

1980

THE LURE OF LIMU

"Sea vegetables" can be turned into either
a feast or a work of art

By Pat Pitzer

Low tide on a weekend at Ewa Beach: Diamond Head's profile is etched in the distance against a bright blue sky as the sun beats down on an ages-old scene of *limu* pickers gathering their harvest.

While *limu* is the Hawaiian general name for all kinds of water plants, in common use it refers to the seaweeds that are edible or otherwise useful. Long considered a delicacy by the Hawaiians, *limu* is cosmopolitan in its appeal, and the gatherers at Ewa Beach are as diverse as the Islands' population: Hawaiians, Japanese, Chinese, Filipinos, Koreans, Samoans, haoles—perhaps a couple of hundred altogether, as far as the eye can see in either direction.

It is an aspect of Hawaii that many have never seen nor even realized exists, a contemporary version of a ritual of long ago, updated only by the use of plastic buckets and bags.

As the red, green and brown fingers of *limu* beckon from the waves, some gatherers go to meet it, hauling in their catch dripping and glistening from the sea. An ample Hawaiian woman wearing a colorful muumuu wades out into the surf and scoops up handfuls of *limu* from the water—a scene from another century.

Limu pickers have different styles. Some sort through the heaps of *limu* that have been washed up on the beach and marooned there by the receding tide. The beach is strewn with great mounds, much of it what the Hawaiians call 'opala, "junk," no good for eating. Intermingled with it, however, are other, desirable *limu*, so the careful sorter reaps rewards.



'Opala is a subjective term. One person's 'opala is another person's caviar. Surprisingly, many of the *limu* pickers are disdainful of the long, flat, bright green ribbons of the *limu* called *palahalaha* or sea lettuce, abundantly festooning the beach. This *limu*, one of the commonest in the Islands, can be a real delicacy with the proper preparation, but it is rarely collected because few people know what to do with it.

For many, *limu* gathering is a family outing with grandpa and children all contributing to filling their buckets and bags with treasures from the sea. One stakes out a pile on the beach surrounding it, attacks from all

Small children splash through the surf with gusto for the game, foraging with their hands and plastic scoops, bringing back their share of the catch. Lithe teen-agers in their wetsuits gather their *limu* daintily, having graduated from gusto to grace.

There is a sense of camaraderie among the *limu* pickers. While they are searching diligently and choosing their catch knowledgeably, they approach the task as fun, not work, and that pervades the spirit of the scene.

Perhaps there is still some of the old hunter-gatherer instinct. Freed from the necessity of doing what we now can enjoy seeking out food from nature, finding it at the seashore instead of the supermarket.

The weekend *limu* gathering is a sort of sport with the same elements present: an outdoor environment shared by congenial people, rapport with the sea, and the reward of bounty on the table.

Limu gathering also takes place on Oahu's Windward shores and on other beaches on the Neighbor Islands, for all have fertile *limu*. You'll find different varieties

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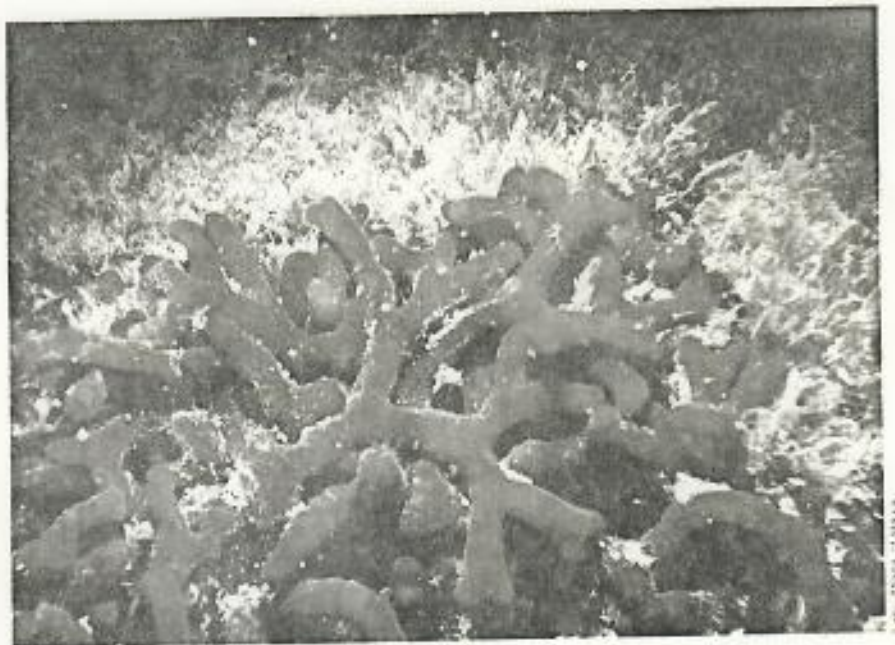
different locations, and in a single location the *limu* will vary according to the season. But, like Hawaii's flowers, there are some forms of *limu* present in each season year round.

