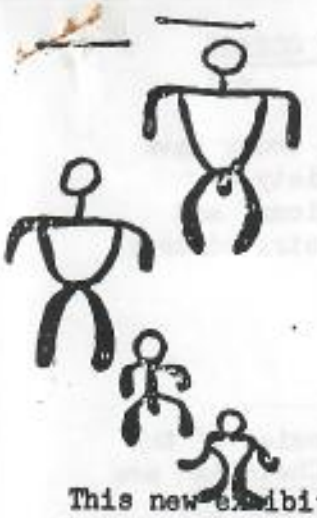

State of Hawai'i
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RESEARCH MATERIALS, BULLETIN NUMBER 21
Mrs. Violet Ku'ulei Ihara
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ENDANGERED NAVIGATORS: TURTLES OF THE OCEANS

This new exhibit is on sea turtles: their place in the animal kingdom, their natural history, their importance to man, and their present status as endangered species. The exhibit is located in the upstairs gallery of POLYNESIAN HALL and will remain on view until May 15, 1980. The exhibit materials were researched and prepared by Carla Kishinami, Curatorial Assistant in Vertabrate Zoology. The following materials are label copies accompanying the exhibit. (SEE MAP - page 12)

DOORWAY: Three hundred years ago, when all sea turtles were vastly more abundant, their migration to and from breeding grounds was a conspicuous phenomenon. Today, with their numbers greatly reduced, they still steer their way through hundreds of miles of ocean using some unknown means to find their way back to their natal beaches to breed and lay their eggs.

(MAKAI WALL) AN ANCIENT RELATIVE OF TODAY'S MARINE TURTLES Near the end of the Age of Reptiles, much of America was covered by shallow seas in which the marine turtle Archelon was common. This 12-foot giant was an early representative of the same group that today includes the green turtle, common in Hawaiian waters.

A shell from an average-size adult green turtle is shown here to give some idea of the great size difference between ancient and modern sea turtles.

"LIVING FOSSILS" The turtles (Order Chelonia) are the oldest surviving line of reptiles. They evolved during the Triassic Period, 200 million years ago, along with the first dinosaurs. It is believed that these early turtles originally were marsh inhabitants and that during the Triassic some moved into the sea. These ancestral turtles gave rise to the hard-shelled sea turtles, Family Cheloniidae, and later to the leather-back sea turtles, Family Dermochelyidae.

The wave of extinction that heralded the end of the Age of Dinosaurs also took with it many of the turtle species. Those that survived changed very little in basic form, remaining very much like their ancestors despite the changing environment.

ADAPTATION TO LIFE AT SEA The skeleton above of a freshwater pond turtle shows the "boney box" that has been the hallmark of the turtles from their early beginnings. This armor plating is divided into upper and lower portions (carapace and plastron, respectively), connected by a bridge at the sides. In life it is covered by horny plates called laminae. It admirably achieves its purpose -- protection -- but greatly restricts the movements of its occupant.

The green sea turtle skeleton below, compared with that of the pond turtle, shows the reduction of the "boney box" that was essential for survival in the ocean habitat. This reduction was needed in order to lighten and streamline the shell and increase its flexibility. Bone reduction also provided room for the powerful muscles of the forelimbs, which had become elongated into effective paddles.

ADAPTATION TO DIFFERENT ENVIRONMENTS The twelve Families of turtles living today have adapted in form and behavior to a variety of habitats. They occur on all the major land masses except for the polar regions, and have made their way to numerous islands. Four well-known Families are illustrated here.

Family Testudinidae, Land Tortoises (Galapagos Tortoise)
Family Emydidae, Freshwater and Marsh Turtles (Red-eared Pond Slider)
Family Trionychidae, Soft-shelled Turtles (Chinese Softshell)
Family Cheloniidae, Hard-shelled Sea Turtles (Green Turtle)

LIFE HISTORY GREEN TURTLE, CHELONIA MYDAS Threatened Species Two species of the genus Chelonia are found today. The flatback, Chelonia depressa, is found only in Australia, while the green turtle, Chelonia mydas, is found in warmer waters throughout the world.

Named for the color of its body fat, this turtle - of soup fame - is regarded by many as the most valuable reptile in the world. Its flesh and eggs serve as an important source of protein in many parts of the globe.

