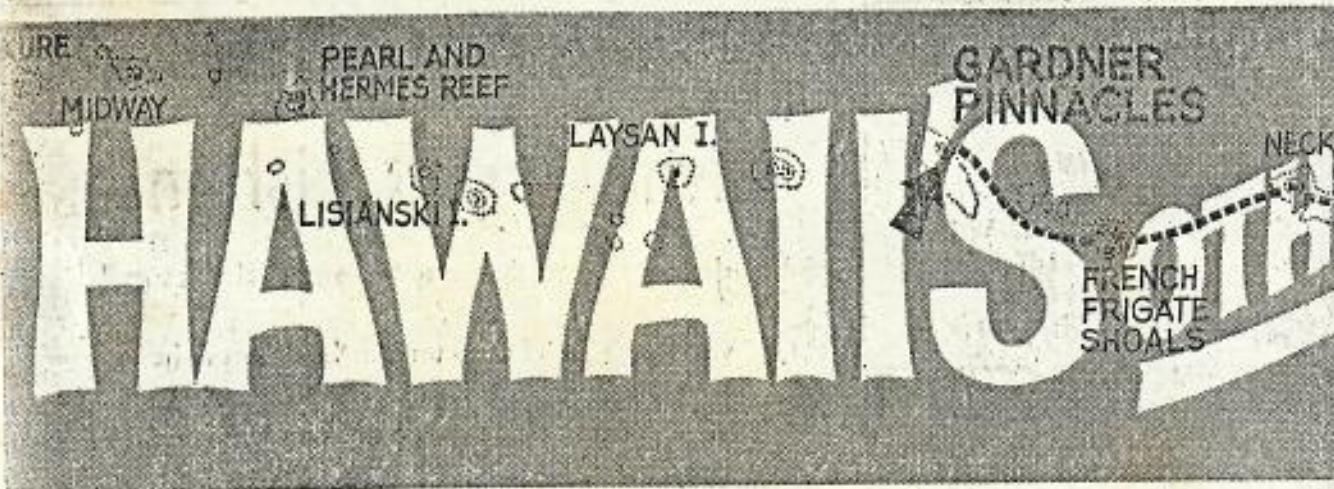


W. ROLL NWHI ARTICLES

1966
SUSAN SCOTT 1989 FFS

GHBALAZS FILE



Stretching 1,200 miles northwest into the Pacific are the tiny reefs, shoals, rocks and islands of Hawaii's leeward chain.

The necklace of islands is inhabited almost exclusively by seals, turtles and thousands upon thousands of sea birds — all under the protection of Federal law.

Rising stark, black and naked from the deep blue of the Pacific, Gardner Pinnacles is perhaps the hardest to land on of all the islands of the National Wildlife Refuge.

On five previous trips scientists were repelled by the raging surf.

This time they landed on the southern slope of the largest rock to inspect the bird population and breeding areas. But even that landing was not easy. As the Coast Guard boat surged up with a wave the wildlife officials would jump one by one onto the rocky ledge—with a four-foot long shark circling the waters nearby.

Gardner Pinnacles are 588 miles northwest of Honolulu. The highest peak is 170 feet; the lowest is 90 feet. The largest of the two islands is about 600 feet long.

Geologists estimate that the volcanic outcrop probably was once the size of Lanai. Wind and high seas have carved it down to a small rock, but submarine banks surround the pinnacles spreading outward from five to 12 miles.

This fall *Star-Bulletin* Chief Photographer Warren Roll accompanied officials of the U.S. Bureau of Sport Fisheries and Wildlife and the State Fish and Game Division on an inspection tour of the islands.

His collection of photographs are a unique—and exclusive—report of the islands and their "population" today.

lands later. This accounts for the many names, including Man-of-War Rock and Pollard Rock, given the peaks.

Sea birds are not the only inhabitants of the isolated pinnacles. Insects, including several varieties of spiders, earwigs, silverfish and centipedes, live among the loose rocks of the peaks.

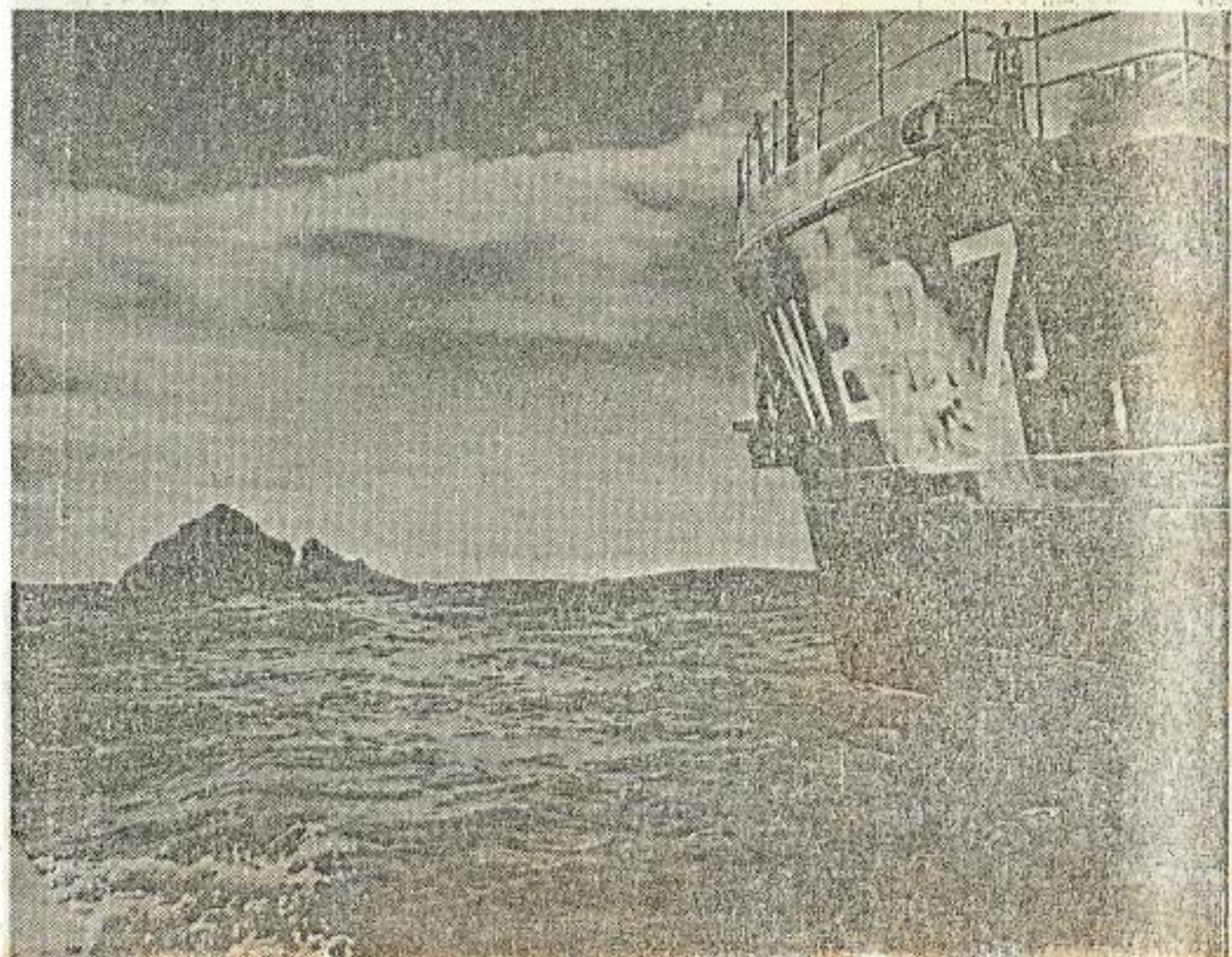
No archaeological remains have been found, which is no surprise to those who have braved a landing on the cliffs.

Landfall . . .

The Coast Guard ship *Ironwood* approaches Gardner Pinnacles looking for a landing spot in the relatively calm sea. The peaks are surrounded by a shelf rich in sea life extending five to 12 miles from the islands at a depth of about 17 to 20 fathoms.

ER I ISLANDS

A stylized map of the Hawaiian Islands chain is overlaid on the large letters of the title. The islands are labeled with their names: NIHOA, KAUAI, OAHU, MOLOKAI, MAUI, LEHUA, NIHAU, LANAI, KAUOLA, KAHOOLOAWE, and HAWAII. A dashed line traces the path of the islands from north to south.



KURE

MIDWAY

PEARL AND HERMES REEF

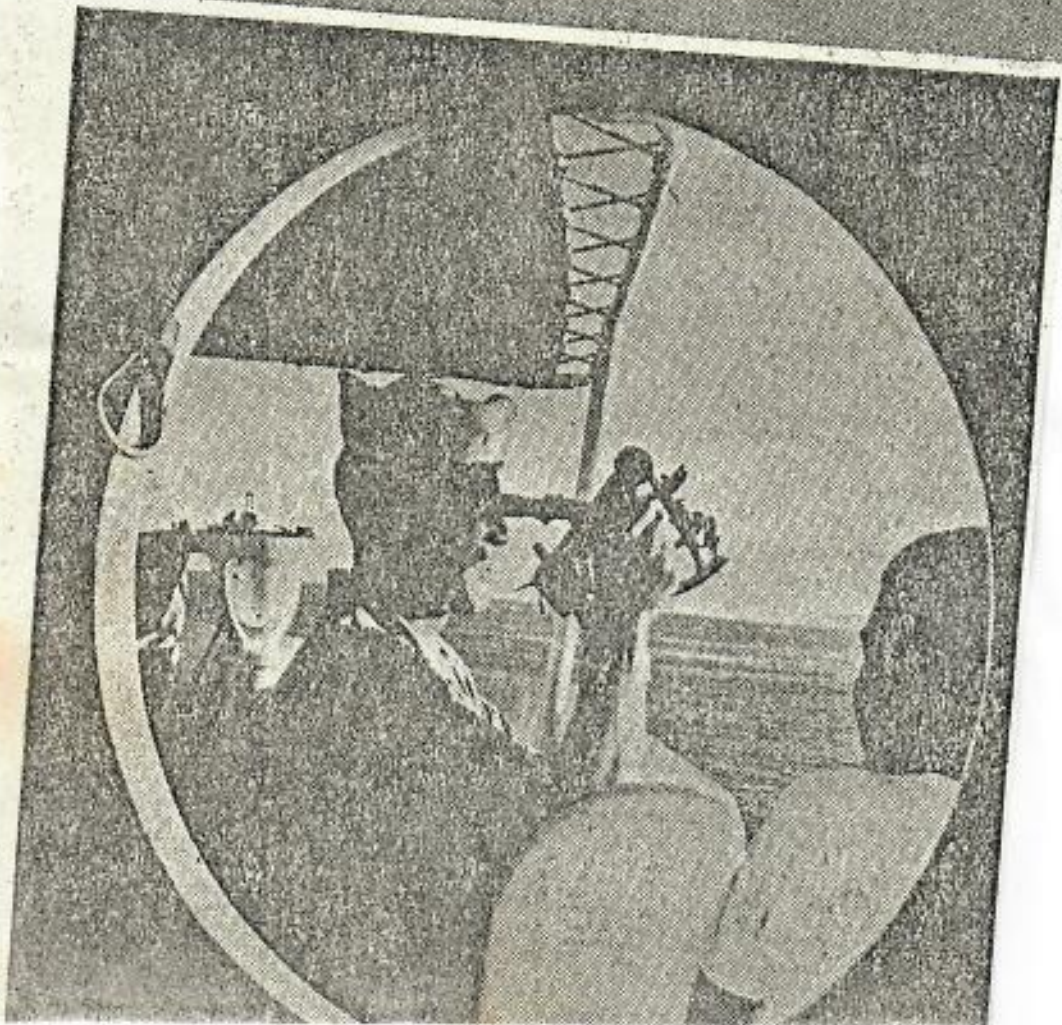
LAYSAN I.

GARDNER PINNACLES

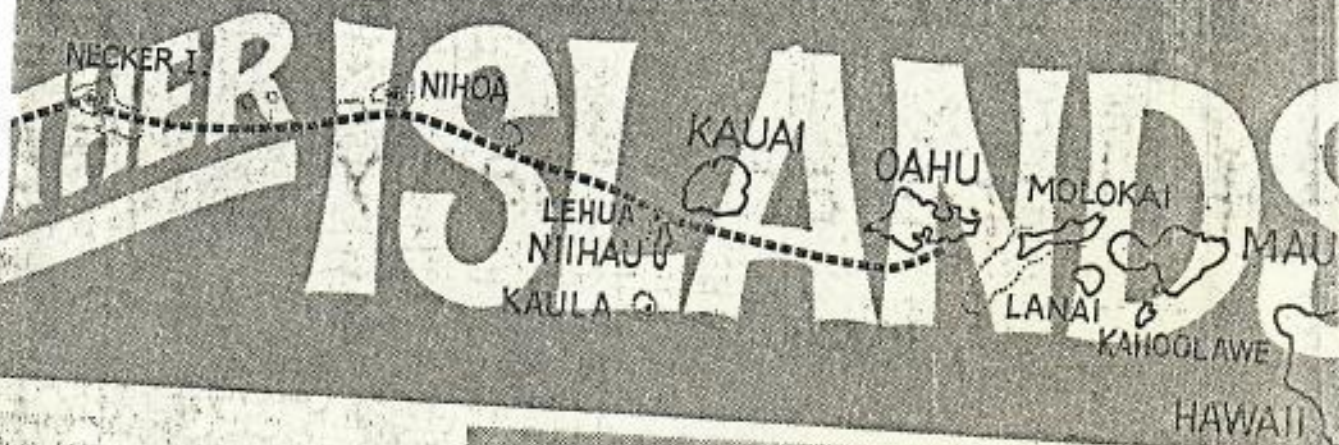
HAWAII

LISIANSKI I.

FRENCH FRIGATE SHOALS



OTHER ISLANDS



The Leeward Islands, often called Hawaii's "other" islands, spread in gold, green and black dots 1,200 miles into the Pacific northwest of Honolulu.

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Geologists estimate that the volcanic outcrop probably was once the size of Lanai. Wind and high seas have carved it down to a small rock, but submarine banks surround the pinnacles spreading outward from five to 12 miles.

At least 34 species of sea birds have been sighted on the pinnacles. About half of them nest there.

During this trip four Hawaiian Monk seals were seen sleeping in the sun.

The only flowering plant found on the less sloping ledges is *Portulaca*, a low flat-looking plant with succulent leaves.

The scientists made another discovery this time. The military had blasted off the top of one peak for a latitude and longitude sighting, part of the Loran system of triangulation and aid to navigation.

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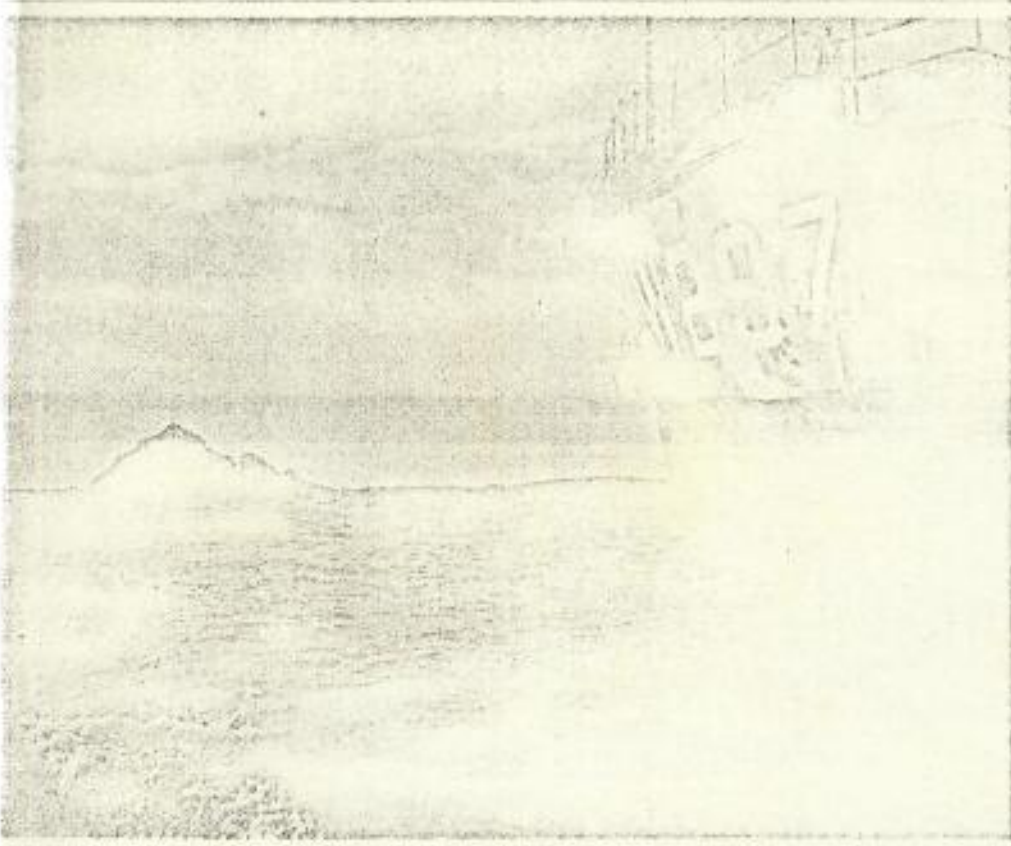
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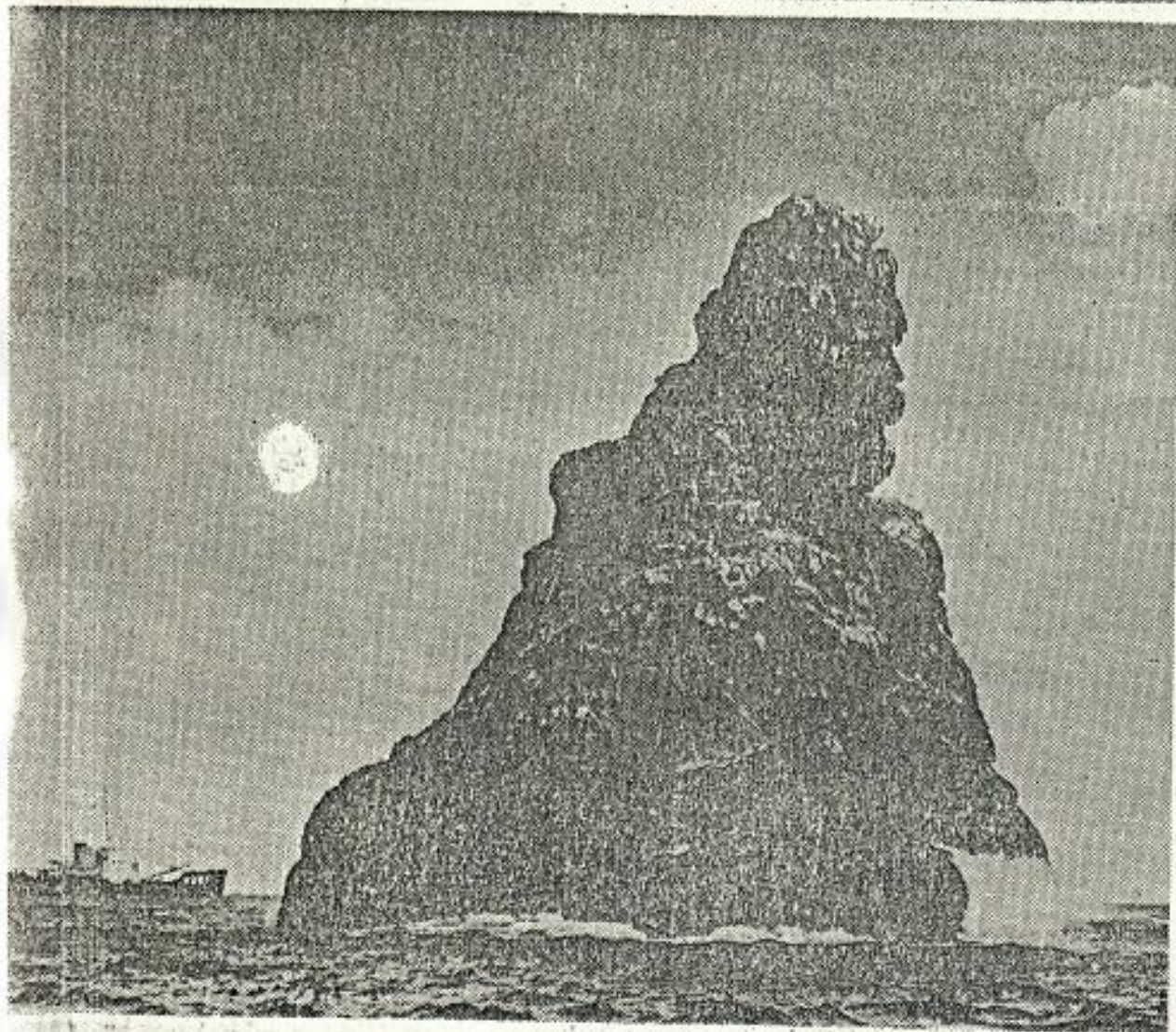
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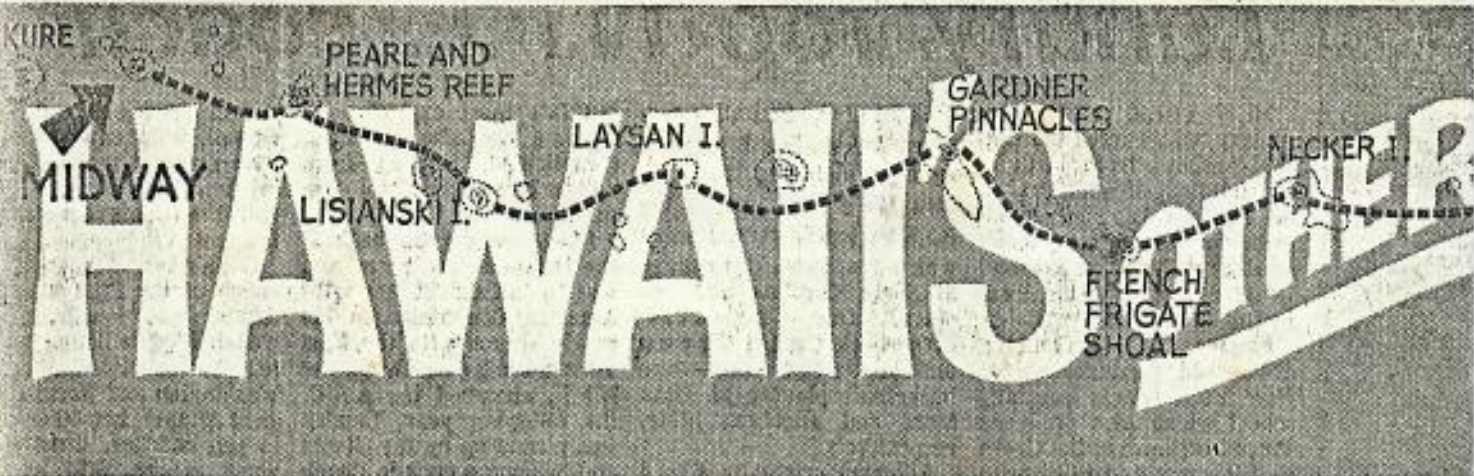
... sea creatures as well as the in-
... are the forbidding peaks. Droppings
... birds send streaks of white down the



...king small from the distance, the peaks tower over the 180-foot long ship. The Coast Guard
...ingly carries officials of the U.S. Bureau of Sport Fisheries and Wildlife and the State Fish and
...me Division on tours of the refuge while it tends buoys and lights in the area.

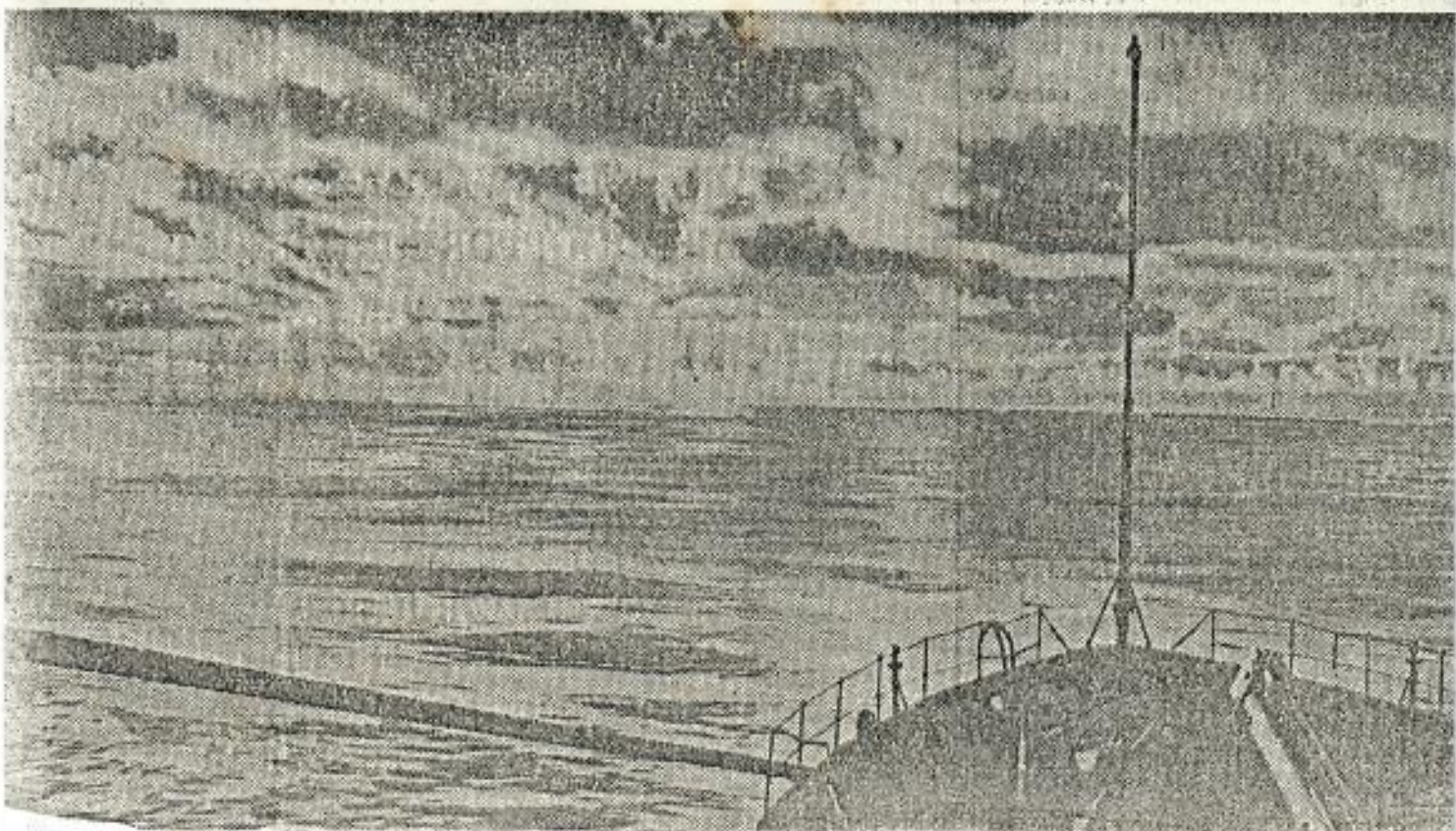


Despite the relatively calm waters landing on the island was no easy task. As the boat surge
the waves the scientists would jump onto the rock cliff. As they leapt the men noticed 4-foot long
circling the boat. This was the first successful landing on the pinnacles in five trips to the reef.



This is the last stop in a photographic journey through the Leeward Islands, the "other" Hawaii, taken this fall by Star-Bulletin chief photographer Warren Roll.

With the exception of Midway, reefs, shoals and rocks of the Pacific all a part of the 50th State.





*the islands,
necklace are*



The history of tiny Midway Islands reads like a library of the better adventure novels.

Tales of shipwrecks and cannibalism, world wars and gooney birds, have all gone into the building of the islands from a pair of flat coral griddles to lush green home for 2,300 Americans.

Midway's most valuable resource is its location. Situated 1,150 miles from Honolulu the atoll with its two islands was the ideal stopping and refueling place first for sailing ships, then steam and diesel ship, propeller-driven planes and jets.

Now in the days of atomic powered ships and non-stop jets the island has begun to lose its human population as the Navy, Air Force, commercial airlines and civil service call back employees.