Many of the gatherers at Ewa Beach are seeking the *limu* known by the Japanese name *ogo* and its native Hawaiian cousin, *limu manauwa*. Members of the same genus (*Gracilaria*), they are by far the most popular *limu* for eating today in Hawaii and are harvested by commercial collectors who sell them to

Left: A beautiful Hawaiian seaweed as seen in its natural habitat is the limu koha, highly esteemed as a delicacy by the Hawaiians.

Right: The limu wawae'iole or "rat's foot" is one of the popular edible local seaweeds.

Below: Limu pickers throng to Ewa Beach at low tide and to many other beaches in the Islands, reenacting a scene from the past.



"...Freed from the necessity of doing so, we can now enjoy seeking out our food from nature, finding it at the seashore instead of the supermarket..."

local markets. In colloquial parlance, both are often called *ogo*, with *limu manauwa* known as "short *ogo*" or "red *ogo*," though it is actually a different species from the "long *ogo*." The latter is not native to Hawaii, but probably arrived here around the turn of the century, hitchhiking on the hull of a Japanese ship. Both have a similar mild flavor and crunchy texture and they resemble each other though, in general, *limu manauwa* has a more reddish cast and is shorter and more branched than *ogo*.

Other *limu* collectors at the beach, particularly the Filipinos, are looking for the fleshy, spongy green *limu wawae'iole* or "rat's foot," which tastes better than it sounds, its name

derived from the stubby, flattened ends of its cylindrical branches.

A young local woman with a fat green "rat's foot" *limu*, when asked how she fixes it, smilingly replies, "with chili pepper and shoyu." Ask a Filipino *limu* picker the same question and you get the answer, "with tomatoes and onions and *bagoong*." One traditional Hawaiian preparation for this *limu* was with sea urchin gonads, and you'll have to ask an old Hawaiian how to find *those*.

Occasionally someone comes up with a prize, a *limu lepe 'ula'ula*, the large, beautiful "cockscorn" *limu*, readily identifiable by its nickname, with its rich red, mottled color and toothed, fringed edges. It is also

sometimes called "Pele's tongue."

Ignored by many but collected by a few knowledgeable in its preparation is *limu kala*, distinctive in appearance with its golden-brown holly-shaped leaves. This *limu*, which has a heritage of ritual and medicinal significance to the Hawaiians, is seasonal, dying out in late summer and returning in early spring.

A few are collecting *limu huna*, a tiny, delicate, lacy red variety with a mild flavor. It is not only good to eat, but is also exquisite when pressed.

This is the other side of the *limu* collector's coin—an appreciation of Hawaii's seaweeds not only as a delectable food but also for their variety and beauty in a pressed



composition. *Limu* can become either a feast or a work of art. You can press some and eat the leftovers or vice versa. That's versatility.

As a prelude to experimenting with seaweed eating and pressing, I was introduced to *limu* gathering by Heather Fortner, author of *The Limu Eater, A Cookbook of Hawaiian Seaweed*. Fortner, who has a degree in the natural history of Hawaii and who works for the

Left: Heather Fortner, author of *The Limu Eater* cookbook, prefers the term "sea vegetables" to seaweed.

Right: Eleanor Williamson and Isabella Abbott wrote an ethnobotanical study of the lore of *limu*.

