawa River.

The museum site is surrounded by the National Gallery, the Parliament building, and the Supreme Court, and they were supposed to have this nice Mall, but of course they compromised their vision, so it ended up being a series of boxes in a group. We got together and decided that the capital should be sort of joined, Quebec

on this side and Ontario on this side, the French and the English in a circle, with the federal buildings around the circle. We have these two so-called "founding" nations, and I question that as an aborigine, with their backs to each other, and the Ottawa River in between. I felt that the museum should respond to this community and also look and open itself to the capital with its different zones, and take advantage of this marvelous Ottawa River.

When we heard about the project, we already wanted to be the architects selected, so we went into the lodge with the elders, and they said, *it is very important that this building be done right because it houses all of our history and the bones of our ancestors, so we want you to make certain that we have a proper vision for all the people of Canada.* I was able to put together a vision which the Prime Minister and the selection committee really liked. I was concerned that the Prime Minister might not approve it because I had fought him on native rights for over ten years. (Once I came to Ottawa with 10,000 Indians and gave him a hell of a time.) But when it came to the commission he just invited me to his office and said, if you make the same commitment to my vision as you did to your people, we'll all have a good museum, and he ended up as my best client.

It is strange how things happen. When I walked on the site with the elders, they said, *you have to understand, there is already a building here, it just happens to be in the future. Understand that you are the grandchild of all the grandfathers that came before you, and you are the grandfather of all the grandchildren that will come after you, so within you is all the past, the present, and the future. So when you walk on this site, the building is already here, it's just in the future, and it's up to you to reveal it.* You have to see the magic when you walk on the site, and feel the power centers, so that is exactly what I had to do, and I sketched those centers and forms.

The project entailed joining together the collections of sixteen museums in Ottawa that were all sort of deteriorating. They wanted to have one place to put all the artifacts, so this building was to be over one million square feet, divided into twelve separate buildings. Each building had to vibrate differently because it is in an earthquake zone, and the environmental conditions had to be like an operating room throughout, because of the conditions required to protect the artifacts.

The collections are on one side, the administration on the other, and exhibits on another side. One is a more female building, and one is more male. Between the male and female forms is water, the source of life, and the building itself evolved from working very closely with all the people in the museum. We had to make eighty presentations before we got a consensus for the design. We were working night and day beginning in February 1984, and I think it was November when we had a consensus. The Prime Minister railroaded it through the Cabinet in one day, and then came out and said, you have to start construction tomorrow. I said, that's impossible, it would take three years just to do the

drawings, and he said, well that might be true, but I won't be around then, so you have to start construction tomorrow.

I was given a cast from Montreal who had never worked on my buildings before, had never worked with computers before, some of them had never even worked before, they were just friends of the Prime Minister's. It was really challenging because since they have legislated against English in Quebec, they all spoke French, and we had to have an interpreter. I gave them my computer base and we soon spoke the same language, Fortran, and we just went for it. We had two hundred separate general contractors to coordinate, because every time we did drawings, we had to put them out for tender, whether for just piles, grade beams, or slabs, it just kept on going; it was mass chaos. We had some 15,000 drawings on the computer as we pulled this thing together. It took seven years of working twelve to fourteen hours a day to do it. The elders wanted us to design a building that grew from the earth and looked as if it was carved from nature, with male and female forms entwined with nature. They wanted us to see our relationship with nature in the building, both in the present and in the future.

The cantilevered forms were a real challenge to the engineers. They said, it can't be done, and I said, well we'll just have to find some other engineers who can do it, and they said, well if anybody can do it, we can do it. We had to create a big dome that sort of just rotates off and out of the way, so that the Imax screen can come out and rise up seven stories. All of these challenges had never been met before; we had to create the computer technology and software to be able to make the mechanical systems in the building work, everything had to be created from scratch.

We wanted to make certain (and this is where I agreed with the Prime Minister, {I never agreed with him on anything else, particularly Indian policy}), that all the cultures of Canada would be represented here. By learning about other cultures, and by understanding and accepting other points of view, we become broader human beings. If you accept somebody else's point of view, you're twice as large, because you have twice the width and twice the depth. So he wanted that illustrated in the museum where the cultures would all be alive and well and functioning together; he called it a mosaic of cultures. I was in complete agreement with his vision, and so we created this museum around that vision.

The Grand Hall is the length of a football field (Fig. 6). What happened was that the English and French were fighting so much about who should be in the Grand Hall, we all settled that the Indians should be there. We created a large west coast village with a 200-foot long screen of the west coast forest floor, which can electronically project all sorts of spirit images through the forest. The dome was painted by a friend of mine; we used to do sweat lodges together out in the prairies, and when we were kids, we dreamed of having our work in the same building; we were able to accomplish this in the Canadian Museum of Civilization. We also built smaller buildings within the larger buildings that are meant to represent

the contributions of all the immigrant cultures over the past one thousand years, and here were represented the Vikings, and the French and the English.

Everything is triple glazed on the outside to cut the ultraviolet rays, and to make certain that we didn't have condensation on our high humidity surfaces, there is air blowing across the glass; this is all very high tech stuff we had to solve. We used the river water to heat and cool the building, which then comes out through the fountains, and by the time it gets back to the river, it's the proper temperature and doesn't pollute the river. So you can see the use of the water here, the Ottawa River, the cascading waterfalls, the source of life. At the opening there was a great celebration.