An herbivore, the green turtle spends much of its life feeding in shallow waters that support an abundance of vegetation. It is the most common turtle in Hawaiian waters, and is one of two marine turtles known to nest here.

(MAP SHOWING DISTRIBUTION OF THE GREEN TURTLE) The green turtle is thought to be the most accomplished navigator among the sea turtles; its migrations are certainly the best documented. The extent of some of these migrations has been traced through females that have been tagged on nesting beaches and later recovered in feeding grounds. One of the longest yet recorded is the 1,400-mile journey between Ascension Island and the coast of Brazil.

Adult green turtles range from 30 to 60 inches in carapace length. Shown here is an immature specimen.

HAWKSBILL, ERETMOCHELYS IMBRICATA Endangered Species This hawksbill is best known for its translucent laminae, the material used for the popular tortoise-shell jewelry. It is an inhabitant of rocky places and coral reefs, but is sometimes found in deeper waters.

Little is known of the behavior of the hawksbill. It is omnivorous, is apparently active during the day, and is generally thought to have an aggressive temperament.

Hawksbills are occasionally encountered around the main Hawaiian Islands and are known to nest here.

Adult hawksbills range from 24 to 36 inches in carapace length.

(MAP SHOWING DISTRIBUTION OF THE HAWKSBILL TURTLE) Since its coral reef habitat usually provides the hawksbill with both feeding and nesting areas, it was thought that it did not undertake long-range migrations. Evidence gathered over the past fifteen years, however, indicates that some populations do migrate to distant nesting beaches, but this has not been thoroughly documented.

LEATHERBACK, DERMOCHELYS CORIACEA Endangered Species The leatherback is the only living member of the Family Dermochelyidae. It has "lost" the horny laminae typical of a turtle shell, and the underlying bone has become greatly reduced. A mosaic of small bones is embedded in the leathery skin, which replaces the hard outer laminae.

Almost nothing is known of the behavior of free-living leatherbacks, except that they are omnivorous with a marked preference for jellyfish. Leatherbacks are pelagic wanderers - roaming the deep waters of the open ocean and rarely entering shallow bays and estuaries. They are regularly encountered in Hawaiian waters but do not nest here.

Adult leatherbacks range in length from 4 to 8 feet and weigh from 700 to 1,600 pounds, making them the largest living turtles in the world.

(MAP SHOWING DISTRIBUTION OF THE LEATHERBACK TURTLE) Leatherbacks travel great distances, but whether these trips are random wanderings or regular migrations is not known. Their travels take them into cold waters that are intolerable to other sea turtles, except possibly the loggerheads.

LOGGERHEAD, CARETTA CARETTA Threatened Species Loggerheads wander widely throughout the marine waters of their range and often enter bays, lagoons, salt marshes, and creeks. In the open ocean they spend a great deal of time floating on the surface, presumably sleeping. They have the reputation of being extremely pugnacious. Loggerheads are almost entirely carnivorous.

In former days the loggerhead was reported to reach weights of 700 to 1,000 pounds, but today a specimen weighing more than 300 pounds is rare. Still, loggerheads are considered to be the largest living hard-shelled turtles.

The white spots on the shell in the photograph are barnacles.

(MAP OF THE DISTRIBUTION OF THE LOGGERHEAD TURTLE) The loggerhead has been so consistently persecuted at the nesting grounds, and so many have been destroyed, that the original nesting range cannot be discerned. Although the Hawaiian Islands are considered to be within their range, only rare stragglers are encountered here.

Adult loggerheads range from 30 to 83 inches in carapace length. This carapace is from a very young specimen.

OLIVE RIDLEY, LEPIDOCHELYS OLIVACEA Threatened Species The olive ridley is one of the smallest sea turtles and the most poorly known. There is some evidence that it is primarily an open-water species, feeding mainly on deep-water crustaceans that come to the ocean surface at night. It also frequents shallower coastal waters where it apparently dives deeply for it food.

The olive ridley is usually a nighttime mass nester. Usually on stormy nights, large numbers will ascend the beaches and lay their eggs as a group. It is thought that stormy weather is preferred because the high wind and surf hel to cover tracks and nests.

