

HE MAKE'E WA'A

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2012-5-19

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Picture by: Leo Hone: Island Heritage

‘ A’OHE A PAU KA IKE I KA HALAU HO’OKAHI

Not all knowledge is found in a single school

WHAT MAKES A CANOE HAWAIIAN?

Prior to the 1930's, the use of the Hawaiian canoe was pretty much limited to traditional Hawaiian fisherman engaged in life subsistence activities. Cultural practices associated with the canoe were firmly grounded in age old traditions that were deeply influenced by the delicately balanced life cycle of an island environment.

Beginning in the 1950's interest began to grow in the sport of Hawaiian outrigger canoe racing. By the end of the 1970's the popularity of outrigger canoe racing had exploded with canoe clubs springing up along the West Coast of the Continental United States and in the 1980's expanding even further to Japan, Canada and England.

With recreational canoe racing being the focused use, the outrigger Canoe began to change in shape and form. Computer designed hulls, changes in paddle shapes and paddling styles began to reflect the desire for pure speed under intense competitive conditions. The purpose of the canoe was no longer a means of sustaining life but a vessel designed to achieve victory in athletic events.

Today, Color coordinated canoes, carbon fiber paddles and quick release outrigger attachments define the "pop culture" of the modern outrigger Canoe.

The 1970's also saw the emergence in long distant voyaging and non-instrument navigation through the launching of the voyaging canoes, Hokule'a, Makali'i and Hawai'i Loa. These canoes served not only as a catalyst in rediscovering "traditional blue water sailing skills" but helped spark what is called today the "Hawaiian Cultural Renaissance."

Like the outrigger canoes, these larger and more famous voyaging canoes have experienced change or "modernization". Use of Escort boats, advanced radio communication, solar power satellite links, modification of sail shapes and designs, new steering paddle materials have made these canoes less like what they were when they were first launched.

This evolution has raised the question: Exactly how much innovation and "modernization" can occur before a "canoe" is no longer "Hawaiian" or "traditional"?

Maybe the answer is not so much what a canoe looks like or what material it is made of, but more with how the people who paddle and sail these water craft-- think, feel and relate; to the canoe, their physical environment and other people that surround them.

Connecting to the deeper cultural values that originally shaped the Hawaiian canoe allows one to connect with; and appreciate more, those that came before us. It may even inspire a sense of belonging to something bigger than one's self. For me, the cultural values that have long been part of Hawaiian canoe construction and operation provide examples of how to live in an island environment. They also provide me with an identity. DAF

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INTRODUCTION

Humans have an insatiable desire to understand the world; the workings of the universe and man's place in that universe. In this quest, Man has developed a variety of philosophical systems, or "world views" that form the foundation on which "cultures" are built.

"World views" provide the principles on which values such as "good" or "bad" are defined and direct the manner in which people conduct their daily lives.

Cultural and social conflict arises when the principles of one "world view" are used to interpret the behavior and practices of people who possess a dissimilar "world view". This is especially true when the fundamental differences of one are not understood or acknowledged by the other. Under these circumstances Sacred religious beliefs of one society are labeled superstition by another; oral historical accounts are discounted as legends and myths; and "Peoples" are classified as being civilized or savage.

Evolving in an environment consisting of vast expanses of ocean, the Hawaiian developed a "world view" significantly different from those formulated by peoples of continental land masses. The vast ocean was viewed not as a barrier or obstacle that had to be overcome or conquered, but as a provider, a nurturer. When man worked in concert with the ocean, it enabled him to accomplish remarkable things.

Dry land, being limited to small isolated islands, was valued not as something that could be possessed or disposed of by man. It was valued for the sustenance and protection it provided.

It was in this environment, that the Hawaiian developed a "world view" that did not place man at the center of the universe or the master of the world. Man was simply a part of the universe and intimately connected to everything in it.

Encrypted in to the design, shape and function of the traditional Hawaiian canoe are many of the core, "island based", concepts of how the universe is organized and how man fits into that universe.

It can be said that the **Wa'a** (canoe) shaped the Hawaiian people physically, intellectually and spiritually as much as the Hawaiians shaped the logs that became their **Wa'a** (canoe). (Herb Kawainui Kane)

UNDERSTANDING THE IMPORTANCE OF “WORLD VIEW”

John Charlot in his book “Chanting the Universe” provides a glimpse as to how differing “world views” influence human perception. “For Westerners, coming from temperate climates, hospitality should be warm. For Hawaiians living in a tropical climate, hospitality is described as being refreshingly cool.” In Western thought, light and the color white are associated with the divine and the sacred. In Hawaiian thought, dark and the color black represent these same attributes.

“Many of the mistranslations and misunderstandings (of Hawaiian Culture, religious beliefs and history) which have plagued Hawaiian writings for the past two centuries stem from authors not having taken into account the traditional thought framework from which Hawaiians experienced the world.” Michael Dudley (Man Gods and Nature)

To be clear, Hawaiian traditions and cultural practices have never been singularly unified nor have they been static. Like other cultures throughout the ages, Hawaiian culture has its variation and has changed over time. It has never possessed an all-encompassing magical answer for forming a perfect society. It has, however, provided valuable tools which have enabled a people to survive and thrive in one of the world’s most geographically isolated places for over a thousand years.

It is true that “Generations have passed since the death of the last Hawaiian who lived and functioned only through the ancient thought –context.” Michael Dudley (Man Gods and Nature)

However, sufficient fundamental principles of the Hawaiian “world view” have been passed down through the centuries and not only survive, but possess relevant elements useful for enhancing the quality of island life today.

In today’s rapidly changing world, critics very easily discount modern day efforts to revitalize aspects of this ancient “world view” as merely being an “invention of tradition” based on myths of an ancestral way of life that has little to do with documented history. However this criticism, denies Hawaiians their right to “express a cultural identity based on a remembered past”. Waka Moana, editor KR Howe.

“ And it is through this “remembered past” that Hawaiians can build a sense of confidence as to their history, who they are and what they need to do to make their islands a better place to live.” Waka maona editor KR Howe.

This “remembered past” can also provide residents of Hawaii that are not genealogically Hawaiian, an opportunity to gain insight into the delicately balanced rhythm of life that exists on an island and help them truly appreciate , protect and help perpetuate those things that make Hawaii such a unique and special place to live.

Nana I Ke Kumu

Genealogical chants, in the Hawaiian world view, do more than just trace the family tree of an individual. The chants serve as the means of preserving and transferring to succeeding generations, the fundamental principles and beliefs as to how the world was created, the workings of the universe and man's place in that universe.

In 1835, Hawaiian historian and teacher David Malo stated that in pre Captain Cook Hawaii, there were "three genealogies considered to be of importance: The Kumulipo, Paliku, and Ololo." He goes on to say that these accounts differed from one another. On the surface these differences may cause one to think, as David Malo put it, "He Kue'e ko lakou mau manao a'ole he like pu)", their ideas are so contradictory. But are they? Are they any more conflicting than differing denominations or sects of Christianity, Judaism, Buddhism or Islam?

Like the various sects of present day world religions, all the different Hawaiian "traditions" contain aspects of what can be called "common elements" or themes that form the foundation on which the Hawaiian World View is built.

Today the most famous of these Hawaiian "traditions" is the Kumulipo. Composed around 1700 AD it traces the development of the Universe, the emergence of life, the birth of the gods and the creation of man. It describes the Universe as being one immense family tree with all things being related to each other.

Rubellite Kawena Johnson in her book "Kumulipo Vol 1. Hawaiian Hymn of Creation says that "While it was not the intension of the Hawaiian priests who composed the Kumulipo to explain the universe in scientific terms, the Kumulipo is comparatively rational for its non-mystical treatment of biological relationships and cosmic time."

The Kumulipo, on its most literal level, traces the genealogy of the Ali'i for which it was composed to honor. In its deeper levels, it provides the foundation upon which past and present day Hawaiians can use for guidance in sustaining life in a very fragile environment.

CONSCIOUSNESS OF THE MATERIAL UNIVERSE

The opening lines of the Kumulipo describes a change, a movement from the eternal stillness and darkness that existed until that moment when creation emerges.

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|-------------------------------------|---|
| 1. 'O ke au i kahuli wela ka honua | Time was altered when the earth became hot |
| 2. 'O ke au i kahuli lole ka lani | Time was altered when the sky turned inside out |
| 3. 'O ke au i kuka'iaka ka la | A time when the days were dark |
| 4. E ho'oma'amalama i ka malama | Brightened only by the moon |
| 5. 'O ke au o Makali'i ka po | A time of Makali'i |
| 6. 'O ka walewale ho'okumu honua ia | The earth originated in slime |
| 7. 'O ke kumu o ka lipo i lipo ai | With its origins in darkness |

8. 'O ke kumu o ka pō i pō ai With its origins in night
 9. 'O ka lipolipo, 'o ka lipolipo Darkness, darkness
 10. 'O ka lipo o ka lā, 'o ka lipo o ka pō Darkness of day, darkness of night

Pualani Kanaka'ole Kanahele

Michael Kioni Dudley in his book *Man Gods and Nature*, points out that the use of the word *Kahuli* (to change or alter) in the opening lines of the chant, instead of the word *Huli* (to change, turn or turn over) is significant because *Kahuli* infers that the change or altering of time came from within, rather than the result of an outside agent causing the change. *Kahuli* would require a conscious decision, a causative act of will. This brings us to one of the basic principles of the Hawaiian world view: The material universe is conscious and alive.

In traditional Western thought, “matter” is incapable of thinking, willing, or any type of knowing. Only spirits, (God, souls of man etc.) are capable of thinking or knowing. In Hawaiian thought, both spirits and matter are capable of thinking and knowing.

A distinction must be made in the definition of thought and knowing. Human thinking and consciousness is largely defined through the use of words and language. Matter, on the other hand, has a consciousness that is not dependent on, or connected to, language or words.

In the Hawaiian “world view”, it is critical that the conscious aspects of matter interact and work with the consciousness of the spirit. “ (Michael Kioni Dudley(*Man Gods and Nature*)

Throughout the 20th Century, this concept of a cosmic consciousness has frequently been dismissed as a superstitious fancy of a primitive people. But there are many examples in nature where material things and different life forms display elements of what could be defined as conscious thinking.

Plants move their flowers to face the path of the sun. It has been discovered that birds use celestial navigation to migrate thousands of miles. DNA in cells provides instructions for the formation of organs and biological functions as a fetus grows in the womb.

Recent studies in Quantum Mechanics, the study of sub atomic particles in atoms, has found that some particles do not behave in the purely mechanical rhythm that one would expect from a non- conscious universe.

INTERCONNECTED UNIVERSE

Through their observations of the world around them Hawaiians became very cognoscente of the theme of birth in nature. The process of birth forms the basis for the view that all elements of the universe are interconnected.

The Kumulipo continues:

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|--|--|
| 10. 'O ka lipo o ka lā, 'o ka lipo o ka pō | Darkness of day, darkness of night |
| 11. Pō wale ho'i | Engulfed in night |
| 12. Hānau ka pō | The night gives birth |
| 13. Hānau Kumulipo i ka pō, he kāne | Kumulipo gives birth at night a male |
| 14. Hānau Pō'ele i ka pō, he wahine | Pō'ele gives birth in the night a female |

Pualani Kanaka'ole Kanahele

Kumulipo, the masculine essence and Pō'ele, the feminine essences emerge through the process of birth from the darkness of creation. Kumulipo and Pō'ele are not considered "gods" in the Western sense of gods. They are "akua" in the Hawaiian sense of spiritual conciseness, the essence of the masculine and feminine forces found in the universe that when linked together form a whole.

The Kumulipo continues describing the emergence of life starting with the smallest and simplest form of life visible to the ancient Hawaiians, the corals. It then continues describing the emergence and birth of more complex creatures ultimately arriving at the emergence of man, in a manner not too different than that described by modern science and principles of evolution.

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| 15. Hānau ka <u>Uku ko'ako'a</u> , hānau kāna, he <u>'ako'ako'a</u> , puka | The <u>Coral</u> gives birth to an offspring, the <u>coral head</u> emerges |
| 16. Hānau ke Ko'e 'Enuhe, 'eli ho'opu'u honua | The Caterpillar gives birth, digging up the earth |
| 17. Hānau kāna, he Ko'e, puka | The Worm emerges |
| 18. Hānau ka <u>Pe'a</u> , ka <u>Pe'ape'a</u> kāna keiki, puka | The <u>Starfish</u> gives birth, the <u>small starfish</u> emerges |
| 19. Hānau ka <u>Weli</u> , he <u>Weliweli</u> kāna keiki, puka | The <u>Sea Cucumber</u> gives birth, the <u>small sea cucumber</u> emerges |
| 20. Hānau ka <u>'Ina</u> , ka 'Ina | The <u>Sea Urchin</u> gives birth |
| 21. Hānau kāna, he <u>Hālula</u> , puka | Producing an offspring, a <u>Sea Urchin</u> emerges |
| 22. Hānau ka <u>Hāwa'e</u> , 'o ka <u>Wanaku</u> kāna keiki, puka | The <u>Sea Urchin</u> gives birth to a <u>Sea Urchin</u> |

Pualani Kanaka'ole Kanahele

Recent genetic research has revealed that “Human beings appear to have no special Human genes. Humans inherit not just the same number of genes as a mouse... but in most cases the very same genes... The same gene that is critical for the normal development of speech in humans is responsible for songs in birds.

(National Geographic February 2009’ Darwins first clues’ David Quamen)

It is this birth process that connects all the elements of the Universe and formally sets forth the principle that all creation is intimately connected.

Duality of Nature:

The world or universe, beginning with the emergence of Kumulip and Po’ele, consists of what might be called “balanced opposition”. It was apparent to early Hawaiians that things in nature appear in paired opposites and that these opposites depend on each other to complete a function or create a whole.

