SCIENTIFIC EPISTEMOLOGY VERSUS INDIGENOUS EPISTEMOLOGY: MEANINGS OF 'PLACE' AND 'KNOWLEDGE' IN THE EPISTEMIC CULTURES

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ABSTRACT: The article is based on a synthetic comparative analysis of two different epistemic traditions and explores indigenous and scientific epistemic cultures through close reading and exploration of two books. The first book, *Epistemic Cultures: How the Sciences Make Knowledge,* written by Austrian sociologist Karin Knorr-Cetina (1999), serves as an excellent foundational material to represent scientific epistemic tradition. The second book by cultural and linguistic anthropologist Keith Basso (1996), *Wisdom Sits in Places: Landscape and Language among the Western Apache,* opens a wide perspective for exploration indigenous epistemic culture. Both of the books deal with questions of knowledge production and social-cultural mechanisms that surround these processes. The article seeks to explain how the differences between methodological approaches, in their distinct questions, and the variance in research subjects eventually leads the authors to completely dissimilar understandings of such shared notions as 'place' and 'knowledge.' Through the comparative exploration of both texts, the present analysis uncovers the meanings of these notions as articulated and presented in each of the books.

KEYWORDS: epistemic culture, knowledge production, scientific epistemology, indigenous epistemology

Introduction

Theorizing about creating paradigms of truth, establishing knowledge that becomes truth, or reconstituting ways of creating knowledge are all aspects of epistemology. It has been recognized that knowledge is constructed by communities, and "such communities are epistemologically prior to individuals who know."[1] Considering a diverse variety of epistemic traditions and world views embedded in social-cultural environments of different communities, in recent decades the notion of 'epistemic culture' has gained a considerable academic

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[1] Lynn Hankinson Nelson, "Epistemological Communities," in *Feminist Epistemologies*, ed. Linda Alcoff and Elizabeth Potter (New York: Routledge, 1993), 121–160.

attention.[2] Epistemic culture can be described as a set of specific social-cultural norms, beliefs, traditions and restrictions, shaped by affinity, necessity, and historical coincidence, and defined by causal and principled ideas coupled with a common knowledge base and policy goals.[3] Epistemic cultures are nurtured and developed within particular epistemic environments which belong to broader historical cultural paradigmatic contexts of human civilizations.

The epistemic culture of Western civilization, based on the ideas of "knowledge society" has long established foundational principles of epistemic traditions, recognizing science or scientific enquiry as the most trustful source of knowledge. Scientific paradigm of epistemic culture predominantly relies on such concepts as objectivity of approach and acceptability of the results.[4] Objectivity refers to employment of specific ways of observation or experimentation which exclude the possibility of falsifying results; and acceptability is attested in terms of the degree to which observations and experimentations can be reproduced. Scientific method is traditionally based on two major reasoning processes: inductive reasoning or developing general hypotheses upon results gained through specific observations and experiments; and deductive reasoning, which, in contrast, is based on prior theoretical foundations leading to developing specific experiments for testing predicted results. Both of the reasoning processes build the foundations of the broad laws that become part of the understanding of the natural world within the scientific epistemic community.[5]

This view of scientific inquiry is one that is commonly and almost universally accepted in the Western academic world even today.[6] This scientific epistemic tradition or scientific epistemology has been dominating the field of research and knowledge production for many generations and has come to be fixed in the public consciousness.[7] However, in recent decades, the feminist, postcolonial, and postmodernist studies have challenged these epistemic canons and opened opportunities for exploring alternative worldviews, which required

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[2] Karin Knorr-Cetina, *Epistemic Cultures: How the Sciences Make Knowledge* (Cambridge: Harvard University Press, 1999).

[3] Peter Haas, "Introduction: Epistemic Communities and International Policy Coordination," *International Organization* 46, 1 (1992): 1-35.

[4] Arthur David Ritchie, *Scientific Method: An Inquiry into the Character and Validity of Natural Laws* (London: Routledge, 1923).

[5] Ritchie, *Scientific Method,* 12.

