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The Human Ecology Dialectic: Culture as a Behavioral Adaptation

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The Human Ecology Dialectic: Culture as a Behavioral Adaptation

Cover Page Footnote

Columbus Travel Media Ltd. (2014). Nunavut weather, climate and geography. Retrieved from <http://www.worldtravelguide.net/canada/nunavut/weather-climate-geography>. The website provided a narrower geographic description of the Canadian Central Arctic, as it exists today. The line pattern could represent facial tattooing or advanced age. This maskette is the oldest known depiction of a human from the Canadian Arctic (Hessel, 1998, p. 12). The wand could have been used by a shaman. The various faces possibly represent spirit helpers, a community, ancestors, or clan members. Note, there are no carved animal faces on the wand (Hessel, 1998, p. 15). The simplicity of the carvings on the long piece of ivory is indicative of the ability of the Thule to relate stories. Within a carved frame there are hunting, camping, and battle scenes ((Hessel, 1998, p. 17). The sea goddess Sedna was believed to anthropomorphize the idea of fertility. When angered she would withhold food animals, which would cause starvation. To appease Sedna shamans would comb and braid her hair. This particular depiction of Sedna is amusing because the artist carved her as a diva who does not like to be kept waiting for her hair styling appointment (Hessel 1998, p. 56).

The Human Ecology Dialectic: Culture as a Behavioral Adaptation

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The *Human Ecology Dialectic* (Figure 1) is a conceptual tool to understand how the seemingly oppositional theories championed by naturalist Darwin and cultural anthropologist Boas can coexist within the dialectic realm of biological anthropology. The theories will pose a dynamic discourse about the evolution of the Inuit and their ancestors' behavioral adaptation process to the Arctic environment, which resulted in and was culturally demonstrated through their art. Foley (1984) wrote, "It thus belongs to a long anthropological tradition, that of man-environment relationships" (p. 3).

The core of Darwinian evolutionary theory is natural selection, and its doctrine facilitated in the understanding of the patterns of biological variation found in human behavior (Foley, 1984). In that, the environment would affect behavioral adaptation. The environment is not a static denominator but a viable biological community that is actively engaged in the human behavioral adaptation process. The human and environment correlation has been analyzed through the perspectives of different branches of anthropology, which resulted in conflicting results and questions. Does the environment impact human behavioral adaptation? Or does human behavioral adaptation manipulate the environment? The *Human Ecology Dialectic* allows the environment to influence human behavior. This dialectical process takes into account the evolution of a cultural and biological synthesis for stable community development, which results in a taxon to create artistic forms. Further, through the *Human Ecology Dialectic* human manipulation of the environment was achieved in accordance with the use of raw organic materials for cultural purposes. This transaction included the utilization of resources to produce functional tools for survival extending from prehistoric to contemporary cultures.

