

Dominant knowledge systems and local knowledge

John Studley

1998

John_Studley@compuserve.com

Keywords: knowledge, indigenous knowledge, local knowledge, knowledge systems, paradigm shifts.

1.1 Knowledge

1.2 Knowledge systems or worldviews

1.3 Paradigms and Paradigm Shifts

1.4 Knowledge Processing or Cognitive Mapping

1.5 Modern Knowledge Systems

1.6 Indigenous Knowledge Systems

1.7 The importance of studying Modern & indigenous knowledge systems

1.8 Comparing Indigenous Knowledge Systems and Modern Knowledge Systems

1.9 Integrating indigenous and modern knowledge systems

References

The relationship between the "modern world" and the "developing world" has often been expressed in the language of development. Although vast sums have been invested trying to find a solution matters appear to have got worse rather than better. It would appear that some development projects actually contribute to this deterioration. In addition development has often produced an environmental crisis and the serious depletion of forest resources (Banuri and Marglin 1993). A largely neglected aspect of such development is the dominant part played by "modern" or "western scientific" knowledge. Not only is indigenous knowledge ignored or dismissed, but the nature of the problem of underdevelopment and its solution are defined by reference to this world-ordering knowledge. Until very recently little or no credence was given by scientists and scholars grounded in Western tradition to the validity of non-Western indigenous knowledge. Even now when Western scholars begin to acknowledge the existence of indigenous knowledge they have trouble understanding and interpreting what for them is a foreign level of reality. Since indigenous knowledge generation does not use the same methods of data collection, storage, analysis and interpretation as the scientific tradition, those trained in the scientific tradition have great difficulty in acknowledging the validity of data generated in unfamiliar ways. Even those who do acknowledge the existence of indigenous knowledge generally apply scientific methods to verify and validate indigenous knowledge. They seek to recognize their categories in native systems, and apply their typologies to what they think indigenous knowledge systems are. Few Western scholars are able to accept indigenous knowledge as valid in and of itself. They have great difficulty rethinking groupings so as to uncover basic organising principles which are unfamiliar, and to identify and affirm the integrity of

indigenous systems. Recently efforts have been made to think through the implications of recognising fundamentally different knowledge systems (Wolfe 1992, Colorado 1988, Harman 1989, Watson and Chambers 1989, Banuri & Marglin 1993, Shiva 1989) One aim of this paper is to explore the relationship between scientific knowledge systems and indigenous knowledge systems, but before that we need to address the nature of knowledge, knowledge systems, paradigms, and cognitive processes so that we have a conceptual framework.

1.1 Knowledge

Knowledge is constituted by the ways in which people categorize, code, process and impute meaning to their experiences. This is as much true of "scientific" as of "non-scientific", everyday forms of knowledge. We should not therefore equate knowledge with some professional, specialized or esoteric set of data or ideas. It is something that everybody possesses, even though the grounds for belief and the procedures for validation of knowledge will vary. Knowledge emerges out of a complex process involving social, situational, cultural and institutional factors. The process takes place on the basis of existing conceptual frameworks and procedures and is affected by skills, orientations, experiences, interests, resources and patterns of social interaction (See Arce & Long in N and A Long 1992). Moreover knowledge is constructive in the sense that it is the result of a great number of decisions and selective incorporations of previous ideas, beliefs and images, but at the same time destructive of other possible frames of conceptualization and understanding. This is not an accumulation of facts but involves ways of construing the world. Nor is knowledge ever fully unified or integrated in terms of an underlying cultural logic or system of classification. Rather it is fragmentary, partial and provisional in nature and people work with a multiplicity of understandings, beliefs and commitments.

1.2 Knowledge systems or worldviews

The processing of knowledge can best be understood in the context of the "worldview", "knowledge system", "life-world" (Schutz & Luckmann 1974), "cognitive systems" (Banuri in Marglin & Marglin 1990) or culture of the people who share it. Although the term "culture" is not easy to define, because of different emphasise:- Historical (Geertz 73), Behavioural, Normative, Functional, Mental & Structural (Levi-Strauss 74) I cannot agree with Banuri that "culture" is synonymous with worldview (1990 p 76). There are many who appear to regard culture and worldview as distinct categories (Jolly nd, Sahtouris 1995, CAU nd, Eaton 1998, Gimbutan nd, Kwok 1998 & OBU 1997). More properly worldview could be regarded as a foundational element of Culture. The term culture will be used, in this study; to refer collectively to a society and its way of life; to comprise what people think, what they do, and the material products they produce; and be considered as a learned social phenomenon (see Bodley 97) From this view cognitive processes, beliefs, values, knowledge, worldviews and paradigms are all elements or sub-sets of culture. The conceptual basis of "worldview" is derived from an extensive literature in sociology, psychology, and anthropology (See Banuri & Marglin 1993,