As described by Martha Beckwith and Rubellite Johnson in their translations and analysis of the Kumulipo and other chants, some common and more simplistic examples of these “pairs” are:

Earth	Sky
Moon	Sun
Darkness	Light
Land	Sea
Left	Right
Disease	Health
Weak	Strong
Cold	Hot
Wet	Dry
Down	Up
South	North
West	East
Setting	Rising
Broad	Narrow
Prostrate	Upright
Death	Life

It is important to understand that these elements, in and of themselves do not possess a good or bad element, they simply are.

It is the balance or imbalance between these elements or forces that create what man defines as either “positive” or “negative” conditions.

Another critical point is that the term balance does not mean physically equal. The most effective example of describing this “unequal” balance can be found with the outrigger canoe. The Hull (**Ka’ele**) of the canoe is much longer, wider and heavier than the outrigger float (**ama**). Yet the **Ka’ele** cannot float up right without the **ama**. The **ama** being much slimmer and shorter cannot carry any cargo nor can it float upright without the **Ka’ele**. It is the combinations of the attributes of these totally different things, when joined together allow a canoe (**Wa’a**) to not only float, but carry people and cargo to where ever they need to go. The result of the **ama** and the **ka’ele** balancing each other describes the balanced state called **Pono**.

The Kumulipo continues describing how organisms living in the sea are linked to organisms living on land.

35. Hānau ka <u>‘Ekaha</u> noho i kai	The <u>Black Coral</u> gives birth, it is found in the sea
36. Kia’i ‘ia e ka <u>‘Ekahakaha</u> noho i uka	Guarded by the <u>Bird’s Nest fern</u> in the uplands
37. He pō uhe’e i ka wawā	The night becomes tumultuous
38. He nuku, he wai ka ‘ai a ka la’au	Ranting, plants are sustained by water
39. ‘O ke Akua ke komo, ‘a’oe komo kanaka	The Gods enter, man does not have access
40. ‘O kāne ia Wai’ololī, ‘o ka wahine ia Wai’ololā	Wai’ololī is the product of males, Wai’ololā of females
41. Hānau ka <u>‘Aki’aki</u> noho i kai	The <u>Seashore Rush Grass</u> gives birth, it is found in the sea
42. Kia’i ‘ia e ka <u>Mānienie ‘Aki’aki</u> noho i uka	Guarded by the <u>Seashore Rush Grass</u> in the uplands
43. He pō uhe’e i ka wawā	The night becomes tumultuous
44. He nuku, he wai ka ‘ai a ka la’au	Ranting, plants are sustained by water
45. ‘O ke Akua ke komo, ‘a’oe komo kanaka	The Gods enter, man does not have access

Pualani Kanaka’ole Kanahale

This linking of what are obviously very different forms of life again illustrates the connectedness of the universe. Things that appear to be extreme opposite are linked as if they are two sides of the same reality. Life and death, male and female, are merely different aspects of the same whole. “Knowing how elements in nature work together allows man to work with nature to his greater benefit. (Michael Kioni Dudley(Man Gods and Nature)

Does Akua mean god?

In most writings on Hawaiian culture and religion, the Hawaiian term “akua” has been translated as “god”. While the term “akua” is frequently associated with supernatural beings similar to those described in Greek and Roman theology, it is more often compared to the concept of a “Supreme Being” who is eternal, all-powerful, and all knowing. This over

simplification of the translation of “akua” unfortunately creates confusion, and in many instances, significant misinterpretation of some aspects of the Hawaiian “world view”.

Dr. Michael Dudley, in his book “Man, Gods, And Nature defines “akua” as being a spirit consciousness or a “cognizant entity” which has the capacity to “know” and “will”. He provides an example of how the limited interpretation of “akua” to mean “god” caused Lorrin Andrews in his 1865 edition of the Hawaiian Language dictionary to miss the real meaning of the word “akua”.

Dr. Dudley writes “Andrews states that “akua” was the name of any supernatural being, the object of fear and worship, a god”. He describes how “the Hawaiians applied the term “akua” to artificial objects, the nature or properties of which the Hawaiian did not understand such as the movement of a watch or compass, or self-striking clock.”

Dr. Dudley goes on to explain that Lorrin Andrews example shows that all three of the things to which the Hawaiian applied the term “akua” were things which moved from within, and seemingly of their own volition. These things exhibited a consciousness within. The objects were not “gods” but were thought to have a causative spirit entity within.

When the Hawaiian used the term “akua” more often he intended to convey the simple concept of “spirit consciousness”. Only in certain applications of the word “akua” did the Hawaiian mean “divinity”.

Mana And Divinity

Mana has traditionally been defined in English as spiritual power. This however oversimplifies the concept to the point of making it almost meaningless. While Mana is associated with power, influence, ability and sacredness, it is much bigger and deeper than these attributes.

In his analysis of Mana in the book Polynesian Religion, E.S. Craighill Handy states that “mana” was not merely power or energy, but procreative power, derived from an ultimate source and diffused, transmitted, and manifested throughout the universe.”

“Mana is both a spiritual force and physical force. It is a universal energy. It has the power to perform purposeful and directed action. It has a consciousness, it is energized thought.”

(Polynesian Religion, Bishop Museum Publications: ES Handy)

Mana permeates both animate and inanimate objects. It is the force that holds things together and the force that pushes things apart. It manifests itself in the outstanding abilities of a person and at the same time manifests itself in the strength in the handle of a canoe steering paddle. It can produce life and it can also cause death.

E.S. Craighill Handy describes the characteristics of mana as being; “analogous in so many ways to the known nature of electricity. “ “The superior, divine aspects of nature were the reservoir of ‘positive’ potential, while the inferior, common earthly aspects, the uncharged negative pole”.

Handy goes on to say that in many Polynesian Creation accounts, “evolution is described as proceeding by the charging of the negative by the positive. When the flow from the superior positive to the inferior negative occurs under improper circumstances, ... the superior is to some extent drained of potential energy and the inferior, unsuited as a transmitter or container for the mana, is subject to various injurious effects as a result of the overload or surcharge”.

The amount of mana contained in an animate or inanimate object could be increased provided the object was spiritually prepared to accommodate the increased “charge”. This was done through prayers, appreciative use or the actual transferring of mana from one to another. If abused or misused, mana could be diminished or even lost.

Almost everything in the Hawaiian universe contains some amount of mana. The more mana an object has the more powerful and more “divine” it is. The difference between the average or common akua (spiritual conciseness) and what would be called “divine” akua, is that the amount of mana an akua possess. More mana, the more powerful .

NA AKUA

As mentioned before the word “akua” has frequently been translated as god. But it should be remembered that the Hawaiian concept of “god” was not an all-powerful, all-present divinity.

These “akua” essentially were the elements of the universe and the forces of nature which took on human attributes. This allowed mortal man to make sense of, and provided for, an understandable structural order to the vast, interrelated, complex universe. These “akua” were also identified with ancestors creating a genealogical or “family” connection which in turn provided a sense of security with increased likelihood of a positive response when asking for assistance or when requesting a reprieve. This is especially significant when those forces are seen as being paramount in either enhancing the quality of life or possessing the ability to destroy it.

The four major gods Kane, Lono, Ku and Kanaloa can be directly related to the forces in life that dominated the island world of the Hawaiian.” (Na na I Ke Kumu Vol I)

Kane: The symbol of basic life force and nature in general. Kane is associated with Sun Light and running fresh water (streams) .

Lono: Associated with weather, clouds and rain.

Ku : Associated with political power and industrial nature of man.

Kanaloa: Associated with the salt water, ocean surface, sea winds, waves and ocean currents.

Pairing of the akua:

Like all other aspects of nature, the gods possessed attributes that were paired in complementing opposites with each pair forming a “whole”.

Kane and Kanaloa were said to travel together and in some traditions referred to as brothers.

Kane- fresh water

Kanaloa: salt water

Ku and Lono:

Ku: of war

Lono: of peace.

Both Kane and Ku are associated with the forest.

Kane: The totality of the forested lands, the combined energy of all living things in the forest.

Ku: The strength of individual plants and trees growing in the forest

Both Ku and Lono are associated with medicine.

Ku: associated with the forest where many medicinal herbs grow.

Lono: associated with agriculture also a source of medicinal herbs.” the domesticated plants”.

Both Kanaloa and Ku are associated with the ocean

Kanaloa: the ocean surface, waves and ocean currents, ocean winds “natural forces of the Ocean.”

Ku: fishing, “activities of man on the ocean”

(Na na I Ke Kumu Vol I)

As described in the Kumulipo, the universe was organized into a hierarchy of beings beginning with the simplest forms then leading up to the most complex forms. This hierarchy carried over into the understanding of those spiritual beings that would be described in English as gods.

This hierarchy of spiritual beings was organized along the lines of the amount of mana a spiritual entity had. A common person would no sooner contact the highest “deity” directly than he would approach an Ali’I Nui directly. There was a “chain of command” that had to be worked through with the worshipper first soliciting the aid of the “akua” closest to him. It was through this chain of command that the most powerful gods were approached. This indirect process protected those who were not capable of handling an over charge of mana from injury and protected the deity from an improper discharge of mana. This “chain of command” approach contributed to the development of the multiple forms of the major gods. It is said that there were thousands of spiritual entities in the world of the Hawaiian.

'AUMAKUA

“There is a sea of time, so vast man cannot know its boundaries, so fathomless man cannot plumb its depths. The sea is one with the sky and the land and the fiery surges that rise from deep in the restless earth. For this is the measureless expanse of all space. This is the timelessness of all time. This is eternity. This is P_o.” (Nana I Ke Kumu Vol I)

“Into this dark sea plunge the spirits of men released from their earthly bodies. In P_o there dwell our ancestors, transfigured into akua possessing the strange and awesome power of gods, yet forever our relatives, having for us the loving concern a mother feels for her infant, or a grandfather for his first born grandson.” (Nana I Ke Kumu Vol I)

“As gods and relatives in one, they give us strength when we are weak, warning when danger threatens, guidance in our bewilderment, and inspiration in our arts.”

“They are equally our judges, hearing our words and watching our actions, reprimanding us for error, and punishing us for blatant offenses. For these are our godly ancestors. These are our spiritual parents. These are our ‘Aumakua.” (Nana I Ke Kumu Vol I)

The ohana (family clan) formed the basic social unit in the Hawaiian society. The ‘aumakua were spiritual ancestors of the members of an ohana and thus occupied the revered position of being a senior member of the family.

It was this “family connection” that allowed an individual to ask for and receive divine guidance and intervention without the almost paralyzing awe the impersonal akua inspired. They often served as the spiritual go between, passing on prayers to the higher akua.

In Western religious thought, evil doers are punished at the time of death by being cast into hell which is frequently described as being a hot fiery place where lost souls suffer burning pain for ever.

To the Hawaiian, where the family connection was of utmost importance, the punishment for a life of wrong doing was to be left alone at the time of death. Hell was where no ancestor or family member would greet or acknowledge a relationship with the departed soul. The ultimate pain to the Hawaiian soul was to be alone, cut off from family and friends.

Enabling-Strengthening concepts associated with the ‘aumakua:

(Na na I Ke Kumu Vol I)

Kihei pua: “flower shoulder covering”

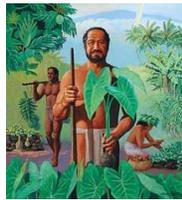
Like a protective (shawl) the aumakua would gently cover a helpless, sick or aged “pupalupa” (decendant) which enabled an otherwise helpless person to function and help himself. This Assistance came as an unsolicited gift from the aumakua.

Ho'o ulu ia: "make grow"

Manifested itself in a surge of strength, control or inspiration that allowed a difficult job or task to get done. This gift could be prayed for and when received turned an acceptable bit of work into a superior one.

Noho: "Possession"

Noho was a total but not permanent possession best illustrated by the example of a mother Being able to lift a heavy object before it crushes her child or the second wind an exhausted Swimmer receives to make it to shore. In Noho, normal capability becomes superhuman.



MAN'S PLACE IN THE WORLD

In Polynesian genealogical order, the first born, Hiapo, received special status, privileges and deference. Younger siblings, Poki'i, were expected to serve the first born and to provide allegiance and support. In return for this support the elder is expected to provide the younger with protection, stability and guidance.

In traditions recorded by David Malo, Samuel Kamakau and other Hawaiian historians it is said that Wākea, the ancestor of all Hawaiians, took to wife Ho'ohokulani and to them was born an immature fetus. This fetus was taken by Wākea and buried near the eastern corner of their house. Not long after a taro plant grew from this spot and Wākea named it Hāloa-naka.

In time a second child was born to Wākea and Ho'ohokulani. This child lived and Wākea named him Hāloa and it was this Hāloa that humans were descended.

In this way man (humans) became the junior sibling (Poki'i) to the taro (Kalo) and with it the obligations of the younger sibling to the older. The Kalo in turn (Hiapo) provided the protection and sustenance for the younger sibling, Man. Kalo (taro) is the main staple and primary life sustaining food for Hawaiians.

In this account Man is not the master of the world nor is it intended for man to dominate nature. Man is the younger sibling and so is obligated to support and take guidance from nature. In turn the natural world will provide protection and provide sustenance for Man.

(Native Planters in Old Hawaii, Handy and Pukui)

Sense of Place

Hawaiians are not a nomadic People. They come from a “place”. It is that sense of “place” that has allowed Hawaiians to exist as a people for over 1,000 years. Sense of place is a critical element in the foundation of the Hawaiian “world view”.

The Hawaiian sense of place was developed over thousands of years in, and for, living in an island environment. An environment where living the true definition of “sustainability” meant life and the lack of a sustainable life style meant eventual death.

This sense of “Place” is grounded in Geography, History and Social Relationships.

