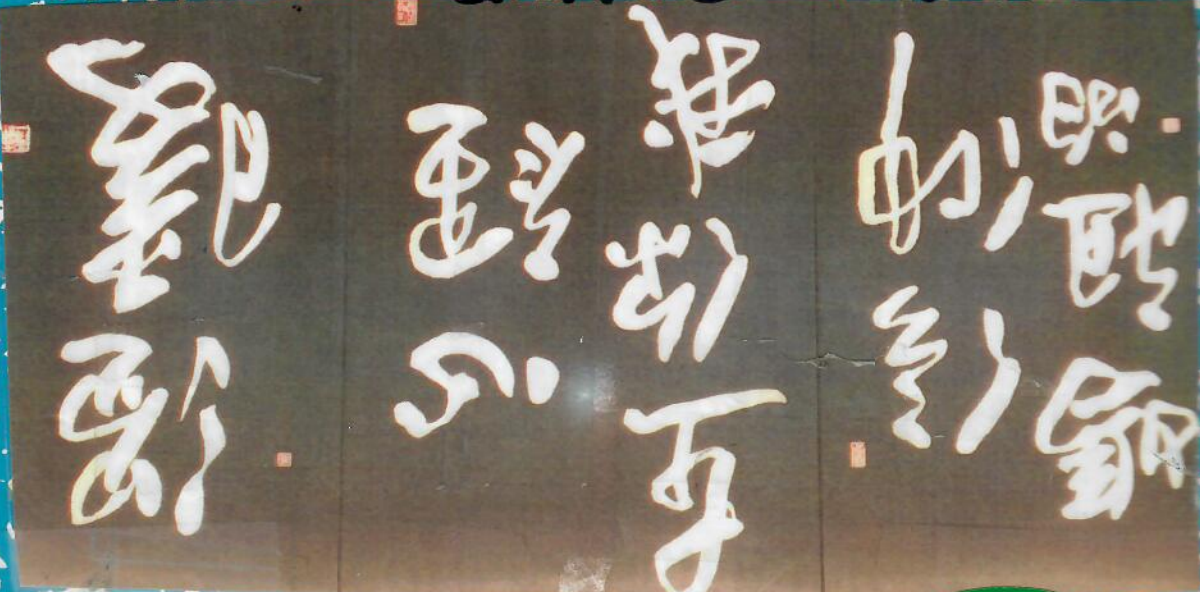


G.H. BALAZS



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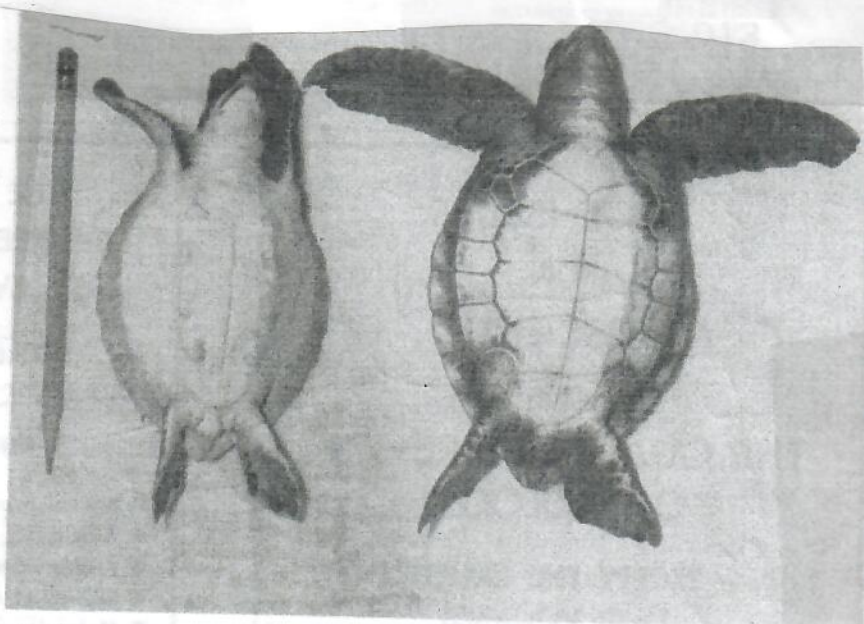


FIG. 3. Central view of the Atlantic (left) and Pacific *Chelonia* shown in Fig 2.

The recent delimitation of the breeding range of the Mexican ridley, *Lepidochelys kempi* (Hildebrand, 1963; Carr, 1963), reveals an extraordinary example of trenchant isolation between sea-turtle populations within a single ocean system. In this

¹ Since this article went to press, the turtles of the Zululand Colony have been found to be the leatherback, *Dermochelys*.

case the isolation is reflected by a fairly well-marked morphologic difference between the separated populations. Taxonomic divergence among separate nesting colonies of green turtles is mostly trivial, however, and on many feeding grounds it is not possible to distinguish between turtles from different breeding areas except perhaps on weakly statistical grounds. In some of the predominantly dark, high-shelled Pacific populations, however, an occasional light-colored, often yellowish,

flat-shelled individual can be noted. I have seen such variants in the mid-Pacific — at French Frigate Shoal and on the islands of Pearl and Hermes Reef where *Chelonia* still emerges to bask on the sand among monk seals and albatrosses, at Espiritu Santo Island near the mouth of the Gulf of California, and in the Bay of Fonseca off Honduras and El Salvador — and others have told me of seeing them elsewhere. The single light-colored, flat yearling seen at French Frigate Shoal was especially

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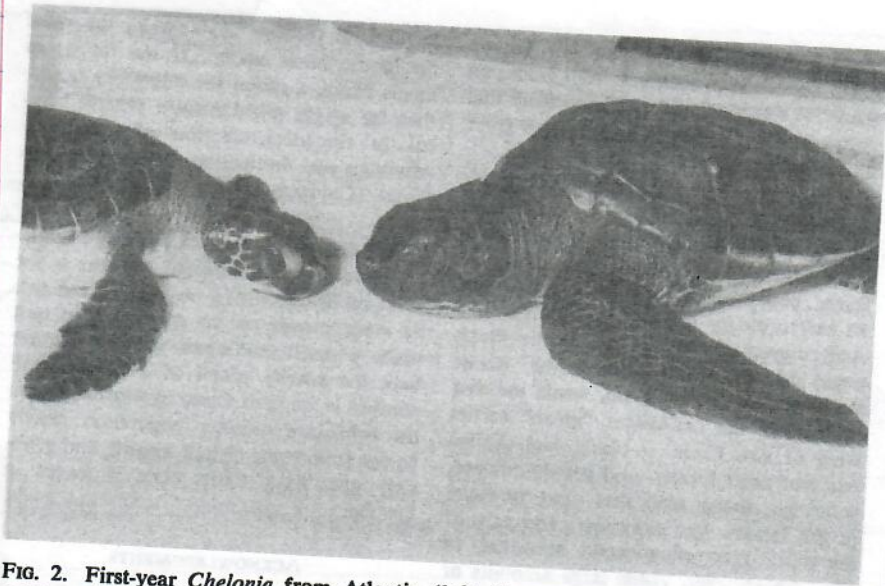


FIG. 2. First-year *Chelonia* from Atlantic (left; Tortuguero, Costa Rica) and Pacific (right; French Frigate Shoal), showing deeper body and heavier black pigment characteristic of most East Pacific stocks.

(over)

Transoceanic *CARR*
Migrations *BIO SCIENCE*
of the Green Turtle 1968

Basking Behavior of the Hawaiian Green Turtle (*Chelonia mydas*)¹

G. C. WHITOW² and G. H. BALAZS³

ABSTRACT: Observations were made on green turtles basking on the white sand beaches at French Frigate Shoals in the northwestern Hawaiian Islands. The highest rectal temperature recorded from the basking turtles was 31.3°C, but the surface temperature of the carapace attained values as great as 42.8°C. During basking, the turtles flipped sand onto their carapaces, but they did not appear to orientate their position in relation to the sun. The duration of basking was inversely related to the mean temperature of a black globe, and the basking beaches were relatively cool. The pattern of breathing during basking consisted of periods of breath-holding alternating with single breaths. The amount of time that the turtles basked varied from 0.3 to 7.5 percent of the total time they were under observation. The biological significance of basking and the advantages that might accrue to Hawaiian green turtles from their unique basking behavior are discussed.

TERRESTRIAL BASKING IS COMMON in freshwater aquatic turtles, and its biology has been described by several authors (Boyer 1965, Moll and Legler 1971, Terpin, Spotila, and Foley 1979). Among sea turtles, however, basking on land is comparatively rare. Only the green turtle (*Chelonia mydas*) has been reported to bask, and it does so only in certain parts of the world, notably in the northwestern Hawaiian Islands. One of eight breeding colonies that have been designated for high priority by the World Conference on Sea Turtle Conservation (1979) is located at French Frigate Shoals in the northwestern Hawaiian Islands.

Little is known about the basking behavior of Hawaiian green turtles. Balazs and Ross (1974) showed that 6-month-old turtles kept

in a tank at the Hawaii Institute of Marine Biology basked when given the opportunity, although turtles of this age have not been observed to bask under natural conditions. At French Frigate Shoals the incidence of basking was highest during the breeding season, when, presumably, the number of turtles present was greatest. Balazs (1980) showed further that during the nesting season, the number of basking turtles declined as the egg-laying season progressed. However, there is not a month in the year when turtles have not been observed to bask. Both male and female turtles have been reported to bask (Balazs 1980). Turtles that formerly basked off the coast of Mexico and in the Galápagos Islands were predominantly female (Fritts 1981) and so also are the turtles that presently bask in Australia (Bustard 1973). In another report, Balazs (1977) described the nocturnal basking behavior of green turtles at Necker Island in the northwestern Hawaiian Islands. This latter behavior points to the possibility that the function of basking may not be that of acquiring heat by solar radiation, although this is believed to be one of the principal functions of basking in freshwater turtles (Boyer 1965).

¹This study was supported by a grant from the National Geographic Society. Manuscript accepted 21 January 1982.

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³University of Hawaii, Hawaii Institute of Marine Biology, Kaneohe, Hawaii 96744.

Occasional measurements were made of the surface temperature of the carapace of the turtles, both at French Frigate Shoals and in the captive situation. The rectal temperature of some turtles at French Frigate Shoals was also measured.

Additional observations on basking behavior were made in the course of a separate study by the authors in which tracking telemetry transmitters were attached to the carapace of four male and four female adult turtles. The purpose of this study and the telemetric techniques used are described elsewhere (Dizon and Balazs 1982). The transmitters incorporated a thermistor, so that when the turtle emerged from the ocean the temperature increased as a result of exposure to the higher air temperature and solar radiation. Consequently, the basking behavior of a turtle could be detected by a rise in the temperature of the transmitter, together with the recording of a continuous signal from the transmitters; the signal from a submerged turtle could not be received. The receiving station was mounted on Tern Island and the range of the transmitters permitted the detection of basking on Trig, Whale-Skate, and East islands. Six of the eight turtles were monitored for a period of 20 days. Contact was lost with the other two turtles—both males—after 4 and 17 days, respectively. In several instances, confirmation of basking, presumed from telemetric recordings, was provided by visual observations. However, at night, telemetric recordings did not permit a distinction to be made between turtles that were ashore nesting and those that were basking. Therefore, the telemetric observations were mainly of value in the detection of basking during the day.

The black globe (Casella & Co., London) was suspended 10 cm above the surface of the sand to approximate the midpoint of the turtle. It was painted with Nextel Black Velvet Coating (Minnesota Mining Co.). The rationale for its use in field studies on the thermal ecology of basking turtles is similar to that for basking seals (Whittow 1978). Sand surface temperatures were measured with mercury thermometers, and the surface temperature of the carapace was determined with a Barnes

Portable Infrared Thermometer (Model PRT-10-L). Rectal temperatures were measured by means of a Yellow Springs Instrument Company Telethermometer (Model 46TUC) and thermistor probe (No. 401). The probe was inserted until its tip was estimated to lie within the rectum or colon. Care was taken to ensure that the tip of the probe was always proximal to the tip of the carapace, rather than in the tail. The interval between breaths was measured with a stop watch; it was easily observed using binoculars, since basking turtles raise their heads at each breath. The orientation of the turtle was recorded with the aid of a sighting pocket compass, which was used to measure the bearing of the sun and wind, as described previously (Whittow 1978).

RESULTS

Thermal Profile of the Basking Beach

On Trig Island, and also on Whale-Skate, the turtles basked on the side of the island facing the outer reef; it was rare to see a basking turtle on the opposite side of the island. The basking beach also faced the prevailing northeast tradewinds. In Figure 2 the temperatures of the sand and black globe are shown for both the basking beach and the beach not used in basking. The data for the two sides of the island were obtained on the same day, so they are directly comparable. It is apparent that there was a striking difference between the thermal conditions on the two beaches, both on Trig and on Whale-Skate. Sand temperatures were lower and black globe temperatures were strikingly lower on the basking beach. The slopes of the beaches, which may have a bearing on the amount of solar radiation incident on the turtles, were slightly different: 7° for the basking beach on both Trig and Whale-Skate, as opposed to 11.5° (Whale-Skate) and 9.3° (Trig) for the beaches where basking was uncommon.