We have done some work in Saudi Arabia with the people there; we sat in the desert and read the Koran, and got some visions for the project. When I went to the Institute of American Indian Arts in Santa Fe, New Mexico, they wanted me to develop a vision for them with their elders. We had elders coming from all over the United States, and they stated their vision for this educational center that would really teach the people about their own culture and arts. It was Pueblo Country and quite influenced by the host nation and the Santa Fe environment. The overall design incorporated the relationship of the sun and the moon, the solstice, and the way breezes would flow through the building.

The village community of Oujé-Bougoumou won a United Nations Award. I worked with their elders very closely. They would state their vision, and I would turn it into words, making certain that whatever was done on paper was exactly what they had said, and then I transferred that into images. I'd always feed back to them until they were completely involved in the design process, and in that way, we constructed the village. I am also working with the elders in Northern Saskatchewan to develop a university where the buildings open out towards the south; the migratory animals travel north and south, so since that's their source of life, opening to the south is more important than anything else.

When I was commissioned to be the design architect on the National Museum of the American Indian here in Washington, D.C., with my partners in Philadelphia, GBQC, the first thing I did was request that we have a vision session with the elders from all over the Americas. They came to Washington, and we gathered together in a circle; each person determined what they felt was a vision for this building on the Mall. We passed an eagle feather around, and each person spoke. In this process, each person is respected for what they say, and indeed we invite people that don't agree with us, because if everybody agrees with us, we only have half a knowledge; so we make certain that the circle is wide, and we get many points of view, and the truth lies somewhere in the center. As people speak, more and more you can see an underlying sort of agreement, or consensus, a direction.

It's been my job for my people for many years to find that, to sense that, to listen to everybody and then say, do you mean this? until their ideas are incorporated into a document that is all

inclusive, where there's a bit of everybody in it, but it follows the same direction. We don't speak from our heads, we speak from our hearts, and once we get our vision down, we declare it. Our Plains culture teaches us that your word is your sacred oath, and if you keep your word, then your visions occur.

That's how the architect and the design team work with the consultants and the constituents, we all work together and keep cycling back, making certain it's not quite a linear process; that's the process for the museum on the Mall project. The museum's theater, for example, is not a Greco-Roman gathering space, it's a Native American gathering space, so the challenge was to bring these ideas here to this very classic setting on the Mall.

When we first looked at the Mall site, we saw that a creek ran through it at one time. We wanted the feeling of water, and to bring back some of the wetland flora that was there before they put in a big grass mall, to bring a hint of the past back to the Mall. Then we started sculpting the building. The elders, of course, wanted the building to relate to nature, to rock forms, and to appear as though it came from the earth. The west elevation faces the National Air and Space Museum, and most people will enter from that side. We will have big rocks as part of the landscape, and as you walk along, water will be coming down; the building looks as if it's been carved by water. The water will lead you to the entrance, and as you approach, you will see these ledges reaching out and protecting you. Most of the buildings on the Mall are more male and don't provide shelter until you are inside; the people wanted this building to be more female and nurturing, to reach out and protect you from the sun and the weather as you are coming into the building (Fig. 7). It's a very exciting project and we look forward to having it finished in 2002. So that's our whole design process, and we are right in the midst of this project.

And now, if you have any questions, I'll be happy to answer them.

***Question*:** Do you classify your work in a certain style?

***Answer*:**Well, I don't really try to classify my work into any style, I just respond more or less to my own background and to the challenges of each project; I nurture ideas and just let it happen. I am often surprised how they turn out because what I first think is completely different than how it ends up. I don't come with a preconceived idea, because that closes up possibilities; I allow the designs to evolve. I don't know how to classify my work, and my fellow professionals are exactly the same; they just scratch their heads and wonder how they can classify my work as well.

Question: How many buildings have you done all together?

Answer: I don't know, maybe 120 or so; I've been really busy. I started my practice in 1964 and I'm a workaholic, because I love my work. If I had two weeks to live, I'd do exactly what I am doing.

Question: What is the plan for involving Native Americans in the administration of the new museum?

Answer: The Director is Native American, and they have Native Americans involved in exhibits, and as curators throughout the National Museum of the American Indian. Their commitment is to have Indian people tell their own story, rather than have other people tell the story of the Indian people. Now, this is rather revolutionary, because there are so many people who take courses in Indian studies and set themselves up as authorities on us.

Question: You said that during the consultation process for the new museum, elders came from all over America. Did they also come from Latin America?

Answer: Yes, we had representatives from South America, Central America, and North America. The building is to house artifacts from all over the hemisphere and it will be the first time in 500 years that the aboriginal people of the Americas will have such a strong presence in the nation's capital, so it's a tremendous window of opportunity. It was a marvelous process to go through with the elders; first we talked about the horror stories of all our tribes and what has happened to us over the past 1200 years; it was very hard to get past that, but the elders said, *you have to understand that this is a very wonderful opportunity we have, and we want to show our contribution. Yes, we have a very difficult history, but we have survived, and the museum should be a place of celebration, a place of sharing, a place of showing our contribution. We cannot be perceived as victims, because that does not honor our people; we have to get off that, we have to forgive. When we want to bring people into this place, we want to feed them, house them, and provide warmth; we want them to have an idea of the kind of people we are as Native Americans, what we are about.* We want to break all the stereotypical images, and we have worked hard to get away from being displayed next to the dinosaurs in the Museum of Natural History. We've made great contributions, 60% of all the food people eat in the world today comes from Native American agriculture like corn, squash, potatoes, all of those things. Even the American Constitution is very close to our great book of *Laws of the Six Nations*, with the difference that our Great Law has women's rights, and certain ways on how to choose a leader. So we would like to tell our story, and the story has always been told by someone else, never by us.

