American Indian Science

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Paper presented to 46th Congress of the Americanists
Amsterdam, Holland. July 4 - 8. 1988

INTRODUCTION

Until the present time, we have had to stretch Western science so far that knowledge about Indian culture seems unreal. Research has been perceived and presented as mono-cultural, thus not accepted by the Indian community. All peoples including Native Americans have science or a way of coming to knowledge; each tribe has its specific methods, but for the purposes of introducing the concept of Native science, we will deal in generalization about "Native" metaphysics.

Reflecting on the implications of "sciences", it is clear that a bicultural research model recognizing both Indian science and Western science needs to emerge. Newly evolved Western research methods such as ethnographic research, content/issue analysis, and the framework of Participatory Research can be drawn upon to complement or meet Indian science and culture.

Traditional Indian science must be articulated in contemporary terms to permit scholarly exchange growth and to empower Indian people in the scientific arena. Further, an integration of Western and Indian ways of thinking must occur if we are to develop research strategies and outcomes which are acceptable and respected by both cultures. ("Integration" refers to a blending of research findings, not the domination or extension of ideological control by one culture's science).

A bi-cultural research model must be both valid and reliable; strengthen traditional Indian science and enhance cross-cultural communication and understanding, and simultaneously promote the growth of both sciences. This paper will present an epistemological foundation of Indian science and will explore the possibility of creating a scientific, intercultural, infrastructure.

PHILOSOPHY

INDIAN SCIENCE

"...This is what Raven did for us...The shelter is the tree..."

Indian science, often understood through the tree, is holistic. Through spiritual processes, it synthesizes or gathers information from the mental, physical, social and cultural/historical realms. Like a tree the roots of Native science go deep into the history, body and blood of the land. The tree collects, stores and exchanges energy. It breathes with the winds, which tumble and churn through greenery exquisitely fashioned to purify, codify and imprint life in successive concentric rings - the generations. Why and how the tree does this is a mystery but the Indian observes the tree to emulate, complement and understand his/her relationship to this beautiful, life-enhancing process.

The Meaning of Science

To the Indian, the tree is the first spirit or person on Earth. Indeed, the tree which oxygenated Earth's atmosphere, is the precursor to our human existence. Because of its antiquity it is a respected Elder but the greatest power of Native Science lies in the reasons behind the tree's existence.

When discussing the origins of the tree Chief Donawaak, Tlinget Elder says:

> *"This is where stories begin, there is no story before this...When Raven spirit and Black Raven are working on this land, they put coves in it where you can come in when it's blowing - a place where you can come ashore.*
>
> *My Great Grandfather who told this story to me said - the cove is where you're going to be safe. If you pass that harbour you're not going to go very far...you will tip over or drown. But if you come to the cove you will be safe. This is what Raven did for us. The shelter is the tree. You could get under the tree and stay there overnight. All this is what the Raven did...(Colorado, 1985)"*

From these words we see that Native science has a sacral basis and that its teachings are grounded in the natural world. The Navajo and the Natural World are one; he expresses that unity in this way:

> *The foundation, you have to know your roots, where you are coming from. It is understood that we all come from God, God created us. But you have to understand in your own Indian way, where your roots are. You see a tree that is weak, about to give up. Sometimes you find people like that. Why is that tree just barely making it. Because the roots are not strong. If the roots are solid and strong, then you see the tree is strong and pretty. It can withstand cold, hot weather and winds. The human, has to have those roots because we are growing*

too. The Great Spirit put us here with nature. We have to understand the nature. That is why we understand how an animal behaves. That is why we have to talk to them. We don't pray to them, we talk to them because they breathe the same air we do. We are put here with them. We are also a part of the plant life. We are always growing, we have to have strong roots. (Colorado, 1985)

Indeed all of life can be understood from the tree.

...just after the earth's crust was formed Raven (the Creator) made the tree. Why did he make this tree? He made it to shelter us. Even before Raven broke light on the World, people took shelter from the tree. And after he broke light, look what you're sitting on, what's above you, it comes from the tree.

And that's where the Tlingit gets his canoe, his house, his clothes - everything. The Raven put it there for him (the people).