LIMU EATING EXPLORED

If your only introduction to eating *limu* is *ogo* chopped in *poke* (Hawaiian style raw fish) or the dried seaweed called *nori* wrapped around *sushi*, you're missing a whole range of culinary possibilities. There are countless ways to enjoy these versatile sea vegetables and it's fun experimenting and discovering them. (You don't have to like slippery, slimy things, either.)

Here are some of my favorites, a combination of those gleaned from Heather Fortner's book, *The Limu Eater*, tips from Isabella Abbott and Eleanor Williamson, and recipes from Jeff Hunt, along with some of my own ideas thrown in.*

General observations: Each *limu* is distinctive in texture and flavor, but all have the tang of the sea, so I opted not to go the traditional Hawaiian route of salting the *limu* or letting it stand for hours or days in water to "ripen." I figured it was already salty enough and its flavor had sufficient authority.

Most types of *limu* blend well with a variety of other fairly strong flavors, such as garlic, curry, chili peppers, onion, sesame. *Limu* is extremely

compatible with other sea creatures, fish and shellfish. It also goes well with chicken and beef.

To many, eating *limu* means eating it raw, mixed with raw fish or made into a relish or pickle. While it is good in these ways, that's only half the story. It is also delicious cooked and served hot as a vegetable or as an ingredient in a main dish. You can, in fact, prepare a seven-course *limu* dinner to serve to your more adventurous friends.

Just because a variety of *limu* is tough or unpalatable raw, don't overlook its possibilities cooked. If you try *limu 'ak'aki* raw, even chopped in a salad, its tough brown strands are like chewing vintage rubber bands, in my opinion. However, Abbott and Williamson noted that the Hawaiians of old baked this *limu* with chicken in an *imu*, offering a glimmer of hope for the tough little stuff. I chopped the 'ak'aki, mixed it with melted butter, added a little mashed garlic and poultry seasoning, and packed it as a coating around pieces of chicken, then baked it in a slow oven in a pan covered with foil, removing the foil toward the end of the baking time to let the chicken brown. The Hawaiians knew what they were doing.

The holly-shaped leaves of the *limu kala* also tend to be tough when eaten raw, but they are marvelous as a stuffing for baked fish (another tip from the old Hawaiians). Taking off on Fortner's recipe for *limu*-stuffed baked fish, I took fish filets, placed a slice of bacon on each, sprinkled them with soy sauce and chopped onion, then stuffed them with chopped *limu kala*, folded them over, wrapped the stuffed

fish in *limu palahalaha* (sea lettuce) and baked it in a moderate oven for a half hour. Fortner's recipe uses *ogo* or *limu manaua* as the stuffing, and this, too, is good, but I was particularly partial to the *limu kala* as a stuffing.

Limu kala is one of the best of many seaweeds that are delicious deep-fried in tempura batter. Heather Fortner's tempura recipe is a star for practically any kind of *limu*. My favorites prepared this way, in addition to *limu kala*, were the little red *limu huna*, *limu kohu* (the prized red one sold in markets) and the nearly black hair-like *limu huluhuluwaena*. (One of the traditional ways of eating the latter, still practiced today, is chopped with raw liver. My broad-ranging tastes do not extend so far as raw liver.)

LIMU TEMPURA

Many different kinds of *limu* can be cooked in this style, including *limu manaua* (*ogo*), *limu huna*, *limu huluhuluwaena*, *'opihī limu*, *limu kala* and sea lettuce.

1 lb. *limu*
1 cup flour
½ tsp. sugar
1 tsp. salt
1 Tbsp. soy sauce
1 egg
½ cup milk
Dash of MSG
Oil for deep frying

Clean the *limu* and drain well. Mix the other ingredients except the oil into a thick batter. With a fork or salad tongs, pick a suitable piece of *limu*, dip into the batter and coat thoroughly. Transfer to the hot oil (approximately 375 degrees) and deep fry until golden brown. Drain excess oil on paper towels. Serve hot as an appetizer or

* Excerpts from *The Limu Eater* by Heather Fortner are reprinted with permission of the University of Hawaii Sea Grant College Program.

Hawaii Natural Energy Institute, has created an imaginative gourmet's guide to *limu*, covering more than two dozen varieties of edible Hawaiian seaweed.