But the population of Laysan albatross, or gooney birds, once the bane of aviators landing on the

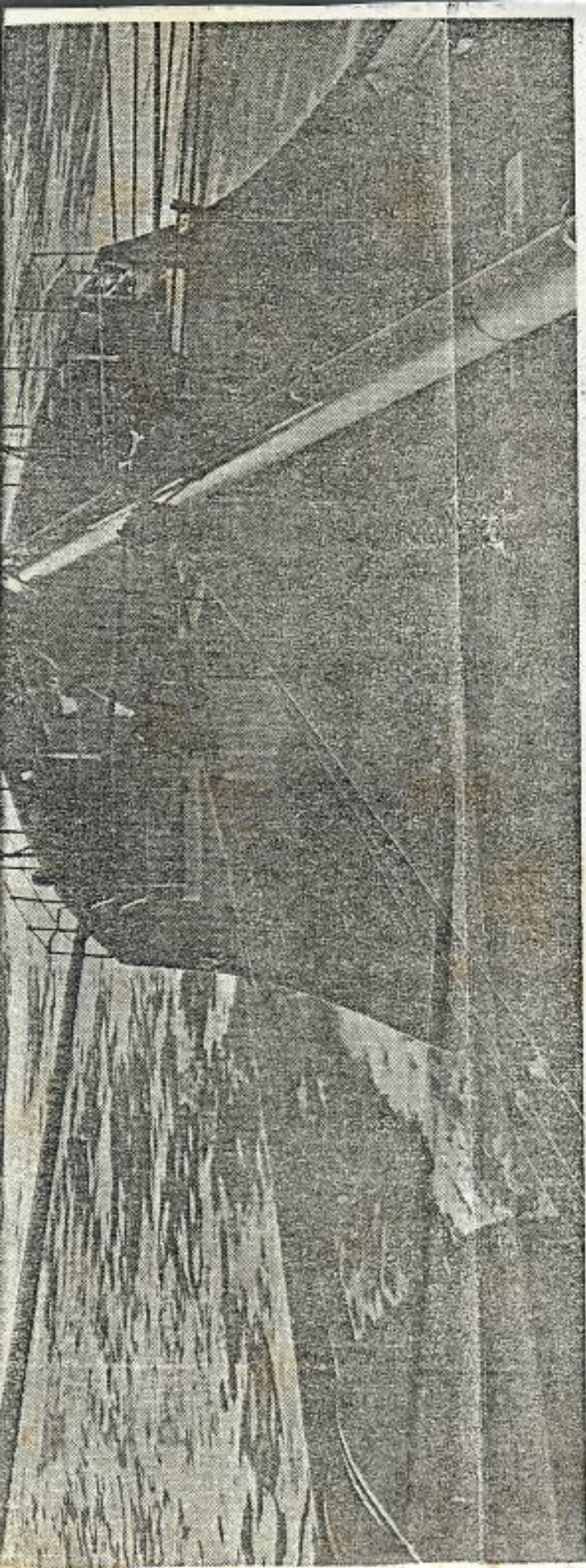
the Hawaiian bark *Gambia*. Brooks claimed the islands for the United States despite the fact that his ship carried the flag of the monarchy.

An attempt to dredge a harbor in the lagoon several years later was accompanied by series of shipwrecks and fantastic stories of starvation and rescue.

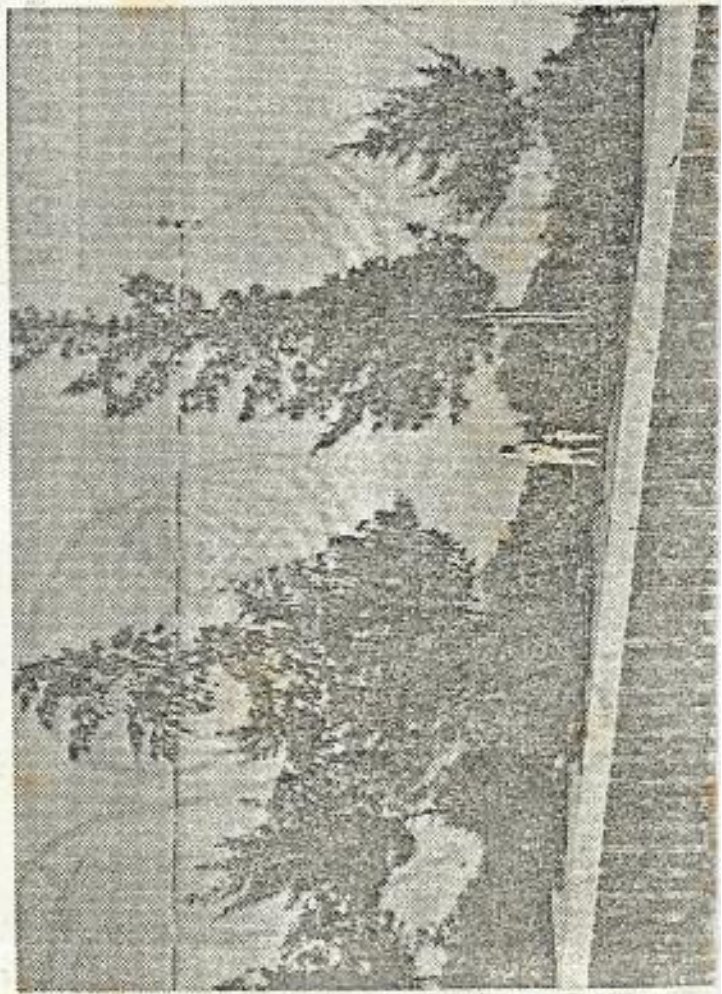
The gravestones of five Navy doctors who died on the island between 1906 and 1950 mysteriously lie side by side in their own little cemetery.

The islands reached their historical apex during June 1942 as the war raged to a turning point at the Battle of Midway in the waters surrounding the atoll.

Although Midway is only 400 miles further north than Honolulu, it is no longer in the tropics. Winds become chilly during the winter and sudden, violent storms rise and fall with little warning.



Slicing through a silent ocean and a turbulent sunset the Coast Guard cutter Ironwood approaches the flat Midway Islands seen as only as a thin line on the horizon in the final leg of photographer Roll's journey. The reef-rimmed atoll surrounds a lagoon that is relatively shallow except for a 60-foot-deep depression in the center and a 30-foot-deep harbor.



service can back employ-ees.

But the population of Laysan albatross, or gooney birds, once the bane of aviators landing on the island, continues to grow.

While riding their "horses," or bicycles, virtually the only means of transportation on the three-square-mile Sand Island, the human population does its best to avoid hitting the 50,000 clownish, pea-brain birds who share the islands.

Living mostly in government housing residents seek their recreation in community groups and activities or in the clear reef-protected lagoon that offers excellent boating, fishing and swimming.

The atoll was discovered and named Middlebrook Islands in 1859 by Captain N. C. Brooks of

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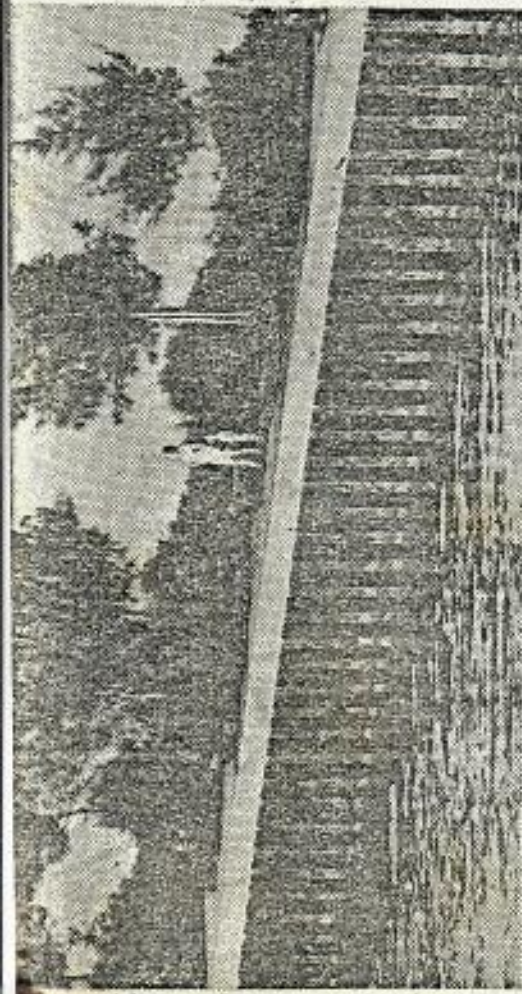
Unlike the other islands of the Loewards, Midway is not a part of the City and County of Honolulu nor the State of Hawaii. Officially it is a national defense area.

Midway's neighbor, 50 miles to the west is the last island in the chain. Kure Island is not only a part of the State but is a State wildlife refuge.

Originally a part of the Hawaiian Island National Wildlife Refuge, the island and its wildlife are protected by the State Fish and Game Division.

The sandy island atoll has claimed the loss of at least six ships during its short recorded history.

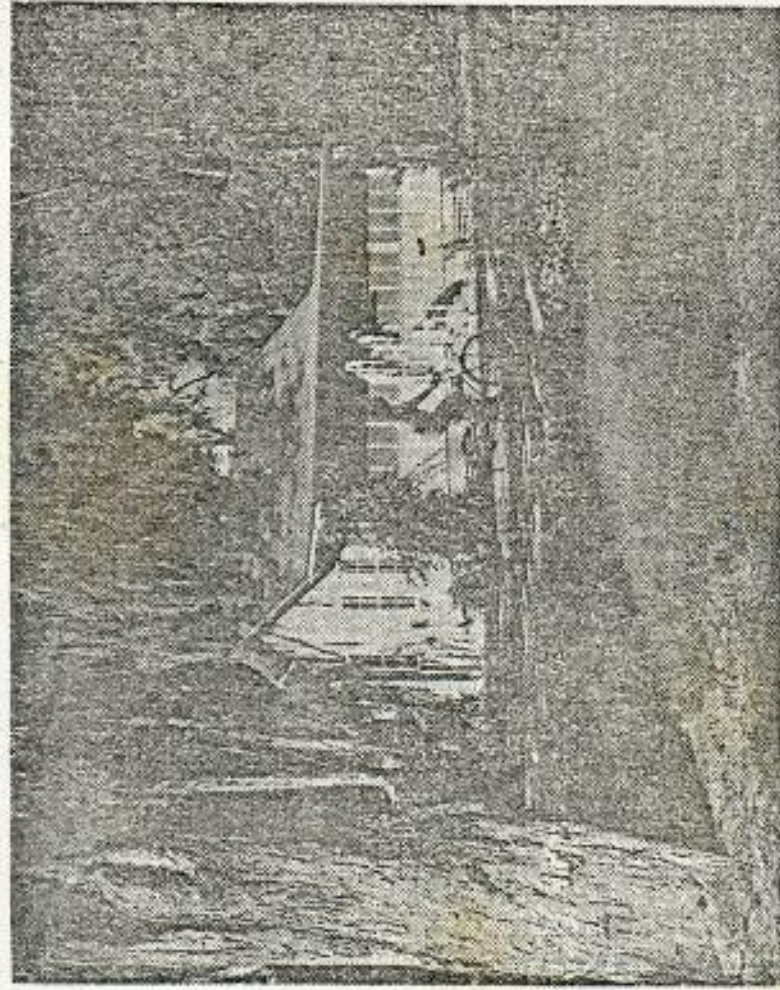




A Navy wife and her small daughter stroll on the wharf jutting out from Sand Island. Almost all the 2,300 residents of Midway are Navy personnel or dependents.



Tall ironwoods now grow where once there was only coral and windswept grass. Much of the top soil was shipped from Honolulu by residents who wanted to make the coral atoll a home.



All housing on Midway is now under the control of the government. The island once supported an

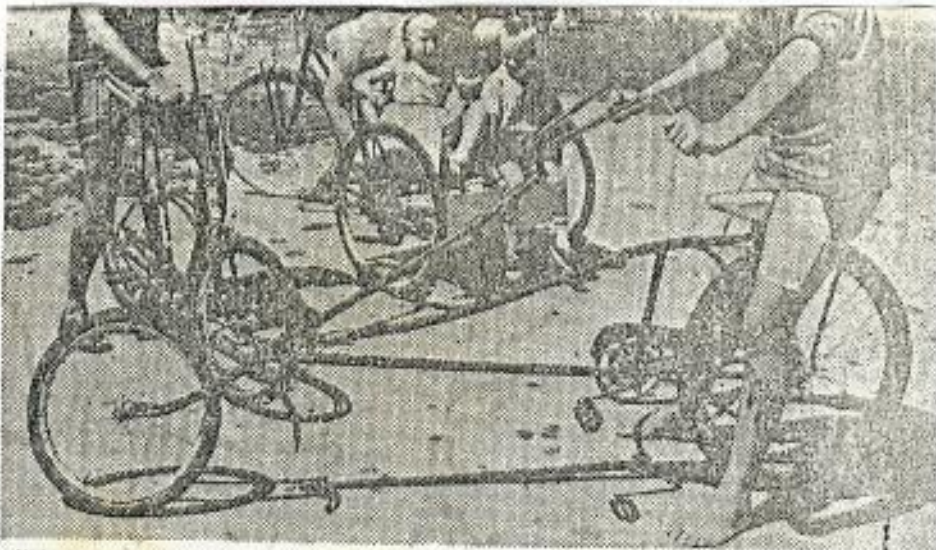


active cable station, a Pan American Airways re-fueling stop and a quarantine station for the Territory of Hawaii.

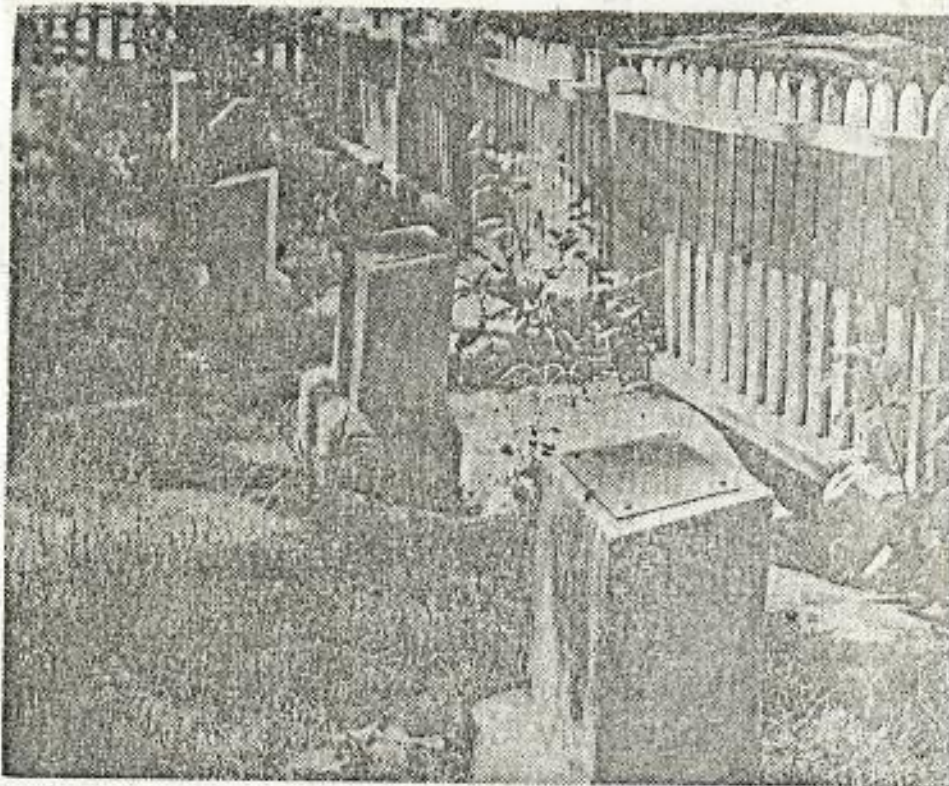
Few of Midway's residents, all of whom are only assigned to temporary duty on the islands, choose to be buried on the remote atoll. Five of




them who did are buried in their own fenced cemetery — all were doctors and all were American government employees. The five died between 1909 and 1950.



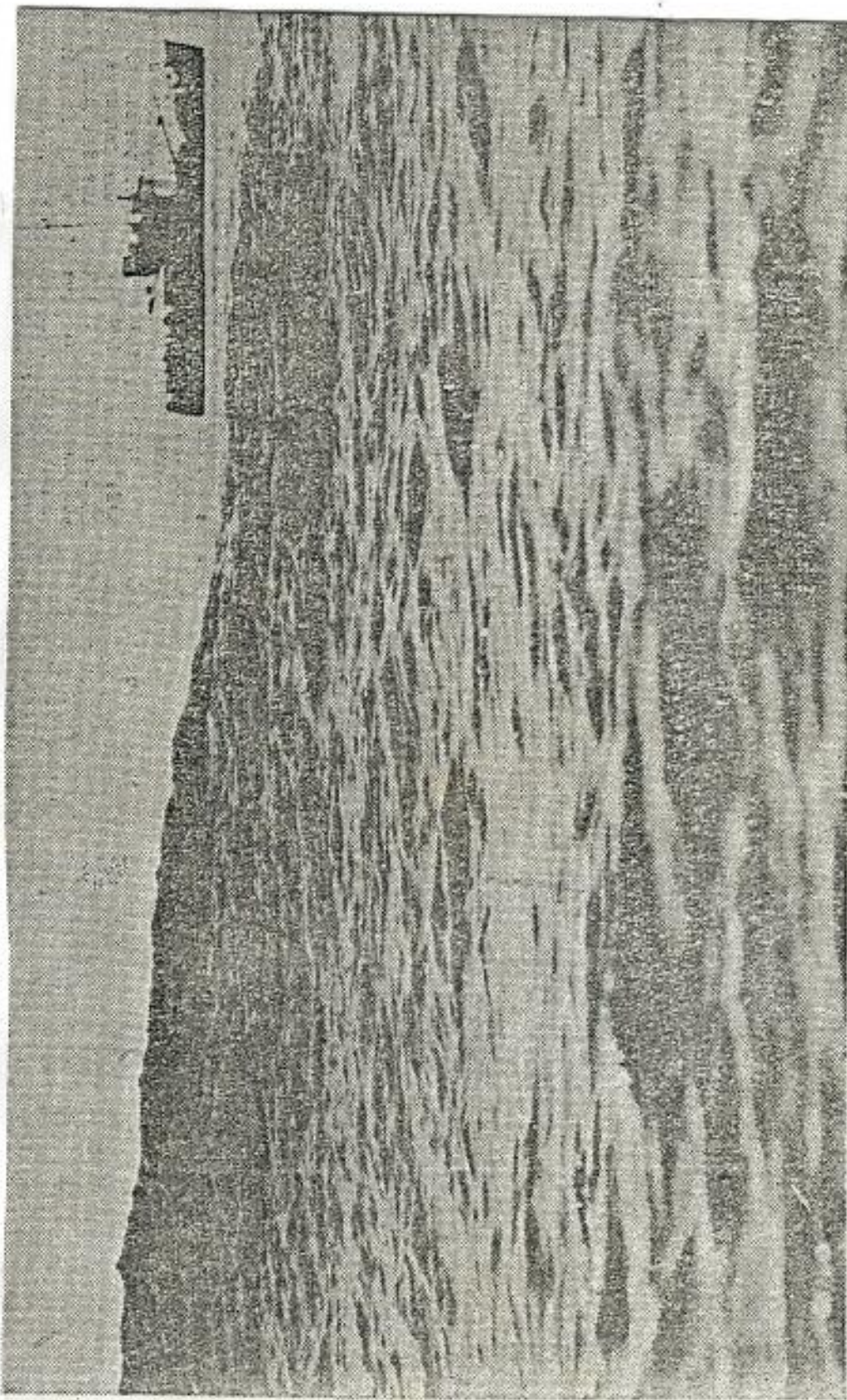
"Horses" are the only means of transportation for those not on official duty. In an effort to create bigger and better bicycles the islanders have developed some unusual new "species."





Frigatebirds circle debris left on Southeast Island by the Navy. Most of the islands in the reef are little more than shifting sand bars less than four feet in elevation, but they act as resting and breeding areas for seals and turtles. In the spring thousands upon thousands of Laysan Albatross, often called "gooney" birds, nest on the island.

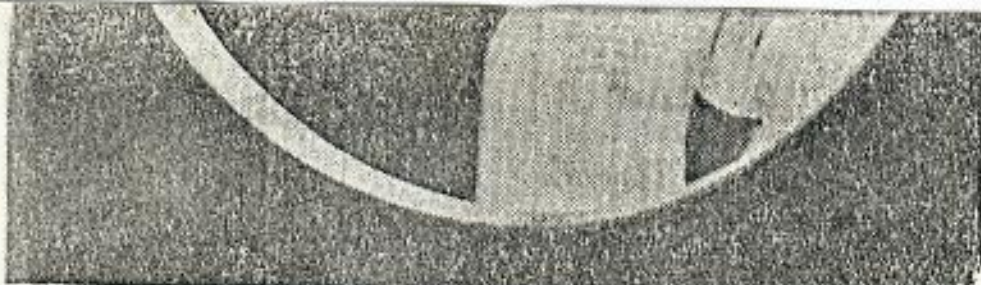
Left on the flat, barren Southeast Island scientists wave farewell to Coast Guardsmen who will pick them off the reef a week later. The scientists visited all seven islands within the lagoon counting and observing seals, turtles and sea birds. The sign at left warns unauthorized visitors that trespassing and disturbing the wildlife bring stiff penalties.



The Coast Guard Cutter Ironwood heaves to just outside the growing swells that constantly pound Pearl and Hermes reef. The jagged reef crowned by an oval of breakers surround the 17-mile-long lagoon except two narrow entrances for small boats. The shark-infested water within the reef is dotted with large protruding coral heads making travel between the islands difficult.



This healthy green sea turtle easily passed an inspection by Ron Walker of the State Fish and Game Division. During the week-long stay on Pearl and Hermes Reef, scientists counted and tagged 43 new turtles, including this youngster, and recorded 10 others that had been previously tagged. Most turtles also were given a large circle of fluorescent red paint on their backs so scientists can follow their travels through reports from ships and fishermen.



Taking a noon sight, Ensign Michael Cain, navigator aboard the Coast Guard cutter Ironwood, determines the position of the ship in relation to Pearl and Hermes Reef. The low-lying reef and small sand islands are difficult to spot. Even radar can not pick out the flat islands. The Ironwood transported the scientists throughout the refuge while on a buoy- and light-tending mission.

For a brief time during its 144 years of recorded history it looked as if Pearl and Hermes Reef would become the economic gem of the Leeward Islands.

The short-lived boom came in 1927 when pearl oysters were discovered in the 17-mile long, 10-mile wide lagoon.

But today the real gems of the reef and the seven small sand islands within are the hundreds of Hawaiian Monk seals and green sea turtles that feed and breed in the warm waters.

These frolicking animals are the result of almost 60 years of protection in the Hawaiian Islands National Wildlife Refuge.

During an inspection tour of the refuge this fall scientists stayed a week at Pearl and Hermes, counting wildlife and tagging seals and turtles to follow their growth cycles and travels.

this fall.

His photographic record our "other" neighbors.

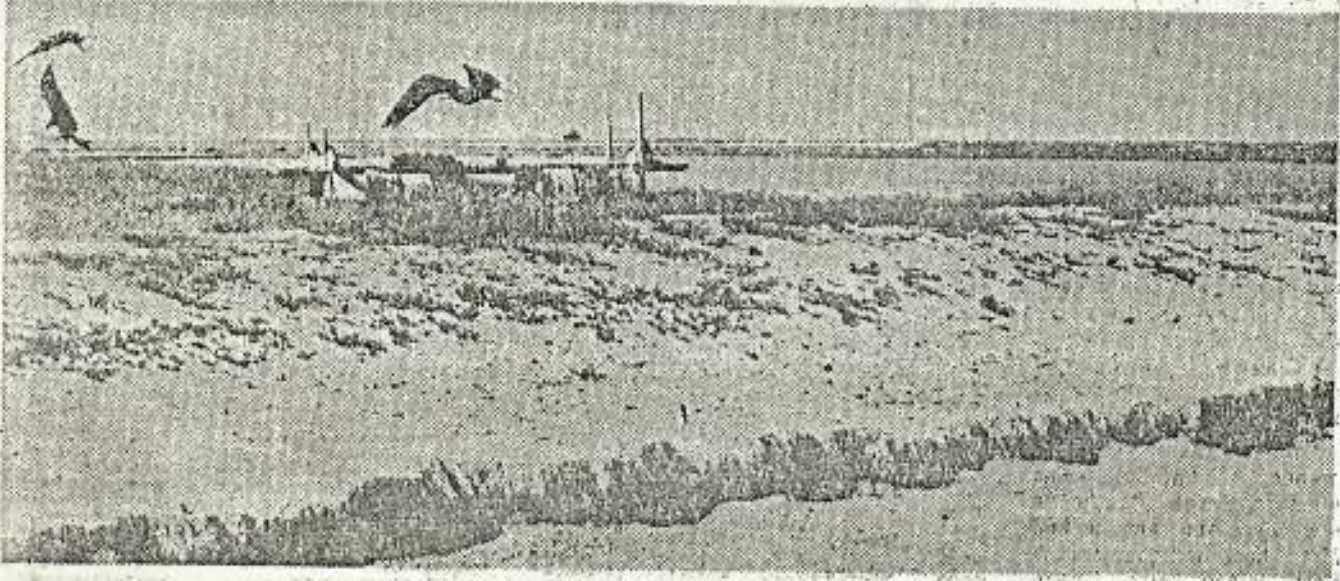
The discovery of pearls, an unusual and ironic event, came more than a century after the naming of the island.

On a moonless night in April, 1822, two English whalers—the Pearl and the Hermes—ran aground on the reef within 10 miles of each other.

The crews of both ships camped on one of the sandy islands while building a 30-ton vessel, the Deliverance, from the wreckage of the two ships.


Director of the construction was 24-year-old James Robinson, chief carpenter of the Hermes. After safely navigating the 1,100 miles to Honolulu, Robinson established the first ship building business and founded the influential Robinson family here.

The discovery of pearls in the lagoon brought a short-lived industry to the reef as Filipino divers, directed by



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A Japanese glass ball and dozing Hawaiian monk seals form a Leeward Island still life on a hot, sultry day. The seals sleep in the warm sand during the day and chase squid and sometimes fish for food at night. Scientists spotted 109 seals on the reef during this trip and tagged 49 of them. Eight seals were found with tags from previous trips.

Honolulu managers, brought up several tons of pearl shells from the lagoon.

Soon after a team of scientists from the U.S. Bureau of Sport Fisheries and Wildlife studied the reef and reported that the pearl beds were almost completely wiped out by just the few months of exploitation and recommended that fishing and pearl diving be stopped until the sea life had a chance to recultivate.

Recent checks on the pearl beds indicate that the original damage was so thorough that the chances the beds will ever reach abundance to support commercial use again are remote.

Scientists have reason to suspect that the lagoon of the atoll contains many variety of aquatic life not found anywhere else in the world. Extensive studies of the reef are still in the future.

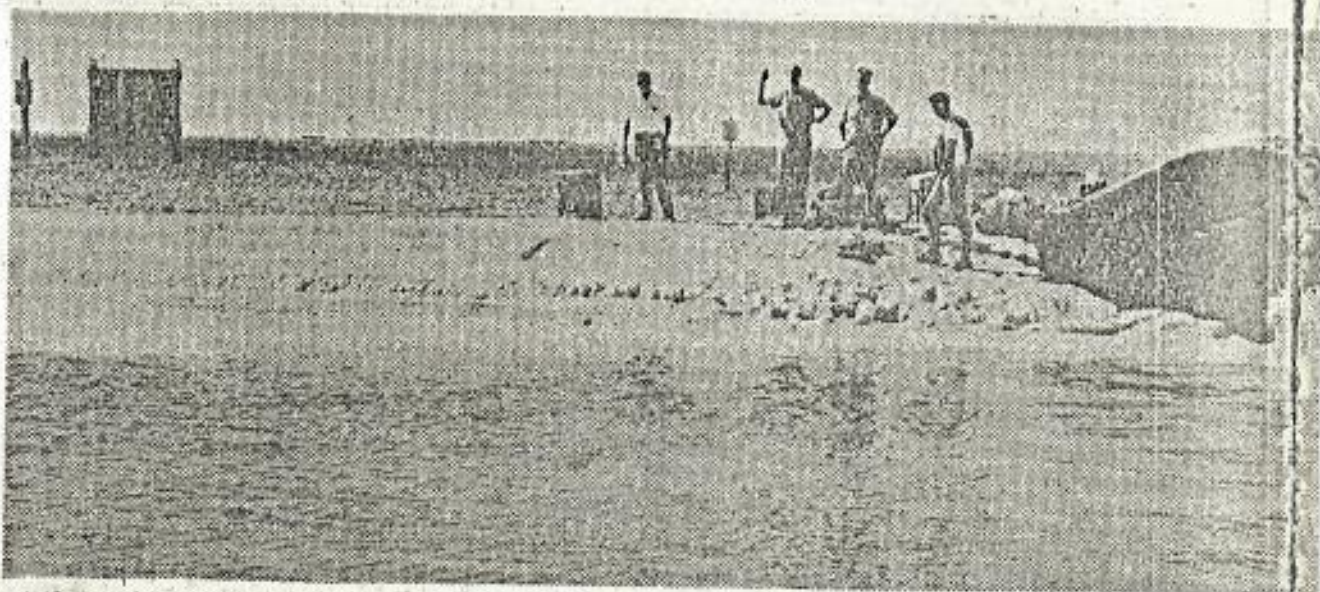
The oysters and sea life are protected by both State and Federal law.

The island was also leased by guano diggers in the 1890s, but the company made little use of the island which sport far less of the white bird droppings than several other islands of the refuge.

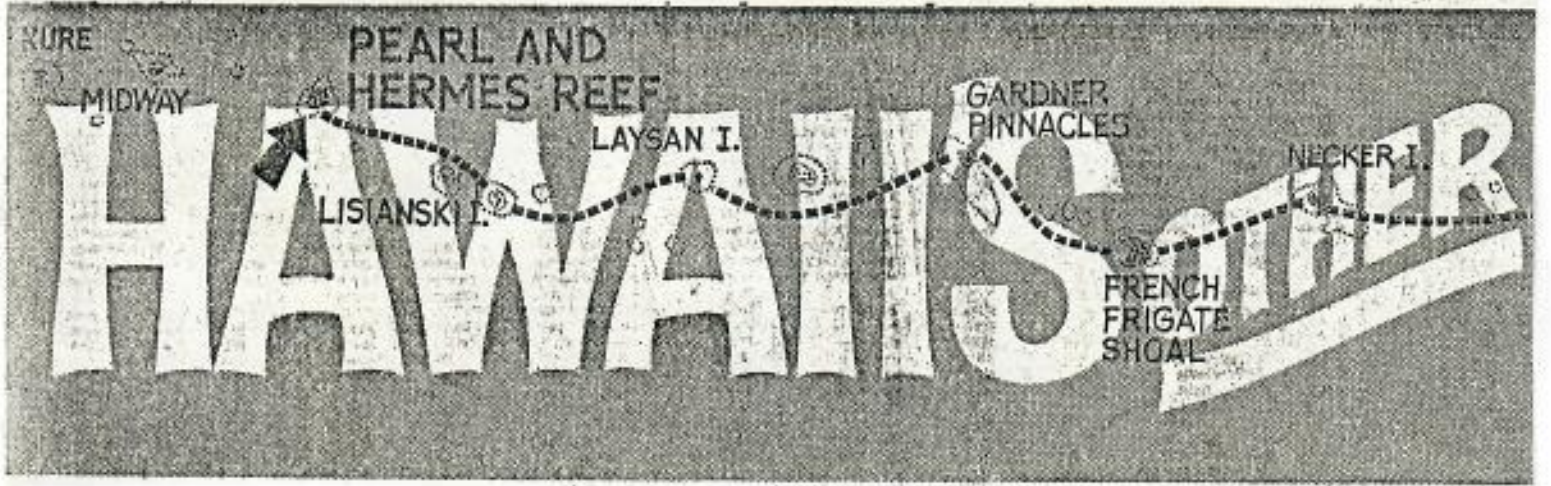
No land birds make their home on the flat shifting islands, which are devoid of trees.

