= Mau Piailug =

Pius " Mau " Piailug (pronounced / ?pa??s ?ma? pi??a?l?? / ; 1932 ? July 12 , 2010) was a Micronesian navigator from the Carolinian island of Satawal , best known as a teacher of traditional , non @-@ instrument wayfinding methods for open @-@ ocean voyaging . Mau 's Carolinian navigation system ? which relies on navigational clues using the sun and stars , winds and clouds , seas and swells , and birds and fish ? was acquired through rote learning passed down through teachings in the oral tradition . He earned the title of master navigator (palu) by the age of eighteen , around the time the first American missionaries arrived in Satawal . As he neared middle age , Mau grew concerned that the practice of navigation in Satawal would disappear as his people became acculturated to Western values . In the hope that the navigational tradition would be preserved for future generations , Mau shared his knowledge with the Polynesian Voyaging Society (PVS) . With Mau 's help , PVS used experimental archaeology to recreate and test lost Hawaiian navigational techniques on the H?k?le ? a , a modern reconstruction of a double @-@ hulled Hawaiian voyaging canoe .

The successful , non @-@ instrument sailing of H?k?le ? a to Tahiti in 1976 , proved the efficacy of Mau 's navigational system to the world . To academia , Mau 's achievement provided evidence for intentional two @-@ way voyaging throughout Oceania , supporting a hypothesis that explained the Asiatic origin of Polynesians . The success of the Micronesian @-@ Polynesian cultural exchange , symbolized by H?k?le ? a , had an impact throughout the Pacific . It contributed to the emergence of the second Hawaiian cultural renaissance and to a revival of Polynesian navigation and canoe building in Hawaii , New Zealand , Rarotonga and Tahiti . It also sparked interest in traditional wayfinding on Mau 's home island of Satawal . Later in life , Mau was respectfully known as a grandmaster navigator , and he was called " Papa Mau " by his friends with great reverence and affection . He received an honorary degree from the University of Hawaii , and he was honored by the Smithsonian Institution and the Bishop Museum for his contributions to maritime history . Mau 's life and work was explored in several books and documentary films , and his legacy continues to be remembered and celebrated by the indigenous peoples of Oceania .

= = Early life (1932 ? 1974) = =

= = = Satawal , Micronesia = = =

Mau was born Pius Piailug in 1932 , in the village of Weiso on the small coral island of Satawal , in Yap State of the Caroline Islands , a part of the Federated States of Micronesia . Satawal is a wooded island with an area of 1 @.@ 3 square kilometres (0 @.@ 50 sq mi) , located in the Western Pacific Ocean about 800 kilometres (500 mi) south of Guam . Mau 's personal connection to the sea began early in his life , when he was placed in tide pools in his infancy so he could feel the pull of the ocean . At the age of four or five , Mau was chosen by his grandfather Raangipi to study as an apprentice navigator . Mau initially protested his grandfather 's teaching , preferring to spend his time playing on the beach with children his own age . Raangipi trained Mau as a young navigator for many years . Their day would begin at sunrise , when they would eat breakfast together and afterwards , take care of chores before going fishing . During the evening , Mau would join the men in the canoe house as they drank , listening to their stories about navigation and sailing . Raangipi told the young boy that if he chose to become a navigator , Mau could gain respect from his community , eat well , and maintain a position in Satawalese society higher than that of a chief . Encouraged , Mau learned basic navigational clues regarding the " stars , swells , and birds " from Raangipi , but his grandfather died sometime before Mau was fourteen .

After his grandfather died , Mau began training with his father , Orranipui . Mau learned more about navigating by stars (wofanu) from his father , and how to fish and build canoes . When his father died before he turned fifteen , Mau was adopted by his aunt and uncle . Sometime around the age of eighteen , Mau 's aunt and uncle sent him to study with Angora , an acclaimed navigator . His

studies culminated in his initiation as a master navigator (palu) in the Weriyeng school of navigation during the revered pwo ceremony presided over by Angora . It was to be the last pwo held on Satawal for the next fifty years . After the ceremony , Mau lived for a month in the canoe house where he received rigorous lessons from three navigators . When the final training was complete , Mau made his first solo voyage of about 92 kilometres (57 mi) . Because he had a tendency to sail in all weather conditions , he was given the nickname " Mau " , from the Satawalese word maumau , meaning " strong " . After becoming a navigator , Mau married Nemwaeito with whom he raised ten boys and six girls .