Geographic: Every Geographic location, no matter where in the world it is located, has geophysical and climatic characteristics that make it unique. It is these unique characteristics that allow man to distinguish one place from another. Distinguishing one place from another allows man to know here he is at the present and where he wants to go in the future, be it to get food, find water, seek shelter or go on vacation. This human need to communicate “place differences” contributes to man’s inclination to name places.

Hawaiians seem to have named more places than many other cultures. These traditional geographic names contain not only the character of a “place” such as types of soil, nature of the winds and rain that blow across the “place”, but also contain aspects of historical events that were important to the people who lived in that place in the past.

Knowing the traditional name of a place allows a person not only to get a glimpse into the history and character of the place, it encourages that person to treat “the Place” with respect. Having a name, by its very nature, removes the anonymous or purely materialistic perception of a place. With a name, a place has a soul.

Historical: A person’s position and condition in life is greatly influenced by the decisions and actions of their ancestors. Understanding the conditions under which ancestors made decisions can greatly help an individual or even a society, make better decisions for the future. Decisions made today significantly impact the quality of life for the generations yet to come. Accepting this assumption compels one to make decisions that improve things for the long term rather than for reaping the maximum benefits for the individual in the present or immediate future. In the Hawaiian Place Name, that history is very often reflected in the place name.

Social: In traditional Hawaiian culture, blood relation was extremely important in all social interaction. Even today Hawaiians, when introduced to someone for the first time, will search for some genealogical connection, no matter how distant or removed. This is done in an effort to bring context to the relationship. Discovering that a new acquaintance comes from the

same childhood home town or has a relationship with a mutual friend, or better yet, is a distant relative, quickens the pace in which acceptance and trust is developed.

But this process is not unique to Hawaiians. It comes from a basic human need to find familiarity in new, and changing situations.

Establishing common ground through the discovery of mutual interests, mutual associations or relations, reduces the level of “unknown”. It encourages trust, reduces fear and lowers psychological barriers that hinder cooperation. Knowing what “Place” a person comes from begins this process.

CULTURAL VALUES:

“World views “provide the principles on which values such as “good” or “bad” are defined and direct the manner in which humans conduct their daily lives. These principles can be further defined as core cultural values.

On any canoe voyage whether it is a long or short, the limited space on the canoe physically confines people of different temperaments into a small space. If the people on this canoe voyage do not possess a common set of values, differences of opinion or perception of physical conditions can quickly erupt into conflict.

Unresolved conflict occurring on the ocean will lead to Death.

Core values:

Aloha

Mahalo

Mālama

Pono

Kokua

Kuleana

Ha’aha’a

Lokahi

Ahonui

Manawanui

Aloha: Dictionary meaning:

Greeting, Love, affection

Modern English connotation: Aloha means Hello and also means goodbye.

Kaona: (hidden Meaning) Two part word:

1- Alo: to face, suggesting to present one's self without a defense or obstacle

2- Ha: breath of life.

Aloha is a serious action in which one person shares one's life force (Ha) or soul without any protection or obstruction (alo) with another person. The sharing of Aloha is a serious matter that should not be taken lightly.

Aloha carries much more than Hello or goodbye. It is a greeting where one lowers ones Guard, extends trust and opens their soul for interaction with another person in a spiritual context.

Mahalo: Dictionary Meaning

Thanks, gratitude, appreciate, admiration, respect, esteem

Modern English connotations: means simply Thank You

Mahalo carries with it a deeper feeling than just "Thank You". It expresses an appreciation that is filled with admiration, respect and esteem while at the same time expressing gratitude.

Mahalo is a state of mind that is appreciative of everything around you not just of a deed or action done for you. It is an appreciation for simply existing. Mahalo is the frame of mind through which all other Hawaiian values are to be expressed.

Mālama: Dictionary meaning:

To take care of, tend, attend, preserve, protect, maintain, to serve

Kaona: (hidden meaning) Two part word:

Ma: Contraction of the word Ma'a

1- Ma'a: Accustomed, used to, knowing thoroughly, familiar, experienced

2- Lama: Torch, light, lamp' in turn suggests enlightenment

In order to Mālama anything, one has to become Ma'a to it.

To become Ma'a one must be patient, have an open mind so as to truly

understand the whole and be willing to study and to learn. (see manawanui)

Through the process of becoming Ma'a one can become enlightened (Lama).

Only when one is totally familiar (Ma'a) with the thing being cared for and is enlightened (Lama) can that person truly Mālama in a "Pono" way.

Pono: Dictionary Meaning:

Goodness, uprightness, morality, correct or proper procedure, equity, true condition or nature, right, proper, fair, just.

Kaona: Balance

The universe is composed of opposing forces. "Opposing" does not mean in an antagonistic way but in a complementing way. These forces do not possess a good or evil nature. They just are. When balanced, these forces form a whole or complete a function. When there is an imbalance between these forces, functions fail to work and what should be a whole becomes splintered. When these forces are Balanced, the resulting condition is Pono.

It must be emphasized that reaching the balanced state of Pono does not usher in a state of idealic bliss. The complementing opposite forces, when in a balanced state, continue to maintain their identity and are dynamic in their relationship with each force, ebbing and flowing. For a lack of a better English term, internal Tension exists.

As stated earlier the state of Pono can be described by the interaction between the **ama** and the **ka'ele** of a **wa'a kaukahi**. Unequal in size and shape the **ama** and **ka'ele**, when bound together create stability and balance. The binding, the lashings, the **Aha**, is critical to maintaining this balance as it absorbs the tension created by the movement of the sea in relation to the **ama** and **ka'ele**.

Kokua: Dictionary Meaning:

Help, assist, aid

Kaona: To do the right thing, for the right reason, at the right time, and to do it without being asked.

Kuleana: Dictionary Meaning:

Right, privilege, concern, responsibility, business, liability

Kaona: Every "right" comes with a responsibility and obligation. Claiming a right TO

Something Or to DO something, carries with it a responsibility and obligation to enhance the “mana” of that thing or activity.

Ha’aha’a: Dictionary Meaning

Humble, unpretentious, modest, unobtrusive, lowly.

Kaona: The interconnectiveness of the universe means all elements are dependent upon each other. Humility allows a person to perceive and experience that connection which in turn will allow these elements to work together for the benefit of the of the individual and the Ohana.

Lokahi: Dictionary Meaning

Unity, unison, harmony

Kaona:

Two part word:

- 1- Lo, short for lo’o to obtain
- 2- Kahi- single, one

The interconnectiveness of the universe means all elements are dependent upon each other. Lokahi is the process of bringing, what appears to be contrasting elements together to form a functioning whole. Especially with regard to human activities.

Ahonui: Dictionary Meaning:

Patience, enduring long suffering, to tolerate.

Kaona:

Two part word:

- 1- Aho-Breath
- 2- nui-many, much

The kind of Patience described by the word Ahonui is when a person recognizes that something is not working right but is unsure as to exactly what needs to change so things can be corrected. It is the kind of patience that allows a person to realize that speaking out at “this time” to confront a perceived wrong or injustice would not change the situation and might even make matters worse. Best English translation is “to let go”.

It is important to know that practicing Ahonui does not mean giving up or falling into a State of hopelessness. It means waiting, observing, learning, allowing things to align and Issues to become more clear before taking action.

Manawanui: Dictionary Meaning:

Patience, steadfast, courageous and persevering, fortitude

Kaona:

Two part word:

- 1- Manawa-Time
- 2- Nui-much, many

This kind of Patience is best described as holding and working for an ideal in a firm but not violent way and allowing time for things to work their way through. It requires calm persistence. It requires one to take their position calmly and in a firm manner and not abandon the endeavor or position when others disagree or the odds of success seem overwhelmingly against you. It requires that one remain engaged with the people or situation for as long as it takes to bring about the desired change.

The Canoe: Begins in the Forest



The Hawaiian Islands are the most isolated group of islands found on the planet Earth. Located more than 2,000 miles from the nearest land mass or other island group, the Hawaiian Islands are the furthest away from anywhere a person can get on this planet. Being Volcanic in origin, the Hawaiian Islands have never been connected to any land mass nor have they ever been close to any other island group.

The amount of rain fall, soil types and mild temperatures available, make the Hawaiian Islands exceptionally inviting for occupation by plants and animals. They also provide a wide range of habitat and ecological niches. (Hawaii a Natural History: Sherwin Carlquist)

The isolated nature of these islands required that any form of life living on these islands had to have arrived by flying over, or floating on, the ocean. This limited the number and kinds of animals and plants that could and did successfully make it to these islands and survive to produce offspring.

In the past five to ten Million years that the Hawaiian Islands have been available for occupation only a small number of colonizers (prior to the arrival of man) succeeded in establishing a foot hold. As a result, at the time of the first Polynesian settlers, there were no mammals (except for a species of bat) reptiles or amphibians.

For the early plant and animal colonists that did survive and prosper, there were many ecological zones and niches to fill allowing them to evolve over time and to create populations of unique plants and animals that were more diverse than the Galapagos islands, where Charles Darwin was inspired in formulating his theory of evolution. In Hawaii, one kind of dragon fly evolved into 800 different species. Two hundred different flowering plants became 1,800 different species. (Hawaii a Natural History: S. Carlquist)

In this isolated environment, these **indigenous** (arrived without the help of man) and **endemic** species (evolved from indigenous plants and found nowhere else in the world) developed a life cycle that made them interdependent, interactive and interrelated. They developed a life cycle where competition was limited and their interdependence promoted each other's survival.

It was into this world that the first Polynesian colonist arrived sometime between 300 AD and 600 AD. Traveling over the ocean in their canoes, they brought new plants and animals that were critical for food and other materials necessary for their survival. These **introduced** plants and animals along with the clearing of native forests and wetlands for agriculture, greatly changed the Hawaiian landscape.

The archeological record indicates that many **endemic** species became extinct soon after the arrival of these first settlers.

As subsequent generations of these early Polynesian settlers explored, experienced and began to understand their island home, they recognized and began to understand the balanced life cycle of these islands which had allowed the original plant and animal settlers to thrive.

The descendants of these first settlers realized that they too would have to fit into the cooperative life cycle of these islands if they were to survive. They too would have to become interdependent with the other species that lived on and around these islands. They would have to become **Pono**. It was through this process of becoming **Pono** that they, became Hawaiian.

For some 800 years the Hawaiians lived in a delicate balance with their environment. The plant and animal resources that they used from the forests replaced themselves by natural regeneration. Contact with the Western world shattered this fragile balance so much so that within a few decades these vast forests were greatly depleted. (The Hawaiian Canoe by Tommy Holmes)

In 1792 Captain James Vancouver's well intended gifts of goats and cattle, were devastating to the native forest. Allowed to roam free and lacking any predators, these animals multiplied. Attracted to the sweet bark, juicy roots and tender juvenile seedlings these animals decimated the native forests.

Followed by the sandal wood trade, the clearing of forests for sugar cane and cattle ranches along with increased logging, the once vast forests were reduced to a fraction of their original size. The introduction of aggressive alien plants and insects further decimated the native forests and the unique resources they originally provided.

Canoe Plants:

Ka'ele: The Hull

The Ka'ele or hull of the Hawaiian canoe was hollowed out of a single log. The abundance of trees large enough to do this allowed the Hawaiians to move away from the strip plank method of hull construction found on the more southern island of the Pacific that where trees of sufficient diameter to construct a solid single log hull did not exist.



Koa

There are two botanically recognized species of Koa in Hawaii. The first and the one used for canoe hulls is Acacia Koa, called simply **Koa** by Hawaiians. The other is Acacia Koai'a or called simply **Koai'a** by Hawaiians. The **Koai'a** does not grow as tall as **Koa**, has thinner leaves and the

wood tends to be twisted and gnarled. It usually grows in dry land forests. Its primary use was in the construction of paddles.

Both forms of Koa are **Endemic** (plants that evolved from Indigenous plants into species found only in Hawaii)

The most favored wood for constructing the hull of the canoe was the Koa. The Koa, prior to the 1800's, grew in vast forests on the Island of Hawaii and Maui. Less quantities of Koa did grow on the Islands of Oahu and Kauai but never to the extent or reaching the size of the Koa trees growing on Hawaii Island and Maui.

In 1792, Archibald Menzies, botanist on Captain Vancouver's ship describes a trip into the Koa forests in the ahupua'a of Kealahou in South Kona, Hawaii Island.

"The largest trees which compose the vast forest I have found a new species of mimosa (KOA). I measured two of them near our path one of which was seventeen feet and the other about eighteen feet in circumference, with straight trunks forty or fifty feet high. As we advanced, the wood was more crowded with these trees than lower down where both sides of the path had been thinned of them by the inhabitants".(The Hawaiian canoe by Tommy Holmes)

Early Hawaiian canoe builders possessed detail knowledge of the differing physical characteristics of woods and in particular Koa. The trained canoe builder recognized three different types of Koa. They were distinguished by the shape of the tree trunk, color of bark, type of grain and branching pattern.

Lau Mai'a: Tended to have a yellow hue to the wood, was somewhat softer than the other two classification of grain. It dried lighter than the other two and was considered feminine by some canoe builders. This wood tended to make a lighter canoe with the wood being somewhat less durable. The bark of this tree was whitish in color and called Kaekae.

Lau Kane: Tended to have a reddish brown hue to the wood and was much preferred for making canoe hulls. It was more durable than the Lau Mai'a and considered masculine.

'I'o 'Ohi'a: This grain was "hard like 'Ohi'a". It tended to be very dark in color. The grain was twisty and the wood heavy. It was avoided by canoe builders. The bark of this kind of tree tends to be red and is called Maua. (James Kaholo'ilihala and The Hawaiian Canoe by Tommy Holmes).