Question: Is there a specific component in the museum design, from a specific region?

Answer: The elders wanted us to *catch the spirit*. One of the matriarchs who came here said, I want you to make a west coast lodge, but not a west coast lodge; what she meant was I don't want to be ethnocentric, forcing our west coast culture on you, but I want you to catch that spirit; so then it became a question of what spirit would we capture: for one, the love and appreciation of the land, the feeling that we and the earth are one; and then there was the

symbol of the gathering place, that it should be open in the four directions of heaven and earth. Everybody felt that we share the symbol of the rising sun to the east, so we wanted our entrance to lead us to the east, to a new dawn, a new era, which then again faces the Capitol building. Natural rock forms give us the feeling of being in the earth; water reminds us we are near the Potomac River. They wanted the building to relate to the sun and the moon, because we are not just earth creatures, we are also related to the heavens. And because the heavens have guided our harvesting, the constellations and the rhythms of the sun and moon are very much a part of who we are. All these things were held in common, so we reinforced the common things we all share throughout the building.

Question: When you design, do you take hand drawings and pictures and scan them into your computer?

Answer: I always work with models because computers are flat-screened and don't have depth; they are always a 2-D version of a 3-D image. Even if they call a computer image 3-D modeling, it's not because you don't get the depth. So I work with models in clay and then go to computers. I sketch computer drawings over and over again. I may change a curve a thousand times and drive people crazy until it is exactly in that particular form, that particular shape I want, and then I put it in memory where it can be calculated because we have to build it out of steel and stone and concrete. I find that we have to do three times as many drawings as anybody else to be able to keep our costs down, because we have to guide all of the contractors, subcontractors, and suppliers, and work very closely with the construction industry. They have to understand how they can build these things and still be cost effective, or else we'll blow ourselves out of the water economically, since we have to compete with the "boxes."

Question: How do you convince people to accept these designs?

Answer: I think it comes with the vision. When we had this cast of thousands from Montreal building the Canadian Museum of Civilization, we also had a revolving door of ministers and a Prime Minister who resigned half way through the project. It was a completely impossible project, and the only way for us to pull the whole thing together in the midst of the chaos was to look to the vision. There were three teams: our Quebec team, our Alberta team, and our Upper Canada team. These three regional factions are tearing the country apart, so instead of throwing stones at each other, we had to build with the stones. We declared a vision in which we all believed, it was almost like a motherhood issue: how can you deny a commitment to excellence for all the people of Canada, are you going to argue against that? We never sought agreement, we sought alignment to a common vision. You see, because that's so Indian; anybody who is a warrior would rather be beaten to death than be forced to agree with another human being. So we seek alignment, we agree to be aligned.

The elders started us off with a very strong vision for the National Museum of the American Indian, however there are many agendas for this project. There is the Architect of the Capitol, there is the finance committee, the National Capital Planning Commission, the Historic Preservation Review Board, the Smithsonian Institution, the National Museum of the American Indian, it goes on and on. Everyone agrees that the elders' vision is very powerful, and speaks to the heart no matter what culture you are from, and that binds everyone together. It's amazing that in Washington, D.C., which is a thoroughly controversial and adversarial kind of town, when we followed the direction of the elders, we had unanimous approval from all the agencies to proceed with construction, so I'm surprised at how well it works, no matter in which culture.

Question: When did you decide to become an architect?

Answer: Well, it was a challenge for me because I used to follow my father on the trap line, he was a trapper and a hunter. It was my mother who always said that I would be an architect, even though I didn't know what that was. So I knew when I was six years old, because she kept telling me that I was going to be an architect.

Question: Did you find the idea of building the last museum on the Mall a little daunting?

Answer: Oh yes, one has to consider that the Mall started around 1780, so there's a whole history of how it should be. This is the last piece on the Mall, so it has to fit, and complete the overall composition (Fig. 8). What we did was we put together a shape of a certain size that would complete the Mall. It was like carving an aboriginal sculpture from a block of stone, you just carve away enough until a powerful icon emerges, but you can still see the shape of the stone. That was the challenge of the Mall: to have the new museum balance with the surrounding classical compositions, and yet still have a powerful voice for our people.

Question: What do you think of the name of the National Museum of the American Indian?

Answer: I don't know, some people are unhappy with the name. I mean, even the name "Indian"; just because Christopher Columbus was looking for India... What if he had been looking for Turkey, we'd all be Turkeys.

Douglas J. Cardinal is of Blackfoot Indian ancestry, and was born in Calgary, Alberta on March 7, 1934. He received his Bachelor degree in Architecture from the University of Texas at Austin in 1963, and began his practice in 1964. In addition to his many building projects, he is frequently invited to lecture all over the world, and to serve as a juror for international design competitions.

His many honors and awards include the Canada Council Molson Prize for the Arts (1992), the Great Canadian Award (1992), and Officer of the Order of Canada (1990). The Oujé-Bougoumou community in Quebec, which he designed, won the "We the Peoples-Fifty Communities" United Nations Award in 1995. He has received honorary degrees from Carleton University, Trent University, University of Lethbridge, University of Windsor, University of Calgary, and the Massachusetts School of Art.