Beyond her own experimentation, much of what she has learned about the art of *limu* eating she gathered word-of-mouth from anonymous *limu* pickers at the beach.

Limu gatherers share a kindred spirit. It is as if they are an initiated society with a secret—a knowledge of and aloha for *limu*. They are, however, friendly folk who gladly share their secret with the uninitiated. In fact, once they discover you're interested, they are eager to share information about the *limu* they're col-



Pat Pickle

side dish with shoyu and Chinese mustard.

Sea vegetables make excellent additions to soups and stews. Add them to your favorite stew or soup during the last few minutes of cooking time and they will serve as natural thickeners. *Ogo* and *limu 'ele'ele* are good this way, but best of all is the *limu lepe 'ula'ula*, the cockscomb, sometimes sold in markets as red sea lettuce. This soup from Fortner has a particularly splendid consistency and, if you like curry, it is superb with a little curry powder added.

LIMU LEPE 'ULA'ULA SOUP

1 cup wet *limu lepe 'ula'ula*, packed
1 onion, thinly sliced
1 Tbsp. oil
½ cup rolled oats
5 cups water
3 Tbsp. shoyu
1 tsp. salt
1 tsp. black pepper

In a medium saucepan stir-fry the onion in oil until the strong smell goes away. Add the oats and cook until slightly browned. Cut or break the *limu* into bite-sized pieces, then add the water and *limu* to the soup pot. Bring to a boil, then lower heat and simmer for 20 minutes. The soup should not be too thick. Add shoyu and seasoning.

The English are *limu* eaters, too. As a cooked vegetable side dish for roast beef, they eat *Porphyra*, a seaweed they call laver. The variety of this broad-leaved seaweed found in Hawaii is called *limu pah'e'e* or purple sea lettuce. I substituted the cockscomb *limu*, boiling it until tender and serving it with a sauce made of two

parts beef gravy to one part lemon juice. An interesting and tasty accompaniment to roast beef.

Limu makes a zesty addition to omelets. Chop *limu koku*, *limu 'ele'ele* or *ogo* and spread it over the omelet just before it sets, adding your choice of chopped onion, crisp crumbled bacon, grated cheese or all three. You may wish to blanch the *ogo* first to soften the crunchiness. Be prepared to be startled. The instant you plunge it into boiling water it turns bright green.

One of my most successful experiments was a takeoff on Fortner's '*opihī*' in escargot sauce. Not having any '*opihī*', I substituted sliced cooked *tako* (octopus) in this garlic-butter-sea lettuce sauce, and it was, indeed, the *limu* eater's answer to escargots.

'OPIHI IN ESCARGOT SAUCE

Although '*opihī*' are traditionally served raw, they are also excellent cooked in an escargot garlic-butter sauce. Chopped sea lettuce adds flavor and color.

'*Opihī*' in the shell, preferably freshly picked
Butter to cover a pan to ¼ inch
Garlic, finely minced and mashed
Sea lettuce, finely chopped
Salt and pepper to taste

In a large saucepan melt the butter over low heat; add the garlic, sea lettuce and seasonings; mix well. Set the '*opihī*', foot down, in the hot butter and cook until '*opihī*' loosen from shell—about 2 minutes. Remove from heat, serve immediately.

There are many superb salads using *limu*. The dark green *limu 'ele'ele* is particularly good chopped, combined

lecting and how they prepare it.

In addition to those we gather, Fortner gives me other *limu* treasures she has collected elsewhere. Among them is the *limu 'ele'ele* (the Hawaiian word for black) which actually is a dark green with filaments resembling long, soft, slippery, dark grass. Frequently found where freshwater streams meet the ocean, it is considered one of the most delicious by many *limu* eaters.

Another bears the descriptive Hawaiian name *limu huluhuluwaena*, meaning "pubic hair," for its almost black, hair-like strands. There is also some *limu 'ak'aki*, meaning "to nibble as a fish; bite, bite," which is what you have to do to eat the tough,

with garbanzo beans and chopped onions and marinated a couple of hours in oil and vinegar, mixed in proportion to suit your taste (I like it half and half).

