Sailing The Farm

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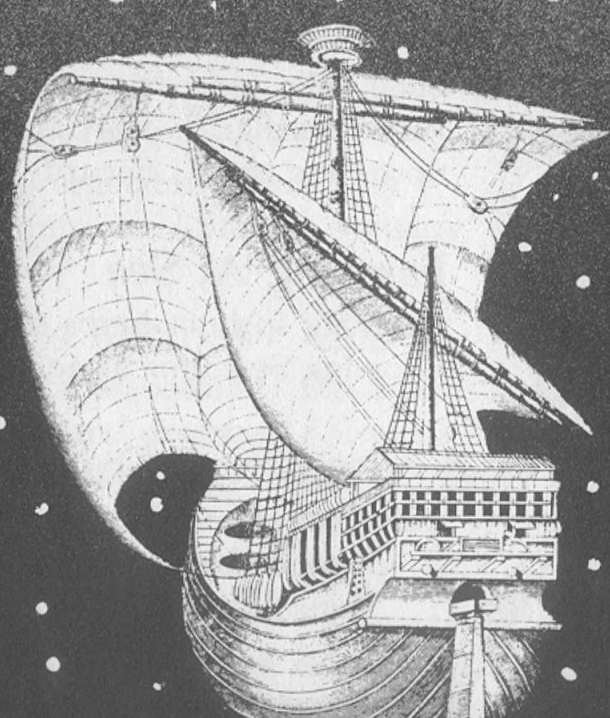
I see before me fathomless depths
and far flung distances – vastness beyond vast.
I see names of places, transcendental spaces,
strange faces.
I see routes across the earth,
well tracked routes of famous men,
men saying "Come, I have been here,
the way is not safe,
but Death stalks surely where you now reside –
and boredom – Death's brother."



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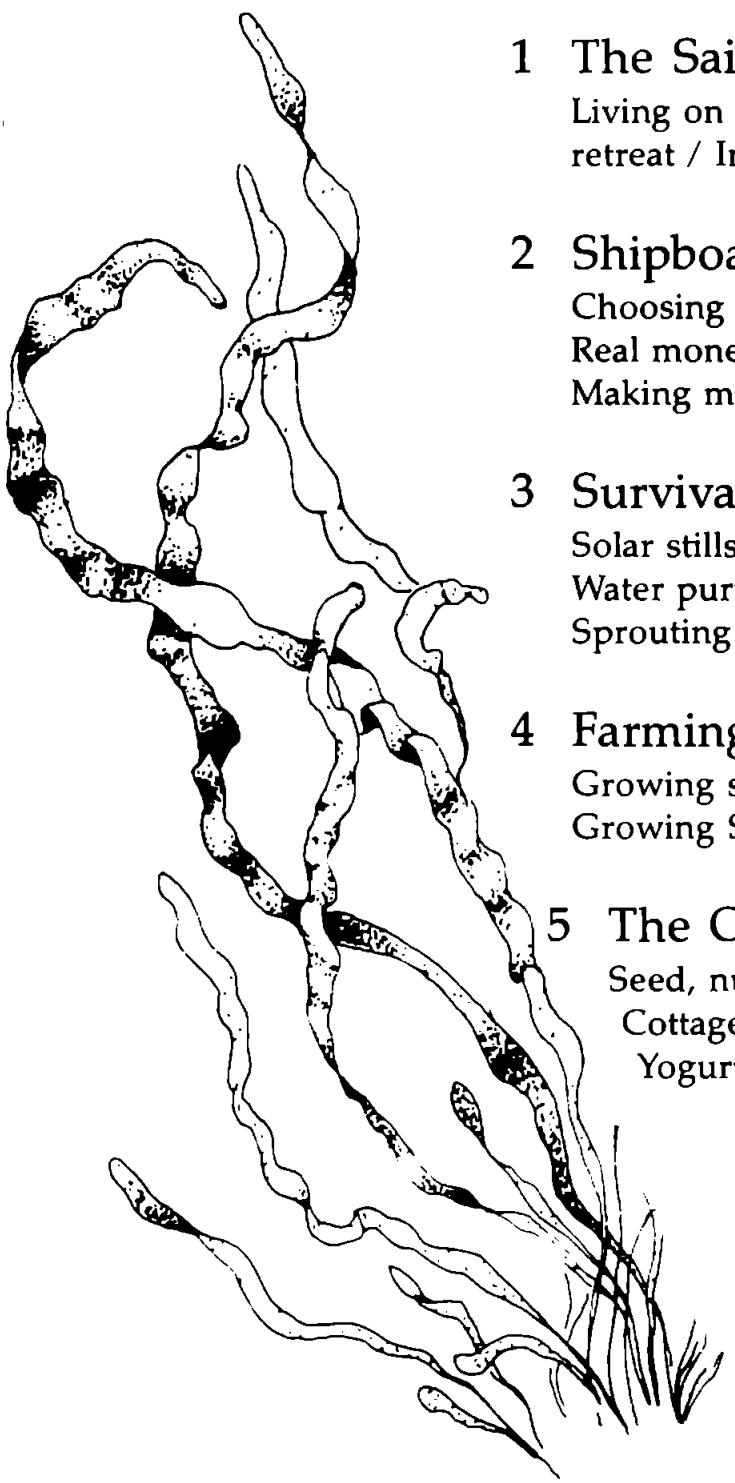
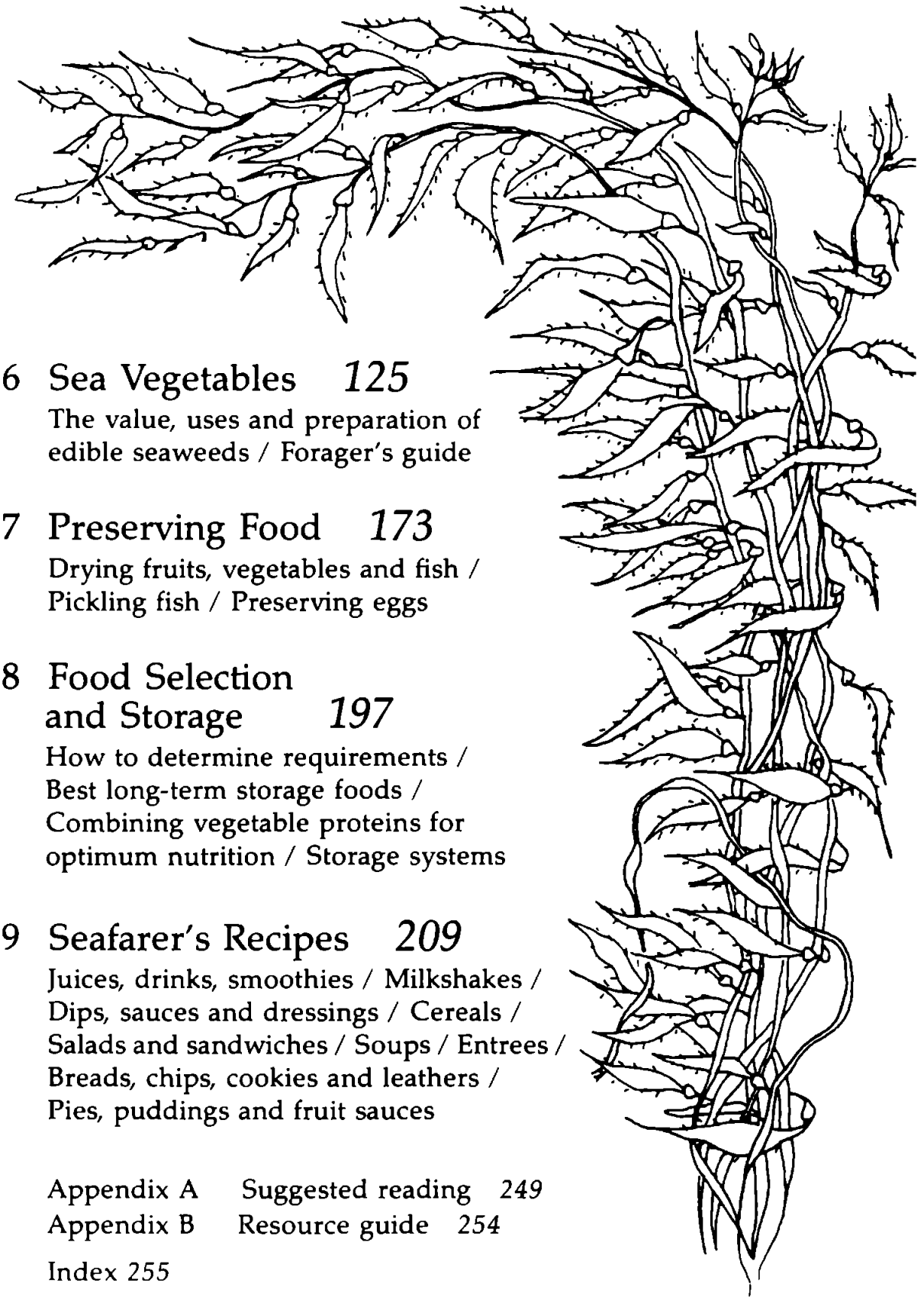




Introduction

Ever since I was 15 years old I knew that someday I would live on the sea. That was when my father bought a 27-foot Bristol sloop. At 15, that sloop seemed like a ship to me, and the Hudson River on which I lived, a sea. My father would take the family and friends for cruises through the Hudson Highlands to West Point and along the New England coast to Cape Cod, Block Island and other far away exotic lands. They were really rather nice sails and it was a very nice boat, but alas it was definitely a one-man boat. The sails responded only to my father's hand and the tiller only to his direction. To me, the beauty of sailing was much more than a sport: a sailboat could be a place to live, work, discover and entertain in a dramatically changeable environment.

Two years later I was the proud owner of a brand new 30-foot Sparkman and Stephans mahogany sloop. When I was just three years old the builder, Fred Burger, started

constructing this boat by cutting down some oak trees in his back yard and setting them to cure. Sixteen years later he hadn't quite finished with the project when he lost interest in it. I bought his unfinished dream, put a summer's work into outfitting her and sailed *Salu* past Miss Liberty in New York harbor. I sailed her south; I sailed her far. That boat and I cruised throughout the Bahamas and Florida Keys for the better part of a year before I was 19 years old. Indigo waters, foreign lands, lobster and grouper dinners every night, deserted islands — I was hooked! This surely was the way of life for me that was meant to be.

But *Salu* had too many shortfalls for an ocean-voyaging machine as she was designed to be a fast weekend cruiser. The narrow seven and one-half foot beam and high aspect rig resulted in very tender responses and a well-heeled ride in any kind of fresh weather. Her liveliness was exciting during a dash across the Gulf Stream, but a little too intense for longer passages. One year and 7000 miles after I bought the good ship *Salu,* it was sold in Miami for a nice profit.

For the next year I didn't step or sail on a boat. That year saw me motorcycling across America, living in communes in Oregon and California, working in health food stores and studying esoteric realities. Gradually the idea formed in my consciousness that a sailboat could be a self-sufficient movable platform on which to base my increasingly mobile lifestyle. These thoughts condensed into a 30-foot long by 10-foot beam 8-ton Yugoslavian double-ender, the *Kona High.* After one year of rebuilding (supposed to be two months!) I again let go of the dock lines from my Hudson River berth and slipped quietly out of New York harbor during a snow flurry.

While cruising the southern and western Caribbean I learned and applied many techniques of regenerative seastead sailing. Special jars and trays were set up in the galley to grow all the fresh green sprouts the crew could eat. With the local inhabitants, I traded various manufactured goods for

fuel, paint, food, etc. In Jamaica I was able to make over $100 per day taking tourists out for day sails. During this time I learned that cruising didn't have to be just a 10-day vacation from a miserable monotonous job in the frozen north. A reasonable amount of planning and work could sustain my voyaging indefinitely if I chose to stay on that tack.

After about two years of this ocean living, I started to get the desire for shoreside experiences, education, relationships and other popular landlubber dreams. Right after *Kona High* was sold, when I thought I'd see the part of the world that is farther than just a walk from the beach, a friend told me about an outrageous boat that was for sale on the island of St. Lucia in the West Indies. I told Mark that I wouldn't be at all interested in another boat for at least a few years, but he could go ahead and tell me about it anyway. Well, he said, she's about 40 foot long on deck, 12 foot beam, 6 foot draft and displaces 18 tons. The hull was of solid galvanized steel, constructed by dedicated Dutch craftsmen. Diesel engine, beautiful mahogany interior joinery, 1000 mile range tanks, hot water shower, stereo, etc., etc., and mine for just $24,000. A week later I was in St. Lucia to close the deal. I figured that I was just a boat addict and couldn't help myself, so what the hell, why not another boat?

After an easy downwind sail along the Antilles and Bahamas to Miami, the refit job began. *La Lionesse* was fitted with a greenhouse instead of a front sleeping cabin, a steam sauna head, fresh water collection – solar distillation system, nitrogen gas food preservation system, bulk food storage units, an alternator belted off the main prop shaft for electric power under sail and a solar cell panel on the cabin roof. I didn't want to ever come back to land unless there was a pretty or fun reason to do so.

La Lionesse was the lab where I installed and used all the ideas and technologies that I had been developing on my previous boats. The only thing I couldn't get or make myself

was diesel fuel and propane. No big deal for a sailboat you say? Well — my mistake with that boat was in choosing a heavy displacement motorsailer for my life support platform. Her enormous size allowed caverns of living room, but it took a near gale to drive her or a whole tank of fuel. At 4 knots under power the craft could cover 1000 miles on 150 gallons of fuel, not bad all things considered. Still, my next boat will surely be of light displacement with either a very small motor or none at all.

La Lionesse and I sailed about 20,000 miles in the Bahamas, eastern and western Caribbean and Pacific Ocean. I had become a strict vegetarian when I bought *La Lionesse* and therefore ate no fish whatsoever. I supported myself nutritionally on sprouts, fruit, nuts, etc., while financially I thrived by trading these foods, fishing gear, digital watches and other small goods to yachtsmen and natives. This voyaging was a self-perpetuating lifestyle, but after two years I decided to take the boat up to San Francisco to put her up for sale. The gods had other plans, however, and 350 miles south of San Diego, while coming into one of the very few refueling stops along the Baja California coast, I was caught in a storm that deposited *La Lionesse* crudely upon a very rugged and nasty rocky shore at 2 a.m. one foggy morning. After spending the rest of the night on a wet rock, I was able to survey the situation. The 4 mm steel hull plating was no match for the constant slamming the hull took against sharp rocks. It was definitely curtains for that brave and stalwart ship. Nothing other than a backpackful of souvenirs, some survival equipment and a parrot was salvageable as I had to scale a 1000-foot sheer cliff that faced the beach and after that at least 50 miles of some of the most desolate desert in the world.

So what about the next boat? It's still whistling around in my head and I have a few sketches on the drawing board. *Fuseiki* looks like a 40-foot ply and epoxy trimaran ketch. Light displacement, fast under sail, efficient under power,

easy to beach for hull repairs, and lots of interior and deck space for a family of ocean nomads committed only to the pursuit of expanding freedom. A two-cylinder diesel will provide rugged dependable power for getting in and out of tight spots. Trailing water turbine-powered generators, solar cells and a windmill will provide the electricity needed for running environment adaptation tools like a ham radio, stereo, pina colada blender, lights, rebuilding-refinishing tools, etc. Two built-in solar distillation units will insure a plentiful supply of fresh water to keep the lexan-covered greenhouse in the aft cabin nice and moist for growing sprouts, wheatgrass, strawberries, tomatoes, Spirulina algae, mushrooms, etc. No point going around hungry, is there? I gave up canned tuna fish a long time ago! Some of the technology I am working on right now that will be installed if feasible involves the conversion of seaweeds and sewage into methane gas and seaweeds, fruit, and grains into alcohol. Either of these two fuels can be used to run an engine for propulsion or power generation.

We ocean voyagers are going to have to get a lot smarter and more independent if we are to continue our chosen lifestyle. When fuel is $10 a gallon, if you can find it, how ya gonna keep going? These shortages and squeezes are bound to occur so let's materialize our self-sufficient spirits or we'll just be taking weekend sails and living in the marina instead of *out there.*

1
The Sailing Homestead

If there are two things that the sea has provided man throughout history, they are the abundance of wealth to be found within its waters and the ability to travel long distances. With the proper tools and skills man has lived from the sea since time began and will continue to do so as long as he survives on this watery planet.

What do economic upheaval, civil strife and dangerous social conditions mean to the self-sufficient sailor when the sight of land slips for the last time below the horizon? It's hard to believe the existence of these realities on shore. Unless a radio is turned on you could easily imagine it was all just a dream you had last night. But now you're awake! Great clouds harnessed to tall masts push your craft through sparkling blue waves surrounded only by the unbroken vastness of the open sea. It's your own little world. All the tools necessary to earn a living are on board, as are the charts

to guide the craft anywhere there is six feet of water. A large supply of food and a fresh water still provide plenty of security against shortages. You could sail for a year without seeing or being seen from land. With this independence the decision on where and when to come ashore may be governed by conscious choice — not dictated by necessity.

Political and economic reports are forecasting a gale that could wreck anyone's ship if preparations are not made in advance. When a hurricane is forecast to strike in a few days we would hurry about to batten down hatches and set out heavy storm anchors. Well, a storm of another kind seems to be headed our way and the only port of refuge is our own personal ability to provide food, shelter and defense when they become otherwise unavailable due to outrageously high prices, shortages or war.

What can we do to prepare for this heavy weather? I have learned from many years of sailing that the ocean is the safest place on the planet — but the shore will ruin you. Losing a boat on the rocks isn't the only pitfall to concern us. The freedom to roam where intuition guides, to go where food is cheap or free and to live without that "big brother is watching you" feeling does not seem to be possible on land. Real estate tax, sales tax, income tax, Social Security tax, etc., etc. Cut it loose! Get a boat and head for the open sea.

A boat is a perfect homestead retreat at this particular stage of the world's evolution. Instead of a place way up in the hills that can't move to adapt to changing political and economic movements, a boat will take you anywhere in the world. Even if it stays right at the dock you'll save money by not having a yard to maintain or real estate taxes to pay. Electricity and heating costs are but a fraction of those in a house. If you live totally on the boat you won't need cars with all the costs they entail, or the constant drain on your pocketbook for "entertainment" in the unimaginative world of modern life.

A sailboat can slip in and out of harbors so quietly that the world, in its mindless whirlpool full of fiddlers fiddling while Rome burns, will never notice you. There are many deserted islands and stretches of coastline where you could live like an enlightened king in the wilds on your own self-contained, fully equipped living module. This floating capsule can be transported wherever you wish, to stay until the boat's bins are loaded with fresh dried fruit, seaweeds and fish to trade along the ways of your travels without taxes or government supervision.

A hundred thousand miles of practically deserted sea-coast along the Alaskan and Canadian shoreline are absolutely teeming with salmon, seaweeds and wild foods of all kinds. There are some areas where there may not be another human soul for a hundred miles. The reason why this vast region, so rich in natural resources, is so thinly settled is that people have not yet learned to adapt themselves to its sometimes harsh environment. With a boat you could live in these less populated areas in the summer, and then sail south with the geese in the fall before the harbors become solid ice and life hibernates for the winter.

In the Pacific Ocean alone there are hundreds of islands both big and small that are almost totally uninhabited due to the lack of modern conveniences. As in so much of the world, the populations have flocked to the larger ports in quest of a piece of the Twentieth Century Dream. I'm not saying that they all left behind paradises complete with mountain waterfalls and young virgins. Some of these islands are little more than atolls barely above the surface of the water. By bringing your own familiar portable life support systems with you into these areas, even just a limited amount of technology, carefully gleaned from the western civilization, will allow your family to live comfortably in an otherwise inhospitable corner of the world. If you are more interested in the latest hit

movies and fancy new cars than the pursuit of happiness and freedom, then this lifestyle is obviously not for you.

How about this cruising life? Sound good? Many individuals are doing just this or rushing around trying to get a solid boat together before it becomes impossible. But there is much to learn in order to make the oceans your backyard and put all of its wealth in your pocket.

A home on the ocean? Could you really live there? Deep-sea or coastal? Could the sea actually be your permanent home? What is this life called cruising? Is it where we work very hard to build a structure and store up necessities in order to buy ourselves some free time to go where pressures and demands can't reach or find us? Is it where we take vacations and holidays from the real world for a short time only to return from paradise to the purgatory of earning a living? Or is it the desire for a laissez-faire, live-for-today-come-what-may kind of life? Many of us who have spent time at sea have often wished we could live there. I don't mean just to visit or to run down our batteries and bank accounts only to have to haul in on the apron strings for another recharge on shore. I mean we would like to charge our batteries at sea, and build new ones too! We'd like to grow, learn and live in the new environment we have chosen for our home.

A few million years ago we were perfectly adapted to life in the watery seven-tenths of the planet. I'm not sure exactly why we all crawled up out of the water to live on terra firma or why, if humans are the most intelligent beings around, the porpoises and whales beat us back to the sea. The land has a lot going for it. I'd recommend it to anybody wholeheartedly; however, it may soon only be a nice place to visit for a short while.

To survive in a new environment while moving out of a familiar one, there are many new skills and changes that we must develop. This new awareness may be acquired in many ways — from native teachers, or from direct experiences.

Let's first take a look at some of the common practices that keep most folks stuck on dry land.

Man is the only animal who cooks his food. Are we humans so very different from all the other species of animals that our food requirements are much more evolved? Do we really have to work hard to buy kerosene to heat food for dinner? I hope not, because cooked food helps to keep us attached to the umbilical cord ashore.

If cooking food and using stove fuel is a waste of energy, is it really necessary to bring cans of cooked food on board for a long voyage? While helping many sailors stock their crafts for an extended cruise or ocean voyage, I would see cases of bottles and cans. What are they putting aboard this miniature world where every square inch, gram and dollar is hard earned and rare? Granted, some canned foods add variety and a gourmet flair on a long passage, but they can't possibly compete nutritionally with their fresh counterparts. Who would prefer a can of peas to a bowl of fresh ones right out of the garden? It seems a waste of energy and quality when food is cooked once for canning and then again before eating. Cooking either makes unavailable or destroys much of the vitamins, enzymes and protein in the food we eat. Because of its lower vitality and nutrient value, you need more cooked food for the same energy and body building materials than food eaten in its raw state. There's no room in the food cycle for waste on your boat. You don't throw engine fuel overboard so why waste food energy? We save energy for use in other places if we eat less and spend less energy preparing food.

There are many kinds of incredibly delicious and nutritious foods that can be prepared without cooking. Any of the seeds, grains, beans and nuts may be germinated and sprouted instead of cooked. This saves fuel and also vastly increases the vitamin and enzyme levels of the seed. In a few days dried seeds become fresh green vegetables and a really

healthful basis of our cruising diets. These dried and easy-to-store basic raw materials can be sprouted to make beautiful fresh salads, milks, cheeses, solar breads, juices, spices and a lot more. With a couple hundred pounds of seeds, a few dried fruits and a solar still for fresh water, a family could sail around the world without ever having to make that long upwind tack to the grocery store for manufactured products shipped from half a world away.