Basking Behavior

Three of the four female turtles and three of the four males with telemetry transmitters

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FIGURE 3. An aggregation of basking turtles on the beach at Whale-Skate.

attached basked. Mean basking time for the three female turtles was 2.8 percent of the time they were observed, with a range of 0.3–7.5 percent. The mean time that the males were basking was 4.6 percent of the total time telemetric recordings were made from them, with the range 2.9–7.3 percent. These values represent minimal durations of basking, because of our rejection of some data due to uncertainties. When the basking period included hours of darkness, only periods of basking that could clearly be differentiated from nesting activities were included in the data.

The turtles began to come ashore and bask at midmorning and continued to do so during the afternoon (Figure 3). Duration of basking varied considerably. The longest basking period, recorded telemetrically, was 600 min; the greatest duration of basking recorded by direct observation was in excess of 450 min—from 1000 to 1730 hours. Some evidence was obtained that the duration of basking was greater, the lower the mean black globe temperature while the turtle was basking (Figure 4). On shore, the turtles were extremely inac-

tive and the only discernible movements were (a) raising of the head each time the turtle breathed and (b) sand flipping.

Breathing Pattern

The characteristic pattern of breathing in the basking turtles consisted of single respirations alternating with long periods of apnea (breath-holding). Mean duration of apnea was 219.2 sec (Table 1), but the range of values was considerable (50–635 sec). There did not appear to be any trend in the respiratory pattern with duration of basking. The breath-hold times recorded in captive animals at the Kewalo Marine Laboratory and Sea Life Park were within the range of those at French Frigate Shoals. So also were the times of voluntary submergence of the captive turtles in water, measured on seven occasions. However, on an eighth occasion, a captive turtle remained under water for 1032 sec. Most turtles raised their heads during a respiration, and many of them moved the head to one side. The turtles seemed more alert when taking a

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TABLE 1
DURATION OF BREATH-HOLDS IN BASKING GREEN TURTLES AT FRENCH FRIGATE SHOALS,
AND IN CAPTIVE TURTLES ON OAHU, HAWAII

	FRENCH FRIGATE SHOALS	KEWALO MARINE LABORATORY	SEA LIFE PARK
Mean (sec)	219.2	227.8	217.4
Standard deviation	123.1	130.1	106.4
Number of observations	138	13	14

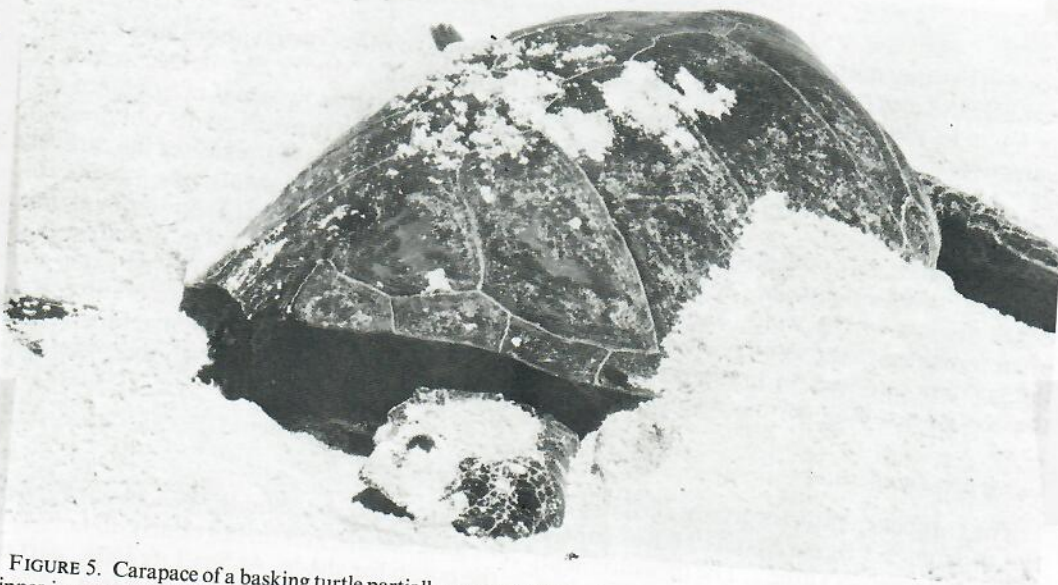


FIGURE 5. Carapace of a basking turtle partially covered with sand as a result of sand flipping. Note that the left rear flipper is covered with sand. The sand on the carapace is moister than the sand on the surface of the beach.

breath, and any small movements made by the turtles were executed immediately following a breath.

Sand Flipping

Many turtles flipped sand onto their carapaces with their front flippers during basking. Because of the smooth surface and rounded contours of the carapace, little sand usually remained on the carapace but it tended to accumulate on the edges (Figure 5). However, continued vigorous sand flipping could cover as much as one third of the carapace with sand. Sand flipping did not occur until the carapace was dry, and it occurred with greater

frequency on very hot days. On relatively cool days, with considerable cloud cover, sand flipping was not seen. Simultaneous measurements of the temperature of the sand-covered carapace and of the uncovered carapace revealed that the latter could be as much as 10°C warmer than the sand on the carapace. In those turtles in which carapace surface temperatures were measured (see below), sand flipping was evident only when the carapace surface temperature exceeded 35°C. Sand flipping was observed in a turtle with a rectal temperature (see below) as low as 28°C.

A variation of sand flipping behavior was seen in the captive turtle at the Kewalo Marine Laboratory. This turtle was provided with a

(OVER)

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dence of basking was high on the first sunny day following stormy, rainy weather. Turtles that had emerged from the ocean to bask during sunny weather remained ashore with the advent of cloudy weather, both at French Frigate Shoals and under captive conditions.

DISCUSSION

The observations made in this study suggest that basking green turtles may absorb a significant amount of solar radiation. Thus, the maximal values for carapace surface temperature are not compatible with a surface that is highly reflective to solar radiation. The maximal value for rectal temperature is also consistent with this belief. Thus, assuming that the mean body temperature of the turtle was equal to the rectal temperature (31.3°C), that the specific heat of the tissues is 0.83, and that the turtle's body temperature was close to that of the ocean when it emerged to bask, it may be calculated that the turtle stored 465 kcal of heat during basking. This calculation is based on an estimated body weight of 112 kg, derived from measurements of the turtle's linear dimensions. The estimated weight of the turtle was also used to obtain a value for the resting metabolic rate of the turtle (Prange 1976). These calculations show that the quantity of heat stored by the turtle was more than 12 times the hourly metabolic rate of a turtle of the same size.

The thermoregulatory behavior (sand flipping) evinced by the turtles also conforms with the suggestion that the turtles had absorbed heat during basking and that they were mildly heat-stressed. The stimulus for sand flipping has not been elucidated in the present study, but, on the basis of the limited number of measurements of rectal and carapace temperatures, it seems likely that sand flipping is evoked by an increase in peripheral (carapace surface) rather than central (rectal) body temperatures. It is interesting that the turtles did not display any indication of thermal polypnea or open-mouthed panting. In this respect, green turtles differ from the slider turtle (*Pseudomys scripta*), which gapes when it basks (Moll and Legler 1971).

Sapsford and van der Riet (1979) came to a similar conclusion with regard to the absorption of solar radiation by a sea turtle (*Caretta caretta*) basking on the surface of the ocean. They suggested further that the pulmonary circulation may play an important part in the transfer of heat from the lungs, which are immediately below part of the carapace, to the rest of the body. McGinnis (1968) and Heath and McGinnis (1980) also reported a rapid increase in carapace temperatures in green turtles during simulated basking both on the surface of the ocean and ashore. However, they concluded that the transfer of heat from the carapace to other parts of the body was slow. Spotila, Standora, and Foley (1979) also observed a rapid rise in carapace temperature, and a slower increase in deep-body temperature in green turtles crawling on the beach in daylight.

Other observations made in the present study suggest that the impact of the heat absorbed by solar radiation is lessened by a number of factors such as the selection of a relatively cool beach and the complete inactivity of the turtles, apart from thermoregulatory behavior, while basking. These factors may enable the turtles to stay on the beach for a longer period of time than they would ordinarily.

• Taken together, the observations made in this study, in conjunction with those made elsewhere, lead to the tentative conclusion that Hawaiian green turtles basking ashore do not primarily increase their body temperature. Indeed, increase in body temperature appears to limit the time they may stay ashore. The unique basking behavior of Hawaiian green turtles may have been made possible by the prevalence of the northeast tradewinds and the highly reflective, cool, white sand in the northwestern Hawaiian Islands. A similar conclusion was made with regard to the thermoregulatory behavior of the Hawaiian monk seal, which shares the basking beaches with the turtles (Whittow 1978). The absence of any clear orientation toward the sun is also in accord with the belief that the turtles were not maximally exposed to solar radiation. In contrast, in a freshwater turtle (*Pseudomys scripta*) there is some evidence that the turtles

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UNCLE GEORGE, JUNE 2013

THANK YOU FOR MENTORING ME THROUGH
OUT HIGH SCHOOL. THE PROJECTS AND
THINGS I HAVE WORKED ON AND LEARNED
FROM YOU HAVE NOT ONLY HELPED ME ^{IN}
HIGH SCHOOL, BUT OPENED UP MANY
MORE OPPORTUNITIES FOR MANY YEARS TO
COME. THANKS AGAIN!

DAVID
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EEO Policy
message

Dr. Kathy Sullivan



June 2013

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Kathryn D. S
Acting Under

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EEO Policy Statement

message

Mr. Kathy Sullivan <announcement@noaa.gov>

Fri, Jun 14, 2013 at 7:15

Message from the Acting Under Secretary

June 2013

National Oceanic and Atmospheric Administration Policy Statement on Non-Discrimination and Equal Employment Opportunity (EEO)

The National Oceanic and Atmospheric Administration (NOAA) reaffirms its commitment to provide a workplace that is free of discrimination. We continue to take a comprehensive approach to managing diversity by practicing equal employment and engaging in affirmative efforts to create and maintain an environment that supports and encourages the contributions of all employees.

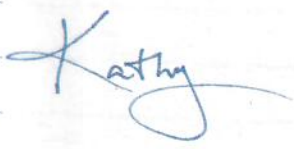
The success of our Agency requires the steadfast support and commitment of every employee. We cannot accomplish our vital mission without the talent, dedication, and skills of all employees. As such, NOAA will not tolerate discrimination based on race, color, religion, sex (including sexual harassment and pregnancy discrimination), sexual orientation, gender identity, national origin, age (40 years of age and over), genetic information or disability (physical or mental), including the provisions of reasonable accommodations on the basis of disability to qualified applicants and employees. Retaliation against those who initiate discrimination complaints, serve as witnesses or otherwise oppose discrimination and harassment is strictly prohibited. NOAA's policy is to ensure that EEO covers all personnel/employment programs, management practices, and decisions.

The NOAA Civil Rights Office (CRO) is charged with the vital mission of ensuring adherence to Federal civil rights laws and regulations in all aspects of employment. Employees and applicants for employment who believe they have been discriminated against and wish to initiate an EEO complaint must contact NOAA's CRO within 45 days of the date of the matter alleged to be discriminatory or, in the case of personnel action, within 45-days of the effective date of the action. For information on the EEO complaint process call 1-800-452-6728 or visit www.eeo.noaa.gov.