Limu makes an excellent pickle, relish or condiment, marinated in a variety of sauces. Here are two of Jeff Hunt's recipes featuring delicious marinades for *ogo* or *limu manaua*.

PICKLED LIMU

1 cup vinegar
1 clove garlic, mashed
1 stalk green onion, chopped
1 tomato, chopped
¼ cup shoyu
¼ tsp. Aji-no-moto
1 green pepper, chopped
2 tsp. sugar
1 tsp. salt

Add rest of ingredients to vinegar. Boil *limu* in water 3 or 4 seconds, then drain it and place it in a jar. Cover the *limu* with vinegar mixture. Let stand for a day in the refrigerator to develop full flavor.

KOREAN STYLE LIMU

1 lb. *limu manaua* or *ogo*, chopped into 1- to 3-inch pieces
1 cup rice vinegar or to taste
½ cup shoyu
1 Tbsp. sesame oil or to taste
1-2 Tbsp. roasted sesame seeds
2 Tbsp. brown or white sugar
2 Tbsp. *mirin* (rice wine)
"Ko Choo Jung" hot sauce to taste (optional)
Chili pepper to taste
Chopped garlic to taste

Clean *limu* well; pour boiling water over *limu* until color just turns greenish. Drain. Mix ingredients together. Add *limu* to mixture. Refrigerate overnight. —P.P.

How many you can stack and press at one time depends on the quality of your press. Students in Jeff Hunt's class using a "proper" plant press, which can be ordered from the Mainland for \$70, were able to stack and press a couple of dozen at a time. If you are really serious about getting into *limu* pressing, you may wish to consider this. But improvised do-it-yourself presses also work. Some of Hunt's students used pieces of plywood for the top and bottom of the press, with the pressure applied by adjustable buckle straps. Barbara Stephan has her students make presses by drilling holes in four corners of pieces of particle board. Screw clamps, fitting through the holes, apply the pressure.

Or you can make do with whatever



Bar P. P.

you have on hand, stacking large books on top of the pressings, using rocks, bricks, concrete blocks or gallon bottles filled with water as your weights. With a makeshift press like this, however, you shouldn't try to stack more than 10 pressings at once.

You will need a moderately heavy weight to squeeze the water out of the *limu* and its mounting paper and to prevent warping. It is particularly important to distribute the weight evenly.

The other major thing to remember is to keep changing the newspapers as they absorb moisture, replacing them with fresh ones as the pressing is in progress. You should change the papers twice a day the first day and once a day after that until the piece is dry.

Limu usually will press in three or four days, though some of the larger, fleshier ones may take a week.

Most *limu* have enough mucilage in them to adhere to the mounting surface by themselves. You won't have to glue them since they have their own natural glue. The red varieties in particular stick the best, followed by the browns, then the greens. For those occasional ones that don't stick, use watered-down white glue and a fine brush to apply it very sparingly to the underside of the *limu*. Place the *limu* on the mounting paper, cover with waxed paper and press about an hour until the glue is dry.

With experience, you will learn which types press best, stick best, combine well together and, above all, you will learn the desirability of simplicity, to display the natural form and beauty of the *limu*. —P.P.



Far left: Barbara Stephan instructs students in trimming and arranging seaweed aesthetically before pressing it.

Above: Jeff Hunt gives his students at Windward Community College experience with pressing seaweed with two different kinds of presses.

Left: Ray Tabata demonstrates the exacting technique of lifting mounted *limu* from a pan of water.

rubbery, reddish-brown tubular fibers. Because of this characteristic, it is not a favorite collectors' item, though it can be redeemed with the right preparation.

Theoretically, all Hawaiian *limu* are edible in the sense that none are poisonous. But some are so calcareous that you could break a tooth on them, and others have such a bitter, unpleasant taste that you wouldn't choose to dine on them short of being marooned on a desert island. Edibility and palatability are two quite different things.

A caveat: Seaweeds, which are part of the large and diverse group of plants called algae, are classified according to color, and there are a few blue-green *limu* found in Hawaiian waters which may cause a rash and are not considered edible. Also, some seaweeds resemble corals in appearance because of their deposits of calcium carbonate. In fact, for many years these plants were mistaken for corals and were classified in the animal kingdom. While we think of Waikiki and the Islands' other fringing reefs as coral reefs, actually they are primarily composed of calcareous algae.

