

The Native American Academy

Is Native Science Science?

When encountering the expression “Native Science” it is quite natural to ask, “In what sense can the traditional knowledge systems of indigenous peoples be understood as science?” Western science is couched in terms of mathematical and mechanistic theories, and possesses a well-developed hypothetical, deductive and experimental methodology. Indigenous knowledge systems incorporate many but not all of these elements, and they are embedded in a larger social and human context. Therefore, interpreting “science” in the narrowest sense can render traditional knowledge systems “non-science.” We believe this is shortsighted. Despite the remarkable accomplishments and benefits of science and technology over the last 500 years, it would be arrogant in the extreme to regard this period as the start of all science. Humans possessing equivalent cognitive, emotional and spiritual capacities have lived in stable human communities for many thousands of years.

Moreover, many of these societies have come to value observation and the understanding of nature, combined with societal arrangements for holding, developing, and applying knowledge gained thereby for common benefit. Given that the advances of Western Science have at times also had unforeseen and significant negative consequences on the Earth and human society, it is timely to broaden the concept of science so as to include other systems of knowledge that may be more attuned to complex interdependencies between human innovation and the social and natural environment. Productive collaborations exist between Western and Native scientists in environmental research, land use, geographic information science, and hydrology. For example, ethnobotanist and MacArthur fellow Gary Nabhan’s project “Native Seed Search” was conducted in collaboration with traditional knowledge holders.

Principles of Native Science

Certain elements of the Native Science Paradigm are common to Western science; while others go beyond the conventional framework. For example, the following tenets are held by both Western and Native science:

- ∞ Basic relationships, patterns and cycles in the world can be properly understood by a mathematical approach.
- ∞ The simplicity and beauty of nature reflects a dynamic, multi-dimensional enduring harmony in the Universe.
- ∞ Curiosity about the natural world is an essential motivation and careful observation an essential discipline for acquiring scientific knowledge.
- ∞ Imagination and creativity are essential for the advancement of science, although these processes are understood poorly in Western science.
- ∞ Scientific knowledge, once gained by individuals, is contributed to the community, and appropriate technologies must be developed to meet societal needs while simultaneously protecting the environment.

Native Science extends these tenets in the following ways:

- ∞ Native science does not view living systems reductively, but rather grants them full integrity and ontological standing. Such integrity and standing is likewise granted to the rest of the universe, in which everything is viewed as animate and having spirit.
- ∞ Based on this worldview, the human being logically is in existential relationship to all domains of nature with corresponding responsibilities.
- ∞ As self-conscious agents, human beings must recognize our role and responsibility to assist in maintaining dynamic balances of the natural world through participation and renewal.

- ∞ Responsibilities people naturally feel towards communities and individuals are extended also to 'place,' because each place reflects the whole order of nature.

- ∞ Knowledge holders must be ethical elders and leaders.

- ∞ The technologies we develop should not only be appropriate and non-destructive but also reflect and contribute to these balances and renewal.

- ∞ Human actions should emerge from a source beyond individual motive, and instead be sanctioned through ritual and ceremony reflecting a larger spiritual world order.

Recent developments in Western science have brought it closer to Native science views:

- ∞ Complex, adaptive systems display emergent properties at high levels of organization.

- ∞ Self-organizing systems are leading to appreciating life from the level of the cell to that of the planet.

- ∞ Quantum mechanics and relativity theory have led to profound changes in concepts of space, time and causality.

The Native Paradigm

Through the Native paradigm we experience a relational universe and know that our relationship with the interconnected web of life sits at the heart of deep learning. Fundamental to these relationships is the openness of the human to the continual flow of energy in the universe. As this openness is developed, it enables people, and potentially, societies, to remain in harmony with a continually evolving

cosmos. This cosmos, the universe and everything within it, is experienced as a living phenomenon. Lastly, knowledge is embodied and contextual: abstract ideas do not constitute knowledge so much as does capacity evident in a person or group, and all knowledge is inseparable from its social and physical setting. This means that knowledge intrinsically encompasses a moral and ethical dimension, and who holds the knowledge is inseparable from the knowledge itself. This paradigm gives rise to philosophies that underlie and give distinctive form to science, law, health, ethics and governance – in short, all aspects of native life and culture.

Methodology

Native Science

- ∞ **Observation**, The Native American scientific approach to seeking knowledge is done through long-term observation of the total web of relational networks with the intent of maintaining balance and harmony.
- ∞ **Lived Experience**, The day-to-day experiences of the individual and collective which may be based on knowledge gained through all of the above.
- ∞ **Search**, (as opposed to research). The Native American view is that the entire universe consists of energy waves that are in a state of constant flux: transforming, combining, recombining, deforming, etc. One can say that the Native American is forever “surfing the flux” to discover regular patterns, which then can be used as reference points.
- ∞ **“All My Relations,”** Knowledge can come from “All My Relations”- that is from meaningful connections with all domains of nature. Knowledge may come to a person from “All My Relations” in a state of awakesness, in a vision, or dream.
- ∞ **Dreams**. Reality is not limited to a state of awakesness. Dream reality is part of the overall reality and lived experience. Knowledge can come from dreams in the same way knowledge can come from experiences in a state of

awakesness – both are subject to validation, which is done through testing conducted in a state of awakesness to ascertain the uses and values contained in the knowledge.