Adult olive ridleys range from 24 to 28 inches in carapace length. Shown here is an immature specimen.

KEMP'S RIDLEY, LEPIDOCHELYS KEMPI Endangered Species In 1968 the Kemp's ridley was declared the most endangered of all sea turtles. Since the discovery of its nesting grounds in 1947, it has suffered a 99% decline in its population.

The carnivorous Kemp's ridley inhabits the shallow waters of coastal areas. It is a mass nester, even more so than the olive ridley, and unlike any other marine turtle, it usually nests during the day. Like the olive ridley, it prefers to nest when the surf and wind are high. It forms large aggregations offshore before ascending the beach en masse to nest - a maneuver that is thought to overwhelm and confuse its predators. These aribandas (Spanish, "arrivals") were first documented in 1947, when an estimated 40,000 females were filmed covering the beach at Rancho Nuevo, Mexico. In 1979 no more than 450 females arrived there to nest.

Adult Kemp's ridleys range from 20 to 28 inches in carapace length.

The Kemp's ridley has the most restricted range of all the sea turtles. Almost the entire population of breeding females returns to nest on the southern coast of Tamaulipas, Mexico, usually within a few miles of Rancho Nuevo.

By contrast, the olive ridley is found in a narrow band of tropical waters around the world.

(MAP OF DISTRIBUTION OF THE OLIVE RIDLEY AND KEMP'S RIDLEY TURTLES)

('EWA WALL) The leatherback is the fastest and most powerful swimmer of any of the sea turtles. A growth of red algae on this female's neck gives it a pink tinge.

This olive ridley male shows the six lateral laminae that help differentiate it from the green turtle and the hawksbill, which only have four.

Both the flatness of the carapace and its upturned edges identify this turtle as a flatback, a species native to Australia.

The pronounced beak of the hawksbill gives it its name.

HAWAIIAN GREEN TURTLES All marine turtles reproduce by periodically migrating to their breeding grounds, where courtship and mating precede the female's ascent up the beach to lay her eggs. It is widely accepted, but as yet uproved, that marine turtles return to the same nesting beach where they themselves were hatched several years earlier. It is known that the turtles often travel over long distances of open ocean to reach these beaches, and that they return to the same beaches on recurrent nesting seasons, but what guides them on their journey is still a mystery.

Hawaiian green turtles begin their migration from feeding grounds to nesting beaches each March. The females begin laying their eggs in May and continue through July. Formerly, green turtles nested on some of the main Hawaiian Islands, but today the last remaining colonial nesting sites, or rookeries, are in French Frigate Shoals in the Leeward Islands.

LIFE IN THE LEEWARD ISLANDS (MAP OF FEEDING GROUNDS AND MIGRATION ROUTES) The two principal nesting sites in the Hawaiian Islands are in French Frigate Shoals, on Whale-Skate Island (above) and on East Island. Islands to the northwest of French Frigate Shoals may, on occasion, host a few separately nesting females.

Newly hatched Hawaiian green turtles scamper toward the ocean. Hatchlings usually emerge at night and make their way to the water by moving toward the brighter horizon over the ocean.

(MAUKA WALL) Green turtles retire to nooks and crannies in the reef to sleep. Here a turtle pauses to allow smaller "cleaner" fish to nibble at its skin and shell.

In all marine turtles the adult male is easy to identify because of its long, prehensile tail, which extends beyond the hind flippers. The female's tail barely reaches beyond the end of the shell.

Except for the female during nesting, most marine turtles never again return to land after leaving the natal beach. The Hawaiian green turtles are unique in that they habitua habitually come ashore to bask in the sun for hours - sometimes with a friend.

Males use their flippers to clasp the female's shell during mating.

Most marine turtles reproduce in two- to four-year cycles. During the breeding season, the female usually lays two or three clutches of eggs at intervals of 10 to 15 days. Green turtles have been known to nest up to eight times in a season.

A NESTING GREEN TURTLE Most marine turtles use the cover of night to lay their eggs. After the female has cautiously ascended the beach and selected her nesting site, she begins construction of her nest by using all four flippers to fling sand out of the way. Depending on the species of turtle and the consistency of the sand, the body pit thus excavated varies from a slight depression to a deep hole, sometimes twice the depth of the shell.