So, to be strictly accurate, one would have to say that all non-calcareous *limu* of the red, green and brown groups are edible. The color distinctions are sometimes misleading, for within each group there is a wide color variation and even a given species can take on different hues depending on the season, where it is growing and the amount of exposure to sunlight.

At any rate, among the edible and palatable seaweeds in Hawaii, there is an enormous variety in size, form, color, taste and texture.

"Sea vegetables" is Fortner's preferred term rather than seaweeds. It's a good point, since "weed" has a pejorative connotation, while "vegetable" indicates a nutritious edible.

The nutritional value of sea vegetables, like that of land vegetables, varies widely. However, all *limu* are rich in vitamins and minerals, have beneficial fiber content and are low in calories.

If you don't want to go to the ocean and gather your own, you can find some *limu* for sale in the markets, but your choice is limited. A recent check of the Farmers Market on Auahi revealed *ogo* for sale and *limu kohu*, a small, pink-to-red, pungent-flavored *limu* which they

sell salted and rolled into little balls. Highly prized by the Hawaiians, *limu koku* should be used sparingly because of its penetrating taste.

The venerable Tamashiro Market on King Street always has *limu* among its selections of delicacies and oddities from the sea. At Tamashiro's a steady stream of customers files past three big bins labeled "long *ogo*," "short *ogo*" and "cooked *ogo*." Taking plastic bags off rollers as one does in an ordinary grocery store for other vegetables, the customers scoop up handfuls of the sea vegetables and take them to the checkout counter to be weighed. This is vegetable-buying Island style.

Ogo at Tamashiro's sells for \$2.65

to \$2.95 a pound. The *limu* special that day was labeled "red sea lettuce" for \$1.49 a pound. This, it turns out, is a popular term for the *limu lepe 'ula'ula*, the "cockscomb." Like the *limu wawae'iole* ("rat's foot"), this is an occasional item at the market, depending on the *limu* catch from the independent collectors who supply it. Almost every day you will find there the little red *limu koku*, which at \$2.98 for a 4-ounce container—on a per pound basis, close to \$12—might be considered the caviar of *limu*.

Part of the reason for this variety's high price, in addition to the demand, may be the fact that it is difficult and sometimes dangerous to harvest, since it is found in rough water areas

where there is heavy wave action. This is no place for the novice. Occasionally, as with 'opihi pickers, *limu koku* gatherers are overwhelmed by a wave and become casualties of the sea.

If you do go collecting other *limu*, it's best to go at low tide. Take along a bucket or a large plastic bag to put it in. You might find it convenient to take along several smaller plastic bags to keep the different kinds of *limu* separate in your larger container.

There are two cardinal rules of collecting. First, don't overharvest. Try not to collect more than you will use. The second rule applies to those

HARVESTING THE OCEAN

You use seaweed products every day but probably don't realize it. The next time you brush your teeth, shampoo your hair, drink a beer, or eat a salad or ice cream, think of seaweed.

Without seaweed, your toothpaste and shampoo wouldn't be smoothly blended, the ingredients in your salad dressing would separate, the ice cream would melt faster and have a less pleasing texture, and your beer would be murky and lacking a nice head of foam.

These are just a few uses of valuable extracts called colloids which are produced by certain brown and red seaweeds. Already a multimillion-dollar business, the market is expanding rapidly as new uses for these extracts are developing almost daily. Because of the clamor for colloids, there is an impetus for cultivating seaweed commercially that extends beyond its direct use as food.

Is there potential for cultivating seaweed in Hawaii, harvesting the ocean? Many people familiar with the field say yes, and believe that seaweed as a new commercial crop may have economic significance in Hawaii's future.

William Magruder and Jeffrey Hunt state in their book, *Seaweeds of Hawaii*, "Seaweeds have long been and still are commonly used as food in Hawaii. It is envisioned that their future use and value in industry and as

food for animal aquaculture will far exceed that of human consumption... Hawaii's utilization of seaweeds has the potential of undergoing a transition from a 'wild harvest' food resource to one of planned seaweed farming."