Sea birds, such as the Laysan albatross and the booby, dig burrows between the bunches of grass and low herbs that grow on the larger islands.

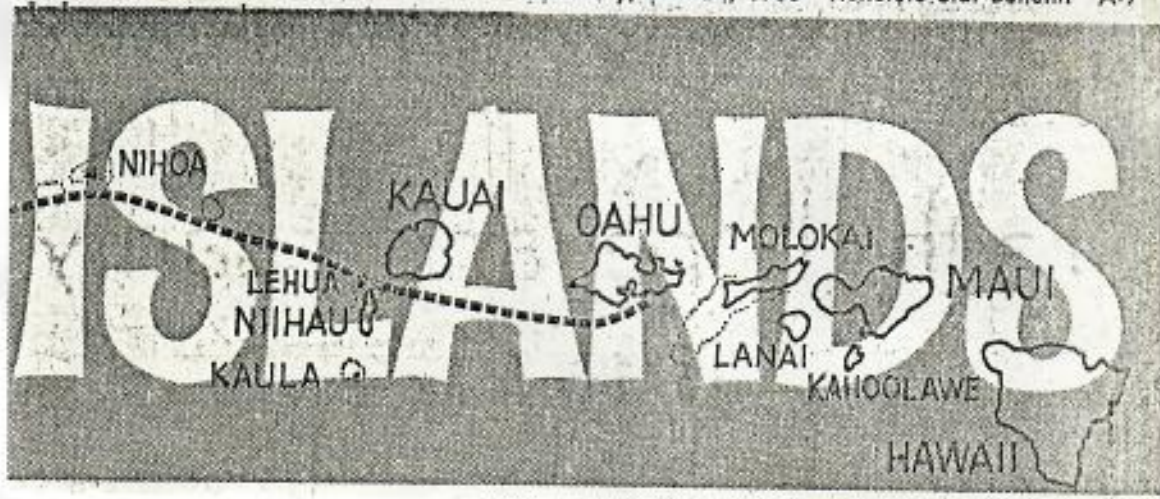
Only two narrow breaks on the south rim of the reef allow very small boats to enter the lagoon. The rest of the oval reef juts above the water or lies only a few feet under water.

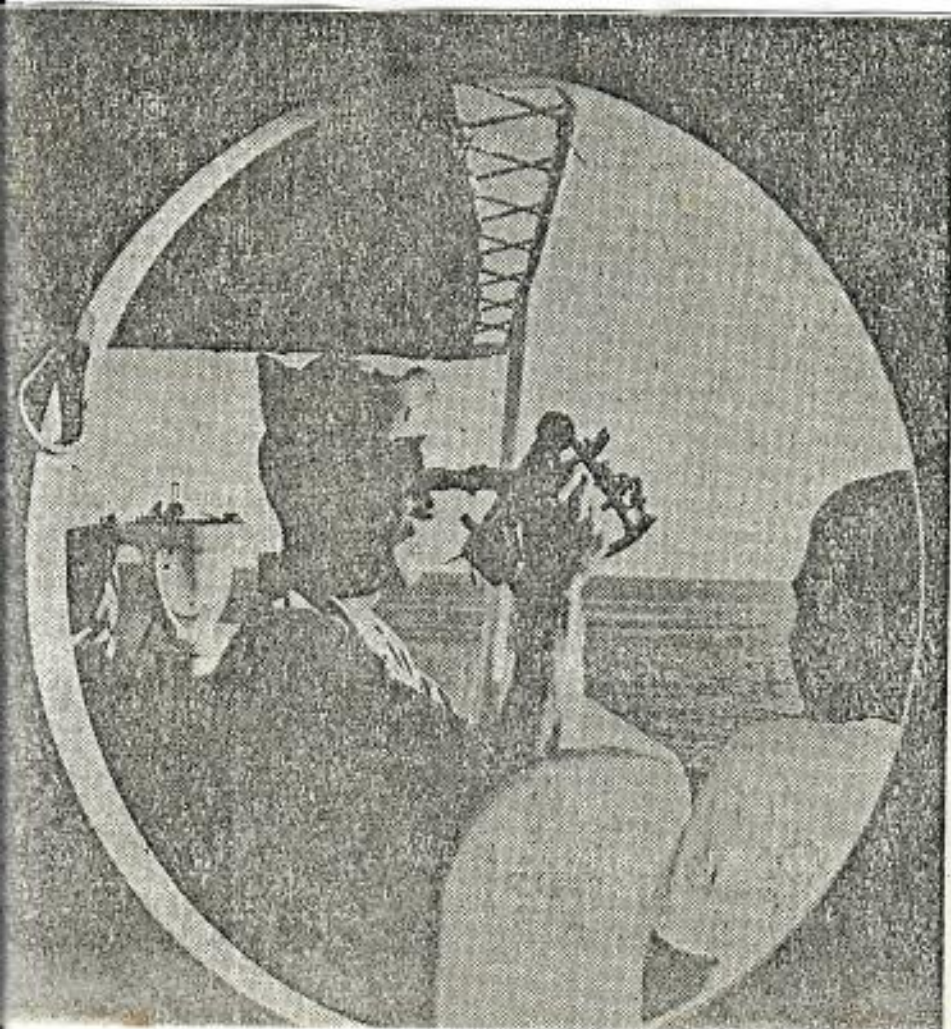


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Saturday, Dec. 24, 1966 Honolulu Star-Bulletin A-9





The Leeward Islands, often called Hawaii's "other" islands, spread in gold, green and black dots 1,200 miles into the Pacific northwest of Honolulu.

All but unknown and sparsely inhabited, most of the islands have been set aside by the Federal government as the Hawaiian Islands National Wildlife Refuge to protect the unusual biological life for future generations.

Travel through the refuge is restricted by the U.S. Bureau of Sport Fisheries and Wildlife, Star-Bulletin chief photographer Warren Roll accompanied scientists on an inspection tour this fall.

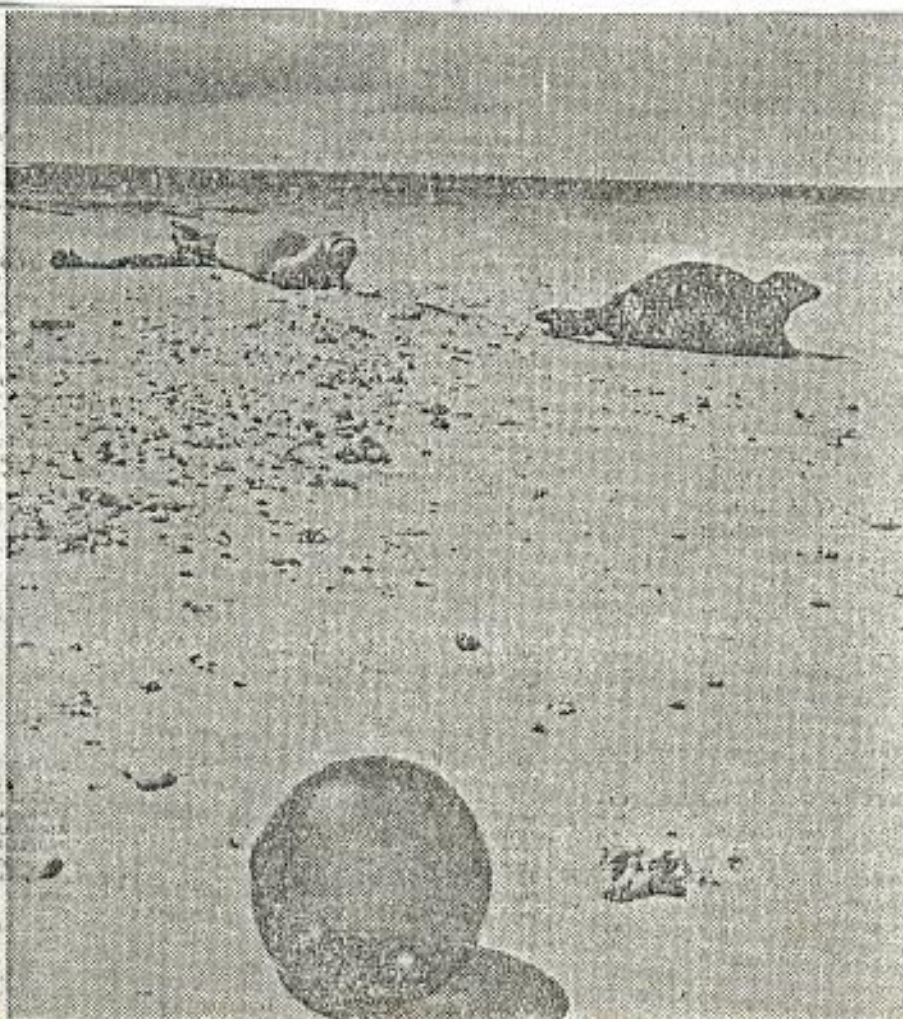
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Putting 1,200 miles into the Pacific the "other" islands of Hawaii form a sparkling necklace of reefs, shoals, rocks and islands.

Among the world's most beautiful and fascinating birds circle and play above the islands, most of them a part of the Hawaiian Islands National Wildlife Refuge.

For the protection of the birds and other wildlife, entrance to the islands is restricted by the U.S. Bureau of Sport Fisheries and Wildlife.

This fall Star-Bulletin chief photographer Warren Roll received permission to follow wildlife officials on an inspection tour of the islands. His photographs form a unique documentary on the islands and their "inhabitants."

LISIANSKI Island was discovered the hard way. At 10 p.m. October 15, 1805 the Russian exploring ship Neva ground to a halt against one of the reefs to the east of the flat coral and sand island.

An angry Captain Urey Lisiansky ordered all guns, anchors, cables and heavy objects thrown overboard so the ship could be refloated.

Two days later with his ship out of danger the Russian captain explored the island that today carries a misspelling of his name (officially adopted by the U.S. Geographic Board in 1924) and the shoal to the east carrying his ship's name.

He found the island 905 miles northwest of Honolulu to be a flat sandy rectangle a mile and a quarter long and three quarters of a mile wide. Jagged reefs protected the small island which abounded in birds, seals, turtles and fish.

At one end of the island a V-shaped mound of sand rose to an elevation of 40 feet. This barrier perhaps once guarded a lagoon or shallow lake.

Despite a history of tragic destruction of life on the island, Lisianski today looks little different from the day Lisiansky set foot on it—thanks to almost 60 years of protection by the U.S. Bureau of Sport Fisheries and Wildlife.

The many jagged reefs surrounding the island and Neva Shoal provide an effective natural protection from human disturbance.

At least three ships are known to have met their fate on the silent reefs—the American ships Conahassett and Holder Borden and the Japanese ship Aju.

Ships now steer clear of Lisianski. But not long after



the turn of the century large parties of Japanese plume hunters landed on Lisianski and Laysan killing thousands upon thousands of sea birds for their feathers.

Once 75 stranded men were arrested when found with thousands of dried bird wings. The United States leveled \$20,000 worth of damages against the men, but at that time no law was found to protect the birds.

Today the island, like all in the Hawaiian Island National Wildlife Refuge, is being protected by the government until the plant and animal life can reach a safe balance.

Heavy fines and imprisonment now face any unauthorized persons who trespass or disturb the wildlife.

About the same time the plume hunters were slaughtering birds, rabbits introduced from Laysan Island by Captain Max Schlemmer were busy eating off almost all the vegetation on the tiny island. The rabbits were joined, again thanks to Schlemmer, in their unfortunate task by guinea pigs.

Finally, with only a single tobacco patch left, the rabbits and guinea pigs probably began eating each other until 1923 when none were found on the island.

The loss of the plants, several of them found only on that island, brought fantastic destruction to the sea birds who used the grasses and low plants for shelter and breeding areas.

Turtle hunters added to the destruction of wildlife by killing off by the hundreds the now rare green sea turtles—almost wiping out the entire breeding population of Lisianski.

Where once the beaches were dotted with turtles sunning themselves, scientists only found two turtles on this trip.

When the refuge was established by President Theodore Roosevelt in 1909 patrols sent to the island promptly arrested and prosecuted 15 Japanese bird killers found on Laysan and eight found on Lisianski.

Today grasses and low-lying plants cover the island, which is pox-marked with the underground burrows and nests of sea birds.

Two lone palms and seven small ironwood plants provide the only shade.

Scientists on this trip counted 139 Hawaiian monk seals and tagged 17.

Unlike Laysan, which was able to develop its own species of land birds, Lisianski probably was never the home of land birds.

Scientists have counted as many as 2,600 Laysan albatross nests and estimate the population of Bonin Island petrels and Sooty terns at 100,000 each.

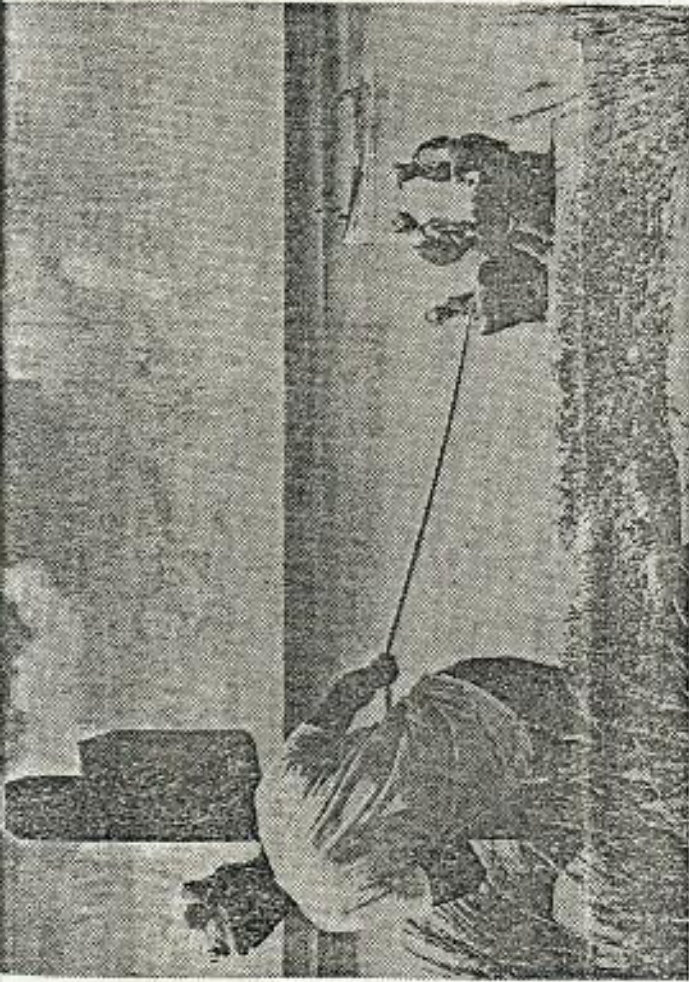
Landing on Lisianski has not been easy for scientists. A narrow passage winding through the reefs is dangerous even in calm weather. But several times heavy surf has prevented scientists from landing.

Because of its natural protection and its similarity to some other islands in the refuge scientists are exploring the idea of transplanting to Lisianski several of the rare species of birds threatened with extinction on the islands with the hope that they will survive and breed on the new island.

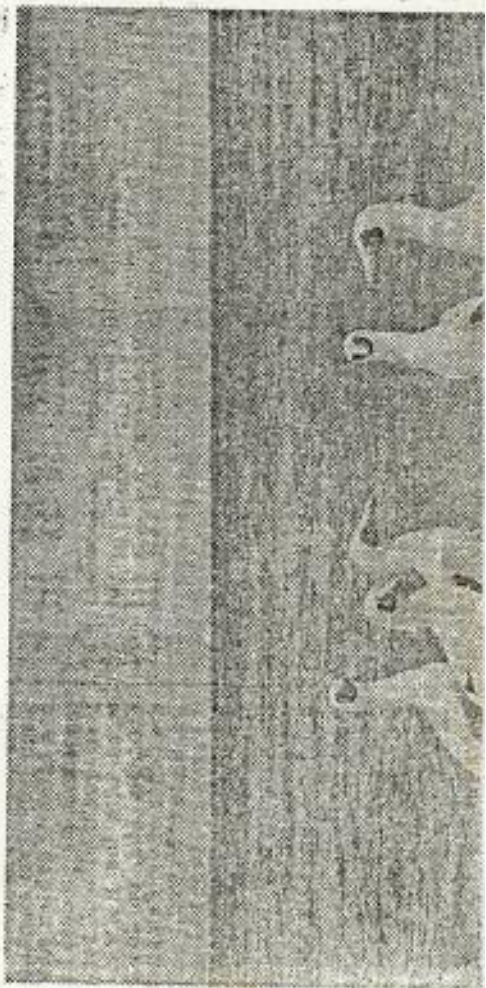
By spreading the distribution of these rare birds, scientists hope to prevent the elimination of the birds by a single wind storm, disease or natural calamity on their native island.



Boatswain's Mate First T. C. Otte steers the launch carrying a group of scientists away from the Coast Guard Cutter Ironwood through the winding passage to Lisianski Island. The Coast Guard, and sometimes the Navy, transports wildlife officials through the Leeward Islands on irregular inspection tours.

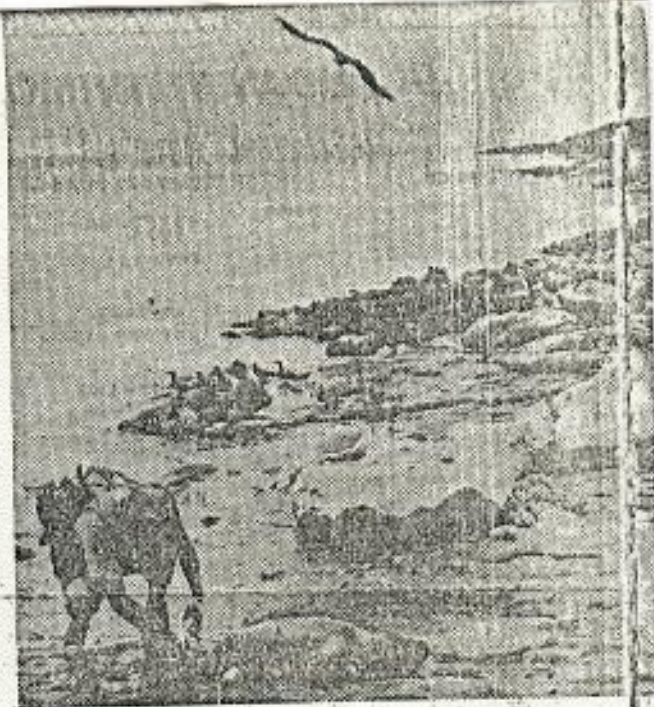


Safely through the jagged reefs, shown through the calm waters in the background, the scientists pull their boat ashore. The extra boat was taken along in case the first were to accidentally strike a reef or in case the fast-rising surf were to leave the men stranded on the island. During a previous trip the men were stranded on Laysan Island for four extra days while heavy surf prevented their rescue.





Two lone palm trees provide virtually the only shade on the rectangular-shaped island. Walking across the island is exhausting as scientists break through the underground burrows.

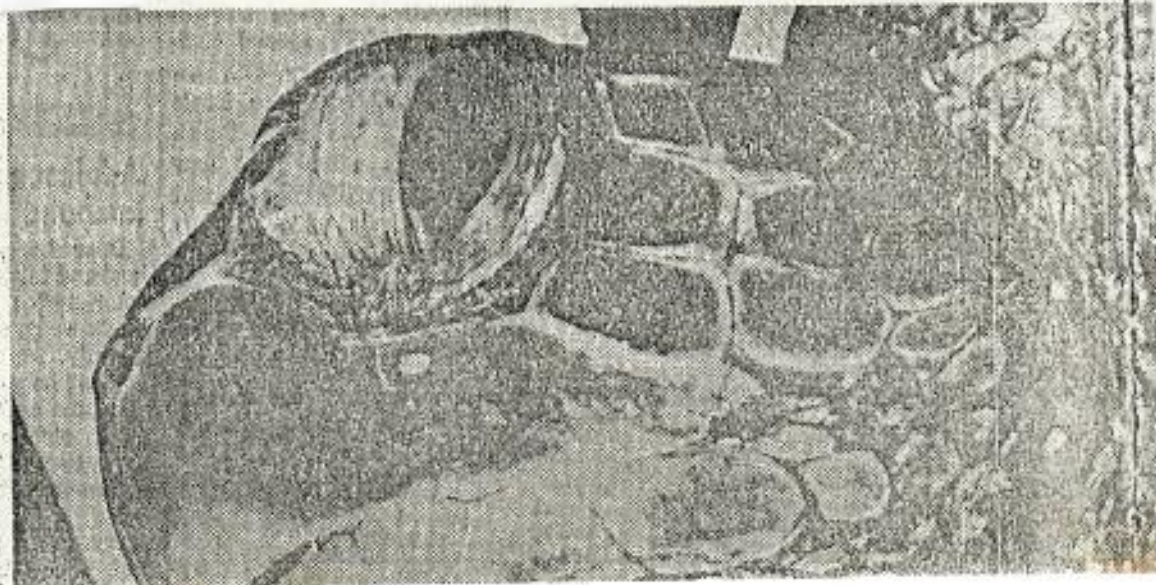


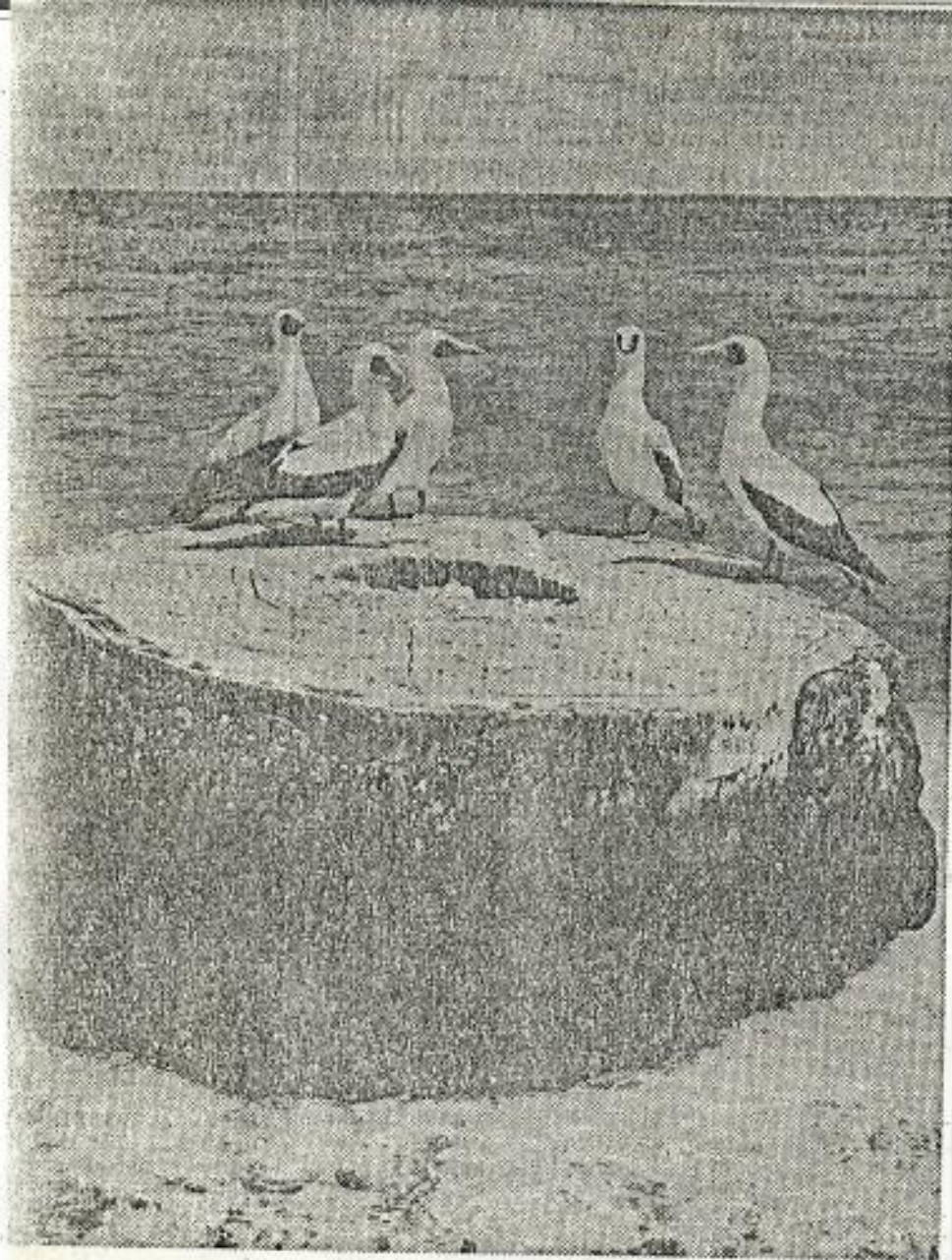
While a frigatebird above and roddy terns and blue-faced boobies look on, Eugene Kridler, manager of the refuge and head of the local office of the U.S. Bureau of Sport Fisheries and Wildlife, tags a young sleeping Hawaiian monk seal. Once tagged the seal opened his eyes, looked at Kridler then went back to sleep. "Seals can bite," Kridler said. This one luckily didn't.

A green sea turtle lifts the heavy protection from its eye to take a look at the world. Only two of these turtles were spotted on Lisianski during this trip. Although they are found throughout the



temperate climates of the world, the refuge is the primary breeding grounds for the turtle. Scientists tag the turtles to follow their travels and to learn how to pro-



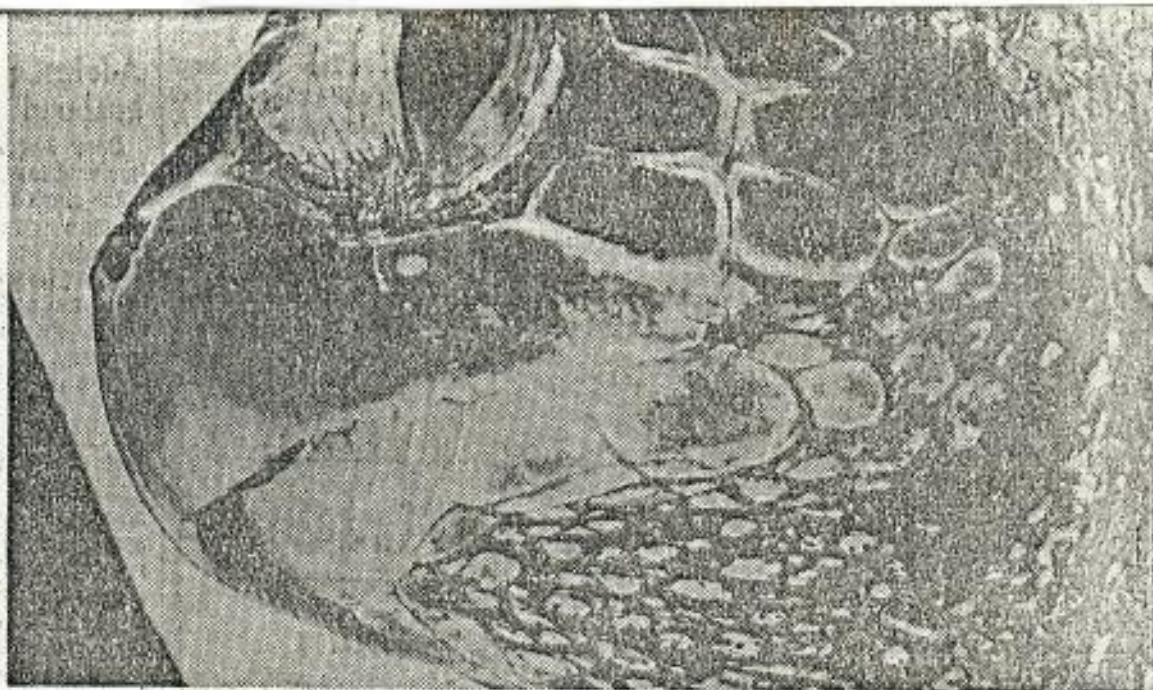


at a time finds these blue-faced boobies swapping gossip on a redwood stump. Often called the masked booby, the heavy bird lays two or three eggs but usually only raises one young at a time. It dives in the waters around the reefs for small fish and nests on the ground.

A green sea turtle lifts the heavy protection from its eye to take a look at the world. Only two of these turtles were spotted on Lisianski during this trip. Although they are found throughout the



temperate climates of the world, the refuge is the primary breeding grounds for the turtle. Scientists tag the turtles to follow their travels and to learn how to protect their breeding areas.