His work has been displayed at the Liege and Mons Exhibition in Belgium, and at the Museum of Modern Art, in New York. Numerous magazines have carried articles on his work, including *Smithsonian, Canadian Geographic, AWARD, Time Magazine, L'Archaedizioni, Obras, Building Design, Design Journal, Architectural Record,* and *Arts Canada.*

LIST OF PROJECTS

OFFICE/ADMINISTRATION

Castor Provincial Building, Castor, Alberta	1968
Provost Administration Building, Provost, Alberta	1971
Ponoka Provincial Building, Ponoka, Alberta	1976
Dakota-Ojibwa Band Office, near Brandon, Manitoba	1976
Spruce Grove Multi-use Building, Spruce Grove, Alberta	1981
Dental Building, Spruce Grove, Alta	1980
Parada Office Building, Edmonton, Alta	1982
Thunderchild Band Office, Thunderchild Indian Reserve, Saskatchewan	1983
St. Albert Place, St. Albert, Alberta	1983
M.D. Realty Office Tower Study, Ottawa, Ontario	1986
NCRPO Office Fit-Up, Ottawa, Ontario	1991
York Regional Administration Centre, Newmarket, Ontario	1992/4
Oujé-Bougoumou Band Office, Chibougamau, Quebec	1993
Oujé-Bougoumou Business Centre, Chibougamau, Quebec	1995

HEALTH

Oliver Infirmary Building, Oliver, Alberta	1969
Stettler General Hospital, Stettler, Alberta	1970

Rocky Mountain Spa, Osoyoos, B.C.	1970
Poundmakers Lodge-Alcoholic Rehabilitation Centre, St. Albert, Alberta	1974
Bonnyville Indian-Metis Rehabilitation Centre, Bonnyville, Alberta	1975
Beaver Lake Detox. & Rehab. Centre, Beaver Lake Indian Reserve, Alberta	1984
Oujé-Bougoumou Health Clinic, Chibougamau, Quebec	1994

RESIDENCES - INSTITUTIONAL AND PERSONAL

Parsons Residence, Alberta	1963
Guloien Residence, Alberta	1964
Weir Residence, Alberta	1968
Millwoods Public Housing Concept, Edmonton, Alta	1970
Gibeau Residence, Alberta	1975
Isolated Communities Home Program for Alberta Housing, Government of Alta	1976
Van Stolk Residence, Alberta	1976
Grouard Housing Project, Grouard, Alberta	1978
Grotski Residence, Alberta	1978
Slave Lake Senior Citizens Residence, Slave Lake Indian Reserve, Alberta	1978
Taylor Residence, Alberta	1978
Cardinal Studio, Stony Plain, Alberta	1982
Onion Lake Elders Home, Onion Lake Indian Reserve, Saskatchewan	1983
Minto Luxury Condominiums-Centerpoint Study/ Concept, Nepean, Ontario	1986
Burk's Luxury Condominium Study/ Concept, Toronto, Ontario	1986
Oujé-Bougoumou Elders Residence, Chibougamau, Quebec	1993
Oujé-Bougoumou Teachers Residence, Chibougamau, Quebec	1993
Oujé-Bougoumou Nurses Residence, Chibougamau, Quebec	1994

EDUCATIONAL FACILITIES

Diamond Jenness High School, Hay River, Northwest Territories	1972
Ile a la Crosse Elementary School, Ile a la Crosse, Northern Saskatchewan	1975
Kehewin Elementary School, Kehewin Indian Reserve, Alberta	1975
Precam Elementary School, Lac La Ronge, Northern Saskatchewan	1976
Saddle Lake Composite High School, Saddle Lake Indian Reserve, Alberta	1976
Grande Prairie Regional College, Grande Prairie, Alberta	1976
St. Teresa Elementary School, Edmonton, Alberta	1981
Muir Lake Elementary School, Muir Lake, Alberta	1981
Pelly Crossing Elementary School, Pelly Crossing, Yukon	1981
Churchill High School, Renovations and Addition, Saskatchewan	1982
Spruce Grove Composite High School, Spruce Grove, Alberta	1982

Holy Trinity Catholic High School, Edmonton, Alberta	1984
Kipohtakaw Education Centre, Elem. & High School, Alexander Indian Reserve, Alta	1984
Grouard Elementary & High School, Grouard, Alberta	1985
Garden River Elementary School, Garden River, Alberta	1985
Paddle Prairie Elementary School, Paddle Prairie, Alberta	1985
Loon Lake Elementary School, Loon Lake, Alberta	1985
Chipewyan Lakes, Elementary School, Chipewyan Lakes, Alberta	1985
Oujé-Bougoumou School, Chibougamau, Quebec	1993
Saskatchewan Indian Federated College, Regina, Saskatchewan	In progress
Kianai Middle School, Blood Tribe Indian Reserve, Alberta	1995

HOTELS

Oasis Inn Study, Ponoka, Alberta	1975
Arctic Gardens Hotel Study, Grande Prairie, Alberta	1977
Oneida Hotel & Casino, Oneida Indian Nation, New York	1997