Weber 1930, 1947, Durkheim 1933 1951, Parsons 1954, Mead 1934, Dumont 1977, Geertz 1973). Most of us are not conscious of our worldview. We do not learn it so much as absorb it from our surrounding culture. It is passed on from generation to generation with minimal change, the assumptions rarely being reviewed or revised. A worldview gives a culture structure, a subconscious legitimacy in the minds of the people. It serves as the basis for evaluation, judging and validating experience. It is a yardstick with which people measure events and circumstances in the culture, providing criteria of acceptability. It provides psychological reinforcement for a society's way of life. It creates a "we-they" dynamic; through a common worldview people identify with their society as opposed to all other societies. A worldview provides an integrating function for new information, values, philosophies or experiences. According to Schutz (1962) Knowledge is organized in spatial and temporal "zones", or domains of different degrees of relevance. Everyday life is dominated by the solving of practical problems and this occupies a prominent place in a person's knowledge. Its validity is taken for granted until one encounters a problem that cannot be easily solved. This requires other more explorative types of knowledge, and often requires choices between alternatives. To do this we intuitively draw upon existing stocks of knowledge, on prefabricated strategic models, or allow ourselves to be guided by certain normative views or social commitments. While certain ideologies discourage innovation, others encourage it. The incorporation of new ideas or modes of behaving entails a process of transformation or if necessary a "paradigm shift" (Gilmour & Fisher 1991).

1.3 Paradigms and Paradigm Shifts

Kuhn (1962), the US historian and philosopher of science seemingly showed that social and cultural conditions affect the directions of science. He argued that even scientific knowledge is relative, depending on the "paradigm" that dominates a scientific field at any given time. Such paradigms are so dominant that they are uncritically accepted as true, until a "scientific revolution" creates a new orthodoxy. Kuhn's ideas have spread to the social sciences and have prompted heated debate in the forestry community (Danbury 93, Studley 94, Finlayson 94, Kanowski 94, Hobley pers. comm. 95). The credit for introducing paradigm to the forestry literature appears to belong to John Dargavel (1980). who drew on Foster-Carter (1976). Mary Hobley (pers. comm. 95) introduced Foster-Carter's paper to Nepal-Australian Forestry Project which led to the emergence of a "community forestry paradigm" (Gilmour D.A, King G.C. & Hobley M 1989, Gilmour D.A & Fisher R.J 1991). Foster-Carter (1976) defines a paradigm as "a set of domain assumptions which define a field of study" and Studley (1994) as a "sub-set of a worldview" (Finlayson 94). For foresters "community forestry" (with its emphasis on people, social systems and indigenous knowledge) represented the "new orthodoxy" which could not be accompanied by a conceptual framework derived from traditional industrial forestry (although many still seemingly try!). The new orthodoxy required a "paradigm shift" from "one set of domain assumptions to another". The new paradigm will seemingly better explain the particular anomaly which led to the demise of the old paradigm and simultaneously re-interpret previous known phenomena. (Foster-Carter 1976).

Starting from a new paradigm has led to new perceptions of a number of forestry related problems in Nepal (Gilmour 1988)

1.4 Knowledge Processing or Cognitive Mapping

One approach to analysing worldview, culture and knowledge processing is through cognitive filters or maps, which can be ontological (self), epistemological (knowledge) or cosmological (the universe). These cognitive maps categorize the world of experience into classes of phenomena which eliminate the necessity of responding to every unique event in the environment (see Bruner et al 1956 and Banuri 1990). The maps assist the individual to reduce the complexity of the environment and organize their behaviour. Category systems enable the individual to identify those aspects of the environment that are significant for adaption, give direction to instrumental activity, and permit the anticipation of future events. These maps are integral elements of every worldview and culture whether modern or indigenous and according to Banuri (1990) the tension between knowledge systems provides the principal dynamic of cultural evolution and social change, and what distinguishes one culture or worldview from another. An ethnographic description of a group and its worldview must tap the cognitive world of the individuals concerned. It must identify the different category systems individuals use and it must discover those features of objects and events that are regarded as significant for defining concepts, formulating proposals and making decisions.