Human Ecology Dialectic

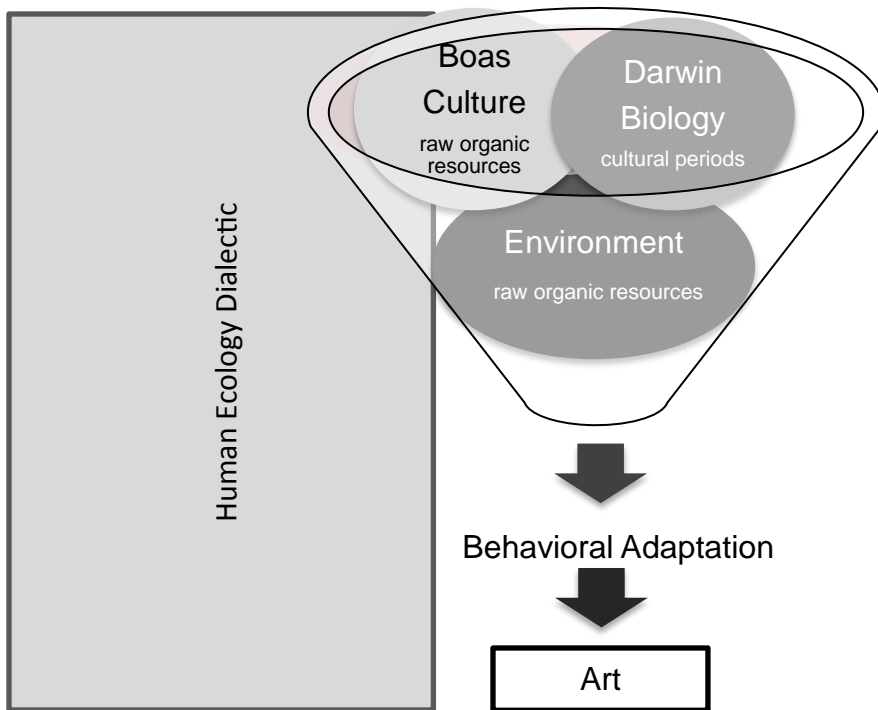


Figure 1: Marcia S. Taylor, *Human Ecology Dialectic*, 15 Sept. 2014.

The dialectic model was used by Georg Hegel, Karl Marx, and Friedrich Engels as a philosophical approach to explain interrelationships and external relationships within a cause and effect system, and as a contradictory interaction among those relationships.

The Human Ecology Dialectic (Method)

Marx considered the dialectic as an interactive association between the involvement of individual human activity and an intentional social structure (Swingewood, 1975). In that, a human’s social existence determined his consciousness; thereby, knowledge is a trait of social structure and a component in change (Swingewood, 1975). Anthropologically, Marx considered social theory in terms of its human and historical nature (Swingewood, 1975). His fundamental summation of the human adaptation process was based on four tenets:

- Humans are part of nature; consequently, nature provided the objects that humans objectified (Patterson, 2009). According to Marx this interactive subjectification process caused the expansion of human self-expression (Patterson, 2009). Marx wrote, “Man is directly a natural being” (as cited in Patterson, 2009, p. 42).
- Humans are active beings that sense and feel their surrounding environment. Developed over millions of years, human perceptual and anatomical systems have disposed their environmental adaptation in a variety of ways, one of which was cultural development (Patterson, 2009).
- Humans differentiate themselves from their biological community through self-objectification (Patterson, 2009). Thereby, objects are subjected to human purposive activity (Patterson, 2009).

- Humans convert their bodily limbs such as arms, legs, and brain into production mediums. This transformation enables humans and their objects hegemony over the biological action between themselves and nature (Patterson, 2009).

The culmination of these four tenets is Marxist essentialism. Marx considered real science a paradoxical dialectic because it involved apparent externalized forms and conscious motives and thoughts (Huaco, 1999). Therefore, through consciousness, humans formed externalized objects or artistic cultural expressions.

Environment as the Common Denominator: Canadian Central Arctic (Site of Study)

As with many cultures the connection with the environment, specifically the weather, produced traditional survival practices. The Inuit believed in *sila*, which is translated best by the concept of climate. *Sila* expressed itself in the four changing seasons (Stuckenberg, 2007). Nalungiaq, a Netsilik woman from the Canadian Central Arctic, told the folktale of how the winds, rain, snow, and storm came into being by the power of *sila* (Stuckenberg, 2007). Within the harsh Arctic environment the distinct seasons determined climatic conditions, or *sila*, in the forms of ice melts and floes, animal migrations, and the subsequent Inuit biological and cultural connectedness to them all. This relationship is understood conceptually through the uniqueness of their art.

Overall environmental facts should be identified to comprehend fully the contemporary Inuit seasonal way of life:

- Located in the Canadian Central Arctic the Nunavut Territory covers one-fifth of Canada. It spans from Ellesmere Island off the Greenland coast to a Saskatchewan/Manitoba border, then west to the Arctic coast near Amundsen Gulf. Geographically, the territory is diverse and consists of wilderness, tundra, cliffs, and plateau. Pack ice surrounds the Arctic Islands where the area meets glaciers and ragged mountains. Hazardous weather conditions can arise due to the combination of low temperatures and high winds. (“Nunavut Weather, Climate & Geography,” 2014).ⁱ
- The cold winter is dark, and can last six to seven months of the year. Temperatures in January can drop to -22° F to -40° F.
- The short summer will last for two to three months of the year. Temperatures on the average range from 40° F to 60° F.
- Over eight hundred species of plants, hundreds of animals and a few dozen of bird species exist in the region (Hessel, 1998, p.5).
- The subsurface layer of soil is permafrost because it remains frozen for more than two consecutive years. The permafrost would bring about a plow-less subsistence (Figure 2).