It seems odd that some people uproot their whole life and routine in order to go down to the sea, but never realize this drastic change in their life might require an environmental adaptation as well. You take yourself with you wherever you go. Sea voyaging is a perfect chance to expand your horizons in many directions at once while it teaches you to simplify and lose old habits that keep you attached to the you of yesterday.

Everything changes. The stars, waves and weather are moving and drawing us into a closer and closer alliance with the natural ways and cycles of the earth. Some patterns require much energy and time to perpetuate while others require less and less. There are many ways of solving certain problems that are extremely easy, but we're so caught up in doing things the way we always have that we can't see the obvious solutions. You can walk around a flagpole or climb over it. Either way you get to the other side, but one way is a lot easier.

Eventually an ecology is evolved that is most efficient for the particular niche we wish to create for ourselves. By selecting the materials most suited to our needs and handling them in the most effective way, we can now produce more from a limited environment than was ever before possible. Disposing of the by-products of this production that is in harmony with the new cycle that develops, keeps the whole system healthy and reduces waste.

Man seems to be the most generally adapted form of life

on this planet today. He can do everything without totally specializing in anything. While some animals have grown in surprising ways to adapt themselves to the environment, their specialization is actually self-limiting. Extreme specialization usually results in change-defying rigidity. But man can design, make and use fishing tackle, underwater breathing gear and airplanes and interchange these adaptations at will.

It may be that man specializes by specializing in everything! He designs tools to enable him to fit and adapt more easily in his given or chosen reality. Darwin taught us that the most efficient species survive and thus dominate a given space. Man is able to adapt to practically every environment on earth. From underwater to intergalactic space, man is the adventurer, the designer, the settler. He is constantly extending the limits of the environments in which he lives.

Man can live in a space capsule for long periods of time while pursuing many different interests other than his basic survival. While solar cells and water recycling systems can supply some needs, a present day space station is a totally enclosed life support machine completely dependent on its base. This whole earth is a space station as well, but because of its huge mass and energy conversion systems we think of it as being unlimited in its resources and in its ability to absorb human pollution.

A sailing vessel can be a nearly self-sufficient entity and only very rarely needs to return to a port for supplies. It is a perfect platform or stage to develop and integrate the techniques of independent survival while living in harmony and in touch with this huge space vehicle planet that is presently our home. We are beginning to understand that nothing is free and that everything we do affects the ecology in some way. How to live lightly on the earth, how to convert energy efficiently, how to minimize needs for expensive resources and how to reduce unrenewable energy requirements — these are the basic questions we must answer to

attain greater levels of self-determination and control. These skills will determine our fate and destiny as humans.

By self-sufficient I do not mean that you must rely totally upon yourself with no connections to the world about you. The world is a relatively enclosed system that supports an incredible array of different kinds of life; however, the primal source of energy to move this whole system is the Sun. I wouldn't say that the Earth is perfectly self-sufficient, but it doesn't seem to borrow much from the universe either!

If every member in a society, system or ecology takes more than it gives, or is not able to use the abundant sources of energy that exist all around, the unit soon dies and the experiment is over. An analogy is the seed. Nature supplies the tiny germ of life with enough nutrients and intelligence to establish itself in a given location. Without any need of outside materials, save for water and air, it can sprout and grow into a totally activated and on-line living entity. However, if it fails to sprout in the sun, therefore depriving itself of an unlimited source of energy to convert raw materials in its environment for its own use, it soon uses up all the rations it was issued when produced and dies. Man is in the same situation now. Unless we are able to develop ongoing renewable energies and new ways to use them, we will not continue to survive.

For now, we can use the sun to blow our vessels whereever we wish, grow food, distill fresh water, heat a shower, power lights and run appliances — but we must go on from these simple skills to a greater understanding of life requirements and a knowledge of how to take greater advantage of opportunities that the environment offers. The more sympathetic our relationship with the Earth's food and energy cycles, the more adaptable we will be to the incredible changes taking place in population, technology and governmental control. The Earth is quickly becoming a high-rent

district where the price of residence is expanding the intelligent use of our consciousness and our environment.

So grow your own, learn your own, find your own, make your own, take care of your own — but stay in touch with the rest of us. Who knows — someday someone might come up with something better!

2
Shipboard Finances

A certain amount of planning now can save a great deal of hardship and pain later on when the waves start breaking over our heads. When things get tough, and long lines appear not only at gas stations, but at hardware and food stores as well, the time for effective action is over.

Right now you can methodically and peacefully be putting a vessel together that will support your family with a high standard of living. Tools are available, along with bulk seeds, weapons, charts, boat loans, storage supplies, etc. Even if you have only small means, a 30-foot used boat can be found very reasonably if you look around. *This opportunity may not exist later on!*

I'd rather have a well stocked sailboat and the ability to sail it anywhere in the world than money in a bank that might fail, a job from which I might be laid off, a government pension that could dry up, insurance policies, etc. The ability

to carve your living out of the raw earth is the best security you could have anywhere at any time. The shaky financial structures in which people today find their security may not last in any one of dozens of imaginable situations that may become realities.

So what can you do? In the first place, start looking for a really solidly built boat or build one yourself. Because of the high price and scarcity of fuel, a sailboat with a small auxiliary engine is the only practical vessel to be considered for homestead use. Fuel supplies can be turned off at any time, leaving motorboats at the pier. Even now, unless you are incredibly wealthy, a motorboat is prohibitively expensive to operate. The wind is one resource that will never run out and it's free!

The size of a boat is not nearly as important as the construction. It's important to get a boat that is going to last and remain seaworthy without a lot of maintenance and materials. A good fiberglass hull with aluminum mast, stainless rigging and diesel engine won't ever have to be hauled and painted. The bottom can be cleaned underwater from time to time and forgotten for years, if necessary, without going to pieces. A wood or steel boat requires hauling out of the water and complete painting at least every year if it is to last. How are you going to do that without a large tide, boat lifts or paint? Finding the time to keep a wood or steel boat up in Bristol fashion might not be a major problem; however, materials may be in very short supply and expensive when you can find them.

Dacron sails, nylon lines, stainless rigging, aluminum mast and fiberglass hull will last for many years with only minimal attention. The old cotton sails, hemp rope, galvanized wire and wood masts all work well, but the price to maintain them is enormous. If all this seems too expensive, then get a smaller boat. It is better to have a small boat that

lasts forever than a big one you can't keep up that becomes dangerously ill-maintained.

With the choice between owning a piece of property or a boat as a homestead, I would much rather have a boat because land just doesn't move when I want to! Mobility is one of our most important assets. Why possess land when there are millions of acres on the seacoast of the world that nobody will contest you using? Maybe not on the beach at Waikiki or Manhattan, but who would want to live there anyway? You just have to have a means to live and a shelter that can be easily moved —and the answer is a sailboat. Spend your money on tools, not land that in many places is already free.

A boat does not have to be fast, it just has to be strong. There is no big hurry to get anywhere because as soon as you get somewhere you'll be thinking about getting back on the ocean as soon as possible! Sleek, flashy racing boats are sold for a real premium and not what you need at all. A vessel with moderate draft of less than five feet will give you plenty of flexibility in approaching most land areas and docks. Moderate displacement with a comfortable beam will insure ample storage space for tools and food. The heavy double-enders that are so popular today are perfect load carriers. Such a craft of just 30 feet could safely take you to the ends of the earth. There are many excellent books on the subject of selecting an appropriate design for ocean voyaging, some of which are listed in the appendix.

Study the boat you purchase very carefully to know what spare parts you should have on hand to perform engine, electrical, mechanical, sail and rigging repairs. You won't need a lot, but a good range of parts makes repairs much simpler. Many items can be fabricated in almost any port in the world where there is some industry.

Be sure to have a complete inventory of detailed sailing charts of ocean areas in which you might operate. It's not possible to have too many charts on board as they can always

be traded. A chart is worth many times its weight in gold when you need it to get through a tight opening in a coral-studded offshore reef in the Tuamotus!

REAL SECURITY

After you have a boat in your possession you can start thinking about how to turn it into a floating homestead —or seastead. Basic requirements are the same everywhere for food, shelter and security. Seasteading has its own peculiarities and with a little ingenuity you should be able to find ways suitable for your own particular situation for fulfilling essential needs.

Proper tools for adapting to the environment are necessary to realize the full advantage of the ocean's resources. Fishing equipment, food preparation tools, storage container systems, security alarms, solar water stills, solar food driers, solar ovens, solar hot water heaters, etc., are not expensive and provide a level of real independence only dreamed about until recently. Tools should run on solar power when possible. Wasting scarce fuel with a stove is an unnecessary use of expensive energy. Foods can be eaten raw or solar cooked. The recipe chapter lists many delicious meals prepared this way. Sources are listed in the appendix for tools and materials with which to stock a boat to enable you to live with greater self-sufficiency at sea.

Purchase needed items that you can't easily acquire otherwise. To build up emergency funds you must be able to perform some task for whatever society with which you may come in contact. One solution is obvious — everyone has to eat. Dried fruits, fish and seaweeds can be foraged and traded. Frequently these foods may be acquired for free by just collecting them anywhere you cruise. Learn a skill such as marine or auto mechanics, dental care or hair cutting. One woman I met in the Virgin Islands made an easy $50 per day

cutting hair at the marinas around the islands! Doctors can find work anywhere in the less governed parts of the world and are accepted with open arms. If you don't have the formal training of a physician or surgeon then train yourself as a paramedic. In less than a year a paramedic can learn to take care of 90% of the problems he would come in contact with except heavy surgery. Few men or women will ask to see a diploma from a prestigious university while you are skillfully putting stitches in their daughter's leg! Tools, fuel, food and other materials could be traded for these services.

Many types of craft work can be done on board for sale or trade. Making cloths, wooden carvings, jewelry, stained glass pieces, fishing nets, hammocks and collecting rare tropical fish or shells are things I've seen people earn money with to stay cruising instead of tied up to a dock. As your seastead is being built, look around to determine what skills could be easily turned into cash or food no matter where you are, even if you wash up naked on the shore without a stick in hand to defend yourself. Eventually all these tools, boats, governments and even our bodies will not be able to adapt to certain changing realities. At this point we have to let go of them or go down with them. If you are the captain of the vessel, don't be too hung up on going down with it. Maybe you were always meant to be a castaway, not a sailor at all! Stay loose but interested, flow with your own intuitions, relate with other people — but learn to depend on yourself.

In the meantime, learn what seaweeds can be eaten and enjoyed. Seaweed is absolutely everywhere and loaded with life-sustaining nutrients. Some are exceptionally delicious and considered as real gourmet food to millions of people who pay up to $40 per pound in the markets. Learn to preserve foraged foods to hedge against days of shortages. Learn to do without refrigeration if it costs fuel to run. By practicing these survival skills right now you will be much

more prepared if any crunch does come. Even if it doesn't, you can't lose by collecting foods to live by, reducing expensive fuel needs and learning skills. If there is a problem, and you are ready for it, you'll stay alive; if there isn't an emergency you'll just be that much richer.

Self-sufficiency also might require defensive abilities against others who don't have their acts as together as you do. A pretty little sailboat looks like a million dollars to many poor people or to bored adventurers looking for an opportunity. Simple alarm systems can be rigged to detect an intruder's presence while you are asleep or off the boat. Of course, keeping a watch on board is always a good idea, particularly when in ports that are suspected of extreme lawlessness.

Many governments encountered while cruising frown on the keeping of guns and will take temporary possession of them while the boat is in their waters. For this reason I always keep several loaded flare pistols on board to be used in self-defense. Governments do not regulate them as they are not considered to be firearms. Anybody can purchase one at any marine supply store in the United States regardless of his age, needs, mental disposition, etc. The flare gun is a single-shot weapon. So keep a backup handy. One and one-half times the size of a 12-gauge shotgun shell, the flare cartridge shoots a ball of white hot burning magnesium. At short range it is deadly.

Shotguns, rifles and pistols are handy for hunting game and definitely have a place on board. Small pistols can be hidden to prevent their surrender to authorities. Realize that you have to strike a balance between the need for such a tool and the penalties for the illegal possession of guns. You can be sure that just when the government takes away your weapons is when you will need them the most. I've known sailors who had arsenals hidden for years with no problem, however. Keep a flare gun and be safe. They can be carried to shore

when you're foraging for food, and if anyone asks, you say they're needed in case you get lost. Be sure to keep all guns well oiled and check the actions from time to time to make sure they are free and the barrels clean.

You may eventually wish to settle on a deserted beach-front somewhere to build a base of some sort, or to get off the boat awhile. For this there are several tools and materials that could make survival much more comfortable than a straight Robinson Crusoe adventure. Brush saws, hammers, folding shovels, tents, etc., as well as nails, mosquito netting, lashing rope, clear plastic sheeting, water stills and vegetable seeds can't help but make life much easier. They are not expensive, nor do they take up any more room than a couple of duffle bags. Remember, any of this gear can be sold or traded in many places if necessary for much more than you paid.

Friends of mine have lived for months at a time on islands in the Caribbean while they farmed the sea and land for goods to bring back to Miami for sale. Get the right tools and materials now when and where it's easy to do so. Think of all the possible ways you can live from the sea if you are prepared. The appendix lists several good books on wilderness survival and should be studied thoroughly. Books are sure cheap compared to the price of learning some lessons first hand.

REAL MONEY

When your vessel is together with all gear well stowed and ready to go anywhere in the world and you've gone over every possible scenario of how to deal with future situations, then think about what you can use for cash in this brave new world.

Legal tenders that have worked just about anywhere at any time have been gold, silver and precious gems. You should keep some of each of them. It's not necessary to have a

lot. Even a little will be valuable when nobody wants to deal in government promises. But while you can have too much gold and silver, it is not possible to have too much food, tools and know-how. These can be traded for anything.

Don't think that a savings account insured for $100,000 is any kind of hedge. If it starts to storm, all those life rafts are going to sink from overcrowding and rotten bottoms. Inflation rots cash, but gold coins and fiberglass boats last just about forever.

A bag of silver coins could come in real handy if hard cash is needed. When silver was recently up around $50 per ounce, gasoline was selling for $1.20 per gallon paper money or a ten-cent silver coin. Surely a sign of things to come! One hundred dollar bills don't cost anything to make and will very likely become totally worthless all over the globe. One hundred dollars won't buy very much right now anyway.

A $1,000 bag of silver coins could be hidden on your boat where even *you* might not be able to find it. I used to carry gold coins in the bilge with tar stuck around them. What thief would dip his hands into six inches of oily bilge water under the engine to find something he didn't know was there? Keep in mind that there are plenty of people who wouldn't think twice about killing you to get a load of gold if they knew you possessed it.

A gold coin is easier to hide than a bag of silver, but because of its concentrated value it is not nearly as practical to spend. Silver coins are convenient for everyday shopping needs. Who can give change for a $500 gold piece when you're buying a bag of oranges? Nobody can, particularly if the banks have been closed for a year. Silver coins are easy to buy, easy to store and easy to trade. No matter whose picture is on the front or what inscription is on the back, silver is silver and it all has the same shine.

Spread out surplus cash into different kinds of investments — not too concentrated in any one form. Money has a

place in the world but don't rely too much on it. If it works to get what you need, fine. If it doesn't work, that's fine too. By all means, use paper currency as long as possible because it's an efficient way to store and exchange energy. However, currency is essentially only a token chip in a game of promises and trust, and games have a tendency of falling apart when the players stop trusting in them or cease playing by the rules. *Skills first — tools and food second — gold and silver third — paper money last!* The only thing to be said for paper money in an emergency is that a big bag of it might make a good raft if your ship sinks.

BARTER GOODS

Instead of carrying cash, which might not be worth anything in some places, you might carry hard value, tradeable goods. These are compact and extremely valuable commodity items that could fetch a ransom anywhere the flow of normal business is disrupted. Barter may be the only way to buy and sell during emergencies such as shortages, depression and war. For every ten dollars spent on barter goods *now,* you might get ten acres of land or more fresh fruit than you could eat in a month. Even if there are no large scale economic problems, trading or selling these goods will insure that there are no economic emergencies with your own ship's finances.

Tobacco

Many people in the world, if they don't have a cigarette several times a day, cease to be responsible for themselves or their actions and will do anything to get a smoke. In times of shortages you can be sure that this drug will be worth its weight in gold coins or used as legal tender just about anywhere. Several one-pound tins could easily be stashed on board and passed as personal effects if going through customs in a foreign country. The fact that governments like

to make a nice profit on this material limits what you can do with it when traveling internationally as a heavy duty is levied to import over a certain amount. If you don't travel across borders, store as much as you can. American cigarettes are always in high demand throughout the tropics. Make sure to always have your duty-free limit whenever clearing into these places. Obviously, there is not a lot of profit to be had from small moves like this, but by working all of them wherever you go it's possible to exist in the free fall of cruising much longer before pulling the chute and returning to a shore-side job.

Storage Foods

If the trucks and supply ships stop running because of some interruption, it might be real handy to have some extra food on board to sell or trade. Everybody has to eat. There are some foods that are so concentrated that it is possible to put a whole year's worth in just two five-gallon pails. This diet may get a little boring after a while, but at least you'll be around to be bored! Dried fruits, vegetables and fish can be sold to other boat voyagers and land dwellers alike.

One particularly valuable survival food is Spirulina plankton. It is the highest *totally natural* form of concentrated complete protein available anywhere. The protein contents of fish, eggs, meat, milk and soybeans don't even come close to Spirulina, which is 70% protein as compared to 32% for soybeans and 22% for most meats. Just three teaspoons of Spirulina contain 12 grams of protein, 3000% RDA of vitamin A, 600% RDA of vitamin B-12, all the essential amino acids and many other minerals and enzymes. One and one-half pounds will keep a 150-pound man confortably alive for one month and will store almost forever in a plastic bag. There is no better survival food. It should definitely be in the seasteader's "cash" portfolio as well as in the normal diet and life raft survival kit. The plankton should never be cooked.

This makes it a perfect survival ration or quick meal. Just mix with water, gravy, juice or what have you to make a healthful and delicious food.

Spirulina is grown commercially in Mexico at this time and is rather expensive — about $25 to $30 per pound. When it is considered that only a very little bit will keep you alive for a long time, it doesn't really seem that high-priced. I know several people who have 50-kilo drums of "green gold" stashed for when the supermarkets all close. The price of Spirulina is only going to go up so why not invest in something you can eat in case the bottom falls out of the commodities market? Try eating a share of common stock! Who knows, there may be more nutrients in the paper than in most foods available at the grocery stores now. A ten-kilo can of Spirulina and a couple five-gallon pails of dried fruit and seeds will store handily on any boat. They just might be worth more than the boat someday!

Long ago, I stopped putting faith in the concoctions and formulas that the American food industries invent for fast-food addicts. These merchandisers say they can mix 100 chemicals and come up with a product that replaces breakfast, lunch and dinner in one easy, delicious mouthful. The concentrated protein extract products available are not naturally whole, complete and integral foods. There are many cases of ill-health reported from people who relied too heavily on them.

Nature supplies a plant with all of the nutrients necessary for its growth. By eating these plants we take advantage of a billion years of evolution. It's hard to believe that man now understands enough about the subtle mechanics of life to be able to second guess what makes it work! Without any of the amazing instant manufactured foods being produced today man has been eating for a few million years at least and has adapted quite well to this planet. When a scientist comes out of the laboratory with a perfect cookie which includes all

the nutrients guaranteed to sustain human life, I'll let him feed it to his children first and see what they and their children look like first.

Vegetable Garden Seeds

These are items that are worth a great deal in many places. We are so used to seeing grocery stores loaded with fresh fruits and vegetables that it is hard to visualize a time or place where this might not be true. In many foreign countries seeds are practically impossible to find in the best of times. During disrupted delivery conditions they could become exceptionally valuable. A man can keep his family alive for a year with ten dollars worth of bean, tomato, cabbage, potato, spinach, carrot and other assorted seeds, and give anything for them. Seeds will last forever if properly stored. If not sold they can always be planted if you happen to light somewhere and settle down for a while.

Remember that hybrid plants will not give the same remarkable results when the next generation of seeds are planted. The best seeds to have are non-hybrids which will produce satisfactory progeny time and time again. Hybrids only work for one generation and then revert back to their original form, like Cinderella's carriage which turned back into a pumpkin at midnight. The original form might not be anything like the outrageous plant it was tricked into becoming and might not bear edible portions at all. This is one way the seed companies get us hooked on their products, knowing all the time that if their seeds are not purchased every year, there will be no harvest. Check the appendix for non-hybrid seed sources. They are definitely worth any extra cost.

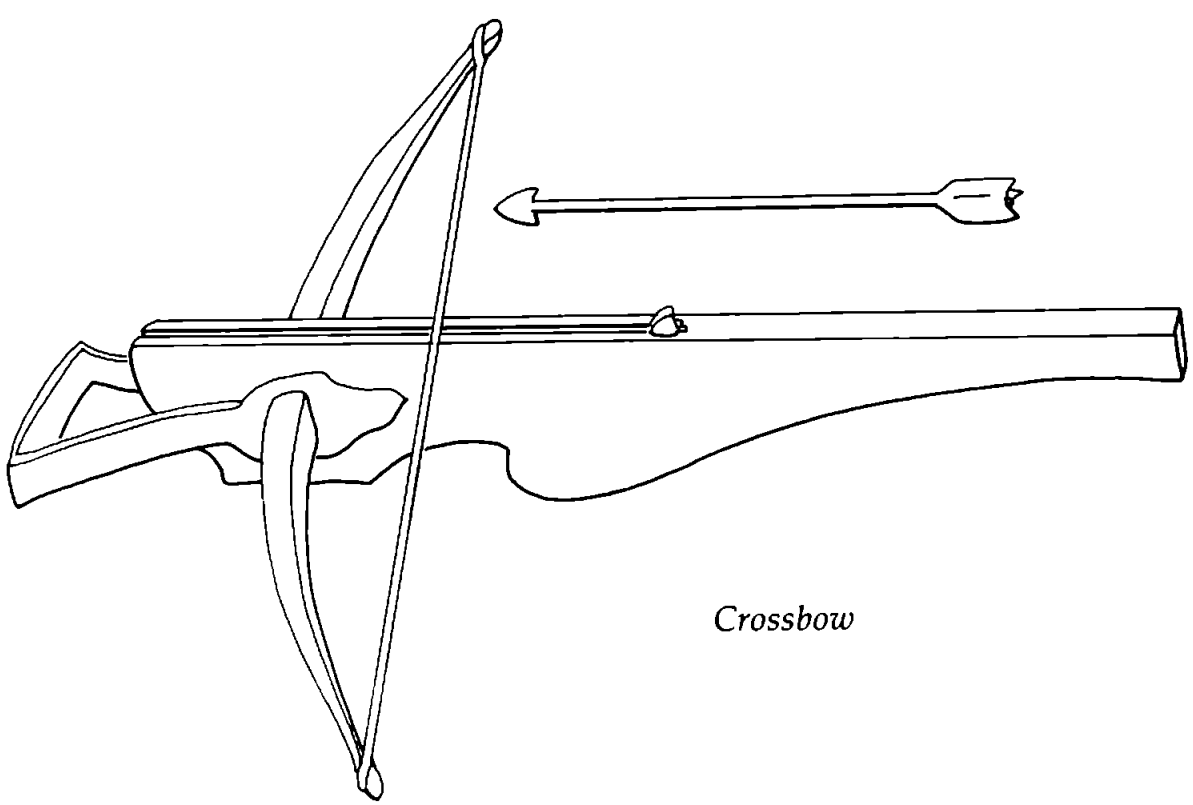
Hunting and Fishing Gear

Several thousand .22 caliber shells will fit into a shoebox and are extremely valuable in the right place. With a rifle or shotgun a person need never be short of fresh fish or meat. The guns will last many years but there is always a need for

shells. Don't think that self-defense won't ever be necessary. The law of the jungle operates at sea as anywhere. The veneer of civilization is thin and peels off fast when people are hungry. It is best to be prepared.