[6] John Rudolph, "Epistemology for the Masses: The Origins of 'The Scientific Method' in American Schools," H*istory of Education Quarterly* 45, 3 (2005): 341-376.

[7] Rudolph, "Epistemology for the Masses," 342.

new methodologies outside of the dominant tradition.[8] Indigenous epistemology has emerged as a new epistemic culture out of a necessity to provide indigenous ethnic groups to assert the validity of their own "ways of knowing and being, in resistance to the intensifying hegemony of mainstream epistemology from the metropolitan powers."[9]

The indigenous epistemology is not only about ethnic identity or revitalizing traditional cultures, but more about exploring alternative ways of constructing knowledge. It refers to a cultural group's ways of thinking and reformulating knowledge using traditional discourses and means of communication, such as face-to-face personal interactions.[10] The indigenous knowledge is usually contrasted with scientific knowledge within numerous rural development discourses and practices, which account for the development agenda in the international arena in regard to improving the poor economic situations in so called "developing" countries, for example in Africa, Latin America or the Pacific Islands. Usually, these discourses do not go beyond a mere advocacy for incorporation of indigenous knowledge into development practices, which are already based on the Western knowledge systems, values, and social formations.

Likewise, within ethnographic or anthropological research frameworks on the study of indigenous cultures, when outsider researchers explore other peoples' cultures, usually they construct accounts of indigenous socio-cultural environments based on their own perceptions and world views. As anthropologists Gegeo and Watson-Gegeo insightfully point out "the foregoing activities, while they draw on indigenous cultural knowledge, are imagined, conceptualized, and carried out within the theoretical and methodological frameworks of Anglo-European forms of research, reasoning, and interpreting."[11] The concept of indigenous epistemology is different from these 'outsiders' theories and accounts for specific ways of theorizing knowledge and employing particular methodological approaches in exploring 'the truth' beyond the dominant academic tradition.

Though the indigenous epistemology is gaining a growing recognition as a contested epistemic paradigm, there is still a room for conceptualizing the differences between the scientific and indigenous epistemic cultures. This article

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[8] Michael Hart, "Indigenous Worldviews, Knowledge, and Research: The Development of an Indigenous Research Paradigm," *Journal of Indigenous Voices in Social Work* 1,1 (2010): 1-16.

[9] David Gegeo and Karen Ann Watson-Gegeo, "How We Know: Kwara'ae Rural Villagers Doing Indigenous Epistemology," *The Contemporary Pacific* 13, 1 (2001): 55.

[10] David Gegeo, "Indigenous Knowledge and Empowerment: Rural Development Examined from Within," *The Contemporary Pacific* 10, 2 (1998): 290.

[11] Gegeo and Watson-Gegeo, "How We Know," 55.

aims to address these issues and provides a modest contribution to the theoretical framework of exploring epistemic cultures and traditions through comparison and contrast of the two knowledge production models. This work presents a synthetic comparative analysis of the indigenous and scientific epistemic cultures through close reading and exploration of two books, which both deal with questions of knowledge production and social-cultural mechanisms that surround these processes. The first book, *Epistemic Cultures: How the Sciences Make Knowledge,* written by Austrian sociologist Karin Knorr-Cetina (1999), serves as an excellent foundational material to represent scientific epistemic tradition. The second book by cultural and linguistic anthropologist Keith Basso (1996), *Wisdom Sits in Places: Landscape and Language among the Western Apache,* opens a wide perspective for exploration indigenous epistemic culture, both through the eyes of the indigenous communities, as well as the Western anthropologist, the author of the book. Both of these research studies originate from completely different cultural and epistemic contexts and backgrounds in terms of goals set, arguments employed, and empirical data collected and analyzed. However, both of these studies aim to rethink the spatial questions of epistemic environments through the mapping of cultural structures around knowledge generating and transferring mechanisms.