While Koa is found from near sea level to about 7,000 feet, Koa really flourishes between 3,000 and 6,000 feet elevation. It grows best in areas that have between 75 to 200 inches of rain per year.

For a Koa tree to grow into a canoe quality log of at least 4 feet in diameter and 40 to 60 feet long it takes between 100 and 150 years.



Kukui:

The Kukui is found throughout the Tropical Pacific Islands but not on the Asiatic Continent . Because the seeds/nuts of this tree do not float nor are they resistant to salt water it seems certain that Kukui was brought to Hawaii by the early Polynesian settlers. **Introduced** (Native planters of Old Hawaii)

Kukui being a soft light wood was easily worked and was especially favored as a play or training canoe. These kinds of canoes were between 10 and 15 feet long. By the 1800's there were not many Kukui canoes in use. The Kukui tree is considered a Kino Lau of Kamapua'a and associated with the akua, Lono.

The Kukui is most noted for its use in providing light. The husked cornels of the Kukui nut are rich in oil and burn with a yellow light thus giving the Kukui its English name Candle Nut Tree.



Ulu:

Ulu is associated with the akua Ku. It is said that in order to save his children from starvation Ku had himself buried alive in the earth near his home. "From his head sprang the tree bearing as fruit the staff of life shaped like a man's head." (Native planters in old Hawaii)

Ulu (Bread fruit) is considered native to the Islands of Indonesia. The plant reproduces from root runners and not from seed or simple cuttings. The transplanting of ulu root runners takes very special care so transplanting the Ulu from the southern Pacific islands to Hawaii was no simple matter.

In the story of the ancient voyager Kaha’I, son of the voyager Mo’ikeha of Waipio Valley Hawaii Island, Kaha’I is said to have sailed to Kahiki and to have brought the Ulu back to Hawaii.

There is only one variety of Ulu associated with the Hawaiian Islands while there are numerous varieties of Ulu growing in the Marquesas, Tahiti, Samoa and other southern Pacific Islands.

Ulu was the least used in the construction of a canoe as Ulu was never as abundant as in Tahiti or the Marquesas but also because they were valued much more as a source of food than for canoe construction. The Hawaiian species of Ulu rarely attained the needed girth and length for making canoes.

It was, however a favorite for repairing cracks or holes in canoes. It was also used in the construction of the Kupe, or “manu” (bow and stern covers) and the mo’o (gunwales) of the canoe. Ulu is an **Introduced** plant meaning it was brought to Hawaii by man.

Kupe: (Manu or bow/stern covers)

The bow and stern of the canoe was outfitted with a carved cover called the **Kupe**. Today these end pieces are commonly called the “**manu**” . Traditionally manu referred only to the up turned elliptical expansion of the upper ends of the bow and stern **Kupe**.



‘Ahakea:

By far the most favored wood for the **Kupe** and **Mo’o**, the ‘ahakea is found only in Hawaii. The wood has a distinctive yellowish color to it. Ranging in height from 20 to 50 feet it can be found in dry to wet forests. ‘Ahakea is an **Endemic** native plant but It is not very common today.



Kawa'u:

Native to Hawaii but also found in Tahiti and the Marquesas, Kawa'u can grow as tall as 45 Feet. It grows in more wet forests and has a tough wood that was used for adze handles as well as the **Kupe** and **Mo'o** on canoes. Kawa'u is an **Indigenous** plant.

Koa:

Commonly growing to over 70 feet in height, Koa is still one of the most dominant trees in the Hawaiian Forests (Second only to 'ohi'a.) It is found only in Hawaii however close relatives are found on other Pacific islands and in Australia.

Ulu:

Ulu was the least used in the construction of a canoe, as Ulu was never as abundant as in Tahiti or the Marquesas but also because they were valued much more as a source of food than for canoe construction. Hawaii has only one species of Ulu.

Mo'o: Gunwales or hull side boards

Attached to the upper edge of the canoe hull (**niao**) was a plank running from the front **Kupe** to the back **kupe**. This plank ranged from 3 to 6 inches in height. This plank added free board to the canoe hull and also protected the **niao** of the canoe hull from wear due to paddling and pulling in nets and fishing line.

'Ahakea:

By far the most favored wood for the **Kupe** and **Mo'o**, the 'ahakea is found only in Hawaii. The wood has a distinctive yellowish color to it. Ranging in height from 20 to 50 feet it can be found in dry to wet forests. It is not very common today. 'Ahakea is **Endemic**.



Kōlea:

There are a total of 21 species of Kōlea. The Kōlea, which is unique to Hawaii, was used in the making of the **Kupe** and **Mo'ō**. Kōlea range in size from a small shrub up to 25 feet tall and get up to about 6 to 8 inches in diameter. The distinguishing feature of all Kōlea are the pink color of new leaves. Kōlea is **Endemic**.



Naio:

Native to Hawaii but also found in the Cook Islands, Naio, also called "False Sandal wood" can be found growing from sea level to 6,000 feet. It grows to heights of 30 feet. The wood is relatively hard and has a Yellow-greenish color to it. The wood does have a similar scent to Sandal wood. In the 1800 when the Sandal wood trade with China was coming to an end due to the decimation of the 'Iliahi (Sandalwood) forests in Hawaii, Hawaiians attempted to substitute Naio for the 'Iliahi. Chinese refused the substitute and the Sandal wood trade came to an end in Hawaii. Naio is an **Indigenous** (Arrived in Hawaii without human help but is also found elsewhere in the world).

Kawa'u:

Native to Hawaii but also found in Tahiti and the Marquesas, Kawa'u can grow as tall as 45 Feet. It grows in more wet forests and has a tough wood that was used for adze handles as well as the **Kupe** and **Mo'o** on canoes. **Indigenous.**

Ulu:

Ulu was the least used in the construction of a canoe, as Ulu was never as abundant as in Tahiti or the Marquesas but also because they were valued much more as a source of food than for canoe construction. Traditionally, Hawaii has only one species of Ulu. **Introduced**

Koa:

Commonly growing to over 70 feet in height, Koa is still one of the largest trees in the Hawaiian Forests (Second only to 'ohi'a.) It is found only in Hawaii however close relatives are found on other Pacific islands and in Australia. **Endemic**



'Ohi'a:

The most common native tree, the 'Ohi'a ranges from sea level to the 9,000 feet. It can take the form of a small shrub in the highest alpine regions of Hawaii's mountains to 100 foot Giants in the mid level rain forests to average sized trees at sea level.

Considered a Kino Lau of Ku, the tough wood of the 'ohi'a was used for the carving of temple images, to house Posts, spears, tapa beaters, and **mo'o** for canoes. 'Ohi'a is **Endemic.**



Ho'awa:

Native to Hawaii, there are 10 species of Ho'awa. They grow from near sea level to about 6,000 Feet. They range from dry land forests to rain forests. It was also the favorite food of the alala, Hawaiian Crow. Ho'awa is **Endemic**.

Wae: Out rigger hull attachments, U-shaped spreader

Unique to Hawaiian canoes, the **wae** spanned the width of the hull and served both as an attachment point for the **kua 'iako** lashing and provided added reinforcement for the Hull.

'Ohi'a:

The root section of the 'ohi'a tree was the favored material of making a **wae**. The strength and Natural curve of the root made the best **wae**.

Koa:

A naturally curved branch of the Koa was cut and shaped to fit into the **wae** position and koa was the next favored material for making a **wae**.

'Iako: Out rigger booms

The outrigger booms were usually placed on the left side of the hull. There is no known Tradition explaining why this is so. Selecting a **'iako** required the log to have a good arch so As to keep the **'iako** out of the reach of the waves while traveling.

Hau:



Hau Kae kae



Hau Koi'i

Hau is native to most tropical countries in the Pacific. It is believed that hau was brought to Hawaii by the early settlers. **(Intorduced)** It is found from the shore to an elevation of about 2,000 feet.

Because of its usefulness Hau was held in very high regard and it was a serious offence for a Maka'ainana (commoner) to cut any hau without first obtaining permission from a Konohiki or Ali'i to do so.

In addition to being used for 'iako and ama, hau was vital for making fire. Rubbing a harder wood like 'ohi'a or olomea against a piece of hau was how fire was made. The bark of the hau was used for making rope and kapa. Pieces of Hau were used for floaters for fishing nets.

Hau grows in thick tangled forests with its branches that naturally curve frequently creating a natural arch required for a good 'iako. Shaping an arch into a hau log by steaming in an Imu has been described. It was also a practice to train and shape young braches of the hau into the desired arching shape with the use of other branches and ropes.

Two types of Hau are recognized:

Hau ko'i'i: Very hard wood, flower and leave have a reddish tinge to it, bark has many folds. Flower Stems remain on the branch ends for a long time forming dry clusters of Stems. Planted for shad and wind breaks.

Hau kae kae: Yellow flower, smooth bark , wood is softer than Ko'l'i . This type was Used for 'iako and ama. The bark was used for making cordage and ropes.

'Ohi'a:

While Hau was the favored 'iako for single outrigger canoes, 'ohia was favored for the cross Booms for double canoes.

While arched **‘iako** for double canoes were common at the time of western contact this Innovation was created by Kanuha in the 1600’s. Prior to this double canoe **‘iako** were straight.

Ama: Outrigger float

The construction of **ama** in old Hawaii was done by a specialized guild of people that were different from canoe builders. Hawaiians developed a uniquely shaped outrigger float.

Curved, with both the front and back ends of the **ama** rising out of the water, it has been suggested that this shape was invented to cope with the rough waters and lack of barrier reef lagoons surrounding the Hawaiian island. While Wiliwili was the preferred wood for constructing **ama**, the large abundance of Hau made it the more commonly used wood.



Wiliwili:

Trees range in height from 15 to 30 feet. The Hawaiian Wiliwili is unique to Hawaii. It Grows from sea level to about 2,000 feet. It tends to grow in dryer areas. It has been Said that young wiliwili trees were shaped as they grew similar to the practice of shaping Hau trees for **‘iako**. Wiliwili is **Endemic**.

Hau:

Hau is native to most tropical countries in the Pacific. It is believed that hau was brought to Hawaii by the early settlers. **(Introduced)** It is found from the shore to an elevation of about 2,000 feet.

Aho (Aha): cordage (Plants)

All the different parts of the canoe were lashed together. Fixed or rigid attachments of parts of the canoe, especially the attachment points for the **ama**, **‘iako**, or holding two hulls together in a double canoe could not withstand the thousands of pounds per square inch of force the constantly tossing sea would exert on a traveling canoe. The use of lashings allowed the different parts of the canoe to dissipate or absorb bursts of torque (force) that the constant moving ocean surface exerts.

Olona, **‘ie’ie** and niu (coconut) were used in lashing a canoe. Niu was by far was the most preferred for the **‘iako** and **ama** lashings and double hulled canoe lashings. (The Hawaiian Canoe, Holmes)



Olona:

Olona is found only in Hawai'i. (**Endemic**) While primarily used for making fish nets, fishing line and for lashing house beams together, Olona was sometimes used for lashing canoes. Because of its very high tensile strength, Olona was much favored as a trading item after Western contact. Western ship captains valued the Olona for replacing their original rigging for their square rigger sailing ships.

(Hawaiian Cordage C. Summers.)

Olona was found not only growing wild in the forests but was also cultivated in large plantations. The Olona fibers were removed from the plant stems in a process not too much unlike the process to obtaining Kapa fibers from Wauke or Mamaki.



'Ie'ie:

'Ie'ie is thought to have arrived in Hawaii without the aid of man. (**Indigenous**) It is found on other Pacific islands. While used in religious ceremonies and associated with the hula deity Laka, 'ie'ie was sacred to the deity Ku. Aerial roots from this vine were used extensively in the weaving of baskets and formed the foundation for the creation of the noted Feathered God tiki associated with the akua Ku.

Not much is known as to how the aerial roots were prepared for making cordage other than they were pounded cleaned then twisted and braided into cordage.

Ili Hau:

Cordage made of hau was the common every day use cordage. The plant was conveniently located, abundant and the preparation of its bark for making cordage did not require special skills. The cordage could be made from the entire bark or for finer cordage could be made from the inner bast alone.

Hau cordage was made both by twisting and braiding.



Niu:

It is believed that the Coconut (Niu) was brought to Hawaii by early settlers.(**Introduced**) The Niu is a tropical tree found from Madagascar in the Indian Ocean through the Island of the Pacific. Hawaii seems to be located at the extreme northern boundary of its growing range. Found between sea level and 1,000 feet elevation, early western explores noted that there not nearly as many coconut trees in Hawai’I as found in the southern Pacific island. Niu was highly valued in Hawaii. Cutting down a coconut tree was considered an act of declaring war. Niu was associated with the akua Ku.

There are only two varieties of Niu considered “native” to Hawai’i: Niu Hiwa and Niu Lelo



Niu Hiwa: The outer husk of the nut is dark green while the inner shell is black. Niu Hiwa was used for ceremonial purposes. The fiber from the outer husk (pulu niu) used for making cordage tended to be light in color.



Niu Lelo: The outer husk was orange at maturity while the inner shell was tan in color. The Pulu niu tended to take a reddish color. Niu Lelo was used for non religious implements.

The niu takes anywhere from 10 to 15 years before it bears fruit.

When selecting a nut for the purpose of obtaining pulu, nuts that were narrow and long were preferred. These nuts provided long strands of fiber creating stronger cordage.

Once the pulu was pulled from the nut the fibers were soaked for anywhere from three to four weeks in salt water. The fibers were then beaten with a wood club to separate the interfibrous material from the usable fibers.

Creating the cordage was done by rolling pulu fibers on a bare thigh with the hand. These “threads” were then either twisted into round cordage or braded into flat cordage. It was the flat cordage that was used for lashing **‘iako** and **ama**.