Northern Canada Natural Resources - Permafrost Zones

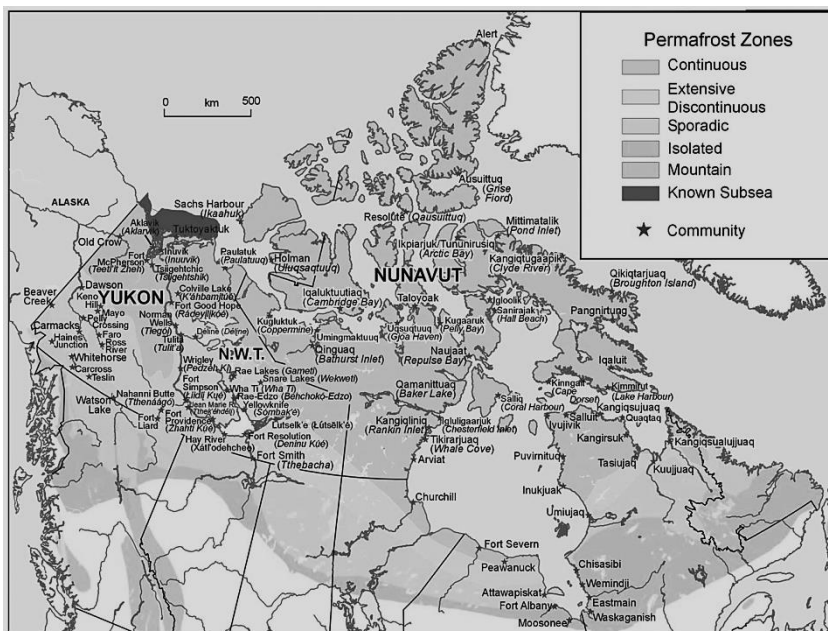


Figure 2: Northern Canada Natural Resources – Permafrost Zones (20 Nov. 2014).

The map illustrates the continuous permafrost zones of the Canadian Central Arctic. Retrieved from <http://www.nrcan.gc.ca>

Based on Arctic environmental factors art historian Auger (2005) reasoned:

The settlement patterns of the historic and prehistoric Inuit were affected by similar environmental conditions, so it is not surprising that both were characterized by seasonal changes in location in accordance with the necessary changes in subsistence base. Settlement patterns, particularly the degree of sedentariness, have a significant impact on social structure and, in many cases, on artistic production (p. 13).

Due to seasonal differences the prehistoric and historic Canadian Central Arctic Inuit lived in temporary settlements (Auger, 2005). Thus, subsistence required simple technologies for migratory settlement patterns centered on hunting and fishing. Lithic and other raw organic resources would have been gathered to fashion tools. Based on archaeological evidence in the Canadian Arctic, the earliest artifacts are called the Arctic Small Tool tradition (ASTt), which references the (a) Independence I (to c. 700 B.C.), (b) Independence II (to 200 B.C.), and (c) Pre-Dorset (to c. 700 B.C.) prehistoric cultural periods (Auger, 2005, p. 22).

Cultural Periods of Art of the Canadian Central Arctic Inuit (Participants)

The Pre-Dorset culture evolved into the Dorset culture around 800 B.C. (Crandall, 2000). In 1925, anthropologist Diamond Jenness identified the Dorset culture, which was named after Cape Dorset (Kinngait) on Baffin Island (Qikiqtaaluk) where some of their first artifacts were discovered. The Dorset culture gradually vanished due to two factors: the advent of warmer weather, approximately A.D. 900, and the arrival of the Thule from the West, about A.D. 1000 (Crandall, 2000). The Thule were named after a northern site in Greenland where their

cultural artifacts were found. They were considered the ancestors of the contemporary Inuit of the Canadian Central Arctic. The migration from the West contributed to the disappearance of the Thule culture around A.D. 1600 (Crandall, 2000).