1.5 Modern Knowledge Systems

The worldview and value systems that underpin modern knowledge were formulated in the sixteenth and seventeenth centuries. Between 1500 and 1700 there was a dramatic shift in the way people understood and interpreted the world. This new orthodoxy gave western civilization the characteristics of the modern era. It has been the dominant paradigm of the modern worldview for the past three hundred years but is seemingly going through a process of change (Capra 1982). Before 1500 the dominant worldview in Europe as well as in most other civilizations, was organic. People lived in small, cohesive communities and experienced the natural world in terms of organic relationships, characterized by the interdependence of spiritual and material phenomena and the subordination of individual needs to those of the community (see Cooper 1990). The scientific paradigm of this organic worldview was predicated on the works of Aristotle and the Church. As the modern scientific age unfolded people increasingly believed that the world had been created for the sole benefit of humankind, and that humankind had a pivotal place in the created order. The influence of the thirteenth century theologian Thomas Aquinas was profound. Aquinas drew on Aristotle, and Christian theology and ethics. He stressed the difference between God and creation, using the long-established theological idea of a "hierarchy of being". To Aquinas the whole of nature was subordinate to human need and the life of plants and animals is preserved not for themselves but for man. (see Santmire 1985). His paradigm remained unquestioned throughout the Middle Ages and scientists used it to understand the meaning and

significance of phenomena in their world. The medieval attitude changed more radically in the sixteenth & seventeenth centuries. The organic worldview was gradually replaced by the modern (often named the Cartesian worldview) characterised by the world-machine as the dominant metaphor of the age and the "ascendancy of humankind" (see Thomas 1983). . These changes were brought about initially by the mathematical theory of Isaac Newton, the philosophy of Rene Descartes and the scientific methodology of Francis Bacon and later by modern political and economic theory of John Lock , Adam Smith and Thomas Jefferson (Slater 1995, Capra 1982). The discovery, at the end of the nineteenth century, of Maxwell's theory of electrodynamics and Darwin's of evolution involved concepts that could not be understood or interpreted from a Cartesian worldview or the world-machine metaphor. In spite of this the basic ideas that underpinned Newtonian physics, although insufficient to explain all natural phenomena were still believed to be correct. Scientists were not yet prepared to go through the paradigm shift to understand and interpret the new "levels of reality". At the beginning of this century physicists began to investigate atomic and subatomic phenomena, which culminated in the theory of relativity and quantum theory. They became aware that the Cartesian worldview they had adopted had very poor goodness of fit with the reality of their studies. The questioning of the very basis of their most cherished ideas resulted in major reworking of their worldview (see Capra 1982) Physicists were followed by avant guard elements within other disciplines (art, music, architecture, literature, philosophy, politics & social theory) who sought new paradigms, including "poststructuralist" (Barthes 1993, Derrida 1976, Foucault 1970) and then the "post-modern" worldview (Lyotard 1979, Baudrillard 1976 , Jencks 1989 , Rorty 1985). Many other disciplines, especially those most influenced by the Cartesian worldview (biology, medical science, psychology, psychotherapy, economics, science, "scientific forestry" and development studies) have now reached the limit of their worldview and will seemingly need to adopt an alternative paradigm to be consistent with modern physics.. There is an apparent need for them to transcend the classical models, to go beyond mechanistic and reductionist paradigms and embrace holistic and ecological paradigms.

1.6 Indigenous Knowledge Systems

Indigenous peoples throughout the world, occupying different agro-ecological zones have generated vast bodies of knowledge related to the management of their environment. This store of knowledge is known by many names. It is termed "indigenous knowledge", "traditional knowledge", "indigenous technical knowledge" (Howes & Chambers 1980), "local knowledge", "traditional cultural knowledge", "traditional ecological knowledge" and "traditional environmental knowledge" (Johnson 1992) denoting slightly different meanings to different users of the concept. There is, however , consensus amongst scientists using various terms that such knowledge:- a) is linked to a specific place, culture or society b)is dynamic in nature c)belongs to groups of people who live in close contact with natural systems and d)contrasts with "modern" or "Western formal scientific" knowledge. Indigenous knowledge encompasses spiritual relationships, relationships with the natural

environment and the use of natural resources, relationships between people, and is reflected in language, social organization, values institutions and laws. (Traditional Knowledge Working Group 1991 p 12). I will use the term "indigenous knowledge systems" (IKS) to refer to a body of empirical knowledge and beliefs handed down through generations of long-time inhabitants of a specific locale, by cultural transmission, about the relationship of living beings with each other and their environment (Warren 1991, Gurung nd, Johnson 1992 p 4, Gadgil et al 1993 p 151)

Although some Indigenous knowledge systems (IKS) include sacred texts (see IUCN 1997 p 47) most are oral-based, often revealed through stories and legends. For this reason, it is often difficult to transmit ideas and concepts to those who do not share the language tradition and cultural experience. Thus when language is threatened or diminished the cultural transmission of IK is jeopardized. (Warren 1991 Gurung nd IUCN 1997)