Wa’a : Design / Part names

THE TERM CANOE:

The term Canoe comes from the Carib Indian word Canaoa and was taken back to Europe by Columbus, to describe the water craft he observed in the New World. In time, the term would be used by European explorers to describe all water craft of non European design that were found in the Americas, Indonesia, Indochina the islands of the Pacific and in the Indian ocean.

The term **Wa’a**, Vaka or Waka is what is used by the peoples living on the island of Pacific Ocean to describe their water craft. **Wa’a** is the term used in Hawai’i.

It is said that the early voyaging canoes that traveled between Hawai’i and Kahiki were made of planks sewn together with Aha and calked with ulu sap and other ingredients. (Na Hana o ka po’e Kahiko, Samuel Kamakau)

These voyaging canoes tended to have more of a V shape to their hulls which assisted in reducing side slipping while under sail.

In time, when the voyaging to Kahiki ended, the canoes began to be designed more for coastal and inter island travel. The design of the Hawaiian canoe shifted to features that were more functional for traveling through the choppy interisland waters and landings on often time’s steep and rocky shorelines.

TYPES OF WA'A:

There are two classification of **Wa'a** in Hawaii.



Wa'a Kaukahi :

The single hulled canoe equipped with an outrigger.



Wa'a Kaulua:

The double hulled canoe. Two hulls lashed together by means of booms creating a single water craft.

There are a multitude of more defining terms for Wa'a that were specifically designed for surfing, fishing and racing.

Directional labels on the canoe:

On water craft throughout the world, seamen of all maritime cultures have devised standard terms for direction when working a vessel. The Hawaiians are no different.

Mua and **Ihu**: front of the canoe

Mua: Used when referring to the general front of the canoe, it is not used to describe a specific part or area of the front of the canoe.

Ihu: When referring to specific parts of the canoe that are located at the front of the canoe, like the **Manu** or the **'iako**, the term **ihu** (nose) is used to designate toward the front. such as **Manu Ihu**, or **'iako ihu**.

Hope: toward the back of the canoe

Unlike **Mua** which refers only to the general direction of "front" the term **Hope** is Used for all references (specific or general) to the back section of the canoe. The rear **manu** is called **manu hope**, the rear **'iako** is called **'iako hope**.

'Akea: right side of the canoe when facing toward the front.

The general word **'Akea** refers to any open, broad or wide space. So referring to Side of the canoe not occupied by the outrigger is logically **'Akea**.

Ama: Left side of the canoe when facing the front.

The **ama** (outrigger float) was traditionally placed on the left side of the canoe. Logically The side of the canoe on which the **ama** was placed is called the **ama** side.

The Terms **'Akea** and **Ama** apply to both single (**Wa'a Kaukahi**) and double (**Wa'a Kaulua**) Canoes. In the case of a **Wa'a Kaulua**, the Hull placed on the left side (when facing front) is called the **Ama** Hull and the Hull placed to the right is called the **'Akea** Hull.



Ka'ele: Hull

The **Ka'ele** is made of one piece, as opposed to hulls built of planks.

The existence of the Koa and its ability to grow to massive proportions allowed Hawaiians to construct solid log canoes. In many South Pacific Islands canoes are made by lashing planks of wood together with the seams calked with ulu sap and niu pulu. The longest Hawaiian canoe measured in the early 1800s was 107 feet. It had been carved out of one solid log.

Hawaiians hewed the inside of the hulls rather than burning the inside of the hull. Fire was never used in the construction of the **ka'ele** of a Hawaiian canoe as in the Case of many North American Indians.

Opu Hue: Traditionally the hull (**Ka'ele**) has a rounded U shape to it.

Many South Pacific canoes have a V our deep V hull. These V hulls “track” better Than the U shaped hulls (reduce the side slipping) however do not rise up and over Choppy seas as well as the U shaped Hull. This leads to easier swamping in choppy Seas when using a V hull. The buldge on the side of the canoe that forms the U shape Is called the “**Opu Hue**” or simply **Opu**.

Hawaii, with its lack of a barrier reefs has its shores exposed to the full strength of ocean swells. The U shape design is better adapted to the rough and choppy Seas that surround Hawaii.

Kaka: Hulls most frequently have a “rocker” shape.

The “rocker” shape describes the curvature of the hull from front (**Mua**) to back

(**Hope**). This curving from end to end called "**kaka**" allowed the **Ka'ele** to rise Over choppy sea swells reducing the chance of swamping.

'Omilo: The deepest and widest section of the hull was located just to the rear of the middle of the hull.

It was thought that the tapering (**'omilo**) from back to front allowed more carrying Space in the canoe and also prevented the back (**Hope**) of the canoe from sinking lower in the water than the (**mua**) front when the canoe was underway.

'Eku: The **Mua** "bow" and the **Hope** "stern" narrowed and were tapered coming to a rounded point.

The rounding of the "**hope**" allowed for less drag on the canoe when underway. The up curving point of the "**mua**" called the "**'eku**" allowed for the bow to cut through the water with less drag while at the same time allowing the bow to rise up over in coming swells or waves.

Kuamo'o :Hawaiian canoes lacked a significantly defined Keel. At times a slight ridge line did run down the longitudinal center of the canoe forming what could be called a subtle keel.

Many canoes had a very slight ridge that ran from just behind the **'iako hope** to the **'eku** at the **mua** of the canoe. This ridge is called the "**kua mo'o**". (The Hawaiian Canoe by T. Holems)



Waha:

Mouth; open hollow of the interior of the canoe hull.

The **Waha** refers to the open hollow of the canoe hull. The **waha** was traditionally rough hewed in the forests along with the rough shaping of the outer hull. Once placed in the **Halau Wa'a**, work began on positioning and carving the cleats where the seats and outrigger attachments points were made.

Pepeiao: literally meaning ear, are the projections carved into the inside, side of the hull on Which the seats (**Noho'ana**) and the "U shaped spreaders (**wae**) rest.

Positioning the **Pepeiao** was an art. The proper placement of the **Pepeiao** is critical to the proper displacement and balance of the weight of passengers and the supporting force exerted by the **Ama**, in the case of a **Wa'a Kaukahi**, and balance between the two hulls, in the case of a **Wa'a Kaulua**.

Noho'ana: Seats are shaped to fit snugly between the two sides of the hull while resting on the **Pepeiao**. The seats are named according to where they are located in the Hull.

Kamani 'ula: Most forward seat in the canoe

Papakonane: Seat directly behind the front main **'iako**.

Kahihika'ale: seat or seats directly to the rear of the **Papa Konane**

Pani: Seat directly in front of the Steersman's seat

Papaki'i: Steersman seat the last seat in the hull.

Wae: generally referred to as canoe spreaders, the Wae served as lashing points for **'iako** that Attached the **Ka'ele** to the **ama**, in the case of a **wa'a kaukahi**, or held the two hulls of a **Wa'a Kaulua**, together.

Wae were frequently made from the roots of the 'ohi'a tree and generally were shaped in a U or V. The **wae** rested on and were lashed to a **pepeiau** specifically constructed For it.

The **wae** was very important in absorbing and distributing the loads of force caused by Ocean waves and swells as they struck the **Ka'ele** as the canoe traveled through the sea. Without the force absorbing and distributing function of the **wae**, the gunnels (**mo'o**) or Hull (**Ka'ele**) would break. (The Hawaiian canoe T. Holmes)



Moa Moa or **Maku'u**:

After the log was felled in the forest and the rough hewing was complete, a neck was constructed at what was to be the stern of the canoe for the purpose of attaching drag ropes for hauling the canoe out of the forest.

When the canoe was being finished, the **Maku'u** was trimmed down to form a small Point that extended beyond the end of the **Manu hope**. This refined pointed Extension was sometimes also called the **Moa moa**.

The **moa moa** or **Maku'u** was provided for the 'aumakua or guardian spirits of the canoe to ride on when the canoe set out to sea.



KUPE:

Bow and Stern End Pieces

At the “bow” **Mua** and “stern” **Hope** of all canoes, were fitted with finely carved end pieces called **Kupe**.

Except for a sometimes slightly higher and more pronounced bow end piece, both the bow and stern **Kupe** were identical.

The **Kupe** had various parts to it with the most obvious being the up turned elliptically shaped point called the **Manu**. Today most people use the term **Manu** for these end pieces instead of the more correct term **Kupe**.

Pali Kai: On the front **Kupe** (the **Kupe ihu**) was constructed a “breakwater” positioned to prevent waves from coming into the canoe. This Break water was called the “**Pali Kai**”. At times a “**Pali Kai**” was also constructed on the **Kupe Hope**, but not always.



Manu:

The elliptically shaped up turned point on the end of the **Kupe** was described by early explorers and cultural researchers as being purely ornamental. It is now understood that the design, while pleasant to look at, is meant to help the canoe break through on coming waves and to prevent swamping. The flattened front portion of the **Manu** provides just enough resistance to push the front of the canoe up and out of the waves.

The slim nature of the **manu** with its rounded or pointed top, cuts through the water preventing the wave from pushing the front of the canoe down.

(The Hawaiian Canoe T Holmes)

It is interesting that the Nuku Hiva (Marqueses) Island canoes, the tops of these end pieces were frequently carved into the shape of the heads of birds. In Hawaiian **Manu** means Bird.



Mo'o:

Gunnels:

Attached to the upper edge or rim (**njao**) of each side of the **Kae'le** are side planks called the **Mo'o** (Gunnels). These **Mo'o** served not only to increase the free board of the canoe above the water line, they also served as a protective edge that absorbed the wear and tear of paddling and pulling of fishing lines and nets into the canoe. The **Mo'o** were more quickly replaced when worn out by having paddles rubbed against them or fishing lines and nets repeatedly rubbed against them than having to carve out a whole new **Ka'ele**.

The method of lashing these **Mo'o** to the **Ka'ele** was unique to Hawaii. Longitudinal slits were drilled in the bottom edge of the **Mo'o** and the top edge of the **Ka'ele**, called the **Njao**. Aha was passed through these matching holes in a long lashing method called "Kaholo". When completed the lashings were almost invisible on the outside of the hull.

(Arts and Crafts of Hawaii, Te Rangi Hiroa (Sir Peter Buck))

OUTRIGGER



In English the booms and float extending out one side of the single canoe are collectively called an Outrigger. Hawaiians do not have an equivalent term for the term "outrigger."

The booms and float are considered an integral part of the **Wa'a Kaukahi**, like the seats, so are not separately defined as a unit. They are referred to by their specific parts, **'iako** and **ama**.

'IAKO:

For any water craft to float upright, the width of the hull must be of sufficient width to disburse the weight of the craft keeping it balanced and preventing it from flipping over. A "dugout canoe" hull cannot be wider than the width of the tree it was carved from. Since the trees found in Hawai'i used to build canoes never grew wider than a few feet, it was almost impossible to carve a canoe wide enough for the hull to remain up right without either being lashed to a second hull or having an outrigger attached to it.

The booms that connected a **Ka'ele** to an **ama** in a **Wa'a Kaukahi** or the **Akea** Hull to the **Ama** Hull in a **Wa'a Kaulua** were both called **'iako**.



'Iako Kaukahi: Single Hull Outrigger boom.

In Hawai'i, **Wa'a kaukahi** were fitted with only one outrigger. There are areas in Indonesia where canoes have outriggers extending out on both sides of the hull. Double outriggers are best suited for calmer seas. The single outrigger allows the Hawaiian canoe to travel through rough water without breaking the **'iako** or swamping the canoe.

In rough water, a double outrigger system holds the canoe a little too stable. With two **'iako** and **ama**, the hull is prevented from freely rolling with steep or large ocean swells. Being held so stable in rough seas creates extreme torque forces on the outrigger system, causing the **'iako** to snap or the hull to swamp.

The **'iako** for the single hull canoe in most cases, were made from naturally arching branches of the Hau tree. A famous Hawaiian Canoe builder of the late 1800's Kalokuokamaile, observed that the **'iako** had to be "arched well and not easily reached by the sea lest the canoe be slow in traveling."

The ideal **'iako** was straight where it crossed the **Waha** of the canoe over the **Wae** then curved slightly upward then curved downward to where it attached to the **ama**.

(The Hawaiian canoe, T. Holmes)

Wa'a Kaukahi had two **'iako** which traditionally extended off the left side of the hull. There is no known tradition as to why this is so. There are instances where the outrigger is placed off to the right side of the hull but the more common placement is off the left side. Extending the **'iako** off the left side of the hull is common in all Pacific island areas.

There are three parts to a **'iako** and Hawaiians have names for these three specific parts.:

KUA 'IAKO:



The **Kua'iako** is the straight part of the **'iako** that spans the **Waha** of the **Ka'ele** above the **Wae**. This is where the **'iako** is lashed to the canoe.

LAPU 'UNA:



Laup'una is the arching part of the **'iako** that extends out from the **Mo'o** and down to the **ama**.

KAPUAI:



The **Kapuai** is the part of the **'iako** that descends down to and attaches to the **Ama** by lashings.

There are some Qlelo No'eau "Thoughtful sayings" related to the **'iako**:

“You can’t find good **‘iako** standing on the ground.”

When looking for the natural curves in a Hau forest, one must climb up into the branches of the HAU grove to get a better view of where the “good” **‘iako** are. It is dangerous to climb up high into these branches for if one should fall, the injury will be severe.

In life one must step outside of their comfort zone in order to reap higher benefits in life.

“You don’t cut the **‘iako** you shaped from a sapling. That is for your children. You cut the **‘iako** shaped by your father.”

Some canoe builders would take young branches of Hau and shape them into what they thought was the best arch and turn. It took years for the Hau to grow and mature into size and strength that would be suitable for a **‘iako**. So it was important for a person to not cut the **‘iako** he had shaped but shape it for the purpose of it being harvested by his children.