Following a hot, exhausting inspection of the wildlife on the island Kridler (left) and Ron Walker of the State Fish and

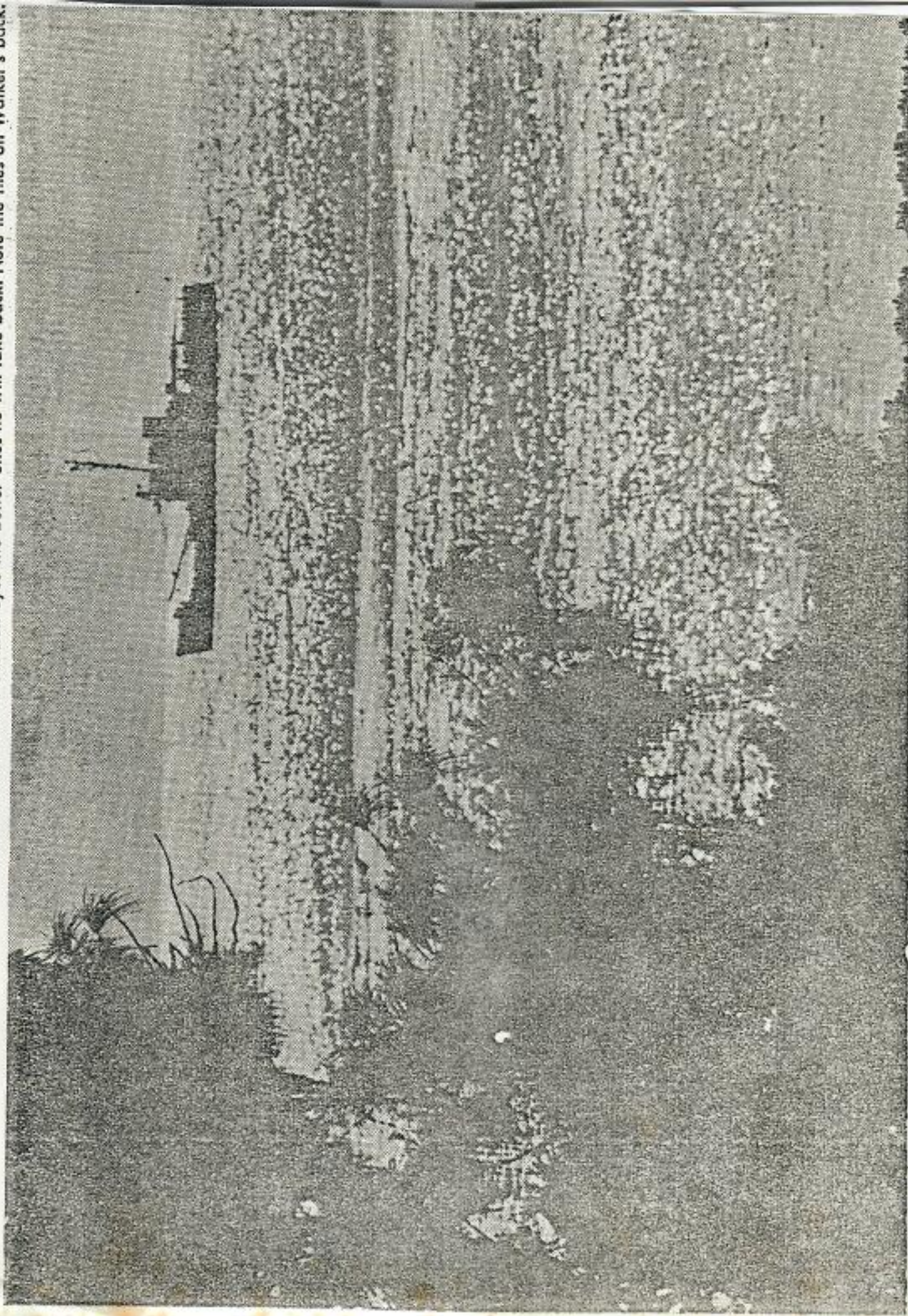


Game Division share some coconuts from the island's two trees. Thousands of pesky house flies cling to the men's backs as they go about their business.



read.
Others face a stiff fine and imprisonment if caught trespassing or disturbing the wildlife on the islands of the refuge.

Glass balls galore clutter the beaches of Laysan and many of the Leeward Islands. Ron Walker of the State Fish and Game Division eyes the better ones he will take back. Note the flies on Walker's back.

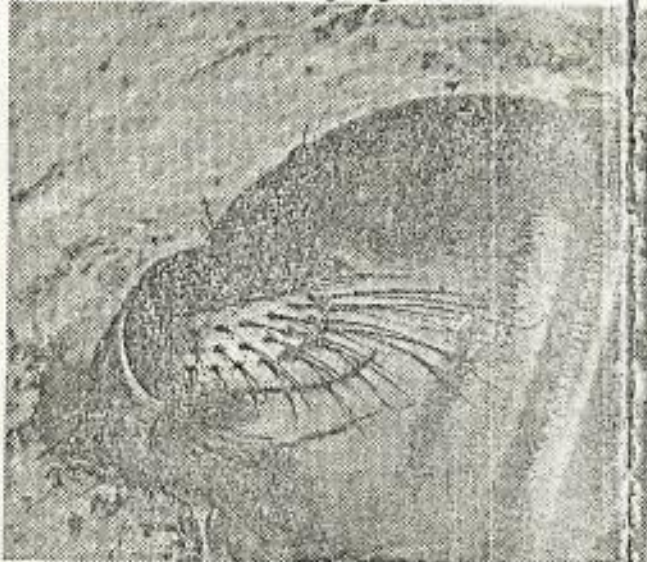


U.S. Coast Guard cutter Ironwood lays at rest near its namesake, the only ironwood tree on the tiny island of Laysan. The tree supplies a nesting place for Laysan's birds.

through its only habitat, the island of Laysan. The dusky colored 16-inch-long duck almost met extinction during the early 1900's when rabbits ate off the vegetation it uses for shelter and nesting. Scientists estimate that between 450 and 500 ducks now live on the island—an encouraging comeback for the docile bird.



This bristle-thighed curlew had just completed its annual migration from its home in Alaska—a fantastic 2,000 mile non-stop journey. In May the curlews will begin their long flight north.



A Hawaiian monk seal dozes in the warm sand and shallow waters of Laysan. The mammals sleep during most of the day and hunt fish at night.

Finally in 1903 the island's only inhabitant at that time, Captain Max Schlemmer, introduced rabbits to the coral island.

Within a few years the rabbits had literally stripped the island of all vegetation causing untold casualty to the birds.

The bird population dropped from about 10 million in 1902 to less than one tenth that in 1911.

Before the rabbits themselves died of starvation or were killed by scientists, their work had claimed the existence of at least three species of the precious endemic land birds.

The island, 790 miles northwest of Honolulu, is shaped like a giant Hawaiian poi-pounding board or serving dish. It is two miles long and about a mile wide.

It ranks alongside Nihoa Island as having the most abundant wildlife population throughout the islands of the Hawaiian Island National Wildlife Refuge.

Laysan's beaches rise from the water's edge to about 15 feet in elevation, then flatten and rise slowly to a maximum height of 40 feet. This oval rim then sinks down into the lagoon 15 feet in depth at its deepest point. Only tiny brine shrimp and microscopic creatures live in the lagoon, which is twice as salty as the ocean.

The island was discovered by the captain of an unrecorded American vessel in the early 1800's. Not knowing of the discovery, Captain Stanikowitch sighted the island in 1828 and named it Moller Island after his ship.

Today, after almost 60 years of protection, the birds and plants are beginning to return to their normal abundance.

Scientists counted 126 Laysan ducks on this trip and estimated that 10,000 Laysan finches are now living on the island. The duck, once down to only seven, now are estimated at 450 to 500 in number.

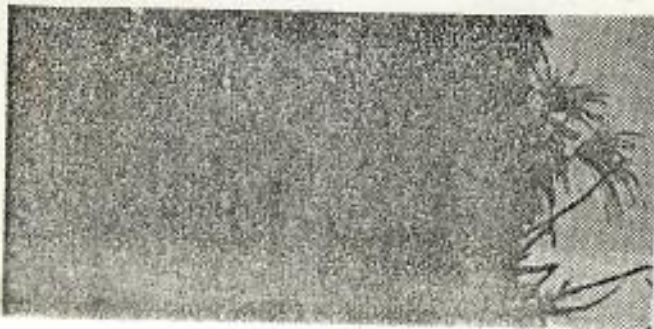
Although threatened with extinction, these birds survive, while the world will never again hear the chirps of the Laysan Rail, the Laysan Millerbird and the Laysan Apapane.

The island also supports about a million sooty terns, 150,000 Laysan albatross, 20,000 black-footed albatross and 200,000 Bonin Island petrels.

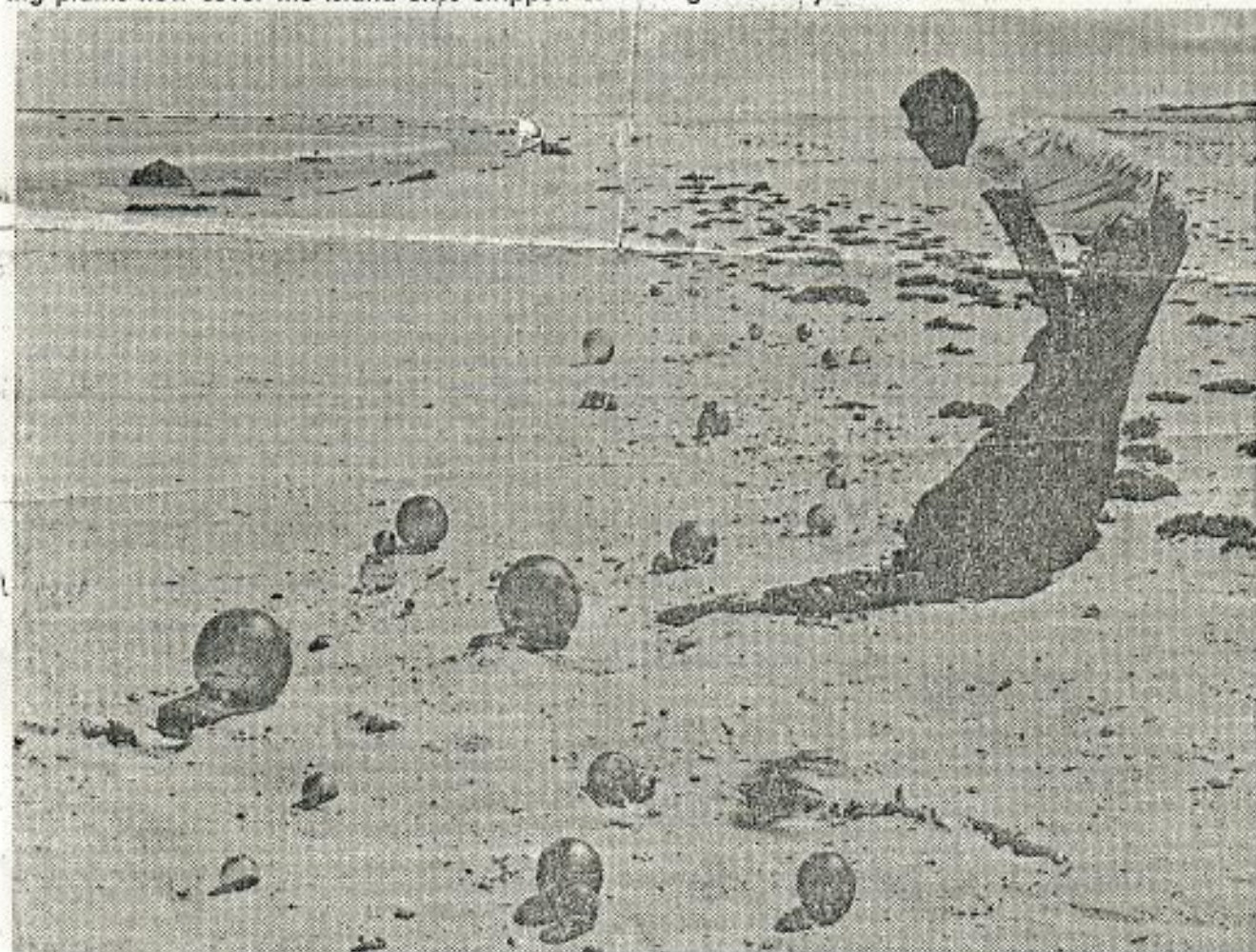
"People don't realize it, but just one seed or insect caught in the cuff of a pair of trousers can upset the balance again."

Entry to the island is temporarily restricted almost exclusively to scientist who receive permission from the bureau.

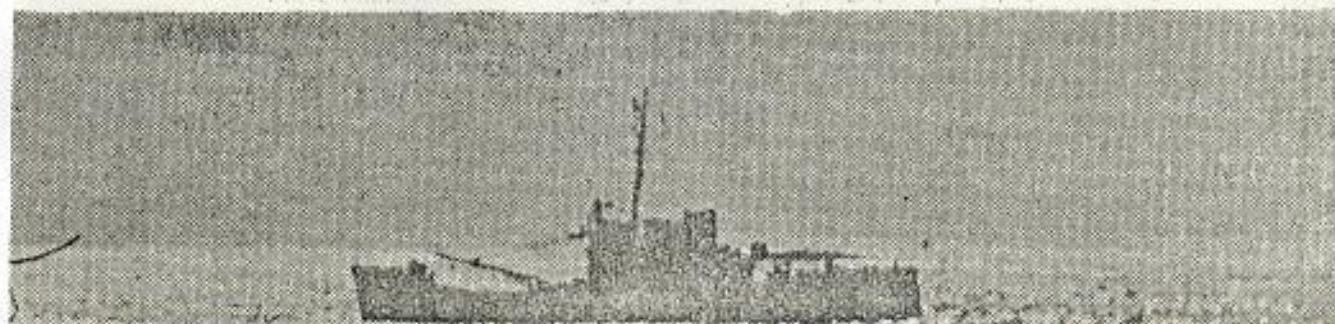
Others face a stiff fine and imprisonment if caught trespassing or disturbing the wildlife on the islands of the refuge.



A cluster of nine palms supply the only interruption in the flat, poi-pounding board shape of the island. Sea birds nest in holes dug into the sand and coral. Only an observant eye and a sure foot prevent the scientists from accidentally stepping into the camouflaged nests. A light cover of grasses and creeping plants now cover the island once stripped of all vegetation by rabbits.



Glass balls galore clutter the beaches of Laysan and many of the Leeward Islands. Ron Walker of the State Fish and Game Division eyes the better ones he will take back. Note the flies on Walker's back.

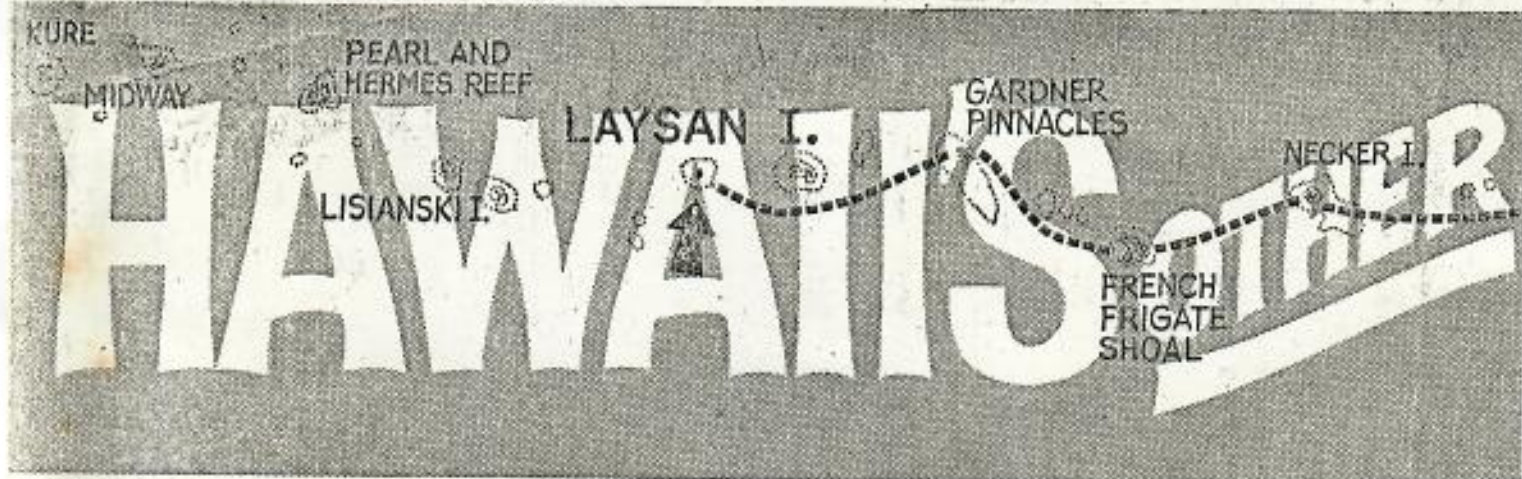


The Laysan finch is the only songbird left on the island. The little yellow-breasted bird is often heard mimicking the many local sea birds, although its own song is a pretty one. Once decreased to a handful, scientists now place its number at 8,000. Several of these birds were brought back to the Honolulu Zoo and sent to the Mainland to determine if the birds can be bred and protected in captivity.



The Laysan duck, also called the Laysan teal, survives through its only habitat, the island of Laysan. The dusky colored 16-inch-long duck almost met extinction during the early 1900's when rabbits ate the vegetation it uses for shelter and nesting. Scientists estimate that between 450 and 500 ducks now live on the island—an encouraging comeback for the docile bird.





Widely unknown to the inhabitants of the "lower seven" a necklace of coral islands and atolls, all a part of Hawaii, stretch 1,200 miles northwest into the Pacific.

Many of the islands harboring beautiful and rare birds are a part of the Hawaiian Islands National Wildlife Refuge.

They are protected from dangerous outside influences by the U.S. Bureau of Sport Fisheries and Wildlife and the State Fish and Game Division.

Star-Bulletin chief Photographer Warren Roll accompanied the wildlife officials on a unique tour of the islands this fall.

Laysan Island, a flat sand and coral rectangle, sports few trees and a large briny lagoon.

Beneath the few palms, sandalwood and ironwood trees of the two-square mile island five distinct species of land birds have evolved—birds found no where else in the world.

Laysan is a fascinating example of how the plants and creatures of nature can thrive so abundantly even on a small, remote coral island.

But it is also an unfortunate example of how man can almost destroy that life by just slightly tilting the balance of nature.

The first imbalance came in 1800 when guano hunters arrived to harvest the thick white droppings which have accumulated for centuries.

Next Japanese bird poachers slaughtered hundreds of thousands of birds for their feathers.

Finally in 1903 the island's only inhabitant at that time, Captain Max Schlemmer, introduced rabbits to the coral island.

Within a few years the rabbits had literally stripped the island of all vegetation causing untold casualty to the birds.

ISLANDS

NIHOA

KAUAI

OAHU

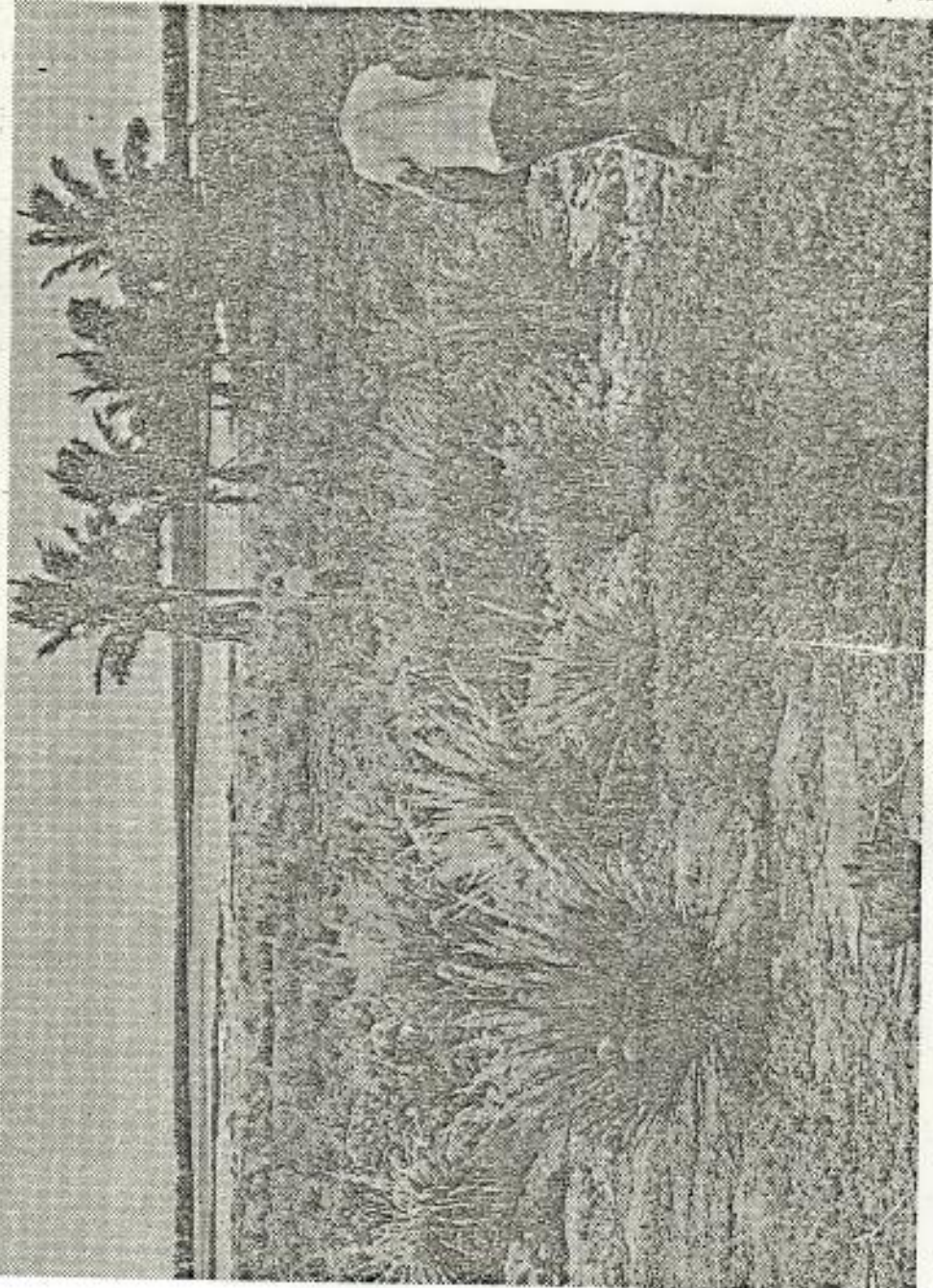
MOLOKAI

MAUI

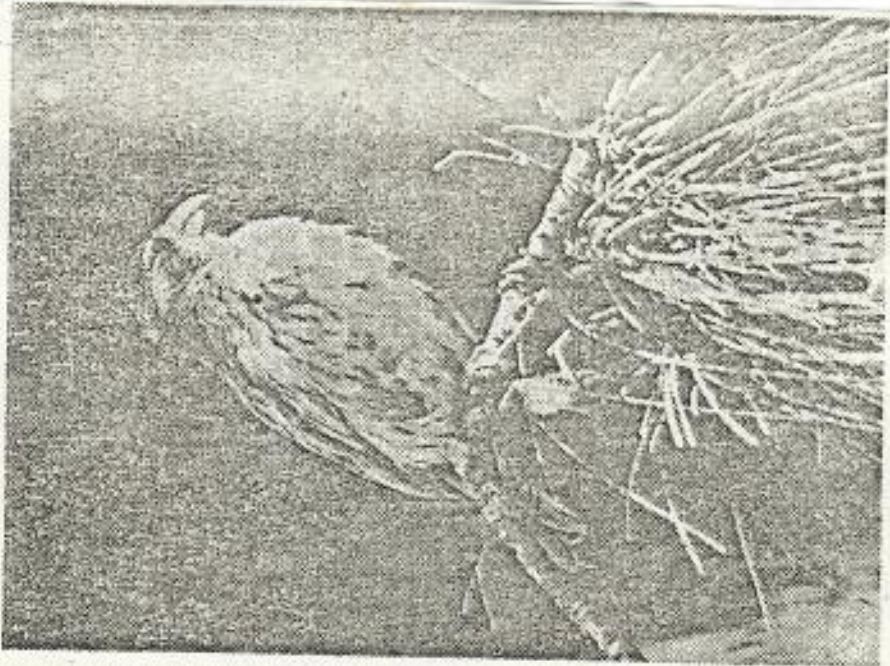
LANAI

KAHOLAWE

HAWAII



A cluster of nine palms supply the only interruption in the flat, poi-pounding board shape of the island.



The Laysan finch is the only songbird left on the island. The little yellow-breasted bird is often heard mimicking the many local sea birds although its



MILLIONS of years ago lava erupted from the bottom of the sea to form a high volcanic peak perhaps 15 miles in diameter above the ocean.

Rain and waves eroded the slopes and coast of this volcanic peak located 480 miles northwest of Honolulu until all that is left of the nameless volcano is a rocky peak 122 feet high and 500 feet long.

La Perouse Rock stands in the eye of the crescent of reefs, shifting sands and coral islands that make up French Frigate Shoal. When the light is right, sailors say, the rock looks like a frigate under full sail.

The shoal was named, not for the rock, but for the two French vessels of Jean Francois de Galaup, Comte de la Perouse, which nearly met their doom in 1796 on the jagged protective reef.

The flat sandy islands within the reef are the breeding ground for thousands of sea birds, the rare Hawaiian monk seal and the green sea turtle—all of which live under the strict protection of the Federal and State governments.

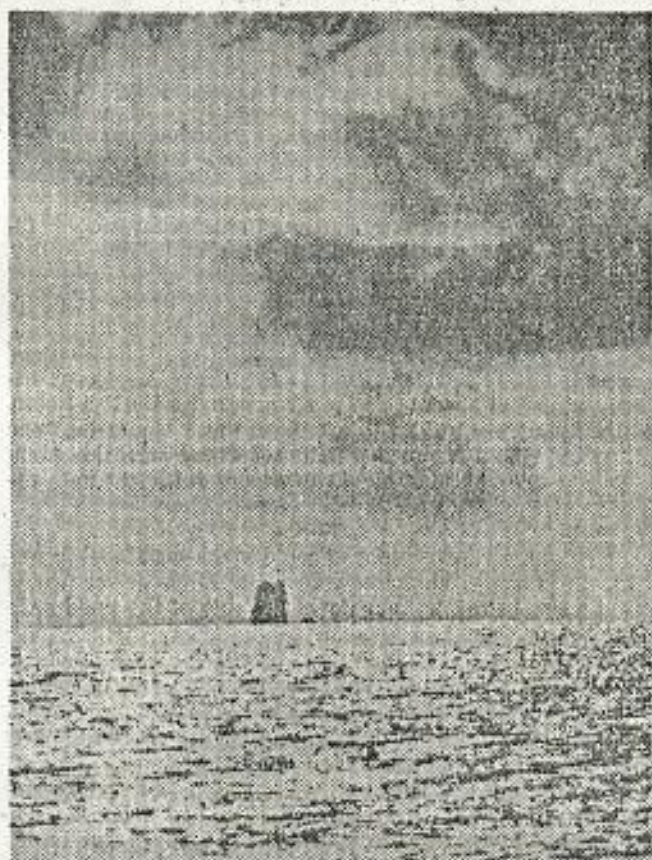
One of them, Tern Island, is also the home of about 20 Coast Guardsmen who man the Loran (Long Range Navigation) station, guiding ships through and away from the Leeward Islands.

The Shoal was the third stop for officials of the U.S. Bureau of Sport Fisheries and Wildlife and the State Fish and Game Department. Here the men banded seals, measured and marked turtles, counted birds and conducted other biological studies while looking for signs of intruders.

Watching 65 tiny turtles hatch

One special treat on this trip was the chance to observe 65 tiny turtles hatch from their underground nest and creep their way down the beach to the ocean.

The crescent reef of the shoal is 18 miles in diameter. At least 12 of the sandy coral heads poking above the water have been named with a name.