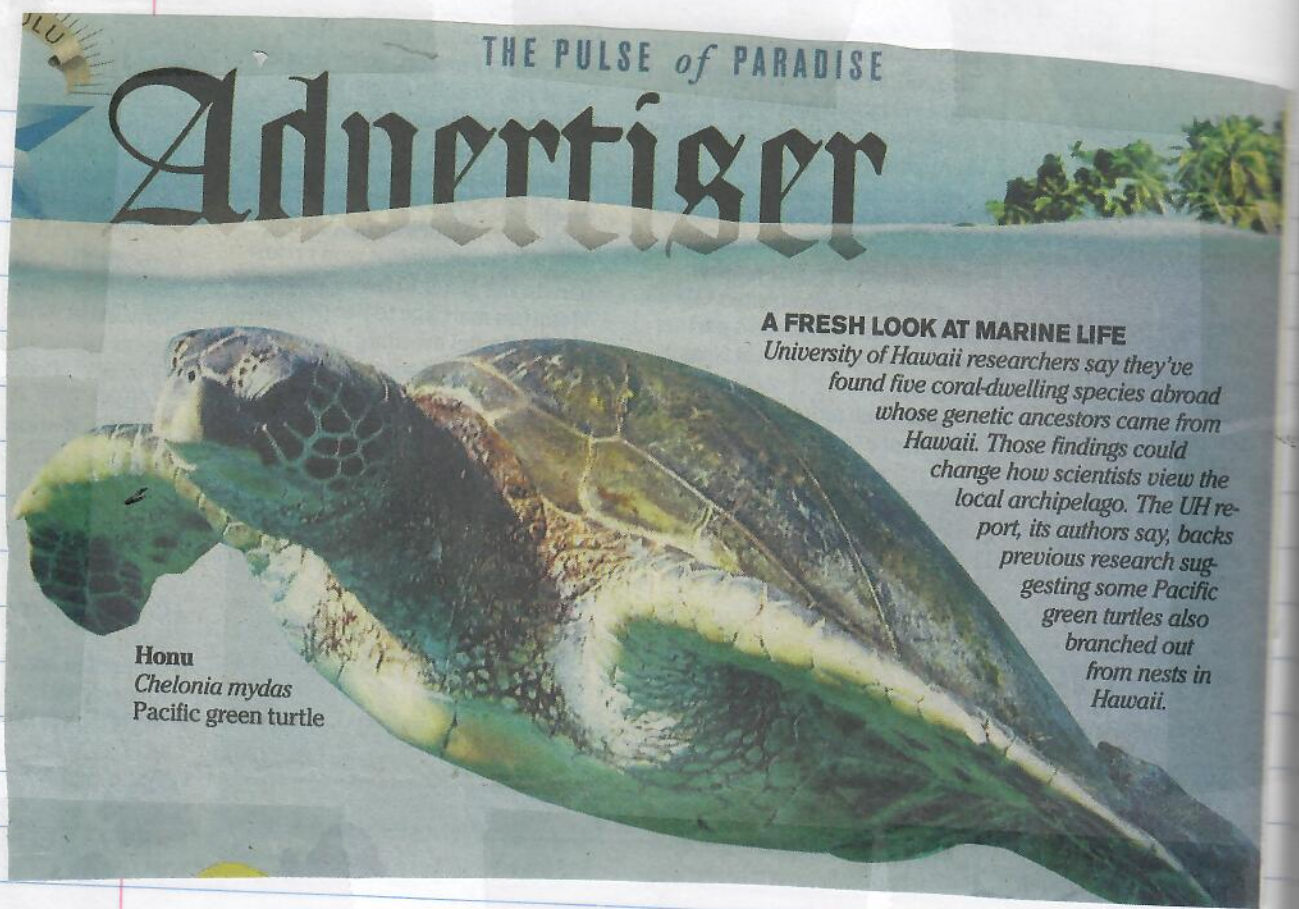
I strongly support civil rights, EEO and Alternative Dispute Resolution initiatives. The diversity of our workforce enriches the workplace and our community. I urge each manager, supervisor and employee to embrace and develop a workforce within NOAA that reflects the diversity of the Nation we serve. All of us share in the responsibility for creating and maintaining a workplace free of discrimination, harassment, and reprisal.

We must foster an inclusive environment in which every employee is respected and valued. Let us continue to cultivate and reap the benefits of a diverse workforce that is rich in talent, ideas, background, and experience.

Sincerely



Kathryn D. Sullivan, Ph.D.
Acting Under Secretary of Commerce



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A FRESH LOOK AT MARINE LIFE

University of Hawaii researchers say they've found five coral-dwelling species abroad whose genetic ancestors came from Hawaii. Those findings could change how scientists view the local archipelago. The UH report, its authors say, backs previous research suggesting some Pacific green turtles also branched out from nests in Hawaii.

Honu
Chelonia mydas
 Pacific green turtle

George, 9-2013
 Thank you so much for helping with my helmet!
 I have always been so grateful to have your support. I will be sure to take very good care of it, and especially the tough girl inside it. 😊
 Shandell

MARINE: Efforts to protect species date back to 1909

Continued from A1

The report, he says, supports earlier findings that some sea turtle species abroad originally branched out from nests in Hawaii.

For the latest study, a team of about a dozen graduate students and postdoctorate researchers from UH and the private San Francisco-based California Academy of Sciences examined marine life far west of Hawaii, near Japan; and to the south, near the Johnston Atoll and Line Islands, Bowen said.

THE DISCOVERY that the Hawaiian Islands are "radiating" their unique marine biodiversity back out into the ocean's larger coral networks — not just hoarding it locally — could give extra weight to protecting the remote region's coral habitats, Bowen and others say.

It also lends urgency to stopping the mysterious bacterial disease that has killed large swathes of coral on Kauai's North Shore at a worrisome pace in recent years, Bowen said. Federal biologists, who examined

the problems on Kauai last month, plan to update the public soon on what they've found.

During the past six years, the UH-based team looked at 25 marine species, examining them in distant waters around the Pacific and back in the laboratory, Bowen said. They found five species with genetic ancestry stemming from Hawaii: the yellow tang, ember parrotfish, bullethead parrotfish, Hawaiian pink snapper (also known by its Hawaiian name, opakapaka) and lollyfish sea cucumber (or loli).

Trends in Ecology and Evolution had the UH research peer-reviewed by the journal's own list of experts in February, Bowen said.

THE FINDINGS, he added, bolstered his studies in the early 1990s that linked eastern Pacific green sea turtles to ancestors that had nested in Hawaii.

"That was the first hint and that was 20 years ago," he said.

In 2006 federal officials created the Papahānaumokuākea Marine Monument, protecting 139,797

square miles stretching northwest of the main Hawaiian Islands from fishing, direct pollution and other human effects in an area larger than all of the U.S. national parks combined, according to the monument's website.

"It adds a whole new dimension to the reasons to protect the monument," Bowen said Thursday. "Nobody had dreamed of that when they created (it)."

EFFORTS TO HELP marine life at Papahānaumokuākea date back to 1909, when then-President Theodore Roosevelt sent troops to protect the archipelago's bird species from being wiped out by feather hunters, said Andy Collins, the monument's education coordinator. Since then federal agencies have gradually buttressed the protections there with stronger designations, he said.

The latest research showing some of Papahānaumokuākea's marine life feeds into the oceans' larger systems is "critically important," Collins said. The findings could influence what research proj-

ects local biologists do, including those at the monument, which is managed by seven different state and federal agencies, he said.

UH's findings could also boost the significance of other remote island chains and ring-shaped atoll coral reefs scattered across the oceans, Collins added.

THE UH STUDY shows Hawaii sending distinct marine species westward toward the "Coral Triangle," a hot spot between New Guinea, the Philippines and Indonesia which is recognized as "the pinnacle of marine biodiversity," Bowen said. That system is one of the oceans' most important engines generating marine life, including the seafood caught all over the world, he added.

The UH Institute of Marine Biology plans to expand its research on species origins to include marine mammals such as dolphins, Bowen said.

"In order to solve this definitively, we want to get up to 50 species" traced back to Hawaii, he said. "The fact that it's published now means it's real."

Milestone Title	Contact	Description	Status	Initial Planned Completion	Rescheduled Completion	Actual Completion	Accomplishment Narrative
SE Convene Workshop on China-US Sea Turtle Research	Balazs, George (808) 295-2899	Building on work begun in FY12, PIFSC scientists will convene a workshop to explore ways to enhance US-China joint research on Pacific sea turtles. This effort supports the ongoing U.S.-China Strategic and Economic Dialogue, which recently proposed regular bilateral fisheries consultations that will focus on conserving and managing marine living resources. This milestone also involves writing a 3-5 page plan about PIFSC's international sea turtle efforts.	Completed	8/31/2013		4/26/2013	In March 2013, a 6-page plan was completed entitled "Development of a plan to strengthen, expand, and enhance the PIFSC's network of sea-turtle related partnerships in the East Asia-Pacific Region." This document served as the foundation to convene a group of PIFSC scientists on April 26, 2013 to exchange and discuss experiences and strategies found useful in their own careers doing international partnership research. Seventeen discrete recommendations resulted from this productive gathering. The recommendations resulting from the group session, and the 6-page developmental plan, will be of interest and useful to all PIFSC personnel, hence appropriate for posting on the Center's website.
Complete Documentation of Terms and Fields in PIFSC Sea Turtle Research Database	Murakawa, Shawn (808) 963-5731	Fully document the definitions of terms and fields used in the PIFSC Sea Turtle Database (known as the Turtle Data Processing System) as an internal report. This effort represents another step in the transition of this database from Microsoft Access to Oracle.	Completed	9/31/2013		3/27/2013	PIFSC Staff completed documentation of terms and fields in PIFSC Sea Turtle Database as part of the process of transitioning the Turtle Data Processing System from Microsoft Access (TDPS) to Oracle (OTDPS). With the implementation of the fully functioning OTDPS, all of the old databases (stranding, nearshore, and nesting) will be combined into one database making it easier to input and retrieve data. We are now awaiting the return of the programmer, who retired in December 2012, to volunteer to assist in updating OTDPS with the defined fields.

Fauna and Flora is the primary law in Japan that intends to conserve endangered species. It prohibits the capture of sea turtles and eggs for sale for all seven species and prohibits domestic assignment or transfer of endangered species listed in CITES (Umigame Hogo no tameno, 2006). This law was established in accordance with CITES and is enforced by the Japan Ministry of Environment (page 28 Maison *et al.*).

Ogasawara Islands of Japan. The Ogasawara Islands were designated a National Park by the Japanese government in 1972, and most uninhabited islands have restricted access (Maison *et al.*, 2010). In Japan, there are eight laws and ordinances that regulate (allow via permit) or prohibit actions harmful to sea turtles, such as taking, buying, and selling turtles, their eggs, and any derivative products, or restrict access to nesting beaches. In general, harvest is prohibited but exemptions may be obtained for subsistence use. The Law for the Conservation of Endangered Species of Wild Fauna and Flora is

the primary law in Japan that intends to conserve endangered species. It prohibits the capture of sea turtles and eggs for sale for all seven species and prohibits domestic assignment or transfer of endangered species listed in CITES. This law was established in accordance with CITES and is enforced by the Japan Ministry of Environment (Maison *et al.*, 2010).

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Who Would Kill a Monk Seal?



Peter Schirer for The New York Times

By JON MOOALLEM
Published: May 8, 2013 149 Comments

The Hawaiian monk seal has wiry whiskers and the deep, round eyes of an apologetic child. The animals will eat a variety of fish and shellfish, or turn over rocks for eel and octopus, then haul out on the beach and lie there most of the day, digesting. On the south side of Kauai one afternoon, I saw one sneeze in its sleep: its convex body shuddered, then spilled again over the sand the way a raw, boneless chicken breast will settle on a cutting board. The seals can grow to seven feet long and weigh 450 pounds. They are adorable, but also a little gross: the Zach Galifianakis of marine mammals.

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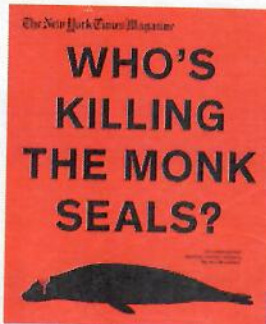
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Monk seals are easy targets. After the Polynesians landed in Hawaii, about 1,500 years ago, the animals mostly vanished, slaughtered for meat or oil or scared off by the settlers' dogs. But the species quietly survived in the Leeward Islands, northwest of the main Hawaiian chain — a remote archipelago, including Laysan Island, Midway and French Frigate Shoals, which, for the most part, only Victorian guano barons and the military have seen fit to settle. There are now about 900 monk seals in the Leewards, and the population has been shrinking for 25 years, making the seal among the world's most imperiled marine mammals. The monk seal was designated an endangered species in 1976. Around that time, however, a few monk seals began

A New Comedy

<http://www.nytimes.com/2013/05/12/magazine/who-would-kill-a-mo>

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trekking back into the main Hawaiian Islands — “the mains” — and started having pups. These pioneers came on their own, oblivious to the sprawling federal project just getting under way to help them. Even now, recovering the species is projected to cost \$378 million and take 54 years.

As monk seals spread through the mains and flourished there, they became tourist attractions and entourage-encircled celebrities. Now when a seal appears on a busy beach, volunteers with the federal government’s “Monk Seal Response Network” hustle out with stakes and fluorescent tape to erect an exclusionary “S.P.Z.” around the snoozing animal — a “seal protection zone.” Then they stand watch in the heat for hours to keep it from being disrupted while beachgoers gush and point.

But the seals’ appearance has not been universally appreciated. The animals have been met by many islanders with a convoluted mix of resentment and spite. This fury has led to what the government is calling a string of “suspicious deaths.” But spend a little time in Hawaii, and you come to recognize these deaths for what they are — something loaded and forbidding. A word that came to my mind was “assassination.”

The most recent wave of Hawaiian-monk-seal murders began on the island of Molokai in November 2011. An 8-year-old male seal was found slain on a secluded beach. A month later, the body of a female, not yet 2 years old, turned up in the same area. Then, in early January, a third victim was found on Kauai. The government tries to keep the details of such killings secret, though it is known that some monk seals have been beaten to death and some have been shot. (In 2009, on Kauai, a man was charged with shooting a female seal twice with a .22; one round lodged in the fetus she was carrying.) In the incident on Kauai last January, the killer was said to have left a “suspicious object” lodged in the animal’s head.