This article compares and contrasts the aforementioned readings concerned with place and knowledge from multiple angles. It seeks to explain how the differences between methodological approaches, in their distinct questions, and the variance in research subjects eventually leads the authors to completely dissimilar understandings of such shared notions as 'place' and 'knowledge' which representatively account for distinct differences between the scientific and indigenous epistemologies. Through the comparative exploration of both texts, the present analysis uncovers the meanings of these notions as articulated and presented in each of the books. The article starts with the analysis of research subjects investigated by Knorr-Cetina and Basso and then moves to compare the methodologies employed for each of the research projects. Eventually, this work discusses how the authors understand knowledge, people, and place within the contexts of their research studies and questions the implications for science and society in each of their positions.

Research subjects: knowledge society versus wisdom culture

In her book, Knorr-Cetina contextualizes her research in a study of 'big' sciences in knowledge societies to argue that science is geographically and culturally dispersed enterprise. Her research aims to prove that contemporary science is a

whole "landscape-or market-of independent epistemic monopolies producing vastly different products."[12] Interestingly, Basso in his research on the indigenous community of the Western Apache culture also looks at the notion of 'place' and explores the significance of this concept in the knowledge paradigm of Apache tribe. He investigates the connections among place, knowledge, and morality as understood within the Apache culture and builds his research project on the deep immersion into and exploration of the historical tribal past as re-articulated for him in the present.

To analyze knowledge processes and decipher scientific epistemic tradition or "construction and fashioning of social arrangements within science" Knorr-Cetina looks closely at two science monopolies that are "at the forefront of academic respectability, intense, successful, and heavily financed."[13] These sciences are experimental high energy physics and molecular biology. Knorr-Cetina draws her analytical observations and comparisons through analysis of contemporary machineries of knowing by questioning how they work and what principles govern their procedures. She aims to understand if social order norms can be employed as patterns to describe and analyze the organizational structures around science agencies and how these patterns differ across the landscapes of science or so called epistemic 'sub-cultures.'[14] As a result of her comparison between physics and biology disciplines, she points out the 'epistemic disunity' of contemporary natural sciences by contrasting institutional forms and structures that define and shape knowledge systems and processes:[15]

> These were the differences between the liminal approach to truth in physics and 'blind' variation in molecular biology, or the difference between physics' way of locating data at the intersection between signs, simulations, and theory and molecular biology's experiential conception of measurement, or the difference between communitarian mechanisms in one case and individuation in the other.[16]

Looking also at social and cultural construction around knowledge systems of indigenous culture, Basso, on the other hand, grounds his anthropological research in an exploration of Apache epistemic tradition with its 'non western' conceptions of knowledge, space, and time. In contrast with Knorr-Cetina, who is concerned more with larger social structures as monolith systems, Basso advocates

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[12] Knorr-Cetina, *Epistemic Cultures*, 4.
[13] Knorr-Cetina, *Epistemic Cultures*, 4.
[14] Knorr-Cetina, *Epistemic Cultures*, 3.
[15] Knorr-Cetina, *Epistemic Cultures*, 8.
[16] Knorr-Cetina, *Epistemic Cultures*, 246.

for sensitivity to individual human experiences bounded to "human existence that is irrevocably situated in time and space."[17] Concerned with the questions of production and the sharing of 'knowledge of the self' in the Apache cultural system, Basso investigates the schemes of reproductions of knowledge within larger social and cultural fields including community, places, and tribal historic past.[18] Specifically, Basso is interested in understanding the role of place in the cultural domain of Apache communities located within the geographical and cultural landscapes of Cibecue.[19] Through a depiction of the peculiarities of the Apache culture, Basso illustrates how a geographic concept of place acquires cognitive, emotional, esthetic, and social dimensions:

> When places are *actively sensed*, the physical landscape becomes wedded to the *landscape of the mind*, to the roving *imagination*, and where the latter may lead is anybody's guess.[20]

Building on the Apache cultural understanding of place significance, Basso discovers that geographical locations and objects can generate their own meanings and communicate their own "aesthetic immediacies, their shifting moods and relevancies, their character and spirit."[21] However, the ability of the places to "speak" is heavily grounded in the social interactive capacities of embedded environment which comes to life through communication among individuals sharing the same physical and cultural space.