Artistic cultures represented by the Pre-Dorset, Dorset, and Thule did not exist in isolation. The art demonstrated the migration or diffusion of the people themselves. Artistic trait distribution on the raw organic resources, such as walrus tusks and caribou antlers, provided mapping of where people had to seasonally migrate for food or lithic sources. In addition, trait acknowledgement provided evolutionary evidence of cultural interaction and assimilation or dominance as exhibited by the Thule. Foley (1984) developed the “diversity-stability” hypothesis to explain community evolution (p. 12). He stated, “The energetics and resource technology explanations suggest that stability is a function of the gross ecology of the community” (Foley, 1984, p.12). Whether the community settlement patterns were nomadic, semi-nomadic or more sedentary they had the capabilities to become stable and flourish culturally. The stabilization of the community was dependent upon evolutionary adaptations and the diversity of the “ecological space” (Foley, 1984, p. 12). For the Inuit and their ancestors the diversity of their environment was limited. The simplistic example of their use of chert tool stone drew the Pre-Dorset to occupy those areas where the lithic raw resource was obtainable (Landry, 2013). Thus, they were able to adapt to the environmental issue of resource availability. Foley (1984) contended that environmental issues could be a stimulus, and the adaptation the product, which is analogous to the *Human Ecology Dialectic*. Landry (2013) referenced an archaeological analysis in determining a technological process with the use of lithic raw resources. He stated the process flowed from (a) environmental conditions, (b) social strategies, (c) technological strategies, and (d) design to an (e) artifact form (Landry, 2013, p. 27). Thus, for both Foley and Landry the environment stimulated human behavioral adaptation where the outcome was art production.

Pre-Dorset Culture.

Due to decomposition of the raw organic resources used, the Pre-Dorset culture (1800 B.C. to 800 B.C.) left few intellectually designed artifacts for archaeological identification. These artistic objects include a piece of polished bone with cross-hatching, a small carved ivory seal, and maskettes (Crandall, 2000). Auger (2005) denoted Pre-Dorset cultural artifacts were similar to the Independence I cultural period; however, they also were indicative of advanced technology. The Early Palaeo-Eskimo (Pre-Dorset) artifact chosen as an example demonstrates the use of ivory, and illustrates the physical appearance of an ancestral Inuit from the Canadian Central Arctic (Figure 3).ⁱⁱ

Early Palaeo-Eskimo (Pre-Dorset)

Figure 3: Early Palaeo-Eskimo (ca. 1700 B.C.), Devon Island (True Love Lowlands). Miniature mask, ivory, 5.4x2.9x0.8, Canadian Museum of Civilization. Hessel, I. (1998). *Inuit art*. New York, NY: Harry N. Abrams, Inc. These materials are included under the fair use exemption and are restricted from further use.

Dorset Culture.

The Dorset culture (800 B.C. to A.D. 1450) was named after Cape Dorset in the Nunavut Territory where some of their first artifacts were found (Crandall, 2000). Given the limited diversity of resources in the Arctic, the Dorset developed a lithic technology that comprised of a more sophisticated adaptive “toolkit” (Landry, 2013 p. 20). This was evident in how they produced and fashioned artifacts, which included three-dimensional carvings (Crandall, 2000). The raw organic resources used were bone, antler, ivory, soapstone, and occasionally wood. Attention has been given to the symbolic importance of Dorset art based on their more nucleated and sedentary settlement patterns (Auger, 2005). This rationale is congruent with the correlation between increased leisure times with artistic productivity. Biologically, decreased stress would result in the evolution of more aesthetic artistic characteristics. Dorset art has been associated with shamanistic purposes, which would indicate thought progression to include the cultural spirituality facet. Kahler (1968) defined culture in an evolutionary milieu (p. 5). Anthropologically, culture was assessed in terms of the “other.” Hence, culture became synonymous with development. In that, it was measured by the progress established by the dominant standards of the succeeding culture. Thereby, certain cultures were determined as improved by the influence of the successor as artistically evidenced by the Pre-Dorset to Dorset cultures. The featured Dorset artwork is an antler with numerous carved faces with varying expressions (Figure 4).ⁱⁱⁱ

Dorset (Late Dorset)

Figure 4: Late Dorset (A.D. 600-1300), Bathurst Island. Wand with faces, antler, 19.5x5.1x3.3, Canadian Museum of Civilization. Hessel, I. (1998). *Inuit art*. New York, NY: Harry N. Abrams, Inc. These materials are included under the fair use exemption and are restricted from further use.