THEATERS

Grande Prairie Regional College, Grande Prairie, Alberta	1976
Spruce Grove Composite High School, Spruce Grove, Alberta	1982
St. Albert Place, St. Albert, Alberta	1985
Edmonton Space Sciences Centre, Edmonton, Alberta	1984
Canadian Museum of Civilization, Hull, Quebec	1989
Oneida Hotel & Casino, Oneida Indian Nation, New York	In progress
Kahnawake Tourist Village, Kahnawake, Montreal	1997

STUDIES/MASTER PLANS

Fort McMurray Vocational Training Centre, Fort McMurray, Alberta	1969
Rocky Mountain Hospital Study, Alberta	1969
Spirit River Hospital, Alberta	1969
Indian Education Centre Offices, Edmonton, Alberta	1970
Masterplan for Indian Education in Alberta	1970
La Ronge Education Masterplan, Lac La Ronge, Northern Saskatchewan	1974
High Density Townhousing Study	1974
James Smith 15-Year Comm. Devel. Plan, James Smith Indian Reserve, Sask.	1975
Kehewin Village Development Masterplan, Kehewin Reserve, Alberta	1975
Onion Lake 15-Year Comm. Devel. Plan, Onion Lake Indian Reserve, Sask.	1978
Thunderchild 15-Year Comm. Devel. Plan, Thunderchild Indian Reserve, Sask.	1978

Saddle Lake 25-Year Comm. Devel. Plan, Saddle Lake Indian Reserve, Alberta	1978
Cold Lake 25-Year Comm. Devel. Plan, Cold Lake Indian Reserve, Alberta	1980
Blue Quills Native Education Centre, St. Paul, Alberta	1982
Kipohtakaw Education Centre Masterplan, Alexander Reserve, Alberta	1984
Victoria Island Aboriginal Centre, Ottawa, Ontario	1990
Oujé-Bougoumou Village Masterplan, Chibougamau, Quebec	1991
Institute of American Indian Arts Masterplan, Santa Fe, New Mexico	1993
Sask. Indian Federated College, Strategic Plan and Regina Campus Master Plan	1993
Penticton Indian Band, Community Master Plan, Penticton, British Columbia	1993
Penticton Indian Band School (K-12) Concept, Penticton, British Columbia	1993
En´owkin Centre Adult Education and Cultural Centre	1993
Gwich´in Territorial Park, Gwich´in, Northwest Territories	1996
Minnesota American Indian Aids Task Force, Vision Plan, Minneapolis, MN	1996
Kahnawake Tourist Village Master Plan, Kahnawake, Montreal	1996

INSTITUTIONAL ORGANIZATIONS

Alberta Liquor Retail and Wholesale outlets, Red Deer & Lethbridge, Alta	1968/70
Slave Lake Drop-in Centre, Slave Lake, Alberta	1978
Edmonton Space Sciences Centre, Edmonton, Alberta	1984
Mannawanis Native Friendship Centre, Bonnyville, Alberta	1985
Arriyadh Science Complex Design Competition, Riyadh, Saudi Arabia	1988
Canadian Museum of Civilization, Hull, Quebec	1989
Natl. Museum of New Zealand Design Competition, Wellington, New Zealand	1992
National Museum of the American Indian, Washington, D.C.	In progress

RELIGIOUS

St. Mary´s Church, Red Deer, Alberta	1967
Terrace Church Study, Terrace, British Columbia	1972
Aylmer Jehovah´s Witnesses Kingdom Hall, Aylmer, Quebec	1991
Oujé-Bougoumou Church	1995

SOCIAL CENTERS

Oujé-Bougoumou Business Centre	1994
Kainai Multi-purpose Cultural Resource Centre	In progress
Children and Elders Centre, Oneida Indian Nation, New York	In progress

OTHER

Design Studio, Leighton Colony, Banff School of Fine Arts, Banff, Alberta	1985
Design Concept, Water Tower and Convention Centre, Damman, Saudi Arabia	1988
Petro-Canada Service Station, Hull, Quebec	1990
Recreational Vehicle Park, Oneida Indian Nation, New York	1994

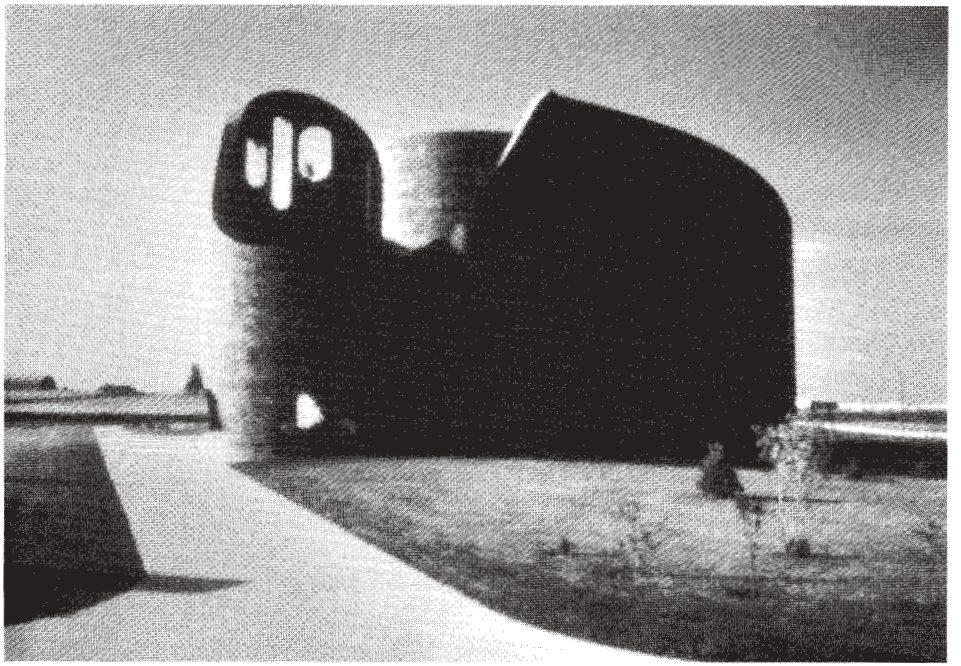

Fig. 1. St. Mary's Church, Red Deer, Alberta, 1967.