The differences of the research subjects explored by Basso and Knorr-Cetina contextualize their research projects in oppositional cultural and social environments of scientific and indigenous epistemologies. Examining the influential science agency and its epistemic 'subcultures', Knorr-Cetina investigates the scientific epistemic tradition from the position of a distinguished sociologist, who was educated within the Western knowledge production system and who belongs to it. On the contrary, Basso, as an 'alien' to the Apache culture and its epistemic environment, tries to reach an understanding of the indigenous epistemology by digging into the world of a small indigenous tribe striving to survive in a modern world under the pressure of globalization. These cultural and social differences in the chosen research environments, as well as researchers' dissimilar positions within these environments lead authors to choose completely

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[17] Keith Basso, *Wisdom Sits in Places: Landscape and Language among the Western Apache* (Albuquerque: University of New Mexico Press, 1996)*,* 106.
[18] Basso, *Wisdom Sits in Places*, 34.
[19] Basso, *Wisdom Sits in Places*, XV-XVI.
[20] Basso, *Wisdom Sits in Places*,107.
[21] Basso, *Wisdom Sits in Places*,109.

different tools and methodological approaches in order to uncover and reveal the complex mechanisms of knowledge production within the scientific and indigenous epistemic cultures.

Methodologies: intellectual abstraction versus cultural immersion

As Australian psychologist, Dawn Darlaston-Jones, insightfully indicates: "the ability to identify the relationship between the epistemological foundation of research and the methods employed in conducting it is critical in order for research to be truly meaningful."[22] The focus on methods shapes not only theoretical frameworks of epistemic cultures but more importantly defines how epistemic traditions, which are under investigations, can be understood and interpreted. The rules of scientific research require systematic, skeptical, and ethical enquiry based on empirical data.[23] Within the positivist paradigm of scientific epistemology this means controlled, objective, and value free enquiry which can lead to justified generalizations and theorization.[24] However, as researchers Berger and Luckman from the postmodern social constructivism tradition advocate, opening wider frames of scientific enquiry can significantly diversify and broaden a range of methodologies, which allow a more accurate and deeper understanding of the unique characteristics of a domain and the individuals who comprise it.[25]

Both of the authors, Knorr-Cetina and Basso, in order to collect their data utilize quite similar methodologies of anthropological field studies, originating from the scientific epistemological tradition. However, they employ quite different approaches in the use of these methods which naturally immerse them deeper in their research environments and help to uncover the subtle structures and complex mechanisms running through epistemic environments. Knorr-Cetina contrasts two sciences of high energy physics with the molecular biology. She chooses these two scientific fields because it allows her to compare the differences in the communication systems between scientists within both fields in order to: evaluate the scales of time and space in their organizations and workflows; contrast semiological and linguistic differences in the fields; and to question the

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[22] Dawn Darlaston-Jones, "Making connections: The relationship between epistemology and research methods," *The Australian Community Psychologist* 19, 1(2007): 19.

[23] Colin Robson, *Real World Research* (Malden: Blackwell, 2002).

[24] Darlaston-Jones, "Making connections," 21.

[25] Peter Berger and Thomas Luckman, *The Social Construction of Reality* (Middlesex: Penguin Books Ltd, 1966).

role of the empirical versus experimental sides of the sciences.[26] The author attempts to examine physics through the lens of biology and vice versa by employing a 'comparative optics' analysis that 'visibilizes' patterns extracted from one science that become amplified through the analysis of an equivalent phenomena in the other science.[27] Thus, Knorr-Cetina intentionally employs external analytical observation and personal abstraction on both a cultural and epistemic levels from the worlds of laboratorial explorations in physics and biology.