Elsewhere, seaweeds are harvested specifically for their colloids, one dramatic example being the giant kelp off the coast of California. These sequoias of the sea have an extremely rapid growth rate and grow to be 100 feet tall.

Seaweed colloids are used extensively in a tremendous variety of products as stabilizing, emulsifying, thickening or jelling agents. Their application is widespread in food and dairy products, drugs and cosmetics, in the production of everything from wine to antibiotics to pet food, and in such diversified industrial processes as the manufacture of paint, paper, textiles, insecticides and rubber products. Research is being conducted in Hawaii and elsewhere on the use of seaweeds as an energy source to produce synthetic fuels.

Maxwell Doty, UH professor of botany, who has earned an international reputation for his work with seaweeds, speaks with enthusiasm for the ingenious applications of seaweed colloids. He points out that they are used to time-release fertilizer for crops and in timed release capsules for human medication—those capsules with all the little colored beads in them. It's the algae gels in the coatings that control the timed release, dissolving at different rates.

Versatile seaweed extracts are what keep the chocolate distributed through-

out chocolate milk, instead of settling down to the bottom as it did in years past. Doty says it is a sign of the generation gap whether you automatically shake a bottle of chocolate milk or not.

Doty has developed commercial *limu* farming operations in the Philippines, Malaysia, Micronesia, Chile and on Christmas Island.

While there are experimental projects growing *limu* at several sites on Oahu and in ponds on Molokai, most of his projects are overseas because, he says ironically, "It's easier to get federal money for overseas projects."



Maxwell Doty, U.H. professor of botany who has pioneered seaweed-growing projects in other countries, believes it has significant potential as a future commercial crop for Hawaii.

who are picking *limu* live, rather than gathering from the beachwash. That is: Do not pull it up by the roots. (Actually, it doesn't have roots, but a point of connection to the bottom called a holdfast.) Take along a knife to cut off the top portion, always leaving the base part so the plant can continue growing and rejuvenate itself for future harvest.

Limu always should be cleaned thoroughly. It gets its initial washing in salt water at the beach. Many experienced collectors add some sea water to their container, and a few even take along a portable ice chest to keep the *limu* cool until it reaches the haven of the refrigerator.

Opinions of veteran pickers differ

The immediate objective of the experimental *limu* projects in Hawaii is to relieve the market demand for *ogo* as food. Although this market for fresh *ogo* is substantial, the greatest potential for farming *ogo* and *limu manauoa* in Hawaii is in dried *limu* for export and as a source of commercially valuable colloids. Another colloid-producing species Doty thinks would work well in the Islands is *Eucheuma*, which is now being farmed successfully in the Philippines.

Doty envisions *limu* as a link in a diversified aquaculture program. Sea farms or marine plantations could grow seaweed as an add-on crop to provide food for the fish or shellfish being raised. Says Doty, "When you grow *limu* in a fishpond, you can double your yield of fish or shellfish. This is a big thing for fish farmers."

This technique is being used in the Philippines, where aquaculture is extensively practiced, often from a family farming approach.

The problems facing the would-be family *limu* farmer in Hawaii, says Doty, are: "site competition—the lack of available coastal sites and competing with recreation and development for their use, the lack of suitable legislation to permit reef farming on a small scale, and the overly concerned, ecologically inclined who don't know what they're talking about and are scared of possible consequences."

Still, he is hopeful. "Raising seaweed can be done here—and it's a crime that it has not been done. I think it's possible for Hawaii to have a commercial *limu* crop in the next few years." —P.P.

as to whether it's better to store the refrigerated *limu* in salt water or to shake the water from it and store it dry. You will probably want to keep it in a jar with a secure lid or, if in a plastic bag, be sure to twist the opening shut; even then, your kitchen may have something of the aura of the sea about it.

A *limu* enthusiast named Flora Lee Simpson, writing in a 1944 issue of *Paradise of the Pacific* on the joys of *limu* gathering and eating, tells of being advised by an old-timer that it keeps better in a jar without a lid. She tried it and related the results:

"The butter tasted of low tide, the milk tasted like a John Masefield poem, which poems, as everyone knows, were written to be read—not eaten, and when the door of the refrigerator was opened, Conrad's ghost stalked the room."