And look, what's growing under that tree? The grass. In the spring the Bear comes down to eat that grass and the wolf, the moose and the mountain goat. All these things, they come. And the berries, growing there - salal, salmonberry, huckleberry and beneath them, the plants, - the medicine. All that, it comes from the tree...(Colorado, 1985)

So the roots and their functions form the basis of Native scientific methodology. Seeking truth and coming to knowledge necessitates studying the cycles, relationships and connections between things. Indeed a law of Native science requires that we look ahead seven generations when making decisions!

Principles of Native Science

Laws and standards govern Native science just as they do western science. In an Indian way, Bear who is the North, represents knowledge, healing and comfort. The Bear is also fierce, his claims are non-negotiable. Western Science understands Bear in terms of rigor, reliability, and validity.

In the spring Bear marks his territory on the tree. Stretching as far as possible, Bear uses his claws to score the tree. Other bears, passing by are challenged to meet this standard. If they cannot reach the mark they leave the territory. For the Native scientist the tree is not merely science but science interwoven inseparably with life. We meet the mark or die. Like the Bear passing through, no one watches us; the science relies on utmost integrity.

Native science assumes its character through power and peace. Vine Deloria, (1986) noted Lakota scholar discusses its principles:

> Here power and place are dominant concepts--power being the living energy that inhabits and/or composes the universe, and place being the relationship of things to each other...put into a simple equation: Power and place produce personality. This equation simply means that the universe is alive, but it also contains within it the very important suggestion that the universe is personal and, therefore, must be approached in a personal manner...The personal nature of the universe demands that each and every entity in it seek and sustain personal relationships. Here, the Indian theory of relativity is much more comprehensive than the corresponding theory articulated by Einstein and his fellow scientists. The broader Indian idea of relationship, in a universe very personal and particular, suggests that all relationships have a moral content. For that reason, Indian knowledge of the universe was never separated from other sacred knowledge about ultimate spiritual realities. The spiritual aspect of knowledge about the world taught the people that relationships must not be left incomplete. There are many stories about how the world came to be, and the common themes running through them are the completion of relationships and the determination of how this world should function.

Deloria notes that there is no single Native science, each tribe or Nation follows ways specific to a locale. However, the tree and the Bear are nearly universal. From South America to the Arctic, the tree and all that it implies has been guiding and shaping the thought of Native people since the dawn of humanity. Those who follow this natural science do so in search of balance, harmony or peace with all living relations. Iroquois call this SKANAGOAH.

The Goal of Indian Science

Skanagoah, literally interpreted as "great peace", is the term used to describe the still, electrifying awareness one experiences in the deep woods. This feeling or state of balance is at the heart of the universe and is the spirit of Native science. For the western educated audience, the notion of a tree with spirit is a difficult concept to grasp. The English language classifies reality into animate and inanimate objects, with most things falling into the inanimate classification. Native languages do not make the same distinction. As Deloria says, the universe is alive. Therefore, to see a Native speaking with a tree does not carry the message of mental instability, on the contrary, this is a scientist engaged in research!

Put another way, western thought may accede that all natural things are imbued with energy. Much like the electromotive force in a capacitor, the force of the energy is transmitted without there being a direct flow of energy. If you had a piece of wire, electricity would travel from one end to the other uninterrupted. But if you put a

capacitor in the line, the force is transmitted from one side to the other without there being a direct flow of electricity from one side to the other. This is how energy is transferred from tree to tree and tree to person without there being a direct flow of energy. The spiritual energy of a tree isn't transmitted directly but rather its life force is felt. Like a capacitor, the thickness of the dielectric, the physical distance between the person and the tree, is not important; the exchange still occurs.

This exchange suggests that human beings play a vital part in Skanagoah. Through the tree, Indian science generates data to inform us of the condition of, and possibilities for, completing relationships ravaged by four generations of colonialism. We see that the research itself is a process for healing and identifying relationship. We are related, we are all one, life and death, good and bad, we are all one. The Indian acknowledges this and so discovers the most liberating aspect of Native science; LIFE RENEWS and all things which support life are renewable.

The Bear Has Made His Mark...

Can you Reach It?