Benefits enjoyed by the present generation are made possible by the work of the previous generation. The present generation in turn must make decisions and conduct their lives in a way that will benefit succeeding generation.

‘Iako Wa’a Kaulua: Double canoe ‘iako



John Papa ‘Ii in his “Fragments of Hawaiian History” states: “the arched sticks of the double canoe were carefully selected from the bent trunk of the ‘Ohi’a Lehua as they were the best of all arched sticks.

While it was not unusual for a double canoe to have only two **‘iako**, more often than not, they had three or more **‘iako**. In 1893, a forty seven foot long double canoe was observed to have six **‘iako**. Another observer in 1793 saw eight. (The Hawaiian Canoe, T. Holmes)

David Malo in his account of Hawaiian cultures (Mo'olelo) says that in ancient times the **'iako** for double canoes were straight but in the time of Keawe (around the 1600's) Kanuha, son of Keawe, invented the curved double canoe **'iako**. The **'iako** would be straight where it crossed the hulls of the canoe but arch upward in between the hulls. **'iako** on a double canoe had two **Kua 'iako** sections and one **Lapu'una**.

A platform, called the **Pola**, was placed in-between the two hulls and secured to the tops of the arched section of the **'iako**. (**Lapu'una**) Passengers and cargo were placed on the **pola** elevated from the waves and swells.



The distance between the two hulls varied and was dependent on the intended use of the canoe and sea conditions. The wider the spacing between the two hulls the more stable the canoe would be. However, the greater distance between the hulls increased the tendency for the hulls to work against each other.

Placing the hulls closer together increased speed and reduced the torque forces on each hull in rougher water.

Captain Cook estimated that the hulls of a Seventy foot long double canoe were placed at eight feet apart. Ten years later, Capt Townsend described a similar length canoe being five feet apart. In 1843 one observer noted that a forty foot double canoe was placed at one and a half feet apart while another canoe was placed at nine feet apart.

(The Hawaii canoe, T. Holmes)

AMA: Outrigger float

According to Kamakau, **ama** were made by a separate guild of craftsmen then the people who built the canoe hulls. It is said that "different people hewed out the **ama** and these were much traded for in the olden days". All **ama** made in pre-contact Hawai'i were made of once piece.

(Works of the people of old, S. Kamakau)

The preferred wood to make an **ama** was the **wiliwili**. **Hau**, being more abundant was the more common material used.

The design of the Hawaiian **ama** with its curved shape and unique fore-end are unique to Hawai'i and believed to have been developed to handle the "rowdy and unpredictable waters of Hawai'i". (The Hawaiian canoe, T. Holmes.)

Peter Buck, in his documentation of Hawaiian artifacts describes the uniquely shaped fore end of the ama, called the **LUPE**, as having “had the sides cut away to form a thin vertical board acting as a cutwater to lessen water resistance when the fore-end was submerged”

The **ama** on Kamehameha V 35 foot long canoe was 20 feet long. This proportion seems to be a common ratio between the length of the canoe and the **ama**.

The pronounced curvature of the **ama** allowed the body of the **ama** to remain in contact with the choppy surface of the sea minimizing the risk of flipping the canoe. The main body of the **ama** was thicker toward the front half of the **ama** than the back half. This provided more buoyancy at the most critical point of water contact.



LUPE:

The Lupe is the front section of the ama. It had the sides cut to form a “cut water”. The Lupe was never painted.



UMAUMA:

This section of the ama was located between the end of the Lupe and where the Forward ‘iako attached to the ama.



KINO:

The Kino is the body of the ama located between the two ‘iako.



KANAKA:

The Kanaka is the section of the ama located to the rear of the back 'iako. The Kanaka was usually flattened on the top while the underside remained round.



Hoe : Paddles

Like the Hawaiian canoe, the Hawaiian paddle displays distinct characteristics. The shaft is long and thick and the blade short and wide. The Hawaiian paddle typically lacks any ornamentation and its simple design, totally utilitarian. This paddle design probably evolved in response to the need for efficient propulsion of a relatively heavy canoe through rough water.

(The Hawaiian Canoe, T. Holmes.)

Paddles found in the Bishop Museum range in total length from 55 to 71 inches with an average length of 62 inches. The lengths of the blades range from 19 to 26 inches with an average of 23 inches. The average diameter of the paddle handles is a little over 1 ½ inches. Most of the paddle handles in the Museum are round with a few being elliptical.

(The Hawaiian Canoe, T. Holmes.)

While Koa was the most favored wood for making paddles, Hau, 'ahakea, Kawa'u, Naio and Ulu were also used.

Paddles were frequently named by their makers or owners. This was more so for steering paddles.

While pre-contact paddles were generally made of one piece of wood, different parts of the Paddle had specific names:

Ku'au: Handle of the paddle

Pu'ukole: Point of the paddle where the handle entered the blade of the paddle.

Pu'uhele: Ridge that ran down the middle of the blade of the paddle from the **Pu'ukole** to the middle of the blade.

Laulau: Blade of the paddle

Koho: Pointed tip of the blade.



Pe'a: Sail

The Hawaiian sail was designed to be auxiliary power for the canoe with paddling being the primary means of propulsion and like so many other features of the Hawaiian canoe, the type of sail used in Hawai'i became specialized. A uniquely Hawaiian form of oceanic sprit sail called a "crab claw" was developed. The sail is three sided with the apex down near the mast. (The Hawaiian Canoe, T. Holmes)

The top edge of the sail characteristically had a deep crescent cut which contributed to the descriptive comparison to a crab's claw.

The sails were made out of finely woven Lauhala mats averaging between 18 and 20 inches wide. These narrower mats were sewn together with Olong cord to form the complete sail.

While drawings and descriptions of the traditional Hawaiian sailing rig do exist, details as to how the sail, mast and spar were rigged are "Scanty". (Hawaii Arts and Crafts, Sir Peter Buck)

Kia or Pou: Mast

Webber, the artist that sailed with Captain James Cook made several sketches of double and single canoes under sail. On double canoes, the mast was stepped in a "shoe" (**moku**) mounted on the **Pola** (Platform) above the second **'iako** from the front. In single canoes the mast is mounted just forward of the forward **'iako**. David Malo and Samuel Kamakau in their works report that the mast was made out of Ohi'a in the larger double canoes. It is suggested that Hau was also used in making a mast.

MOKU /HAKAKAU: are the names of the block or "shoe" into which the mast fit that was either located above the forward main **'iako** in a double canoe or on the floor of the single canoe.

Dictionary meaning:

Hakakau- Perch or shelf

Moku: to hold in one place; to stake out.

Paepae: Boom

Kamakau and Malo indicate that the **Paepae** (boom) of the sail was made of Hau and had a slight Curve to it.

Sail attachment:

The sail was laced to both the **Kia** (Mast) and the **Paepae** (boom) with “aha” coconut cord or cord Made of Olonā. When the sail was to be lowered, the entire Mast was removed and lowered.

Kaula: ropes/rigging

The mast was supported by a series of lines that went from near the top of the mast to the ‘**lako**’ Located on either side of the mast and toward the front of the canoe.

KAULA PU: were the ropes that were tied out to the side of the mast.

KAULA IHU: were the ropes that either went out to the bow of the canoe in the case of a single Canoe or to a forward position of the mast in double canoe.

KAULA HOPE: were ropes that were secured toward the back of the mast on a double canoe and single canoe.

KAULA PAEPAE: is the term used for the “sheet” or the rope that was attached to the **paepae** or the Spar and was used to control the position of the sail while underway.

In most voyaging canoes today and in the smaller costal Hawaiian sailing canoes, a modern adaptation in mast/boom construction has occurred using elements of the traditional Manhiki islands of the South Pacific. This design consists of a stationary “mast” upon which a “spar” on the leading edge of the sail is raised. This allows for the quick raising and lowering of the sail itself by less people and in a shorter time then if the Mast has to be totally dismantled in the traditional Hawaiian rig.



(Manahiki canoe)-Herb Kane

In Hawaii, the mast was referred to as both **Pou** and **Kia**. With this modern adaptation, the term **Pou** is used to describe the stationary “mast” while the **Kia** refers to the “spar” which the sail is attached to.

Pou: is the term applied the stationary mast.

Kia: spar to which the sail is attached and the part that is raised up to the **Pou**.

Sail Rig Design



The up curving **Paepae** (boom)allowed the sail to swing from side to side over the hull high above the heads of passengers and crew on both the double and single canoe.

The curved upper edge of the **Pe’a** (sail) evenly reduced the area of the sail that had to be supported by the boom (**Paepae**) in proportion to the distance from where the boom is attached mast (**kia**). This allowed for less bracing and in general reduced the weight of the sail. (The Hawaiian Canoe , T. Holmes)

The “claw” shaped upper edge of the sail also lowered the driving pocket of the sail reducing the “heeling” over effect when the wind hit the sail from the side. The curve also served as a sort of safety valve allowing excess wind to spill out over the top of the sail, relieving pressure and minimizing the chance of the canoe flipping over.

Hoena: Act of Paddling

While sails were observed by early European explorers on most canoes, paddling seemed to be the most favorite mode of propulsion. In many instances canoes were paddled while under sail

Europeans wrote in amazement of the speed and endurance Hawaiians demonstrated when paddling a canoe. "They row very fast with their broad paddles and easily keep up with the ship when going moderately." (The Hawaiian Canoe, T. Holmes)

In his book "The Hawaiian Canoe" Tommy Holmes notes that "Those who displayed prowess in paddling, navigating, steering, surfing and general handling of a canoe were accorded special status in the community and often materially rewarded. Unusually strong paddlers and those who particularly distinguished themselves in their knowledge and all around management of a canoe in rough, open ocean conditions were often conscripted by a chief to serve in his employ."

Johin Papa I'i notes of Kepa'alani "that because of his paddling ability he became a favorite of the king and it was thus that he received the whole of Pu'uwa'awa'a and the fish ponds of Pa'aiea in Makaula and Kaulana in Kekaha" North Kona.

Sam Kamakau writes that because "Paka'a was a strong paddler and his skill in navigation he became director of Keawenui a Umi's sea travels."

The traditional length of the paddling strokes as described by early westerners is that they were longer than today's competitive paddle strokes. However the length of the stroke depended greatly on the number of paddlers in a particular canoe. While a forty foot racing canoe of today is designed to accommodate six paddlers, a similar size canoe two hundred years ago would have seated up to twelve paddlers. (The Hawaiian Canoe, T. Holmes.)

The early Hawaiians pace for paddling seems to have been around twelve to thirty strokes per minute as compared to the sixty plus strokes per minute in today's long distance outrigger canoe races.

Elements of a paddling stroke

John Papa I'i also wrote that "there were many ways of paddling a canoe, some differing from others".

A paddling stroke consists of :



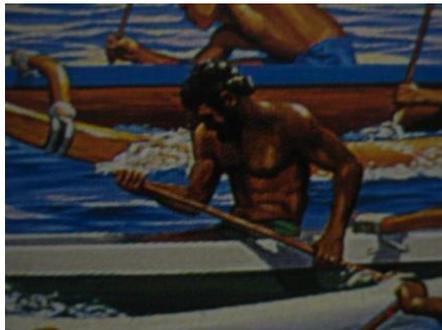
Entry:

where the paddle is placed in the water in front of the paddler



Pull:

where the paddle is pulled back giving the canoe thrust



Follow through:

point after the maximum strength pull where the canoe is allowed to glide

Return: where the paddle is pulled out of the water and positioned for the next entry.

The difference between these strokes has to do with the position of the paddle blade at each of each of these four positions in a stroke, amount of body twist during the entry and pull, and where the power is applied during the pull.

The late John D Kaupiko, master paddler and one of those credited with revitalizing modern canoe paddling, knew and taught several styles of paddling using their Hawaiian names.
(The Hawaiian Canoe, T. Holmes)

Kahi malie: a long easy stroke.

Reach out in front is moderate, slight twist in the body, Follow through at the end Of the stroke has the top hand On the paddle brought to mid chest level. Return is relaxed. Power is emphasized after the First few inches of the pull, but power is relatively light and quick.

Ma'oki'oki: a short choppy stroke.

Reach is just forward of the knees, pull back is quick with slight body twist, follow Through is short just past the seat. Return is quick. Power is emphasized almost at the entry. Power is strong and applied abruptly just after entry.

'Opelu: a long power stroke.

Reach is far out in front with pronounced twist in body. There is a Strong forward push on the top hand as pulling power is applied with the lower hand. There is a strong Twist of the body and push back on forward foot as paddle is Pulled back. Follow through has top had come down to stomach, return is quick but long. Power is emphasized after a few inches of the initial pull with graduated increase (as opposed to abrupt application of power) in power as pull comes back with maximum pull between knee and back of seat.

There is a common misconception that the best way to get a canoe moving through the water is to have as much "Power" in the paddling stroke as possible. A good paddling stroke does not over power the glide of a canoe but works with the glide. A good paddling stroke has to be **Pono** between the power applied by the stroke of the paddlers and the response to that power by the canoe (forward movement) described in English as the glide.

A good stroke has a rhythm that allows all the paddlers to work together not only in timing (entering the water and pulling at the same time) but with synchronized mental thoughts and body movements. Good paddling has to have **Lokahi** in it.

Other paddling maneuvers

Kipu: To "back paddle" in an effort to reverse a canoe

Ho'oku: To "hold water" with the paddle to stop a canoe's forward motion.

HO'OKELE: Steering

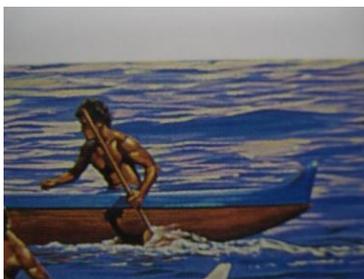
While virtually every Hawaiian had some experience at paddling a canoe, only a few became master steersman. Far greater responsibility was upon the steersman, who had to be able to steer unerringly on unpredictable waves, handle virtually any ocean condition, and know, when under sail, how to compensate instantly for any combination of sudden wind shifts, gusts and waves. (The Hawaiian Canoe. T. Holmes.)