Killing an endangered species in Hawaii is both a state and federal offense. Quickly, the State of Hawaii and the Humane Society of the United States put up a reward for information. “We’re all in agreement that somebody knows who did this,” one Humane Society official told me. The islands are close-knit but also loyal, particularly the native Hawaiian communities. In January, when I met with the state wildlife agency’s chief law-enforcement officer for Kauai — a man named Bully Mission — he confessed that, after a year, Kauai’s tip line hadn’t received a single call. In fact, there was still a reward out from a seal killing in 2009.

A quick aside about Bully Mission: I went to Hawaii thinking I’d write a straight-up police procedural — you know, “CSI: Monk Seal.” When I heard that Kauai’s top wildlife cop was named Bully Mission, I figured I’d found my hard-boiled protagonist. But for one thing, Bully Mission isn’t anything like the detectives on TV. He’s a small, wide-smiling man, who seems to inner-tube through life on currents of joy and amusement. (His real name is Francis.) Wildlife crime-solving doesn’t fit the network-drama formula, either. The wilderness is a big, unwatched place. The ocean is a violent environment. Sometimes it’s

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Peter Buhler for The New York Times
The mayor of Kauai, Bernard Carvalho Jr., who wonders if conservationists don't sometimes go too far.

tough even to determine a cause of death. (A seal with skull fractures may have been beaten, or it may have died miles out at sea of natural causes, then knocked around in the surf.) When your victim is a seal, one federal agent points out, "you can't interview the seal; you can't interview its friends." Often, you can only pile up a reward and wait.

And so, as the deaths kept coming after that initial murder on Molokai, environmental groups chipped in more money, bringing the total reward to \$30,000, or \$10,000 per seal. Then, in April 2012, a fourth seal was killed on the east side of Kauai. This particular seal was well known in the neighborhood; it frequented an inlet under a scenic walking path. Locals nicknamed it Noho, Hawaiian for "homebody."

Mary Frances Miyashiro, a retired teacher and social worker who patrols that coastline as a volunteer monk-seal responder, arrived on the scene first. She sat with Noho's body for an hour, waiting for others to come and heft the seal into an insulated body bag so it could be driven into town for a necropsy, or animal autopsy. "My heart sank," Miyashiro told me. "I didn't know what to do with those feelings, so I picked up trash." It felt hopeless, like the killings might go on forever.

Readers' Comments

"Regardless of the legitimacy of your grievance, if you express it by harming innocent animals you're a coward."

Hillary Rettig, Boston, MA

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Two days later, a uniformed law-enforcement officer from the National Oceanic and Atmospheric Administration (NOAA), the federal agency responsible for monk seals, flew to Kauai from Honolulu to open the U.S. government's investigation. This officer's name was Paul Newman.

Newman went to the crime scene — the beach — and photographed whatever seemed notable. Not much, really. There was one lead — someone had overheard a man badmouthing the monk seal — but it went nowhere. So that night, Newman hopped a commercial flight back to Honolulu. He had a cooler with him, packed with ice, sealed with official tape. Inside was Noho's wounded head. The head was the only evidence.

The reward ticked up to \$40,000.

We live in a country, and an age, with extraordinary empathy for endangered species. We also live at a time when alarming numbers of protected animals are being shot in the head, cudged to death or worse.

In North Carolina, for example, hundreds of brown pelicans have recently been washing ashore dead with broken wings. The birds, nearly wiped out by DDT in the 1970s, are now plentiful and often become semi-tame; they're known to land on fishing boats and swipe at the catch. One theory is that irritated fishermen are simply reaching out and cracking their wings in half with their hands. In March, in Florida, someone shoved a pelican's head through a beer can.

Around the country, at any given time, small towers of reward money sit waiting for whistle-blowers to come forward. This winter four bald eagles were gunned down and left floating in a Washington lake (reward: \$20,250); three were shot in Mississippi (\$7,500); and two in Arkansas (\$3,500). Someone drove through a flock of dunlins — brittle-legged little shorebirds — on a beach in Washington, killing 93 of them (\$5,500). In Arizona, a javelina, a piglike mammal, was shot and dragged down a street with an extension cord strung through its mouth (\$500), and in North Carolina, 8 of only 100 red wolves left in the wild were shot within a few weeks around Christmas (\$2,500). Seven dolphins died suspiciously on the Gulf Coast last year; one was found with a screwdriver in its head (\$10,000). Sometimes, these incidents are just "thrill kills" — fits of ugliness without logic or meaning. But often they read as retaliation, a disturbing corollary to how successful the conservation of those animals has been.

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Since the passage of the Endangered Species Act 40 years ago, so much wildlife conservation has been defensive at its core, striving only to keep animals from disappearing forever. But now that we've recovered many of those species, we don't quite know how to coexist with them. We suddenly remember why many of us didn't want them around in the first place. Gray wolves, sandhill cranes, sea otters: species like these, once nearly exterminated, are now rising up to cause ranchers, farmers and fishermen some of the same frustrations all over again. These animals can feel like illegitimate parts of the landscape to people who, for generations, have lived without any of them around — for whom their absence seems, in a word, *natural*. As Holly Doremus, an environmental legal scholar at the University of California, Berkeley, writes, America has saved so much without ever asking "how much wild nature society needs, and how much society can accept."

The monk seal is not one of these success stories. The species, as a whole, is still slipping toward extinction. But the situation in Hawaii follows the same script: there used to be zero monk seals living around the main Hawaiian islands; there are now between 150 and 200. And I heard story after story from fishermen about seals stealing fish from their nets or hooks, or lurking at favorite fishing spots and scaring away everything else. A lot of fishing in Hawaii is done for subsistence — a way for working-class people to eat better food than they can afford to buy. The monk seals are perceived as direct competition, or at least an unnecessary inconvenience. "They're troublemakers," a young spear fisherman told me one morning at Kauai's Port Allen pier.

Also, as often happens with endangered species, many of the people asked to coexist with the monk seal see the animal less as an autonomous wild creature than as an extension of the government working to save it. There has been frustration with the federal government among fishermen and other "ocean users" in Hawaii since at least 2006, when President George W. Bush turned the water around the Leewards into the Papahānaumokuākea Marine National Monument, barring a small number of fishermen who had permits to work there from 140,000 square miles of the Pacific, an area larger than all of America's national parks combined. Now various agencies are bandying about so many other proposals — to protect corals, humpback whales, sea turtles — that several people I met on Kauai seemed to be making second careers of attending the government's informational meetings to keep watch over their rights. It's unclear if these proposals might lead to new fishing regulations, but the sheer volume of environmental strategizing, and the bureaucrats' sometimes inelegant ways of communicating their plans, have led some people to presume that it's all one big, aquatic land grab. A commercial fisherman named John Hurd told me that he believed the feds wanted to make the ocean "a fishbowl." "Divers can't go in there, fishermen can't go in there," he said. "It's going to be an aquarium."

That skepticism is compounded for native Hawaiians. After all, they now walk beaches that their families have used for centuries and find tracts of sand literally roped off by NOAA monk-seal responders — men and women who, on Kauai, are almost exclusively white, wealthy retirees from the mainland. (It's these *haole*, as Hawaiians call white outsiders, who have the luxury of standing watch over a sleeping monk seal all day.) Even the idea that a wild animal needs such coddling strikes some locals as absurd. "The seal needs to rest!" one man, Kekane Pa, told me sarcastically. "The seal needs to rest because it's been swimming in the water."

Pa is 49 years old and gigantic, with a voice that's somehow both hoarse and totally overpowering. He'd picked me up at my hotel, found a nice spot to park his truck at Waimea Beach and proceeded to shout his side of the story at me for nearly two hours, popping a Heineken at one point and rolling down his window whenever he fogged the windshield.

Pa works construction and is also the speaker of the house of the Reinstated Hawaiian Government, a grass-roots shadow government trying to reclaim Hawaii from the United States, which, it maintains, annexed the islands unlawfully in 1898. Like others I met, Pa saw the monk-seal controversy within this historical context. He brought documents to show me and delivered a scathing people's history of the islands, from the overthrow of the Kingdom of Hawaii in 1893 to the "Apology Resolution" signed by President Clinton in

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1993. He felt the same imperial indifference coming from the government now: Hawaiians are second-class citizens, he said; the tourists come first. Now Hawaiians were being skipped over again — for a seal. "There's issues here that have never been resolved since the time they stole Hawaii," Pa told me.

He shouted all of this with a mix of exasperation and righteousness; his eyes never stopped saying, *Can you even believe this is happening?* He was asking for recognition for his people — these living, breathing afterthoughts that so-called civilization had long ago pushed aside. It was the same cry the monk seal, or any endangered species, might make if it had a voice. And yet the seal was now getting all the help and money it needed without ever having to ask.

I asked Pa if more seals would be killed. "I hope not," he said. "But I can tell you this: it's just starting to heat up, brah."

As monk seals became more visible in recent years, this umbrage and suspicion stacked up like kindling. Then, in September 2011, when NOAA officials toured the islands to hold a series of public meetings, it ignited.

A meeting was required by law to hear public comments about NOAA's new "programmatic environmental-impact statement" for Hawaiian monk seals, or PEIS. As a hundred or so locals arrived at an elementary school on Kauai one Saturday evening, they were offered USB drives loaded with the document. It was 462 pages long, not including appendices.

The PEIS outlined new ideas for helping the monk seal, which, despite how things looked around Kauai, was in a dismal tailspin as a species. Young seals in the Leewards seem to be having trouble getting enough to eat. Pups are being picked off by sharks, which have learned to slither toward them while they're nursing, in as little as six inches of water. Also, for a long time, there have been more male seals than females on some of the Leewards, and pups had been bitten or drowned by sexually frustrated males trying to get to their mothers, or crushed when those rippling bulls tried to have sex with them instead. Females have been smothered when multiple males tried to mate with them simultaneously in so-called "mobbing" attacks.

The scientists working in the Leewards were trying everything they could to protect the female pups especially — the future breeders. They used wooden shields called "crowding boards" to break up fights, or swatted the belligerent bulls away with palm fronds, or ran down the beach screaming at them. Now the PEIS was proposing an elegant workaround to the problem: NOAA wanted to move a number of young female monk seals out of the Leewards every year and into the friendlier waters around the mains. They would mature there for a few years, then be captured and moved back once they were able to fend for themselves. NOAA called this process "translocation." Ecologically speaking, the idea made sense; it bordered on ingenious, even. But sociologically — if you focused on Hawaiian people, and not just Hawaiian monk seals — it was hopelessly tone-deaf.

For one thing, many in Hawaii were convinced that, as one attendee put it at the elementary school, the entire "history of the monk seal is based on a lie." Because the species was eradicated in the mains so long ago, people have lived on Kauai their entire lives without seeing a single monk seal until recently. Traditional Hawaiian knowledge carries great authority on the islands, and in every cranny of the culture where you'd expect to see monk seals, people saw none: no mention of the seals in traditional chants, no wood carvings. People often point out that they don't even know of a Hawaiian word for the animal. (NOAA believes the ancient word *ilioholoikauaua*, "dog running in rough water," refers to the seal, though that has been resisted; at one public forum, a man called applying that word to monk seals a "defamation of my language and my culture.") The logical explanation, for many, was that the seal wasn't actually native to Hawaii, that the government had brought the animals, in secret, to create jobs for scientists and push its environmentalist agenda. (This conspiracy theory may have grown from a bit of misunderstood truth; in 1994, NOAA brought 21 monk seals to the mains from one Leeward island in an earlier attempt to even out the genders there.) It seemed arrogant for NOAA to announce that it wanted to bring more now.

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Another objection was rooted in an equally uncooperative set of coincidences: namely, the situation with the birds. It was Kauai's mayor, Bernard P. Carvalho Jr., who filled me in about the birds. A towering, debonair man in an earth-toned aloha shirt, Carvalho met me in his office to talk monk seals. But it was obvious that, as far as he was concerned, I was asking about the wrong animal. He explained how seabirds called Newell's shearwaters come to Kauai to mate and nest every spring. In the fall, the fledglings leave the nest and become disoriented by bright lights. They will drop from the sky and freeze up. For as long as Carvalho can remember, he said, when you find a dazed shearwater, you simply pick it up and bring it to the firehouse, where it's tucked in a pigeon box and tended to until it recovers.

The shearwater fledgling season happens to coincide with the high-school football season. One local described how little kids have always raced around the sidelines, under the Friday-night lights, collecting the paralyzed birds. But the Newell's shearwater is a federally protected species. In 2010, the U.S. Fish and Wildlife Service informed the County of Kauai that each downed shearwater would be considered a violation of federal law. Fines, the mayor was told, could reach \$25,000 per bird. "So that was kind of a big . . . what?" he said.

Friday-night football became Friday-afternoon football. Working parents had trouble seeing their kids play, and the island lost one of its central forms of entertainment. There was anger, incredulity and T-shirts that read "Buck the Birds." The mayor, a former high-school football star on Kauai, told me: "Friday night is football night. Don't even go there!" Now, more than two years later, the county was still working with the federal government to retrofit the lights and get in compliance. In part, the mayor explained, this involved keeping track of the relative brightness of the phases of the moon.