FOUR DYNAMICS DRIVE OUR METHODOLOGY

Our methodology picks up where our description of Native science ends - that is, with prayer. However, an inseparable part of both description and methodology is the common thread which binds their fabric - Feelings. Because the understanding achieved through Native Science is manifested in feelings and that its nature is spiritual, Elders never attempt to explain. (NOTE: The author employs terms for the dynamics whose concepts appear to be universal among Native peoples.)

1. FEELINGS

The Basis, The Medium, The Message, The Understanding. The nature of Native Science is that it is qualitative and subjective rather than quantitative and objective. Feelings tell us whether we are prepared for the task, whether the situation is right, whether location is correct, and whether there is balance.

> *"To do this work, you have to have feelings and love for the child. Many times I pray with my kids as I do this research, especially when I have hurt feelings, or need an open mind, I pray when I need guidance. When I go to interview, I have to know how to approach people. Some people I know; I can visit them right away. Others I don't know so I go to visit once or twice just to get them comfortable with me. Some I don't know how to approach so I get the help of other Elders. I say, "You know me and you know the other family; we don't usually talk but I have this work to do..." I then explain the Child Welfare research and ask how can I approach them to get something good out of it, and they tell me. In every interview you have to establish trust; you have to put a relation type thing in it. I know when to interview. Before I interview I have to make me feel good first. If I'm not feeling good, I don't interview anyone that day. I pray or see an Elder and wait until my mind is open again (Theresa Tuccaro, 1987)."*

2. HAA SHAGOON, HISTORY AS A TOOL

...Haa Shagoon is a concept by which Native science collapses time and space; i.e., collapses the distance between the creating and this place.

> *"In Western thought, history may only be an objective chronology of the occurrences of events. Whereas, to Natives, it is a way of experiencing all of the feelings, emotions, and responses to events experienced by ancestors, beginning with the creating (Woodrow Morrison, Jr., 1987)."*

To be valid, our research must be more than longitudinal chronology. Today, every day, we see our ancestors making the trail for us as we work and move about the face and surface of our mother, the Earth. Past, present, future perfect, and future exist at this moment. For example, when a baby is born, an Elder cradles the infant and speaks softly into the child's ear.

"When you're talking to the newborn baby, when that little baby listens, it stays there, everything we say. Anytime in life that child starts talking, it's (the words you spoke to it) going to come out in front, like the tape recording when you play it. That's the reason we talk to our babies so that what we try to teach will stay in its mind (Chief Donawaak 1985)."

3. GII LAII

Prayer as a Medicine--Gii Laii is the quiet, still place (a round hole in the bed of a stream or lake of water and the quiet, still place of balance within ourselves). Prayer is a medicine where all life begins, exists within, without and between us and our relationships. It is an actual place and state of being that marks the endpoint/beginning of our science. Occasionally, non-Indian people report experiencing a sense of time slowing down; a sensation of suspended animation. This is something like Gii Laii (the water held in suspension while life continues to move through it), with one distinction. That is Gii Laii created a sensation of total alive"ness", awareness, and peace along with the sense of slowed time. But, then, where is this place; how do you find it, and how do you know that "this is the Place"?

"Another thing about interviewing; you have to pick a good spot, and you have to feel, 'this person will fit in good here'. One day I went to see a Social Worker. I explain the research, what I'm trying to do and she agrees to be interviewed. But, I don't do it because it don't feel right. So I tell her how about tomorrow morning. I'll bring coffee; she says O.K. The next day I come back to this office. I bring two cups of coffee. I can see it; the spot is right. But you have to know the right place/time to begin. You don't just jump in. You have to visit, make the other person feel comfortable (Theresa Tuccaro, 1987)".

True Native scientists actually see the "spot". This ability stems from prayer, the hallmark of Indian science. In prayerful research, the voice of the people becomes the data; the words create a feeling in the reader and give a credence to the findings. This is the normal method by which Native people arrive at consensus, or in this case, confidence in research findings. This process is similar to triangulation in Western science and is vividly and poetically portrayed in Pulitzer prize winner, F. Scott Momaday's *House Made of Dawn.*

4. RELATIONS

The Indian theory of relatediveness demands that each and every entity in the Universe seek and sustain personal relationships. Furthermore, the spiritual aspect of knowledge about the world teaches that relationships not be left incomplete (Deloria). Traditional protocols, Native language and stories teach the lessons of relations. For an

example, let us look at the function of the Story. Native stories, which may be 30 to 50,000 years old, have the ability to integrate and synthesize all the living relationships or events at any given moment in life. When we rely on a story to guide us, we are not only integrated with the natural environment around us and with our living relations, but also with the timeless past and culture of our ancestors. Because American Indian cultures are so ancient, and the stories so old, there is almost no human experience or learning which has not been recorded in those stories. Moreover, they are tied so intricately with motion, relations, and a sense of collapsed time, that there is a spiritual essence to them which people often describe as timeless.