Daily life in Mau 's village on Satawal involved harvesting taro and gathering breadfruit and coconut . The Satawalese people also raised chicken and pork and caught fish , their primary source of protein . A freshwater pond served as bathing facilities . Local materials were used to construct outrigger canoes called proa . The island 's isolation helped preserve the lifestyle of the Satawalese people and Mau 's role as a navigator . Even with the arrival of the Germans (1890) and the Japanese (1914) in Micronesia , Satawalese culture remained intact . American missionaries who arrived after World War II built the first church and school on Satawal .

In the late 1960s , Mau attempted to verify his navigational knowledge of the wider Pacific by working as a seaman on an inter @-@ island ship run by the Trust Territory of the Pacific Islands . From 1969 ? 1973 , Mau became friends with Mike McCoy , a Peace Corps volunteer stationed on Satawal . As well as marrying Mau 's niece , McCoy sailed with Mau and they worked together on a project tagging turtles . McCoy became interested in Satawalese navigation , published several articles on the topic and kept in touch with the anthropologist Ben Finney , who was researching Polynesian navigation . When McCoy 's assignment on Satawal ended , he asked Pialug if he wanted to come to Hawaii with him .

= = = Honolulu , Hawaii = = =

Mau first visited Hawaii in 1973 , and McCoy introduced him to Ben Finney . Later , Finney suggested to the Polynesian Voyaging Society that they should try to recruit Mau for their H?k?le ? a project , since no Hawaiian traditional navigators remained . The project goal was to test the hypothesis that Polynesians made intentional non @-@ instrument voyages across the Pacific . Tevake , a renowned Polynesian navigator , had died in 1970 and only six others were known . Navigators were reluctant to release their sacred knowledge to " outsiders . " At the time , Mau was just forty @-@ one years old , and the youngest navigator out of the group . Mau feared that traditional navigation would die in his own culture , just as it had in Hawaii . He had tried to teach the young men of Satawal the skills passed on to him , but he was not optimistic . The members of the younger generation were too busy with school and too attracted to Western culture to undertake the rigorous course of study and apprenticeship . Further , Mau 's people did not seem to care that traditional navigation was dying , and could be lost forever .

= = Later life (1975 ? 2010) = =

= = = H?k?le ? a = = =

With Finney 's help , Mau was awarded a special fellowship at the East @-@ West Center . Mau returned to Honolulu in April 1975 to begin work with the Hawaii @-@ based Polynesian Voyaging Society , eventually navigating the double @-@ hulled canoe , H?k?le ? a , from Hawaii to Tahiti on its maiden voyage in 1976 . Mau trained and mentored Native Hawaiian navigator Nainoa Thompson , who later would become a master navigator . David Henry Lewis , a scholar of Polynesian navigation , documented Mau 's work .

Mau 's first @-@ hand knowledge of traditional navigation had been accumulated in Northern Hemisphere study and sailings , but the voyage to Tahiti required Mau to familiarize himself with the geography and night sky of the Southern Hemisphere . Of this preparation , Finney writes ,

... To prepare Mau Piailug for the voyage , David Lewis briefed him on the geography of the islands in this part of the Pacific and the winds and currents that could be expected along the way , all information that an early Polynesian navigator acquainted with this route would have carried in his head . In addition , to alert Mau of how the elevation of stars above the northern and southern horizons would change as the canoe sailed farther and farther south , we held training sessions in Honolulu 's Bishop Museum planetarium to graphically show how , for example , as one sailed toward Tahiti [,] Polaris sank lower and lower on the northern horizon until it disappeared at the equator while the Southern Cross curved higher and higher in the sky . During his first few days of the voyage , Mau received further coaching on the pattern of winds and currents from Rodo Williams , a veteran Tahitian seaman on the crew who the year before had sailed a yacht from Tahiti to Hawaii and could therefore provide Mau with a firsthand account of what he could expect to encounter .