Thule Culture.

Though the Dorset did contribute artistically to the Thule culture (A.D. 1000 to 1600), they gradually assimilated into the technologically advanced culture of the Thule (Auger, 2005). Archaeologists speculated the Thule arrived via Alaska to the Canadian Central Arctic. They were sea mammal hunters as identified by their functional artifacts, such as hunting weapons largely made of ivory, and the Alaskan heritage depictions (Hessel, 1998). While technologically more advanced, Thule art is more functional, and is considered as “rudimentary” when compared with the Dorset (Crandall, 2000, p. 19). However, beyond its functionality their art demonstrated skilled craftsmanship (Figure 5).^{iv} This detail supported the migratory patterns of prehistoric Arctic peoples and the Darwinian biogeography theory.

Thule

Figure 5: Thule (A.D. 1100-1700), Baffin Island (near Arctic Bay). Bow-drill handle, ivory, 42.9x5.1x0.4, Canadian Museum of Civilization. Hessel, I. (1998). *Inuit art*. New York, NY: Harry N. Abrams, Inc. These materials are included under the fair use exemption and are restricted from further use.

The Thule culture was devastated by the Little Ice Age (A.D. 1600 to 1850) because it froze the food-rich sea waters (Hessel, 1998). This caused the Thule to retreat from the coastal areas into the interior to hunt for land mammals. The culture was further decimated

by the encroachment of Western explorers. What emerged were “regional cultural patterns” now considered the contemporary Inuit (Hessel, 1998, p. 19)

Contemporary Inuit Culture.

When Inuit art is discussed there is reference given to the Historic Period (1770s to 1940s) during which time art shifted from traditional forms to that of a commodity (Hessel, 1998). The prehistoric cultures used raw organic resources to produce and create art for traditional purposes for the enhancement of life and for daily existence. Carvings were used for trade, amulets, weaponry, and tools. Today, the contemporary Inuit culture (1940s to Current) still use art to support their lifestyle and provide a reliable income for food security. Their art has been marketed as folk art, souvenirs, mass-produced, kitsch, camp, and museum quality. The contemporary cultures of the Canadian Central Arctic include the (a) Copper, (b) Netsilik, (c) Igloodik, (d), Baffin Island Inuit, and (e) Caribou (Figure 6). More specifically, the Inuit of this particular Arctic area are identified as the (a) Cooper Inuit of Banks and Victoria Islands and the adjacent mainland, (b) the Netsilik of Boothia Peninsula, (c) the Igloodik of North Baffin island, (d) the Baffin Island Inuit of South Baffin Island, and (e) the Caribou Inuit of the west side of Hudson Bay in the region of Qamani'tuaq (Auger, 2005, p. 4).

The Arctic People – Groups in the Canadian Central Arctic Region

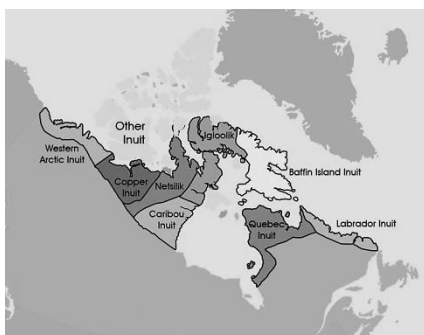


Figure 6: *The Arctic People – Groups in the Canadian Central Arctic Region* (9 Nov. 2014). The map illustrates the geographic areas of the Canadian Central Arctic Inuit.

Retrieved from

http://firstpeoplesofcanada.com/images/firstnations/teachers_guide/inuit/Inuit_map.jpg

Contemporary Inuit culture had been stretched from its traditional seams due to more stresses from the outside world. In the 1950s a TB epidemic ravaged the Arctic Inuit, which resulted in the separation of families (Crandall, 2000). Arctic Inuit were moved to the southern regions for treatment where they became exposed to a Western culture ripe with lower-protein foods and modern clothing styles (Crandall, 2000). Even when they returned to the Arctic, the Western acculturation had a permanent effect on their traditional life-ways. Artistically, the traditional use of raw organic resources, however, is still apparent in the contemporary culture (Figure 7).^v

Contemporary



Figure 6: Natar Ungalaaq m. (born 1959). Igloodik. *Sedna with Hairbrush*, 1985, grey stone, fur, bone, 21.5x20.0, National Gallery of Canada. Hessel, I. (1998). *Inuit art*. New York, NY: Harry N. Abrams, Inc. These materials are included under the fair use exemption and are restricted from further use.