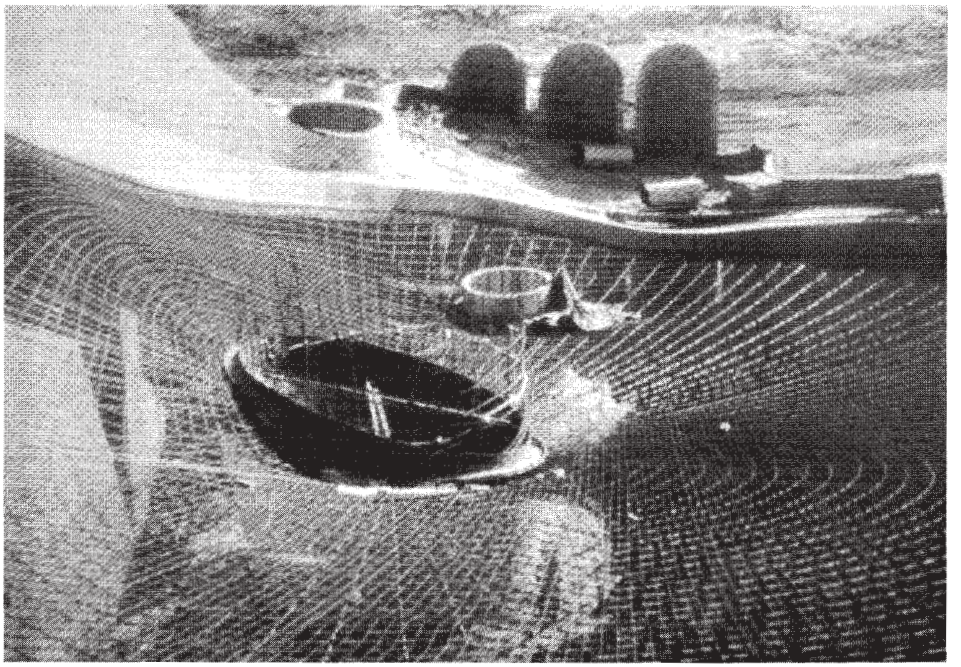

Fig. 2. Constructing the roof of St. Mary's Church.

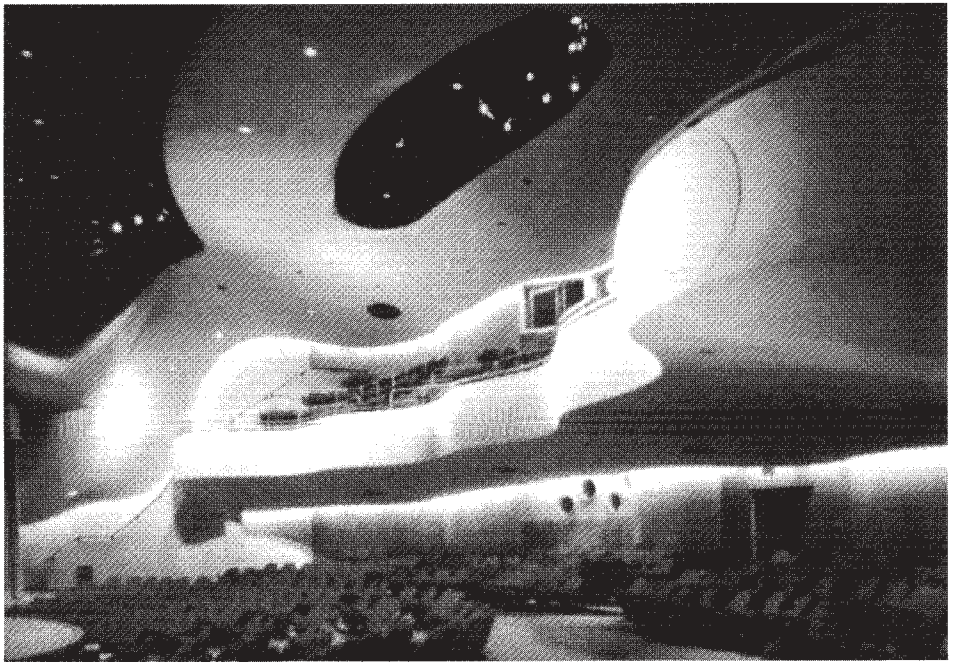

Fig. 3. Theater of Grande Prairie Regional College, Grande Prairie, Alberta, 1976.