An IKS provides the basis for local-level decision making in all the areas of contemporary life including agriculture, nutrition, food preparation, health, natural resource management, education and community and social organization. This body of knowledge consists of dynamic insights, and techniques gained through processes of trial and error in response to changing environmental and socio-economic circumstances and opportunities. These knowledge systems are usually embedded in naturalistic epistemologies and belief systems, which differ radically from those of scientific systems. (Gurung nd IUCN 1997) Indigenous knowledge has value not only for the culture in which it evolves but also for researchers who are interested in improving conditions in rural localities (Gurung nd Warren 1991)

1.7 The importance of studying Modern & indigenous knowledge systems

We need to study both western knowledge systems and indigenous knowledge systems in order to ameliorate the negative impact of the dominant system and facilitate appropriate development among indigenous communities. The study of IKS also results in the validation of their world, self worth & identity and legitimizes their knowledge and belief systems. An IKS study can contribute to an empowerment of these communities and result is societies that are more viable and sustainable. (See Gurung nd)

1.8 Comparing Indigenous Knowledge Systems and Modern Knowledge Systems

When we compare modern and indigenous communities we are not seemingly just dealing with different political affiliation but different systems of knowledge, different ways of understanding, perceiving, experiencing and of defining reality (Banuri & Marglin 1993). The following table has been compiled from a number of papers which represents the current debate (Gurung nd, Agrawal 1995, Banuri in FA & SA Marglin 1990, Browder 1995, Banuri and Marglin 1993, Johnson 1992 & Wolfe et al 1992) and contrasts the main differences. The elements (and sub-elements) within these knowledge systems are generalizations and represent polar opposites at

either end of an epistemological continuum. The different elements that comprise the knowledge system are not mutually exclusive for either system. Dominance of one element within a cultural group does not prevent many individuals in that same group from being highly functional in another element. Social change is occurring in both modern and indigenous societies such that new values and ways of thinking are emerging in both.

Table 1 : A Comparison between Indigenous Knowledge & Modern Knowledge

Indigenous<=====	=====	=====>Modern
Epistemology (Knowledge)		
* generated through observations and experiments of uses (Woodley 1991) and by identification with the object of knowledge (Rorty 1979, Habermas 1984 Foucault 1980) Nandy 1987a)	* Means of Knowledge Acquisition	* learned in abstract manner, not always linked to application and from the separation of the observer from the object of knowledge (Caldwell 1982
* intuitive and subjective	* Basis of cognition	* analytical and objective
* usually recorded and transmitted orally, sometimes via sacred texts (IUCN 1997)	* Process of Knowledge transmission	* transmitted deductively through written word
* holistic, subjective, experiential ,embedded & integrated in the social, cultural and moral dimension	* Integration with worldview and culture	* reductionist, objective, positivist, disembedded compartmentalised - convergent - homogeneous
Cosmology (The Universe)		
* views all matter as having life force, including inanimate forms- Animistic	* View of Life Forces	* recognises only plants and animals as having life force- separation between God and man
* ecological - based on worldviews which emphasise social and spiritual relations between life forms (Fee 1986)	* Perception of Nature & life forms	* hierarchically organized and, vertically compartmentalized- the environment is reduced to conceptually discrete components
* spiritual explanations of environmental phenomena, revised and validated over time	* Explanation of environmental phenomena	* explanations derived through testing of hypotheses, using theories and laws of nature

* shaped by the ecological system in which it is located (Norgaard 1984)	* Basis of relationship with nature	* predicated on mans ability to dominate nature (Engles 1987 Marx 1970, Balbus 1982)
* a finite good (Ereira 1990, Foster 1965a 1965b 1973)	* Nature of knowledge as a "good"	* infinite good (Maor 1991)
* sees all entities in a relational context.	* View of Universe	* instrumentalism (views everything as sources of gratification)
* stresses inter-dependency and equality of all life-forms	* Equality between Life forms	* sees humans (especially Western men) as superior life-form, with an inherent right to control and exploit nature (Santmire 1985, Merchant 1989, Capra 1982, Bacon 1964)

Ontology (Self)

* predicated on group values or 'holism'	* Basis of self worth	* predicated on individualistic values - nothing but the sum of a biological core and behavioural surfaces - the product of random genetic activity - identity and significance are derived from economic production or consumption
(Dumont 1977)		
* A phenomena to be rejected or integrated into worldview Technology	* View of Technology	* A measure of civilization or backwardness (Engles 1987 Marx 1970)

Context

* diachronic - based on a long time series in one locality (Maybury-Lewis 1992)	* Dealing with phenomenological change over time	* synchronic - based on short time series over a large area
---	--	---

* time is measured cyclically	* Time measurement	* time is linear
* bound by time and space, social contextuality and moral factors (Amanor 1991)	* Contextual	* superior on the basis of universal validity
Validity		
* requires a commitment to the local context	* Geographic contextuality	* values mobility and weakens local context