Darwin Biogeography Theory (Test One)

Biogeographically, Darwin (1859/1964) determined that “barriers of any kind, or obstacles to free migration, are related in a close and important manner to the differences between the productions of various regions” (p. 347). However, due to the recognition of the proximity of northern land regions there might have been free migration as demonstrated in “strictly arctic productions” (Darwin, 1859/1964 p. 347). As a naturalist Darwin reasoned that each species could not have been produced in one area alone. Instead, migration occurred because of geographical and climatic factors, which archaeologists have speculated transpired with the Dorset and Thule cultures. This speculation leads to another point of the Darwinian biogeography theory; in that, “successive groups of beings, specifically distinct, yet clearly related, replace each other” (Darwin 1859/1964, p. 349). A summation of Darwinian biogeography is best explained in his own words:

This bond, on my theory, is simply inheritance, that cause which alone, as far as we positively know, produces organisms quite like, or, as we see in the case of varieties nearly like each other. The dissimilarity of the inhabitants of different regions may be attributed to modification through natural selection, and in a quite subordinate degree to the direct influences of different physical conditions. The dissimilarity will depend on the migration of the more dominant forms of life from one region into another having been effected with more or less ease, at periods more or less remote; - on the nature and number of the former immigrants; - and on their action and reaction, in their mutual struggles for life; - the relation of organism to organism being, as I have already often remarked, the most important of all relations (Darwin 1859/1964, p. 350).

Based on the harshness of the remote Arctic, competition for regional subsistence among the Pre-Dorset, Dorset, and Thule cultures would prove which was better adapted to their environment. As history indicated the Dorset assimilated into Thule culture.

In the Inuit language a *silarqisiurpuq* is “someone who is smart enough to travel with good weather” (Stuckenberger, 2007, p. 33). This personal understanding of the perplexity of

the surrounding environment is extremely important because it denotes that one has grasped the skills to live off the land. As stated previously, the definition of environment is a biological community, and successful adaptation to it increases efficiency or specialization (Alland, 1967). Per Darwin (1859/1964) specialization exemplified a variation for survival and reproduction: “Man does not actually produce variability; he only unintentionally exposes organic beings to new conditions of life, and then nature acts on the organization, and causes variability” (p. 466-467). The artistic differences and use of raw organic resources among the prehistoric cultures, and later the contemporary Inuit, justified behavioral adaptation accessed through the interactive biological-environmental relationship. Again, reference is given to the adaptability of the Thule as they were forced to migrate to the interior to hunt for caribou as a result of the Little Ice Age.

Boas Cultural Adaptation Theory (Test Two)

Boas wrote there is “the elementary relationship between land and people” (Müller-Wille, 2014, p. 31). During the 1880s he was particularly focused on the relationship between the Inuit and their Arctic environment. In 1883 Boas embarked on a year-long expedition to the Canadian Central Arctic, notably Baffin Island, to conduct “geographical exploration and discovery with cartography, concentrating on *Physiogeographie* and *Anthropogeographie* with hints of ethnography, ethnology, and physical anthropology” (Müller-Wille, 2014, p. 38). A mentor of Boas encouraged him to study Inuit migrations and their causes (Müller-Wille, 2014). This additional scientific study is apparent in the slight overlap between the Boas culture and the Darwin biology numerators in *The Human Ecology Dialectic*. In other words, the Darwinian biogeography theory was applicable to the Boasian approach that linked cultural adaptation to climatic and other environmental conditions. Further acknowledgement of the connection the Inuit had with their environment was observed by Boas, and written in his journals. Boas (1888/1964) noted, “The Eskimo (Inuit) exhibit a thorough knowledge of the geography of their country” (p. 235). He noted Arctic environmental conditions affected hunting practices and potential, settlement patterns, economic endeavors, and social groups (Müller-Wille, 2014, p. 49).