Their collaboration proved successful when , on the thirtieth day at sea on the 1976 voyage , Mau stated soon they would see land , and the next day , Tahiti . A few hours later , they spotted land @-@ based white terns (Gygis alba) followed by a diminution of the trade @-@ wind swell . That night they spotted Mataiva . After a brief stopover , with little more than another day 's sailing they made landfall at Tahiti where they were welcomed by 17 @,@ 000 people ? half the population of Tahiti .

Nainoa 's ambition was to sail H?k?le ? a to Tahiti as navigator using recreated traditional techniques . He spent years training on his own and with Mau . Mau 's training and mentoring helped Nainoa achieve that goal in the 1980 Tahiti voyage . It marked the first time in over 500 years that a Native Hawaiian had mastered the stars , the seas , the birds , and the winds to guide a sailing canoe from Hawaii to Tahiti and back . The two men joined again for the 1985 ? 1987 Voyage of Rediscovery to New Zealand , again with Nainoa as principal navigator and Mau as mentor . The voyage to New Zealand stoked M?ori interest in cultural history , navigation techniques , and canoe building . It also brought to life for M?ori the stories in their folklore of the great canoe voyages of migration and settlement in Aotearoa (New Zealand) . Describing a ceremony held at Waitangi to commemorate the Hawaii ? New Zealand voyage of H?k?le ? a , Nainoa writes :

Sir James Henare , the most revered of the elders of Tai Tokerau , got up and said , " You 've proven that it could be done . And you 've also proven that our ancestors did it . ... because the five tribes of Tai Tokerau trace their ancestry from the names of the canoes they arrived in , and because you people from Hawai 'i came by canoe , therefore by our traditions , you must be the sixth tribe of Tai Tokerau .

In 1995 , Mau took part in the N? ?Ohana Holo Moana voyage of H?k?le ? a to Ra ? i?tea . Sailing with his son Sesario Sewralur , and Nainoa as sailing master , Mau watched as Nainoa 's students Ka?au McKenney and Keahi Omai served as navigators . Mau had seen Nainoa succeed in the 1980 and 1985 ? 1987 voyages ; finally , in this 1995 voyage , Mau saw proof that the knowledge was carried forward to the next generation . The canoe not only landed successfully at Rarotonga , but the voyage resulted in the lifting of a six @-@ centuries @-@ old taboo on voyaging from Ra ? i?tea . H?k?le ? a had sailed from Hawaii with sisterships Hawai ? iloa and Makali ? i ; these canoes rendezvoused at Taputapuatea with other voyaging canoes from across Oceania .

= = = Makali ? i = = =

To help preserve Hawaiian culture , Milton " Shorty " Bertelmann and his brother Clay established the nonprofit organization , N? Kalai Wa ? a Moku o Hawai ? i on the island of Hawaii in 1992 . Beginning in 1994 , the two brothers helped construct Makali ? i , a 54 @-@ foot voyaging canoe , launching it in 1995 . From February to May 1999 , " Shorty " Bertelmann navigated Makali ? i to Satawal in a voyage known as ? E Mau ? Sailing the Master Home . ? This voyage was to pay homage to master navigator Mau Piailug and to thank him for his teachings . Mau sailed home aboard Makali ? i as their honored guest . Makali ? i continued her 1999 voyage through half the length of Micronesia . She was the first Hawaiian voyaging canoe to visit the far reaches of Micronesia and her appearance stimulated interest amongst Micronesians in their own cultural

history .

= = = Alingano Maisu = = =

On March 18 , 2007 Mau presided over the first pwo ceremony for navigators in fifty @-@ six years on the island of Satawal . Five Native Hawaiians and eleven other people were inducted into pwo as master navigators , including Nainoa Thompson and Mau 's son Sesario Sewralur . The Polynesian Voyaging Society , as part of the 2007 H?k?le ? a " One Ocean , One People " voyage named " K? Holo Mau , " presented Mau with a canoe named the Alingano Maisu ? a gift for his key role in reviving traditional wayfinding navigation in Hawaii . The canoe was built in Kawaihae , Hawaii under the nonprofit organization N? Kalai Wa ? a Moku O Hawai ? i . The commitment to build this " gift " for Mau was made by Clay Bertelmann , captain of Makali ? i and H?k?le ? a . Maisu was given to Mau on behalf of all the voyaging families and organizations that actively continue to sail and practice the traditions taught by Mau Piailug .