The **Ho'okele** sat in the stern seat, **papaki'i**. Steering was done by paddling (**Lolia & Lou**) and what is today called "poking" or **'o 'o**.



Lolia:

A good steersman will paddle as much as they can, changing sides independently of the crew changes in order to keep the canoe on course. As the canoe moves forward through the water by paddlers, the canoe tends to pull to one side then the other. This drifting from side to side can be caused by ocean swells pushing against the side of the canoe hull or by the uneven pulling of the paddlers on their respective side of the canoe. A good steersman can feel the canoe start to move off course before it can actually be seen to move off course. At the first "feel" of the canoe swerving off course the steersman counter acts the "swing" by paddling on the side the canoe is swerving toward. To keep the canoe on course the steersman frequently changes sides while paddling to counter the tendency of the canoe to veer off course. This frequent changing back and forth is called **lolia**. If this maneuver is of insufficient force to hold the canoe on course the steersman then uses one of two maneuvers, either **'o 'o**, or **Lou**.



'o 'o :

is when the paddle is placed against the side of the hull in an upright position which causes the canoe to turn to the side on which the paddle is placed while the canoe is underway. Running down the middle of the **lau** (paddle blade) is a raised ridge, **pu'uhele**, that causes the blade to sit at an angle when placed flat along the side of the canoe. The leading edge of the paddle is forced against the side of the canoe by the flow of water. The slightly turned angle of the paddle blade directs the flow of water off at an angle from the **ka'ele**, thus causing the canoe to turn to the side on which the paddle was placed.

Une: is used when a drastic change in course is needed or when the turning force of the canoe cannot be altered by **'o 'o** or **Lou**. From the **'o 'o** position the steersman pulls on the top of the paddle handle causing the paddle blade to "kick" out away from the hull. While less used when fully under way, this maneuver is more frequently used when traveling at slower speeds

where tight maneuvering or quick turns are required or when pivoting the canoe in a small area.



Lou:

Lou is when the steersman reaches out with his paddle in a paddling stroke, on the side the canoe is veering towards (to as much as 90 degrees) and pulls in towards the hull. This counter actions pulls the stern of the canoe in line with the bow and keeps the canoe traveling on course. This technique is also used when maneuvering a canoe at slow speeds in close quarters.

KUKUI O'OLOPU: Steering points

Kukui: light (fig) guide

O'olopu: to change as appearance

When traveling from one point to another the **Ho'okele** uses a variety of orientation points to keep the canoe on course. As the name implies, **Kukui o'olopu** are not necessarily stationary marks but reference points that are transitional. **Kukui o'olopu** can consist of land marks such as a point of land, notch on a mountain top, a hill or dark spot on the landscape. They can be a unique cloud shape on the horizon or the position of the rising sun, moon, or stars. (James Kaho'oilihala)

Kukui o'olopu are not restricted to being located at the front of the canoe or precisely in the direction the **Ho'okele** is desiring to go. They can be located off to the side and even behind the canoe. Usually **Kukui o'olopu** are used in "clusters" where the **Ho'okele** uses the relational space between the various points to keep oriented.

It is important to note that when steering a canoe,, the shortest distance between the departure and destination points is not always a straight line. Winds, currents, reefs, direction of ocean swells may all cause a straight course to be the worst course. In fact keeping a canoe perfectly aligned on any one guide point is extremely difficult if not impossible to do. It is also possible to go off course if the **Ho'okele** becomes overly fixed on a single land mark or cluster of guide points. (**Nana kuli / Hahai ao**)

The **Ho'okele** strives to keep the canoe going in the general direction of the desired destination while making the minimum amount of abrupt turns or drastic course changes to keep on course. Course corrections, in general, should be gradual. It is important that the **ho'okele** not

be transfixed to any single way point but continuously be on the lookout for replacement **kukui o'olopu** as the canoe's progress makes the original guiding points ineffective or obsolete.

The critical element in keeping a canoe on course is always knowing the direction at which the point of departure is located. The point of departure serves as the basic reference point upon which all future **kukui o'olopu** derive their usefulness.

Aweawe: wake

The wake of the canoe while underway is very useful in measuring side drift of the canoe caused by wind and or currents. It also helps a **Ho'okele** judge how straight a course is being kept. The **Aweawe** is a very important **Kukui o'olopu** in judging progress and in maintaining a consistent course direction.

Dangers when using Kukui o'olopu:

Nana kuli: To look but pay no attention

Nana: To look

Kuli: Deaf

When steering toward a dominant guide point the steersman keeps the canoe directly lined up on the point without noticing if the wind or a current is pushing the canoe sideways. If gone undetected the canoe could drift past the guide point while still being pointed directly toward the guide point.

Hahai ao: Chasing a cloud

Hahai: To follow

Ao: Cloud

Steering guide points like cloud formations or the sun, moon or stars are very effective in keeping a canoe on course. However the steersman must always consider that these guides move. If overly fixed on these guide points and not aware that they have drifted off or moved from the original position when first identified, the steersman could very well end up steering in circles.

NA ALE: Ocean Swells and Waves

Having some understanding of how ocean swells and waves are created, enhances the ability of a **Ho'okele** to keep a canoe safe and on course.

The most common and numerous waves found in the ocean are created by wind blowing across the surface of the ocean. (As compared to waves caused by landslides, earth quakes) The wind,

through friction, transfers some of its energy into the water which then takes the form of waves. These waves are not the movement of water but the movement of energy through the water.

The height and strength of a wave is determined by three factors; the strength of the wind blowing, the distance the wind blows across the water, and the length of time the wind blows. The stronger the wind; the longer the distance the wind travels along the surface of the water and the longer the time the wind continues to blow, the larger the waves.

These “wind waves” tend to be choppy and bumpy and lose power and strength as soon as they leave the area in which the wind is blowing.

The winds creating these “wind waves” do not blow at a consistent speed all the time but vary in strength and duration. This gusting behavior of wind, creates waves that travel at different speeds.

Where the winds blow over long distances (ie Hundreds of miles) “wind waves”, traveling at similar speeds tend to merge creating an ocean swell. This resulting Swell contains enough energy that allows it to travel well beyond the immediate area of the storm. They are no longer dependent on the wind to maintain their energy level.

When these swells leave the turmoil of the storm area, they escape the chop and become more uniform and consistent. These swells travel thousands of miles without losing much energy. It is these swells that help non instrument navigators find their way across the sea.

Swells, traveling at similar speeds tend to travel together in packs or what are sometimes called Swell trains. The common name for trains is “swell sets”.

Ale/Nalu: Hawaiian terms for Swells and waves.

Hawaiians from the earliest times made a distinction between “waves” and “Swells” but their terms differed from the English terms used above. The Hawaiian calls the “waves” created by the wind on the open seas, **Ale**. The waves that crashed onto the shore or reef of an Island are called **Nalu**.

Ale traveling in the open sea were given names that described their behavior, shape and size. Likewise **Nalu** were further described by the manner and shape in which they broke and rushed to shore. (S. Kamakau: Na Hana a ka Po'e Kahiko)

Ale Names and descriptions

In the 1800's a man by the name of Bradford devised a system of categorizing “wind wave” and sea conditions for the Royal English Navy in an effort to standardize the classification of ocean

sea conditions in what is now called the Bradford Scale. The scale uses a “Force” number to define certain wave sizes and sea conditions.

In comparing the different “Force numbers” on the Bradford Scale with known definitions of traditional Hawaiian **Ale** names, a remarkable correlation is observed. While the Hawaiian terms do not contain a specific height measurement of the wave, relative wave size and accompanying, Sea Condition described in the Bradford Scale, come every close to the description attributed to each of the Hawaiian **Ale** names.

The modern Bradford scale with Hawaiian Ale names

Hawaiian Name (Pukui Dictionary)	Wind speed				Description	Wave height		Sea conditions	Sea state photo Bradford score Expanded photos below
	km/h	mph	kts	m/s		m	ft		
Alania	<1	<1	<1	<0.3	Calm	0	0	Flat. Sea is like a mirror	Force 0 
Nao	1-5	1-3	1-2	0.3-1.5	Light air	0.1	0.33	Ripples without crests.	Force 1 
Hauliuli	6-11	3-7	3-6	1.5-3.3	Light breeze	0.2	0.66	Small wavelets. Crests of glassy appearance, not breaking	Force 2 

Owe	12-19	8-12	7-10	3.3-5.5	Gentle breeze	0.6	2	Large wavelets, crests begin to break and whitecaps are scattered	Force 3 
Halu'a	20-28	13-17	11-15	5.5-8.0	Moderate breeze	1	3.3	Small waves. Few but consistent white caps begin to appear	Force 4 
Kai Ahulu	29-38	18-24	16-20	8.0-10.8	Fresh breeze	2	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Force 5 
Kupiki'o	39-49	25-30	21-26	10.8-13.9	Strong breeze	3	9.9	Large waves with foam crests and some spray.	Force 6 
'O'oloku	50-61	31-38	27-33	13.9-17.2	High wind, Moderate Gale , Near Gale	4	13.1	Sea heaps up and foam begins to streak.	Force 7 
Kai Ko'o	62-74	39-46	34-40	17.2-20.7	Fresh Gale	5.5	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Force 8 



BEAUFORT FORCE 0
WIND SPEED: LESS THAN 1 KNOT
SEA: SEA LIKE A MIRROR

ALANIA



BEAUFORT FORCE 1
WIND SPEED: 1-3 KNOTS
SEA: WAVE HEIGHT .1M (.25FT), RIPPLES WITH THE APPEARANCE OF SCALES, BUT WITHOUT FOAM CRESTS

NAO



BEAUFORT FORCE 2
WIND SPEED: 4-6 KNOTS

*SEA: WAVE HEIGHT .2-.3M (.5-1FT), SMALL WAVELETS,
CRESTS HAVE A GLASSY APPEARANCE AND DO NOT BREAK*

HAULIULI



BEAUFORT FORCE 3
WIND SPEED: 7-10 KNOTS

*SEA: WAVE HEIGHT .6-1M (2-3FT), LARGE WAVELETS,
CRESTS BEGIN TO BREAK, ANY FOAM HAS GLASSY
APPEARANCE, SCATTERED WHITECAPS*

OWE



BEAUFORT FORCE 4

WIND SPEED: 11-16 KNOTS

SEA: WAVE HEIGHT 1-1.5M (3.5-5FT), SMALL WAVES BECOMING LONGER, FAIRLY FREQUENT WHITE HORSES

HALU'A



BEAUFORT FORCE 5

WIND SPEED: 17-21 KNOTS

SEA: WAVE HEIGHT 2-2.5M (6-8FT), MODERATE WAVES TAKING MORE PRONOUNCED LONG FORM, MANY WHITE HORSES, CHANCE OF SOME SPRAY

KAI AHULU



BEAUFORT FORCE 6
WIND SPEED: 22-27 KNOTS

*SEA: WAVE HEIGHT 3-4M (9.5-13 FT),
LARGER WAVES BEGIN TO FORM, SPRAY IS PRESENT,
WHITE FOAM CRESTS ARE EVERYWHERE*

Kupiki 'o



BEAUFORT FORCE 7
WIND SPEED: 28-33 KNOTS

*SEA: WAVE HEIGHT 4-5.5M (13.5-19 FT), SEA HEAPS UP,
WHITE FOAM FROM BREAKING WAVES BEGINS TO BE
BLOWN IN STREAKS ALONG THE WIND DIRECTION*

'O'LOKU



BEAUFORT FORCE 8
WIND SPEED: 34-40 KNOTS

SEA: WAVE HEIGHT 5.5-7.5M (18-25FT), MODERATELY HIGH WAVES OF GREATER LENGTH, EDGES OF CREST BEGIN TO BREAK INTO THE SPINDRIFT, FOAM BLOWN IN WELL MARKED STREAKS ALONG WIND DIRECTION.

KAIKO'O

Additional Ale Names:

The **Ale** names listed above were used to describe **Ale** that are still within the wind area or the storm or weather cell that created them. Hawaiians had additional names to describe **Ale** that had traveled beyond the weather cell and what are called "Swells". Some of these **Ale** were the swells used to navigate on long ocean voyages. Others describe the manner in which these swells affected the traveling canoe.

'Aui ale- a large swell that when it rolled under the canoe would pull or push the bow or stern Sideways. The **Ho'okele** when encountering this kind of swell would anticipate the pushing action of the swell and counter act it by **'O'o** before the wave could push the canoe off course.

'Ohu- Well formed and clean swell that was steep enough to push a canoe forward but would

Not break. A good **Ho'okele** would recognize this swell as it approached from behind The canoe and would take advantage of this swell by surfing the canoe on the swell.

Ale pa pua'a- This swell comes frequently as a surprise striking the canoe hull on the side Creating a thumping sound and then splashing into the hull of the canoe. If large Enough, this swell could swamp a canoe.

Kua haka- This swell usually came from the direction of shore and was caused by large Incoming swells striking a cliff and then bouncing back out to sea in the opposite Direction. This swell could be encountered a significant distance from land but most frequently within sight of land.

Kahela- Well formed and consistent "Swell sets" They tended to be consistent in size and in spacing between swells.

Nu'a- When **Ale**, (either the "ocean swells" or the "Wind waves") are bunched up close together they were called **Nu'a**. **Nu'a** are very dangerous to a canoe, because they can swamp a canoe very easily. When the peaks of the swells are close together large sections of the canoe hull are not supported by water and canoe settles into the swell patten causing the canoe to swamp. When a **Ho'okele** encounters **Nu'a** the best defense against swamping is to run the canoe at an angle to the swells. Never take **Nu'a** head on or allow them to approach directly from the back. Nor should the **Nu'a** Strike the canoe broad side.