If you are planning to cruise in areas that won't allow keeping guns or ammunition on board, consider the possibility of trading air rifles, air pistols and crossbows. A friend of mine made some really good money selling pump-powered air guns and pellets to individuals he met while cruising in Honduras, Belize, Mexico and Costa Rica. These guns are not regulated as firearms and can easily be cleared through customs. Modern air guns are not toys and can be just as effective as a .22 for taking small game.

A crossbow is a rifle stock with a spring steel bow mounted in the front. It is no more difficult to shoot than a rifle. Even if you've never used a regular bow, you can be hitting a nine-inch pie pan at 45 yards with only a day's practice. The beauty of crossbows over rifles and longbows is that they are silent, deadly and accurate. They fire reusable



Crossbow

arrows and you don't require a lot of practice to become proficient. When shells for firearms are not available you can make arrows for a crossbow with only a little equipment.

The 150-pound steel bow is powerful enough to shoot an arrow through several oak blocks. With a longbow it is necessary to hold this pressure while aiming, but a crossbow is cocked and then held by a trigger until fired. A lever is used to cock the bow which makes it easy for anyone to use.

A fishing arrow and line spool is used to provide all the fish you want and razor-edged arrows are employed for hunting game. These bows are just about the most versatile tools ever devised for hunting and you must really give them some thought when equipping your seastead.

Practically nowhere are crossbows regulated as are firearms. This makes them easy to possess and an ideal trading item. Carry a couple on board and you'll have no trouble selling them for several times what you paid.

Fishing gear is used all over the world and is always in demand. I don't mean rods, reels and fancy lures. Except to an occasional sportsman, these are practically worthless for trading purposes. In the more backward areas you'll likely be cruising in, a steel fishing hook may be worth ten pounds of fresh fish. In Jamaica for just a couple of hooks I could get a stalk of bananas or a bag of mangos. You can buy thousands at wholesale for a few dollars and trade them for fruit, fish, carvings, etc. Nylon fishing line is also impossible to get in many third world countries and has surprising value. Be sure to stock up on these items. Robin Lee Graham sailed around the world when he was 16 using ball point pens for cash in the Pacific Islands. They don't work so well now but fishing gear always will.

Another very good trading or cash item is a nylon casting net. I sold three for $80 apiece in Costa Rica that I had paid $25 apiece for in Miami. If I had a couple dozen more there would not have been any trouble selling them too. How

can you know about these things? Next time I sail by there I'll have plenty of them.

Casting nets are an in-demand commodity as one man without a boat can catch a fair amount of fish to sell or feed his family. With all your free time sailing between ports a profitable handicraft could be to manufacture these nets. The only materials are heavy nylon twine, a steel ring and lead sinkers. Once you master the technique it won't be difficult to make a good living this way. Use a commercially made net for a model and *The Ashley Book of Knots* by C.W. Ashley for instructions on the knots. Hammocks are another item that are easy to make and easier to sell. Ashley's knot book has hammock construction details along with instructions for many other interesting projects.

Medical Supplies

Antibiotics, disinfectants, first-aid supplies and many other non-prescription products are totally unavailable in many remote places or during hard times. There are several excellent books out on being your own doctor. They describe what materials should be carried in wilderness areas, remote islands and cruising boats. These are listed in the appendix and should be studied by anyone venturing far offshore or into primitive environments.

Many of the medical cases you are likely to come across in your travels an eighth grade student with a couple of semesters of paramedic training could probably properly diagnose, prescribe and treat. The American medical profession has led people to believe that individuals are not able to heal themselves and for some reason must pay $40 to be told to stay in bed and drink plenty of liquids. In the same way witch doctors and priests have brainwashed many people to think that they cannot get to God or cast out evil spirits without their expert and divine intervention, the doctoring craft today has much the same hold over their patients. Many

people cannot even afford to visit a doctor but somehow lay hundreds of dollars on the altar of the healer for his fix. This is so reminiscent of Dark Ages religion and sacrifices that it is difficult to understand that more people don't see through it.

Any dog or cat that gets sick stops eating its regular diet and goes out on the lawn to chew some grass. They instinctively know how to treat themselves, but man has somehow forgotten this trick of self-help and legislation practically makes it illegal under all kinds of paternalistic regulations. It can not be emphasized enough that you should become thoroughly familiar with all kinds of doctorless preventative and corrective health care. This will be handy both in the primitive environments of ocean cruising and in a world of $300 a day hospital costs.

Obviously, there are many drugs and procedures that a well-trained doctor can use in order to save a life in circumstances such as surgery and in difficult diagnoses. But you can learn enough about the workings of the human body to treat most cases. Indeed, there is no other choice when you are half way to Mozambique and you get into trouble.

Powerful sulfa-based antibiotics are not cheap but they can save lives. A supply of these compounds could come in handy on a sick island. Be sure you don't handle drugs that could be confused by over-zealous police officials as contraband. I had that trouble when some ironized yeast tablets were confused for hashish in Mexico!

Electronic Hardware

The list of the possible kinds of gadgets available for under $20 is almost endless. Calculators, digital watches, radios, quartz chronometer movements, tape recorders, etc., are easy to sell or trade in the less-developed nations and can be cleared through customs as personal ship's gear, even in quantities. Frequently just the batteries are worth as much as the equipment they power. A, C and D batteries are common

enough, but the special ones for calculators and watches are impossible to find anywhere outside industrial countries. Wherever you go in the tropics, if people know you're on a boat they will ask for batteries to power the watches given to them by other yachtsmen. A digital watch is a prized possession to these people and they will often wear it even if it has a dead battery! So help them out and help yourself to a nice profit by stocking several of the most common battery types on board.

Another craft project I made money on while sailing down in the Lesser Antilles was building custom quartz chronometers for the many charter and cruising yachts in that area. The movements cost about $15 each, the case a few more dollars. I sold them for $75. Each takes only a couple hours work. Some of them were made of solid teak or mahogany with the boat's name chiseled into the wood. A Dremel grinder would do this job in a fraction of the time if you have 110 volt power on board. The quartz accuracy is about plus or minus one minute a year and perfect for celestial navigation. These movements and bezels are available through several sources, including those listed in the appendix.

Many navigators still work out the sight reduction problem by hand with the Air Almanac. I just about cry when I see some of the sharpest guys I know blowing smoke out of their ears working out this simple problem. There are many boaters who would like to know how to navigate by the stars but are reluctant to learn, thinking it's some complicated mathematics reserved only for those with extensive specialized training. With the electronic calculators available today and straightforward patterned procedures, any person able to follow simple directions can navigate a ship across the ocean. Any instrument that has scientific notation, such as the Texas Instrument TI-30, can solve the astronomic triangle in less than one minute. By solving the triangle directly you don't

need a shelf of sight reduction tables for every latitude. The calculator costs only about $20 and is all you need besides a chronometer, Nautical Almanac and sextant. Hewitt Schlereth's book *Commonsense Celestial Navigation* explains this easy method of sight reduction.

I could have sold my calculator a dozen times over after showing people how to navigate this way. Bring a bunch with you on your next cruise, show folks their place in the universe and make a bundle at the same time! You could even put a notice up in a yacht club or marina for classes in celestial navigation if in port awhile. Celestial navigation is the voyager's ticket to freedom — so collect some fares!

EARNING MONEY WITH YOUR BOAT

While the world's economies are still functioning at least reasonably well, there are many ways to make good money with a small boat and be your own boss. Opportunities abound for lucrative businesses such as fishing, seaweed farming, producing dried tropical fruit, and chartering and hauling freight. The small size of your boat and cargo doesn't limit your ability to make a profit. Even very long freight hauls can earn you money because there are hardly any fuel costs. The days of commercial sailing freighters may soon be upon us again as fuel prices continue to skyrocket and raw material supplies dwindle.

The United States government will foot the bill for medical and dental expenses for owners of U.S.-documented vessels engaged in the maritime industries. The government also allows business expenses from the commercial use of a boat to be deducted from income tax payments. These two benefits of commercial boating can save you a lot of money and make using your boat commercially while cruising very attractive.

Let's take a look at how you can actually get into these

well-paying work-while-cruising-and-having-fun jobs and let go of that shoreside nine-to-five thing that's keeping you all tied up.

Fishing

With a boat you could live in the beautiful wild regions of the Pacific Northwest during the salmon and king fishing season between April and September. In today's market it is possible to make $3000 a month if you are motivated and have a good boat. Don't think you need a large craft or have to venture far offshore to get into this profitable business. A good-sized fish will bring $50 to $80 so you don't need to catch and hold very many before coming in for the night. If possible, stay out several days when you find a particularly rich area. By cleaning the fish as they are caught, keeping them out of the sun and frequently rinsing them off with the cold Pacific water, no refrigeration is necessary. This reduces a lot of costs.

The big commercial rigs run with huge freezers, sophisticated electronics, hired hands and huge overheads, but your operation needs only a few essentials. You definitely should have a good radio to stay in touch with weather services, other fishermen and the Coast Guard if assistance is needed in an emergency. A fish finder-depth sounder is very useful for locating fish schools as well as for determining depth. A depth sounder is indispensable on a cruising boat for safety in unfamiliar areas. For making it back to port and returning to rich fishing areas, a Loran navigation system will make your job a lot easier. The Loran's accuracy in most conditions within the usable range is measured in yards and just the thing you need when bad weather prevents celestial navigation. Never fall into the habit of relying only on the Loran for your position, however. You might blow a fuse sometime!

After the fishing season, wash your face and hands and steer down with the current to the tropics. Stop in San Francisco along the way to spend some of the silver you just

netted. When you've resupplied the boat and stayed long enough to remember why you left in the first place, it's a downwind passage to Hawaii, Polynesia or South America. Twenty days of sailing wing and wing into the setting sun puts you off the black volcanic beaches of Kealakekua Bay, Hawaii or a bit longer to the rugged coast of Costa Rica and the deserted offshore islands of Panama.

In New England, lobster fishing is big business and very nice profits are possible with only a minimum of up-front cash. By making the traps or buying second-hand your costs are practically nil. There are many beautiful bays and harbors just in Maine alone where you could live for nothing, while anchored away from the noise of the ports and docks. One of the loves of my life supported herself very well this way on a 22-foot sailboat while going to school during the summer. She loved the freedom of doing her own thing and made darn good money too!

Collecting Tropical Fish

The warm, clear waters of the Caribbean, Pacific, Indian, etc., oceans can yield all sorts of treasures besides those that are edible. Anytime you dive on a coralhead looking for a lobster or grouper dinner, it's impossible not to see hundreds of different species of fish, crustaceans, eels and other sealife that are extremely valuable to salt-water aquaria enthusiasts. The incredible variety of undersea life with all its beauty and astonishment is well known to most sailors voyaging on the warm waters of the earth. We sailors tend to take much of the wonder of our enviroment in stride as we live with it day to day. However, to many of the grounded members of our species, this undersea reality may as well be on another planet. To them, these ultraviolet-colored fishes with phosphorescent specks glistening like drops of gold are surrealist creatures of the mysterious deep.

Why not collect these fishes and sell them when you get

back to port? The money paid for some species makes them worth their weight in gold. A little leg work and telephone research will get you in contact with many dealers of tropical aquarium fish. Find out from them what species are easiest to sell, keep alive, and bring the most profit. A good-sized dealer gets his fish from many different sources — why not you? Tropical fish are regularly shipped from all around the world in plastic bags and boxes. If you have prior arrangements with a dealer, you could catch the fish on an isolated atoll in the Pacific and then ship them to San Francisco for a very nice profit. The key to this business is a well-established contact to receive and pay for the fish.

Carrying small live fish aboard a boat for long periods of time is not as difficult a situation as you might assume. Live fish wells are used extensively by many offshore fishermen to keep bait fresh and alive. I met a commercial tropical fish collector in Key Largo in the Florida Keys and had a chance to check over his operation. He lived aboard a 35-foot motor cruiser set up with four tanks built into the bilge. The tanks were made of fiberglass and were no different from ordinary water or fuel tanks except that they had easily removable openings in the top. Each tank was comprised of four 30-gallon compartments with separate 12 inch by 24 inch openings through which the fish could be placed and then netted for removal. To prevent sloshing, all the tanks were kept completely full. With full tanks there is not any water motion to upset the fish. Water circulation was accomplished with a small pump that could also be used to lower the liquid level in the tank for removal of the lids. With this arrangement he would cruise the Keys sometimes for a month before returning to Miami to sell his catch.

It is important that only cohabitable species be put into the same tank or you might find only one large fish at the end of a collection expedition! It would behoove you to do some studying on the ecologies of the marine environment's

inhabitants before attempting this scheme. Various factors you'll want to be familiar with before diving into this work are species cohabitability, symbiotic dependencies, feeding requirements and marketability. Other related things you should know are some legal details such as customs regulations concerning importation of live fish (usually no problem) and exportation from foreign waters. Some countries, like the Bahamas, are very strict about taking fish from their waters. Others have no regulations at all or can be accommodated.

Seaweed Foraging and Farming

Farming these incredible plants has been going on for centuries in Japan and other seaside civilizations. World industry and hungry populations way outstrip the supplies of these valuable resources. In Japan they are planted and tended for optimum growth in much the same way as land crops are. The plants grow faster than their dry land cousins and enormous yields are possible in much less time.

In areas of high population density, like Japan, it is necessary to constantly start new plants to prevent ruining the natural ecology, but in most of the rest of the world these plants are not collected at all and are abundant to the point of clogging channels and beaches. High latitude areas of the Pacific and Atlantic oceans are rich in the most well-known varieties of commercially familiar seaweeds, although the warmer latitudes contain types just as edible but not as well known. At the outrageous prices being paid for these foods, it would be a very lucrative business to harvest, dry and package seaweeds for sale. Prices of $40 a pound for the dried plants are usual for some common species in Oriental, health and gourmet food shops anywhere in the country. Information on how to identify, collect, dry and use seaweeds is given in separate chapters.

Dried Fruit

Now that the winter is closing in on all your friends in Oregon and Maine, you sail south with all the geese and robins to the wintering grounds in the tropics. While you're working out a celestial sight or Loran fix, getting microseconds and hour angles all mixed up and out of place, look up at the terns flying over your head and meditate on their built-in navigation systems that always bring them to the same little pond in Venezuela and back again to Maine. The old navigators of Polynesia had a similar awareness of their location and direction. Sensitivity to the environment is a precondition of our existence here on the earth. You have to be loose and able to move. To cruise. To go where the Wind wants you. During the winter the Wind wants you in the tropics collecting the bounty of fruits that can be dried and brought back to the cold country when life is again normal and not a constant fight for survival against the snow!

A dollar will buy a huge stalk of bananas. When dried to a fraction of their original bulk and sold, four ounces will bring $1.50. Mangos, papayas, pineapples, oranges and many other fruits can be either bought cheaply or collected for free in practically all of the tropical coastal areas. I do this all the time when cruising and am amazed at how easy it is to make enough money to provide for all my needs. Most any voyager could get into this with hardly any investment at all.

While sailing about the world for the last several years talking to other boaters about how they were able to finance their life, it became obvious that most people considered themselves to be on vacation. They don't even think of how to support their life while living it. A short cruise and then back to the grind! Many folks think that they are not allowed to engage in a paying occupation when in a foreign country. This is sometimes true of regular employment, but this is not the only way to make money. Picking and drying fruit will never cause you a problem as long as it is not sold under the

gendarme's nose. You can either spend time laying on the deck thinking how lucky you are to get out of the office for a couple of weeks, or you can get a tan while hiking in the jungle hunting fruit to sell back in Los Angeles a few months later.

Take a look in the grocery stores at the price dried fruit sells for. Realize that you could sell a much better quality and selection, have fun relating to the people in a foreign land as more than just a tourist and make a good living at the same time! Complete information on drying foods is given in a following chapter.

Chartering

Many people are able to live anywhere they like, do what they want to do and earn very good money by chartering their boat. To do this openly and legally there are sometimes many rules and regulations that must be followed precisely. Some countries won't allow it at all. In some it is permissible if you pay for a license and keep a native on board to act as "captain." Other nations have no restrictions at all. I have always been able to at least earn spending money by just taking friends out for a day or week and asking them to "contribute" to the costs. This way you don't advertise yourself as a chartering company and get a lot of attention from the government thrown your way.

In the U.S. it is necessary to have a license to operate, as well as a vessel built in the U.S. This is to make sure that the person handling the boat is qualified and that special interests benefit from the vessel's manufacture and sale. Foreign-built crafts need not apply. Our government makes it difficult for some of us who happen to own imported boats. Many of these restrictions are not applicable just about anywhere in the tropics and you are free to make as much as you can from your chosen occupation. Much detailed information on the legalities and practicalities of chartering is available in the

cruising literature that you should become familiar with.

Put advertisements in college newspapers, travel sections of Sunday newspapers and boating publications. Many people only dream of a life at sea and would jump at the opportunity to actually live it for a while. If prices are kept reasonable it is possible to be booked solid throughout most of the year. Take out groups of vacationing students for a week at a time and learn what they are studying in their ivy-walled classrooms.

I knew a man who took students and professors sailing in the Virgin Islands for two-week stints and was paid directly by a university. There is so much interest in marine studies these days that it wouldn't be too difficult for you to convince a college administrator of the value of this kind of direct learning experience. Remember that money flows a lot easier when needs are vocational instead of vacational. Parents always seem to have enough money for their children's education. I think that it would be a thrill to be responsible for a student actually getting some *real* education in the way life *really* is! How could a person not get a thousand times more out of studying starfish in their natural environment than in a school lab in Nebraska? The ocean is an ever-pervasive reality instead of some well-written words in a college text. Necessary book study is a heck of a lot more meaningful and fun when done on the deck of a sailboat over the crystalline waters of the Caribbean. For sure!

You can go around to the various colleges that offer courses in marine sciences and present a course outline and itinerary for a field study program. Private colleges are money-making institutions just like a steel company or the corner drug store and you'll have to appeal to that sense of profit-making with college administrators. By offering field experiences like this to potential students, the college cannot help but attract more tuition fees to help cure ailing budgets. You can start your own school-on-the-sea. If it so happens

that you are a certified teacher or hold some degree, then so much the better. A long-time dream of mine has been to organize a school on a vessel large enough to accommodate 20 or 30 students and teachers for months at a time, while sailing around the world as a fully-accredited high school or college. There would be no reason for tuition to be any higher than other private colleges and the interest a school like this would generate would advertise itself. Anyone interested in this is invited to communicate with me.

Floating Welding Shop

In Martinique I met a retired welder living aboard his 41-foot Morgan Out Island. Well, retired is probably not the right word. The man sold his welding business in New York and bought a boat to sail the seven seas. He didn't know much about sailing when his round-the-world adventure started, but how to make a living at sea was one thing he did know. He fitted the engine with a 300-amp DC generator bought from a surplus sales outlet and rigged up some extra long welding cables. This rig was not difficult to install and took up little more room on the engine than a refrigerator compressor. With this arrangement he almost never had to turn down a cutting or welding job because his equipment could handle almost anything.

If you've ever brought a piece of steel into a welding shop you know the value of this kind of work. Have you ever had work done on a boat or other nonmovable equipment? Not too cheap, was it? My welding friend would just tie up next to a fishing trawler, crank up his diesel and repair a heavy steel net handler right there at anchor in the bay. Depending on where he was at the time, and the circumstances, his rate of pay averaged $30 per hour plus materials. In any anchorage around the world there is probably at least one yacht or commercial vessel that desperately needs some kind of welding repair. Tied up to a dock or bulkhead, repairs can be

done on automobiles, industrial equipment, farm machinery, etc. Remember that in parts of many third world countries there are no welding facilities on shore to be found. All you have to do is let it be known that you'll be tied up to the town quay on such a day and there will probably be more business than you can handle. The possibilities for bartering this service for food, supplies, fuel and rum are almost unlimited.

A complete floating shop does not in any way turn your pristine yacht into an industrial zone. A small footlocker holds all the tools and supplies that are required. The welding generator needs about 20 horsepower and can be mounted either to the main engine or an auxiliary power generator, whichever is appropriate. You should also have a heavy duty grinder to prepare and finish the welding work. This may be run off the auxiliary generator as well. Aside from these tools the only other items needed are a long set of welding cables, assorted welding rods, a helmet, heavy gloves and a few other odds and ends. Total cash outlay need not exceed $500 or $600. This investment will be returned time and time again as you sail the seas stopping here and there to strike up an arc. See the appendix for the names and addresses of some surplus companies that sell welding equipment.

Freight Hauling

There's nothing about hauling freight that requires a huge boat for lucrative cargoes. A friend of mine told me all about how he does this with his 40-foot ketch. He hauls all kinds of food, hardware items, passengers, goats, building supplies and other small items needed by off-the-beaten-track islands and landlocked areas. By studying the customs regulations you can haul items that have little or no import duties in order to increase profits. It's not possible to carry much, so make sure that what is carried you'll make money on. When in a foreign land look around for what you can get cheap and what to sell back for a good return. Prearranging the sale of the

cargo to shopkeepers will eliminate much confusion.

The fortunes of many huge shipping industries historically and presently are based on two-way trade, so learn from them. By taking dried fruit or carved objects, for instance, back to the U.S. and bringing tools and manufactured items to these island areas you can make an excellent profit. You can really get involved in this or just do it on the side while cruising. Be sure to carefully study the customs regulations of the countries dealt with to avoid paying heavy taxes or making the police unhappy.

There are many routes and products that the commercial companies don't touch because the return doesn't justify the expense of a full freighter. With the little overhead you're working with it might be possible to make a nice profit. Smuggling liquor, drugs or anything else around coastal patrols and intelligence networks for black market sale is of course one of the most profitable businesses in the world. You could make more money in two months than in a lifetime of more legal work. However, unless you have no respect for the law, have nerves of steel, have something to do in jail for 50 years or are about to commit suicide anyway, I would recommend earning a living another way.

It's up to you. The sea has been the source of wealth to independent individuals for thousands of years and opportunities are available everywhere all the time if you just look for them and have the tools needed for the particular job. You might not make the money of an Onnasis or develop the accounts of the Cunard Lines while chartering a boat, but you can make a good show for yourself just the same while doing pretty much what pleases you.