= = = Death = = =

After a long struggle with diabetes , Mau died on his home island of Satawal at 18 : 30 Micronesia time , Monday , July 12 , 2010 . As is the tradition on Satawal , travel between the islands was temporarily suspended in Mau 's honor . Because there is no morgue on the island Mau was buried the following day , and a nightly rosary was held until the memorial service on July 21 at Santa Soledad Church . Mau 's son Henry Yarofalpiy will continue teaching students about their culture , preserving the legacy of his father .

= = Awards = =

Mau was awarded an honorary Doctor of Humane Letters in 1987 by the University of Hawaii . On May 9 , 2000 , he was honored by the Smithsonian Institution at the National Museum of Natural History . At the ceremony , then @-@ secretary Lawrence Small said , " The rebirth of non @-@ instrument navigation came about largely due to this man , Mau Piailug . " The Bishop Museum presented Mau with the Robert J. Pfeiffer Medal on July 12 , 2008 , honoring him for " exceptional dedication to the advancement of maritime affairs and the perpetuation of maritime heritage in Hawaii and the Pacific . " Mau also was honored for his " devotion and outstanding civic leadership " and for exemplifying " the spirit and purpose of the Museum 's founder Charles Reed Bishop " .

= = Legacy = =

The success of Mau 's navigational feats sparked cultural pride in Tahitians , M?ori and Hawaiians and connected all Polynesians to stories their forebears told of similar voyages of generations past . The voyage of H?k?le ? a attracted the interest of young students such as Milton " Shorty " Bertelmann and later Nainoa Thompson . Mau not only led H?k?le ? a to Tahiti , but reconnected the people of the Pacific to their cultural roots . Revived interest in preserving traditional culture and navigation methods reinvigorated the art of canoe building and cultural studies in Hawaii , New Zealand , Rarotonga , and Tahiti , as well as Mau 's homeland of Satawal .

Two centuries before Mau and the H?k?le ? a , Captain James Cook , with the help of Tupaia , gained knowledge that otherwise would have been closely held . Before his death in 1779 , Cook hypothesized that Polynesians shared common ancestry ; he even pinned their origin to Asia . However , Cook 's theory did not prevent debate among scholars . Before the H?k?le ? a voyage in 1976 , academic debate about the settlement of Polynesia was divided between several schools of thought .

Norwegian ethnographer Thor Heyerdahl hypothesized that the Pacific was settled by voyages from South America and set out to prove this with his Kon @-@ Tiki expedition . Scholars did not take Heyerdahl 's hypothesis seriously . New Zealander Andrew Sharp proposed the accidental voyaging

hypothesis in 1957 which (erroneously) argued that Oceania was too vast to have been settled by intentional voyaging , so migrations must have happened by accidental drift voyages . Sharp granted that Polynesians did likely settle the Pacific from Asia , but held the opinion that their crude vessels and navigational tools were not reliable for intentional sailing from Tahiti to Hawaii or New Zealand . He stated that voyages of more than three hundred miles were likely accidental voyages , with landfall at the mercy of wind and current . A 1973 study and computer simulation by Levison , Ward , and Web investigated the probability of Sharp 's hypothesis , but found it improbable .

Finney disagreed with the accidental voyaging portion of Sharp 's hypothesis . To investigate the problem he founded the Polynesian Voyaging Society with Herb Kane and Tommy Holmes in 1973 , intent on building a voyaging canoe to sail from Hawaii to Tahiti to test whether intentional two @-@ way voyaging throughout Oceania could be replicated . With the help of Mau 's navigational knowledge guiding H?k?le ? a , the Polynesian Voyaging Society demonstrated that intentional voyaging was not only possible , but that the ancestors of the Polynesians could have settled the Pacific on similar voyages using non @-@ instrument wayfinding techniques such as Mau 's . Finally , linguistic and archaeological evidence suggests that the history of the Polynesian people does not originate in the east Pacific , but in the west . Recent developments in the field of DNA analysis have unequivocally settled the debate of Polynesian origin . They prove Polynesians share common ancestry with indigenous Taiwanese and East Asians .