La Perouse Rock, the last remains of a giant mid-ocean volcano, seems to sail stationary in the crescent reef of French Frigate Shoal. When the

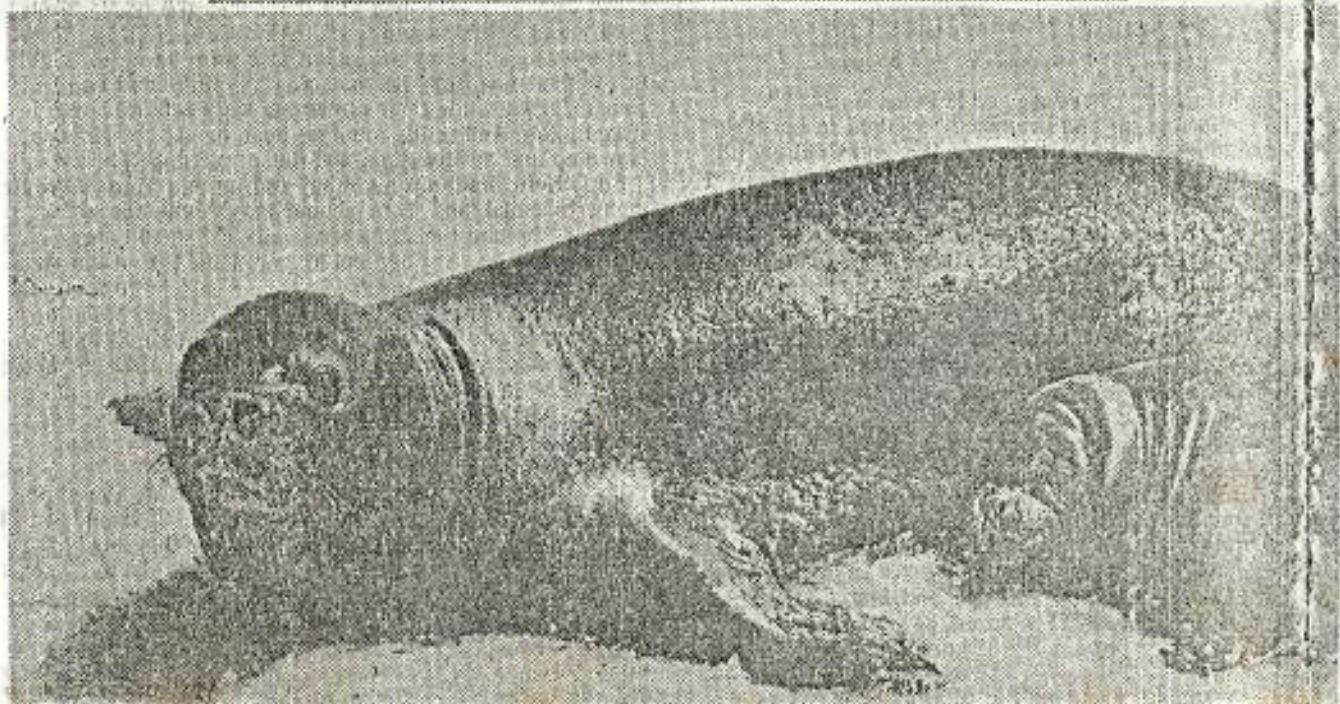
ISLANDS

Widely unknown to the inhabitants of the "lower seven" islands of Hawaii, the coral and sand dots of the Leeward Islands stretch northwest into the Pacific.

The tiny islands and reefs are inhabited almost exclusively by seals, turtles and thousand upon

thousands of land and sea birds. For the protection of these animals, many of them rare species, entry to the islands is restricted by law.

Star-Bulletin Chief Photographer Warren Roll visited most of these islands this fall on an inspection tour by wildlife officers and the Coast Guard.



Watching 65 tiny turtles hatch

One special treat on this trip was the chance to observe 65 tiny turtles hatch from their underground nest and creep their way down the beach to the ocean.

The crescent reef of the shoal is 18 miles in diameter. At least 12 of the sandy coral heads poking above the water have been graced with a name.

The islands, like all those in the Hawaiian Islands National Wildlife Refuge, is a part of the City and County of Oahu. If they desired, the resident Coast Guardsmen could vote in municipal and State elections.

Tern Island, the home of the Loran station, is a flat, mostly man-made coral rectangle—looking from the air like a stationary aircraft carrier.

The 1,100-yard-long runway was built from coral dredged from the reef during World War II to act as the "unsinkable aircraft carrier" during the expected attack on Midway.

The \$1,800,000 project was never needed for that purpose, but it allowed Navy strategists to sleep a little sounder. The project manager for the dredging was Lowell S. Dillingham, now president of the multi-million dollar Dillingham Corporation.

Commercial fishing vetoed

After the war the Navy, which had technically been trespassing on the already established wildlife refuge, and the State government talked briefly about opening the shoal for commercial fishing, using the runway to fly catches back to Honolulu.

But this, as well as another suggestion to form a fishing resort, was discouraged by conservationists who insisted the islands continue to be set aside to protect for future generations the delicately balanced and, in many cases, endangered fish and wildlife populations on the islands.

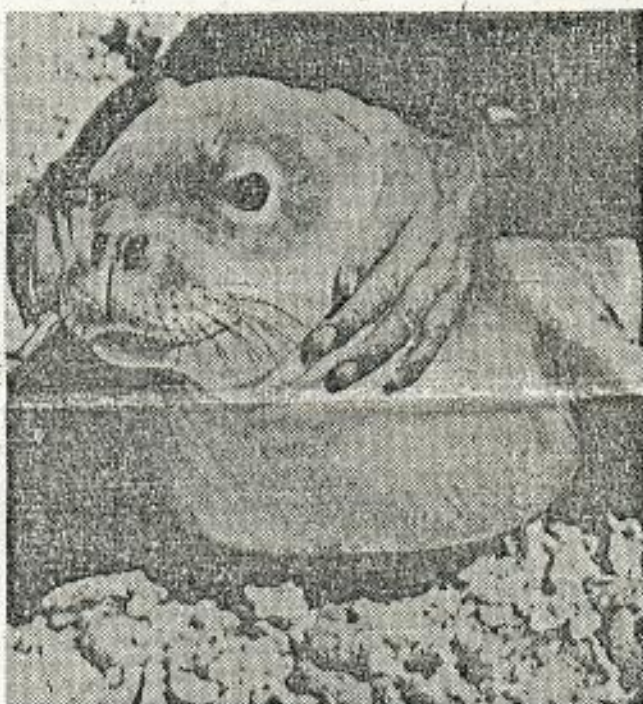
Today, after more than 50 years of protection, the Hawaiian monk seal population, found principally in the waters of the Leewards, now number at least 1,500.

The Hawaiian seal is one of only three species of monk seals. One species, the Caribbean variety, is nearly extinct, and the Mediterranean species survives in greatly reduced numbers.

During inspection trips through the refuge scientists affix three-inch tags to the tails of seals and the flippers of sea turtles.


This enables them to follow their travels and learn of their habits and thus determine needs, such as the protection of breeding and feeding areas.

La Perouse Rock, the last remains of a giant mid-ocean volcano, seems to sail stationary in the crescent reef of French Frigate Shoal. When the sunlight strikes it from the right angle, the white bird droppings on the cliffs shine giving the rock the appearance of an ancient ship under full sail.

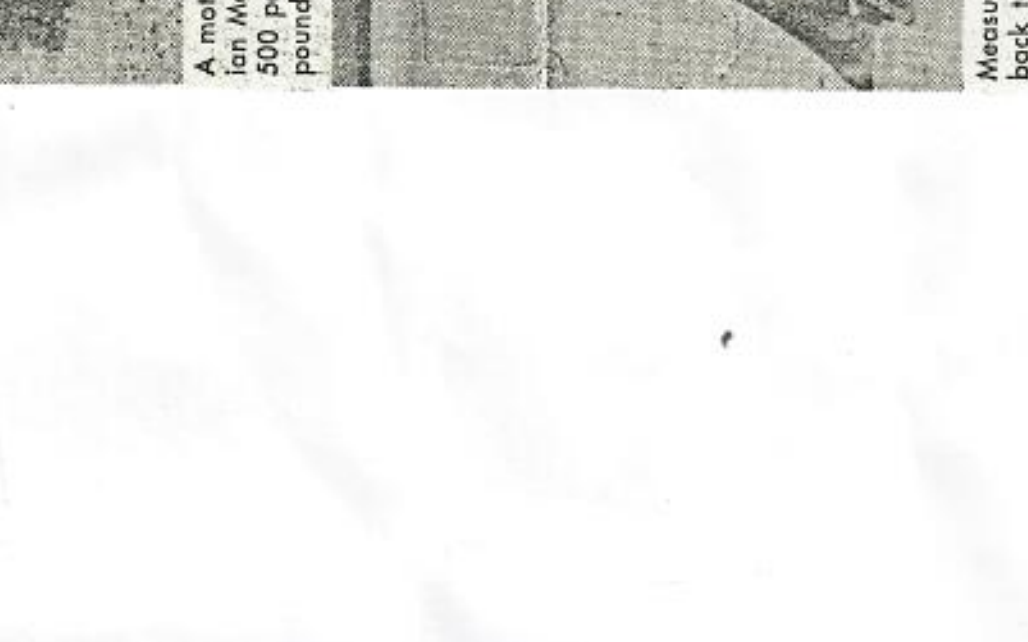


A scientist inspects a healthy baby seal while another applies a tag. On these inspections officials have counted 500 seals on the refuge islands. French Frigate Shoal usually harbors about 50. Eighty four were tagged on this trip, many of them during a week-long stay at Pearl and Hermes Reef.





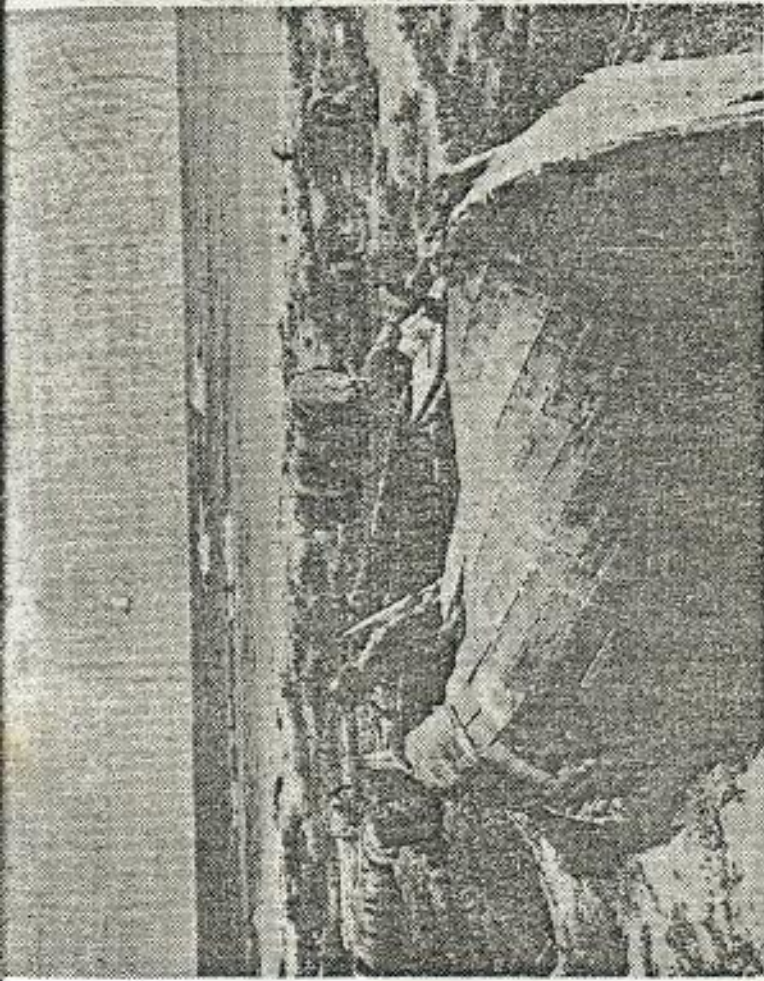
A mother seal and her pup cast a wary eye at biologists who are preparing to tag the pup. Hawaiian Monk Seals weigh about 36 pounds at birth and are nursed by their mothers, who weigh about 500 pounds, for six weeks. The mother does not eat while she nurses the pup and loses about 200 pounds. This pup will soon be abandoned by its mother and make its own way in life.



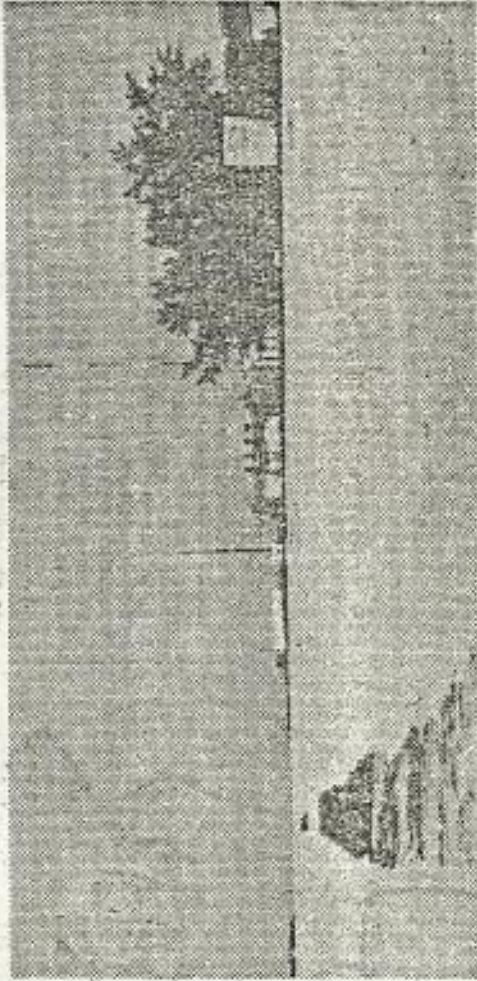
Measuring the green sea turtle is no easy job when the creature applies all its energies to crawling back to the ocean. The turtles measure from 34 to 39 inches wide and weigh 200 to 300 pounds. Scientists tag them and spray the backs of some to record their travels. The refuge is the most important breeding area for the species in the United States.



Poking above their underground nest two tiny (3 inches) Green Sea Turtles see the light of day for the first time. A nest of 65 hatching eggs was found on East Island. The eggs were laid underground to protect them from enemies such as ghost crabs 50 to 55 days before. The tiny turtles struggled about 50 feet down the beach to the ocean and new enemies like sharks and other fish.



Debris lies scattered over East Island located near the center of the shoal. The island was headquarters for the Coast Guard Loran station until it moved to Tern Island eight years ago. The quiet scene is broken only by the wailing of birds and the thunder of the breakers on the reef.



Tern Island, the "unsinkable aircraft carrier" of World War II, houses the only human life in the Hawaiian Islands National Wildlife Refuge — 20 men at the Coast Guard Loran station. The 1,100-yard-long runway is now used only once a week when food, supplies and mail are flown to the men.



Attempting a new method of seal tagging Eugene Kridler (left) of the U.S. Bureau of Sport Fisheries and Wildlife and Brian Harrington of the Smithsonian Institution place a tarp over the head of a big sleeping bull seal. The idea, taken from walrus taggers in the Arctic, is that the seal will be quieted by the dark.



It didn't work—at least not on this Hawaiian monk seal. The seal would not cooperate and thrashed all the harder. In the end it won and slithered tagless into the ocean. Scientists tag animals to follow their travels and learn of their habits. This enables biologist to determine their needs, such as the protection of breeding and feeding areas.

The Fairy Tern, often called the most beautiful bird of the Pacific, soars above its home on Necker Island. The white bird, only a little longer than a foot, was considered sacred by Hawaiians and many other Polynesian peoples. Feeding on tiny silver fish that flap above the water, the Fairy Tern is not often found in the major islands of Hawaii.



A Hawaiian Monk Seal grunts its protest at having been awakened by Eugene Kridler, Hawaii administrator of the U.S. Bureau of Sport Fisheries and Wildlife. The monk seal is one of the mammals listed as threatened by extinction and protected by the U.S. Department of the Interior.

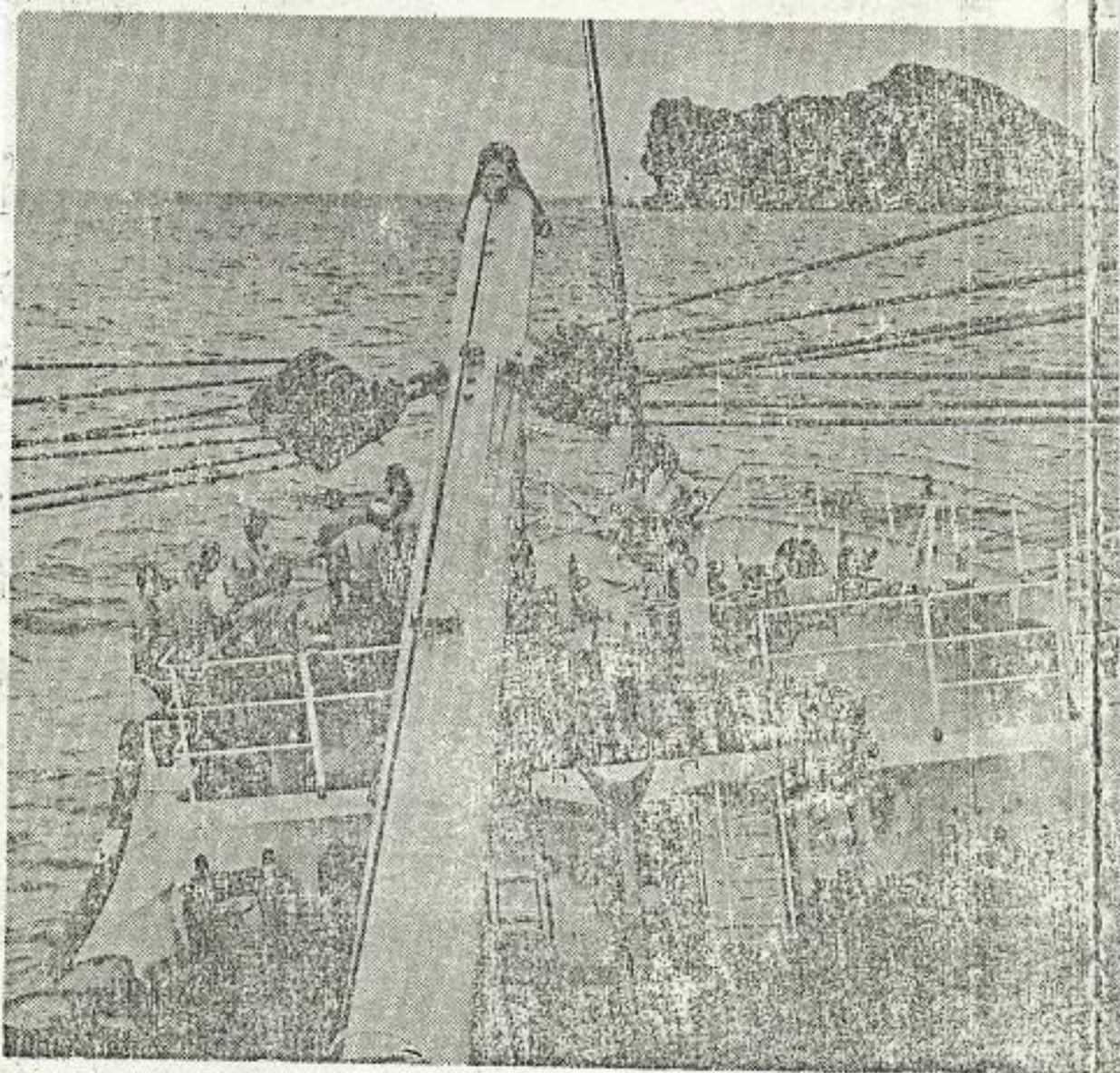
In 1894 six images, the last to be found on the island, were removed. Only four of those remain—two in the British Museum and two in Honolulu's Bishop Museum. Still perching on the upright slabs are the thou-

stay the previous month.

The island is distinguished by its many house and temple ruins and by two tiny land birds, the Nihoa Millerbird and the Nihoa Finch, both considered threatened with extinction by ornithologists.



Dawn at Necker Island



Rolling in the Pacific swells the Coast Guard cutter Ironwood approaches the rocky cliff island. The sea was relatively calm, however, and those who had landed many times before called it the "quietest landing yet."

wide. The highest of its five small peaks is Summit Hill, 276 feet in elevation.

A cove formed by the joint of the rocky fish hook is aptly called Shark Bay.

The expedition, which included representatives of the U.S. Bureau of Sport Fisheries and Wildlife and the State Fish and Game Department, landed near a rocky ledge in relatively calm waters.

"We encountered the quietest waters and easiest landings we've ever had," reported Eugene Kridler, Hawaii administrator of the U.S. Bureau of Sport Fisheries and Wildlife.

The island was "discovered" and named by the French navigator Jean Francois de Galaup comte

de la Perouse in 1788, long after the Polynesians had left. It was named for Jacques Necker, French minister of Finance under King Louis XVI.

Violent winter surf prevented La Perouse from landing on the rocky cliff-lined coast.

The Necker people, proba-



The Fairy Tern, often called the most beautiful bird of the Pacific, soars above its home on Necker Island. The white bird, only a little longer than a foot, was considered sacred by Hawaiians and many other Polynesian peoples. Feeding on tiny silver fish that flap above the water, the Fairy Tern is not often found in the major islands of Hawaii.



spits. They are also suspected to be the remains of the archaic Hawaiian culture.

bly pilgrims from the other Hawaiian islands, never numbered more than 200 on Nihoa, a neighboring island, and probably consisted of a handful on Necker, according to a study of the two islands by Kenneth P. Emory of Bishop Museum.

But on the smaller island the people built 34 maraes, low platforms with upright slabs of stone. Against some of these slabs the Necker people apparently propped small stone images of male human figures, Emory says.

The maraes were not used as burial grounds, archeologists estimate, but as shrines for some unknown religious practice.

After the island was abandoned it was used occasionally by the Hawaiians for seasonal camping and bird-hunting.

The stubby basalt figures and the tools of the Necker people differ from any discovered among the Polynesian culture, leading Emory to believe that the Necker people were a part of the original culture of Hawaii.

Abandoned and untouched for seven centuries the culture was preserved in its tools and art objects while the original Hawaiian culture was changed with the arrival of new Polynesians from the south, Emory speculates.

In 1894 six images, the last to be found on the island, were removed. Only four of those remain—two in the British Museum and two in Honolulu's Bishop Museum.

Still perching on the upright slabs are the thou-

sands of sea birds who have never deserted the island.

Wildlife officials have counted as many as 25,000 nests of the Hawaiian Sooty Tern on the tiny island. On the trip this fall they counted 4,000 nests of the Common Noddy.

Also sharing nests on the rocky cliffs and ledges are the Laysan Albatross, the Blue-Faced and Red-Footed Boobys and the pirate-like Frigatebird.

Soaring above them all in beauty is the small white Fairy Tern, often called the most beautiful bird of the Pacific.

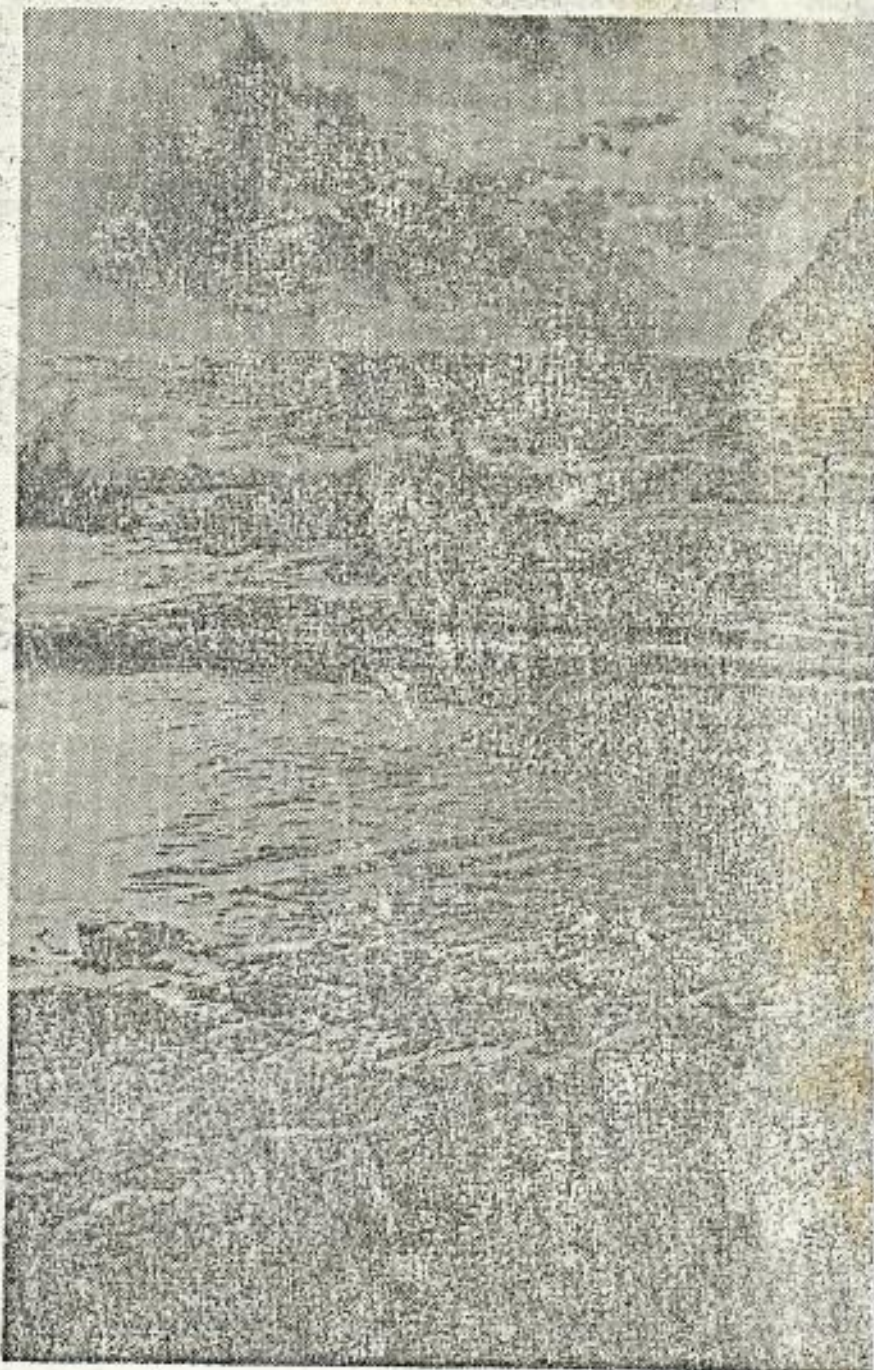
On this trip wildlife officials also counted on the rocky shores 10 Hawaiian Monk Seals and six Green Sea Turtles, both of which are being protected by the U.S. Department of the Interior.

With the exception of its size and vegetation, Necker is little different from its neighbor of 180 miles, Nihoa Island.

Nihoa or Bird Island ranks alongside Laysan Island in its vital importance to the bird populations of the Leeward Islands.

The 156-acre volcanic peak was not visited this fall by the Wildlife officials because a team of scientists studied the island in an extensive stay the previous month.

The island is distinguished by its many house and temple ruins and by two tiny land birds, the Nihoa Millerbird and the Nihoa Finch, both considered threatened with extinction by ornithologists.



Dawn at Necker Island





A precipitous narrow fish hook of volcanic rock, Necker Island was the second stop on the journey this fall of the Coast Guard cutter Ironwood.

It was also the first stop this trip in the Hawaiian Islands National Wildlife Refuge. With healthy populations of at least nine sea birds, the wildlife officials aboard scoured the island, counting nests, noting feeding and breeding areas and looking for signs of intruders.

The rocky islet was once inhabited by a small group of Polynesians, whose stone images have been both a delight and puzzlement to archaeologists.

Necker located 393 miles northwest of Honolulu is, like all the islands in the refuge—a part of the City and County of Honolulu—a technicality that makes the county perhaps the longest (1,200 miles) in the world.

Carpeted only sparsely with five varieties of low-lying grasses, shrubs and weeds, the island is about 1,300 yards long and 150 yards wide. The highest of its five

A visit to Necker

Hawaii's "other" islands, a necklace of reefs, shoals and rocks stringing northwest into the Pacific, are off limits to virtually all by Federal and State wildlife officials who are fighting to preserve the delicately balanced nature of the islands.

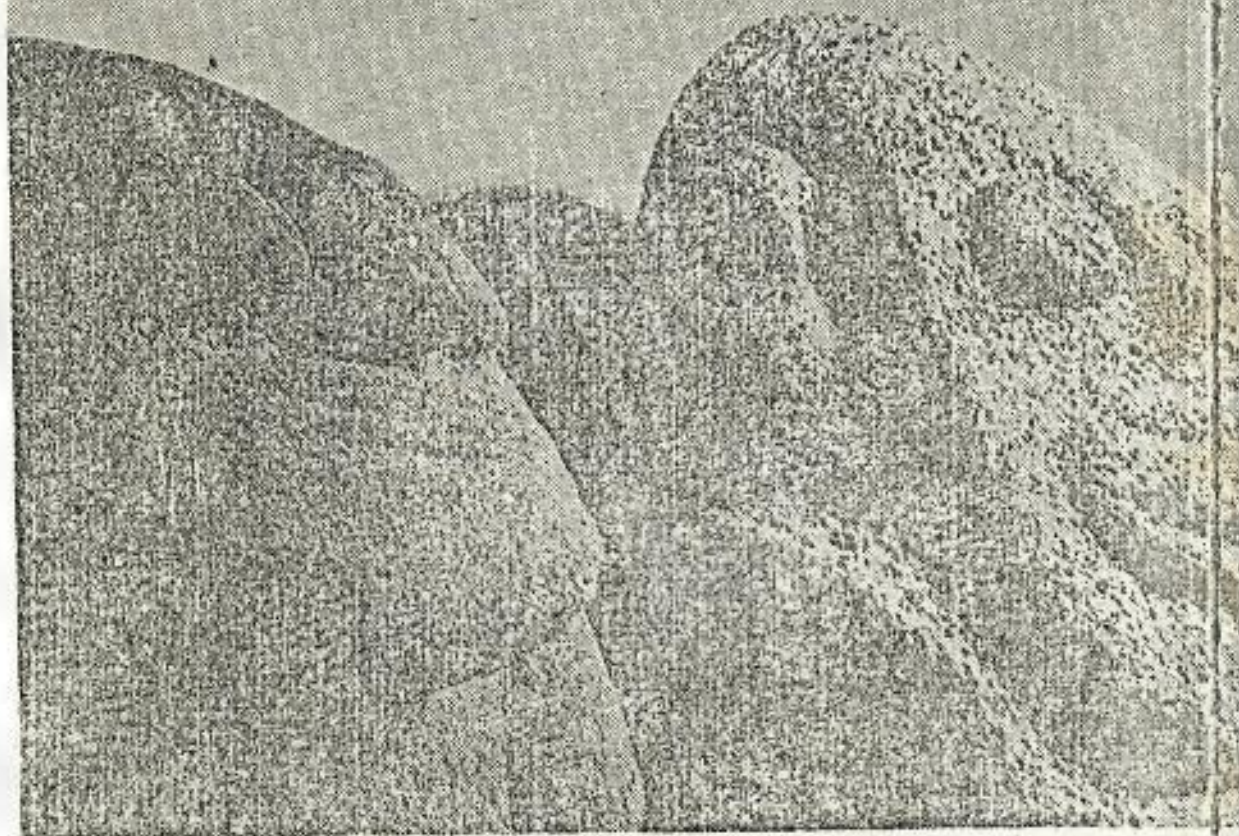
Last fall Star-Bulletin Chief Photographer Warren Roll accompanied

a team of officials on an inspection tour of most of the islands.