3
Survival Tools

A thousand years before Columbus shocked the European world by sailing over the edge of the flat Earth, the Polynesians criss-crossed the entire Pacific Ocean countless times with no more navigation tools than a coconut with some holes drilled in it to align stars. The fact that sextants, chronometers and radar had not yet been invented didn't seem to deter their voyaging in the least! The awareness of the environment these ancient navigators demonstrated to guide their catamarans across watery space to tiny islands is still a mystery and the envy of all of us who sail the sea. Undoubtedly, long apprenticeships were necessary to learn the ways of the old masters. These navigators were often held in higher esteem and awe than the chiefs and priests of these seafaring people. But, while it took them years and years to learn the arts of navigation, we are able to safely steer a boat anywhere in the world with no more than an hour's instruction in the use of the Loran and Omega systems.

By turning on a radio and reading latitude and longitude numbers on an LED display it is possible to determine position to within a few tens of yards. This doesn't require a great deal of intelligence or sensitivity on the part of the operator, but it will get a boat through a chain of offshore reefs in the fog. Living in the twentieth century allows us to take advantage of certain technologies to improve our chances of survival and independence. This does not mean that we should unleash the whole of Pandora's box. The use of nuclear reactors for generating electricity to run an electric toothbrush might get your teeth clean, but your children may be born without any teeth to worry about.

For food preparation you do not need a microwave oven, food processor or an electric burger grill, but several particularly handy items exist that can reduce the hardship of many tasks. The available cruising cookbooks suggest that the only foods people eat on boats at sea is goose liver, pickled pig's feet and champagne. This is of course ridiculous. A few simple tools can make preparing beautiful meals no problem at all. Good food is a necessity and it doesn't have to be fancy or right out of a can. Nutritious and delicious food that is easy to prepare is essential if we are to sustain energy and health in the ocean environment.

The few tools I consider basic on board a small craft for maximum independence and safety are inexpensive and will pay for themselves many times over. Some of these are a bit unusual but extremely important for the self-sufficient voyaging sailor. Sources for these and other tools are given in the appendix.

Solar Stills

This planet's surface is seven-tenths water but you can't live more than a very short time if you drink it. Each liter of seawater contains over 28 grams of sodium chloride and many other minerals dissolved in it. Taking this into the body

will destroy fluid equilibrium systems, mineral balances and other vital functions. To convert this "water, water everywhere but not a drop to drink" into the fresh, sweet, wonder drink we can use, we must first remove the salt.

Reverse-osmosis membrane units and waste engine water de-salinizers do a very effective job and produce large amounts of fresh water. They also use large amounts of fuel. On the seastead these are not practical due to the cost and unavailability of fossil fuel energy.

The Sun is constantly evaporating the ocean's water, turning it into vapor and then condensing it as rain. Most water requirements may be met with rain catchers such as tracks on the boom under the sails and tarps strung to funnel water into the ship's tanks. Don't ever let a rainstorm pass without topping up the tanks — you never know when a chance might come again. However, you can't depend on Mother Nature's water still always working so you need to have your own. Many sailors have reported not getting a drop of rain during a whole ocean crossing.

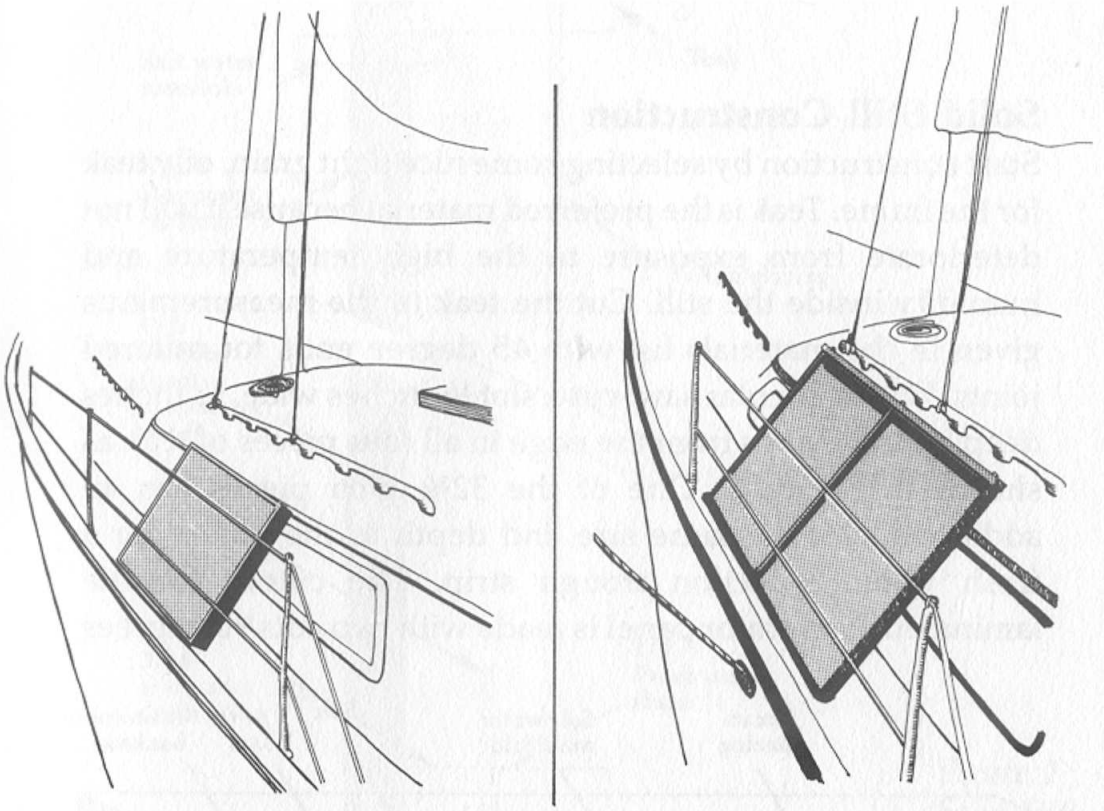
Solar-powered stills that work on the principle of a greenhouse can be used very effectively on a boat. The sun shines through a covering of special ultra-violet resistant vinyl plastic and warms a black wick that is soaked with seawater. The water evaporates, condenses on the cooler plastic sheet and drips into a collection trough. This all happens silently, with no fuel, and will supply water for drinks, growing sprouts, food preparation, etc. In the tropics a small still will furnish approximately one-half gallon of fresh water a day.

With the water supply of most cities nearly undrinkable due to bacteria and chemicals, a solar still is a very reasonable way to provide free, fresh, pure water. Water supplies in many tropical ports are contaminated and you are likely to contact any one of several diseases if you drink the water without first treating it.

Directions follow for the construction of two stills, a collapsible type and a solid one. If you are handy with boat-building materials and tools, you can build one of these simple cruising stills to transform your ocean desert craft into a floating fresh-water oasis. Design parameters for a practical ocean-going still are based on durability, ease of set up and stowage, minimum obstruction on deck when operating and reasonable water output. These design features are met very satisfactorily in both models to provide years of untroubled service in the harsh marine environment aboard small crafts. Your own particular needs dictate which type of still will be the better one for you.

The solid still is small enough to be stored in a locker or under a bunk, yet produces about a quart of fresh water per day. Multiple units may be ganged together to increase water yield for larger normal or peak demands. This is a flexible system that can change as your water requirements change. Build as many as you need; operate as many as you need. Brackets are mounted along both cabin sides to facilitate instant mounting and dismounting. The teak frame and lexan collector glazing insure a very long life with almost no chance of breakage.

The collapsible model rolls up into a tight bundle and has the advantage of high output with minimum stowage space requirements. The still is built of teak, heavy-duty clear vinyl and black vinyl reinforced nylon fabric — materials easily obtained from most lumber and auto upholstery shops. The fabric materials have proven their durability in the marine environment for years as boat awnings and windows; however, the vinyls do undergo a certain level of ultra-violet degradation. With 40 gauge clear vinyl and 22 ounce black vinyl, life spans of at least 18 months continuous exposure can be expected before the materials start to dry out and crack. Since the still will probably not be used continuously, but rather intermittently while at sea, three to five years is a



Solid Still *Collapsible Still*

more accurate figure. By carrying an extra vinyl cover to fit over the teak frame assemblies you will be protected against any possible damage that might occur.

Whichever way you go, either of these stills can provide a good portion of your fresh water needs for drinking, preparing meals or growing fresh sprouts aboard. If you ever run out of fuel in a coastal area with plenty of cheap or free fruit you could even make alcohol with one of these stills! Just mash up the fruit in a large barrel, add yeast and let her bubble. After fermentation is complete in a few days, run the mash into the brine inlet of the still and collect the alcohol from the fresh water outlet. What you can't drink your engine will love! If you want to investigate the fuel self-sufficiency implications of this process there are many good books available to show the way — check the appendix.

Solid Still Construction

Start construction by selecting some nice tight grain, oily teak for the frame. Teak is the preferred material because it will not deteriorate from exposure to the high temperature and humidity inside the still. Cut the teak to the measurements given in the materials list with 45 degree ends for mitered joints. With a circular saw, cut a slot 1/8 inches wide, 3/8 inches deep and 3/8 inches from the edge in all four pieces of teak as shown in Figure 2. One of the 32¾ inch pieces has an additional slot the same size and depth as the others for a fresh water collection trough strip. The cutout for the laminated evaporator panel is made with two cuts 90 degrees

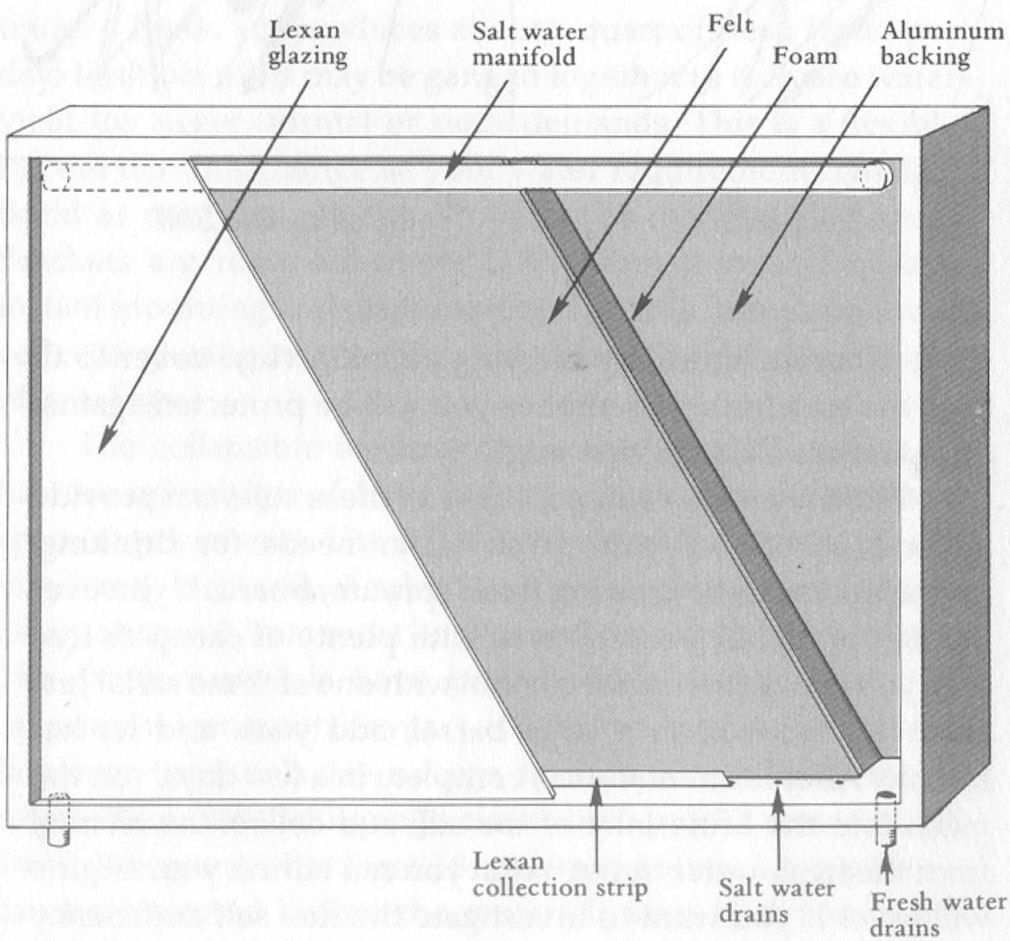


Figure 1 – Solid Still, cut-away view

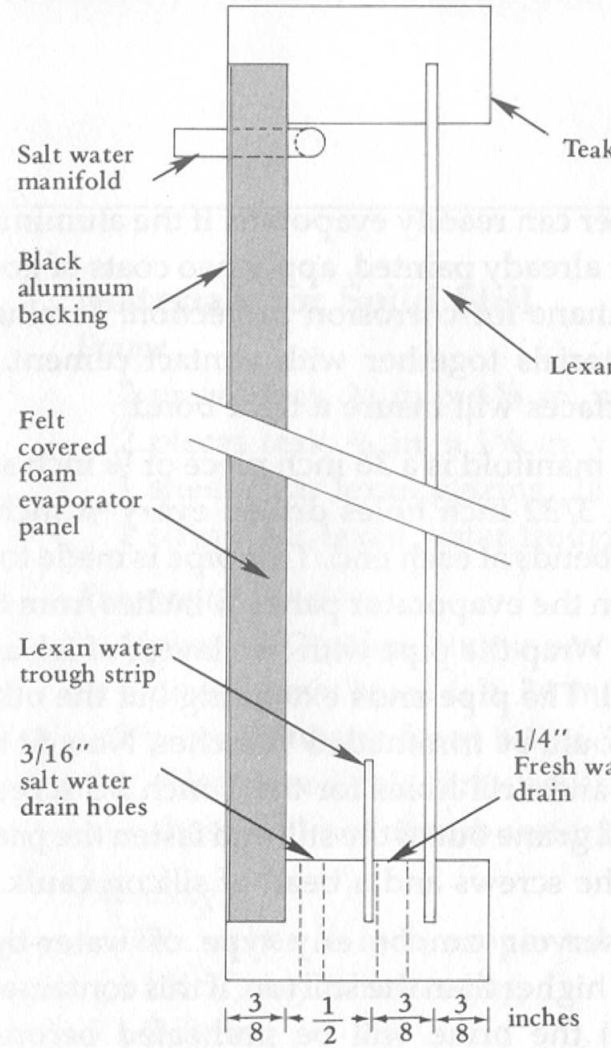


Figure 2 Solid Still, side view

apart and ⅜ inches deep. Assemble the lexan sheet and frame dry to insure good alignment. When it fits right, nail and glue the frame together with two-part epoxy and finishing nails. Bed the lexan sheet and water trough strip with clear silicon caulk. It is important that the still be made as airtight as possible for maximum efficiency. To allow excess salt water to drain out of the still, drill four 3/16 inch holes in the frame between the water collection trough strip and the evaporator panel. This water is simply allowed to run on deck. The fresh water drains are ¼ inch holes drilled in each end of the frame between the collection trough strip and the lexan glazing. Epoxy a 1¼ inch piece of ¼ inch copper tubing into these two holes for attachment to a runoff hose.

As shown in Figure 2, the evaporator panel is a laminate of painted aluminum sheet, urethane foam board and heavy black felt. This makes a strong, vaporproof, insulated hot wick

from which salt water can readily evaporate. If the aluminum you purchase is not already painted, apply two coats of good enamel or polyurethane for corrosion protection. Laminate the evaporator materials together with contact cement. A light coat on all surfaces will insure a tight bond.

The salt-water manifold is a 36 inch piece of ¼ inch soft copper tubing with 3/32 inch holes drilled every ¾ inches between 90 degree bends at each end. This pipe is made to fit through two holes in the evaporator panel ¾ inches from the side and top edges. Wrap the pipe with two layers of felt and mount on the panel. The pipe ends extending out the other side of the panel should be trimmed to ½ inches. Now fit the panel to the frame and drill holes for the 1 inch SS screws. Blow all the dust and grime out of the still and fasten the panel to the frame with the screws and a bead of silicon caulk.

The brine reservoir can be any type of water-tight container mounted higher than the still top. If this container is of a black material the brine will be preheated before it reaches the still, increasing fresh water output considerably. A black vinyl hot-water shower bag is the most convenient device I have used for this purpose. These bags are readily available through many marine outlets and will find lots of use around the boat to make hot water for showers, washing dishes and clothes, etc. Connect the brine reservoir to the still with a T-fitting, two needle valves and two lengths of ¼ inch vinyl hose.

So there you have it. The outside of the frame may be finished with a clear sealer to protect the wood but don't apply any finish to the inside as this might taint the fresh water. To set up the still, place brackets in several convenient locations on deck which will allow multiple stills, changing running rigging arrangements, different tack and sail shade situations, etc. Obviously, the still must have sunlight falling on it to work at its best, but light reflected off the water will

Materials for Solid Still

Frame

2 pieces teak, ¾ in. x 1⅝ in. x 24¾ in.
2 pieces teak, ¾ in. x 1⅝ in. x 32¾ in.
1 sheet clear lexan glazing, 24 in. x 32 in.
1 strip clear lexan water trough, 1 in. x 32 in.

Evaporator Panel

1 piece .032 gauge aluminum, 24 in. x 32 in.
1 piece heavy black felt, 24 in. x 32 in.
1 piece urethane foam board, 24 in. x 32 in.
(Use closed cell Airex or Kelgecell; these will not absorb water.)

Plumbing

38½ inches ¼-inch copper tubing
1 black vinyl shower bag
1 T-fitting
2 needle valves
2 small pieces ¼-inch vinyl hose

clear silicon caulk
contact cement
two-part epoxy glue
finishing nails
1-inch stainless steel screws

also power the unit. A 45 degree tilt collects both direct and water-reflected sunlight. Mount the top edge as close to the horizontal as possible to allow even drainage and brine flow through the felt wick.

Operating the still requires a bit of practice at first. Begin your water-making career by filling the reservoir and allowing it to heat up. Open the brine valves and adjust them so

that just a slight drip flows evenly across the top of the still from the copper manifold. Too little flow won't saturate the evaporator's felt wick and salt crystals are not flushed out with the excess brine. Too much flow and the excess will drain heat from the unit causing a much lower output of fresh water. Salt crystals deposited on the felt reflect energy, drastically reducing still efficiency. Experiment with this regulation until you get the maximum level of fresh water production possible.

Roll-Up Collapsible Still

The collapsible still features 10.5 square feet of collector surface yet rolls up into a package just eight inches in diameter by 60 inches long. When not in use, the still is placed in an acrylon bag and stowed on deck or in the cockpit locker. One of these easy-to-stow, easy-to-use stills produces at least a half gallon per day — enough for several glasses of drinking water with plenty left over to grow lots of fresh sprouts.

The principle of the still's operation is quite simple. At the top of the still, salt water runs through copper tubing that has been drilled with many small holes. The water drips slowly onto a layer of felt, and as it is heated by the sun, the water evaporates. Fresh water condenses on the clear vinyl face of the still, and is collected at the bottom as it runs off. (See Figures 4 and 5.)

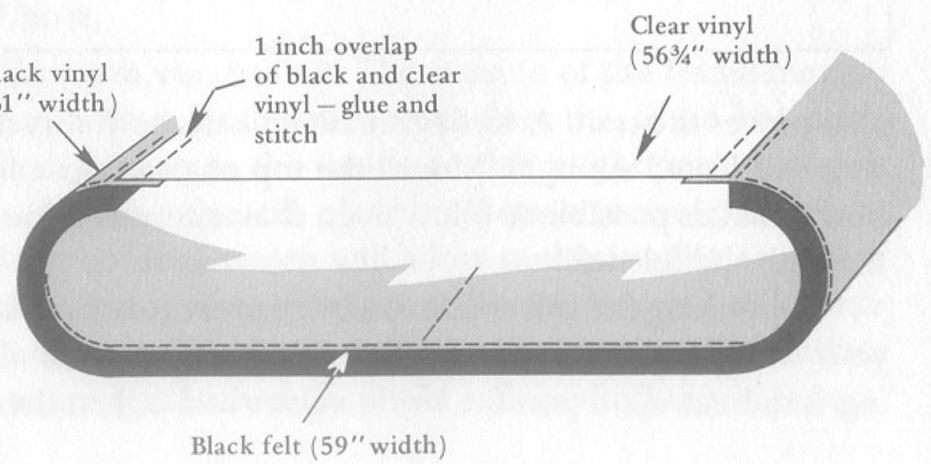


Figure 3 – Fabric Construction for Collapsible Still

Start construction by cutting the black felt, black vinyl and clear vinyl fabrics to the sizes designated in the list of materials. It is important not to substitute a lighter gauge material than that specified for the vinyl fabrics. The heavier gauges will last much longer and not stretch out of shape in the hot sun. Align the black felt onto the middle of the black vinyl using a light coat of contact cement. Now machine stitch the felt to the black vinyl around the edges and down the middle. The contact cement is used to hold the felt in position while it is being stitched in order to avoid bunching and misalignment of the fabrics. This completes the dark, heat-absorbing side of the still that evaporates pure water from the salt solution. Next the clear vinyl is fastened to the evaporator to form a surface for the water vapor to condense upon.

As shown in Figure 3, the clear vinyl is cemented and sewn to the black vinyl to form a continuous 27-inch wide loop with the felt to the inside. Overlap the clear vinyl 1 inch onto the black vinyl and fasten with vinyl cement and a double stitch. If your sewing machine cannot handle these materials then have an upholstery shop do this for you.