In contrast, Basso tries to fully immerse himself in the cultural, social, and geographic environment of the Apache communities. For Basso it is very important to ground his anthropological exploration by living on the edge of denying/forgetting his personal cultural background and epistemic tradition in order to grasp the full nuances of Apache collective cultural-epistemic construct that he attempts not to deconstruct, but to *describe* with detailed preciseness. Basso is concerned that local understandings of external realities cannot be fully achieved by any anthropologist because "Cultures run deep, as the saying goes, and all of us take our 'native's point of view' very much for granted."[28] The ethnographic research that he conducts thus seeks to extend the boundaries of understanding the 'other' without re-interpreting the realities of a different cultural setting from the point of view of his own cultural significance.[29]

From the methodological perspective, the role and place of the researcher in these field studies, that each of the authors conducted, also differ significantly. Knorr-Cetina and Basso engaged themselves in similar commitments of nonstop field work over multiple years which entailed a strong personal dedication. However, they situate themselves within research on quite different levels. Knorr-Cetina emphasizes the importance of her personal contribution to the research being implemented across the two different fields. Despite the fact that her field studies required collaboration with a great number of scientists from both of the laboratories and the help of two observers, she stresses that "The present study is the outcome of the comparison conducted by *myself*."[30] Knorr-Cetina emphasizes her strong individual intake in collecting, analyzing, and interpreting data from the field. She nurtures her conceptual understanding of 'epistemic culture' through analysis of highly selective data gathered in her

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[26] Knorr-Cetina, *Epistemic Cultures*, 4.
[27] Knorr-Cetina, *Epistemic Cultures*, 246.
[28] Basso, *Wisdom Sits in Places,* 72.
[29] Basso, *Wisdom Sits in Places,* 72.
[30] Knorr-Cetina, *Epistemic Cultures*, 19.

selected fields with formal preciseness. She finds the evidence for her generalizations and specifications of social and cultural patterns across physics and biology by conducting structured interviews with scientists, collecting written records provided by laboratories, such as "meeting transparencies, internal notes, versions of talks and papers," as well as soliciting internal e-mail correspondence reflecting the development of scientific projects run by teams of scientists.[31]

Thus, she places herself 'above' the cultural domain of the laboratorial life that she researches and brings the wealth of her academic expertise into the careful design of her research. In every stage of the study's development, she exercises her strong power as an independent researcher and intellectual to direct the data collection and analysis processes according to specific scholarly instructions and schemes. In this way she seeks to legitimate the results of her fields' observations and to supply all the necessary evidence to validate the scientific "truth" that she is pursuing.

In contrast, Basso takes a completely different approach in his anthropological research. He almost shocks readers by deliberate diminishing his role in the project and by portraying himself as a mere transmittor or recording device that aims to preserve pure information in the form comprehendible within his own culture. In order to achieve a high sensitivity to cultural nuances and to embrace the complexity of the Apache epistemic construct, grounded in the notion of geographic and cultural locality, Basso transforms from an authoritative academic to a proper student. Throughout his research project, he develops the narration of his learning processes through sincere and honest depictions of his failures on the long way to the cultural truth he is trying to uncover. He positions himself in a complete reliant state dependent on his 'teachers' who not only open their world of knowledge and wisdom to him, but also dictate to him where, when, and how to conduct his anthropological observations and collect his data. For example in the first chapter, Charles, one of the Apache who accompanies Basso on a field trip, insists on taking a break from the study and explain that collected data has to be properly translated which is a highly time consuming process. The Apache teaches Basso that "it would not be wise for us (he means me) to do it in a hurry."[32]

Even the privilege of personally knowing people from the Apache community for several years does not allow the author to leverage his friendship to request data and interview people whenever he feels like doing it. The author is

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[31] Knorr-Cetina, *Epistemic Cultures*, 19.
[32] Basso, *Wisdom Sits in Places*, 29.

extremely careful to *listen and wait for* when people are ready and eager to share their opinion and knowledge with him and he trains himself to be patient:

> *I have known Dudley for twelve years* and on other occasions have seen him withdraw from social encounters to keep counsel with himself. I also know that he is mightily interested in red ants and holds them in high esteem. *I would like to ask him a few more questions, but unless he invites me to do so* (and by now, I suspect, he may have had enough) *it would be rude to disturb him*.[33]