This is one of a series of photographic reports.

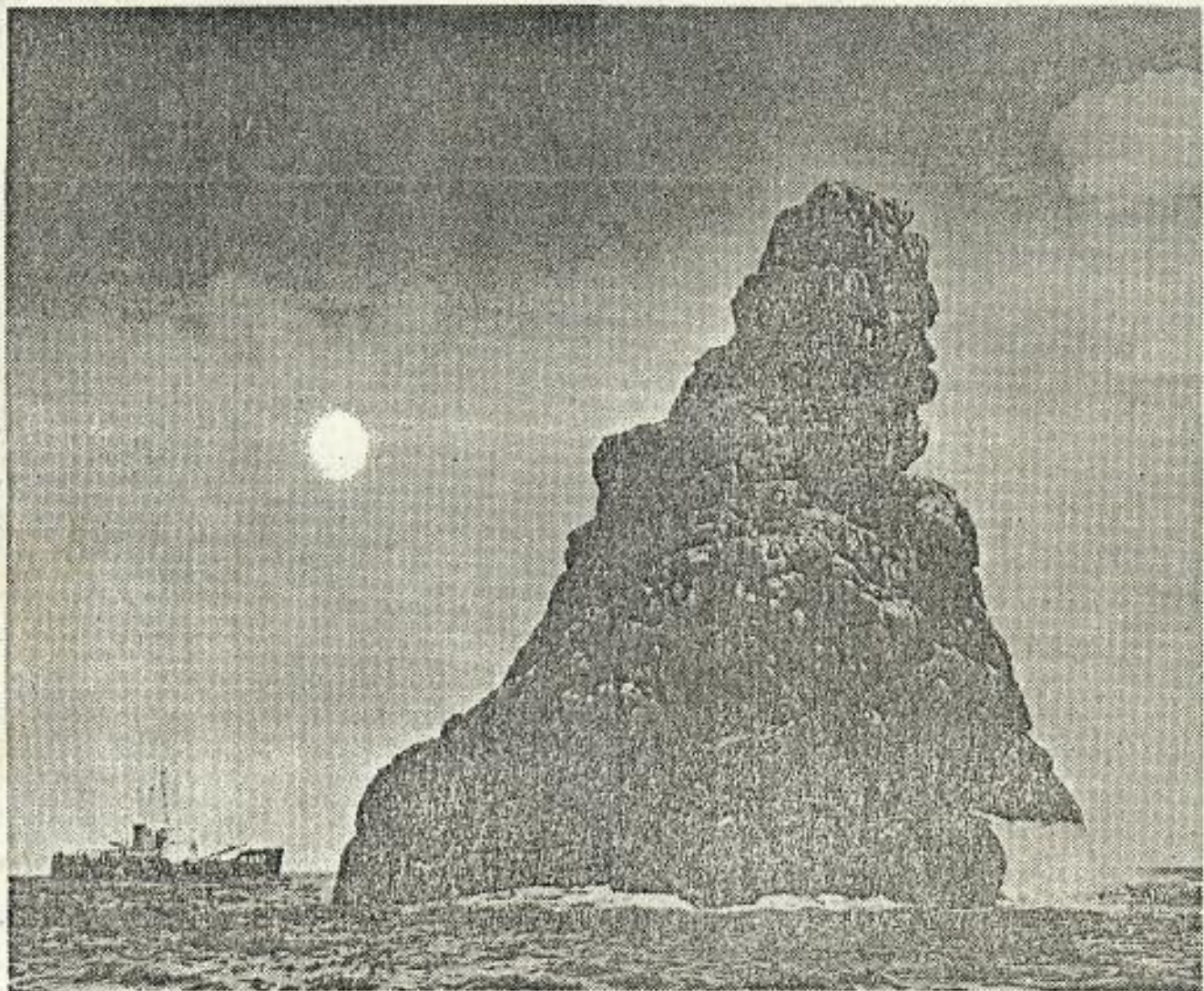
His photographic record of the journey is perhaps the first published view of the remote, and for the most part uninhabited, islands of the Hawaiian "fleet."

ISLAND



FROM NECKER'S PAST — Two images collected from Necker Island in 1894 stand in Hon
Museum. The small stone statues are believed to be images of humans rather than de
spirits. They are also suspected to be the remains of the archaic Hawaiian culture.

on fish and small sea creatures as well as the insects who share the forbidding peaks. Droppings from the birds send streaks of white down the cliffs.



Looking small from the distance, the peaks tower over the 180-foot long ship. The Coast Guard willingly carries officials of the U.S. Bureau of Sport Fisheries and Wildlife and the State Fish and Game Division on tours of the refuge while it tends buoys and lights in the area.



Despite the relatively calm waters landing on the island was no easy task. As the boat surged up the waves the scientists would jump onto the rock cliff. As they leapt the men noticed 4-foot long sharks circling the boat. This was the first successful landing on the pinnacles in five trips to the refuge.

largest of the two islands is about 600 feet long.

Geologists estimate that the volcanic outcrop probably was once the size of Lanai. Wind and high seas have carved it down to a small rock, but submarine banks surround the pinnacles spreading outward from five to 12 miles.

At least 14 species of sea birds have been sighted on the pinnacles. About half of them nest there.

During this trip four Hawaiian Monk seals were seen sleeping in the sun.

The only flowering plant found on the less sloping ledges is *Portulaca*, a low flat-looking plant with succulent leaves.

The scientists made another discovery this time. The military had blasted off the top of one peak for a latitude and longitude sighting, part of the Hiran system of triangulation and aid to navigation.

Angered Wildlife officials noted that the military did receive permission from the U.S. Bureau of Sport Fisheries and Wildlife to land briefly but not to use explosives or to scare the birds.

All the islands of the refuge are protected by Federal law to enable the animal life, many of whose species are endangered or to thrive.

Entry is restricted to those who receive permission from the bureau, usually biologists who will help the government in its attempts at preservation.

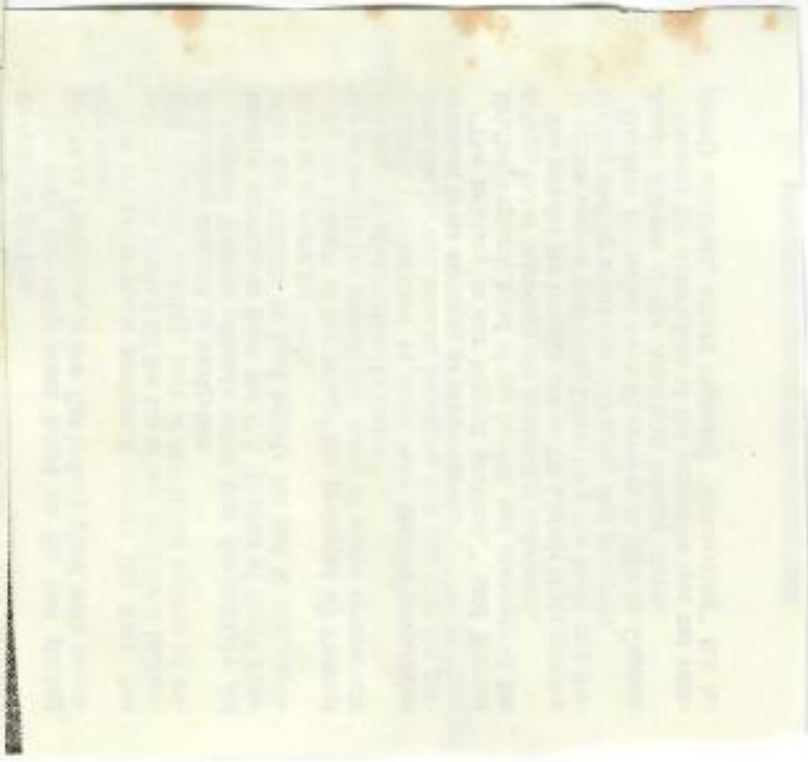
"The military is our biggest problem," said Eugene Kridler, regional head of the bureau and manager of the refuge. Other intruders are occasional fishermen.

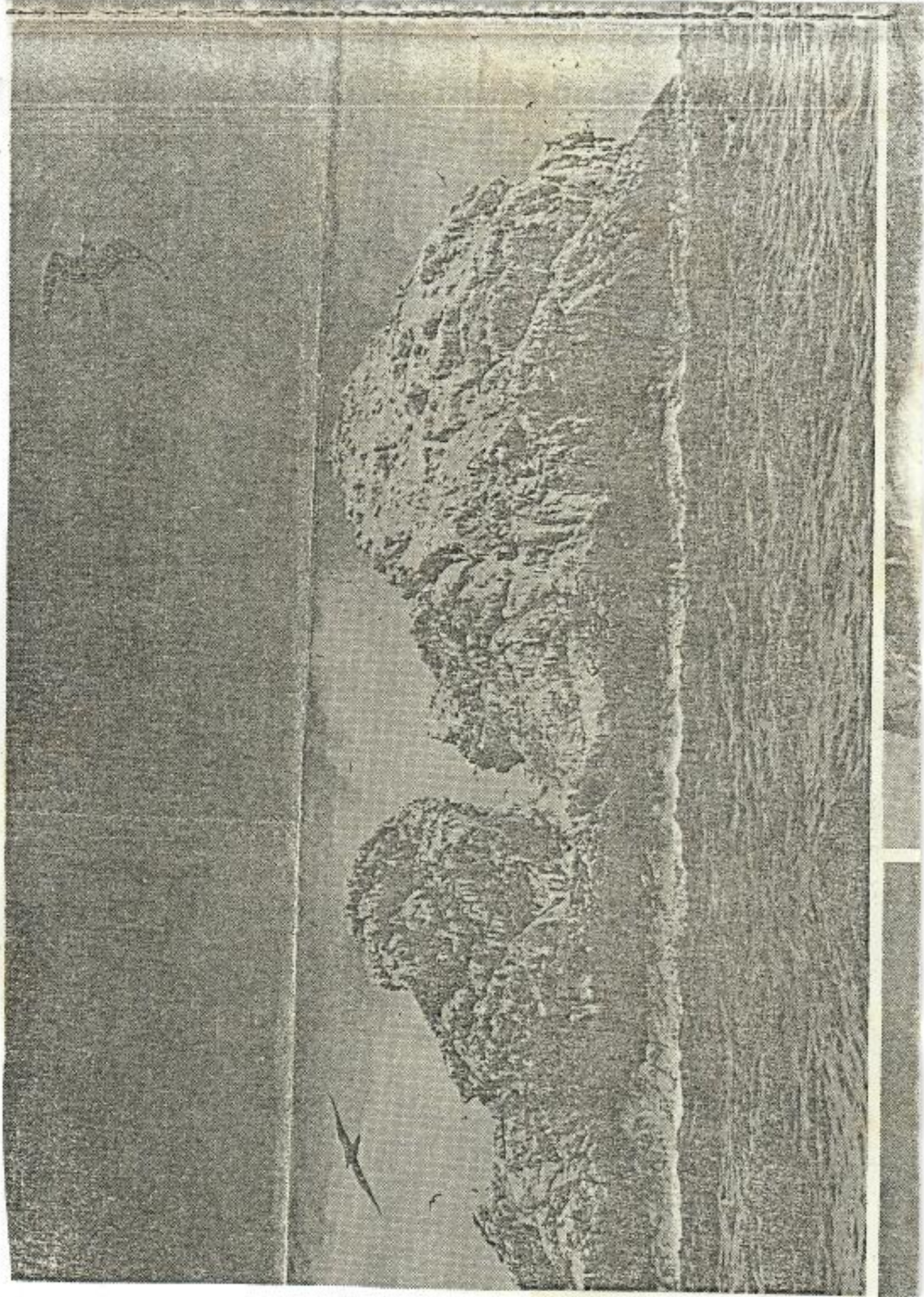
The penalty for trespassing on the islands is six months in prison and/or \$500 fine. Disturbing the birds and disturbing nesting areas can also bring stiff penalties.

Gardner Pinnacles were discovered in 1820 by Captain Joseph Allenon of the American whaler *Marco*.

Because his description of the pinnacles was not completely accurate, others reported "discovering" the is-

The Coast Guard ship Ironwood approaches Gardner Pinnacles looking for a landing spot in the relatively calm sea. The peaks are surrounded by a shelf rich in sea life extending five to 12 miles from the islands at a depth of about 17 to 20 fathoms.

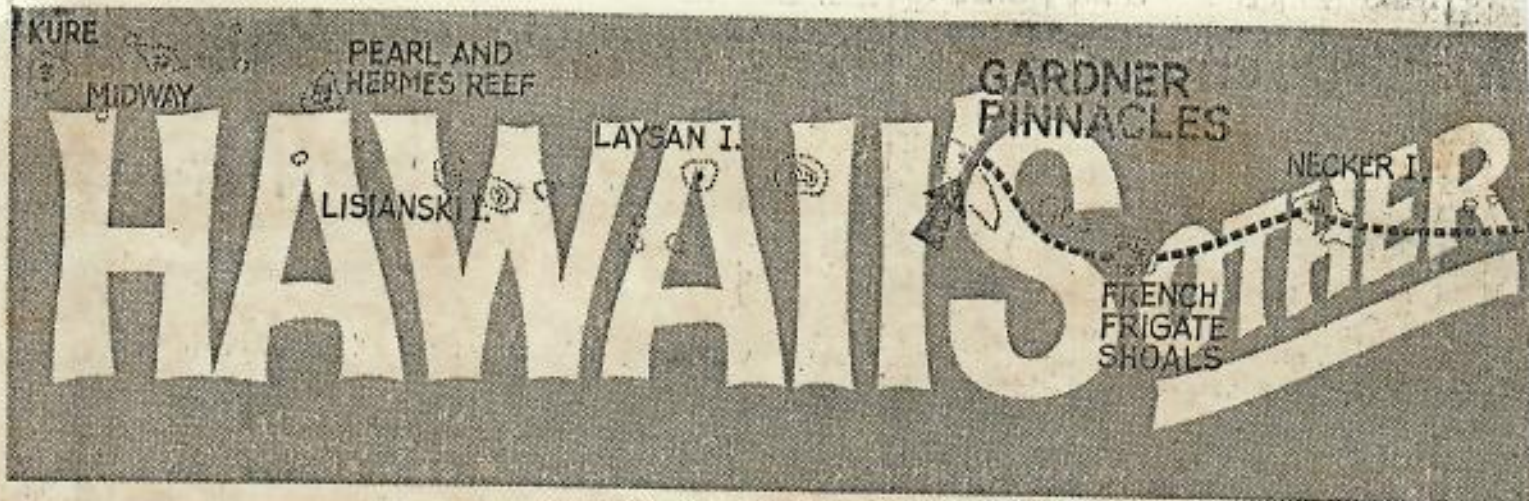




Circling seabirds

Noddy terns and boobies circle the islands continually. They and the other varieties of sea birds feed on fish and small sea creatures as well as the insects who share the forbidding peaks. Droppings from the birds send streaks of white down the cliffs.





Stretching 1,200 miles northwest into the Pacific are the tiny reefs, shoals, rocks and islands of Hawaii's leeward chain.

The necklace of islands is inhabited almost exclusively by seals, turtles and thousands upon thousands of sea birds—all under the protection of Federal law.

Rising stark, black and naked from the deep blue of the Pacific, Gardner Pinnacles is perhaps the hardest to land on of all the islands of the National Wildlife Refuge.

On five previous trips scientists were repelled by the raging surf.

This time they landed on the southern slope of the largest rock to inspect the bird population and breeding areas. But even that landing was not easy. As the Coast Guard boat surged up with a wave the wildlife officials would jump one by one onto the rocky ledge—with a four-foot long shark circling the waters nearby.

Gardner Pinnacles are 588 miles northwest of Honolulu. The highest peak is 170 feet; the lowest is 90 feet. The largest of the two islands is about 600 feet long.

Geologists estimate that the volcanic outcrop probably was once the size of Lanai. Wind and high seas have carved it down to a small rock, but submarine banks surround the pinnacles spreading outward from five to 12 miles.

This fall Star-Bulletin Chief Photographer Warren Roll accompanied officials of the U.S. Bureau of Sport Fisheries and Wildlife and the State Fish and Game Division on an inspection tour of the islands.

His collection of photographs are a unique—and exclusive—report of the islands and their "population" today.

lands later. This accounts for the many names, including Man-of-War Rock and Pollard Rock, given the peaks.

Sea birds are not the only inhabitants of the isolated pinnacles. Insects, including several varieties of spiders, earwigs, silverfish and centipedes, live among the loose rocks of the peaks.

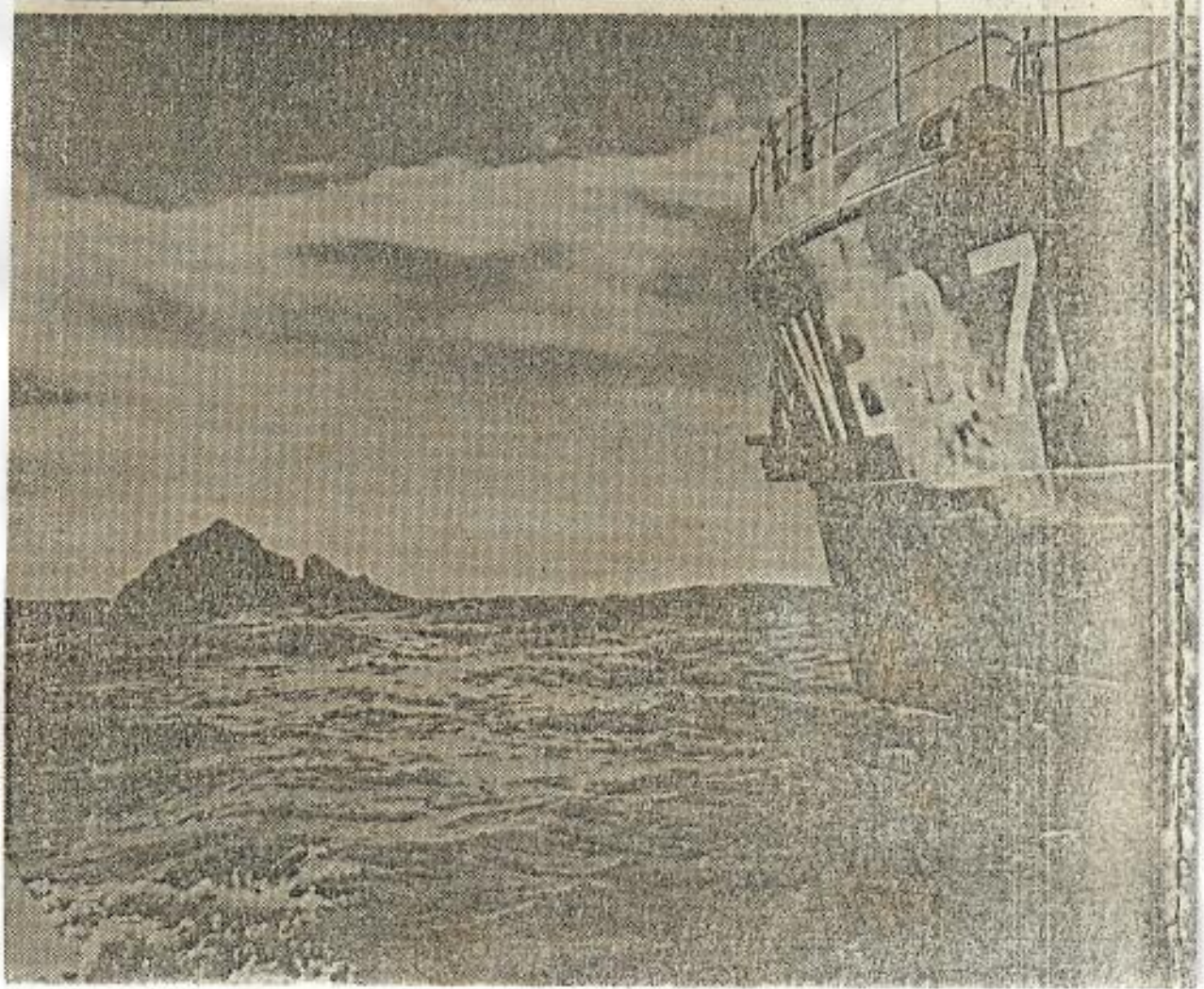
No archaeological remains have been found, which is no surprise to those who have braved a landing on the cliffs.

Landfall . . .

The Coast Guard ship Ironwood approaches Gardner Pinnacles looking for a landing spot in the relatively calm sea. The peaks are surrounded by a shelf rich in sea life extending five to 12 miles from the islands at a depth of about 17 to 20 fathoms.

ISLANDS

A map of the Hawaiian Islands is overlaid on the word 'ISLANDS'. The islands are labeled with their names: NIHOA, KAUAI, OAHU, MOLOKAI, MAUI, LEHUA, NIIHAU, LANAI, KAHOOOLAWE, KAULA, and HAWAII. A dashed line indicates a path or route across the islands.



Hawaii has Galapagos of its own

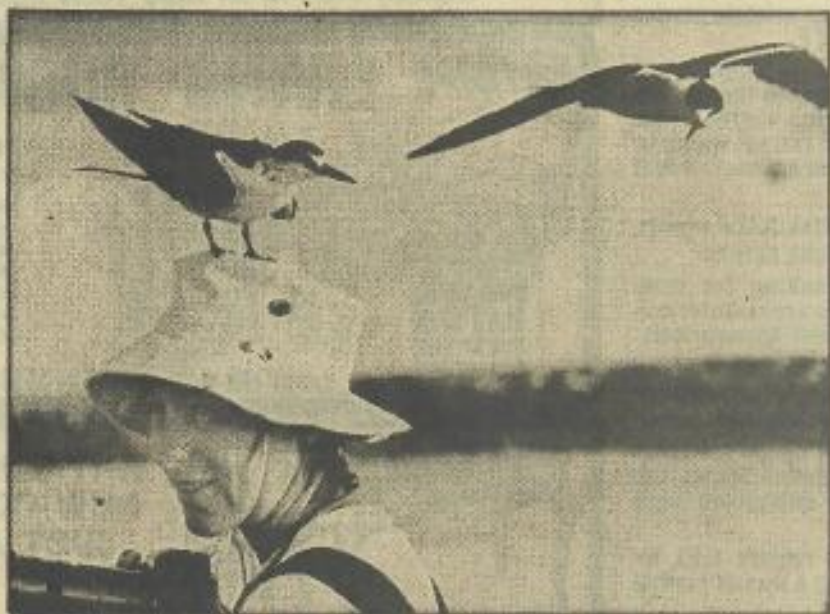
□ Tern Island's sights, sounds and smells are unique

Last in a series

By Susan Scott
Special to the Star-Bulletin

TERN ISLAND, Hawaii — Hawaii has its own little Galapagos in French Frigate Shoals, rich in history, scenery, wildlife and people who care deeply about these things. Here are some of the sights, sounds, smells and events that make this place so special:

■ When a pair of red-footed boobies abandoned their tiny chick, workers at the Tern Island field station decided to hand-feed it. The chick, named J.R., soon believed that all people were its parents.



By Craig Thomas, Special to the Star-Bulletin

A sooty tern nests on the head of author Susan Scott while another searches for a place to perch.

Now whenever any person is in sight, the young chick madly slaps its wings against its sides, which is what booby chicks do when they see their parents.

The Tern people are crazy about this animal, which now is flying but still needs a supplemental evening feeding. A sign on the refrigerator says: Have you fed

J.R. tonight? Under that another says: And preened his neck on the right side?

After J.R. gets his meal, he loves to have his neck scratched — but only on the right side.

■ Life on Tern Island means having bird droppings on your head. And on your shirt and on

See **SHOALS**, Page A-1

SHOALS: State has its own Galapagos

Continued from Page A-1

your shorts and on your legs and

There is so much guano here that when the rains wash it into the ocean, long milky streaks appear like sandbars. Guano kills the bushes the birds like to sit in — they fertilize them to death.

No one takes a shower before they go counting or banding in a bird colony, and most wear hats that protect from pecking as well as guano.

And there's a fine art to knowing how long to hang out your laundry. Should you take it in slightly damp but clean of you-know-what? Or wait a little longer and risk having to wash it again to clean off the avian graffiti?

■ This is the land of weird noises. At night, people calmly sit around the lounge area watching movies on the VCR while just outside the open windows it sounds like there's been a terrible accident involving a bus full of children.

It's startling at first, but it's just the wedge-tailed shearwaters walling and groaning. These birds sound just like injured children, and Ken Niethammer, assistant refuge manager on Tern, says it gets much worse in the fall. "Even I have trouble sleeping then," he laughs.

If the wedgies aren't lamenting, the monk seals are snorting and belching up a storm. Most have nose mites and so they are constantly blowing their noses, which isn't nearly as rude as some of the other sounds they make.

And if those sounds don't get you, there's always the thousands of sooty terns shrieking day and night.

"I wish I had a tape recorder to put out my bedroom window at night," said Alice Reuter, a veterinarian who volunteered to work for Fish and Wildlife this summer. "People at home will never believe what it sounds like here."

■ French Frigate Shoals is part of the Hawaiian Islands National Wildlife Refuge, which hosts up to 14 million birds, is the last haven for about 1,500 Hawaiian monk seals and is the only major nesting grounds of the Hawaiian green sea turtles. And it smells like it.

You can smell Tern Island before you get there and, while it's not like a breath of flowers, it isn't at all disgusting. This odor is



By Craig Thomas, Special to the Star-Bulletin

A young albatross tests its wings as two green sea turtles bask in the

organic, the combined smells of many living things.

When you do get there, though, the smells are more specific. The guano is the most pervasive and is easy to get used to. This smell goes unnoticed quickly, but get downwind of a monk seal and you know it.

Monk seals molt periodically, so it's common to find large pieces of fur lying around the beaches like tiny pieces of green or gray carpet.

These little treasures are interesting to look at and examine, but you don't want these rugs in your house without some serious airing or cleaning first. They smell awful, and so do all hands that touch them.

You wouldn't think that sea turtles, covered with that hard armor, would contribute much to the smells of the islands, but they do.

When turtle researchers dig up a turtle nest five days after the little turtles have hatched, you know immediately that there are some unhatched eggs in there.

During these digs, people often find live hatchlings that got trapped in the nest, so the work is rewarding in that way — they are saving turtles' lives.

But counting the undeveloped and partially developed eggs, which involves tearing open the leathery shells and poking around in the 2-month-old contents, is not the best-smelling job in the world. This is another one that's bad on the hands.

■ A small animal cage that said "Handle with care — Live Bird" came off a recent supply plane. When Tern islanders opened the cage they found a bristle-thighed curlew, a shorebird that annually migrates back and forth between Alaska and Hawaii.

Normally, these birds use their own wing-power to do this, but Curly had flown the friendly skies, migrating by plane.

Fish and Wildlife workers in Alaska found Curly with a hurt

wing and nursed it back to health. But when migration time came, it wasn't quite ready to make the trip. So they sent him to Honolulu Fish and Wildlife by plane, which then sent him to Tern.

Tern workers built an enclosure for him so they could watch him for a while, sneaking looks out of a nearby window because Curly got agitated when people approached the cage.

After a few days, the bird looked healthy and Niethammer turned it loose, free to cavort with the other curlews that already had flown, by their own power, to the island.

The curlews that visit Tern Island have a thing for hot dogs, and Niethammer gives them wiener treats every now and then. They almost always come running when he whistles.

Sometimes the curlews amuse observers by spearing the hot dog pieces with their long beaks and then getting them stuck there.

■ The sky above Tern Island is one continual air show, even at night.

Frigate birds are the most noticeable because they are such great fliers and because they cause so much commotion.

If you disturb a frigate parent on a nest, you should hope that you're with a person taller than you are — or you should grab a stick and hold it high because an angry frigate bird will not hesitate to dive-bomb territory offenders.

All the birds go for the highest point, so sticks are good defenses.

Frigate birds also harass boobies in the air to give up their fish. These amazing flight shows are most prevalent at dusk when boobies come flying back to the colonies in quiet graceful squadrons, only to be intercepted by waiting frigates.

Boobies are often outmaneuvered by the frigates and drop their fish, which the pirates catch in mid-air.

This area's for playing, sharks aside

□ 'I'm terrified and fascinated at the same time'

By Susan Scott
Special to the Star-Bulletin

LOOK," said Mitch Craig as he abruptly turned the 17-foot Boston Whaler toward a dark shape in the water. "There's a tiger shark." Just as he said the words, a dark dorsal fin broke the water's surface.

Craig, a National Marine Fisheries Service employee who is working on monk seal research at French Frigate Shoals this summer, had just finished his weekly atoll census and was leaving Whale-Skate Island. He steered his boat into the turquoise lagoon waters and watched the shark patrol along the island's edge.

"What amazes me about these guys is what shallow water they swim in," said Craig.