There were other birds too, he went on: like the Hawaiian nene goose, which was once within a few dozen birds of extinction. Now many congregate on a golf course next to the airport, where the mayor worries — "God forbid" — that one might bring down a flight. Conservation is important, he said, "but where does it end? How far does it go?"

A version of this question was raised at the elementary-school hearing again and again. As one man put it, "Nowadays, it seems that wildlife has more support than the people." The government was focused so narrowly on helping monk seals survive an immediate threat, but it wasn't communicating any cohesive vision of the future. How many monk seals in the water around Kauai would be enough? What would coexistence with that many seals look like? One speaker asked, for example, whether he'd be fined for striking a seal if the animal threatened his little cousins while they were swimming. But the NOAA officials holding the meeting couldn't answer his question — or anybody's. There had been town-hall meetings held throughout the year, but federal law required that this hearing be a "listening session" only. The panelists were barred from speaking to anyone who testified. It was meant to be respectful — we're all ears — but it came off as insulting. ("Silence," one participant, a construction worker named Kimo Rosa, told me. "Silence!") And so, one by one, people rose to delineate their conspiracy theories or plead for respect, until a timekeeper flashed a red sign and their three minutes were up.

Near the end of the hearing, a man named Kalani Kapuniai noted that if the government were here to ask for the community's input on translocation, then "from what I gathered over here, you guys, the answer is no. . . . So put [this] down in your notes," Kapuniai said. People are getting fed up with the monk seals, and "they're going to kill them. Bottom line."

There was applause. All the moderator could do — all she was allowed to do — was say, "Thank you." Eight weeks later, a beachgoer found the 8-year-old seal slaughtered on the Molokai beach, the first of the four killings that winter.

Many of the monk seals slipping back into the main Hawaiian Islands in the early '70s landed first on the shores of Niihau, the island closest to the Leewards. Niihau is plainly visible from the west coast of Kauai but also, in a sense, completely invisible, since it has been privately owned since 1864, when a family named Sinclair bought the island from King Kamehameha V for \$10,000 in gold.

Niihau is 72 square miles — the size of Brooklyn, roughly, or one and a half San Franciscos. While the 20th century was happening to the other Hawaiian islands, the Robinsons (the Sinclairs' heirs) pugnaciously kept outsiders away from theirs, preserving it, like a diorama, for the family's old-fashioned ranching operation and a small community of natives who still live in a village at one end. Even after a two-way radio was installed on Niihau in 1959, information was still regularly relayed to Kauai by messenger pigeon — when information was relayed at all. Mostly, the Robinsons and the Niihau people wanted to be left alone. An irresistible scrim of secrecy still hangs around the island. In 1957, a journalist seemingly went so far as to crash-land a small airplane on Niihau so he could look around.

Pristine and mostly empty, Niihau has been a perfect gateway for Hawaiian monk seals as they have recolonized their species' ancestral habitat. It's no secret that lately the federal government's recovery effort has been mired in a fair amount of desperation. (In March, NOAA indefinitely postponed the translocation from the Leewards, not because it lacked public support, says Jeff Walters, the agency's monk-seal-recovery coordinator, but because NOAA "needs more time and resources to grow our capacity to better manage and protect the seals already living in the mains before bringing down any new animals, even temporarily.") And so the scientists involved can get a little breathless when they speculate about the fantastic number of monk seals that must be living happily on Niihau. But no one knows for sure: Keith and Bruce Robinson, the aging brothers who, along with their mother, inherited control of Niihau in 1969, haven't given the government the kind of access or data it would like. Walters described the island as both one of the real "hopes for monk seals in the main Hawaiian islands" and as a giant "black box" at the center of the story.

"What a horrible-looking sow!" Keith Robinson bellowed as a scraggly black hog materialized from the bushes and scampered alongside our truck. Robinson seemed somehow uplifted by its hideousness. It was the jolliest I'd see him all day.

I'd managed to talk Robinson into giving me a tour of his family's island. He is 71 and bracingly direct. He lives on Kauai — neither Robinson brother has ever lived on Niihau for longer than a few months at a time — and within seconds of our meeting there, he handed me a copy of his self-published book, "Approach to Armageddon: One Christian's Speculation About the End of the Age." The cover showed a wasteland of mushroom clouds and twisting pillars of smoke. At the bottom, standing like a solitary figure in a Japanese landscape painting, was an old man in work clothes and a green hard hat, carrying a rifle. The man in the hard hat was Keith Robinson. He was wearing the same outfit, including the hat, when I met him in the doorway of his office.

The Robinson brothers have made Niihau a marginally more open place than it once was. They started allowing a small number of tourists, though they barely advertise, don't run tours on any discernible schedule and permit outsiders to visit only certain parts of the island. Keith Robinson presented himself and his brother as wretchedly cash-poor — he spent the 20-minute helicopter flight over from Kauai badgering the pilot to fly in a straight line, so as not to waste fuel — and the island as a cherished grandparent to whom they're devoted to keeping alive, no matter the cost or aggravation. The Robinsons have been able to afford this largely through partnerships with the U.S. Navy, which operates tracking stations on the island for aircraft and missile testing offshore. The Navy also holds exercises in the channel between Niihau and Kauai — which, Robinson explained, can be used as a proxy for the Strait of Hormuz, the link between the Persian Gulf and the Arabian Sea, off the coast of Iran. Years ago, the Navy also ran downed-pilot drills on Niihau's interior. A pilot would be tasked with finding his way off Niihau, as if after a crash, while bands of Niihau people pursued him. The Niihau are solidly built and fast; one of the few native women I was able to talk with described how they hunt hogs on the island: by running the animals down on foot and grabbing an ankle. They took to the downed-pilot drills enthusiastically — their only extramural sport. The poor pilots never had a chance, Robinson explained.

We trundled around the northwestern portion of the island, looking for monk seals in a battered, Korean War-era weapons carrier, a kind of truck, with wooden planks for benches. Our chauffeur was a silent, barrel-chested Niihau man. He pushed the truck over

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the sand, or on primitive dirt trails, while Robinson issued him quick, clipped instructions in Hawaiian. (The Niihau may be the last surviving community of native Hawaiian speakers.) The scenery was spectacular, in an illicit, "Jurassic Park" kind of way. The beaches looked like screen-saver beaches. Every so often, we saw a monk seal and stopped, rising from our seats in the truck to observe the animal doing nothing. Robinson had not been on Niihau for many months, and was disturbed by how few seals we were spotting. "There are no monk seals here!" he kept saying. He blamed fishermen from Kauai who've been turning up to fish Niihau's pristine reefs. He claims these fishermen are disturbing, and even occasionally shooting, the monk seals. I sensed that these "marauders," as Robinson called them, were also an affront to the isolation and privacy that his family has always cherished. Robinson described these Kauai fishermen the way the fishermen described the monk seals: as an invasive species, barging in to threaten the natives' survival.

"Darn it, this is not good," he huffed as we crossed another empty beach. "This is a catastrophe. This is disastrous." His shock and concern were quickly phasing into sulking.

Relatively speaking, Niihau is actually packed with monk seals. At its peak, about a decade ago, the population there may have reached 200 — about a fifth of the world's current population. Returning from their millennium-long exile in the Leeward Islands, the seals found, in Niihau, a landscape that not only looked remarkably the way it did when they left it behind but that was also governed by two eccentrics willing to make room for them.

It turns out that the Robinson brothers are devout conservationists. "I'm a right-wing extremist," Keith told me, and this means feeling an obligation to use the earth wisely and replenish it, just as God instructed in the Bible. "If they want to shoot monk seals on the other islands, that's fine," he said. "But Bruce and I like having them around."

For decades, the brothers have done their best to foster and protect the seals on Niihau, organizing the Niihau people to monitor them along the coastline. That is, they've cultivated acceptance of the seals among the Niihau people — exactly what NOAA has failed to do elsewhere. Robinson told me that, in the early days, he heard the same grumbling about monk seals from the Niihau people that I encountered on Kauai. "But Bruce and I just said: 'Look, let's tolerate these seals. You may have to work a little harder for your fish, but the fish will still be there, and the seals will have a chance.'" When I asked how they managed to pull this off, Robinson noted that, for one thing, there truly are more fish to go around on Niihau. But also, he added, "well, we're the nasty, old feudal landlords." The Niihau people are the Robinsons' tenants and their employees. No messy public hearings on his island.

Robinson told me that he would happily host as many more monk seals as NOAA wanted to relocate from the Leewards, as long as he could manage the animals his way. He has no stomach for the tyrannical regulations and egregious spending that he feels the government uses endangered species to justify. As we drove, he laid out his case against America's "eco-Nazis," an epithet he uses tirelessly and, I would learn, without hyperbole. (Robinson later gave me writings outlining his belief that environmentalism is a deliberate conspiracy to install totalitarian government in America while distracting its citizens with cuddly, vanishing animals, just as Hitler's rise to power in Germany was cloaked by nationalism.) But look at Niihau, he said: "We've done all this quietly, on our own, and with our own money. It didn't cost the government a cent." On the other Hawaiian islands, people were sticking it to the government by murdering the seals it was working to save; Robinson was sticking it to the government by actually saving them.

Robinson has always imagined his conservation work as this sort of principled, guerrilla resistance to the eco-Nazi regime. A gifted horticulturist, he started growing many imperiled, native Hawaiian plants on his family's land on Kauai in the 1980s. This included a particular subspecies of *Caesalpinia kavaiensis*, a Hawaiian hardwood, which was coming close to extinction in the wild; Robinson managed to produce a single tree from surviving seeds. But in the mid-'90s, he discovered a draft document from the U.S. Fish and Wildlife Service expressing the agency's wish to "secure" and "manage" the tree on his land. He jumped to the conclusion that this meant seizure by eminent domain. (John Fay,

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a former botanist for Fish and Wildlife, told me, "Basically, it was a misunderstanding." Deeper in the document, the agency asserted that Robinson's work should be "supported and assisted.") Robinson called the agency in a rage. He recounted the phone call to me several times, always in a single, Homeric run-on: "I also stated that if they wanted to take my reserve over, they would probably have to engage in a gun battle with me, and kill me, and I said that coming after the debacle at Ruby Ridge and the debacle at Waco, which had just happened a few months before, if the government's next heroic exploit was to attack and murder a conservation worker in his own reserve to take over work that the government was too lazy and incompetent to do itself, that might look a little strange to the public." Seventy-two hours after he hung up the phone, Robinson told me, his *Caesalpinia kavaiensis* tree was dead. The implication was, he killed it. He felt sick about it, he added, but freedom comes first.

Now, Robinson explained, he and his brother were being threatened again. With monk seals flourishing in the main Hawaiian islands, environmental groups are pressuring the federal government to designate the water around Kauai and Niihau "critical habitat" for monk seals under the Endangered Species Act. It's an abstruse legal move that wouldn't directly affect most fishermen, but would subject the Navy to a review process that could ultimately force it to alter or even abandon its work there. This would cut off the income that has allowed the Robinsons to protect the seals' habitat in the first place. And so recently, in an uncharacteristic move, the brothers approached NOAA about including Niihau's coastline and near-shore waters in a national marine sanctuary instead. One of the Robinsons' central conditions would be to ban the Kauai fishermen. (A NOAA spokesman confirmed that the agency is in discussions with the family but that if the waters around Niihau "are proposed for inclusion [in the sanctuary], NOAA will then embark, with the State of Hawaii, in a public process to consider any regulatory changes or restrictions." In February, during a trip through the Pacific, the director of NOAA's National Marine Sanctuaries system, Daniel Basta, visited the Robinsons on Niihau.)

As Robinson explained all this to me on Niihau, his sporadic bleats of indignation and alarm began to sound more nuanced. After all, in his eyes at least, our difficulty finding monk seals was the appalling proof of the damage those Kauai fishermen were doing, of how urgent the sanctuary deal had become. His panic was genuine, but I wondered whether this was why he allowed a journalist on his family's so-called Forbidden Island in the first place: not to see monk seals, but to *not* see monk seals.

"This place should be crawling with monk seals!" Robinson said as we got out to explore one bluff. "Something's awfully wrong here. Awfully wrong."

Dana Rosendal, the pilot for the family's helicopter company, was unfazed. We'd covered only a quarter of the island, he told Robinson, and we'd already seen 10 seals.

"Dana," Robinson cut in, "we've only seen five or six, plus one lousy turtle."

Rosendal ticked off each sighting, then counted up his fingers. Ten, exactly.

"Well, whoop dee do!" Robinson shot back. "Ten seals!" Then he stepped into the shallow tide, in his work boots and hard hat, and walked down the beach by himself. Suddenly, his island must have felt too crowded.

I spent my last morning in Hawaii at a coffee shop on Molokai, waiting for an anonymous monk-seal murderer to show up, or not show up, for an interview.