= = Wayfinding and navigation = =

= = = Training = = =

Navigator training was historically interwoven with culture and ritual . Great discretion had to be shown in candidate selection so that the knowledge preserved through oral tradition would have the greatest chance of survival . A master navigator 's rank was equal or superior to a village chief 's rank . Prudent navigation relies on no single technique , but instead synthesizes position from multiple inputs . Underway , this constant synthesis makes it easy to spot the navigator ? he 's the one with red eyes from sleep deprivation .

For a traditionally trained navigator , these inputs include physical signals from the sea , skies , and stars , memory signals from his knowledge of star , swell , and wind compasses ; and cultural knowledge recorded in chants , dances , and stories . Examples of physical signals include the color , temperature , and taste (salinity) of seawater ; floating plant debris ; sightings of land @-@ based seabirds flying out to fish ; cloud type , color , and movement ; wind direction , speed , and temperature ; the direction and nature of ocean swells and waves ; the position of stars in the sky , and his estimation of the speed , current set , and leeway of his sailing craft . The " compass " he carried was not magnetic , but a mental model of where islands are located , and the star points which one could use to navigate between them . This mental model would have taken years of study to build ; dances , chants (rong) , and stories help him to recall complex relationships of geography and location . The stars give him highly reliable position information when visible , but navigators such as Mau managed to keep their position and tracks in mind even when blocked by clouds , using other references such as wind and swell as proxies .

Mau 's Carolinian star compass (pictured) is the basis for Nainoa 's modern Hawaiian star compass . Apart from the bulk of training which happens at sea , historically boys were taught in the men 's house with pebbles , shells , or pieces of coral , representing stars , laid on the sand in a circular pattern . Which bits of shell or coral are chosen to represent which star or constellation is arbitrary , but generally , larger pieces are used for points of the compass while smaller pieces represent important stars between those points . In Mau 's star compass , these points are not necessarily equidistant . The outer circular formation represents the horizon , with the canoe its center point . The eastern half of the circle depicts reference stars ' rising points on the horizon (tan) while the western half depicts their setting points (tupul) . Swell patterns of prevailing trade winds are represented by sticks (not depicted here) overlaying the star compass in the form of a square .

All knowledge is retained by memory with the help of dances , chants , and stories , wherein the stars are enumerated as people or characters in the stories .

= = = Technique = = =

One aspect of the Carolinian method of estimating longitude on inter @-@ island sailings is to visualize the target island relative to a second reference island 's alignment with a succession of selected stars , points of the star compass . This is a refined system of dead reckoning whereby the navigator constantly synthesizes his position relative to the reference island 's location in his mental model . The most remarkable thing about this is that the reference island (lu pongank) may be over the horizon , unseen , even imaginary .

In its simplest form the star compass describes thirty @-@ two points at which key stars rise on the eastern horizon and set on the western horizon . North latitude is fairly easy to determine because the North Pole has a zenith star easily seen with the naked eye , called Polaris (Wuliwulifasmughet) . Polaris ' height above the horizon (declination) indicates the viewer 's southward displacement from Polaris ' nadir ? the North Pole . Traveling further north , Polaris appears higher in the sky . Only at the true north pole is Polaris directly overhead at nearly 90 degrees declination . Traveling south toward the equator , Polaris appears to descend toward the northern horizon . At 45 degrees north latitude , Polaris is 45 degrees above the northern horizon . Near the equator , Polaris ' declination approaches zero degrees , but for the viewer just farther south , Polaris will have disappeared below the northern horizon .

Continuing south from the equator , though Polaris is no longer visible , Crux (Luubw) , the " Southern Cross , " will have risen above the southern horizon . Traveling further southward , Crux rises higher in the sky . Through Crux 's longest axis , an imaginary line bisecting Gacrux and Acrux points southward toward the southern celestial pole . But the South Pole has no true zenith star from which direct readings of south latitude may be taken . As a proxy , the southern celestial pole lies at the end of that imaginary line extended southward through Gacrux and Acrux , at a distance about 4 @.@ 5 times the distance between them . Nainoa Thompson notes that at Hawai?i 's latitude , the distance between Gacrux and the southerly Acrux is equal to Acrux 's declination above the southern horizon .

To steer the canoe in mid @-@ ocean on a consistent course , the navigator selects a star and keeps the canoe pointed toward it . Should it become cloud @-@ blocked , or rise too high in the sky , he selects another star but offsets his reference to remain true to the first , or steers at the same relative angle to the swell as when steering toward the star .