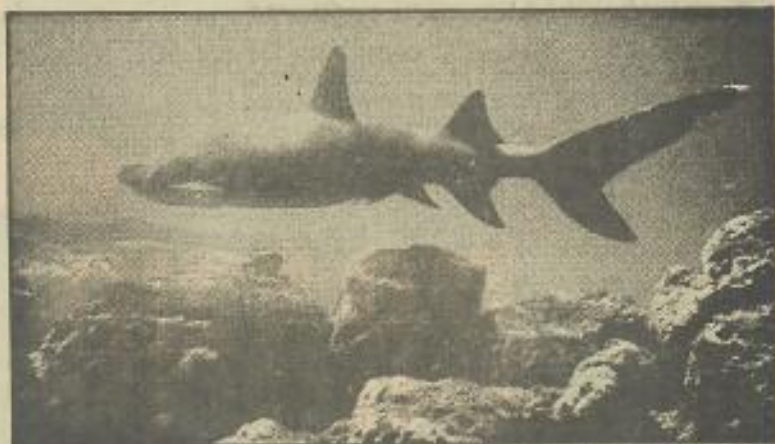
"Right now, this one is in water no deeper than we waded in to get to the boat."

The whaler's occupants, who moments before had done just that, silently considered this fact as they watched the shark move even closer to shore. When the tiger headed for deeper water, Craig followed.

Soon he was alongside the animal, noting that it was about two-thirds the length of his 17-foot boat.

The shark seemed unperturbed by the escort and soon the passengers were taking turns hanging over the side of the boat with a mask and snorkel to get a good look.

Others gripped the observer's



By Craig Thomas, Special to the Star-Bulletin

A white-tipped reef shark patrols the waters near the atoll, where they are constantly seen by divers and snorkelers.

ankles and life jacket since the lean over the rail was a long one. The shark looked huge at that close distance and didn't seem to be paying any attention to the sound of the motors or the faces in the water that were staring at it.

Dark stripes on its back told the story of this animal's name, and the slung-back lower jaw was one of scary movies.

The tiger continued on its slow course. The only sign it gave of noticing the boat was rotating its one large eye.

After everyone had a couple of good looks, Craig headed for home at Tern Island, leaving the shark still patiently patrolling Whale-Skate's lagoon.

In spite of the abundance of sharks in these waters, most people who live and work in French Frigate Shoals occasionally get into the water. Since it's illegal to fish or take any marine life from refuge waters, the area is good for snorkeling and diving.

Ulua (jack fish) swim in groups here, and it's common to see the long antennae of spiny lobsters waving from under ledges. Spotted eagle rays are almost always visible from the surface; huge turtles rest in underwater caves; and occasionally a curious young

seal will swim over to investigate a swimmer.

And this is one of the few places in Hawaii where snorkelers get escorted by seabirds. These, mostly brown noddies, hover above, interested in the colorful snorkels and in what the swimming might stir up. Sharks also are a common sight; gray reef and white tips are the types most commonly encountered by snorkelers and divers.

No one worries much about the white tips that live in caves here because they're not aggressive toward people.

But it's heads up for gray reef sharks because they're so territorial, and tiger sharks, especially when the albatross chicks are sitting on the water while learning to fly.

"I've never seen a tiger shark from the water — only from boats and shore," said Craig, who snorkels and dives regularly here.

Some people here are nervous about the sharks but get in the water anyway.

"I figure if everyone else is doing it, so can I," said Maggie Lee, Craig's assistant. "I'm terrified and fascinated at the same time. It's a strange feeling."

Red-tailed tropic birds fly backward in an upright position while squawking in a sort of in-flight mating dance. These birds are elegant in the air but a disaster on land.

One red-tail used to crash hard into the side of the building every day in an attempt to land near its nest under the building. So Niethammer hung a cushion at that spot on the building and every day after that, the bird would crash into the cushion, then

drop safely into its nest.

And if the frigates and boobies aren't squabbling or the tropic birds dancing and crashing, there's always the sooty terns, thick in the air day and night.

■ During one brutal winter storm on Tern Island, a bunch of albatross eggs rolled out of their shallow nests and were lost as far as the albatross parents were concerned. So Tern volunteers went on an albatross egg hunt, filling buckets with the waylaid

eggs and putting them back in albatross nests.

The only glitch in the plan was that black-footed albatross eggs and Laysan albatross eggs look alike even though the birds are different colors — the first is black, the other white.

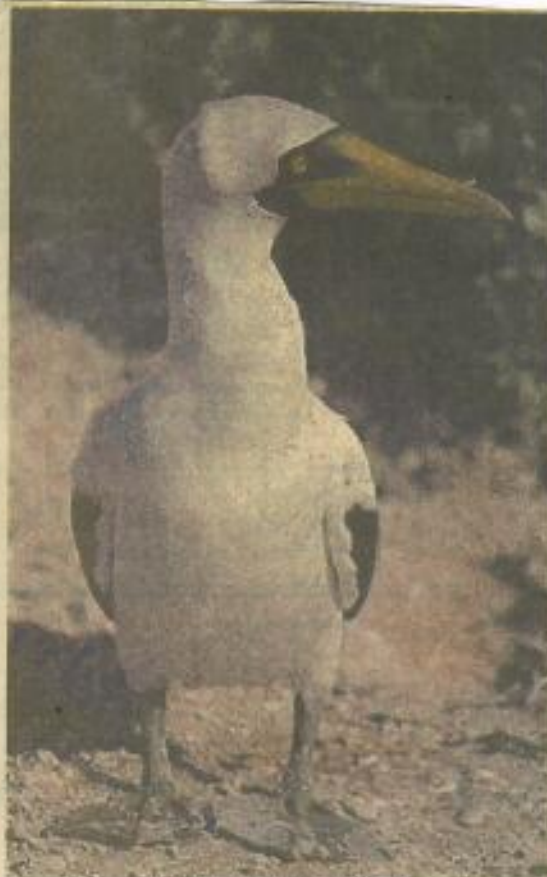
So this spring, the albatross community became integrated, white Laysans raising black-foot and vice versa. The parents didn't seem to notice and the chicks did fine.

Humans share a nesting place



By Susan Scott, Special to the Star-Bulletin

Veterinarian Alice Reuter, above, releases a red-footed booby after she puts a leg band on it on Tern Island in the French Frigate Shoals. An adult masked booby, right, the largest of the three Hawaiian booby birds, stands its ground on East Island.



By Craig Thomas, Special to the Star-Bulletin

About this series

Tomorrow:

- Managing a wildlife refuge
- The shoals' colorful history

Wednesday:

- Birds, birds and more birds
- Green sea turtles reign on East Island

Thursday:

- Getting around by boat and bike
- Communication no simple task

Friday:

- A visitor's notes
- Going underwater in the atoll

□ Tern Island's a place where winged creatures outnumber the people

First in a series

By Susan Scott

Special to the Star-Bulletin

TERN ISLAND, Hawaii — Birds. Think of thousands, even millions of birds swooping and screeching in the air, sitting and squawking on the ground. Imagine every tree, bush and hole packed with birds.

Conjure up a place where the smells, sights and sounds of birds dominate all else, including the remarkable sights of basking monk seals and scurrying sea turtle hatchlings.

This is summer on Tern Island, a U.S. Fish and Wildlife Service field station in the atoll called French Frigate Shoals.

French Frigate Shoals is part of the Hawaiian Islands National Wildlife Refuge, a chain of eight islands, reefs and atolls that extend about 800 miles northwest from the main Hawaiian Islands. Tern Island is the largest of a number of small islets in French Frigate Shoals and is the only island in the refuge that has year-round human inhabitants.

Usually, two full-time assistant managers work and live on Tern Island. In the summer, volunteers, researchers and students bring the population up to a crowded eight or nine. This place, and all of the refuge's islands, are part of Honolulu, but any resemblance to the busy city is in name only.

"You give up a lot to work here," says Ken Niethammer, who has lived on Tern as assistant refuge manager for two years.

A fairy tern named Spike shares the railing he leans on, and the full moon is slowly rising over his bird-chattering island.

"But then, you get a lot too," he adds quietly.

Niethammer is the only full-time permanent Fish and Wildlife Service employee on the island. It is his responsibility to see that things keep working, a challenging task on a 56-acre island hundreds of miles from civilization.

The tiny Tern community has a surprising number of comforts, including a spacious "house" left by the U.S. Coast Guard when the atoll was a LORAN (Long Range Aid to Navigation) station. The one-story residence has two

See **BIRDS**, Page A-8

A-8 □ Monday, October 2, 1989

Star-Bulletin

SPECIAL REPORT: FOR THE BIRDS



An albatross chick rests on the runway at Tern Island, the main isle in the French Frigate Shoals.

BIRDS: Tern Island is a natural habitat

Continued from Page A-1

long corridors with offices and bedrooms, and a central kitchen, dining room and entertainment center shared by everyone who stays there.

Solar panels on the roof help power water pumps, lights, refrigerators and radios. Stoves and refrigerators run on propane. The sun heats water so on clear days residents can enjoy hot, if brief, showers.

The old tennis court at the side of the building is now a platform for catching rain, which is then stored in huge tanks nearby. The tanks were near overflowing this summer because of an unusual amount of rainfall.

But there's a down side. The dark clouds hide the sun enough that Niethammer must run a generator in the evenings to charge the house batteries that keep things going. And during rainy spells, the showers are cold.

Storms slow activity here since most take place outdoors, but even in bad weather, the work goes on. Birds still need banding, the seal census continues and lost hatchling turtles need to be collected and taken to the beach.

Wildlife biology is the bottom line here, and all human activity is tailored to suit the best interests of the animals. Niethammer, a wildlife biologist, is careful that everyone on the island knows the rules about approaching these creatures. Most of the animals have evolved with few predators, which makes them easy to approach, but this isn't always good for the animals' delicate reproduction rituals.

Hawaiian monk seals, especially females, are the royalty of the refuge. Of all the animals, this group is in the most serious danger of extinction. Also, like most other seal species, these animals are extremely sensitive to human activity.

They are solitary creatures and prefer to be alone, hence the name monk seal. Sometimes just the presence of a human walking on a beach will cause a resting mother monk seal to abandon her pup.

So the beaches here belong to the seals.

During the day, the white sand is littered with gray snorting bodies, sleeping like logs in the hot sun. At night, the seals prefer the brushy areas above the beach, which gives the humans a chance to walk the beaches to look for signs of nesting female sea turtles.

If a seal is sleeping under a bush that has a bird study going on in it, forget it. The bird study is put on hold until the seal moves.

Mitch Craig, a National Marine Fisheries Service employee who is on Tern Island from March through August this year to do a seal census, tiptoes and whispers as he counts and identifies individual seals. Some have tag numbers that he tries to read from a distance with binoculars, but he identifies most from body scars.

Craig carries packets of photos and cards detailing individual seals and their scars, and must try to match one of these with each seal he finds. If the animal is lying on its mark, he waits for it to turn, sometimes for 30 minutes or more.

"They always seem to turn the minute I walk away, and then, just when I get back to them, they roll back over the scar," he says.

The job can be frustrating and tedious, but Craig likes it and hopes to stay with the monk seal project back in Honolulu. He learned of it while working with seals at the National Zoo in Washington, D.C.

Except for Niethammer, Craig and all other people who share the quarters at Tern Island this summer are temporary residents.

Two employees of the Fish and Wildlife Service are in French Frigate Shoals for the turtle nesting season, which runs from the end of April through September. But since a larger number of sea turtles bask and nest on East Island, an 11-acre islet about six miles from Tern, these two take turns living and working in a tiny tent camp there.

Glynnis Nakai, a Sea Life Park employee who took a leave of absence from her job in the education department, and Michael Moser, who has worked for Fish and Wildlife since last year when he was still a graduate student at the University of Hawaii, trade off between Tern and East islands every four days.

They work long nights recording which turtles come ashore to lay eggs, how many times they do it and where the nests are. These two stay up nights and sleep during the day while on Tern to keep their night-working rhythm for the work on East Island.

"I'm not ready to go back to Tern yet," said Nakai said from East Island. She talks about Tern Island like it's a crowded metropolis.

"I love being out here alone with the animals," she says. "I like the peace and solitude."

• **TOMORROW: Running a refuge with no money**



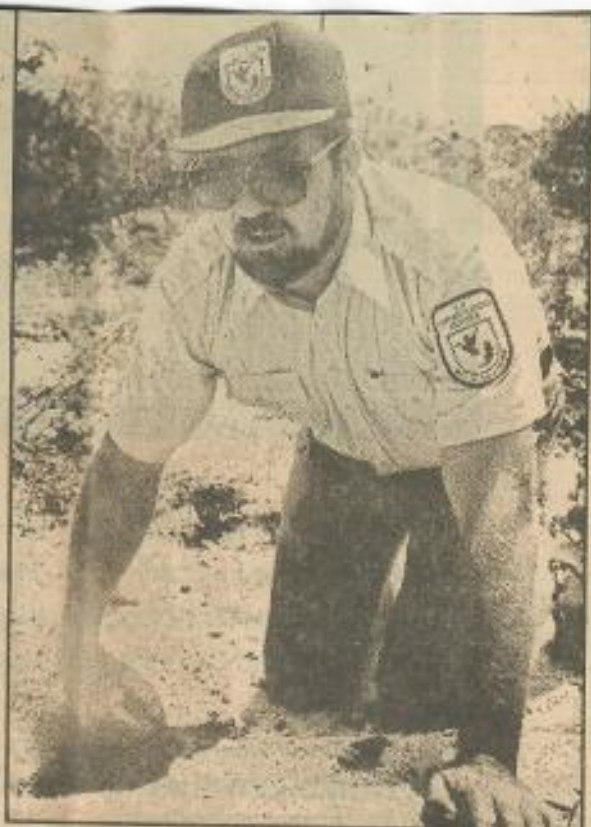
By Susan Scott, Special to the Star-Bulletin

Workers on Tern Island mark when and where each female sea turtle lays her eggs. Then, after about 60 days, they start looking for signs of hatchlings. These little turtles emerged on a moonless night, typical of most nests.



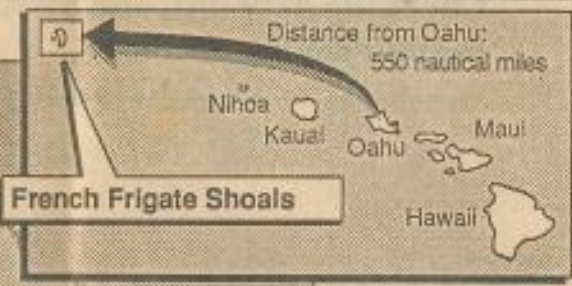
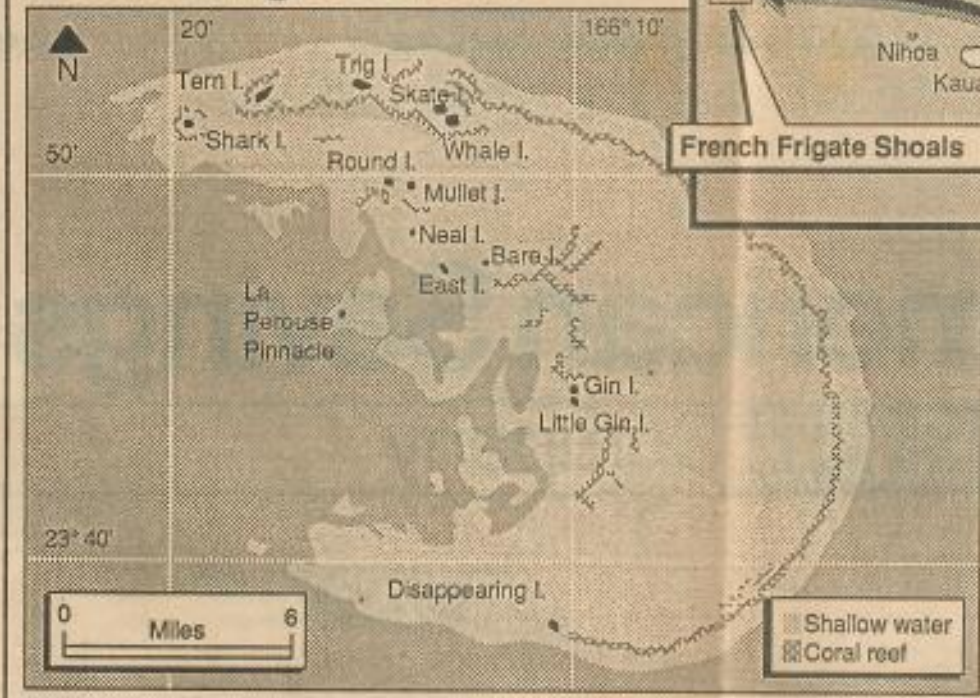
By Craig Thomas, Special to the Star-Bulletin

A Laysan albatross, above, feeds its chick, while Ken Niethammer, right, the full-time resident manager at Tern Island, digs up a turtle nest that hatched five days earlier. He counts the empty egg shells and rescues four trapped hatchlings that didn't escape with their siblings.



By Susan Scott, Special to the Star-Bulletin

French Frigate Shoals



- Area: 56.3 acres
 - Elevation: 6 feet at Tern Island*
 - Population: 6
 - Notable: Largest monk seal population in Northwestern Hawaiian Islands; U.S. Fish and Wildlife field station on Tern Island.
- * Highest point 135 feet at La Perouse Pinnacle.

By Bryant Fukutomi, Star-Bulletin

Wildlife service permits few visitors at Tern

□ The atoll is a last haven for many endangered Pacific marine animals

By Susan Scott

Special to the Star-Bulletin

WHO goes to French Frigate Shoals, a remote atoll some 550 miles from Oahu? Hardly anybody.

But most who do like to work with animals and aren't afraid of being isolated. And those who visit need a good reason and must start months in advance to get written permission to visit from the U.S. Fish and Wildlife Service.

Since the area is part of the Hawaiian Islands National Wildlife Refuge and is the last haven for a large number of protected and endangered animals, refuge managers are careful about who goes to the atoll and for how long.

This is no vacation spot. The people who come to these small desert islands may do it for various reasons, but all come to work.

Take Jean Kenyon, a Ph.D. candidate from the University of Hawaii. She's done two stints at the Tern Island field station in the last year. Since May, she's been studying a type of coral that doesn't grow in waters near the main Hawaiian islands.

But her research is only part of her work here, because she's officially a volunteer for the Fish and Wildlife Service and helps with the daily chores of bird counts and island maintenance.

Robert Cummins also is a student and volunteer worker, a typical combination here. He is a third-year marine science student at Hawaii Loa College and is interested in coming back next year to work with the sea turtles.

Another enthused volunteer is Maggie Lee. Lee just graduated from Stanford with a degree in psychobiology, and volunteered for the National Marine Fisheries Service monk seal program. She will be on Tern Island for six weeks, then go to Kure Atoll for two more weeks.

Why did she come here?

"I'm trying to decide what kind of job I'd like to do or what kind of graduate school I should go to," she said. "And I also like to do interesting and different things each summer. When I heard about this I knew it was for me."

Lee works with fisheries service employee Mitch Craig on the monk seal project getting hands-on experience in wildlife research, work she hopes will help her make a career decision.

And this summer, the island has its own veterinarian. Alice Reuter, in the midst of changing jobs and moving cross-country, volunteered to work here for a month.

"I needed some time to be quiet and get away from it all," she said. "When I told that to Ken (Niethammer, assistant refuge manager on Tern Island), who is an old friend from graduate school, he said 'Boy, have I got the place for you.' And was he right!"

Reuter works with the other volunteers, employees and students on studies and projects, and puts her veterinary skills to good use when someone finds an injured animal, a fairly common event given the huge number of animals here.

Film crews, photographers and journalists also get permission to visit the refuge occasionally. Since this fragile area can't be open to the public and still maintain its ideal breeding conditions, one of the primary objectives of the refuge master plan is to show the place through the media. Earlier this summer, a film crew of eight spent nearly six weeks in the atoll.

Those who come from the media must provide their own transportation and bring their own food and supplies, but even so, large groups tax the limited facilities on Tern Island.

Susan Scott is a marine biologist and free-lance writer. Her OceanWatch column appears Mondays in the Star-Bulletin.

1989

On Tern, wear earplugs, a hat and don't look up

□ All 18 species of sea birds nest on the atoll's islands

Third in a series

By Susan Scott

Special to the Star-Bulletin

TERN ISLAND, Hawaii — The sound track for the movie "Birds" could easily have been made here. Sooty terns escort people in scolding squadrons, causing some workers to wear earplugs and nearly all to wear hats.

This is definitely not the place for people who don't like birds.

Well-named Tern Island is a U.S. Fish and Wildlife field station in the French Frigate Shoals, an atoll about 550 miles from Oahu in Hawaii's northwest chain.

This is the only atoll in the Hawaiian Islands National Wildlife Refuge where all 18 species of sea

birds nest, many of them choosing to settle down on Tern, the largest island of the atoll with 56 acres.

Most nest in the bushes and on the ground on both sides of Tern's runway, but some nestle under buildings and along walkways, raising their fluffy chicks precariously close to human feet.

This is a place where people walk carefully, looking down rather than ahead.

Since these birds have few predators, they aren't particularly alarmed by humans. Some, like red-tailed tropic birds, look at people almost nonchalantly while draping a protective wing over the body of their downy chicks.

Others, like juvenile albatrosses, just slowly stand up and amble away in the clumsy walk that gave these birds the nickname, gooney birds.

One young Laysan albatross, named Albie by its rescuers, caught and tore its wing on a sharp branch during a windy squall. Alice Reuter, a veterinarian



By Susan Scott, Special to the Star-Bulletin

What seems to be a serious situation is actually fun time for J.R., an orphaned red-footed booby who is being fed by his human foster parent.

See **BIRDS**, Page A-8

A-8 □ Wednesday, October 4, 1989

SPECIAL REPORT: FOR THE BIRDS



By Susan Scott, Special to the Star-Bulletin

Research on red-footed boobies in French Frigate Shoals this summer involved measuring, weighing and banding chicks. Here, volunteers measure the beak on this young bird.

BIRDS: Hats, earplugs are vital on Tern

Continued from Page A-1

an and Fish and Wildlife volunteer on Tern Island this summer. found the injured bird and brought it back to the house.

There, she and a visiting physician, Craig Thomas, stitched the mangled wing and applied some human antibiotic ointment.

They carried the amazingly docile bird to a dark storage shed where it would stay out of the

wind for a couple of days so the wing could heal.

"I think it must have been practicing flying in the strong winds and then got caught in the branches," said Reuter.

Albatross parents leave their young some days before they are able to fly, somewhat uncommon in the bird world. The juveniles then stand around in the wind, living off their fat sometimes for weeks until they figure out how their wings work.

Since a good part of their take-off is dependent upon the wind, the long, flat runway on Tern Island is littered in the summer with young, fuzzy-headed albatrosses, trying their wings and getting the feel of flying with little leaps into the air.

When they finally do get airborne, they stay at sea for about four years before they return to land.

The ones that make it out to sea, that is. When some albatross chicks first start to fly, they land on the water to rest near shore.

Tiger sharks know this and patrol the shallow waters near the islands in June and July, the months when most young albatrosses fledge. The resulting carnage is infamous and unforgettable to those who have seen it.

"You can see the fins of the shark, then a gray mouth opens and the chick is gone," said Robert Cummins, a Hawaii Loa student who volunteered to work at Tern Island this summer. "Sometimes you see the chick bob up again but it never escapes once the shark has seen it. It's an awesome sight."

Monitoring the health and status of bird populations is one of the main objectives of the Tern Island station, and the people who work here get emotionally attached to their birds.

Everyone feels some horror about the albatross chicks in the jaws of sharks, but the loss of birds they have been studying is even more difficult.

"You get to know them; you feel like they're family," says Ken Niethammer, assistant refuge manager at Tern whose favorites are the fairy terns. "You see them sit on that egg day after day. Then it hatches and you watch the parents work so hard to feed the chick.

"Then one, day, the chick is dead and you feel terrible. It's a personal loss."

Niethammer oversees the bird studies here and passes the work along as students and volunteers come and go. But he is a firm believer in teamwork and makes a point of saying "we" when discussing the studies.

Animal population

Estimated number of breeding pairs of seabirds at French Frigate Shoals:



Species	No. of pairs
Black-footed albatross	4,000 to 4,500
Laysan albatross	900 to 1,000
Bonin petrel	30 to 50
Bulwer's petrel	200 to 500
Wedge-tailed shearwater	1,500 to 1,750
Christmas shearwater	15 to 20
Red-tailed tropicbird	550 to 600
Masked booby	500 to 600
Brown booby	40 to 60
Red-footed booby	550 to 600
Great frigatebird	350 to 375
Sooty tern	60,000 to 78,000
Gray-backed tern	750 to 1,000
Brown noddy	5,000 to 7,500
Black noddy	750 to 850
White tern	500 to 750

Estimated number of Hawaiian monk seals:



	Male	Female
Adult	136	221
Subadult	95	92
Juvenile	64	56

By Bryant Fukuonui, Star-Bulletin

Sea turtles share their islet home

□ East Island is an assembly line for green sea turtles

By Susan Scott

Special to the Star-Bulletin

EAST ISLAND, Hawaii — This 11-acre island in the French Frigate Shoals belongs to Hawaii's green sea turtles.

Oh, they share it with monk seals, birds and occasionally a few people, but the essence of the island is turtles.

These huge reptiles bask on the beaches during the day and dig out the rest of the island with nesting pits at night.

Because of this, the U.S. Fish and Wildlife Service, in cooperation with the National Marine Fisheries Service, sets up a turtle camp here each summer to collect information about Hawaii's green sea turtle population.

Little is known about these animals, which are threatened by extinction and protected by federal and state laws.

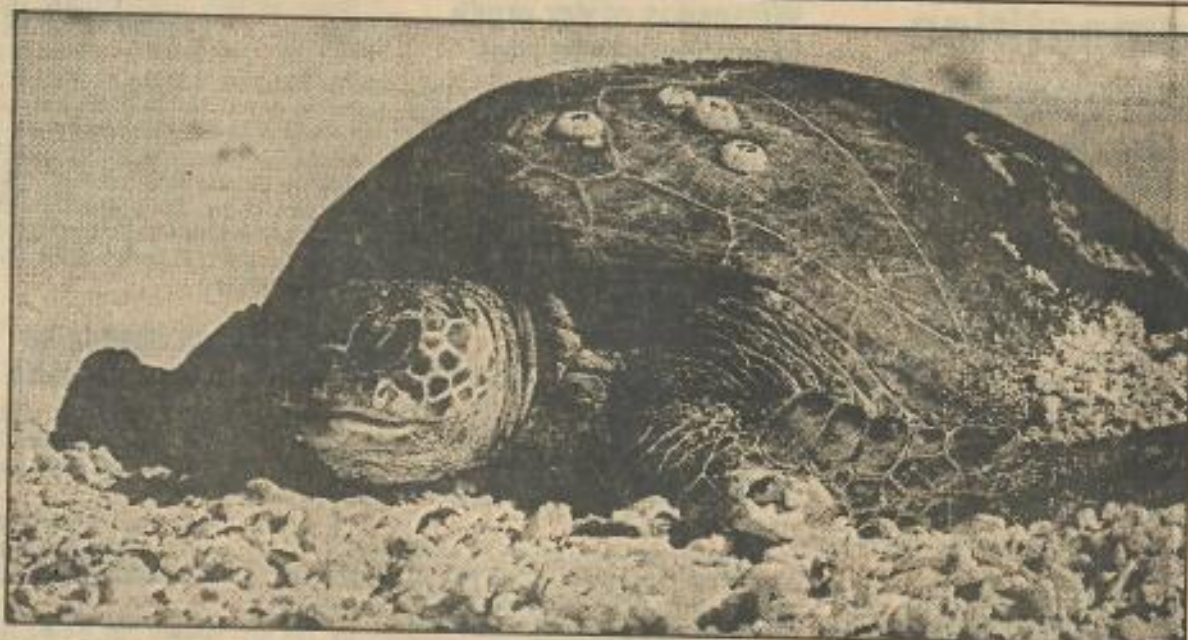
The camp on East Island is a tiny two-tent affair with few of the amenities of the Tern Island field station six miles away.

Two Fish and Wildlife Service employees take turns working here, four nights on and four nights off. They work at night because their job is to tag, number and record information about female turtles that have crawled up to the land to lay eggs, a behavior done almost always at night.

The hours are long and the working conditions are sometimes difficult. Glynnis Nakai, a temporary biological aide for Fish and Wildlife, is one of the "turtle people" as they're called here.

"You won't believe this, but I wear panty hose when I'm working here at night," she said. "This sand is full of ticks from the albatrosses and I'm sensitive to the bites. The panty hose protect my legs."

Nakai's small camp looked di-



By Susan Scott, Special to the Star-Bulletin

A green sea turtle, above, with ocom barnacles on its shell basks on the beach at East Island in the French Frigate Shoals, while another, left, tends her eggs. Sea turtles dig holes in the sand to deposit their eggs. As a result, both East and Tern islands are like obstacle courses because of pits left by nesting turtles.

sheveled and she was tired. She had just spent a long couple of days and nights holding the camp together during the remnants of a tropical storm.

The canvas awnings had blown down so she had no protection from the sun, and most of her supplies were wet.

Although it wasn't time to switch yet, the other turtle person, Michael Moser, had come to East from Tern Island by outboard to help Nakai put the camp back together.

But before work, they shared a cold beer from a small propane refrigerator, one of the few luxuries at the isolated East Island camp.

It's hard to imagine that a busy Coast Guard station was once here, but a lonely telephone pole stands as a reminder of this island's military history.

Inside a wooden box nailed to the pole is an old photo showing rows of Quonset huts and a poem about the godliness of this island.

Now, the sea turtles jockey with monk seals and birds for the best beach space. It's not uncommon to see these animals cuddled up, a seal and turtle sleeping side by side or an albatross sitting next to or even on a turtle.

Hawaiian green sea turtles are among the few populations of turtles worldwide that bask on beaches. Most stay in the ocean full-time except during nesting time.

Right now, these greens look like team turtles because the researchers have painted large white numbers on the dark turtle backs. This allows people to see which turtle is laying eggs in

the sand pits at night without getting too close.

The paint wears off quickly, sometimes too quickly, so the turtles don't swim around with numbers on them for long.