Molokai is the small island just to the west of Maui. It's a poor and rural place, defiantly resistant to large-scale tourism, with a single hotel and a higher percentage of native Hawaiians than any other island except Niihau. Monk-seal politics have been particularly fierce on Molokai, where unemployment is high and the rights of subsistence fishermen feel even more sacred. A local activist, Walter Ritte, described how elders on Molokai have fostered a feeling among the island's youth that monk seals are not actually Hawaiian and should be gotten rid of.

I met Ritte the previous week in Honolulu, where he was spending the day. He is soft-spoken and slight with a knotty beard and a fearsome reputation as an agitator. (Lately, he

has been battling Monsanto, which grows genetically modified crops on Molokai.) On the monk-seal issue, however, Ritte has tried to be a voice of tolerance for the seals — a native voice that can carry that message with more credibility than the government. Everyone knows him as “Uncle” Walter, a Hawaiian term of respect.

In Honolulu, Ritte told me that he knew who killed the first of the four monk seals in 2011 — the big male on Molokai’s southwestern shore. When he heard the news, he said, he made a point of finding out — Ritte commands that sort of unofficial mayoral power on Molokai — and went to speak with the person. By the time they were done talking, he said, “I don’t think that person was really happy with what they did. The remorse was really, really deep.”

I kept after Ritte while I was on Kauai the following week. The people I was meeting there were so angry and entrenched. It was comforting to know that at least one person — the Kid, as Ritte referred to him — seemed to have changed his mind on the issue. Eventually, Ritte called to say that the Kid agreed to have breakfast with me the following morning on Molokai. I flew over. But minutes before our meeting, the Kid called Ritte to back out.

I told Ritte I’d be at Coffees of Hawaii, reading a book, if the Kid changed his mind. Three hours later, for reasons I couldn’t have imagined, he did.

The Kid was nothing like what I expected. He’s in his mid-30s but projected such bashfulness that he seemed 10 or 15 years younger. He’d asked to meet on the porch of a more private location and, with Ritte looking on for support, he explained how, one day shortly after the incident, Uncle Walter simply knocked on his door unannounced and said, “I want to talk to you about the seal.”

The Kid had mustered an enthusiastic defense. He told Ritte that he believed what the elders said: that monk seals didn’t belong here and were upsetting the natural balance Hawaiians depended on. Ritte listened, then told him about his first experience with monk seals — back in 2006, while Ritte was campaigning to stop a developer from building luxury housing on a remote Molokai coastline called Laau Point. Laau Point is a prime fishing and hunting ground, and Ritte and his troops believed that losing access to it would degrade Hawaiians’ ability to provide for themselves, driving them and their traditions even closer to extinction. Hundreds of protesters occupied the point for three months, sleeping on the beach. And there, in the quiet, monk seals began to appear on the sand — the first that some protesters had ever seen. Ritte told me that, sleeping side by side — Hawaiians and Hawaiian monk seals — it was just so clear to him: “I was there for survival, and the seals were there for the same reason. I saw myself in the seals.”

“Uncle Walt is a well-respected man,” the Kid now said. Ritte’s appearance on his doorstep that day was itself a rebuke. So the Kid kept listening as Ritte explained that monk seals had actually lived in Hawaii long before Hawaiians did, and that Hawaiians — a people who know displacement and disregard — should feel kinship with the animals, rather than resentment. The seal was here first, and we have no right to push it out, Ritte told him. This hit the Kid hard; he still sounded crushed under the weight of this truth: “I actually killed another Hawaiian,” he told me.

Outside the Kid’s house that day, Ritte hadn’t actually asked him for any details. He didn’t need to hear: the two sides of the monk-seal debate had become so predictable that it was easy for him to fill in the rest. When we first met, Ritte told me that the Kid was presumably “doing what the elders had said. It was like killing a mongoose that ate his mother’s chickens. I mean, he thought nothing of it.” And now, I caught myself making the same assumptions. Until I asked.

The Kid seemed relieved to walk me through the story. He and his friends had hiked out to fish but kept finding monk seals at all their favorite spots. Finally, at one location, they encountered the 8-year-old bull, a huge animal with a deformed jaw, sprawled out as though it were waiting for them. One of the Kid’s friends was fuming by now — they’d walked so far — and he goaded the Kid to do something. “I guess it was out of anger, frustration,” the Kid told me, “and kind of like peer pressure.” In retrospect, so much about what happened next surprised him: how impulsively he reached for a rock and threw it; how, though he only intended to scare the animal off and was standing a fair distance

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away, the rock somehow struck the seal squarely in the head, and some force inside the monk seal instantaneously shut off.

His friends clammed up. The Kid was the smallest, gentlest guy in the group, and "that was the first time I ever did something like that," he said. At first, they assumed he only knocked the animal out. But eventually it sank in, and they steeled themselves and turned to walk home. "Already," the Kid told me, "it was eating me up."

Later, a federal investigator told me that key details of the Kid's story were consistent with the necropsy report. ("The animal was hit on the head," he said. "It was a blunt trauma to the head.") A government scientist familiar with the case was more circumspect; he explained that it would be possible to kill a resting monk seal by throwing a very heavy rock — maybe on impact, or more likely by causing internal bleeding — but extremely difficult. Frankly, I don't know what happened. The Kid seemed so vulnerable that I believed his story on the spot. I've had moments of skepticism since then — moments when I've wondered if, say, the Kid hadn't actually stood over the animal and dropped a 20-pound boulder on its head, and was now trying to distance himself from that act. But either way, he acted impulsively and now regretted what he had done.

It was only a few weeks after the incident that the second murdered monk seal was found on Molokai. "Then after the second one," the Kid said, "they had the one on Kauai, and I was thinking like, Oh, no, what did I start? Even Uncle Walter told me that it might have set off some kind of chain reaction." The Kid had never really been a churchgoer, he said, but recently his wife decided they ought to start. And a couple of weeks ago, he prayed about the monk seal for the first time. "I kind of just prayed and asked for forgiveness," he explained. He wanted to come clean but worried his family would suffer if he did. "I know what I had done was wrong, and I just basically asked Him for guidance," he said — a safe way to confess. "And lo and behold," the Kid told me, "here you are."

It was sad — every bit of it, and in so many freakish ways. NOAA was focused on saving an endangered species by repairing the ecology around it. But more and more, the success of conservation projects relies on a shadow ecology of human emotion and perception, variables that do not operate in any scientifically predictable way. Looking back, I was astonished by how the pieces just kept snapping together, and stubbornly locking in place, in exactly the worst way: how, at the public hearings, the government's attempts to show respect and empathy were read as just more imperiousness; how reasonable the conspiracy theory about the monk seal's origins actually seemed in context; how the one safe place the monk seals *had* found was under erratic Robinsonian rule. There was so much terrible serendipity. The story of monk seals was pocked with black swans.

And now, here was the Kid: not the angry, musclebound fisherman that environmentalists tended to imagine when they pictured the monk-seal killers — not even really a fisherman, it turned out. He'd gone fishing only twice that year, and the second time, when his companion started threatening a monk seal in the vicinity, the Kid said that he de-escalated the situation by telling his friend that NOAA now implanted tiny security cameras in the animals' eyes and would be watching them. He flashed a hang-loose sign at the seal's eyes and urged his friend to do the same — to tell the bureaucrats hi. "You should have seen the face on that one guy," he told me on the porch. "So gullible." Then he paused a second and said, "I wish I could be there for everybody, and tell them the same thing."

The Kid wasn't technically a kid at all, and yet what he'd described felt like a classic coming-of-age story — something out of a novel you'd read in middle school about a boy who, in a moment of recklessness, shoots a robin with his BB gun to impress his friends, then weeps over the corpse. Except it wasn't a robin; it was a federally endangered Hawaiian monk seal, and so, the Kid worried, his transgression had set off a killing spree. In fact, the night before we met on Molokai, news broke that a 7-month-old female seal had been found speared on an island off Oahu. It survived, and in a photograph that NOAA released, the animal stared into the camera with narrowing eyes, one prong of the metal fishing implement still stuck through her forehead. She looked like a guileless horse that had been ridden into battle and lanced.

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Who Would Kill a Monk Seal? - NYTimes.com

In Hawaii, so many circumstances had knotted together to snare this species. In a way, they snared the Kid too. But he wouldn't allow himself to see it that way. At one point, he mentioned again that he only wanted to scare the monk seal away, not kill it, and I tried to say something sympathetic, lamenting his bad luck. He was quick to correct me: "Mostly, bad decision," he said. "Stupid decision. You got to accept what you did."

INSIDE NYTIMES.COM

Need AMA

Jon Mooallem is the author of "Wild Ones," a book about people and wild animals in America, out next week.

Editor: Sheila Glaser

A version of this article appeared in print on May 12, 2013, on page MM30 of the Sunday Magazine with the headline: Law & Order: Endangered-Species Unit

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Hawaii's Restaurant Menus Have Chronicled the Decline of Its Coral Reefs

by Jason Koebler (author/JasonKoebler)

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Flickr/szeke (<http://www.flickr.com/photos/pedrosz/6131630138/>)

...aste for green sea turtle meat and eggs has led to the giant reptile becoming endangered, but don't blame restaurants in Hawaii, where many green turtles live. A study designed to determine whether the turtle historically appeared on restaurant menus in Hawaii has had an unintended side effect: It's allowed researchers to track fish populations near the island.

<http://motherboard.vice.com/blog/hawaii-restaurant-menus-have-chronicled-the-decline-of-> 8/7/2013
...the whole point was to see if there was sea turtle on the menu, to see if tourism drove sea turtle catches," John Kittinger, of Stanford University's Center for Ocean Solutions said. "There was no turtles on any of the menus at all. But then we decided to look and see what else was there."

...a novel idea, and one that the biologist says hasn't been undertaken before. But he and his team, who published their research in *Frontiers in Ecology and the Environment* (<http://www.esajournals.org/doi/abs/10.1890/13.WB.015?journalCode=fron>) this week, correlated menu offerings with local fishery data and found that they aligned closely. In fact, the data may be able to fill in gaps in fishery data that exist in the 1930s, when fishery statistics were lacking.

...enus are a function of consumer preference, but we think that, based on the existing science, the changes have been driven more by availability than preference. Some of the fish disappearing from menus are still highly prized," he said. "As we overfish, as climate change and pollution take its toll, that shows up on the menus. They're a proxy for what's happening in the ocean."

...desides the kind of odd appearance and sudden disappearance of frog legs and the skyrocketing popularity of beef on menus, Bishop noted that nearshore catches of reef fish—once plentiful in restaurants—barely appear on menus two decades later. Meanwhile, large offshore fish such as ahi tuna and mahi-mahi became much more popular. Imported and farm-grown fish have also become more popular as fish catches declined.

...fish, jacks, and bottomfish were common on menus before 1940, but by Hawaii's state-hood in 1959 these items appeared collectively on less than 10% of the menus sampled," the authors wrote.

...how does one go about tracking down 376 menus—dated between 1928 and 1974—from 154 Hawaiian restaurants? Surprisingly, there's a market for antique menus: The [New York Public Library](http://menus.nypl.org/) (<http://menus.nypl.org/>) has an extensive set of menus from 1851-1930, [Cornell](http://rnc.library.cornell.edu/collections/menus.html) (<http://rnc.library.cornell.edu/collections/menus.html>) has another large collection, and Kittinger says he managed to track down a lot of the menus from private collectors.

...his study, the majority of menus came from a collection at Honolulu's Bernice Pauahi Bishop Museum, which chronicles the state's natural and cultural history. As he became involved in the sea turtle research, he realized that menus could provide more information.

...all happened by accident. We wanted to see if we could use it as a data source, then we realized there was a whole lot of them," he said. "It was one of those real organic happy accident kind-of-things that sometimes happens."

...though the conclusions you can draw from menus are subjective, coupled with fishery information, they provide an important extra data point, according to Lauren McClenachan, a co-author of the paper.

...historical ecology typically focuses on supply-side information," she said. "Restaurant menus are an available but often overlooked source of information on the demand side. They document seafood consumption, availability and even value over time."

NAME IN THE NEWS

Nainoa Thompson

The legendary ocean navigator of Hokule'a fame is about to embark on a voyage around the world

By **Mark Coleman**
mcolem@staradvertiser.com

Nainoa Thompson has made his mark on history several times over, and he's not done yet.

The 60-year-old Thompson, president of the Polynesian Voyaging Society, is about to embark on another deep-sea voyage aboard the traditional Hawaiian sailing vessel Hokule'a, this time around the world.

It was in 1976 that Micronesian master navigator Mau Piailug showed Native Hawaiians it was possible to sail from Hawaii to Tahiti by traditional navigation methods — that is, by the stars and other natural indicators. That was aboard Hokule'a, and Thompson was a crew member on the vessel's return to Hawaii.

Four years later, Thompson recreated the trip to

Tahiti and back, this time as its navigator, becoming the first Native Hawaiian in centuries to sail by celestial navigation. He followed up with voyages throughout Micronesia and Polynesia, including New Zealand and Rapa Nui, along the U.S. West Coast, including Alaska, and Canada, and even Japan, including Okinawa.