> *"When my Grandmother used to tell me stories, I would close my eyes and I would feel as if I was walking through that time. I could just imagine everything the way that it looked, the tools that people used, what kind of clothing they wore, how the weather felt, what people were feeling; it all came alive to me! It is as if I was right there at the time."*

When American Indian people come to an experience in life, we are comfortable the stories have walked us through this before. Thus ancient wisdom helps in the decision making and learning of today. "Relations" become an integral part of this research through language. Researchers must be bilingual so that the community is free to express itself and the research design focuses on qualitative or verbal data.

> *"When that person is relaxed, you begin. Also, keep the language simple, never put yourself above someone else. It won't work. And the interview has to be balanced. I watch the little things. If it's too serious, I joke or tease. As I begin, I have to put my knowledge, mind, and my feelings on the table. I have to come out with it; what I'm there for, what I'm trying to do, how I feel...everything. Then I have to really listen. Sometimes I have all my information and the person goes right on talking, two hours more! Some of our people have never had anyone listen to them; someone they trust to talk to. I just let them go on, as long as they like, and when I leave, they always say, come back again. This is the toughest, hardest job I ever had...It's so amazing, this Indian way of life (Theresa Tuccaro, 1987)."*

5. CONCLUSION

The four tools or dynamics - feelings, history, prayer, and relations are bound together and distinct from each other by virtue of the land they come from. These dynamics take on special form and power depending on the tribe using them.

NATIVE SCIENCE METHODOLOGY

Based on the work of Theresa Tuccaro

1. INTERVIEWING

Like energy or spirit moving through the roots of the tree, the Native scientist moves through the extended family or clan system to collect data. As a tree records its generations, the Native researcher interviews each generation in the community. The data, in keeping with oral tradition, are comprised of words.

A. Preparation

1. Have to have feelings and love for the people.

2. Pray, especially with your kids.

3. Know how to approach people:
   - visit
   - get help of elders

4. Know when to do the interview:

   a. make me feel good first before I interview
      - when I have a hurt feeling
      - need guidance or open mind

   b. pick a good spot
      - you can see and feel a good spot
      - think, "this person will fit in good right here".

B. Interviewing the Generations:

1. Know the right time to begin, "When the spirit shows itself".

2. Establish trust, put in a relation-type thing with the person you interview.

3. Relax yourself and interview.

4. Language must be simplified.
   - never try to be above the other person

5. Has to be balanced, have to work twice as hard.
   - watch the little things

6. Joke, tease.

7. Listen. sometimes people talk two or three hours after the interview; they need someone to listen to them.

8. I put my knowledge, mind, and feelings on the table.
   - This was the toughest, hardest job I ever had!
   - It is so amazing this Indian way of living.

C. SUMMATION:

Each of these methodological elements represents extensive knowledge, experience, and training. Let us examine two: the help of elders and language.

II. GET THE HELP OF AN ELDER

Approaching Elders

Researchers need support, guidance, information, and prayers from Elders to succeed in Native science. Although the search for truth and learning is a spiritual relationship between the individual and the Creator, a tenet of Indian science is that Elders are helpers to the younger scientist in training.

Who is an Elder?

Generally, an "Elder" will have some particular training or expertise in an area of life. Medicine people who represent the finest of Indian science can be characterized by their deep and abiding sense of humility, by their commitment to the people and to a traditonal, natural way of life. Often the true American Indian scientist leads a life of poverty, because the people are too poor to support him/her. A final note on Elders is this. Just like any other culture, some American Indians have more scientific expertise than others. Although all Elders have built up certain knowledge and wisdom over years of living, this is not to be confused with the specific understanding of traditional Native American ways of coming to knowledge.