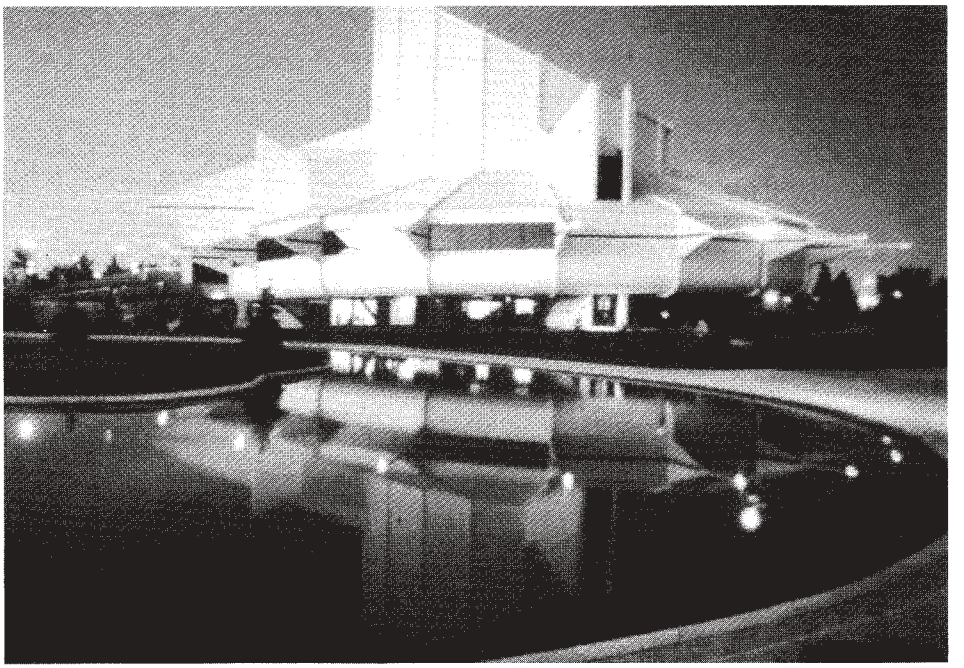

Fig. 4. Edmonton Space Sciences Centre, Edmonton, Alberta, 1984.

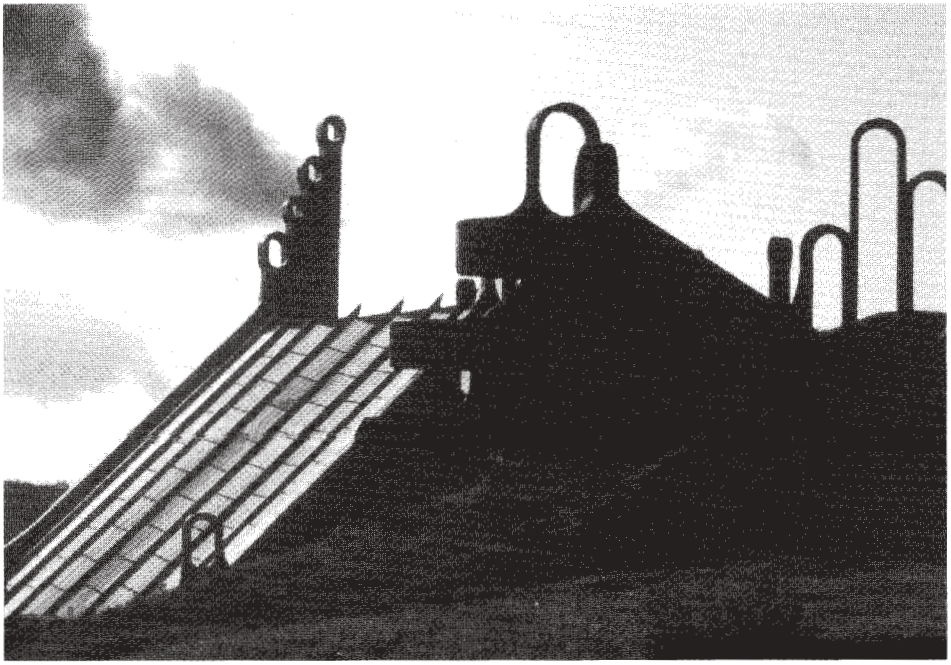

Fig. 5. Cardinal Studio, Stony Plain, Alberta, 1982.