Knorr-Cetina and Basso, as anthropologists, take oppositional approaches in their research studies. In order to establish a strong personal contact with representatives from the Apache communities, Basso suppresses his academic authority and nurtures his innately human abilities to listen, to dialogue, and to wonder. As a result, this approach emphasizes his power as a human being to understand and to learn from the 'other.' In contrast, Knorr-Cetina employs her academic expertise to collect her data and to investigate human interactions in the laboratories. The environment of the science industry urges her to follow academic ethics and utilize formal procedures that establish her authority among other researchers. Eventually, the academic burden, structural formality, and preoccupation to visualize 'patterns' undermine her human powers and learning freedom to go beyond the comparison and evaluation into deep exploration. These different approaches in positioning themselves as researchers in different epistemic environments, scientific versus indigenous cultures, result in oppositional understanding of such notions as knowledge and place, which again rearticulate the role of a researcher within different epistemic traditions.

'Place' as a tool versus 'scientist' as a device

Though both of the authors try to explore the cultural mechanisms of knowledge production and sharing within the context of their research studies, they have quite different understanding of what knowledge is and of the actors who produce and transmit knowledge across time and space. Being grounded in scientific epistemic tradition, which sets a binary opposition between such concepts as knowledge versus belief, the research of Knorr-Cetina reemphasizes again a specific role and place of knowledge in the scientific epistemic paradigm. Within this paradigm, knowledge as an analytical construct, based on subsets of the whole, is a phenomenon acquired through scientific method or independent and rigorous testing, which is accepted and approved within the scientific community. The validity of this knowledge is ultimately based on empirical evidences, which

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[33] Basso, *Wisdom Sits in Places*, 120.

within the scientific epistemic culture have to be interpreted according to reductionist, objectivistic, and positivistic traditions.

Therefore, for Knorr-Cetina, knowledge is "a production context in its own right," that includes processes and knowledge-related structures.[34] She advocates for a definition of knowledge that stresses the importance of processes within environments building epistemic settings. Knorr-Cetina does connect the notion of knowledge with the social constructs involving "multiple instrumental, linguistic, theoretical organizational, and many other frameworks."[35] However, she understands knowledge producers as derivative from the very practices of knowledge creating, as mere devices in machineries of knowledge. Knorr-Cetina stresses that scientists are "specific epistemic subjects" who have been shaped in a similar ways as tools that they use in scientific inquiry.[36] "Scientists are … are part of a field's research strategy and a technical device in the production of knowledge."[37] Knorr-Cetina underlines the secondary role of scientists in laboratory science by revealing "communitarian superordering imposed upon these subjects." She supports her opinion by providing numerous examples from high energy physics that requires collaboration among and involvement of a great number of researchers in experimental processes and developing research projects.

In contrast, for Basso, knowledge is closely linked to the knowledge of the self that reconstructs "one's position in the larger scheme of things, including one's own community, and to securing a confident sense of who one is as a person."[38] Unlike Knorr-Cetina's focus on processes within epistemic structures, Basso draws on the Apache theory of 'wisdom' to link the understanding of knowledge, not with human activities 'per se,' but rather with places, as well as human memory and intangible heritage embedded in these places. Basso's project explicitly demonstrates the key points of indigenous epistemology which is "grounded in the self, the spirit, the unknown," where knowledge must be sought "through the stream of the inner space in unison with all instruments of knowing and conditions that make individuals receptive to knowing."[39]

Knowledge of places and their cultural significance is crucial for Basso because, according to Apache beliefs, they enable "mental conditions needed for wisdom, as well as the practical advantages that wisdom confers on persons who

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[34] Knorr-Cetina, *Epistemic Cultures*, 7.

[35] Knorr-Cetina, *Epistemic Cultures*, 10.

[36] Knorr-Cetina, *Epistemic Cultures*, 32.

[37] Knorr-Cetina, *Epistemic Cultures*, 29.

[38] Basso, *Wisdom Sits in Places*, 34.