More than 90 percent of the Hawaiian turtle population nests on East and Whale-Skate Islands, islands within the French Frigate Shoals refuge.

Many of the turtles that are here now will migrate back to the main Hawaiian Islands after the nesting season to graze on algae along the coasts.

Green sea turtles once nested on the main Hawaiian islands, but people have killed them, taken their eggs and taken over the beaches until the animals were driven to nest far away from people.

The French Frigate Shoals is their last haven.

"Everyone here has some input into the studies we do. If someone makes a suggestion or questions something, we talk about it and try to make a plan together."

Many studies on the island have to do with nesting biology because people know so little about so many of these species.

"I am amazed at the lack of information there is about these animals," said Reuter. "I was shocked when I first came here and the answer to so many of my questions was 'No one knows.'"

Reuter has been continuing the studies on nesting biology of red-footed boobies that was started by a student from the University of California at Davis. When she leaves, another volunteer or Niethammer will keep it going.

Reuter is trying to put bands on the legs of all the booby chicks in her study area before she leaves. This involves two people, one to hold the bird and the other to apply the band.

It's a tedious task on wiggly birds that leave droppings on her skin and clothes and sometimes inflict painful scratches with sharp feet and beaks.

And all this while ducking angry frigatebird parents, which dive for her head because she has come too close to a frigate nest.

Banding is a huge task here that is never complete. The staff tries to band as many young birds as possible because this is a tremendous source of information.

Bird bands can answer many of those "no one knows" questions, such as how long do these birds live, where do they go when they leave here or how many times does a bird nest in one year?

These and all bird bands in Canada, Mexico and the United States come from a central Wildlife Research Center in Patuxent, Md. If someone finds a bird band and mails it to the address stamped on it, this centralized system can tell you how old the bird was, and where it was born.

This information comes back to individuals on a postcard, and is then available to researchers who are interested in that species.

This summer Tern Island staffers are banding about 1,100 albatrosses, 300 boobies, 200 red-tailed tropic birds, 1,500 noddies, 200 shearwaters and 1,000 terns.

It's the screeching sooty terns swarming around and landing on people's heads that give the island such an overwhelming bird personality.

Thousands of these black and white birds, which look like they're dressed up in little tuxedos, nest here in the spring. By summer, the ground and air is thick with them.

"This is an entirely different place when the sooties are gone," said Niethammer. "It's actually quiet. Except, of course, for the wedgies, at night."

Wedgies are wedge-tailed shearwaters, delicate-looking seabirds that nest in ground burrows. They

are shy compared to most birds here, hiding in their holes during the day and flying away if people approach.

But at night, in late summer and fall, these meek little birds transform the island to what could be the sound track from a movie called "Seabirds From Hell." They moan and wail in loud eerie cries that sound like people in pain.

It's hard to believe these sounds actually come from birds performing mating rituals, and Niethammer tells entertaining stories about the first-night terrors of newcomers to wedgie areas.

Wedgie moaning, sooty swooping and being the target of bird droppings are all part of a normal day on Tern Island. It's not for everyone but, for some, like Niethammer who has been here for two years, it's a great place to call home.

He's signing on for another year.

TOMORROW: Getting to and from French Frigate Shoals

Plane Day a Big Day on tiny Tern Island

No-hit landings are highly prized by pilots, and the birds

Fourth in a series

By Susan Scott

Special to the Star-Bulletin

TERN ISLAND, Hawaii — It's Plane Day on Tern Island.

A small orange tractor with two fire extinguishers in its shovel sits ready under a sign that says: "Welcome to French Frigate Shoals International Airport, Elevation 6, Population 4."

A Boston whaler waits on its trailer near the holst, ready for a water rescue.

Six people — some temporary residents — stand in various strategic locations with loaded cameras while

See SUPPLIES, Page A-8



By Greg Thomas, Special to the Star-Bulletin

As far as the wildlife experts and their subjects are concerned, the primary goal of pilot Robert Justman is to avoid all these fluttering birds when he lands and takes off from Tern Island. His record is pretty good.

SPECIAL REPORT: FOR THE BIRDS

SUPPLIES: Hardy pilots highly regarded on Tern

Continued from Page A-1

one U.S. Fish and Wildlife employee drives an all-terrain vehicle up and down the middle of the runway and another pedals a tricycle along the edges. The vehicles cause great clouds of birds to rise up in noisy protest, which is the whole point. The people are saving bird lives by getting them away from the runway.

There's excitement in the air just as there has been all morning when everyone cleaned, mopped and swept in anticipation of guests. No one complains about standing around in the hot sun, and soon the drone of engines is clear above the whistle of the strong trade winds and shrieking birds.

A small silvery dot grows larger and, in almost the blink of an eye, the tiny airplane is down and coasting to a stop.

The island's birds have gone berserk, the air is dark with them and the sound is deafening. Everyone looks anxiously at the white runway for bird bodies as the plane taxis back. But it's another great landing — not one bird has been hit.

The pilot, copilot and a new volunteer emerge from the six-seater plane called The Pacific Pearl, and after greetings, everyone starts unloading an amazing amount of supplies. It's like watching 20 people get out of a phone booth. People haul box after box of groceries and tools into the house until, finally, the little plane is empty.

Everyone congratulates pilot Robert Justman on another no-hit landing. He and the Tern Island staff are proud of his tight takeoffs and landings in this refuge area packed with wildlife.

"He flies that plane like it's a helicopter," said Ken Niethammer, assistant refuge manager at Tern. "He almost never hits a bird."

This is Justman's 192nd flight to Tern Island. "It's great to be here," he says while signing in the visitor's log. "Looks like this year I'll make number 200."

Justman recently signed a contract with Fish and Wildlife to fly supplies and people to and from Tern for another year. He makes the trip about once every six weeks, but he also comes for medical or other emergencies such as a boat stuck on the reef.

Most medical emergencies, he recalls, are from fishermen who are injured or ill. "They come here

“
It's great to be here.
Looks like this year
I'll make number
200.
”

Robert Justman

Pilot of The Pacific Pearl

for help because this is the only place that you can fly in to pick up someone," he says of this area where medical care is nonexistent.

And people occasionally ask for Justman's assistance in boating accidents, not uncommon in this land of atolls where low-lying islands are surrounded by reefs.

Boats are the only other way of getting supplies to and from French Frigate, and a number of boats come here for that reason.

The Townsend Cromwell, a ship owned by the National Oceanic and Atmospheric Administration, comes every four months or so with people, groceries and barrels of fuel, which can't be flown in.

Maggie Lee, a volunteer for the National Marine Fisheries Service monk seal program, came to Tern from Honolulu on the Cromwell.

"I had a great time," she said of her three-day trip. "I was one of the few who wasn't seasick so I watched a lot of movies."

One small, packed-to-the-gills plane that flies once every six weeks and one ship that comes every four months isn't much of a transportation network. Students, filmmakers, photographers and journalists can often get permission to visit the refuge, but getting there and back is their own problem.

One University of Hawaii graduate student, Jean Kenyon, signed on as a worker with a film crew who had chartered a large boat, the university's KILA, to bring them here and pick them up six weeks later. Kenyon worked on her coral research during time off from filming and Fish and Wildlife volunteer work.

Sometimes people hire fishing boats to go to and from this isolated area. A group of researchers on atolls further west of French Frigate have arranged for the Honolulu-based fishing vessel FORTUNA to pick them up at the end of this

research season.

The owners of a sailboat that wrecked on Pearl and Hermes Reef earlier this year during a race to Japan also hired the FORTUNA and its crew for a salvage trip, although rumor has it that the pounding waves and sharp reef hadn't left much to salvage. They did get the fuel out of the tanks though, an issue of grave concern among wildlife managers and researchers.

Sailboats have a hard time in this northwest chain because they tend to be small, light boats that get tossed like corks in the high seas, and their fiberglass hulls are not as resistant to reefs as large metal-hulled boats. Also, as in the main Hawaiian islands, the wind often blows hard from east to west, making the trip here an easy-with-the-wind passage, but the journey back an against-the-wind nightmare.

And either coming or going, the hidden reefs of these ancient atolls are a constant dark specter in the imaginations of skippers and navigators.

Not many sailboats travel to or pass by French Frigate Shoals, but you can see other small fiberglass boats skimming around the atoll nearly every day. These are Tern Island's Boston whalers, the unsinkable workhorses of the station that allow people to conduct counts and research on the atoll's tiny islets.

A chain hoist with a diesel generator lowers one or two of these boats into the water sometimes a couple of times a day since the landing area is usually too rough to leave the boats in the water even for a few hours. Whenever anyone needs to go seal counting, when it's time for the East Island turtle workers to switch, when birds need banding on Whale-Skate Island or when someone needs to go La Perouse for coral research, in go the whalers.

And how do people get the heavy gear they need from the house to the boats? They pedal it to the launch ramp in the baskets of tricycles called Adult Trikes, Tern's pickup trucks. And if both trikes are taken, you can always load your stuff in one of two grocery carts and push it down the coral-rock runway.

Getting to, from and around French Frigate Shoals is almost always an adventure and a challenge, but those who do it treasure the experience and hate to leave when the time comes.

Radios are lifelines for Tern folks

□ Communication rules help ensure everyone's safety

By Susan Scott

Special to the Star-Bulletin

HOW do you communicate with other people in a remote atoll in the Hawaiian Islands National Wildlife Refuge? Sometimes with difficulty but, with persistence, it can be done.

Radios are precious lifelines, and the field station at Tern Island, the communications center for the refuge, is equipped with a number of them.

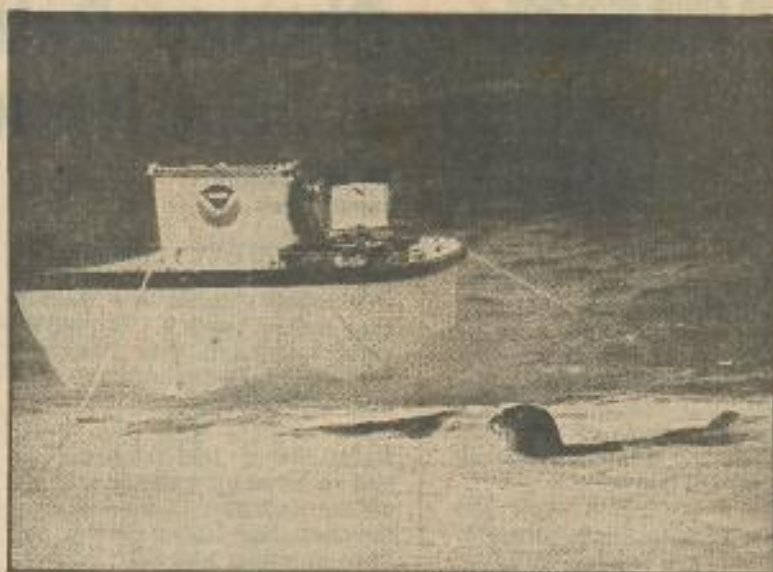
For keeping track of each other within the French Frigate Shoals atoll, workers here use VHF radios that usually have a range of about 25 miles. Communication rules are strictly adhered to in this place where help is often short-handed and far away.

Never less than two people go out in a whaler, and when they do they report in on a hand-held radio when they leave, arrive and are getting ready to return. The turtle worker on East Island, six miles away from Tern and visible only by telescope, must call in at certain times every day and more frequently during bad weather.

One evening, a downpour with strong winds caused Fish and Wildlife employee Glynnis Nakai to call in late from East Island, causing the other workers great worry.

"We can't go over there tonight because we can't see the coral heads," said Ken Niethammer, assistant refuge manager Tern Island, at the time.

She called a little bit later, wet but fine, and as relieved to hear



By Craig Thomas, Special to the Star-Bulletin

A young monk seal checks out one of the three Boston Whalers that are considered the workhorses of the atoll.

the voices of her co-workers as they were to hear hers.

Two single-sideband radios stand ready at the Tern station for contact with Honolulu. Through these, a person is supposedly able to get a marine operator at any time to patch through a telephone call. In reality, the radio waves are finicky; this sometimes works and sometimes doesn't. It isn't something to absolutely count on, but it's a joy for the caller when it works.

If the call is collect, it might not be a joy to the receiver when they see the bill. These marine calls cost \$5 a minute with a minimum of 3 minutes.

More often, Tern Islanders talk to Honolulu Fish and Wildlife people who have another radio in the office. Radio-to-radio calls are free but, again, persnickety.

George Balasz, a wildlife biologist for the National Marine Fisheries Service who is involved in sea turtle research on Oahu, has a single-sideband radio in his car, and sometimes drives around Oahu trying to find a place that will give him good reception and transmission. When he does, he relays messages to friends, relatives

and the Fish and Wildlife office for the people at Tern.

Tern Islanders can usually talk to field camps at Laysan, Pearl and Hermes Reef, atolls hundreds of miles further northwest that can't always get through to Honolulu. They then relay messages, sometimes through Balasz who then delivers it by regular telephone.

Emergencies here are a problem. Medical help comes only as advice over the radio from Dr. Ken Nakasone of Honolulu. If the radio channels aren't clear to Honolulu, Tern can call the Coast Guard, which will patch through calls in emergencies.

All the island's Boston Whalers, as well as the field station itself, have EPIRBS available for last-ditch emergencies. EPIRBS are emergency radio beacons that signal satellites and airplanes on a certain emergency frequency. These frequencies are monitored worldwide, so when someone activates an EPIRB, everyone gets serious.

And those who aren't in a hurry for news, there's always the written word. Mail comes and goes on the supply plane every six weeks.

"I'm not ready to say good-bye to Tern," said Kenyon as she boarded the plane with two volunteers whose time on Tern was up.

After lots of hugs and promises to keep in touch, the plane was

ready to go. Once again, workers shooed birds off the runway and pilot Justman took off in a short space of runway trying to avoid the thousands of birds that rose up in alarm. Two hits this time, both

sooty terns.

It's a sad moment, but it's the price refuge managers must pay to keep this field station going.

TOMORROW: Shoal's sights, sounds and smells

1989

Refuge is a balancing act

□ Issues of protection vs. exploitation arise on a daily basis

Second in a series

By Susan Scott

Special to the Star-Bulletin

TERN ISLAND, Hawaii — Managing the French Frigate Shoals wildlife refuge in the Northwest Hawaiian Islands is a delicate balancing act for the U.S. Fish and Wildlife Service.

Refuge managers must juggle such issues as resource use and public access while working with modest, unpredictable budgets.

The Fish and Wildlife Service addresses these questions of protection vs. exploitation in a refuge master plan, completed in 1986 and written with the purpose of providing long-range guidance for managing the area.

The plan addresses challenging issues:

■ **Public access.** A national wildlife refuge belongs to the public and exists through public support. But how many people can visit such an ecologically delicate place without destroying the qualities that make it a good refuge?

Public access to the refuge is restricted, but a permit system gives individuals a chance to visit the area. Refuge managers issue permits for research and educational programs that will benefit refuge animals or increase the public's knowledge of the refuge and its resources.

The number of visitors here per year is low for a variety of reasons, the most obvious being that human activity can hurt the animals that live and breed here.

Most of these creatures evolved without predators, so they nest on the ground or in low bushes and bask on beaches. When people are around, monk seals often scoot from the beach into the water, female sea turtles sometimes won't lay their eggs and birds fly off their nests, leaving them unprotected.

A continual worry among researchers

See REFUGE, Page A-8

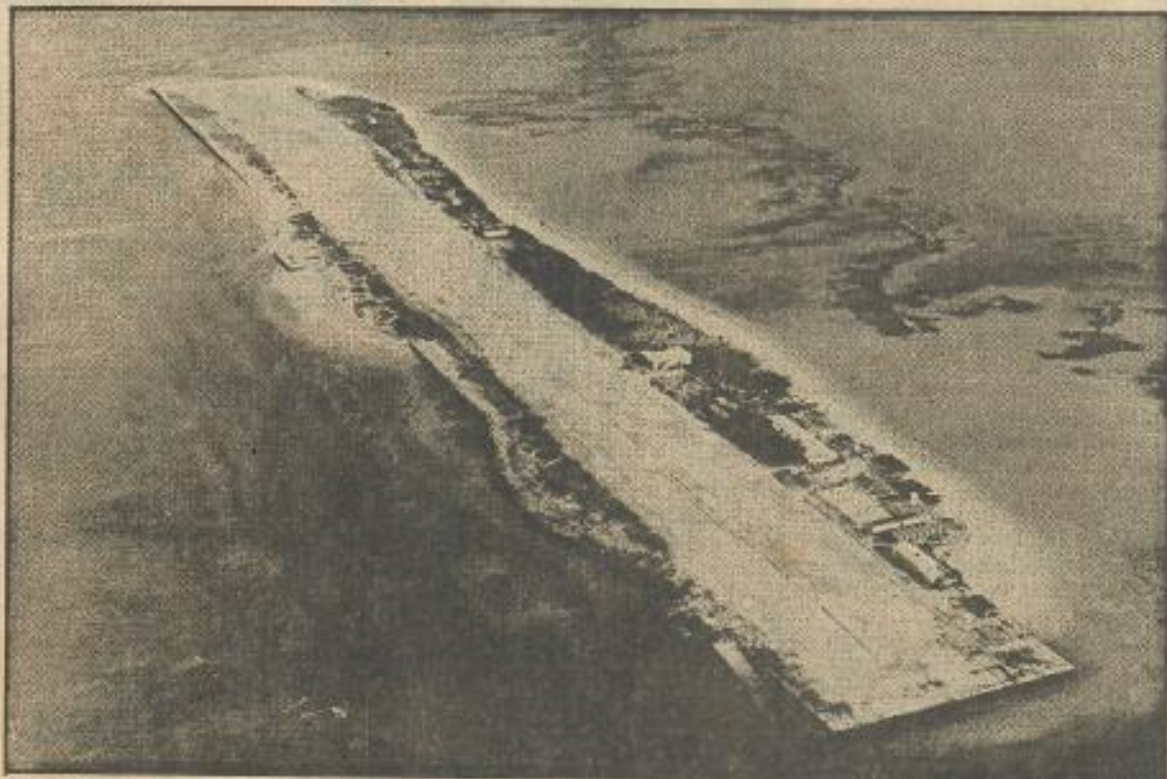
SPECIAL REPORT: FOR THE BIRDS



By Susan Scott, Special to the Star-Bulletin

Monk seals are the royalty of the French Frigate Shoals refuge because they're so precariously close to extinction — and they have faces anyone can love.

SPECIAL REPORT: FOR THE BIRDS



Coast Guard, Special to the Star-Bulletin

This 1967 photograph provides an aerial view of Tern Island. Before 1943, it was a tiny islet, but by 1943, Tern Island had been transformed into an air base shaped like an aircraft carrier.

Atoll rich in life and history

□ The name came after its reef nearly brought an end to 2 French frigates

By Susan Scott
Special to the Star-Bulletin

MENTION French Frigate Shoals and the usual response is: "Where's that?"

Few people know about this Hawaiian atoll, which is rich in wildlife and in history.

French Frigate Shoals lies near the middle of the Hawaiian chain and was so named because it was nearly the end of a couple of French frigates en route from Monterey, Calif., to Macao.

On Nov. 6, 1796, at 1:30 a.m., both ships sighted breakers directly ahead. La Perouse, the French explorer and captain of the ships, immediately turned both around and avoided crashing on the reef with only one-tenth of a mile to spare.

Since La Perouse nearly lost his vessels at this place, he named it the Shoal of the French Frigates. This name was officially changed in 1954 to French Frigate Shoals.

Given his near disaster, La Perouse wasn't too interested in seeing much more of this place and quit when he saw a large lava rock, named La Perouse Pinnacle many years later.

The pinnacle now is the major landmark in the center of the atoll. At 122 feet, it is the highest point around, towering above the flat sand islands.

It wasn't until 1859 when Lt. John M. Brooke visited the area on the U.S. Schooner Fenimore Cooper that the atoll was thoroughly explored. Brooke made

the first complete map of the islands and took formal possession for the United States.

Brookes' report of guano — bird droppings valued as fertilizer — in the area caused some excitement in Honolulu among guano investors, but subsequent voyages to the shoals proved that the tiny islands were not as rich as they had hoped.

Rain and waves continually wash the droppings into the ocean, often turning the water a pleasant milky blue.

It's hard to imagine anyone thinking guano here is in short supply: 18 species of seabirds and four species of endangered birds totaling up to 14 million visit the refuge, leaving their white bird logos on everything, including people.

Early sailors also noted an abundance of Hawaiian monk seals, sea turtles and fish, and it wasn't long before people began killing them for various uses.

Sealers slaughtered monk seals to near extinction. The Japanese began killing thousands of birds for a hat trade that was booming and hauling off huge numbers of turtles.

These events led President Theodore Roosevelt to set aside all the Northwestern Hawaiian Islands, except Midway, as an animal preserve in 1909.

But the military was as interested in French Frigate Shoals as the biologists. In 1928, the officer in charge of a U.S. Coast and Geodetic Survey wrote to the U.S. Naval station commander at Pearl Harbor: "French Frigate Shoals might be a very important point in case of a war between this nation and some power to the westward."

By 1935, the U.S. Navy routinely was using the area as a base for coordinated plane-ship exercises. The Navy was secre-

tive about its seaplane squadrons there, but East Island, an 11-acre islet near the middle of the atoll, became a "tent city" to house naval aviators.

Not long after, the place became a turning point in World War II when America battled that "power to the westward."

On March 3, 1942, the Japanese used French Frigate's lagoon as a point for two submarines to refuel and load with weapons for another raid on Pearl. The U.S. Navy got wind of this, mined the lagoon, stationed Marines on East Island and had Navy vessels patrol the area.

This forced the Japanese to attack Midway without knowing what was going on in Pearl Harbor — namely that the U.S. fleet already was headed for Midway.

The stunning United States victory at the battle of Midway is now history. If the Japanese had won that fight, they planned to use French Frigate Shoals as a staging area for raids on the main Hawaiian Islands.

After this crucial battle, the Navy decided it needed an air base at French Frigate Shoals. The Seabees joined the Hawaiian Dredging Co. and by 1943, tiny Tern Island had been transformed into a new island by dredging coral around the island and dumping it in the shape of a giant aircraft carrier.

After the war, the Navy turned the atoll over to commercial fishing companies; then it was converted to a Coast Guard LORAN — long range aid to navigation — station.

When improved electronic navigation systems negated the effectiveness of the LORAN station, the atoll was given to the U.S. Fish and Wildlife Service in 1979, which re-established its refuge status.

REFUGE: It becomes a balancing act

Continued from Page A-1

here is how many people are too many? Although managers need to learn the biology of these animals to know how to help them, human traffic broadens the chance of someone accidentally introducing harmful organisms that could wipe out entire native populations.

Ants already are a problem on Tern Island, where they swarm over the bodies of baby birds.

And weeds are a constant battle in a place where people must be extra careful about herbicides.

Many concerned individuals and groups believe that public access — including their own — to French Frigate Shoals should be strictly limited if that will help preserve the area.

These people believe that our quality of life is enhanced by simply knowing these animals are there and protected, whether anyone sees them firsthand.

Others believe that a refuge is of little value if no one uses it.

One partial solution to these different views, and a priority of the Fish and Wildlife Service, is to show this unique place to the public through wildlife journalists, photographers and filmmakers.

The master plan also includes supervised visits for educators and wildlife enthusiasts, but these visits depend upon the continuation of the field station on Tern Island in the French Frigate Shoals atoll, another challenge for managers.

■ Tern Island Field Station. The biological base station and only permanently inhabited part of the refuge is at Tern Island, a former military landing strip that is the largest of a number of islands in the French Frigate Shoals atoll.

Tern Island is now just a ghost of the past bustling military community that created it.

Roofs and fittings of the old buildings leak and rust. Metal sheets used for sea walls are deteriorating as the wind and salt water work at claiming them.

These sea walls, which now line three sides of the rectangular island, have been rebuilt twice and repaired once since the creation of the runway.

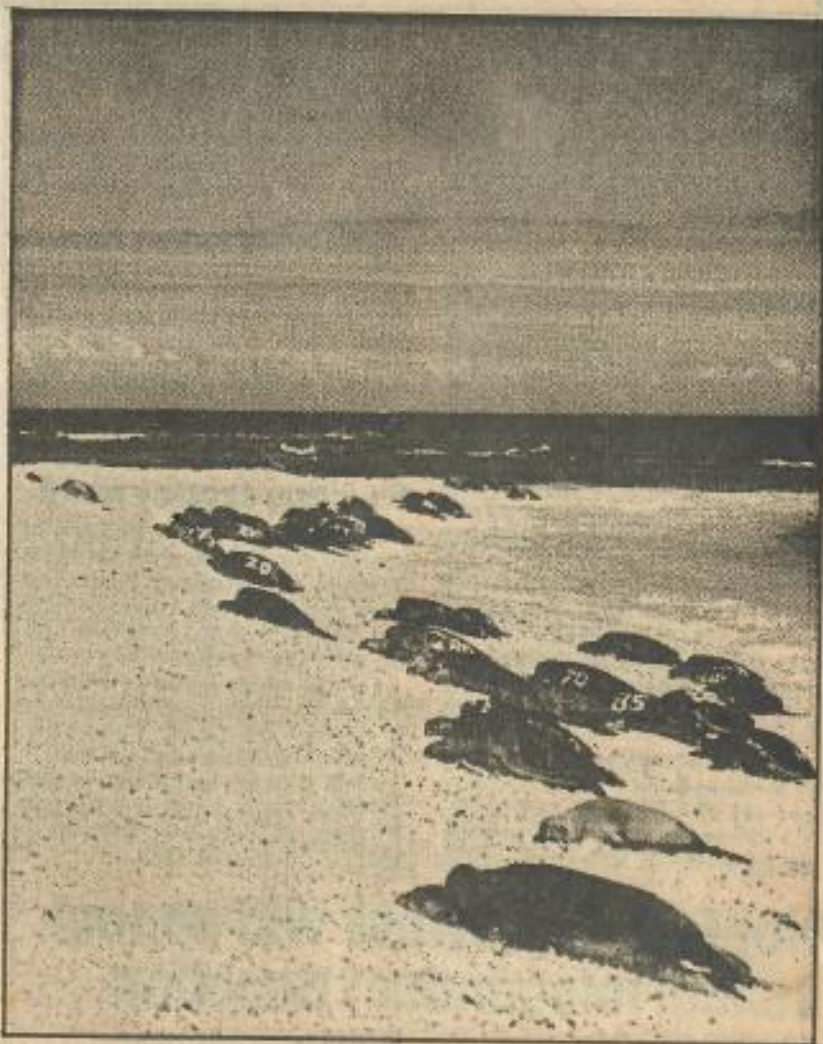
Not only are they rusting away again, they are a bad design for animals, which get caught between the wall and the land. Workers must check the walls daily for trapped sea turtles and monk seals.

The sea wall situation can't be ignored and left to go away by itself for a couple of reasons.

If the breakwaters aren't there, the island will crumble. The ocean would take back the coral rock that is the foundation of this artificial island.

Also, managers fear the rusty structures will form a huge trap for seals and turtles long before the island and sea wall are totally reclaimed by the sea. These animals can swim in through gaps they find, but they don't know how to get out.

The Army Corps of Engineers has proposed rebuilding the island



By Craig Thomas, Special to the Star-Bulletin

U.S. Fish and Wildlife Service workers number green sea turtles to monitor nesting cycles in French Frigate Shoals.

with ramps instead of walls at a cost of \$5 million to \$10 million.

Today, the island runway still is intact and is used to transport people and supplies to this wildlife field station.

Ken Niethammer, the Tern Island manager, grades the runway with a small tractor just before a plane is due. In this way, along with the occasional supply ship, the field station stays in touch with the outside world.

But the fate of the station lies in question because the refuge budget in Hawaii has not increased to reflect the added costs of new refuges in the state, such as Kilauea Point on Kauai and Hakalau Forest on the Big Island.

Also, federal funding comes in little surprise packets tacked onto other legislative bills.

Regional managers recently had decided to close the Tern Island field station because money was so short. But at the last moment, U.S. Sen. Daniel Inouye and Rep. Daniel Akaka added funds to a bill to keep the Tern Island station going.

The station was saved. For now.

Refuge manager Stewart Feffer says that if the Tern Island field station were closed, no one would be there to enforce wildlife laws. That would leave Hawaii's easily approached green sea turtles, monk seals and sea birds vulnerable to poachers.

Feffer worries that vandalism would be a problem on the island, and there soon would be no turning back to make it usable again. And, even without vandals, the salt, wind and waves would finish off the structures.

■ **Fishing interests.** The waters surrounding French Frigate Shoals are teeming with marine

animals, many economically important to the fishing industry. Bottom fish, lobsters, shrimp and kona crabs are abundant near the atoll, and tuna swim around it.

No fishing is allowed inside refuge boundaries and, so far, this hasn't been a problem.

"The fishermen respect our limits," Niethammer said.

"And we do what we can for them when they need help."

Tern Island managers arrange for medical air evacuations when someone on a fishing boat is seriously ill or injured.

Occasionally, fishermen call and request permission to enter the protected waters of the atoll to rest or fix broken parts when sea conditions are rough.

The isolated staff at Tern welcomes contact with these lobster and fishing boats and the same seems to be true of the fishermen, sometimes out to sea for months.

More than once Niethammer has gone to the refuge boundaries in one of the Boston whalers to exchange greetings and cookies for fish and lobsters.

So what is the future of this Tern Island field station that is such a vital part of refuge management?

"Uncertain," said Feffer, "and depends upon future funding."

The money now comes from Congress one year at a time, but even that's not guaranteed, making planning difficult.

Refuge managers hope the Fish and Wildlife Service will get long-term refuge funds through the executive budget in 1991 so Congress doesn't have to decide on this issue every year.

TOMORROW: Birds, birds and more birds