Accountability

* associated with a system of social accountability (eg a Shaman) (Reichel 1992)	* Social Accountability	* not usually associated with a system of social accountability (Orr 1992) except theoretical physicists in their role as "high priests of science" (see Capra 1982 p 23)
--	-------------------------	---

Some western scientists are skeptical of indigenous knowledge (see Johnson 1992 p 9) due to possible erosion, lack of sufficient intergenerational transmission and the assimilation of many indigenous peoples into modern cultures. There is no doubt that much erosion of indigenous knowledge has occurred (IUCN 1997 p 73) however many believe (Osherenko 1988) in the vitality of indigenous cultures and their ability to evolve.

In the same way modern culture is valid even though it has evolved, and new worldviews and paradigms have been adopted (see Capra 1982 p 12). This century some of the fundamental tenets of the Enlightenment, and the Industrial & Scientific revolution (Rational analysis (Descartes 1987), Dualism (Descartes 1989), Functionalism (Malinowski 1922 Radcliffe-Brown 1922), Materialism, (Holbach 1990, Buchner 1891) Objectivism (Bernstein 1983, Peikoff 1991), Positivism (Saint-Simon 1975 ,Comte 1983, Laudan 1996) , Mechanism & Reductionism (Bacon 1870f, Descartes 1993 & Newton 1995), Economics & Politics (Locke 1997 & Smith 1776) and domination over nature (Bacon 1870a-e &1964)) have been challenged for being sexist ,ethnocentric, antiecological, and ignorant of the cultural dimension of technological development. (Bernstein 1987, Prigogine & Stengers 1984, Capra 1982 Banuri & Marglin 1993 , Merchant 1989 , Marglin & Marglin 1990, Shiva 1989)

As a result western science is becoming increasingly interdisciplinary in response to today's globally interconnected world, in which biological, psychological, and social phenomena are recognized as belonging to interdependent systems (see Capra 1982). The contemporary ecological movement, particularly deep ecology,

ecofeminism, bioregionalism, the Gaia hypothesis (Fox 1989 Eckersley 1992, Cooper 1990, Lovelock 1979) and the concept of sustainable development (Icamina 1997, Ulluwishewa 1993) appear to have some resonance with indigenous knowledge (Booth & Jacobs 1990, Johnson & Ruttan 1991, Wolfe et al 1992). Neither indigenous or modern knowledge systems should be judged according to a rigid set of generalizations or a static image of the past. Knowledge systems are dynamic and constantly changing through the assimilation of "outside" knowledge & alternative paradigms and worldviews (Mulvihill 1988). Both modern and indigenous knowledge systems have their strengths and limitations in addressing resource management and both are now inseparably interlinked (Johnson & Ruttan 1991, Gurung nd, Agrawal 1995)

1.9 Integrating indigenous and modern knowledge systems

Many scientists, governments and indigenous peoples agree that given the failure of conventional development models, the pluralistic nature of society and the ecological interdependence between nations, modern & indigenous knowledge systems must be integrated. Despite much discussion on the need to integrate the two systems and a few attempts at co-management (Sneed in Stevens 1997, De Lacy in Stevens 1997, Berkes 1991, IUCN 1997 p132), its role and importance has not been assessed among many people groups. In addition, its effective use in decision making and resource management has yet to be fully tested, and a number of problems have not been resolved. These problems include:

- 1) The disappearance of IK and the lack of resources to document it before it is lost.
- 2) The reconciliation of two very different worldviews
- 3) Translating ideas and concepts from one culture to another
- 4) An acknowledgement of the value of opposing knowledge systems
- 5) Differences between social and natural scientists regarding appropriate methods to document and integrate indigenous knowledge
- 6) The link between political power and modern knowledge. (See Johnson 1992)

Seemingly though integration is not enough, if western people and western institutions aspire to have a role in the developing world we need not only to treat local knowledge as valid and local knowledge holders as equals, but it behooves us to adopt a local worldview and learn to understand and interpret the world from their perspective. Otherwise there are very real dangers of cultural imperialism or non-sustainability.