[39] Willie Ermine, "Aboriginal Epistemology," in *First Nations Education in Canada: The Circle Unfolds,* ed. Marie Ann Battiste and Jean Barman (Vancouver: UBC Press, 1999), 108.

possess it."[40] Understanding knowledge as wisdom and understanding wisdom "first and foremost as an instrument of survival," Apache culture shifts the focus of the epistemic paradigm from knowledge universality to personification of knowledge. Consequently, in any Apache community, wisdom as a "virtue of unusual mental powers" is a truly human ability "to foresee disaster, fend off misfortune, and avoid explosive conflicts with other persons."[41] Knowledge or wisdom is generated inside the communities through individuals' experiences in relation to particular geographic localities which legitimize the past and serve as the main historical evidence for the truthfulness of the stories happened in these places.

Such an understanding of knowledge within the Apache cultural epistemic tradition is coherent with later findings of other researchers who tried to uncover the mysteries of indigenous epistemologies. Therefore, anthropologist from Peru, Mahia Maurial, defines indigenous knowledge as "the peoples' cognitive and wise legacy as a result of their interaction with nature in a common territory."[42] Canadian ethnographer, Marlene Brant Castellano, highlights major characteristics of indigenous knowledge as "personal, oral, experiential, holistic, and conveyed in narrative or metaphorical language."[43]

Furthermore, in contrast with Knorr-Cetina's under-statement of the role of scientists in the processes of knowledge production and further dissemination, Basso celebrates the power of ordinary individuals not only to generate wisdom through their life experiences but also to share knowledge in human interactions. He points out how important it is for the Apache community to keep oral narrations about concrete individuals from the past with their own stories and human characters, with details about their appearances, with their names and their roles in the tribe:

> The Apache landscape is full of named locations where time and space have fused and where, through the agency historical tales, their intersection is 'made visible for human contemplation.'[44]

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[40] Basso, *Wisdom Sits in Places*, 130.

[41] Basso, *Wisdom Sits in Places*, 131.

[42] Mahia Maurial, "Indigenous Knowledge and Schooling: A Continuum Between Conflict and Dialogue," in *What is Indigenous Knowledge: Voices from the Academy,* ed. Ladislaus Semali and Joe Kincheloe (New York: Falmer Press, 1999), 62.

[43] Marlene Brant Castellano, "Updating Aboriginal Traditions of Knowledge," in *Indigenous Knowledges in Global Contexts*, ed. Budd L. Hall, George Jerry Sefa Dei, and Dorothy Goldin Rosenberg (Toronto: University of Toronto Press, 2000), 21-36.

[44] Basso, *Wisdom Sits in Places*, 62.

These stories from the past come to life in the present reality only through person-to-person communication in the act of knowledge transfer from one generation to the other. It is almost "a form of narrative art, a type of historical theater" where the past unfolds in front of one's eyes with respect to his/her own age, character, and ability to understand and appreciate the story. The 'real-ness' of the stories being told is fostered through utilizing active present tense in describing the actions that took places generations ago. The use of quoted speech in the narrations also strengthens the first person experience and captivates "the hearts and minds" of listeners, thus making the wisdom of ancestors relevant and sounding in the presence.[45]

Through his research on endogenous epistemology, Basso highlights a strong focus on people and entities coming together to help and support one another in their relationship, which has become known as "a relational worldview."[46] The most important characteristic of this relational worldview is the stress on spirituality and a sense of communitism or, in other words, a sense of community tied together by familial-tribal relations and the families' commitment to it.[47] Furthermore, indigenous worldviews and their epistemologies are rooted in people's close relationship with their surrounding environments.[48] Interestingly, both researchers, Knorr-Cetina and Basso, illuminate the importance of location in the cultural-epistemic constructs and believe that physical localities "are never culturally vacant." Nevertheless, they look at physical places and conception of space from different perspectives.

Knorr-Cetina stresses the role of laboratories in knowledge production by deconstructing the machinery of science monopolies; she accentuates the power of epistemic environments to shape human interactions. She understands the laboratory space as a defining force that emerges along with the development of cultural and social surroundings that directs human activities. Oppositely, Basso introduces a completely different understanding of locality in the epistemic culture; he puts a special emphasis on the human power (not the power of the place itself) to animate the physical environments:

> Animated by the thoughts and feelings of persons who attend to them, *places express only what their animators enable them to say*; like the thirsty sponges …

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[45] Basso, *Wisdom Sits in Places*, 33.