In the book *Primitive Art* (Boas, 1927/1955/1983) homage was paid to the raw organic resources used by the Inuit for art production:

The second fundamental point to be borne in mind is that each culture can be understood only as an historical growth determined by the social and geographical environment in which each people is placed and by the way in which it develops the cultural material that comes into its possession from the outside or through its own creativeness (p. 4).

In reference to the quote, the first point made had equal validity:

The behavior of everybody, no matter to what culture he may belong, is determined by the traditional material he handles, and man, the world over, handles the material transmitted to him according to the same methods (Boas 1927/1955/1983, p. 1).

According to Boas the man-environment relationship was twofold: human behavioral adaptation was affected by environmental conditions, and humans used the raw organic resources for art production.

Behavioral Adaptation (Results)

Laughlin (1966) studied the circumpolar distribution of ancestral and contemporary Arctic populations. He concluded adaptation to the Arctic environmental conditions was “primarily physiological and cultural” (Laughlin, 1966, p. 474). His claim was based on research data for that time when the study of genetics of physiological adaptation was in its early stages and

not widely available (Laughlin, 1966, p. 474). Archaeological artifacts discovered from the prehistoric cultures displayed adaptation to the Arctic environment. For example, the epicanthic eye fold has been discussed as an evolutionary adjustment due to the acute glare off the ice and snow which could cause snow blindness (Laughlin, 1966, p. 476). However, the discovery of slit goggles proved eye protection was needed especially for travel (Laughlin, 1966, p. 476). As stated earlier, art consists of objects of various forms and functions with aesthetic qualities, which would include the slit goggles made from a raw organic resource.

Hildes (1966) agreed with a more Darwinian hypothesis, "The conditions of life in the Arctic have obvious bearing on physiological requirements" (p. 498). He wrote that it is of interest to contemplate the biological factors which may contribute to the environmental adaptability success of the Arctic peoples (Hildes 1966, p. 497). To prove his theory Hildes (1966) studied Arctic peoples in regard to (a) climate and geography, (b) living conditions, (c) health, and (d) physiological responses (p. 497). He also considered the climatic and environmental issues of (a) low temperature, (b) extended period of snow-covered soil, (c) extended darkness and/or light, (d) lack of agriculture, (e) low density of population, (f) communication problems, and (g) low economic growth (Hildes 1966, p. 498). In his concluding remarks, Hildes (1966) commented:

The experience which has been accumulated through field biological studies in the polar regions provides assurance that intensive studies of selected Arctic populations by multi-disciplinary teams can be carried out, and would provide new information on the role of genetic and environment factors in adaptation to circumpolar living (p. 506).

Dialectically diverse theories of Darwin and Boas worked with environmental conditions to prove how the numerators of biogeography and cultural adaptation interacted together and with environmental conditions generated behavioral adaptation and art production. The fact that the Darwinian biogeography theory was applicable to a Boasian approach that linked cultural adaptation to climatic and other environmental conditions was an interesting and unexpected development of the *Human Ecology Dialectic*.

Discussion

Darwin, Marx, and Wagner (book) by American historian Barzun reaffirmed the revolutionary roles the three men had on science, social science, and art, respectively (Barzun, 1947). He further explained the amalgamation of these fields that created dynamic social change in the Western world. The theories, ideologies, and philosophies of Darwin, Marx, and Wagner expressed through their modes of discourse exemplified dramatically evolving societal institutions and norms.

Upon the formation of the *Human Ecology Dialectic* foundation the artistic component of composer Wagner was replaced by Boas. In his own right, Boas was an ardent journal writer and eager sketch artist. These talents were apparent as a cultural researcher in the Canadian Central Arctic, notably Baffin Island. Boas became keenly aware of how the harsh Arctic environment affected the indigenous people, which propelled his anthropological research into the revolutionary realm of fieldwork and ethnography. Thus, the theoretical culmination of Marx, Darwin, and Boas gave rise to the cooperative relationship the Inuit and their ancestors had with their environment, thereby adapting to their ecological niche, which will be explained further.