The still top and bottom frame assemblies are made from two pieces of choice, oily teak. Cut these to size and grind the sharp corners from the ends. Insert these into the cover right along the edges of the openings. If they are too tight, trim the teak until they fit snugly but do not overstretch the vinyl. Since these two pieces of teak have probably been trimmed to different sizes, mark them either top or bottom. Now cut the aluminum angle water trough 1 inch shorter than the bottom length of teak and secure it with ½ x 6 ss round head screws as shown in Figures 5 and 6. Grind the sharp ends from the aluminum so that there is no chance that the vinyl can be punctured when the still is rolled up. This angle forms the water collection track so put a bead of clear silicon caulk under the angle before you screw it down to make it water tight. To prevent water from running off the

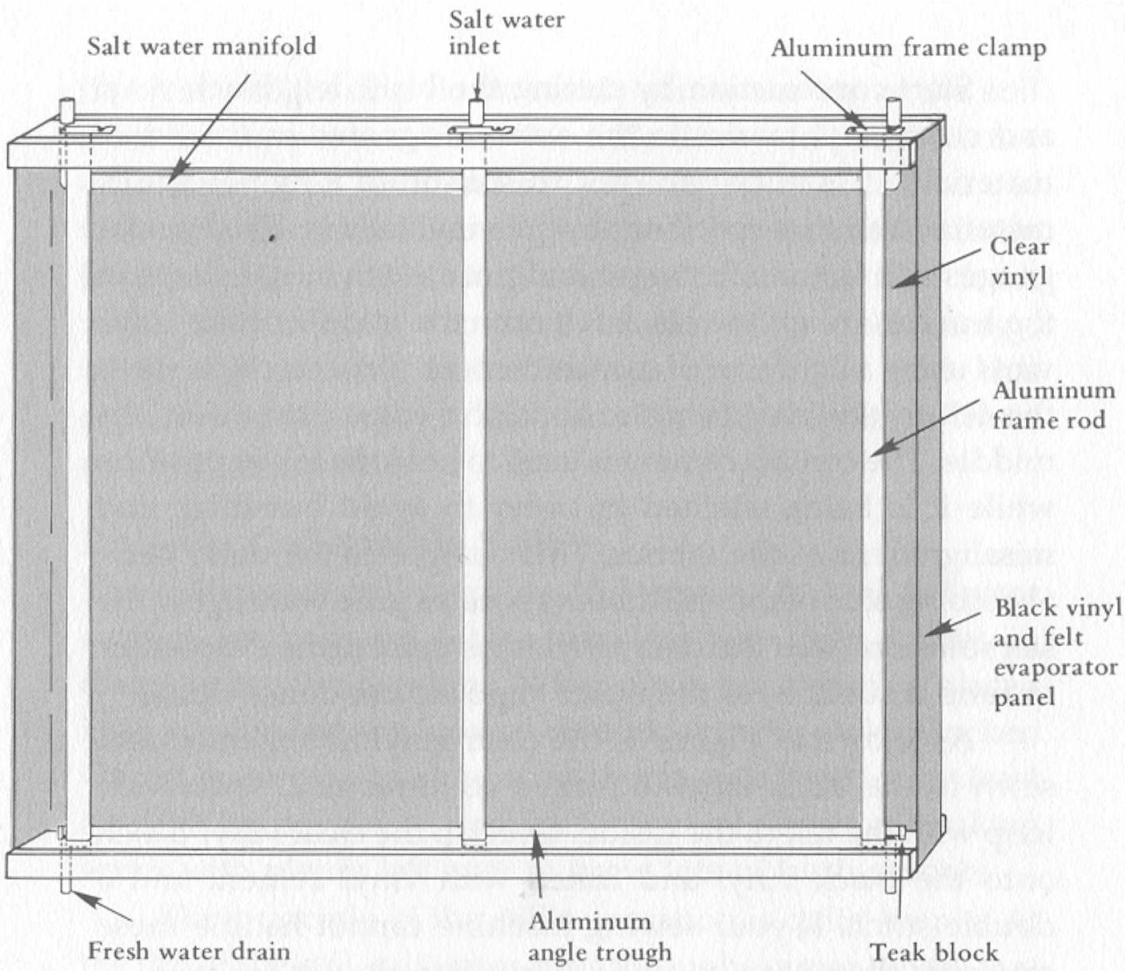


Figure 4 – Collapsible Still, cut-away view

ends of the trough, glue a ½ inch x ½ inch x ⅜ inch teak block at each end of the teak against the aluminum angle. Drill one ¼ inch hole in the teak bottom assembly at each end of the trough just inside of the teak blocks and right next to the aluminum angle for the fresh water collection tubes. These tubes are two 1¼ inch lengths of ¼-inch copper tubing which are glued into the holes with two-part epoxy. Leave ½ inch of one end of the tube on the outside of the teak with the other end flush to the teak. In order to drain excess salt water that wasn't evaporated after running down the felt, drill six evenly spaced 3/16 inch holes through the aluminum angle and teak ⅜ inches from the edge as shown in Figure 6.

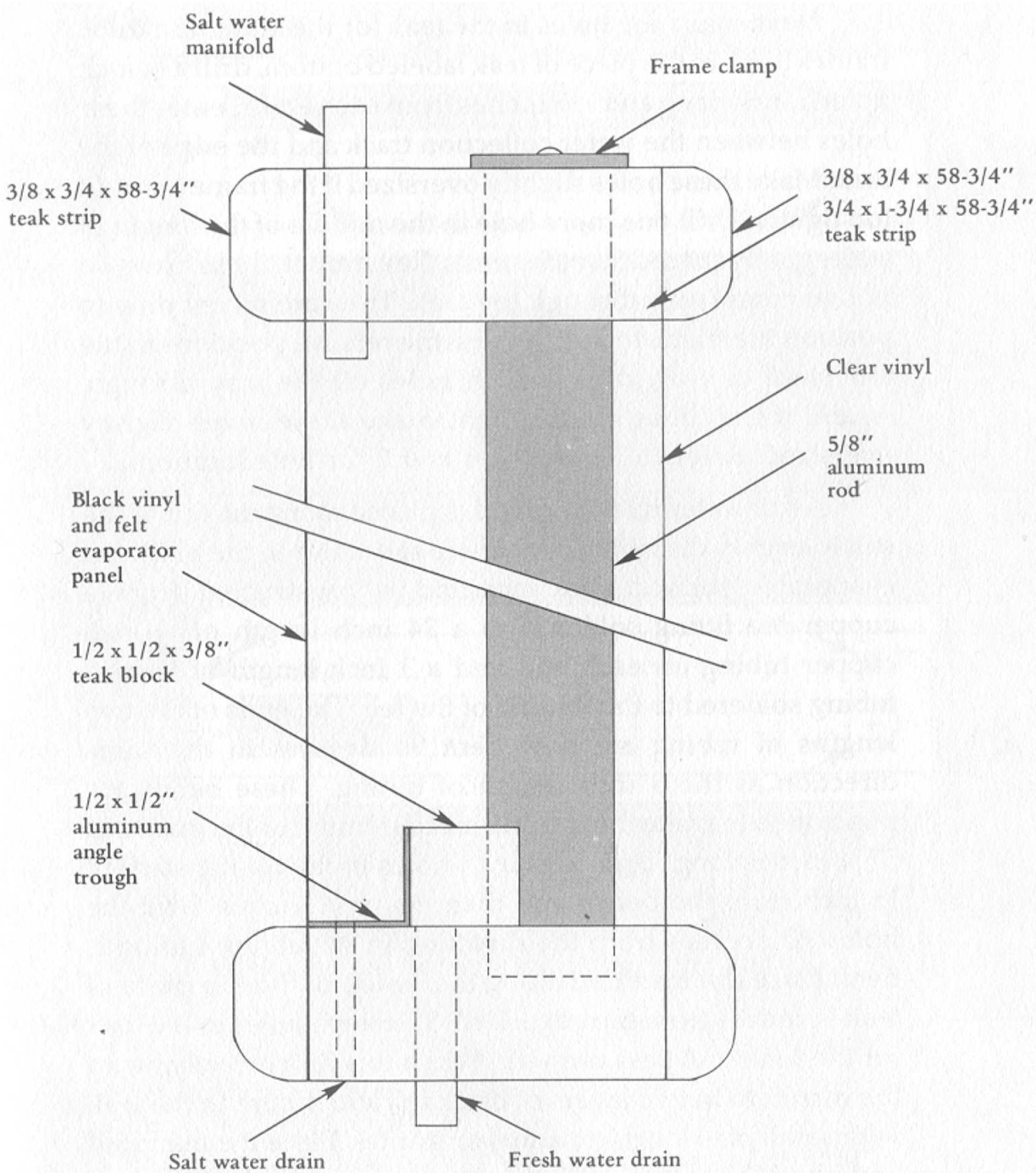


Figure 5 – Collapsible Still, cross section

Next, make the holes in the teak for the aluminum tube frames to fit. In the piece of teak labeled bottom, drill a 5/8 inch hole 1/4 inch deep and 1 1/2 inches from each end. Center these holes between the water collection track and the edge of the teak. Make these holes slightly oversized if the frame tubes fit too tightly. Drill one more hole in the middle of the length of teak equally spaced from the ends. Remember, these holes do not go completely through the teak. They are meant only to position the frame tubes. In the same relative positions in the top piece of teak, drill 5/8 inch holes all the way through. Again, if the tubes are too tight make these holes slightly oversized. Refer to Figures 4, 6 and 7 for hole locations.

A salt water inlet manifold is placed along the top of the still to evenly distribute a trickle of salt water to the black felt evaporator surface. The manifold is constructed from a copper tee fitting soldered to a 34 inch length of 1/4-inch copper tubing on each end and a 3 inch length of 1/4-inch tubing soldered to the middle of the tee. The ends of the two lengths of tubing are now bent 90 degrees in the same direction as the 3 inch length of tubing. These bends are positioned to make the outside measurement of the manifold 57 3/4 inches long. Drill 3/32 inch holes in the tubing starting 1/2 inch from the bends and then every 3/4 inches. Drill the holes 90 degrees from the direction in which the tubing is bent. Place the manifold along the inside of the top piece of teak 1/4 inches from the edge. Drill 5/16 inch holes in the teak for the tubing to pass through. When this fits correctly, wrap the manifold in two layers of black felt and secure to the teak with small plastic cable clamps or staples. Place the manifold with the 3/32 inch holes facing the clear vinyl side. Now seal the holes where the tubing comes through the teak with clear silicon caulk and cut the tubes so they extend 1/2 inch above the teak. Figure 8 depicts the construction of the salt water manifold.

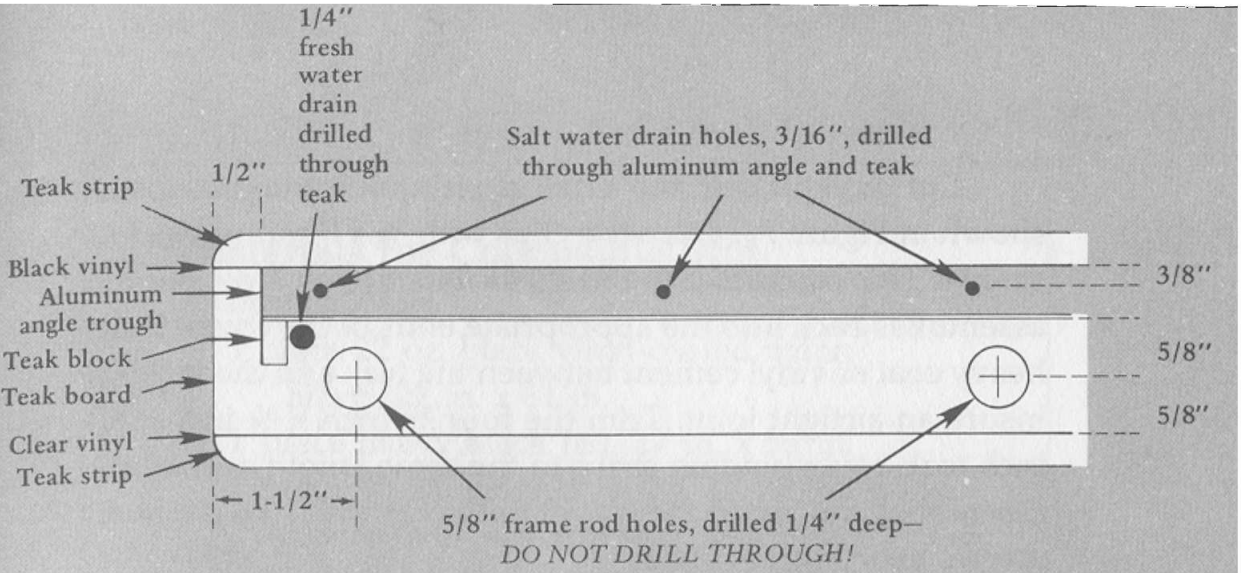


Figure 6 – Bottom Frame, Collapsible Water Still

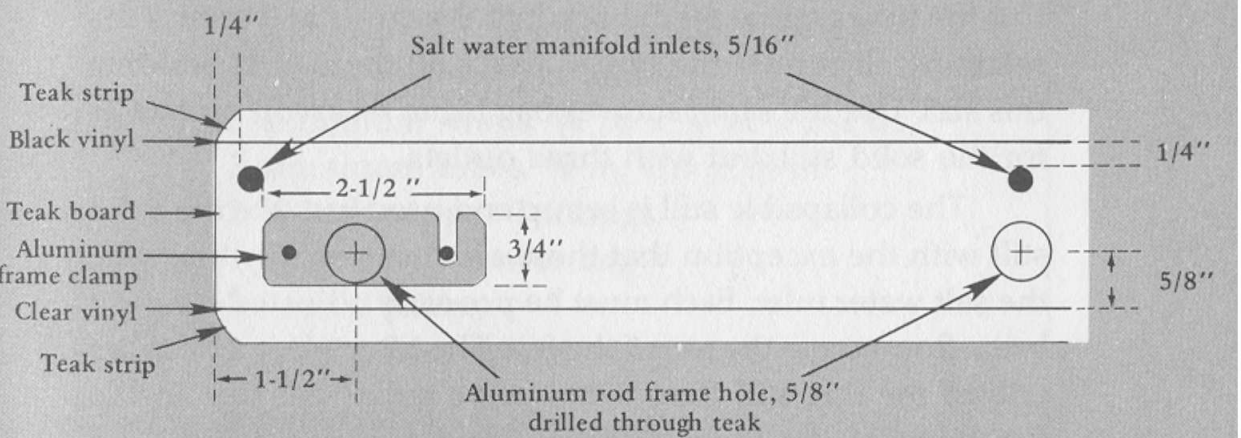


Figure 7 – Top Frame, Collapsible Water Still

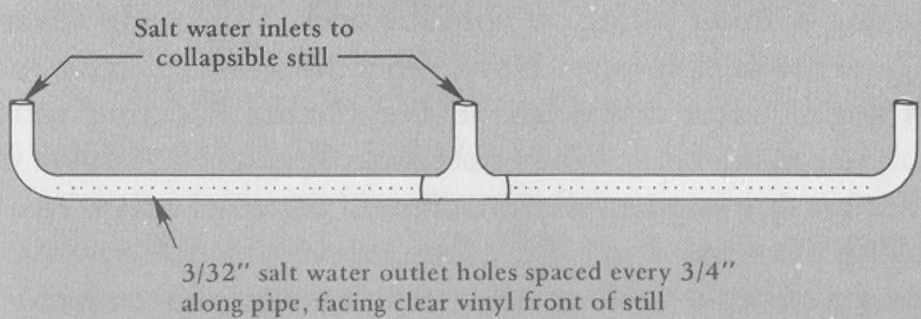


Figure 8 – Salt Water Manifold for Collapsible Water Still

Cut out and drill the three aluminum frame clamps as shown in Figure 7 Fasten the clips with ¾ x 8 round head ss screws. This completes the two teak assemblies. Now put the assemblies back into the appropriate ends of the cover. Put a heavy coat of vinyl cement between the teak and the vinyl to insure an airtight joint. Trim the four ⅜ inch x ¾ inch x 60 inch teak cover holding strips to the same length as the teak assemblies and fasten them over the cover with 1 x 6 flat head screws every three inches.

The three aluminum frame tubes are now put through the holes in the top assembly and fit into the bottom holes. Stretch the cover fairly taut and mark each tube flush with the outside of the top piece of teak where it sticks out of the hole. Cut the tubes, place them back into the cover and secure the retaining clips over the tubes. That's all there is to building this still. Use the same shower bag brine reservoir system as for the solid still, but with three outlets.

The collapsible still is set up and used just like the solid still with the exception that there are three supply tubes for the salt water inlet. Each must be properly adjusted for even brine flow across the top of the felt. The tilt angle is a bit more critical for this still than it is for the solid unit due to the flexibility of the vinyl glazing. Wind blowing against the glazing will cause it to flap even when tightly stretched. This causes water drops to either fall off onto the wick or slide down the glazing into the collection trough. If the still is set at the correct angle the drops will merely slide quickly down the glazing without falling off onto the wick. This is one advantage of the flexible vinyl. However, if the still is set at too low an angle, water drops fall off the glazing lowering water output considerably. When not in use, keep the still rolled up in an acrylon bag for full protection of the vinyl cover. When rolling the cover don't allow the clear vinyl to get any sharp creases or tight folds as they will weaken the material if stowed this way for long.

Materials for Collapsible Still

Evaporator Panel

1 piece 22 oz. black vinyl-coated nylon fabric, 27 in. x 61 in.
1 piece heavy black felt, 27 in. x 59 in.
1 piece 40-gauge clear vinyl, 27 in. x 56¾ in. (convertible auto top rear window)

Frame

2 pieces teak, ¾ in. x 1¾ in. x 58¾ in.
4 pieces teak, ⅜ in. x ¾ in. x 60 in.

Plumbing

5 feet ½ inch x ½ inch aluminum angle
6 feet ¼-inch copper tubing
3 aluminum straps, ⅛ in. x ¾ in. x 2½ in.
3 aluminum tubes, ⅝ in. OD x 28 in.
2 ¼-inch copper T-fittings
1 black vinyl shower bag
3 needle valves
3 small pieces ¼-inch vinyl hose

vinyl cement
silicon caulk
two-part epoxy glue
80 1 x 6 in. flat head SS wood screws
8 ½ x 6 in. round head SS wood screws
3 ¾ x 8 in. round head SS wood screws

Silver Ion Water Purifier

These units will take the dirtiest water found practically anywhere and turn it into fresh, clean, bacteria-free *jus de vie.* The water first passes through a fine mesh or screen filter, then through activated charcoal to remove bad tastes and

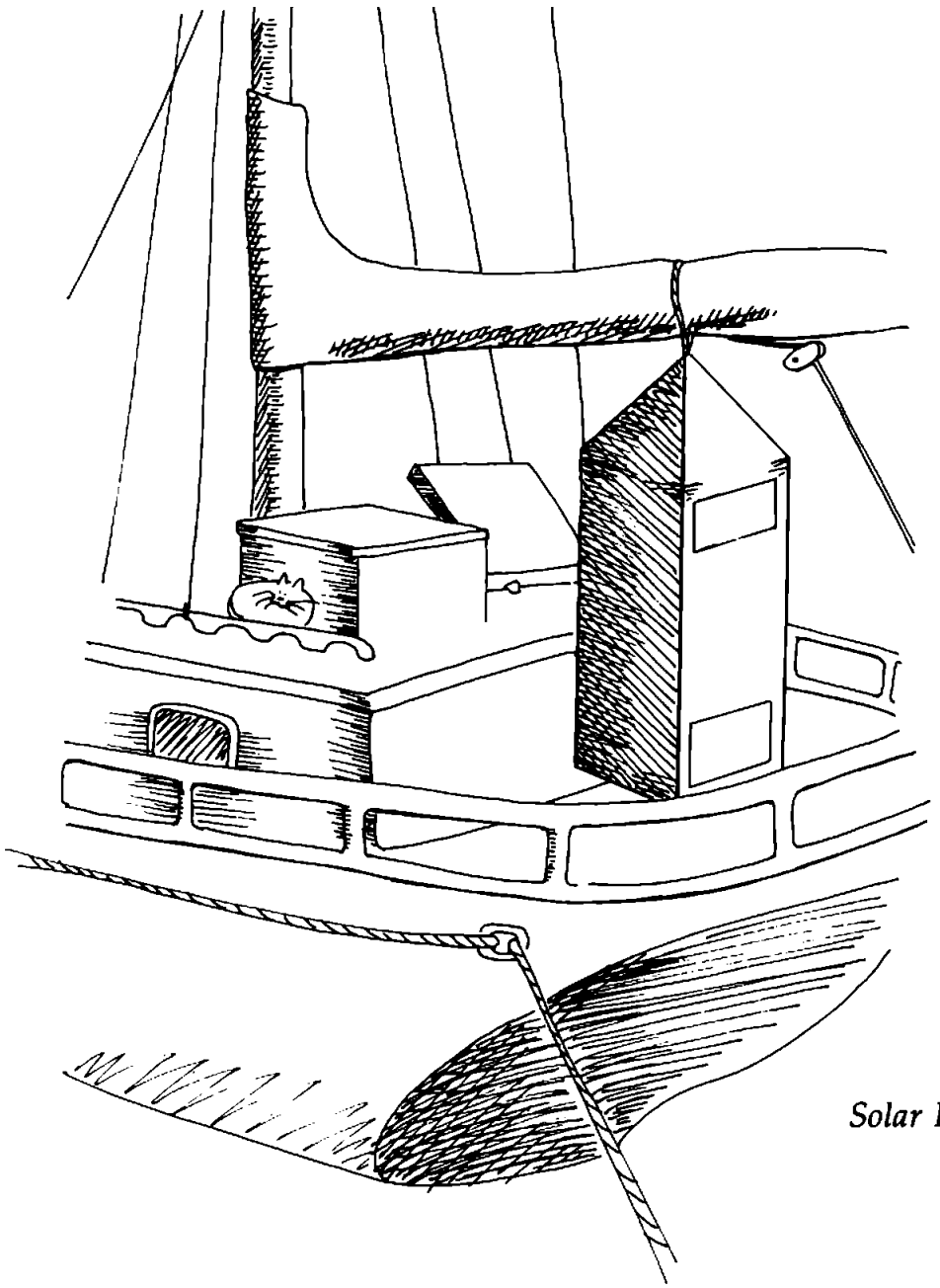
odors and finally through a silver ion compound which kills any bacteria. The units can be portable and carried in the pocket or built right into the ship's main supply line. The only drawback to this system is that the silver element is not cheap and must be replaced from time to time. Their life can be greatly extended by using a good carbon filter in front of the silver unit to pre-clean the water.

To get absolutely bacteria free, sterile water you can add chlorine bleach to the water tank. A regular carbon filter will remove the chlorine before it gets to the tap. Again, don't count on rain or good public water to supply your water requirements. Have on board several regular and back-up systems to furnish this most essential need.

Solar Food Drier

With the ability to preserve food when supplies are abundant and cheap you can be assured of having food during drought, lean times or long passages. By drying food you can quickly turn mountains of spoilable fish, fruit, vegetables, etc., into light and compact packages that will last indefinitely. In many places in the world food can be gathered free with little effort. Lobster, seaweed, bananas, coconuts, oranges, apples, etc., can all be collected by the clever hunter. These dried products are valuable legal tender and may be bartered for currency, goods or services.

It is important that a properly designed drier be used because the humidity of the ocean environment will cause food to spoil if it is not dried completely and quickly. Drying times must be reduced to a fraction of that required for open air drying. To be practical a drier should be collapsible to save space when not in use. It should also be able to handle large amounts of food in a short time. There is nothing worse than having to discard food because it couldn't be processed before spoiling.



Solar Food Drier

The self-sufficient seasteader does not rely on ice or mechanical refrigeration to preserve food. These methods are usually difficult to maintain and will keep you attached to shore. I have known several folks who lost large amounts of food due to their reliance on cold food preservation. Dried food lasts indefinitely. The solar drier can also be used to make granola, cereals, cookies, bread, crackers, and many other nutritious foods without a drop of fuel. Check out the recipe chapter to learn some of the possibilities.