A female turtle appears to weep while nesting. Actually, these "tears" flow constantly from the salt excreting glands, but can only be seen when the turtle is out of water. During nesting, these "tears" help to wash sand from the eyes and keep them moist.

Using the hind flippers, the turtle carefully scoops out the egg chamber. Usually 100 to 120 of the soft, leathery eggs are deposited, and the nest is completely covered to conceal it before the turtle returns to the sea.

Sea turtle eggs have an incubation period of approximately 50 days. The egg chamber, lying about 2 feet underground, protects the eggs from the flucuating outside temperature.

Hawksbill eggs Loggerhead eggs

The baby turtles are hatched underground, and it take several days for their combined efforts to bring them to the surface. Their final emergence usually takes place at night.

Once the hatchlings enter the sea, they are seldom seen until they are at least one year old. Where the baby turtles go and what they do during this "lost year" is not fully known.

Loggerhead Green Leatherback

PREDATORS ON LAND Turtle eggs are dug up and devoured by a host of predators, including mongooses, monitor lizards, racoons, monkeys, and feral dogs and cats. On their way to the sea, the hatchlings are confronted with even more predators - birds, snakes, and crabs.

At French Frigate Shoals, unlike many turtle rookeries around the world, sea birds like these frigatebirds do not seem to bother the turtle hatchlings.

Ghost crabs kill a great many hatchlings wherever the two are found together.

Ghost Crab Monitor Lizard Mongoose

PREDATORS AT SEA Once the hatchlings enter the water they may fall prey to any number of carnivorous fish, including the jack (Caranx ignobilis), locally known as ulua.

Sharks readily eat hatchlings and will even attack half-grown and adult turtles. This damaged shell from a green turtle was taken from the stomach of the 9-foot tiger shark whose jaws are displayed here.

One of the many predators of turtle eggs and the major predator of adult turtles is seen here. CAUTION: LIVING SPECIMEN MAN

This specimen shown here has probably never killed a sea turtle - don't let it start!

TURTLE FOODS Sea turtles vary in dietary preference, from the mainly herbivorous green turtles that graze on seaweeds and sea grasses - munching on an occasional sponge or mollusk for variety - to the highly carnivorous ridleys with a diet consisting mainly of crustaceans and mollusks.

Loggerheads and hawksbills seem to enjoy a balanced diet of plants and animals. Loggerheads are well known for their ability to crush large conch shells and Tridacna clams in their powerful jaws.

Dictyopteris	Gracilaria	Pinna
Sargassum	Portunus	Tridacna
Codium	Natica	Chondrosia (sponge)

Most sea turtles are known to eat jellyfish. Discarded plastic bags floating in the ocean look like jellyfish to the sea turtle, and can cause death by intestinal blockage. Will your sandwich bag kill a sea turtle?

PARASITISM Several types of external parasites are associated with sea turtles; the most obvious are the barnacles, with ten species found exclusively on sea turtles. Some, like Chelonibia testudinaria, cause very little damage, merely "catching a ride," and probably feeding on the residue of the turtle's meals. The burrowing barnacles such as Stephanolepas muricata may cause some discomfort and severe infestations may do a great deal of harm.

A hawksbill with a minor encrustation of barnacles.

Chelonibia testudinaria - a harmless encrusting barnacle.

Stephanolepas muricata - This barnacle burrows through shell or skin anchoring its barbs deep in the turtle's tissue. It erodes the bone of the shell and can form large tumerous masses. Individuals can reach up to four times the size shown here.

Platylepas sp. - This barnacle sits in shallow pits that it forms in the turtle's skin.

Cylindrolepas sp. - By turning the specimen you can see how barnacles of this genus have burrowed deeply into this lamina, from the edge of a turtle shell. The bone that was sheathed by this lamina was eroded where the barnacles burrowed into it.

IMPORTANCE TO MAN Turtles have long played an important role in man's cultural history. They have figured in his mythology, provided material for his tools and ornaments, and satisfied his hunger. Wherever man and turtle have come in contact, man has benefitted in many ways.