Today it is common to see Medicine Men touted as celebrities in the national and international social change circles. These celebrities may have no standing or certification by Native Nations, yet unaware non-Natives promote them and the further degradation of our life ways.

Barriers to Traditional Science

The colonialism and the disruption of traditional American Indian life have created a schism between elders and young people. Elders blame themselves:

> "We (Elders) talked about how our younger ones live... It's our fault. We are not talking to our grandchildren and our sons. Our land: what we used to know before we don't tell. How are they going to learn? We got to tell them everything so they will learn to live. In these times, we just leave our children when they say it's (our ways) oldfashioned. We are scared to talk with them."

Young people feel that they are to blame.

> "We don't know where we fit in.... The older people do not know how to approach us .... They've never seen young people drink like we're doing... sniffing glue, gasoline, pot...it was my impression they just gave up on us..."

But even healthy, accomplished Natives may not know the protocols for relating with an Elder. Yet the culture does not permit an Elder to share information without being properly asked. Moreover, Elders are not aware that the young do not know how to approach them!

Apprenticeship

Even if an Elder is approached in a proper manner, he still may not accept the young person. Again, the accepting or rejecting of the applicant follows culturally dictates. If an Elder responds, "I do not know" or simply shakes his/her head, the answer is "no". But if the Elder says, "I'm getting old, it's difficult for me to remember", the door is opened for future visits.

The visit is an essential ingredient of Native scientific methodology. The Elder will ask the aspiring scientist, "Who is your clan? Who is your family? What is your Indian name?" Socializing will include humor, and finally, raising the purpose of the visit. Through visits, a contract is established. Often the contracting process requires several visits, the apprentice will do chores around the Elder's home, listen attentively and follow directions about mundane activities. Through this process, trust is established and a genuine interest in the welfare of the Elder is promoted. This is important; the Elder is about to share knowledge that is powerful, sacral, and often of a personal nature - the recipient must be prepared.

In addition, the process of the visit teaches the younger person the qualities that are necessary for becoming a Native American scientist. These qualities include tremendous self-discipline, patience, a willingness to share, faith and a belief in prayer. The rather extended period of time for these visits also demonstrates to the Elder that the young person is leading a good life or is committed to a good life. The evidence of this good life is abstinence from alcohol and drugs and a morally correct life in a cultural sense.

When an Elder accepts an apprentice he will often share knowledge without asking, "Why is it that you want to know?" It is enough for the Elder to detect a sincerity and a true desire on the person's part to learn. Sometimes, even if a person is involved with

alcohol and drugs, an Elder will patiently listen to this person and then share some piece of traditional knowledge that the Elder feels may help guide the individual back to himself and out of substance abuse or addiction. This wisdom that the Elder is passing on, although learned personally, derives from tribal experience and from a collective effort to know throughout time. The outcome of this science and knowledge is that people learn to live in balance in relationship with all other living things. Therefore, the Elder faced with the young person who has serious life problems will share traditional information, but only when asked; they never volunteer it.

CASE ILLUSTRATION

"The Elder that I asked to help me through my job on the reserve, she helped me by a prayer and advice. One day I went to visit her; I had my father with me to help interpret and explain to her why I came to visit her. I gave her some tobacco and a blanket. She said to me, "It's nice to give gifts to other people, whether it's very little or a whole lot." She said a prayer for me and accepted the gift. The prayer she said in her own language, and I did not understand her. I asked my father what she said afterwards, but he did not remember. I didn't have a tape recorder at that time; otherwise I would have taped her. Through her I identified the other Elders I would be visiting."

When I visit an Elder, I explain to the Elders why I'm there to see them and give the Elder a traditional offering. I have interviewed five Elders so far. Four of these Elders are 80 years old and over. Two are 70 years and younger. I have visited them various times. Each time I visited their homes, they were either busy or not at home. Finally one day they were at home and I sat and talked with them. I had my father help me with interpreting. I explained to them why I came to see them and why they were chosen.

One of the Grandmother's reponse was, "All along since my 10 children were born, I've raised them up and given them advice that my parents and Grandparents have taught me. Today my children are all grown up. They don't listen to my advice anymore. They argue, don't help each other out, they have forgotten they're Indian. Instead they act and try to live like the white people. So now today, I'm tired, all alone widow. I have a lot of good stories, but I have made up my mind to keep them within me till the day I die." She mentioned that the younger people today don't listen anymore. Maybe because today we live in a totally different world. I thanked her for their time and told her that the few words that she spoke meant a lot to me.