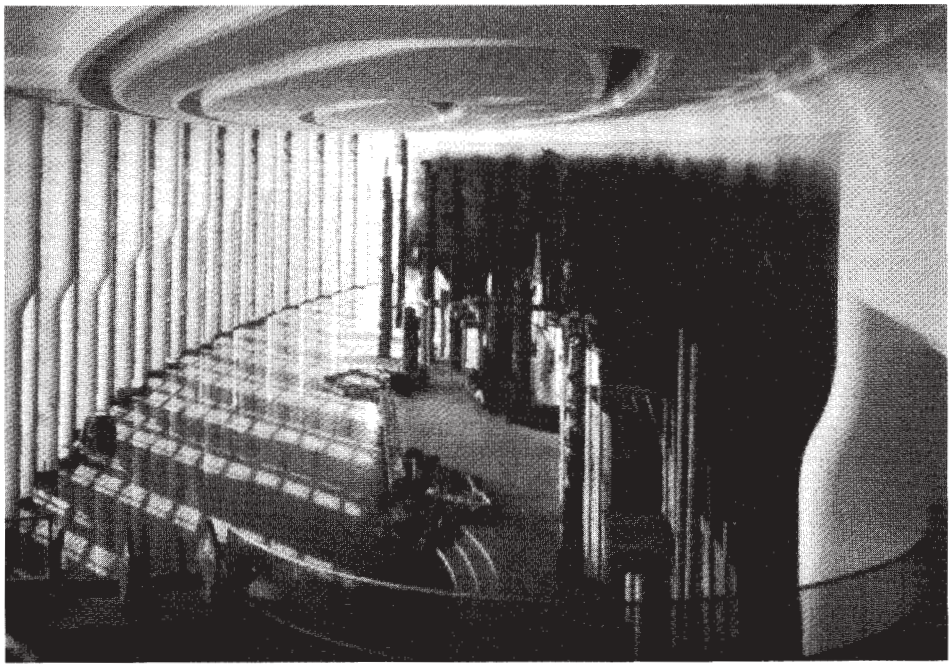

Fig. 6. Grand Hall, Canadian Museum of Civilization, Hull, Quebec, 1989.

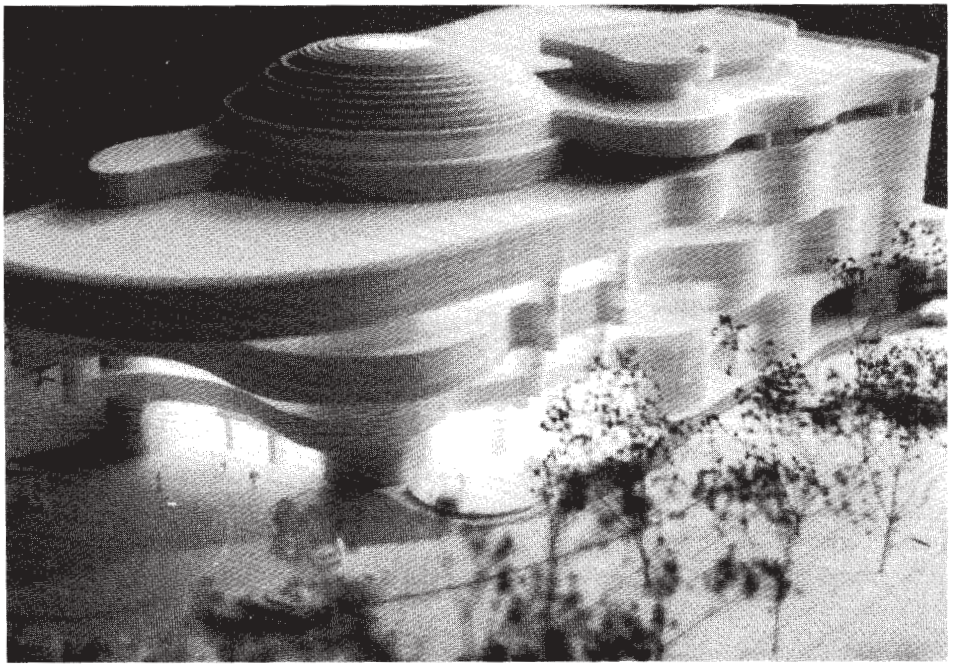

Fig. 7. 1996 model of the National Museum of the American Indian (NMAI).

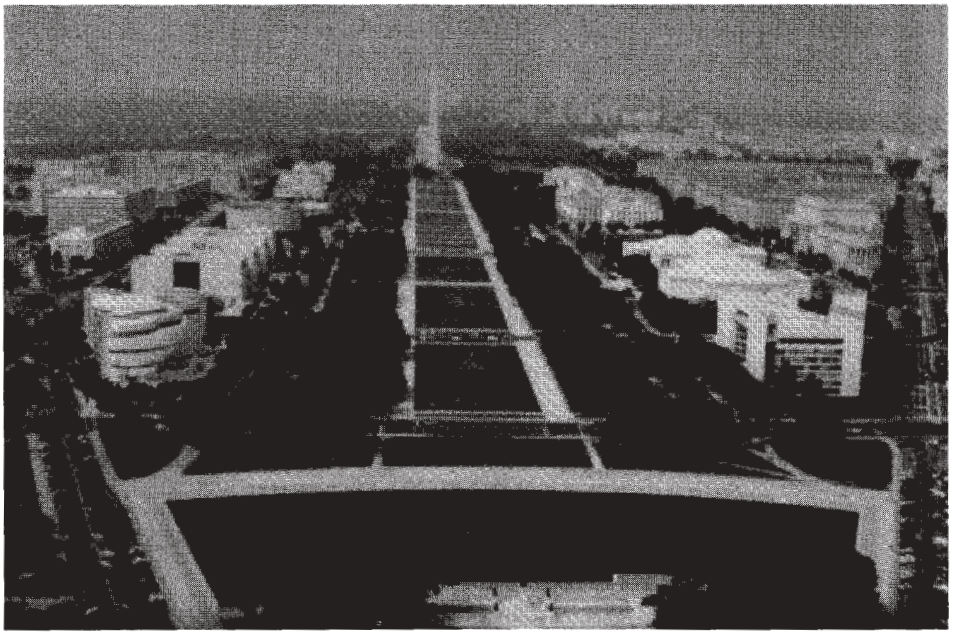

Fig. 8. Mall of Washington, D.C. with model of the NMAI superimposed on lower left.

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1300 New York Avenue, N.W.
Washington, D.C. 20577
U.S.A.

Tel: (202) 623-3774
Fax: (202) 623-3192
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