A modern story board from Palau, Caroline Islands, depicts the following legend:

Two lovers met secretly on a deserted beach. The woman used her skirt as a pillow, but when they were ready to leave she could not find it. They assumed that the turtle they had seen nesting nearby had dragged it into the sea. Several days later the lovers returned to the beach and saw the same turtle coming up the beach to nest, still entangled in the skirt. In this way the people discovered the number of days between nestings of the sea turtle.

The mythical fisherman, Urashima Taro, is figured in this oshie. The story is as follows:

One day Urashima Taro came upon a sea turtle being tormented by a group of boys. Taro chased the children away and helped the turtle back to sea. One year later the turtle came upon Taro fishing, and told him that his mistress, the Sea Princess, had invited him to her underwater castle. Taro eagerly went with the turtle and soon found himself in a castle more beautiful than any in Japan. Taro did not know how long he stayed, but one day he told the Princess he had to return to his home. She gave him a box, telling him that it contained the most precious gift she could give him, but warning him never to open it.

The sea turtle carried Taro back to his home, but the villagers there told him that Urashima Taro had been lost at sea 300 years earlier. Filled with sadness for the family he had left behind, he forgot the Princess' warning and opened the box that she had given him. A wisp of smoke escaped, and Urashima Taro aged swiftly - as his lost years quickly passed by.

Mr. and Mrs. Roland Force, 1967

Rubbing of a sea turtle petroglyph from Hilina Pali, Hawai'i Island.

The popular string game of "cat's cradle" is played throughout the Pacific. Some examples of sea turtle figures are displayed.

Honu tane (male turtle) from Bora Bora and Maupiti, Society Islands
Honu wahine (female turtle) from Tahiti, Society Islands
"Turtle" from Yap, Caroline Islands
Honu from Maui and Kaua'i, Hawaiian Islands

Yapese children making the "turtle" string figure.
Illustration from String Figures by Caroline F. Jayne (Scribners, New York. 1906)

In many protein-deficient societies, sea turtles provide a much needed source of meat and eggs. In some areas there is a virtual taboo against killing adult turtles for meat, since they are the providers of the more highly prized eggs. In other areas, adults as well as eggs are taken.

Fishermen after a day of turtle fishing. Such expeditions are often accompanied by a great deal of ceremony. This photograph was probably taken in Fiji about 1915.

In Malaysia and Sarawak only the eggs of the turtle are harvested. The method of collecting turtle eggs shown here is still practiced in the Sarawak Turtle Islands, where their collection and sale are under government control.

At night, egg collectors mark the site of a nest with a tanda, placed so that the black markings are directly over the egg chamber.

Probes are also used to locate nests.

Hundreds of thousands of eggs are collected yearly. Most are sold locally, but some are replanted as a conservation measure.

Women selling turtle eggs in Kota Baharu, Malaysia.

OUR ENDANGERED SEA TURTLES The worldwide decline in the number of sea turtles is attributable to many factors, but the most important are over-exploitation for food and jewelry, and destruction of the nesting habitat by human activity.

Commercial turtle fishing has been made illegal in the United States and several other countries. It is to be hoped that scenes such as this are now a thing of the past.

Sea turtle products confiscated by officials of the U. S. Fish and Wildlife Service from travelers returning from abroad.

All sea turtles have now been declared as either Threatened or Endangered. This means that under Federal law it is illegal to capture or kill any sea turtle, to import sea turtles or products made from them, and to sell sea turtles or their products interstate.

Although several countries now have regulations either prohibiting or limiting the taking of sea turtles, widespread poaching continues to threaten the animals.

Carcass of a ridley turtle killed for skin and eggs, Tlacoyunque, Mexico.

SEA TURTLE FARMING The world demand for sea turtle products cannot be met by the supply of wild sea turtles. Thus farms have been established in various countries to rear sea turtles in captivity. Their initial stock is composed of wild turtles, augmented yearly by fixed quotas of wild-laid eggs - a practice called "ranching." The eventual goal is self-surficiency, with captive stock producing all the turtles that are eventually marketed.

Opponents of sea turtle farming condemn practices that they believe only hasten the decline of the remaining wild populations. They also contend that promoting turtle products creates a demand that encourages poaching.

Cayman Turtle Farm, Grand Cayman Island, British West Indies, is the largest privately owned sea turtle farm. Their products are no longer allowed into the United States.