LaLand and colleagues posed an interesting reverse perspective on how culture affected the human genome. Simply stated, they purposed a gene-culture co-evolutionary theory (LaLand, Odling-Smee, & Myles, 2010). Through the development of mathematical models a strong relationship between cultural processes and natural selection was established:

Such data are consistent with two branches of mathematical evolutionary analysis: gene-culture co-evolutionary theory, which explores how genetic and cultural processes interact over evolutionary time, and niche-construction theory, which investigates the evolutionary impact of the modification of environments by organisms (LaLand et al., p. 137).

Due to the lack of scientific study on the human genome during their lifetimes, this data was not available to both Laughlin and Hildes. However, they determined cultural and biological components were factors in environmental adaptation.

The niche-construction theory demonstrated by various animals was applicable to *Homo sapiens*. The theory explained in terms of inceptive and counteractive niche-construction, “leads to the expectation that gene-culture co-evolution has been a general feature of human evolution” (LaLand et al., p. 140). Inceptive niche-construction allowed humans to migrate to a new environment, but because of counteractive niche-construction they were able to adjust to some of the selection pressures (LaLand et al., p. 140). In other words, counteractive niche-construction could impede the effects of environmental change, and “it functions to protect organisms from shifts away from environmental states to which they are adapted” (LaLand et al., p. 140). Compared with animals, the human counteractive niche-construction acted more rapidly because of its reliance on culture (LaLand et al., p. 141).

The *Human Ecology Dialectic* provides room for the anthropological disciplines to coexist in order to explain culture as a behavioral adaptation due to environmental conditions, much like the inceptive and counteractive elements of the niche-construction theory. Humans can “initiate or respond to a change in an environmental factor” (LaLand et al., p. 140). As Marx the anthropologist asserted, humans cannot be separated from nature (Figure 8). In regard to the Inuit and their ancestors, archaeologists confirmed this coexistence. Prehistoric peoples migrated to new environments and behaviorally adapted, as explained by the bioanthropological Darwinian biogeography theory and the Boasian cultural adaptation theory, which became culturally verified by artistic production, thus concluding the adaptable relationships within the *Human Ecology Dialectic*.

Contemporary



Figure 8: Caribou parka with caribou pants, canvas over-pants, and caribou mittens, 1913-18, from Canadian Arctic Expedition: possessions of James Crawford, Stefansson Collection on Polar Exploration, Rauner Special Collections Library, Dartmouth College Library. Stuckenberger, N. (2007). *Thin ice: Inuit traditions within a changing environment*. Lebanon, NH: University Press of New England for Hood Museum of Art, Dartmouth College. These materials are included under the fair use exemption and are restricted from further use.

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Figures

Figure 1 *The Human Ecology Dialectic*

Figure 2 Northern Canada Natural Resources - Permafrost Zones

Figure 3 Early Palaeo-Eskimo (Pre-Dorset) Maskette

Figure 4 Dorset (Late Dorset) Wand

Figure 5 Thule Bow-Drill Handle

Figure 6 The Arctic People – Groups in the Canadian Central Arctic Region

Figure 7 Contemporary Sedna

Figure 8 Caribou Parka with Caribou Pants and Mittens

ⁱ Columbus Travel Media Ltd. (2014). *Nunavut weather, climate and geography*. Retrieved from <http://www.worldtravelguide.net/canada/nunavut/weather-climate-geography>. The website provided a narrower geographic description of the Canadian Central Arctic, as it exists today.

ⁱⁱ The line pattern could represent facial tattooing or advanced age. This maskette is the oldest known depiction of a human from the Canadian Arctic (Hessel, 1998, p. 12).

ⁱⁱⁱ The wand could have been used by a shaman. The various faces possibly represent spirit helpers, a community, ancestors, or clan members. Note, there are no carved animal faces on the wand (Hessel, 1998, p. 15).

^{iv} The simplicity of the carvings on the long piece of ivory is indicative of the ability of the Thule to relate stories. Within a carved frame there are hunting, camping, and battle scenes (Hessel, 1998, p. 17).

^v The sea goddess Sedna was believed to anthropomorphize the idea of fertility. When angered she would withhold food animals, which would cause starvation. To appease Sedna shamans would comb and braid her hair. This particular depiction of Sedna is amusing because the artist carved her as a diva who does not like to be kept waiting for her hair styling appointment (Hessel 1998, p. 56).