References

Agrawal,A,1995, Dismantling the Divide Between Indigenous and Scientific Knowledge Development and Change Vol 26 No 3 July pp413-439,,Development and Change,

Amanor,KS,1991, Managing the fallow: weeding technology and environmental knowledge in the Krobo District of Ghana in Agriculture & Human Values 8 (1-2) pp 5-13,,Agriculture & Human Values,

Arce A & Long N,1992, The Dynamics of Knowledge :Interfaces between bureaucrats and peasants in Battlefields of Knowledge (N & A Long eds 1992),London,Routledge,

Bacon,F,1870, New Atlantis in The Works of Francis Bacon (ed J Spedding et al Vol 3),London,Longman and Co,

Bacon,F,1870, Novum Organum in The Works of Francis Bacon (ed J Spedding et al) Vol 4 p 247,London,Longman and Co,

Bacon,F,1870, Preparative Towards a Natural & Experimental History in The Works of Francis Bacon (ed J Spedding et al) Vol 4 p 263,London,Longman and Co,

Bacon,F,1870, Valerius Terminus in The Works of Francis Bacon (ed J Spedding et al) Vol 3 pp 217 219,London,Longman and Co,

Bacon,F,1870, The Great Instauration in the Works of Francis Bacon (ed J Spedding et al) Vol 4 p 20,London,Longman and Co, ,,

Bacon,F,1870, De Dignitate et Augmentis Scientiarum in The Works of Francis Bacon (ed J Spedding et al) Vol 4 p 294, 296 & 298,London,Longman and Co, ,,

Bacon,F,1964, The Masculine Birth of Time in The Philosophy of Francis Bacon (ed B Farrington) p 62,Liverpool,Liverpool University Press, ,,

Balbus,ID,1982, Marxism and Domination: A Neo-Hegelian, Feminist, Psycho-analytical Theory of Sexual, Political & Technological Liberation,Princeton NJ USA,Princeton University Press,

Banuri T & F. A. Marglin,1993, Who will save the Forests ? : Knowledge , power and environmental destruction,London & New Jersey, Zed Books,

Barthes,R,1993, Mythologies (trans by A Lavers),London,Vintage,

Baudrillard,J,1976, L'echange symbolique et la mort,Paris,Gallimard, Berkes et al,F,1991, Co-management: the evolution in theory and practice of the joint administration of living resources in Alternatives 18(2) pp 12-18,,Alternatives,

Bernstein,RJ,1983, Beyond objectivism and relativism; science, hermeneutics, and praxis,Oxford,Blackwell,

Bodley,JH,1997, An Anthropological Perspective from Cultural Anthropology: Tribes, States and the Global System,London,Mayfield Publishing Co,

Booth A & Jacobs HM,1990, Ties that Bind: native American Beliefs as a foundation for environmental consciousness in Environmental Ethics 12 pp 27-43,,Environmental Ethics,

Browder,John O,1995, Redemptive Communities: Indigenous knowledge, Colonist Farming Systems, and Conservation of Tropical Forests in Agriculture & Human Values 12 (1) pp17-30,,Agriculture & Human Values,

Bruner et al, JS,1956, The Study of Thinking,New York,Prentice Hall,

Buchner,L,1891, Force and Matter,New York,Not Known, , ,

Caldwell,B,1982, Beyond Positivism: Economic methodology in the Twentieth Century,London,George, Allen & Unwin,

Capra,F,1982, The Turning Point: Science, Society and the Rising Culture,London,Wildwood House Ltd,

CAU, Not dated, Course curriculum ENG 542 Analysis of black worldview and culture,,CAU,

Colorado,P,1988, Bridging Western and Native Science in Convergence 21 (2/3),,Convergence,

Comte,A,1983, Auguste Comte and positivism, the essential writings ed by G Lenzer,London,University of Chicago Press,

Cooper,T,1990, Green Christianity: Caring for the whole creation,London,Hodder and Stoughton,

Danbury,DJ,1993, Paradigms in CFR 72 (3),Oxford,Commonwealth Forestry Review,

Dargavel,J,1980, The political detection of Australian forestry perspectives in Australian Forestry 43 (15),Australia,Australian Forestry,

Derrida,J,1976, Of Grammatology,Baltimore MD,John Hopkins University Press,

Descartes,R,1989, Discourse on Method and the Meditations (trans by J Veitch),,Prometheus,

Descartes,R,1987, Discours de la methode pour bien conduire sa raison, & chercher la verite dans les sciences,Lecce,Conte Lecce, , ,

Dumont, L,1977, From Mandeville to Marx,Chicago,University of Chicago Press,

Durkheim,E,1933, The Division of Labor in Society,New York,The Free Press,

Eaton,PW,1998, Character: Cornerstone of a decadent society in The Seattle Times 3/3/98,Seattle,Seattle Times,

Eckersley, R,1992, Environmentalism and political theory: Towards an ecocentric approach,London,UCL Press,

Ereira,A,1990, The Heart of the World,London,Jonathan Cape Ltd, Fee,E,1986, Critiques of modern science: the relationship of feminism to other radical epistemologies in Feminist Approaches to Science (R Blier ed)pp 43-56,New York,Pergamon Press,