Building a Solar Drier

Featured here are plans for making a super efficient food drier that costs nothing to operate and can be used anywhere — deep sea, or on an uninhabited island. It is collapsible in design with a black heat-absorbing acrylon cover fitted over nine hanging trays made of wood and fiberglass screening. The hanging arrangement eliminates the necessity for a rigid frame thus allowing the unit to collapse into a small package for stowing. The drier can develop temperatures of over 140 degrees F for speedy and efficient dehydration in the marine environment of all sorts of food from soup to nuts. Adjustable air vents are incorporated in order to regulate the temperature very closely to avoid overheating sensitive nutrients in the food.

Practically any home sewing machine can stitch the acrylon cloth. Acrylon is much easier to sew than coated sail cloth as the material is soft with a tight but not hard weave. Use a number 14 or 16 needle and strong polyester thread. Most canvas shops stock or are able to order the acrylon fabric. A lumber and hardware store can supply the rest of the materials.

Begin the project by marking with a red pencil all the components on the acrylon material. Lay these out according to the plan in Figure 9. Mark the corners along the top edge to use as reference points when installing the roof. The material is cut with a red hot butter knife tip. This will melt the weave, automatically sealing the edge to prevent fraying.

The clear vinyl window and air vents are made 2 inches longer on each side than the cutouts in order to overlap the edges 1 inch all around. Cut out a 4 inch x 4 inch hole 5 inches below the top of the cover edge and sew in the 6 inch x 6 inch window. If your machine cannot sew this material it can be done by hand with a sail needle. Overlap edges A and B of the cover ¾ inch and glue together using contact cement; then run a stitch on both sides of the overlap for maximum

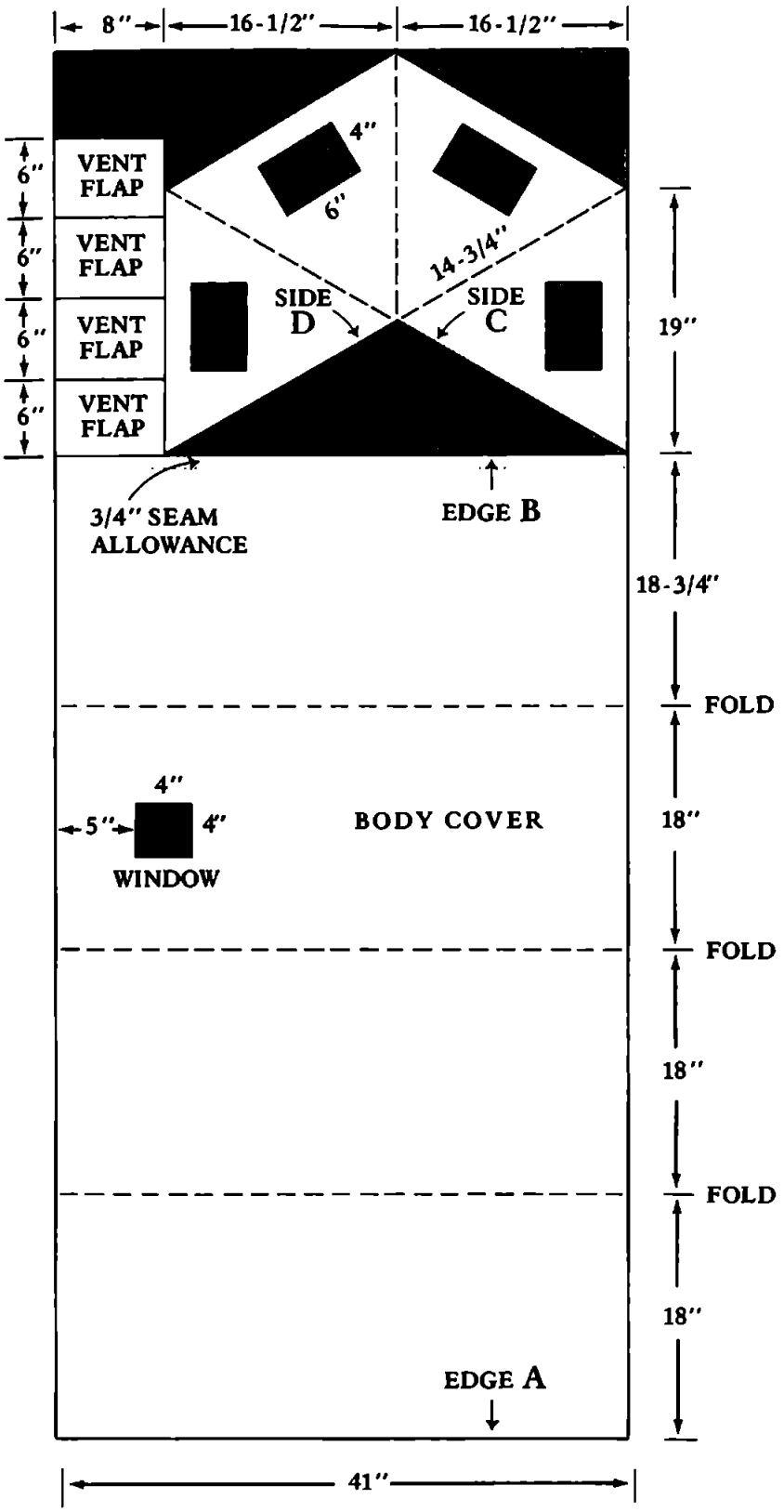


Figure 9
Solar Drier
Fabric Layout

strength. The cover has the vinyl window overlapping the edges of the inside. Now cut out the 4 inch x 6 inch roof vents and install 6 inch x 8 inch screening over the openings. The screening is easily sewn provided it is first lightly glued in place with contact cement. If the screen is not glued it has a tendency to stretch while being sewn causing it to distort. On the outside of the fabric (the other side from which the screen was sewn) sew velcro tape along the two sides and bottom of the vent openings. Also sew the velcro mate along two sides and bottom of the vent cover flap. Now sew these flaps in place aligning them over the velcro fasteners. Sew a velcro tab on the flap and cover to hold the vent open when adjusting air flow. Turn the roof inside out and sew edges C and D with a single seam. With both the roof and bottom cover inside out, sew together using a straight stitch ½ inch from the edges of the fabric. Be sure to carefully align the roof to the corner marks on the bottom cover. Now turn the cover rightside out, snip 1 inch off the top of the roof and sew a piece of 1 inch nylon strap along the edge. This is where the tray hanging straps come through so it must be sewn securely. This will probably have to be sewn by hand. To finish the cover sew a length of velcro along the inside bottom edge. This will secure the bottom tray to the cover and prevent the entrance of insects.

The drying trays are two separate frames made of ⅜ inch x ¾ inch mahogany with a fiberglass screen sandwiched between them. Construct the frames with ¼ inch staples and white glue. Fasten the screen over one of the frames tightly with ¼ inch staples, put a thick bead of glue on the edge of the screen on top of the frame and fasten the two frames together using 9/16 inch staples. When the glue is dry, grind the edges with a disc sander and put a radius on the corners. Along the edge of one tray, glue and staple a length of 1 inch velcro tape. This will be the bottom tray and will hold the acrylon cover securely.

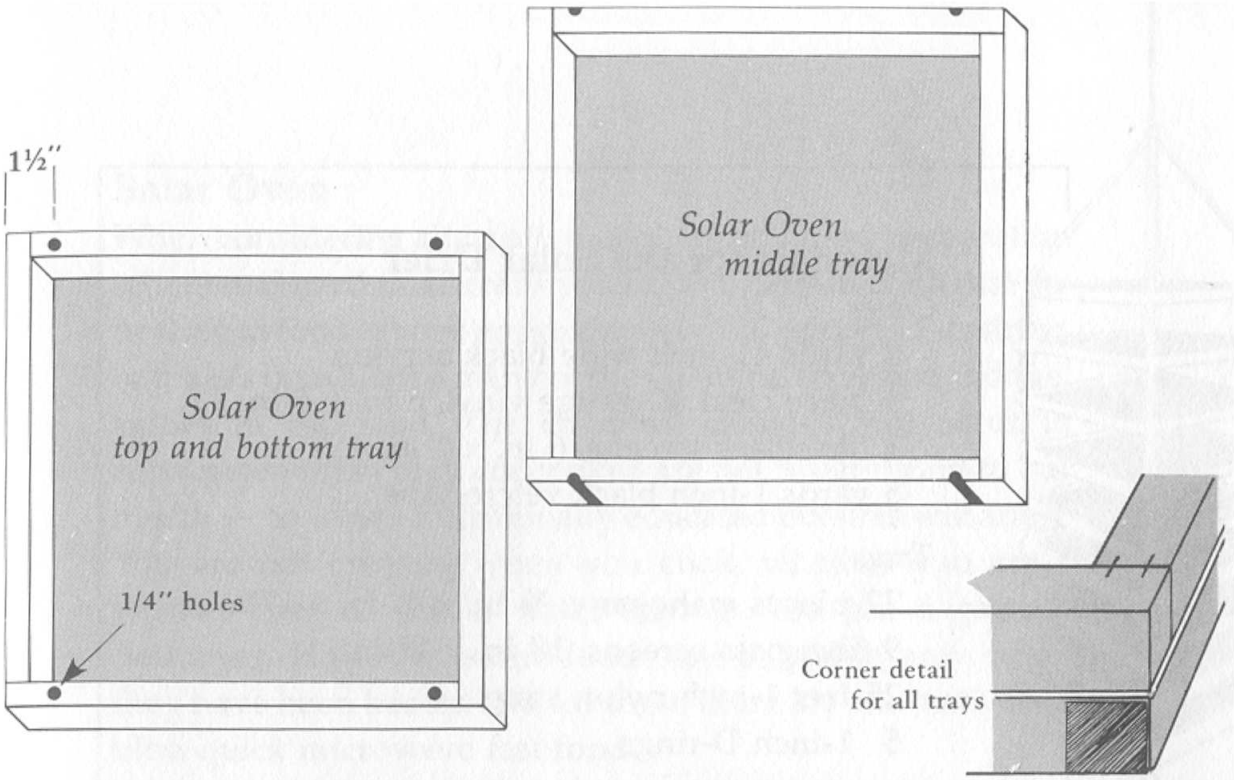
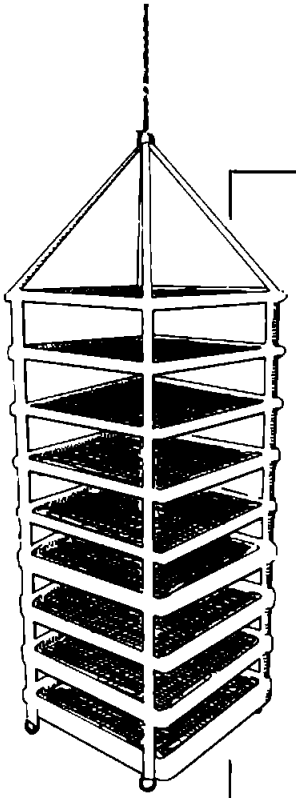


Figure 10 – Detail of tray construction

To assemble the trays, 1 inch nylon straps are fastened to the trays with glue and staples. Mark off on the tape with a red pencil the position of the bottoms of the trays. This will provide even, regular spacing to avoid tilted trays. A D-ring is placed at the bottom of the strap. One inch above this is the first tray and then every 5 inches. Total distance from the bottom of the first tray and the top of the top tray is 40 inches. Above the top tray, mark off 20 inches where the hanging D-ring is placed. The strap is not cut here but passes through the ring and continues down the other side of the trays. Another length of strap is used for the other side. Now place the trays on edge aligned to the marks and glue and staple the strap 1½ inches from the corners. Don't forget to put on the hanging ring before the straps are stapled.

Using the Solar Drier

Hang a line from a suitable location on the boat. A flag halyard works fine or a line from a shroud. Pass the line through the top of the cover and tie to the hanging ring on the trays.



Drying rack without cover

Materials for the Solar Drier

Cover

3 yards 41-inch wide black acrylon
1 piece clear 40-gauge vinyl, 6 in. x 6 in.
4 fiberglass screens, 6 in. x 8 in.
5 yards 1-inch black velcro tape

Trays

72 pieces mahogany, ⅜ in. x ¾ in. x 17¼ in.
9 fiberglass screens, 18 in. x 18 in.
25 feet 1-inch nylon strap
5 1-inch D-rings

white glue
contact cement
black polyester thread
¼-inch and 9/16-inch staples

Adjust the height and secure the bottom rings so that the drier doesn't swing. Now place some food on the trays and put a thermometer where you can see it through the window. Pull down the cover and turn on the sun. Adjust the temperature with the air vents to no higher than 120 degrees F. Beyond this temperature valuable vitamins are lost, destroying the miracle potency of the foods you are processing. Drying will be faster at a higher temperature but the food is considerably lessened in value. If the temperature cannot be brought up to 120 degrees, close off a portion of the bottom screen to further limit air flow. You must have some air flow circulation to carry away moisture, otherwise the foods remain soggy and instead of drying may mildew.

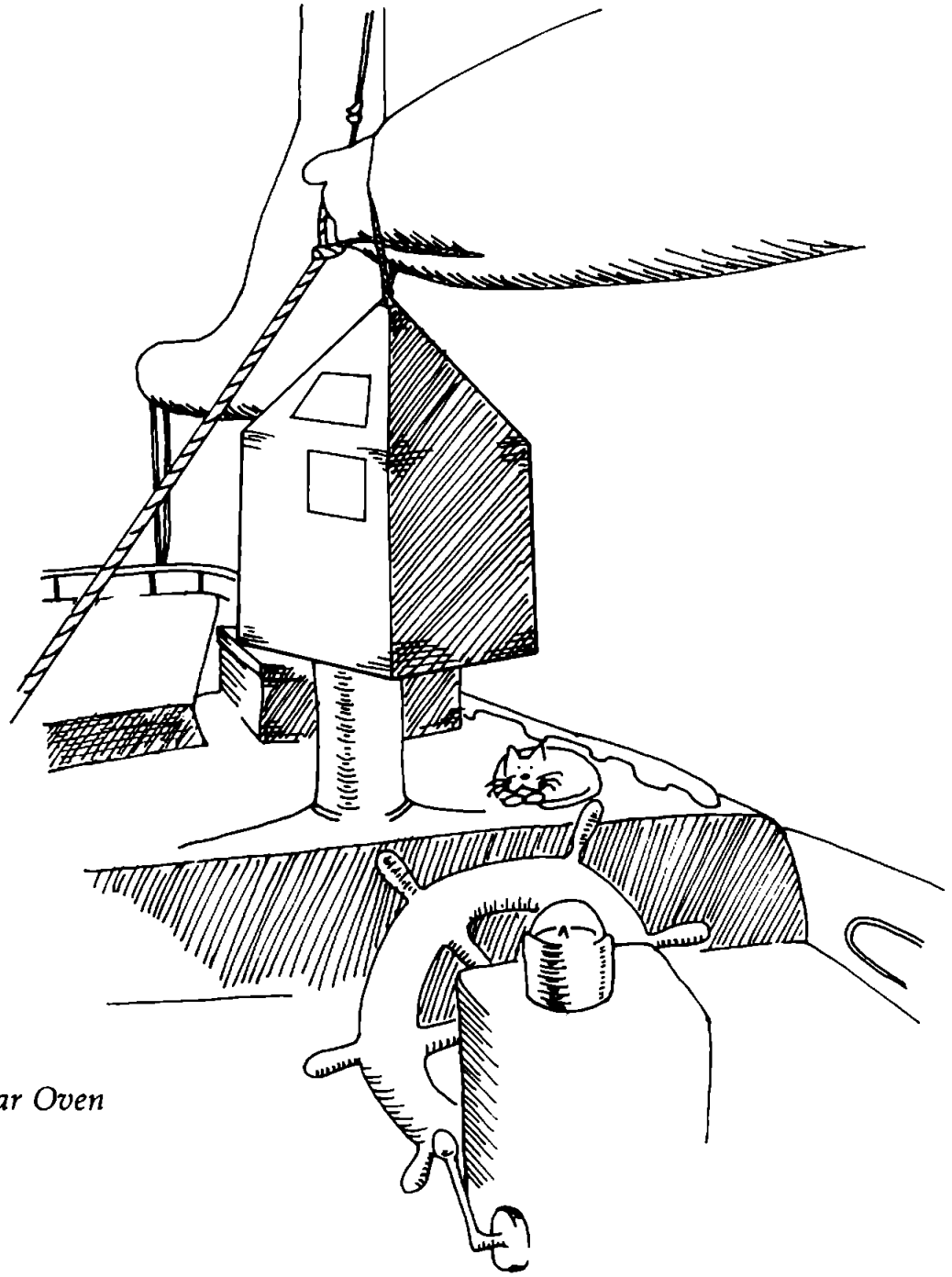
Solar Oven

When considering alternative-cooking and food-preparation schemes aboard small crafts you have to keep in mind that the heating of foods above approximately 120 degrees F destroys or makes unavailable many of the vitamins, enzymes and fuel values in the food. The chemical changes that occur in substances when they are cooked are not insignificant to our health — to which nutritionally educated persons will attest. You are not creating when you cook, whether you are a *gourmet* chef or just a water burner. You are a *gourmet* destroyer. However, some foods are palatable only when they have been heated and for these there are alternatives to ultra-quick microwave fast food.

Foods may either be cooked very hot for a short while or moderately warm for a long while. Whole wheat cooked at 120 degrees for eight hours is just as palatable as when cooked at 200 degrees for ten minutes. The difference nutritionally is that the wheat cooked at the lower temperature will sprout and grow, whereas the quick-cooked wheat is dead. Dead food makes dead bodies. Live food makes live bodies.

Meals may be prepared in a solar cooker that is a smaller version of the solar drier. Its smaller size makes it handier to use on deck while at sea on a regular basis and will prepare cookies, breads, leathers, burgers and many other items described in the recipe chapter.

Besides being of smaller size, there are two construction differences in the oven unit from the drier. Four 12 inch trays are used to provide plenty of capacity for daily use. In order to place a container in the unit, the middle two trays are made removable. This is done by using 3/16 inch rope to hang the trays instead of strap. The rope passes through ¼ inch holes drilled in the bottom and top trays and through slots in the middle trays. Knots tied in the rope support the trays.



Solar Oven

To string the trays together start by tying a D-ring on the end of a length of rope. Pass the line through a ¼ inch hole 1½ inches from the corner of the bottom tray. Five inches up from the bottom of the tray tie a single overhand knot. Tie two more knots five inches apart and then pass the line through the top tray. Mark the line 13 inches from the aforementioned

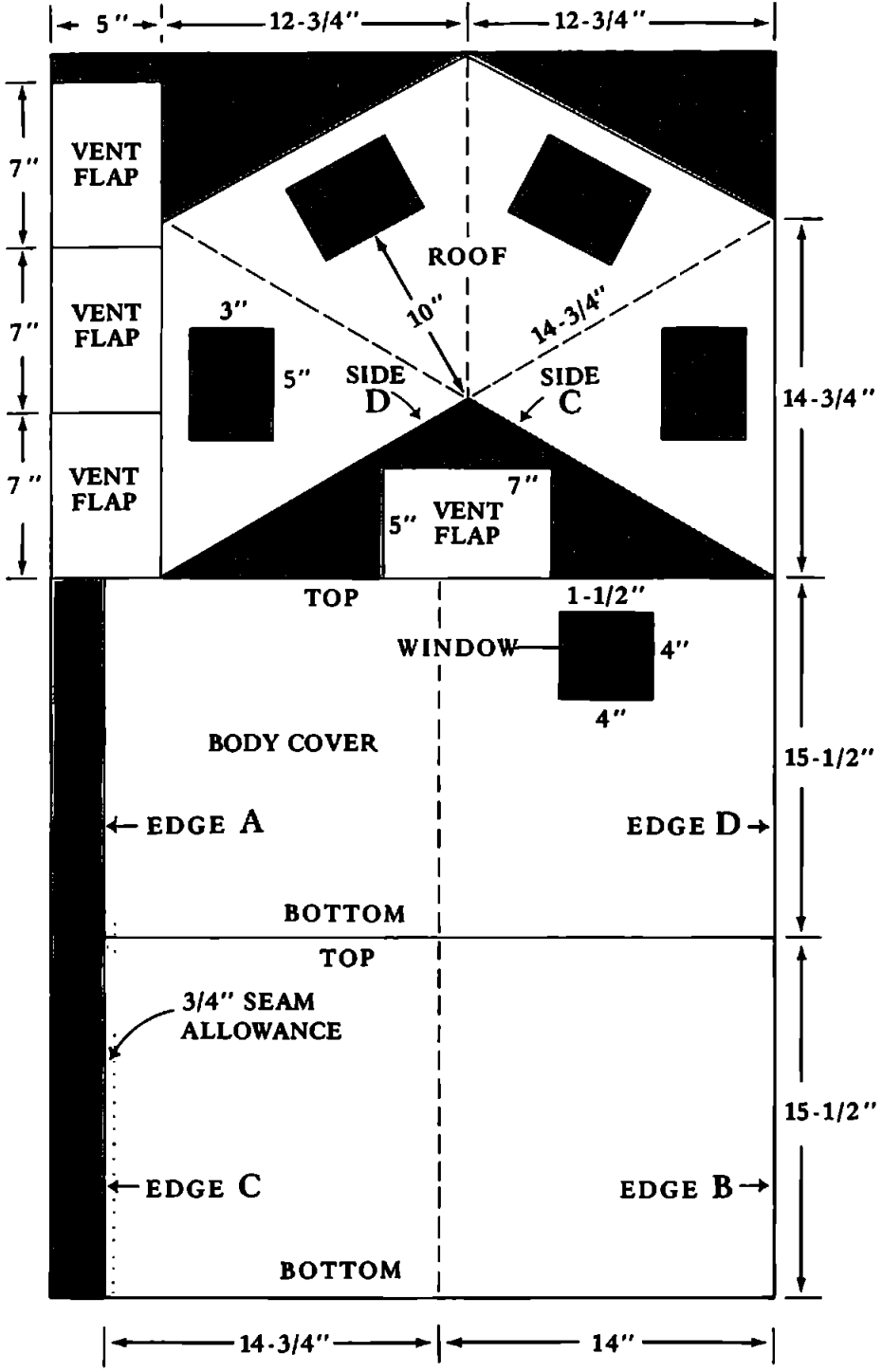


Figure 11 - Solar Oven Fabric Layout

mark. Now continue down through the trays the same as before. Tie a similar separate line through the other side of the trays.

The bottom cover is cut in two places instead of one as with the larger drier. This is done to use the stock size of acrylon more efficiently. Place edge A and B together,

Materials for Solar Oven

Cover

1⅔ yards 31-inch wide.black acrylon
1 piece clear 40-gauge vinyl, 5 in. x 5 in.
4 fiberglass screens, 5 in. x 7 in.
3 yards 1-inch black velcro tape

Trays

32 pieces mahogany, ⅜ in. x ¾ in. x 11¼ in.
4 fiberglass screens, 12 in. x 12 in.
1 piece ¼-inch mahogany plywood, 12 in. x 12 in.
12 feet 3/16-inch nylon cord
5 1-inch D-rings

white glue
contact cement
black polyester thread
¼-inch and 9/16-inch staples

overlapping ¾ inches and sew a stitch on each side of the overlap. Join edge C to edge D in the same manner. Now continue to assemble the cover following the same instructions as for the solar drier.