[46] Thomas L. Crofoot Graham, "Using Reasons for Living to Connect to American Indian Healing Traditions," *Journal of Sociology and Social Welfare* 1(2002): 55-75.

[47] Hart, "Indigenous Worldviews," 3.

[48] Hart, "Indigenous Worldviews," 2.

> they yield to consciousness only what consciousness has given them to absorb…[49]

Landscapes, as Basso stresses, become the devices for people to communicate among each other and to transfer knowledge and wisdom from one generation to the other. Geographical localities in the Apache culture are mere "*tools for imaginations*, *expressive means for accomplishing verbal deeds* … and eminently portable possessions to which individuals can maintain deep and abiding attachments…"[50] As a result, it's the power of people, rather than the spaces, to define learning and knowledge generating experiences; geographical landscapes serve as marks to refer to particular knowledge or wisdom resources in the universe of the Apache culture.

The knowledge-place paradigms, grounded in the scientific and indigenous epistemic cultures, introduced by Basso and Knorr-Cetina, are different and create quite oppositional understandings of person's place and role in their epistemic environments. Knorr-Cetina looks at the epistemic space of laboratories as a powerful force that puts scientists in the position of mere device in more complex structures of knowledge machineries. In opposition, Basso emphasizes the power of people to enable places to acquire human abilities to talk, to interact, and to share.

Conclusion

It is fascinating how both readings, analyzed in this article, present completely different perspectives on how to view knowledge systems and their major components from the positions of two different epistemic paradigms: scientific versus indigenous. The book by Knorr-Cetina describes the functioning mechanisms of gigantic machineries of knowledge that rule society, shape human perceptions of the world, and define the place of the person in this world. This research once again highlights the postmodern uncertain position and dependence of a human agency on numerous contexts that are portrayed as powerful forces in constructing the activities and identities of human beings. The study conducted by Basso, on the other hand, returns people to their roots, to physical geographies of places (not spaces), and to the natural world of social and cultural interactions. The wisdom of the culture that he researches opens bigger philosophical questions of what knowledge is and why the human universe is so deeply connected to the physical reality of our world. His book is a call to scientists and people to look

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[49] Basso, *Wisdom Sits in Places*, 108.
[50] Basso, *Wisdom Sits in Places*, 75.

back inside ourselves to find unlimited resources of knowledge and our power within. It celebrates the human being as a focal point where imaginary and physical realities converge to reflect a mystery and the surrounding beauty of the world.

Indeed, the scientific knowledge generated through centuries has secured a foundational position in the Western civilization and specifically in the epistemic tradition. However, because it is ultimately based on empirical evidence, it cannot provide answers to questions that do not have an empirical basis. "It cannot deal with questions of faith or morals, or controversial subject topics such as eugenics, stem cell research, abortion, and so forth. It cannot be used to make human value judgments."[51] In contrast, the traditional or indigenous knowledge celebrates the pluralism in 'truth,' because it is dependent upon individual experiences and relationships with living and non-living beings and entities.[52] Being holistic and cyclic in nature, the indigenous knowledge as a human-environmental wisdom stresses deep connections between people and their spiritual reality and opens up opportunities for understanding the world around us on a different level. It is imperative to understand, acknowledge, recognize, and appreciate epistemic cultures originating from various historical, social and cultural backgrounds, because these various epistemologies can significantly enrich the nature of human research enquiry and enhance our harmonic world perception.

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[51] Carl Wenning, "Scientific Epistemology: How Scientists Know What They Know," *Physics Teacher Education Online* 5, 2 (2009): 13.

[52] Leanne Simpson, "Anishinaabe Ways of Knowing," in *Aboriginal Health, Identity and Resources,* ed. Jill Oakes (Winnipeg: Native Studies Press, 2000), 165-185.