Finlayson,W,1994, Paradigms in Commonwealth Forestry Review 73 (3) p 143,Oxford,Commonwealth Forestry Review,

Foster,GM,1965, Cultural Responses to Expressions of Envy in Tzintzuntzan in SW Journal of Anthropology 21 pp 24-35,,SW Journal of Anthropology,

Foster,GM,1965, Peasant society and the image of limited Good in American Anthropologist 67 pp 293-315,,American Anthropologist,

Foster-Carter,A,1976, From Rostow to Gunter Frank: Conflicting paradigms in the analysis of underdevelopment in World Development 4 pp 167-180,,World Development,

Foucault,M,1970, The Order of Things: The Archeology of the Human Sciences,New York,Random House,

Foucault,M,1980, Power/Knowledge: Selected Interviews and Other Writings 1972-77 trans Colin Gordon,Brighton,Harvester Press,

Fox, W,1989, The Deep Ecology-Ecofeminism Debate and its Parallels; Environmental Ethics 11 5-25,,Environmental Ethics,

Gadgil et al, M,1993, Indigenous knowledge for biodiversity conservation in Ambio 22 (2-3) p 151-156,,Ambio,

Geertz, C,1973, The Interpretation of Cultures, New York, Basic Books

Gilmour D.A King G.C & Hobley M,1989, Management of forests for local use in the Hills of Nepal 1 Changing forest management paradigms in Journal of World Forest Management 4 pp 93-110,,Journal of World Forest Management,

Gilmour DA & RJ Fisher,1991, Villagers, Forests and Foresters: The Philosophy, Process and Practice of Community Forestry in Nepal, Kathmandu, Sayogi Press

Gilmour,D.A,1988, Not seeing the trees for the forest: A re-aaraisal of the deforestation crisis in two hill districts of Nepal in Mountain Research and Development 8(4) 343-350,USA,Mountain Research and Development,

Gimbutan,M, Date Unknown The language worldview and culture of the goddess in Greenearth Observer,California,Greenearth Foundation,

Gurung,JD, Date Unknown Indigenous knowledge systems: Considerations for Development,Kathmandu,ICIMOD,

Habermas,J,1984, The Theory of Communicative Action,Boston,Beacon Press,

Harman,WW,1989, Reclaiming Traditional Wisdom for the Needs of Modern Society, Indigenous Sciences Conference,Calgary,University of Calgary,

Holbach, Baron PHT d',1990, Systeme de la nature d'Holbach (texte revu par J Boulad-Ayoub),Paris,Fayard, , ,

Howes M & Chambers R,1980, Indigenous Technical Knowledge: Analysis, Implications and Issues in Indigenous Knowledge Systems & Development (ed D Brokensha et al),Lanham,University Press of America,

IUCN,1997, Indigenous peoples and sustainability: Cases and Actions,Netherlands,International Books

Jencks,C,1989, What is Post-Modernism?,London,Academy Editions,

Johnson M & Ruttan R,1991, Dene Traditional Environmental Knowledge: Pilot Project in Lore: Capturing Traditional Environmental Knowledge (ed M Johnson) pp35-63,Canada,Dene Cultural Institute,

Johnson,M,1992, Lore: Capturing Traditional Environmental Knowledge,Ottawa,Dene Cultural Institute/IDRC,

Jolly,K, Date unknown Lost and Found : Indus & Yellow River Civilizations,Hawaii,k.jolly@hawaii.edu,

Kanowski,PJ,1994, Paradigms in Commonwealth Forestry Review 73 (3)p 144,Oxford,Commonwealth Forestry Review,

Kuhn,T,1962, The Structures of Scientific Revolutions,Chicago,University of Chicago Press,

Kwok,KH,98, Postmodernism,,Kai H Kwok,

Laudan,L,1996, Beyond positivism and relativism; theory, method and evidence,Oxford,Westview Press,

Levi-Strauss,C,1974, Structural Anthropology,New York,Basic Books,

Locke,J,1997, The Works of John Locke,London,Routledge/ Thoemmes,

Lovelock,J,1979, Gaia: A new look at life on earth,Oxford,Oxford University Press, ,,

Lyotard,J-F,1979, The Postmodern Condition: A Report on Knowledge,Manchester,Manchester University Press, Malinowski,B,1922, Argonauts of the Western Pacific,London,Routledge and Kegan Paul,

Maor,E,1991, To Infinity and Beyond: A Cultural History of the Infinite,Princeton,Princeton University Press,

Marglin F & Marglin SA (eds),1990, Dominating Knowledge: Development, Culture & Resistance,Oxford,Clarendon Press,

Marx,K,1970, Capital: A critique of Political Economy Vol 3 The Process of Capitalist Production as a Whole (edited by Engels translated by S Moore & E Aveling),London,Lawrence & Wishart,