One of the farm's two breeding ponds can be seen in the background. The farm claims to have reached the stage of self-sufficiency and is no longer dependent on wild-laid eggs.

SEA TURTLE CONSERVATION Since the need for sea turtle conservation was recognized, many years ago, government officials and scientists worldwide have been working diligently on this problem. Three conservation programs are illustrated here.

Vital information on migration movements and breeding cycles, which can be used to protect the species, is obtained through tagging and tracing adult turtles.

Tagging a green turtle, French Frigate Shoals, Hawai'i.

Tagged Turtle

Hatchery programs, like this one in the Sarawak Turtle Islands, insure that turtle eggs and hatchlings are protected from predators.

These hatchlings will soon be loaded onto boats and released beyond the reef, thus avoiding many reef predators.

Patrols are used in many areas during the breeding season to protect the nesting females from human or other predators.

A Mexican marine guards a female Kemp's ridley on the beach at Rancho Nuevo, Mexico.

Poster campaigns also assist in the fight to save the world's sea turtles. A Mexican poster warns: "Don't kill it! The turtle is becoming extinct. Respect the prohibition." A similar "Save the Sea Turtle" poster was recently circulated in Papua, New Guinea.

We ask that you do not touch specimens in this exhibit but, if you like, you may touch these.

Green sea turtle Hawksbill

Be aware of the laws governing wildlife importation!

PLEASE TAKE ONE (Sea Turtle Sighting Report - Teachers Only, Please!)

(MAKAI RAIL CASES) TURTLE-SHELL AND BONE ARTIFACTS, HAWAIIAN ISLANDS

One-Piece Fishook, makau 'ea

Net Spacers, haha kā 'upena
Robert E. Van Dyke Collection, 1938

Scraper, kahi olonā
Geoffrey C. Davis, 1972

Scrapper, kahi olonā
A. L. C. Atkinson, 1917

Kapa Stamps The turtle shell is cut to form the diamond pattern and lashed onto a bamboo wand. It is then dipped into dye and the motif is transferred onto a piece of kapa, barkcloth. Seth Andres Collection, 1848

TURTLE-SHELL ARTIFACTS, HAWAIIAN ISLANDS

Bracelets worn by Konia and Princess Ruth.
Rings, Kalaniana'ole Collection
Chain from possessions of Princess Kekaulike
Chain from possessions of Princess Kapi'olani
Jewelry box used by Queen Emma, wife of King Kamehameha IV
Nī'au kani, Few's harp with turtle-shell vibrator

Wrist ornaments, kūpe'e - The name Kaumuali'i, ruling chief of Kaua'i in 1794, is written on the larger kūpe'e, probably indicating that it once belonged to him. The handwriting is possibly that of Queen Kapi'olani, his granddaughter. Lucy K. Peabody, Kalani and Edgar Henriques, 1932

Niho palaoa - The incomplete niho palaoa shows how the turtle-shell segments are fastened by pegs to the main shaft of the ornament. Lucy K. Peabody, Kalani and Edgar Henriques, 1932

Engraving, after Choris, of a Hawaiian woman wearing a niho palaoa suspended from a lei of human hair. This unusual miniature plate was published in World in Miniature (London, Achermann, 1824).

This collection of hymns by William Ellis and Hiram Bingham was the first "book" published in the Hawaiian language. Of the 2,000 copies printed by the Mission Press, only nine are known to have been bound with the turtle-shell cover. A contemporary note inside the cover of one of these copies states: "Bound at Oahu by Moku, a native of the Sandwich Islands." These two copies, owned by the Bishop Museum Library, are from the first printing in 1823 and the 1830 edition.