- ∞ **Visions**. Visions are a more intentional and disciplined search for knowledge, as opposed to dreams, which can happen any place. Vision quests, for example, require careful and diligent preparation, including a range of ceremonial protocol.
- ∞ **Story, song and ceremony**. Story, song, and ceremony are manifestations of regular patterns in the flux, which are used for knowledge and renewal purposes.

Western Science Methodology

- ∞ **Observation**. Observation in western science is mainly mathematically based. Observation is connected with predictive testing.
- ∞ **Experimentation**. Observation is complemented by experimentation, which is the “fast-forwarding” of nature’s processes. It is the curiosity seeking aspect of science. “Let us see what will happen if we do such and such....if we combine “A” with “X.”
- ∞ **Research**. Disciplined and organized activity to discover, understand and share marks science as a social system.
- ∞ **Technology**. Technology encompasses the equipment and tools of Western science as well as its embodiment. It serves the role of being the gateway to new knowledge, but it also mediates the relationship between humans and nature. Instruments of observation literally stand between human senses and natural phenomena. While they extend and amplify those senses, they may also serve to ‘shift the burden’ to the instrument, as opposed to developing human sensing and awareness. Application technologies likewise separate users from the knowledge embodied in the technology and from many of the consequences of using the technology.

- ∞ **Measurement.** Western Science relies mainly on measurement as a basis for confirmation of new knowledge. If something is not subject to measurement, it is not considered scientific.

How Knowledge is Held: Native American

Individual

- ∞ Can gain knowledge through lived experience.
- ∞ Can gain knowledge through dreams.
- ∞ Can gain knowledge through vision quests.

The knowledge may or may not be shared depending on the individual and his/her dream. An individual can be entrusted with knowledge as a keeper for the benefit of the “Nation” (the society as a whole), e.g., “Bundle Holders.” The Bundles may be transferred to other individuals.

Sacred Societies

- ∞ The societies hold knowledge about some particular aspect of the web of relationships. That knowledge can only be shared among members of the society, and a person who wants to be privy to that knowledge must become a member of that society. This is part of the checks and balances regarding knowledge in native cultures, so that potentially powerful knowledge is not abused. In turn, there are checks and balances on the knowledge keepers themselves: people know who they are and the members of these societies are continually watched by the society at large to gauge their integrity.

Nation

- ∞ Lived experience by the whole nation, which would include individual and collective experiences. This knowledge is conveyed by and arises out of traditional oral history.

How Knowledge is Held: Western

- ∞ **Church.** Prior to the industrial revolution, the main knowledge holder was the church.

- ∞ **Scientists.** Since the industrial revolution, scientists have taken over from the Church as the main knowledge holders. Scientists are the curiosity-seekers about what reality is all about. They do not take responsibility for how society utilizes their discoveries.
- ∞ **Knowledge Patented/Copyrighted.** Knowledge that individuals have come to know but that is protected (for a limited time) for the sole economic gain of the knowledge holder. Supported as an economic incentive for innovation.

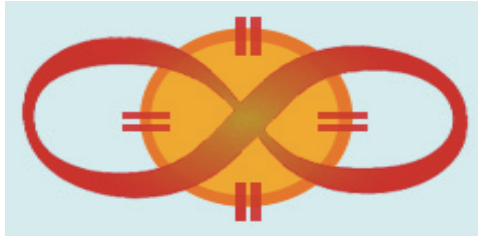
General and Expert Knowledge

Commonality of Native and Western Science

- ∞ General knowledge is accessible to the public (“the nation”).
- ∞ Expert knowledge is only accessible to experts and can be accessed through developing sufficient expertise
- ∞ Expert knowledge requires specialized language and training

Differences Between Native and Western Science

- ∞ Language of expert knowledge in Western Science is technical and usually mathematical
- ∞ Language of expert knowledge in Native Science is particular native language (e.g., Blackfoot)
- ∞ Access to expert communities is largely determined by individual choice in Western Science
- ∞ Access to expert communities is determined both by choice and by invitation in Native Science (in the case of sacred societies)



What is the Native American Academy?

The Native American Academy was founded by a circle of Native scholars and Traditional Knowledge Holders

It is a network of native and non-native people
that has been developing since 1993 through research, dialogue, writing and action projects
focused on making the native paradigm and native science
visible to the western trained mind.

The Academy is dedicated to preserving and protecting Indigenous knowledge
and fostering partnerships between native and western scientific world-views.

Acknowledgements

To bring forward an articulation of divergent worldviews into a synthesis
while sustaining the integrity of each knowledge system is a challenging task.

This paper is the result of the collaborative efforts of
Peter Senge, Amethyst First Rider, Isabel Hawkins, Leroy Little Bear,
Rose v. Thater-Imai, Arthur Zajonc

The Native American Academy

Rose v. Thater Braan-Imai, Director
vnthater@berkeley.edu
www.silverbuffalo.org
(510 237 6217)