The next Grandmother I had visited informed me that she had nothing to say or do. She informed me that she cannot give me any advice. She then asked her husband, but he also said the same thing. They both spoke in their Native language. I thanked them both and left.

One of the Elders I had on my list for interviewing had just died recently. The reason why I wanted to interview him, I saw him to be very traditonal. He had

a lot of grandchildren living with him and his wife. Complaints were never heard from them either.

Up to this date I have recorded four Elders. Each gave their own opinions. In my interview with the Elders, I find them to be saying it's pretty hard for them to remember a lot of the traditional ways of life. Because times were already changing when they were young, they hardly experienced the traditional ways of life, but can remember a lot of what they were told.

Another thing I'd like to mention about talking and seeking information from the Elders is their opinions were, "We don't have much time left on earth to be giving advice."

It has always been in our culture and tradition that an older person must give guidance and advice to the younger people. One elderly lady, a Grandmother told me if you want to record or write down some of the advice I'm going to tell you, do it the first time around, because we are very forgetful and might say things differently the next time around.

One of the Grandmothers who is now 70 years old didn't want to be recorded. She mentioned that she would give me advice, but I don't want you to write it down.

The efforts of this young Native researcher amplify the disruption, pathos, and chaos of our neocolonial context; however, this researcher became very successful at his work and in following traditional processes the researcher created a strong, healthy relationship with his father and Elder helper. This is similar to the experience of other Native people who report fundamental, positive shifts in their awareness, relationships and/or self-esteem as a result of practicing Native scientific inquiry.

Elder Relationships - Summation

Learning that comes from an Elder is characterized by questions or riddles. The result is we go away curious and wanting more. Furthermore, the way the information is passed to us causes us to think deeply and to look at our own lives. This distinction is important. Unlike Western science, Native science relies on total involvement of the person with his or her environment.

Coming to truth in an Indian way involves spirit, body, mind, and relationships. While Western science stresses cognitive abilities and powers of reasoning, American Indian science relies on these two facets as part of the total way of coming to knowledge. American Indian science is based on observation, experience, information, and prayer; Native language is the key to all.

COMPARISON OF INDIAN AND WESTERN SCIENCE

Indian	Western
Subjective - you put yourself into it	Objective - separate yourself and feelings from what you are studying
Spiritual	Separate religion from science
Methods include talk with Elders, prayer, fasting, ceremony	Methods include measurement, breaking things down to their smallest parts; cutting into something to see how it works
Main purpose to understand 'why' or ultimate causality	Main purpose to describe 'how' or immediate causality
Outcome, balance within and with the natural world	Outcome, a report, findings, usually some life has been destroyed through the research process and something man-made now exists
Community control	Expert control

III. LANGUAGE/THE ORAL TRADITION

Elders tell us to prepare ourselves mentally, physically, and spiritually for Indian Science and they stress the power of Words and Stories.

> *...My Grandfather used to tell me, "If you are going up the river, cut a pole so they can push your boat up. Before you give it to your partner who is going to help you, you got to run your hand over the pole. If you don't, sharp ridges on it will cut your hand. Then your partner will not help you." You have to run your hand over the words before you say anything. I tell my children. They are beginning to listen, how to respect each other.*

When we set out to interview our people, we must prepare ourselves," Tuccaro, Cree Grandmother/researcher says. In Mohawk we say, "Sah ni Kora Ahotoriso", which means not only "set your mind at ease", but describes the moment - "When you arrive at the good feeling, you're at harmony with the one you're speaking with."

Our language helps us find the right spot, the "Still Place". In Mohawk, we say "Yohts so non yahts tsiri yoh", which is interpreted as sheer joy. happiness, peacefulness, calm, and contentment. It is a known, verifiable, objective state!

When we speak of relations or "putting a relationship thing into an interview" we say "tahtikosontotiye", which means "As you're being taught, your ancestors are with you as you teach future generations".

Finally, knowing when to start and stop an interview is expressed as, "the Spirit is going to tell you when to rest" or "I recognize that Good Mind or Good Spirit is Around".