TURTLE-SHELL AND BONE ARTIFACTS (Map showing Cook Islands, Tuamotu Archipelago, Easter Is.)
Cane with Turtle-shell Rings, Hawaiian Islands, Victor Houston, 1942
Plates from a Fan, Easter Island, J. L. Young, 1921

Turtle-bone Cutters, Pukapuka, Cook Islands, Ernest Beaglehole, 1935
Fishhook, Pukapuka, Cook Islands
Trolling Hooks, Tuamotu Archipelago, J. L. Young, 1921
Ear Piercer, Fatuhiva, Marquesas Islands, R. Linton, 1921
Ear Piercer, Hivaoa, Marquesas Islands, R. Linton, 1921
Ear Ornament, Nukuhiva, Marquesas Islands, R. Linton, 1921

TURTLE-SHELL ARTIFACTS (Map showing Tokelau, Samoa, Tonga, Marquesas Islands)
"The Chief at S. ta Christina" (Marquesas Islands). This engraving, after William Hodges, was published in the atlas accompanying Captain James Cook's A Voyage Towards the South Pole. Cook wrote: "Their principal head-dress, and what appears to be their chief ornament, is a sort of broad fillet, curiously made of the fibres of the hulk of cocoanuts. In the front is fixed a mother-of-pearl shell wrought round to the size of a tea saucer. Before that, another, smaller, of very fine tortoise-shell, perforated into curious figures. Also before, and in the center of that, is another round piece of mother-of-pearl, about the size of half a crown; and before this another piece of perforated tortoise-shell the size of a shilling."

Trolling Hook, Ha'apai Group, Tonga, W. C. McKern, 1921
Trolling Hook, Atafu, Tokelau Islands, Gordon MacGregor, 1933
Finger Ring, Samoa, J. Morgan, 1899
Trolling Hook, Tutuila, Samoa, P. H. Buck and A. F. Judd, 1927

TURTLE-SHELL AND BONE ARTIFACTS (Map showing Nukuoro, Kapingamarangi, Futuna, Wallis, Takuu)
Scraper, Takuu, Samuel Elbert, 1963
Food Scoop, Takuu, Irwin Howard, 1965
Fishhooks, Takuu, Samuel Elbert, 1963
Comb, Takuu, Samuel Elbert, 1963
Trolling Hook, Futuna
Trolling Hook, Wallis, E. G. Burrows, 1933
Trolling Hook, Kapingamarangi, R. O. Smith, 1948
Trolling Hook, Nukuoro
Trolling Hook, Takuu, Samuel Elbert, 1963

TURTLE-SHELL ARTIFACTS, CAROLINE ISLANDS (Map showing Caroline Islands)
Modern Belt, Ernestine Akers, 1956
Necklace, Yap, Micronesian Expedition, 1936
Arm Ring, Yap, Micronesian Expedition, 1936
Arm Ring, Truk
Pendant, Truk, Geoffrey C. Davis, 1952
Necklace and Pendant, Yap, H. G. Hornbostel, 1924
Ear Stretcher, J. S. Emerson, 1889
Bundle of ear ornaments made from marine shells, coconut shell, turtle shell, beads.
Women's money, Palau, Caroline Islands, E. H. Bryan, Jr., 1963

TURTLE-SHELL ARTIFACTS (Map showing Caroline Islands and Marshall Islands)
Fishhook, Yap, Caroline Islands, Micronesian Expedition, 1936
Trolling hook made from pearl shell, turtle shell, human hair, Micronesia, Ben Finney and Henry Holmes, 1959
Fan, Marshall Islands, Leonard Mason, 1964
Fan, Marshall Islands, J. S. Emerson, 1889
Fishhook, Caroline Islands, Mildred Douglas, 1971
Fishhook, Ifaluk Atoll, Caroline Islands

TURTLE-SHELL ARTIFACTS (Map showing New Hebrides, Fiji)
Fishhook, Fiji
Tattooing Instrument, Fiji, W. T. Brigham

Food Scraper, New Hebrides, R. K. Ethridge, 1914
Kava Dish, Espiritu Santo, New Hebrides, R. J. Ethridge, 1914
Initiation Disk, Espiritu Santo, New Hebrides, J. R. Ethridge, 1914
Arm Bands, New Hebrides, R. J. Ethridge, 1914

TURTLE-SHELL ARTIFACTS (Map showing Anuta, Tikopia, Rennel) (MAUKA WALL)
Nose Ring, Anuta, Templeton Crocker Expedition, 1933
Trolling Hook, Anuta, D. Yen, P. Rosendahl, and P. Kirch, 1972
Ear Ornament, Tikopia, P. Kirch, 1978
Trolling Hook, Tikopia, P. Kirch, 1978
Ear Plug, Rennell, Samuel Elbert, 1958