It is unfortunate that many of the **Ale** and **Nalu** names have been lost and many names that we still have do not come with a recognizable description.

It should be noted that many times the **Ale** that are created thousands of miles away entered an area where there are strong local winds or a local storm. In this case the "Ocean Swell" **Ale** , travels through the locally generated "wind wave" **Ale**. The experienced **Ho'okele** would be able to differentiate between the different **Ale** in what appeared to the untrained eye a jumble of mass wave confusion.

In these cases the "Wind wave" **Ale** and the "Ocean Swell" **Ale** could be traveling in opposite directions increasing the choppiness of the ocean service. In many of these cases the "Ocean swell" like the '**Ohu** or the **Kahele** are bigger and more defined than the local "wind wave" swells that flow over and through the "ocean swell".

Other Important Ocean surface conditions

The Ho'okele used other ocean surface conditions to determine the location of reefs, shallow rocks, currents and other hazards that might threaten the canoe while on a voyage.

Kohola –

Bare reef at low tide, clearly visible but barely above sea level

Kua Pa'a-

Kua-keel of the canoe Pa'a-stuck

Reef or rock which shows itself then is covered from view as the ocean surface surges. There are usually wisps of white water as the water flows over the reef or rock.

Pu Ko'a-

Coral head: sunken reef or rock that causes the color of the water directly above to be different color than the surrounding water. Usually the water has a slight brownish or tan color to it. This indicates shallow water. Small canoes can pass over a Pu ko'a safely.

Kai Kō ele-

Thumping sea: Ocean surface is agitated but there is no white water or white caps. The surface of the water becomes smooth when the ocean surges over the rocks or reef below. It is said that a canoe hull makes a thumping sound when sailing over the reef or rock as the hull strikes the rocks below.

Na Makani: The Winds

As part of the Hawaiian sense of place was the knowledge of the local winds. Every place had its own winds. In the names of winds, was encoded the intensity, direction and personality of the wind along with its effect on the residents of the area.

'Apa'apa'a- The Famous Strong wind of Kohala

'Eka- The consistent moderate sea breeze of Kona

Hau o Ma'ihī- A cool land (mauka) breeze of Keauhou Kona

Mumuku- Very strong, and sometimes destructive mauka wind of Kawaihae,

Kiu lau niu- Strong mauka wind of Makalawena

Ho'olua- Strong wind out of the North along the Kona Kohala Coast.

Moa'e- Strong consistent trade (North East) winds along the Puna Ka'u Coast

Kona- Strong consistent wind out of the South.

To truly know a place or be considered “from” a place, a person had to know the winds of that place.

In addition to wind names associated to geographical places, there are names of sea winds that describe the intensity, direction and effect it has on a canoe at sea. A few of these names are:

Kewai- Wind that precedes a rain squall. Important to recognize when sailing.

Kupapaula- Direct head on wind. Difficult to sail into, requires tacking.

Pahili- Strong wind that frequently changes direction, coming from many sides

Kulepe- Strong consistent wind, good for sailing

Kololio- Strong gusty wind. Blowing in gusts separated by short periods of calm.

Kunu- Soft, consistent, gentle wind good for sailing.

Kele: Sailing

The way one sails a Hawaiian Canoe is somewhat different than sailing a western style sail boat. Some of the factors contributing to this difference are; the Hawaiian canoe is designed as a paddling canoe with the sail being auxiliary power; the Hawaiian Canoe does not have a true keel; the Hawaiian canoe hull is round and designed for traveling in rough choppy seas.

These factors however do not mean that a Hawaiian canoe is not an efficient sailing vessel. It just means the crew of a Hawaiian canoe has to adjust the way they view performance and efficiency. If one sails a Hawaiian canoe with the same thought pattern and operational expectation of a western sailing boat, that person is sure to be frustrated.

If however, the crew sails the Hawaiian canoe from a Hawaiian “world view” perspective, the experience is truly exhilarating.

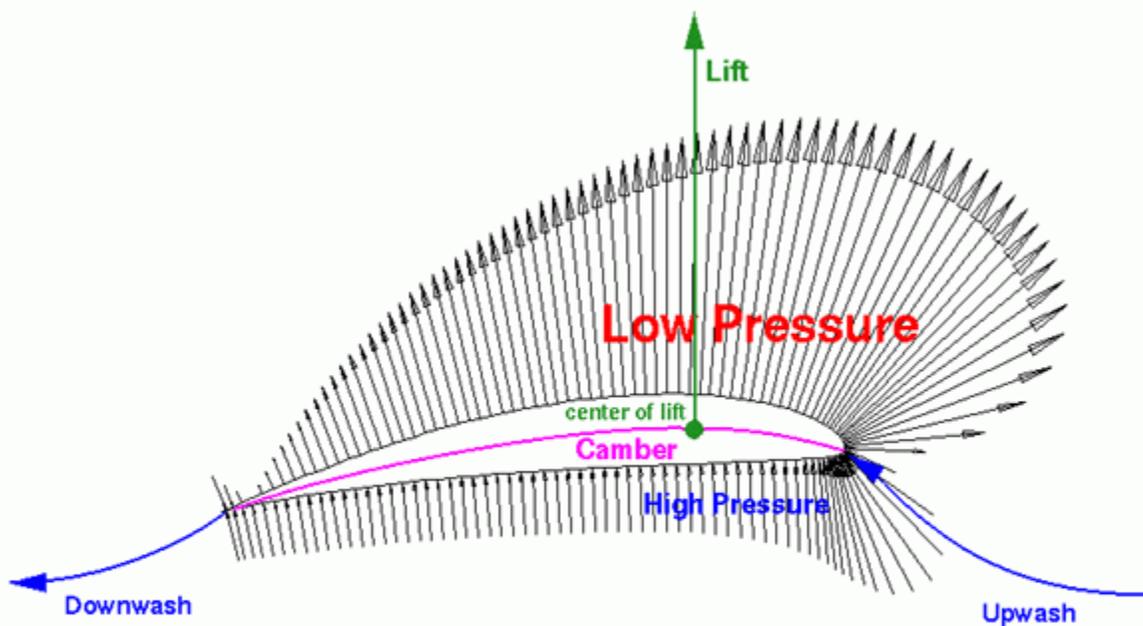
How do Sails Work?

Whether working a Hawaiian sail or a western type sail, sails work under the same physical principles.

When sailing down wind or in the same direction the wind is blowing. The sail simply captures the wind which in turn pushes the vessel in the same direction the wind is blowing.

When sailing across or into the wind, the sail acts as an airfoil just like an airplane wing, only it's positioned vertically rather than horizontally.

When air moves around the curved wing or sail, the air on the top or outside moves faster than the air on the bottom or inside. When the air moves faster, it causes the pressure to drop on the outside of the sail, causing a higher pressure on the inside of the sail. This pressure differential is what gives the airplane lift or moves the boat forward.



Pressure vectors and flow over a cambered section.

Why doesn't the canoe just blow sideways when sailing across or into the wind?

The canoe actually does blow sideways when sailing across or into the wind. However the long sides of the canoe and in the case of an outrigger canoe, the ama, pushes up against the water on the leeward side of the canoe. This resistance causes the hull to move forward because the narrow front of the canoe has less resistance than the long sides of the canoe.

Why is the Hawaiian Sail upside down?



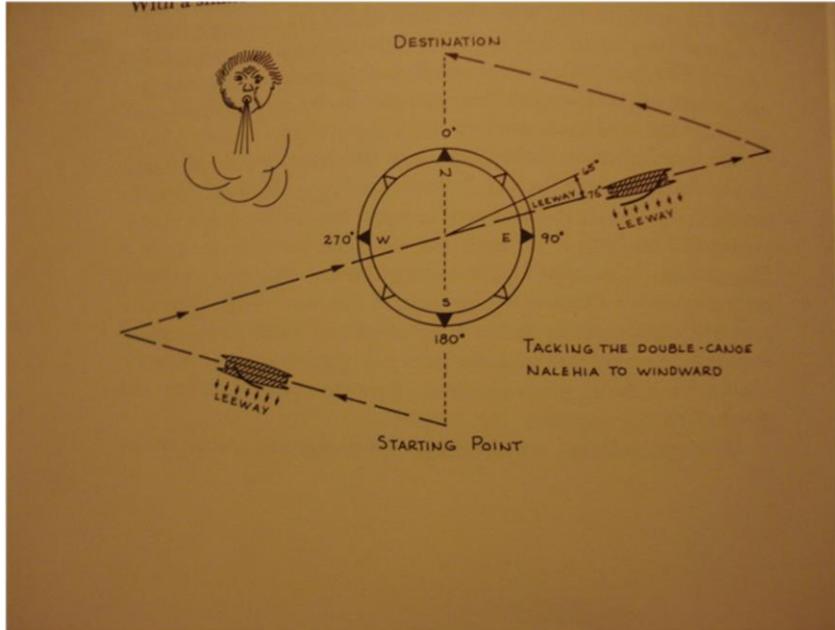
The Hawaiian sail is not upside down, it is right side up for a Hawaiian sail.

Modern Western sails are triangular in shape with the top of the sail tapering to a point. This frequently called a Bermuda sail. The Hawaiian sail is also triangular in shape but wide at the top and tapering to a point at the foot of the sail.

One big advantage for the having the up swept boom on the Hawaiian sail is the occupants of the canoe do not have to duck every time the sail is moved from one side of the vessel to the other.

How high into the wind can a Hawaiian canoe sail?

A Hawaiian Canoe can maintain a heading of about 75 degrees off the wind with sail only. If however, the crew paddles with the sail up, a canoe can go as high as 20 degrees off the wind and still take advantage of the driving force of the wind on the sail.



(Ben Finny, Hokulea Way to Tahiti)

When paddling while sailing the wind and the power of the paddlers have a synergistic effect on the movement of the canoe. The canoe moves faster than if it was only being paddled or if only being sailed. In addition, the paddling is much less strenuous when using the additional power of the wind.

How do you steer while under sail?



When under sail, the canoe tends to want to pull up into the wind. The steering paddle (hoe Uli) is placed in an 'o'o position on the lee side (opposite side from the direction of the wind) of the canoe. This forces the canoe away from the wind. The steersman controls the direction of the canoe by raising and lowering the paddle. The deeper the paddle is thrust into the water the more the canoe will pull away from the wind. Raising the paddle will allow the canoe to pull up into the wind.



How do you keep the Wa'a Kaukahi from flipping over while under sail?

Sailing a Wa'a Kaukahi requires a good sense of balance and the ability to react to a shift in weight or wind strength very quickly. Unlike Micronesian canoes, the Hawaiian canoe has its sail fixed in the forward end of the canoe. When the canoe is sailing with the wind coming from the ama side, a crew member may be required to ride out on the 'iako to keep the ama from lifting out of the water. When sailing with the wind coming from the Akea side of the canoe a crew member may be tasked with hanging out on the Muku side of the canoe to keep the ama from being driven too deep into the water. The crew member whose responsibility is to work the Kaula Pae pae can adjust the pressure on the sail and the heeling over force of the wind by pulling in the sail when the wind is lighter and letting it out when the wind gets stronger. Letting the sail out reduces the force of the wind on the sail.

CONCLUSION:

This presentation has only scratched the surface of both the physical and spiritual elements of the Hawaiian Canoe. These Words written on paper and the spoken words heard in the discussions only hint at the true nature of the canoe and its connection to both the sea and the land. To truly understand the canoe one must rig it, paddle it, sail it.

To truly understand the canoe, the canoe must tell its story in its own language. A language that is not dependent on written words, but on the movement sensed by the eye as a canoe moves over the surface of the sea. A language not dependent on spoken words, but on the sounds detected by the ear as the hull twists and vibrates as it moves through the sea. It is though the experience of feeling the canoe in its environment that an understanding best described by the Hawaiian word **ike**, immerses.

There is much wisdom fashioned into the design, shape and function of the canoe. This wisdom has been placed into the canoe by the Kupuna with great care and aloha. Wisdom that is just waiting for the right person with the right frame of mind to listen, feel and understand it.

And to understand the Hawaiian canoe with a Hawaiian "world view" is to understand the delicate balance that allows life to thrive on the most isolated clumps of land on the planet. He Make'e Wa'a.

E Kulou mai I ka lani	Bend down o heavens
E ho'olohe mai I ka honua	Listen o earth
E o'u mau kia'I mai ka po mai	Ancestral guardians from when time began
H <u>o</u> mai ka ike	Grant us insight and understanding
H <u>o</u> mai ka mana	Grant us spiritual strength
H <u>o</u> mai ke aloha	Grant us Aloha (Alo <u>Ha</u>)
E ola e	So life can thrive

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Leon Sterling-Capt Hokule'a 1976(friend)

Herb Kawainui Kane-Polynesian Researcher, Artist, author (friend)

Nathaniel (Brudda) Lindsay-Canoe Paddler, rigger of canoes (friend)

Tava Taupu- Blue water sailer, Canoe Builder, wood carver (friend)

Ernest Fergerstrom- got me my canoes, helped me with my first 'iako, my father

Flossie Fergerstrom- got me interested in Hawaiian canoes and encouraged me, my mother

Ann Fergerstrom- Canoe companion, paddler my sister

Fay Lindsay-Canoe companion, my sister, paddler

Kenneth Johnston-Canoe fixer, father-in-law

Kiko Johnston-Kitazawa-Boat Builder, Wa'a Kaulua Captain (friend-Brother-in-law)

Jody H. Fergstrom- Canoe paddler, Canoe companion, my wife, friend, supporter, enabler uku
pile good stuff.