When employed as an oven the top and bottom vents do not have to be open, as air circulation is not necessary. By covering the bottom tray entirely with the 12 inch x 12 inch piece of plywood and closing the top vents, 130 degrees F can be developed when the unit is in direct light. When used as a food drier be sure to have some air circulation for highest drying efficiency and quality.

Grain Grinder

White flour is used to make 95 percent of the manufactured flour products such as bread, cereals, noodles, etc. High-speed milling separates the white starchy part of the wheat grain from the germ and bran. Two hundred years ago white flour became a very fashionable and elitist food that separated nobility from the serfs. The common dark, heavy whole wheat breads were replaced by light white breads as the preferred choice of the upper class. When large-scale milling became possible during the industrial revolution it was found that flour would stay fresh much longer if the germ was removed. This is because the oils in the germ oxidize, causing rancidity if left in the flour. The bran was removed because it gave the flour an off-white dirty appearance.

In the interest of higher profit, convenience and ignorance, by far the most nutritious parts of the grain were discarded. Practically all of the protein and vitamins are contained in the germ and bran. Recent research has also shown that the bran is a very important source of bulk needed for proper functioning of the bowels.

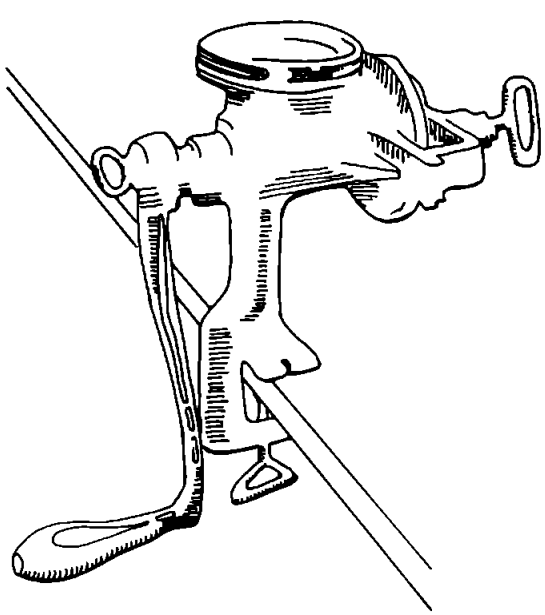
It totally amazes me to see that people are still being duped by the claim on the side of the box of sweet breakfast cereal or loaves of white bread that it is made with enriched flour. If removing 50 natural nutrients while replacing five synthetic chemicals is "enriched," I'll just eat the box instead. It's probably just as nutritious as the contents. If the companies would put some of the vitamins in the paper of the box and advertise how delicious it is, then we wouldn't have such a trash problem in this country.

Nature designed seeds incredibly well to make sure they survive through all kinds of hardships in order to propagate the species. Wheat grains found in ancient tombs will sprout after thousands of years. Upon grinding, the seed is killed and deteriorates rapidly. Remember that a seed is a live plant in a very reduced state of growth. This life force energy is hardly

detectable and the seed can lay dormant for years, but given the chance will sprout into the magnificent plant it was designed to be.

Flour that sits around in the mill house awhile, and sits again in a distributor's warehouse before being shipped to the store where you buy it, is already stale and devoid of much of the original wholesomeness. When the flour is stored on the boat for months before it is used, you may as well eat sawdust. This is why you should grind your own flour from whole wheat, rye, barley, buckwheat, oat, triticale, millet, rice, etc. This will insure absolute freshness with all the sensitive vitamins and oils intact. Store grains, nuts, seeds and beans whole so they'll stay fresh and then grind them as needed. In this way grains may be used for sprouting, to make juice from the greens, cooked whole for cereal or ground into the freshest possible flour for all kinds of familiar recipes.

The grinding tool to do this is an extremely cheap and simple piece of hand-powered equipment. It is similar to a meat grinder, only larger, having grinding stones or burred steel plates instead of cutting blades. A good grinder will cost less than $50, last indefinitely, and supply the flour for the

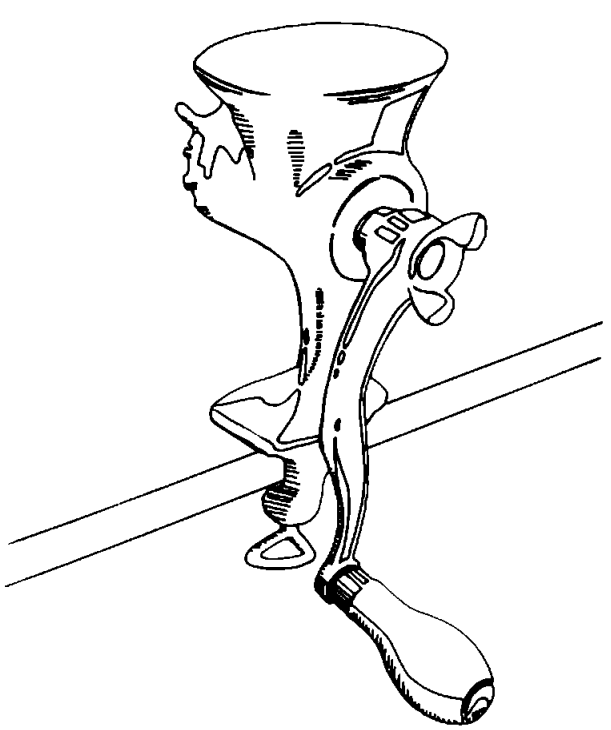


Grain Grinder

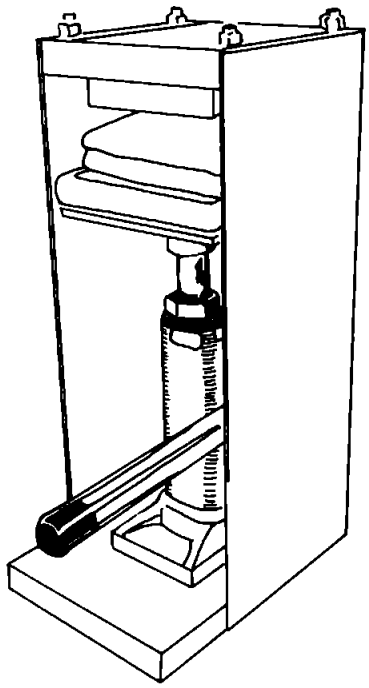
freshest bread in the world even if you happen to be in the middle of the ocean. An extra no-charge feature of a grain grinder is that after running four cups of grain through the grinder to a smooth flour, you've worked up a good appetite and really earned your daily bread! If this just isn't your scene, then lay down and reread an exciting mystery thriller for the twentieth time while your wife pushes a sweet gourmet treat out of a can that she read about in a fancy cruising book written by Walter Mitty's wife! Really. Get a grinder and grind your way to a health attack!

Food Chopper

This is the familiar meat grinder that's in the bottom drawer of every well-stocked kitchen but never seems to get used. They are very handy for grinding nuts, sprouts, dried foods, fresh fruits, vegetables, etc. Many of the recipes and procedures in this book call for using a grinder to prepare certain dishes. Twenty dollars will buy this tool that will be used over and over again. A food chopper will also prepare any fruit or vegetable for juice extraction in a juice press for really nutritious, thirst-quenching drinks.



Food Chopper

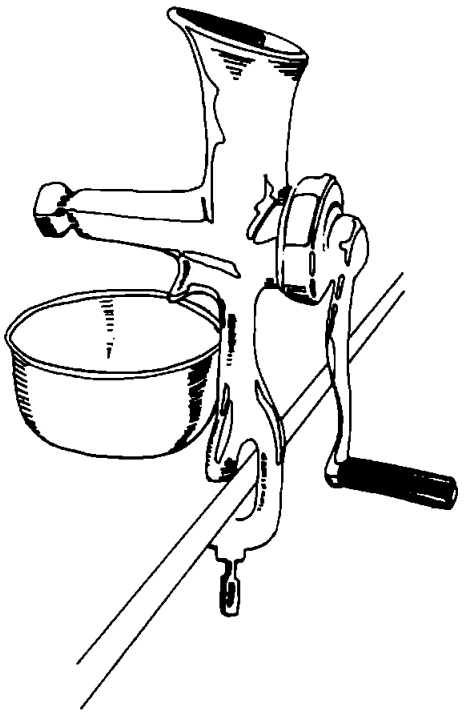


Hydraulic Press Juicer

Fruit and Vegetable Juicers

Electric juicers consume a prohibitive amount of power making them impractical to use on a boat. It only takes a moment longer to juice something by hand. The health benefit of hand extraction is that the juice is not oxidized nearly as much. Oxidation causes rapid deterioration of the vitamins and enzymes and should be avoided as much as possible. Fresh raw juices are probably the most nutritious foods you can eat. Boiling juices for canning destroys enzymes and vitamins, drastically reducing the value of the food. When you're in port or anchored by some tropical beach, and can get fresh fruits and vegetables, you'll find a juicer is an invaluable tool and a great asset to your health.

There are two common types of hand-operated juicers currently available that we can use aboard our boats at sea. One is a device that grinds and squeezes the pulp to extract the juice. Pulp exits from one orifice and the juice from another. The Health Fountain Juicer is a popular example of a well-designed and manufactured unit of this type. The press is another kind of popular juicing tool. These may either be constructed with a screw or hydraulic mechanism to develop



Health Fountain Juicer

pressure on the juice-filled pulp. The food must first be ground using a food chopper, grinder or grater in order for the juice to be efficiently extracted. Employment for the press can be found in other operations around the boat besides juicing. When making cheese or tofu it is an easy matter to remove excess liquid with a press. Developed hydraulically, the device illustrated here is capable of producing 6000 pounds of pressure. This is more than enough to accomplish all sorts of bending and pressing jobs required around the ship from time to time. One time I even used my juice press to install a couple of 3 inch bearing races into the transmission of my boat!

Blender

I consider a blender to be the handiest tool in the galley with the possible exception of a pair of chopsticks! A blender can grind grain, make sauces, soups, salad dressing, fruit smoothies, fruit leathers, the smoothest pancake batter, vegetable and seaweed powders, rehydrated fruit and vegetable drinks, nut and seed milks, etc., etc. You name it, a blender can do it. They can add all kinds of foods to your sea-going diet and makes many otherwise arduous tasks a real snap.

Where in the world can you plug it in? If your vessel has 120 volts then any $25 blender is perfect. If there is only a 12 volt system the situation is still under control. You can install an inverter that changes 12 volt current into 120 volt current for about $150. (Then you can run all sorts of other handy tools as well.) There's also a 12 volt model available that uses less current than the 120 volt unit with an inverter. Whichever type you choose, you'll find that running a blender for a few seconds a day results in an insignificant loss to the ship's battery charge.

A food blender is the only tool that will do so many particular jobs that will save time, food and energy. Let just this one electric beast on your boat, even if it is the only electrical tool on the craft. Use coconut oil lamps, make your own music instead of playing the radio and pump the bilge by hand if necessary to save electricity for the blender.

Imagine yourself rocking on a placid sea with a beautiful sunset throwing colors all over the sky. A dolphin splashes playfully by the side of the boat inviting you to come play with her. Your favorite first mate then comes out of the hatch offering you the sweetest, juiciest, most luscious pina colada you have ever had in your life!!! What else are you going to do? Nothing else will work. Otherwise just stay back in Omaha, speak politely to Big Brother, keep your eyes on the road and your hands upon the wheel!

Thermos Vacuum Bottle

These are one of the most ingenious tools ever and I can't imagine why they are not used more often. A simple thermos bottle can save 90 percent of the fuel now used to cook food on your boat. For instance, rice can either be boiled for 50 minutes or put into a thermos with boiling water. This slow cooks the rice and by the time the breakfast dishes are washed, the charts updated and the deck scrubbed, lunch is ready. With the thermos the water is heated to a boil and

immediately turned off. Forty-five minutes of stove fuel is saved just by thinking of your impending hunger pangs in advance!

A thermos will hold heat for hours while it gently softens proteins and starches into forms the body can more readily assimilate. Valuable vitamins and enzymes are much less likely to be destroyed by slow cooking than by boiling for an hour. Besides saving fuel, you save your health.

In rough weather all kinds of satisfying hot meals are possible with a thermos when the galley is upside down. Just prepare several bottles of perhaps rice, vegetables, stew and coffee to have delicious hot food all day long. Reheating in the middle of the night is unnecessary if you need a snack to keep you going until breakfast.

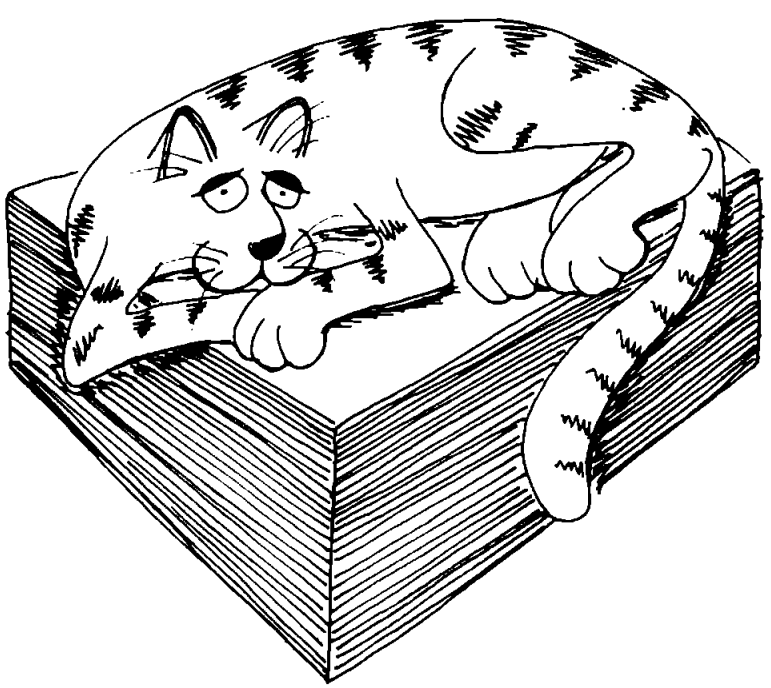
Thermos bottles are cheap and will be used all the time on board. Three hot meals a day, each consisting of a couple of different dishes, are possible with four or five bottles. This would only use ten minutes of stove fuel. What do you use now for a day's cooking? Breakfast cereals, fish, stews, soups, beans, sauces, etc., may be cooked in a thermos with no change in the recipe. Instead of simmering these foods on the stove for hours, bring to a boil for just a second and place in the bottle. Let it cook for four to six hours, or until done. It's a real treat to wake up in the morning to a hot bowl of oatmeal, ready to eat with no more preparation than a twist of the bottle cap!

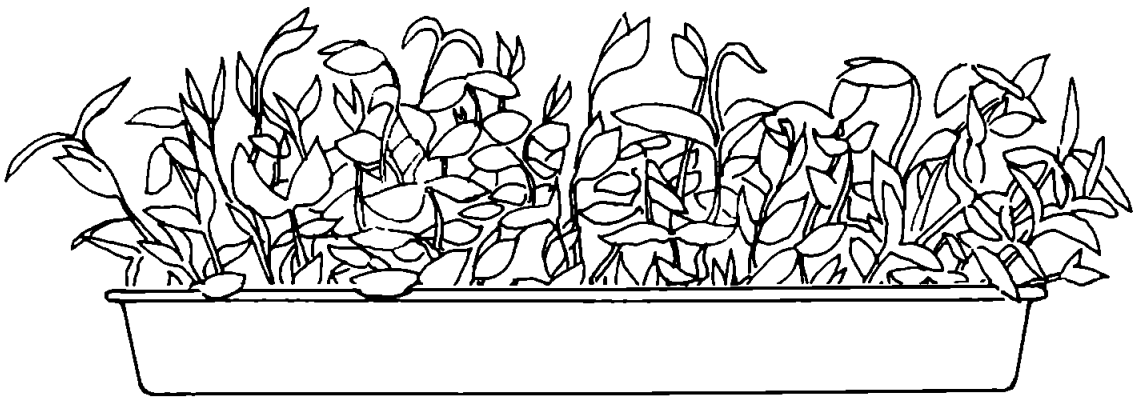
There are several models of vacuum bottles to choose from. Some are wide mouthed and great for thick things like grains, fish and stews. Others are narrow and good for drinks, soups, sauces and other thinner items. The stainless steel bottles cost a bit more but are unbreakable and will last forever. The cheaper glass bottles will shatter when dropped, which is going to happen sooner or later on a boat. Spend a little more now and make up the difference many times over in fuel savings, convenience and more nutritious food.

Insulated Cooker

Here is a plan for making an insulated cooker that is even more versatile than a vacuum bottle for larger quantities. You can prepare a gallon of soup, cereal, rice, etc., to feed a large hungry crew for a fraction of the fuel needed to cook with a conventional stove. Save fuel and vitamins while you keep the cabin cool by leaving the stove *off!*

Find a sealable, heat-proof container such as a Pyrex jar, large clay cheese crock pot with gasket and wire bale, stainless steel can with tight fitting lid, etc. Use whatever size is most convenient for your needs. Cut out a hole slightly larger than the size of the container in several pieces of 1 inch thick urethane insulation board. These are layered to the height of the container and then bonded together with contact cement or epoxy. Make sure there is at least 2 inches of insulation around the container for best heat retention. Build a nice wood box out of ¼ inch mahogany with a hinged lid and clasp. Put a 2 inch thick piece of insulation on the lid that will seal tightly against the insulation in the box when the lid is clasped shut. Instructions for using the cooker are the same as for the vacuum bottle and described fully in the recipe section.





Seed Sprouting Trays

There is no other food you could possibly eat anywhere on the planet that is fresher, more alive and more nutritious than the sprouts of germinated beans, seeds, grains and nuts. With just a little effort you can make mountains of fresh, crispy salad greens, vegetable juices and many other jumping-alive foods right on a boat in the middle of the sea.

Learn how to grow these little plants to have better vegetables than you'd have even if you lived right by a supermarket! These plants are still merrily photosynthesizing right up to the time you put them in your mouth. On a cruising boat the equipment for growing them doesn't have to be elaborate, but some things work much better than others. Glass jars are satisfactory in cooler climates; however, tropical heat tends to cause the plants to rot from lack of air circulation. Special stackable plastic trays are available. They're designed to give the plants plenty of air, to drain rinse water thoroughly and to collect the rinse water for recycling. By stacking the trays it is possible to grow enormous quantities of fresh food in an area only 12 inches in diameter.

Security Alarm

My first circumnavigation of the Caribbean Sea several years ago provided the first solid lessons in the reality of cruising. Because of the lack of facilities for storing or docking a yacht, anchoring offshore was the only way to light for awhile. The cool, lush mountain forests were ever so inviting but the idea of leaving the boat unattended was enough to make me resist those calls of the wild. Why was I cruising if it wasn't to visit the lands and peoples of the world? I was a prisoner of my own responsibilities to the safety of the craft. Keeping a crew on board is, of course, the best security, but when sailing solo or short-crewed, it is hardly practical. Who wants to leave their first mate home on a Saturday night?

It occurred to me that there could be some sort of radio-controlled device to signal if there was a gas leak, water leak, an anchor dragging or an uninvited guest aboard. When back in Miami I set to work finding the components for the system. On my next cruise to California via the Panama Canal, the peace of mind that system gave was worth ten times what it cost. Once I was hiking five miles away from the boat; the alarm went off in the remote unit I was carrying. I rushed back to find that a crew member had left a toilet valve open and the anti-syphoning mechanism hadn't worked. The alarm was set to go off if the bilge water rose more than three inches, so pumping out the small amount of water was no problem. The radio unit paid for itself a few times over that day!

There is so much vandalism on boats it is just incredible. People in poor countries, as well as in richer ones, consider a yacht to be fair game. Boat owners are rich and can well afford the losses, right? Many thefts occur while the crew is asleep or ashore. Dinghies and outboard motors are lost all the time. What are you going to do without the dinghy that fit so neatly up in chocks on deck when you're a thousand miles from where another one could be had?

When a thief sees you leave to go to town for the evening, he has a simple job waiting for him. A pair of bolt cutters is all he needs and you're out money, tools, sextant, radios and all sorts of gear needed for comfort and navigation. In the past a thief could be sure he would be hanged for stealing from a ship. In the old commercial sailing days, captains didn't wish to be stranded in a remote corner of the world with no charts to steer the next course. You can be sure that a person thought twice before stealing anything then! Now stealing is so prevalent, due to lack of punishment, that it is essential to have some type of security system.

Joshua Slocum, on his famous round-the-world sail, placed tacks on the decks while sleeping in the Straits of Magellan. When barefoot pirates came aboard, wild hoots and hollers notified the captain of his visitors. He knew the pirates would just as soon kill him as look at him. That system worked well in his day but now all the thieves wear shoes!

Dogs are good watches on board and might be considered in some cases. The problem with them is that they can't let you know about a leak if you're off the boat. Dogs are also just about impossible to clear through many customs and quarantines without a lot of red tape, so don't think about having one if you're planning to cruise in foreign waters.

How many times have you left a good time in town earlier than you wanted to because you thought the anchor might be dragging? How much sleep has been lost for the same thing? There are alarm systems that are able to detect the anchor shifting its original position. The natural swing of the boat does not affect the alarm. These can be set for a siren or a radio pager.

Modern electronic alarms are inexpensive, use less power than a light bulb, are easy to install and will let you enjoy a cruise without constantly having to keep attention on the boat. Protect your life-support systems and yourself. Nobody else will.

4
Farming At Sea

Your on-board garden will center around mini-crops of delicious and nutritious sprouts. In just four or five days you can have bunches of the freshest vegetables ever to have been set at your table, even half-way to Tahiti in a 30-foot boat. If you lived next door to a vegetable market or had a garden in the backyard, the produce wouldn't be as fresh as sprouts grown aboard your craft. When sprouts are eaten raw they are still very much alive and growing as you eat them.

Sprouts rinsed with pure distilled seawater are by far the most healthful food you can prepare on a boat, or anywhere. The protein, enzyme, vitamin and flavor increases in the first several days of a seed's growth are never higher or repeated throughout the life of the plant. The increase of vitamins is usually four to five times over that of the unsprouted seed. Complex protein structures are broken down into the simple amino acids which the plant uses for its growth. Starch is

converted into natural, easy-to-digest sugars. As a result we are able to assimilate these simplified materials much more efficiently and completely. It is possible to utilize proteins and starches only after they have been reduced to the most basic forms. In effect, sprouting pre-digests the complex materials into the nutrients we can use directly for growth and energy. Sprouts, yogurt, cheese, miso, beer and all other cultured and fermented foods are pre-digested and very easy for us to digest. Cooking food makes similar changes in the chemical structure but destroys vitamins and enzymes.

Sprouts germinate readily out of the sun and in fact should be grown in the dark for the first several days so that the young tissues are not burnt by the direct solar radiation. Normally the seed is underground where it is not exposed to light too early in its growth. After about five days the sprouts may be set out in indirect light for a few hours to manufacture chlorophyll and turn green. Some of the hardier sprouts like sunflower, buckwheat greens, wheat grass and rye grass can be allowed more exposure as long as they are kept moist to prevent their drying out.