Maybury-Lewis,D,1992, Millennium: Tribal Wisdom and the Modern World,New York,Viking Penguin Press,

Mead, GH,1934, Mind, Self & Society (CW Morris ed),Chicago,University of Chicago Press,

Merchant,C,1983, The Death Of Nature, New York,Harper & Row,

Mulvihill,P,1988, Integration of the state and indigenous systems of wildlife management: problems and possibilities,Canada,University of Waterloo,

Nandy,A,1987, Towards an Third World Utopia in Traditions, Tyrannies & Utopias: Essays in the Politics of Awareness,New Delhi,Oxford University Press,

Newton,Sir I,1995, Newton: texts, backgrounds, commentaries (ed IB Cohen & RS Westfall),London,

Norgaard,RB,1984, Traditional agricultural knowledge: past performance, future prospects and institutional implications in AJOE 874-878,,American Journal of Agricultural Economics,

OBU,97, Daily Web Guide Wed Sept 3rd 1997,Okhlahoma,Okhlahoma Baptist University,

Orr,DW,1992, What is education for in Earth Ethics 3 (3) pp 1-5,,Earth Ethics,

Osherenko,G,1988, Sharing power with native users: co-management regimes for Arctic wildlife,Canada,Canadian Arctic Resources Committee,

Parsons,T,1954, Essays in Sociological Theory,Glencoe USA,The Free Press,

Peikoff,L,1991, Objectivism; the philosophy of Ayn Rand,London,Penguin,

Prigogine I & Stengers I,1984, Order out of Chaos: Men's New Dialogue With Nature,New York,Bantam Books,

Radcliffe-Brown,AR,1922, The Andaman Islanders,Cambridge,Cambridge University Press,

Reichel,E,1992, Shamanistic Modes for environmental accounting in the Colombian Amazon: Lessons from Indigenous ethno-ecology for Sustainable Development (paper: Int Sym on IK & SD,Phillipines,ISIK&SD,

Rorty,R,1979, Philosophy and the Mirror of Nature,Princeton,Princeton University Press,

Rorty,R,1985, Habermas and Lyotard on postmodernity in Habermas and Modernity (ed by RJ Bernstein),Cambridge,Polity Press,

Sahtouris,E,1995, Earthdance: Living systems in Evolution,,E Sahtouris,

Saint-Simon,C-H de Rouvroy Comte de,1975, Henry Saint-Simon (1760-1825): selected writings on science, industry and social organisation (trans from French ed by K Taylor),London,Croom Helm, Santmire,HP,1985,The Travail of Nature,Philadelphia,Fortress,

Schutz A & Luckmann T,1974, The structures of the Life-World,London,Heinemann,

Schutz, A,1962, The Problem of Social Reality,The Hague,Martinus Nijhoff,,,

Shiva, V,1989, Staying Alive, London, Zed Books,

Slater,D,1995, Trajectories of Development Theory: Capitalism, Socialism and Beyond in Geographies of Global Change (ed RJ Johnston et al),Oxford,Blackwell,

Smith,A,1776, An inquiry into the nature and causes of the wealth of nations,Glasgow,University of Glasgow,

Stevens (ed),S,1997, Conservation Through Cultural Survival: Indigenous People and Protected Areas,Washington,Island Press,

Studley,J,1994, Paradigms in Commonwealth Forestry Review 73 (2)p 73,Oxford,Commonwealth Forestry Review,

Thomas,K,1983, Man and the Natural World,Harmondsworth,Penguin, , ,

Ulluwishewa,R,1993, Indigenous knowledge, national IK resource centres and sustainable development in IK&DM 1(3),Netherlands,Indigenous knowledge and Development monitor,

Warren,DM,1991, Using Indigenous Knowledge in Agricultural Development; Discussion Paper 127,Washington,World Bank,

Watson H & Chambers D,1989, Singing the Land Singing the Land,Australia,Deakin University Press,, ,

Weber,M,1930, The Protestant Ethic and the Spirit of Capitalism,London,George Allen & Unwin,

Wolfe et al,J,1992, Indigenous and Western Knowledge and resource management systems; Rural Reportings, Native Canadian Issues Series, 1,Guelph Ont,University of Guelph,

Woodley,E,1991, Indigenous ecological knowledge systems and development in Agriculture and Human values 8 (1-2) 173-179,,Agriculture and Human Values, .

Notes to readers

The author is currently an independent ethno-forestry consultant and part-time Ph.D., candidate in Tibetan ethno-forestry paradigms.

The author's email addresses are:

John_Studley@compuserve.com OR john_studley@tiscali.co.uk OR john_f_studley@yahoo.com