The durability or perishability of refrigerated *limu* of various types ranges widely, but most will keep at least a week or more and still be good for eating. There are exceptions, however, and a few fragile types are known by the insiders as "one-day *limu*"—best eaten within a day of the time they are gathered. The "cockscomb" *limu* is one of these, so the day it comes from the beach (or the store) let it find its way into a glorious soup or stew.

Whether for eating or for pressing, *limu* should not be given its final, thorough baptism in fresh water, removing any remaining bits of sand and debris, until you are ready to use it.

For the neophyte interested in learning more about *limu*, in addition to Fortner's *The Limu Eater*, two other books are recommended.

One is *Seaweeds of Hawaii*, an extensive photographic guide by William Magruder, a Ph.D. candidate at Stanford, and Jeffrey Hunt, an instructor at Windward Community College and a coordinator for the Marine Advisory Program. Their book contains color photographs and descriptions of 118 varieties of Hawaiian *limu*, edible and otherwise, as they appear in their native habitat. It graphically conveys the richness of variety in color, shape and form of this plant life nurtured by the sea.

The other valuable resource book is *Limu—An Ethnobotanical Study of Some Edible Hawaiian Seaweeds*

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"... Among the edible and palatable seaweeds in Hawaii, there is an enormous variety in size, form, color, taste and texture ..."

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Limu

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by Isabella Abbott and Eleanor Williamson. This small booklet offers a wealth of information on 12 common types of edible Hawaiian *limu* and their historical, traditional and contemporary uses. This book is now out of print, but it is available at the public library and the authors are planning a revised, expanded version including more varieties of *limu*.

Abbott, who holds a Ph.D. in botany, is a professor at Stanford and the University of Hawaii. Williamson is an assistant in anthropology at the Bishop Museum. Both are part-Hawaiian and have been friends since their years as classmates at the Kamehameha Schools.

Recognizing that *limu*—which the Hawaiians used as food, medicine and in ceremony—was an important part of the Island culture and that much of the lore of *limu* had been lost over time, the authors' purpose was to seek out and record remnants of this heritage.

They spent considerable time on all the Islands, speaking in Hawaiian with the senior members of the Hawaiian community, many of whom had been brought up by their grandparents, so their knowledge extended back a century or more.

Abbott and Williamson were delighted to discover that these older Hawaiians retained much information and folklore about *limu* and that many seaweeds were still used for food in rural areas.

The authors point out that, in early Hawaii, *limu* was an important part of the diet as the third major component of it, along with fish and poi. The *limu* contributed nutritional balance, interest and variety.

Limu played a role in the Island's traditional food barter system. As they did with fish, the Hawaiian living near the shore would trade *limu* to the people in the uplands in exchange for taro and other food.

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One Hawaiian seaweed significant in Hawaiian tradition is the *limu kala*. While this holly-like brown *limu*, commonly found on all the Islands, was used for food, it also played a major role in ritual and medicine. The word *kala* means "to loosen, untie, free, release", it also means "to forgive, pardon." The *limu kala*'s name is symbolic in both senses.

During the ritual of *ho'oponopono*,



Guy Tamashiro, grandson of the founder of the family establishment locally famed as Tamashiro Market, offers customers a choice of "long ago" or "short ago."

when the members of the family gathered to discuss and resolve grievances, *limu kala* was eaten to signify the asking and giving of forgiveness. Some of Abbott's and Williamson's sources remembered this use of the *limu* in family rituals from their childhood.

Limu kala also contributed to a purification rite following the burial of a relative and to a ceremony for fishermen.

Another custom was that of making a *limu kala* lei for a sick person, who would then go into the sea wearing it and let the water carry away the lei, and with it the cause of the illness—the concept of *kala* meaning "to free."

Limu kala was chopped or chewed and applied as a poultice to coral cuts, a practice that continues today.

Other *limu* had medicinal uses for everything from backache to asthma. In addition, *limu* was eaten as a popular remedy for a general run-down feeling—an idea that is not at all far-fetched, since *limu* of many kinds are rich in vitamins and minerals.