Speaking the Native language is essential to the practice of Native Science. Eber Hampton, a Ph.D. Chickasaw tells this story:

> "Once as I was getting ready for a sweat, Manfred, an Elder, told me, Eber, I know you can't pray in Indian, but when you are in the sweat, pray in Indian in English]."

Language is our guide; therefore, ideas and methods suggested in this paper should not be undertaken unless the concepts exist in one's own tribal language and stories.

INDIAN AND WESTERN SCIENCES: SHOULD THE GAP BE BRIDGED?

For the American Indian, there are compelling reasons for scientific pluralism. If we are to survive as a people, we must regain our critical consciousness; we must become responsible to ourselves within the neocolonial context.

Practicing Native science helps restrict scientific colonialism, which, as Deloria discusses, has confused and controlled Native minds:

> "One of the most painful experiences for American Indian students is to come into conflict with the teachings of science which purports to explain phenomena already explained by tribal knowledge and tradition. The assumption of the Western educational system is that the information dispensed by colleges is always correct, and the beliefs or teachings of the tribe are always wrong. Rarely is this

> the case. The teachings of the tribe are almost always more complete, but they are oriented toward a far greater understanding of reality than is scientific knowledge. And precise tribal knowledge almost always has a better predictability factor than does modern science, which generally operates in sophisticated tautologies that seek only to confirm preexisting identities".

The need for Native science is clear from an intracultural perspective, but what of the West? Are there equally compelling reasons to link with the practice of Native science? According to many scholars, the answer is "yes". Beginning with Einstein's theory and moving to contemporary physicists, Western science has been searching for a new paradigm. The old science can no longer contain the data it produces. Quantum mechanics and genetic research, to name a few, demonstrate the limitations of positivist, atomistic, Newtonian mechanics. And on a social scale one need only observe the alienation of human beings and the destruction of the natural environment to see that something else is needed.

UNESCO addressed the global social problems created by the monocultural scientific paradigm.

> "One source of learning for North American social scientists is the third world inside North America; the spaces where Native peoples of Canada and the United States live, the rural and urban hard-core poverty ghettos that trap ethnic minorities, Blacks, women single-heads-of-household, and poor Whites. Development failures are not confined to Africa, Asia, and Latin America. We have colleagues who have emerged from these ghettos to gain research training, and have returned to study what has happened to their people. The reconstruction of colonized cultures, the recovery of oral tradition, is happening every day in North America, too. No one can be ready to work with their world colleagues abroad who has not first learned to work with third world colleagues at home" (Boulding, 1983).

CONCLUSION, based on the story of Chief Donawaak

> *"Ahskanni, tree people; they help us in everything, not only us but the birds, mountain goat; even the bumblebee which crawls beneath the bark.... The tree suffers for us...it is Master of the whold world...that's how I call it. We talk to it, because it listens."*

> *"After (Raven) created everything, He wonders how am I going to get it? (spirit in the Creations). The trees, grass, everything is standing there just the way He made it; nothing is growing and the people, they're already there too, but they don't think..."*

Looking out on the water, Raven sees a flame jump up. The second time, He sees the flame, a young man, Hawk, comes by. Raven asks Hawk to fly out and get the flame.

Taking a branch from the tree, Raven puts pitch on the end of the stick and tells Hawk, "When you fly out there, carry this stick in your mouth. When you get near the flame, turn your face and get the flame on the stick."

This is really important to us, what He (Raven) said.

"You're going to help the whole world if you bring that flame to me. Everybody will know you. When you come near that flame, turn your head sideways so you don't burn. You are suffering for the whole world - all the People who need it. Bring it to me!"

When Hawk goes out to get the flame, he can feel the heat on his face. He is really suffering. When he returns with the flame, Raven takes the branch and, like throwing paint from a paint brush, puts spirit into everything. The grass starts growing, the rocks have life, and "the People standing there, He threw it on them; that's why we think now!"

"Another thing, the roots of the tree go to the other different trees - birch, hemlock, alder, name them all, they've all got roots."

We all have roots and when we begin to trace them back to the source, we discover our relations, peace of mind, a sense of timelessness. For the whole world, for all the people who need it, we must, like Hawk, bring the flame to our science and our People.

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