TURTLE-SHELL ARTIFACTS (Map showing Santa Cruz Islands)
Combs, William Davenport, 1960
Earrings, William Davenport, 1960
Earrings, Tinakula, Templeton Crocker Expedition, 1933
Nose Ring, Tinakula, Templeton Crocker Expedition, 1933
Fishhook, William Davenport, 1960
Breast Ornaments, Templeton Crocker Expedition, 1933

TURTLE-SHELL ARTIFACTS (Map showing Solomon Islands)
Breast ornament with turtle-shell frigatebird, Malaita Island, Templeton Crocker Expedition, 1933
Forehead disk, Eric Craig, 1889
Pendant, New Georgia, J. H. L. Waterhouse, 1930
A Solomon Islands boy wearing a crescent-shaped breast ornament. Illustration from Melanesians of the South-east Solomon Islands by W. B. Ivens
A Solomon Islands chief wearing disk ornament with turtle-shell centerpiece. from Melanesians and Polynesians by George Brown.
Trolling Hooks, Santa Catalina Island, Templeton Crocker Expedition, 1933
Fishhook, Sikaiana, Solomon Islands, Templeton Crocker Expedition, 1933
Trolling Hook, Sikaiana, Solomon Islands, Templeton Crocker Expedition, 1933

TURTLE-SHELL ARTIFACTS (Map showing Bismarck Archipelago and Solomon Islands)
Breast Ornament, New Ireland, Bismarck Archipelago
Forehead Disk, New Hanover, Bismarck Archipelago
Chain, New Britain, Bismarck Archipelago
Nose Ring, New Britain, Bismarck Archipelago, E. J. Ford, 1956

TURTLE-SHELL ARTIFACTS (Map showing Bismarck, New Guinea)
Armbands, New Britain, Bismarck Archipelago, E. J. Ford, 1956
Bracelet, Siassi, Bismarck Archipelago
Bracelet, Poom, New Guinea
Ear or Nose Ring, New Britain, Bismarck Archipelago
Ear or Nose Ring, New Guinea
Earrings, New Guinea
Necklace, New Guinea
Ornamental Fishhook, New Guinea
Trolling Hook, Huon Gulf, New Guinea
Fishhook, New Guinea

TURTLE-SHELL ARTIFACTS (Map showing Japan)
Turtle motifs, symbolic of longevity, are often incorporated in the traditional engagement gifts sent to the bride's family from the groom's family.

Here, a bundle of bark fiber is tied with a decorative knot in the shape of a turtle. The two fans are decorated with pictures of the legendary, long-lived Takasago couple, cranes, a turtle, and a treasure boat, all symbols of good luck and long life.

Mr. & Mrs. Tatsuo Hirose, 1978

Yuino Decorative knots in the form of a turtle and a crane symbolize long-lasting happiness. A Japanese proverb says: "Crane for a thousand years, turtle for ten thousand years."

Bachi Pick for a shamisen, a stringed instrument. The strumming edges are of turtle shell laminated onto the body of the pick, which is probably water-buffalo horn. The turtle shell presumably improves the quality of the sound.

In Japan, turtle shell is highly valued and is generally use for jewelry.

Mrs. Ichiro Nakamura, 1977

Sumo kesho mawashi Young boy's ceremonial apron for sumo (wrestling) The embroidered turtle has a dragon-like head and limbs. Its flowing tail is a common aspect of the sea-turtle motif in Japan.

Mr. & Mrs. Tomiki Tomiyama, 1978

ARTIFACTS WITH TURTLE MOTIFS (Map showing Tonga, Easter Islands)

Tongan War Club, Estelle Fuller, 1964

Kūpe'e, Wrist ornament carved from ivory, Kaua'i, Hawaiian Islands, C. M. Hite, 1939

Carved Turtle Head, Easter Island, J. L. Young, 1921

Crown of human bone and carved turtle shell, Marquesas Islands, S. T. Alexander, 1897

Hand kāhili with turtle-shell handle, Hawaiian Islands, Lucy K. Peabody, Kalani and Edgar Henriques, 1932

Turtle-shell bowl from possessions of King Kamehameha I, Hawaiian Islands, Hawaiian Government Collection, 1890