The plan to circumnavigate the globe has been five years in the making, and is set to start within a few weeks, although it will be at least a year before Hokule'a actually leaves Hawaii waters for Tahiti and beyond. Thompson, who is planning to be onboard for about four of the 18 legs of the trip, said the purpose of the voyage is to inspire young people and help people around the world learn about Hawaii and the Earth's environment overall. The event already has inspired local tourism executives, with

Hawaiian Airlines offering to cover any air fares or cargo costs in areas that it serves.

Thompson's own inspiration was the late Herb Kane, the Native Hawaiian artist, historian and mariner whose idea it was to build the Hokule'a. And just as Kane encouraged Thompson to learn the ancient navigation skills, so Thompson has been working to pass on those skills to young people today.

He is a graduate of Punahou School and the University of Hawaii. He also is a UH regent emeritus, a trustee of Kamehameha Schools, on numerous boards of directors and the recipient of many community awards.

He grew up in Niu Valley, where he still lives today with his wife, television newscaster Kathy Muneno, and their two 4½-year-old twins, son Na'inoa, and daughter Puana.

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QUESTION: So you're going around the world, leaving June 1, right?

ANSWER: In many ways we left already. We've been training for five years. The voyaging leadership statewide came together April 1, 2008, to look at, collectively, this idea of should we go around the world. It was an intriguing question because our experience in Japan (in 2007) was so amazing. ... When we reached outside of Polynesia to another country, it just seemed Hokule'a was magic to this other country. So then it was the idea that we should go. So we had a meeting — all the leadership was there — and hundred-percent consensus said in concept we should go. Well, I tell you, we had no idea what that meant. We've been training five years now.

Q: You say all the leadership was there. How many was that and who?

A: At the time there were 10 voyaging organizations in Hawaii, from the Big Island, Maui, Molokai, Oahu. And that meant probably about 22 people. The necessity was we have to do things in a unified way; we have to be together, especially for something this large. We couldn't even imagine how big it was. But instinctually we knew this was not going to work unless we came together.

Q: So why the trip around the world?

A: Just the need to continue to sail and the importance for Hokule'a and all she represents, that we're still exploring.

But the trip around the world was a real test. It was a test to raise a number of questions. The biggest question, I think, was whether Hokule'a is still relevant in the 21st century. After 135,000 miles of sailing, why? Is it still meaningful? So there was a mandate made at that meeting saying, let's see whether this worldwide voyage has value to young people. And when we say young, we mean those

in their 20s, primarily 20s and 30s. So we mandated that as of April 1, 2008, 40 percent of the crew — which we had no idea of what the numbers were going to be — had to be under the age of 30 as of that date. And, Mark, we have amazing, brilliant, balanced, strong, courageous (young people) ... And they're not like my generation, who know the sense of being the victim, the Native Hawaiians, that come from a sad story. That story doesn't exist anymore. They weren't there. It's a different generation.

We've got one navigator who's in her 20s, last Saturday graduated in mechanical engineering, born in Utah, lived in New York as a child, came to Hawaii, went to Punana Leo (a Hawaiian language immersion program), speaks Hawaiian fluently but she speaks 4½ languages, plays the violin, is an engineer — and she can find Tahiti. Yikes! Makes us old guys look like dummies, I tell ya!

Q: How did she learn navigation?

A: Just training. She's been here for years. And we got another one. She'll graduate next semester in geology. Her whole thesis is on sea level rise, climate change and where the shorelines in Hawaii will be in 15 years. And she's Hawaiian, a Kamehameha Schools graduate, speaks Hawaiian, and *she* can navigate to Tahiti. This story is really about that generation and the strength and balance of it.

Q: Haven't you and the Polynesian Voyaging Society already proved what you set out to prove? Why keep at it? It seems that if there's not a particular theory you're trying to prove, you might just be risking disaster, putting people at risk.

A: There's always risk. Every day's a risk. So we train to mitigate risk. But I think from our lens internally, the value of Hokule'a was not just finding islands. The

value of Hokule'a was in many ways shifting how society sees the world. So back to my point: If you go back to pre-Hokule'a, and if you go back and look at where Native Hawaiians were within the society — second rate, inferior, died younger, made less, worse health ... all those kinds of negative statistics — then you have Herb Kane build a voyaging canoe, you have the navigator Mau Piailug find Tahiti, and then you have these successive voyages, and fundamentally what it did, it changed the foundation of the well-being of Native Hawaiians, because, at the core, being well is about how you see yourself and the issue of identity.

Now you see the measurable change, in every mission statement in every school. ... It changed how society saw and valued something very important that was going extinct.

Q: And that was due to the Hokule'a sparking the renaissance?

A: Hokule'a was just one part of the renaissance; Kahoolawe, clearly, was another part of the renaissance. Punana Leo and the Hawaiian language is another renaissance. Hula is another renaissance. But Hawaiian things are being valued in the world because the way we see the world has shifted.

The worldwide voyage is about the next shift that I think has to happen. And it's about the Earth. If anybody takes a hard look, an honest look, at the last 30 years of peer-reviewed, legitimate science, and looks at the Earth and what we're doing to it, and really is honest about it, if that person is not moved by that data, either they don't understand it or they don't have a pulse. So our next movement is to make sure we figure out ways to rethink about our relationship to the Earth. The reason we go around the Earth is to connect with it, and be with it,

and learn from it about the diversity of culture and the special places around the planet.

Our campaign is really about looking at culture again, with another generation of having Native Hawaiians have the canoe ... that will be a flashlight in the darkness, because young children today don't know Hokule'a, because Hokule'a hasn't really conducted any deep-sea voyages since 2008. This kind of voyage is supposed to create that kind of inspiration.

Q: What stops do you have planned?

A: It's 36 months once we leave. It's 46,000 miles, 28 countries and 62 stops.

Q: Are there people expecting you at each stop?

A: The Pacific is notified, and the connections are made, because we have strong relationships there. The Indian Ocean is something we have to work on, and we have two years to get ready for that.

Q: That'll be happening while you're out at sea, right?

A: No. Our voyage actually begins the end of this month, but we're going to spend one year just in Hawaii.

Q: Going from island to island?

A: We're going to go to 23 ports. We'll engage 30 communities. We'll bring 7,000 school kids to Hokule'a. We will send our crew members to half the schools in the state of Hawaii. And we will do 30 presentations for those 30 communities, and the rationale and the philosophy is that before we can go around the world, we gotta go around our home. We need to make connections by paying respect and honoring our special places in Hawaii first. And to make sure that schools, teachers and children are at least notified about the voyage, and if, by choice, they could follow us through our third canoe (aside from Hokule'a and Hawaii Loa),



CINDY ELLEN RUSSELL / CRUSSELL@STARADVERTISER.COM

Nainoa Thompson, Polynesian Voyaging Society president and Hokule'a navigator, was aboard the Hokule'a on Tuesday as part of a special sailing trip held in honor of Hawaiian Airlines, which is a sponsor of the vessel's upcoming around-the-world voyage.

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which is really the Internet. And we'll be engaging about a thousand teachers.

Q: What kind of mental and physical training have you been doing for this?

A: There are a number of things we had to do in the last five years. One was, we had to do leadership training. We're going to change crew 18 times. And the thing about fatigue is on primarily the leadership; they've gotta carry all the safety decisions, so you have to rotate them. ... So we're targeting in succession 12 new captains and 12 new navigators. So the length of voyage and the amount of miles that we are going to be sailing is really to our benefit in terms of having Hokule'a and the ocean really be a school for the next generation of leadership in voyaging. ... The worldwide voyage, at least in my head, was going to be like a magnet, to pull together multigenerations of leadership. So this is really about young people.

Then in September 2010, we pulled Hokule'a out of the water and she was really, really tired. So again, given that magnet of bringing people together, the next question that we needed to raise was, really, could we restore Hokule'a so that she's in a condition that she can go around the world?

Q: You're going to have to do that probably during the trip, right?

A: New Zealand, Capetown and Miami will be places where we will haul the canoes out. But — this is an important point — the question was, and this is an issue of relevancy: Does the community still care about the canoe? So

we pulled her out. And the mandate was, we take out all rot, we take out all damage. And what we ended up doing was taking everything out. There's nothing from the original canoe except the 1-inch of the hulls. Everything else is changed. That took 18 months and it took 28,000 man-hours of volunteer time. And we had over a thousand volunteers come down and help repair Hokule'a. So on one side, it took the community to repair Hokule'a, but Hokule'a rebuilt the community.

Q: How do you find these people who are going to be crewing for you? Are they volunteers?

A: Everybody's a volunteer, because we'd never be able to afford it. About 40 percent of the crew will be experienced crewmembers from before. And then the other 60 percent is mixed. About 40 percent is going to be targeted for succession leadership. They're going to be all young people. Then the other 20 percent will be specialists: medical doctors, ambassadors from different countries who will come with us, international journalists who will be writing for us, to promote our education program. We're going to have scientists on board, focusing on ocean health. That kind of stuff. So rebuilding Hokule'a and getting that larger diverse community together was what we did in the last five years.

Q: How did the sponsorship with Hawaiian Airlines come about, and what exactly is it going to do for you?

A: Hawaiian's amazing. You know, a good friend of mine, Mike McCartney, from the Hawaii Tourism Authority,

he's a very good friend and supporter of the broader values of the voyage. ... Here's the interesting thing: In the time that we do the voyage, millions of visitors will come to Hawaii. So the world comes here. And Mike's vision is this (voyage) is Hawaii going out to the world. And it's being sailed by its own core values as a tool to help other countries understand who we are.

So Mike said you need to meet this guy, Mark Dunkerley, the CEO at Hawaiian. ... So we met for two hours; it was an amazing meeting. We talked about family more than anything else. ... We never talked about a partnership, we never talked about funding opportunities, none of that. We just met each other. Just me and him. And then, Mark went out and talked to his staff and said, "We're going to help them." ...

Q: Do you have a cost you expect this voyage to total?

A: Yeah, it's high. (Laughter). It's an expensive thing to do, and we're still working on the budget. But we have a team of people that are working on fundraising. We don't really know how to do this well. ... But we have this external team that is helping us, not just in Hawaii but also in the continental United States as well as around the world. So fundraising is a big issue, but we're doing this because we believe it's the right kind of project — and we're learning along the way.

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A fragment of volcanic rock, 910 feet high at its peak, is all that remains of Nihoa Island

屏東縣車城鄉後灣村

後灣路 2 號 生物組

李宗賢

LI TSUNG-HSIEN

NMBA

The Final Ravages of Time and Water

Once-active volcanoes, the 12 Leeward Islands, which extend the Hawaiian archipelago more than 1,200 miles to the northwest of the main islands, are the oldest links in the island chain and the most battered by time and erosion. Each successive Leeward island is older than the one to its southeast and hence displays greater ravages by wind, rain and sea. On Nihoa, the second youngest of the Leewards and some 2.3 million years older than the island of Hawaii, land-building lava flows that countered the forces of erosion ceased so long ago that the island, once 20 miles across, has shrunk to a rock one quarter of a square mile in area (left). Ages of rainfall and wave action have even more thoroughly worn down Kure (right), the oldest and outermost of the Leewards, at one point lowering it to sea level. But the shell of its volcano provided a foundation on which tiny sea creatures slowly built up a spacious, gleaming white coral atoll.

MARRIED 11/2013
 Need CARD 185
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 (Inoguchi)

ATSUTO/EMI ONOZAWA
 husband 7F KASEBIRU 146
 9-3 FUTATSUYA-TYO
 KANAGAWA-KU
 YOKOHAMA-SHI
 KANAGAWA-KEN
 221-0823 JAPAN

SUE JINHWANG
 459 POTRERO AVE.
 SAN FRANCISCO, CA 94110

Best, Jeremy Trylich

Binhai Da Dao, Yu Lan Lu

5 year old son
 "HUNTER"

Yang Guang Jin Dian 10-101

Haikou, Hainan Island 570100

TEL. 86136 98963449
 125 570125

FROM

Hi Linda Paul

HAWAII AUDUBON SOCIETY

February issues of the 'Elepaio during that time period list George H. Balazs as the HAS President only in 1981 rather than for two consecutive years.

- 1979 - Robert J. Shallenberger
- 1980 - Robert J. Shallenberger
- 1981 - George H. Balazs
- 1982 - Charles Lamoureux
- 1983 - Robert Pyle

View Query Results

Query returned 47 rows.

[Close window](#) to return to Your Query

	TURTLEID	EVENT_DATE	ISLAND
1	111FW	18-JUN-66	EAST
2	112FW	20-JUN-66	EAST
3	152FW	12-JUL-76	EAST
	152FW	19-JUN-85	EAST
	152FW	10-JUN-99	EAST
	152FW	11-JUN-06	EAST
	152FW	11-JUN-99	EAST
	152FW	23-JUN-99	EAST
	152FW	13-JUN-92	TERN
4	17FW	27-AUG-65	EAST
5	41FW	13-AUG-65	WHAL
6	4FW	06-AUG-65	EAST
7	58FW	16-AUG-65	WHAL
8	59FW	16-AUG-65	WHAL
9	60FW	23-AUG-65	EAST
10	61FW	23-AUG-65	EAST
11	62FW	23-AUG-65	EAST
12	63FW	23-AUG-65	EAST
13	64FW	24-AUG-65	EAST
14	655FW	28-JUN-80	EAST
	655FW	13-JUN-80	EAST
	655FW	03-JUN-74	EAST
	655FW	27-JUN-80	EAST
	65FW	26-AUG-65	EAST

15	66FW	26-AUG-65	EAST
16	679FW	07-JUN-68	WHAL
17	67FW	26-AUG-65	EAST
18	685FW	07-JUN-68	WHAL
19	689FW	11-JUN-68	TERN
20	68FW	27-AUG-65	EAST
21	70FW	27-AUG-65	EAST
22	71FW	27-AUG-65	EAST
23	724FW	14-JUN-68	EAST
24	725FW	14-JUN-68	EAST
25	726FW	14-JUN-68	EAST
26	727FW	14-JUN-68	EAST
27	728FW	14-JUN-68	EAST
28	729FW	14-JUN-68	EAST
29	730FW	14-JUN-68	EAST

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30	731FW	14-JUN-68	EAST
31	732FW	14-JUN-68	EAST
32	733FW	14-JUN-68	EAST
33	735FW	14-JUN-68	EAST
34	736FW	14-JUN-68	EAST
35	883FW	08-JUL-76	EAST
	883FW	07-JUL-76	EAST
36	8FW	06-AUG-65	EAST

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----- Forwarded message -----

From: **Paul Becker** <paul.becker@noaa.gov>
Date: Thu, Feb 2, 2012 at 8:55 PM
Subject: NIST-PIFSC collaborations
To: Sam Pooley <sam.pooley.coop@noaa.gov>
Cc: Michael Seki <michael.seki@noaa.gov>

Hello Sam,

I would like to extend our appreciation for the efforts of George Balazs and the Marine Turtle Research Program staff at the PIFSC to develop a collaborative program with NIST for establishing a sea turtle biorepository and an associated analytical program to investigate contaminant exposure of these animals. As we began expanding some of our existing programs on marine mammals and seabirds into the U.S. Pacific Region, it was apparent that sea turtles are a top priority because of health and conservation concerns. George has been enthusiastic in working with us and we intend to provide additional analytical data and interpretation that we hope will support his program. Together with George's program, we collected samples from over 90 turtles in 2011 from live-captures, strandings, and longline fisheries. NIST is currently analyzing the samples for organic and inorganic contaminants and exploratory metabolite work is also ongoing that might provide some additional insight into response of these animals to diseases. The NIST lead for developing this sea turtle effort with George is Jennifer Keller, an organic analytical chemist who has done extensive work on contaminant exposure and health of loggerhead sea turtles. She and George are working very well together and will be co-authoring a presentation on this collaborative work at the 32nd International Sea Turtle Symposium this March. In addition, Jenn is preparing a NIST Internal Report describing the program, including objectives, rationale, and protocols.

We appear to be moving very rapidly in development of the biorepository and the analytical component that supports sea turtle research. This could not have been done without George's functioning field operations that are supported by the PIFSC's Marine Turtle Research Program. George has been extremely open, helpful, and excited about this collaboration. We are grateful for the efforts of him and his staff and look forward to the ongoing sampling and research efforts we have established together.

Best regards,
Paul

~~George Balazs~~
~~PIFSC~~
~~2012~~
~~February 2, 2012~~
~~8:55 PM~~

OCEAN BLUE

ISTS
TERRY MEYER
P.O. BOX 2102
SURF CITY, NC
28445

漢字書

海亀の交流の記録
下巻の巻

KM 11

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Sesshuji, Kyoto [京都、雲舟寺 (芬陀院)]

POST CARD

Tomoko Hamabata
Kitashirakawa-oiwakecho
Sakyo, Kyoto University
606-8502 JAPAN

Dear. Mr. George Balazs

Thank you very much for your letter and
Post cards of sea turtles. I was very happy to
receive them.

It was great honor to meet you at ISTS 33, because
I have known your name since I started studying
sea turtles. I hope I can see you again at next ISTS.

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www.pinup.jp

Sincerly, Tomoko Hamabata.



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Ch
SBR
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424 Isl
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189

Miyuki KAJIKI FAMILY
4-5, OI-CHO, NAKA-KU
NAGOYA 460-0015
JAPAN

Gifts 2/21/12
See page 94 & 56 (7)

Richard FARMAN
AQUARIUM des LAGONS
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ANSE VATA
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New Caledonia

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424 Ishikawa, Motobu-cho, Okinawa 905-0206 JAPAN
Phone: +81-980-48-2742 FAX: +81-980-48-4399
E-mail: s-uchida@okichura.jp

Mr. John Ehrismann
7667 Acoma Trl.
Yucca Valley, CA 92284

AUGUST 2013 = 94 years old

Allison Beale Work
PO BOX 2302
Honolulu, HI
96804

TW N
BOX
96804

Nagao is better address to mail.
Please mail to
Nagaomotomachi 5-17-18-302, Hirakata,
Osaka 573-0163 JAPAN
TEL: +81-72-864-0335

TAKAHASHI
ISHIKAWA

However, I tell you the address at Suma Aqualife park for the future.
Suma-ku Wakamiya-cho 1-3-5, Kobe, Hyogo 654-0049 JAPAN
TEL: +81-78-731-7301

YOSHI MATSUZAWA
NAOKI KAMEZAKI TW

Cc: Naoki Kamezaki <JCG03011@nifty.ne.jp>

Kon-nichiwa George-san

My personal address is

Kamakogahara 1-8-1, Higashinada, Kobe, Hyogo,
658-0064 Japan

Yoi-otoshiwo. (Have a good new year!)



Allison Beale
1918 Alewa Dr
Honolulu, HI 96817

488408871 New PP - issue - 30 APRIL 2013
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TRENGTH
 CHARACTER
 FAITH
 EAR MIND
 HEAD
 PASSPORT

AMAGATA - "Heaven Direction"

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- | DATE | MY number | DAYS | DEPART DATE | PLACE |
|----------|--------------------------|------|-------------|--------|
| 2/19/08 | 5 | 6 | 2/25/08 | TAIPEI |
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| 9/30/09 | NO. 6 | | 10/6/09 | TAIPEI |
| 2/16/11 | | 5 | 2/21/11 | TAIPEI |
| 4/6/11 | | 9 | 4/15/11 | TAIPEI |
| 9/29/11 | HENG CHIU NAMBA WORKSHOP | | 10/8/11 | TAIPEI |
| 2/4/12 | NO. 7 | 4 | 2/8/12 | TAIPEI |
| 5/31/12 | YARU wedding | 3 | 6/3/12 | TAIPEI |
| 11/4/12 | LIUQIU #2 | 7 | 11/11/12 | TAIPEI |
| 2/18/13 | HENG CHIU NAMBA NO. 8 | 8 | 2/26/13 | TAIPEI |
| 7/11/13 | LIUQIU #3 | 9 | 7/11/13 | TAIPEI |
| 9/5/13 | TAIPEI KUANDU - DAJIA | | 9/9/13 | TAIPEI |
| 10/10/13 | KAOSHUNG CHIAYI TAINAN | 5 | 10/16 | TAIPEI |

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Kia ora dear George !

Yes, people goes often all round the island to make coprah and sometime but rarely they found a turtle nest.

Thank you very much for the book that you gone send me.
Here is my private adress :

Fasan CHONG aka Jean Kape
B.P. 758 Papeete-Tahiti
98713 French Polynesia

My t phone in case : home (689) 48 16 11 - cellular (689) 71 29 10

Ka noho ra !

USEFUL INFORMATION

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CONVERSION TABLE

METERS	YARDS	INCHES
1.000	1.093	39.37
0.914	1.000	36.00

CENTIMETERS	INCHES	FEET
1.00	0.394	0.0328
2.54	1.000	0.0833
30.48	12.000	1.0000

KILOMETERS	MILES
1.000	0.621
1.609	1.000

GRAMS	OUNCES	POUNDS
1.00	0.035	0.0020
28.35	1.000	0.0625
453.59	16.000	1.0000
1,000.00	35.274	2.2050

KILOGRAMS	OUNCES	POUNDS
1.000	35.274	2.2050
0.028	1.000	0.0625
0.454	16.000	1.0000

LITERS	PINTS	QUARTS	GAL.
1.000	2.113	1.057	0.264
0.473	1.000	0.500	0.125
0.946	2.000	1.000	0.250
3.785	8.000	4.000	1.000

LENGTH

1 meter (m)	=	100 cm	=	1,000 mm
1 millimeter (mm)	=		=	0.001 m
1 centimeter (cm)	=		=	0.01 m
1 decimeter (dm)	=		=	0.1 m
1 decameter (dkm)	=		=	10 m
1 hectometer (hm)	=		=	100 m
1 kilometer (km)	=		=	1,000 m

CAPACITY

1 liter (l)	=	100 cl	=	1,000 ml
1 milliliter (ml)	=		=	0.001 l
1 centiliter (cl)	=		=	0.01 l
1 deciliter (dl)	=		=	0.1 l
1 decaliter (dkl)	=		=	10 l
1 hectoliter (hl)	=		=	100 l
1 kiloliter (kl)	=		=	1,000 l

WEIGHT

1 gram (g)	=	100 cg	=	1,000 mg
1 milligram (mg)	=		=	0.001 g
1 centigram (cg)	=		=	0.01 g
1 decigram (dg)	=		=	0.1 g
1 decagram (dkg)	=		=	10 g
1 hectogram (hg)	=		=	100 g
1 kilogram (kg)	=		=	1,000 g

Table of Time Measure

60 seconds	=	1 minute
60 minutes	=	1 hour
24 hours	=	1 day
7 days	=	1 week
30 days	=	1 calendar month
12 months	=	1 year
365 days	=	1 common year
366 days	=	1 leap year
100 years	=	1 century

Table of Dry Measure

2 pints (pt.)	=	1 quart (qt.)
8 quarts	=	1 peck (pk.)
4 pecks	=	1 bushel (bu.)
1 cord	=	128 cu. ft.

Table of Liquid Measure

4 gills (gl.)	=	1 pint (pt.)
2 pints	=	1 quart (qt.)
4 quarts	=	1 gallon (gal.)
31-1/2 gallons	=	1 barrel (bbl.)
2 barrels	=	1 hogshead (hhd.)

Table of Paper Measure

25 sheets	=	1 quire
20 quires	=	1 ream
10 reams	=	1 bale

Table of Linear Measure

12 inches	=	1 foot
3 feet	=	1 yard
5-1/2 yards	=	1 rod
40 rods	=	1 furlong
8 furlongs (5280 ft.)	=	1 mile

Miscellaneous Measures

12 units	=	1 dozen
12 doz.	=	1 gross
12 gr.	=	1 great gross
20 units	=	1 score
1 hand	=	4 inches
1 fathom	=	6 feet
1 knot	=	6076 feet
3 knots	=	1 league
1 bu. potatoes	=	60 lbs.
1 barrel flour	=	196 lbs.
1 cu. ft. of water	=	7.48 liquid gals. and weighs 62.425 lbs.
Diameter of circle x 3.1416	=	circumference
Atmospheric pressure is 14.7 lbs. per sq. in. at sea level		
13-1/2 cu. ft. of air	=	weighs 1 lb.

Table of Cubic Measure

1728 cubic inches	=	1 cubic foot
27 cubic feet	=	1 cubic yard
128 cubic feet	=	1 cord of wood
24-3/4 cubic feet	=	1 perch of stone
Note: A cord of wood is a pile 8 feet long, 4 feet wide, and 4 feet high.		
A perch of stone or brick is 16-1/2 feet long, 1-1/2 feet wide, and 1 foot high.		

Table of Avoirdupois Weight

16 drams	=	1 ounce (oz.)
16 ounces	=	1 pound (lb.)
100 pounds	=	1 hundred-weight (cwt.)
2000 pounds	=	1 ton (T.)
2240 pounds	=	1 long ton (L.T.)

Table of Troy Weight

24 grains (gr.)	=	1 penny-weight (dwt)
20 penny-weights	=	1 ounce (oz.)
12 ounces	=	1 pound (lb.)

Table of Circular Measure

60 seconds	=	1 minute
60 minutes	=	1 degree
360 degrees	=	1 circumference
A degree of the earth's surface or a meridian = 69.16 miles at the equator.		

Table of Apothecaries' Weight

20 grains (gr.)	=	1 scruple
3 scruples	=	1 dram
8 drams	=	1 ounce
12 ounces	=	1 pound (lb.)

Table of Surface Measures

144 sq. in.	=	1 sq. ft.
9 sq. ft.	=	1 sq. yd.
30-1/4 sq. yds.	=	1 sq. rod
160 sq. rods	=	1 acre
640 acres	=	1 sq. mile

An acre measures 208.71 ft. on each side.
A section of land is 1 sq. mile.
A quarter section is 160 acres.
A township is 36sq. miles.

MULTIPLICATION TABLE

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