The value of chlorophyll can't be overstated. Chlorophyll is the blood of the plant and indeed resembles hemoglobin chemically in many ways. While hemoglobin is built around a central atom of iron, chlorophyll is built around magnesium. Chlorophyll acts as a blood regenerator and cleanser due to its antitoxin and oxygen-carrying abilities. If Columbus had known about and used these remarkable fresh green plants, he never would have had the complaints from his crew of symptoms that are now known as scurvy. Sprouts are loaded with all the essential amino acids, vitamins, enzymes, minerals and sugars in one natural, complete, delicious and beautiful package. Regular inclusion of sprouts in our diet would eliminate any worry about the deficiencies that struck our seafaring ancestors.

NUTRITIONAL VALUE OF 100 g. (3½ oz.) OF SPROUTS

	Mung Bean Sprouts		Soybean Sprouts	
Water (g)	86.3	RDA	88.8	RDA
Calories	46	(2%)	35	(1%)
Protein (g)	6.2	(9%)	3.8	(6%)
Fat (g)	1.4	(1%)	.2	(4%)
Carbohydrates (g)	5.3	(1%)	6.6	(1%)
Minerals				
Ca (mg)	48	(6%)	19	(2%)
P (mg)	67	(8%)	64	(8%)
Fe (mg)	1.0	(6%)	1.3	(7%)
A (IU)	80	(2%)	20	(1%)
Vitamins				
B_1 (mg)	.23	(16%)	.13	(9%)
B_2 (mg)	.20	(12%)	.13	(8%)
Niacin (mg)	.8	(4%)	.8	(4%)
C (mg)	13	(22%)	19	(32%)

VITAMIN B – COMPLEX INCREASE IN SPROUTED WHEAT

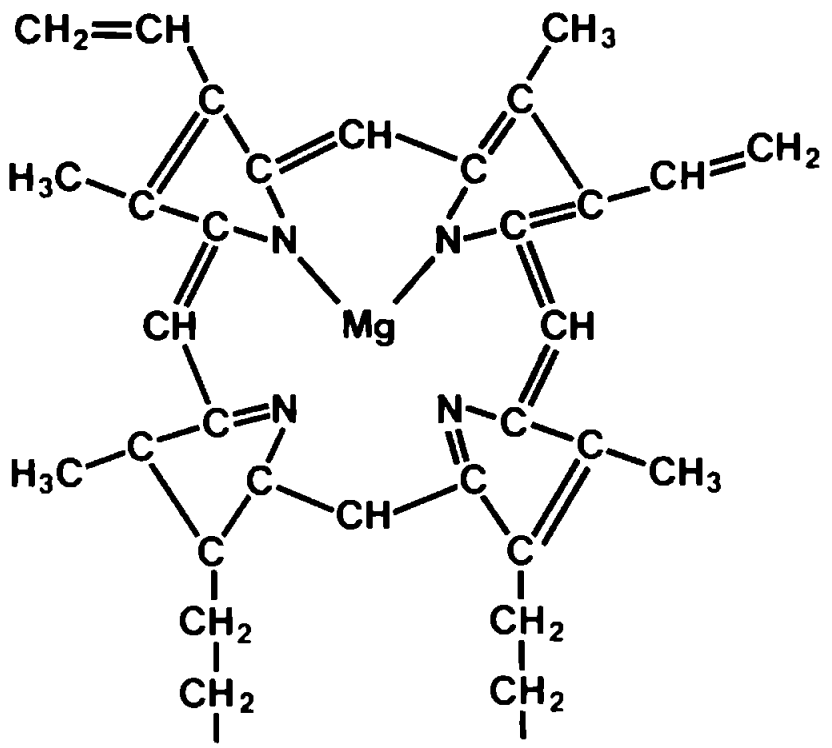
	Wheat Seeds		Sprouts	
B_1	7	(mg)	9	(mg)
B_2	1.3	(mg)	5.4	(mg)
Niacin	62	(mg)	103	(mg)
Pantothenic Acid	7.6	(mg)	2.6	(mg)
Pyridoxine	4.6	(mg)	12.6	(mg)
Biotin	0.17	(mg)	0.36	(mg)
Folic Acid	28	(mg)	106	(mg)

ASCORBIC ACID (VITAMIN C) VALUE OF GERMINATED SEEDS

	Milligrams of Vitamin C
Whole oats	11
Whole oats after germination 96 hours	20
Whole oats after germination 120 hours	42
Dry peas	0
Dry peas after germination 24 hours	8
Dry peas after germination 48 hours	69
Dry peas after germination 96 hours	86

Sprouted seeds are such a complete food that if desired or necessary they can become the entire diet of the seafarer, camper or survivalist. The various sprouts contain all of the nutrients needed by man. Some contain more of certain amino acids than others and by correctly combining them you can be assured of getting enough high quality protein even if you don't eat meat. Frances Moore Lappe in her book *Diet for a Small Planet* explains very thoroughly how to combine foods for highest protein quality and assimilation.

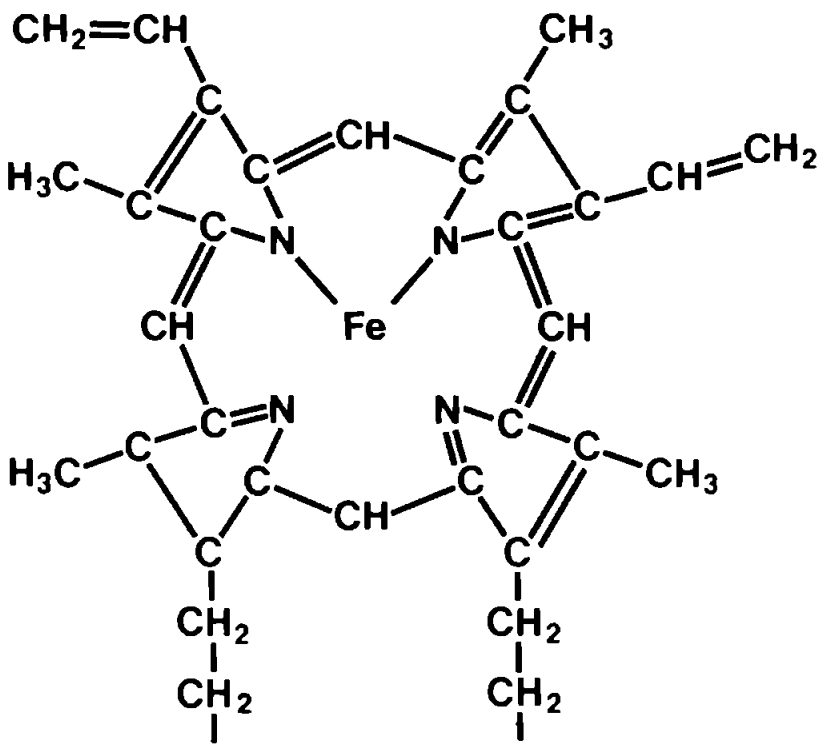
The idea that we must rely on canned meats, eggs and fish to supply much needed protein is totally erroneous as millions of strict vegetarians around the world will testify. Certain products like canned sardines, oysters and meats may



Chlorophyll Molecule

at times add a flavorful dimension and change, particularly if you are not used to relying on an all-vegetable source of protein. However, canned foods are much more expensive and less nutritious than the fresh foods you can grow right on your boat.

For hundreds of generations various civilizations have used vegetable foods to furnish protein needs. Oriental peoples use rice and assorted bean products such as soy milk, tofu and sprouts. Corn and beans have long been a standard staple in Mexico and South America. Generations of Hindus were raised on lentils and rice. The beans in these diets contain amino acids that the rice is limited in. Fresh fruits and vegetables contribute to the variety of the vegetarian's diet as well as the spice that makes life interesting.



Blood Molecule

Buying Sprout Seeds

The storability of live seeds on an ocean-going vessel is one of the most advantageous features of these foods. Many seeds will stay viable for years if packaged properly. Seeds found in caves stored by cavemen thousands of years ago or placed in tombs with departed Egyptian Pharaohs to aid them in their celestial travels have been found to be perfectly alive and capable of carrying on the process of life promised the seed eons ago.

For best germination buy seeds meant for growing sprouts, or high quality food seeds. Items found in supermarkets are almost never as fresh as those in health food stores and should be avoided. When buying any seed make sure they are not treated with fungal and insecticide compounds, as many garden seeds are, to prevent poisoning. When seeds are bought in health food stores you can be assured of getting the best organically-grown and untreated seeds possible. Burpee's and Ferry-Morse seed companies can supply many kinds of bulk vegetable and herb seeds suitable for sprouting, but be sure to state that you wish to sprout and eat the seeds when ordering.

The number of suitable seeds is really immense and basically limited by just a few poisonous types, in particular: tomato, potato and petunia. A whole universe of different flavors, textures and nutrients are to be had in the various sprouts. A partial list includes barley, rice, wheat, rye, lentil, soy, mung, pea, adzuki bean, radish, garbanzo, peanut, almond, flax, sesame, chia, fenugreek, clover, alfalfa, corn, sunflower, pumpkin, spinach, parsley, lettuce, okra, turnip, garlic, celery, buckwheat, garden cress, millet, oat, cabbage, cauliflower, kale, broccoli, chard, endive, mustard, Brussels sprouts, and even weeds such as plantain, sorrel, peppergrass, dandelion and amaranth. By experimenting you will find favorite varieties, but a few are really basic and valuable due to their ease of storing and growing, taste, nutrients and

costs. Wheat, buckwheat, alfalfa, sunflower, mung, fenugreek, almond and pea are recommended for a varied and good selection. Other types are often equally desirable and should be tried for the unique and tasty zip they can add to any dish.

HOW TO GROW SPROUTS ON BOARD

Due to the range of available types of seeds that can be sprouted, there are a few different procedures that are best for each kind. Each seed has its own requirements for temperature, humidity and air circulation that you should become familiar with to grow these plants to their full potential. All seeds are first picked through to remove debris and broken seeds. Any off-color or dead seeds are removed as these will not sprout but rather decompose and ferment. All seeds, with the exception of the gelatinous varieties —flax, chia and garden cress — should be soaked in fresh water for eight hours in order to thoroughly moisten the seed. The gelatinous seeds can either be sprinkled lightly to moisten or simply combined and soaked with other seeds. By combining chia or flax with alfalfa and radish, it is not necessary to use separate containers.

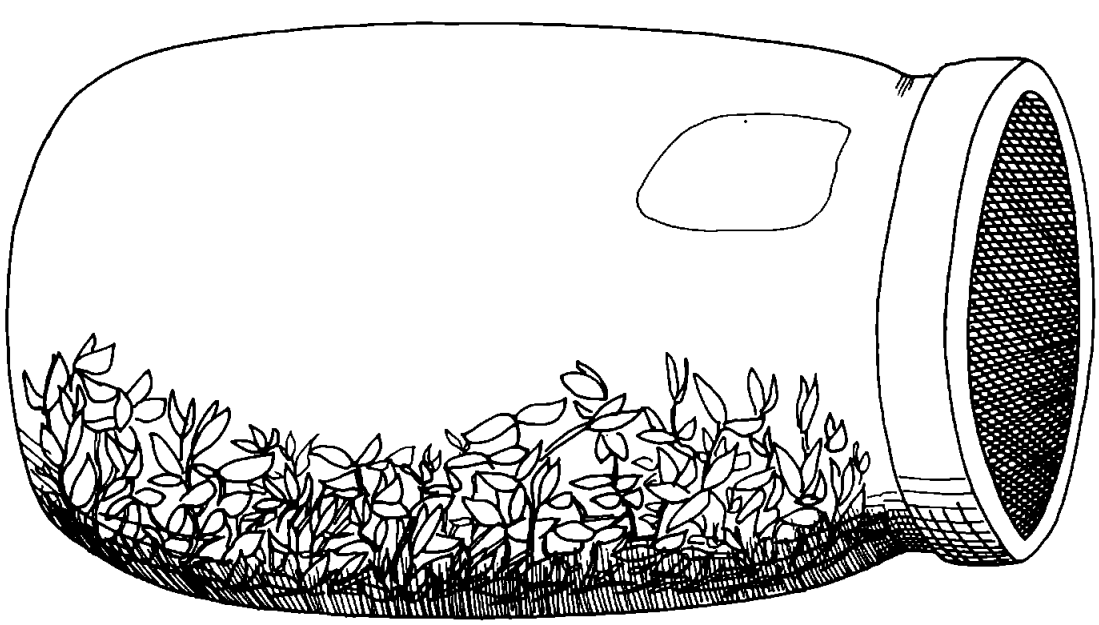
The soaking water ought never be thrown away. Fresh water is dear on a boat and never should be wasted. The colored water that is poured off the seeds is extremely rich in soluble vitamins and minerals. This liquid can either be drunk immediately or used as a base in soups, drinks, sauces, etc. In the very least this liquid can be used to water your onboard herb garden. On a small boat everything possible must be recycled. By carefully using the limited resources available, water shortage will never be a problem. If soak and rinse water is allowed to stand for more than about 12 hours without refrigeration it will begin to ferment. These ferments are a valuable source of friendly intestinal bacteria, enzymes

and vitamins. Ferments are discussed fully as rejuvelac in the milk products chapter. After the initial soaking period there are several ways to achieve optimum growth according to the seed type.

Jar or Tray

Many seeds can be grown right in a jar large enough to accommodate the seeds after they have sprouted. Simply rinse the sprouts two or three times a day, depending on the temperature. Warmer environments require the seed to be rinsed more often to prevent rotting. Keep a piece of muslin or plastic window screen over the mouth and turn the jar upside down to completely drain the rinse water. Any seeds left in standing water will spoil. Keep the jars in as cool a place as possible, out of the light, for best growth.

Experience has shown that in warmer climates jars do not allow enough air circulation and the seeds tend to rot, or if sprouted they are not as fresh as possible. There are several types of commercially available sprouting trays that are



suited for warm weather and are recommended. They are plastic trays with drainage holes in the bottom and can be stacked to minimize the space necessary for growing several kinds of sprouts at once. Water is poured on the top tray which rinses all the trays under it before it collects in a dish at the bottom. This type of tray automatically supplies the sprouts with enough moisture without overwatering and keeps your sprout farm clean and neat. Be sure that you keep a moist towel over the top tray so that the sprouts do not dry out.

Tray and Towel

Some seeds and nuts require an atmosphere that supplies more consistent moisture along with plenty of air circulation. This method involves simply sandwiching pre-soaked seeds between two sheets of thin, moist cloth. To rinse, just soak the top towel and then wring out the excess water onto the seeds. Don't wrap up the seeds too tightly as they must have plenty of fresh air.

Baking Pans with Dirt; Hydroponics

This method is just right for sprouts that should be allowed a longer growth period, or that develop best with root support. Any size tray may be used depending on your requirements and the size of available space. Eighteen inch x 12 inch x 1½ inch baking trays work out very well. Avoid tin as it rusts in a short time. Stainless steel and aluminum are good, the latter being much cheaper. Pack ¾ inches of dirt into the tray and water well but not so much that puddles form. The pre-soaked seeds are placed on the dirt one layer thick with no space between them. Keep a piece of plastic wrap on top of the seeds until the sprouts are about 1 inch high. It will conserve moisture and prevent the soil from drying out. After this remove the plastic and water occasionally as needed. Another method is to use two layers of burlap instead of dirt. Because of their longer growing time, certain seeds require some source of nutrients external to the seed. A solution of ground kelp in water is very good as are several other kinds of water-soluble plant foods. Many other seaweeds are fine as fertilizer and can be collected almost everywhere. A mixture of one teaspoon powdered seaweed to one gallon of water is sufficient. Soak the burlap, place the seeds as described above and then cover with plastic film. The cloth will support the roots without allowing them to drown in too much water.

Recycle unused sprouts and old soil by composting in a five gallon plastic pail with a tight fitting lid placed in the bilge to provide the very best growing medium for later use. By installing a hose on the lid and venting to the outside, air is supplied to the composting bacteria and objectionable smells are carried away. It takes a few weeks to compost these scraps but dirt is rare out in the ocean so save all you have. The better the dirt, the better the sprouts. Food scraps can of course be composted in the same way along with the sprout wastes.

INDIVIDUAL SPROUTING METHODS

Alfalfa

Alfalfa is an all-around sprout that can have a place in your menu every day of the year. These crispy young shoots are also one of the easiest to grow. Besides being used in salads, they can be used to make great juices, soups, salad dressings, sauces and dips. Because of alfalfa's unusually long root system — up to 25 feet when fully grown outdoors — they are rich in minerals and vitamins. Put away the synthetic vitamin pills and have another big handful of "angel's hair"!

When sprouted only two days these are a high protein addition to breads and cereals. I prefer them when two or three inches long with bright green leaves. A very good combination grown in one tray is three parts alfalfa, one part radish, two parts flax and one part clover. This is a convenient way to grow flax as the other seeds break up the glutinous texture of the pure flax. The radish adds a real tang to salads and can be adjusted more or less to your taste as they are quite hot. Even if you don't sprout any other seed, make sure you try alfalfa.

Equipment	Tray or jar
Growing Time	5 to 6 days or 36 hours for ⅛ inch sprouts
Length at Harvest	2 inches for greens or ⅛ inch for breads, cereals, etc., or for steaming
Rinse	2 to 3 times daily

Almonds

If the only way you have ever eaten these is out of a can of roasted and salted mixed nuts, you're in for a real taste treat. The sprouts are crispy and sweet. You'll find that sprouted almonds are softer and much easier to digest than either dry

raw or roasted nuts. Almonds make an excellent snack packed with enzymes and protein for munching under the full moon during the midnight watch. A delicious milk can be made from the sprouts when blended with water or juice.

Equipment	Tray and towels
Growing Time	3 or 4 days
Length at Harvest	When sprout is ⅛ inch to ¼ inch
Rinse	2 to 3 times daily

Barley

Anyone who has ever enjoyed a glass of beer has tried barley sprouts. The malt from which beer is made is a syrup of roasted sprouted barley. Enzymes in the seed break down the starch into sugar which yeast then turns into alcohol in the beer. The only way our body or the yeast is able to use starch is by first converting it to simple sugars. As the seed manufactures sugar from the starch during sprouting, the enzyme and vitamin content multiplies dramatically as well. When we eat pure sugar we overload the body's ability to handle it, as any diabetic will tell you. The sugars in sprouts are not concentrated and are thus easy to digest. Barley sprouts are good in breads, cereals, and salads. Be sure to buy unhulled and unpearled barley for sprouting purposes.

Equipment	Tray or jar
Growing Time	3 or 4 days
Length at Harvest	When root is about ¼ inch
Rinse	2 or 3 times daily

Beans

There are so many kinds of beans available that you might never decide which is your favorite. Sprouted by similar techniques are adzuki, lima, navy, fava, black, pinto and Great Northern. Each has a different flavor and appeal that will never be known unless you try them all. Mung and soy beans are listed separately in this section.

In the Western diet beans are traditionally cooked to break down heavy proteins and starch into a digestible form. This inactivates certain inhibitors which if eaten raw would make the protein unavailable. The problem with cooking, however, is that the enzymes necessary for digestion are destroyed resulting in assimilation problems in many people. Everybody has heard that beans are the "musical fruit"! It's simply that the body cannot handle cooked beans efficiently because it lacks the needed enzymes. The very same chemical processes occur when generating methane gas out of compost for fuel.

The Orientals have always sprouted beans as any Oriental food enthusiast is aware. Mung and adzuki sprouts have been familiar fare in China and Japan for centuries. By sprouting beans they become very digestible and filled with vitamins and enzymes while saving cooking fuel at the same time. Beans are a very good source of protein and form complete amino acid complements when combined with nuts, grains and seeds, preferably sprouted. Some beans produce a very large yield, as much as a quart for only a few tablespoons of seed.

Equipment	Tray or jar
Growing Time	4 or 5 days
Length at Harvest	1 to 3 inches
Rinse	3 or 4 times daily

Buckwheat

Buckwheat sprouts are quite versatile and may be used in several ways depending on the sprouting method. By growing in jars or trays to a root length of ¼ inches, they are good in pancakes, bread, cereals or simply steamed for a rice-like dish. Baking pans with dirt or towels are used to grow greens of five to six inches for a beautiful crop of salad or sandwich makings.

The delicate, crunchy taste and texture is not unlike

watercress and once tried, a salad will never be the same without them. If you like lots of fresh salads along with your sunsets in paradise and on-going dolphin shows, don't miss out on these wonderful sprouts. Be sure to rinse off seed husks from the greens as these are quite hard.

Equipment	Jar or tray for ½ inch sprouts, baking pan with soil or burlap for greens
Growing Time	2 to 3 days for ½ inch sprouts, 9 days for greens
Length at Harvest	½ inch for cereals, breads, etc., 5 or 6 inches for greens
Rinse	2 times daily

Chia

Chia seeds are like radish in that they add a lot of tang to a salad and a little will go a long way. Soaked chia seeds become very glutinous and should either be sprouted with other seeds such as alfalfa and clover, or alone but with no overnight soak. Simply soak the seed for five minutes and then drain. Instead of rinsing just sprinkle with the fine mist of a plant sprayer. Sun for a couple of hours before eating to develop the chlorophyll.

Equipment	Tray
Growing Time	4 to 5 days
Length at Harvest	1½ inches
Rinse	Sprinkle 1 or 2 times daily

Corn

Sprouted corn is a healthful ingredient in breads, cereals and soups. The best tortillas this side of Acapulco are made using sprouted corn with bean sprout filling. Why the Mexican and South American peoples never used sprouted grains and seeds is a mystery to me. Tortillas and frijoles have been a basic staple throughout their history and are still commonly used today.

When corn is fresh picked it is a crime to cook it as the kernels are soft and naturally sweet. A very short while after picking, the sugars are turned into more stable and longer lasting starch. Sprouting then returns this starch back into sugar, but unfortunately the hulls remain tough and must be ground or cooked to be palatable.

Equipment	Jar or tray
Growing Time	3 or 4 days
Length at Harvest	½ inch to 1 inch roots
Rinse	2 times daily

Fenugreek

These sprouts add a real spicy flavor to soups, salads and even sweet snacks. A spoonful mixed with lentil or alfalfa seeds makes a delicious combination.

Equipment	Jar or tray
Growing Time	3 or 4 days
Length at Harvest	3 inches
Rinse	2 to 3 times daily

Flax

Flax is used in two ways depending on the growing method. Two-day sprouts blended with water, a little cinnamon and a dried banana make a very effective remedy for irregularity. Don't get too far from the lee rail after this breakfast! When grown five or six days and greened they are good in salads, soups and sandwiches. Because of their gelatinous nature they are best sprouted with alfalfa and clover. If grown separately, follow these directions.

Equipment	Tray
Growing Time	2 days for blending, 5 or 6 days for greens
Length at Harvest	⅛ inch to ¼ inch in 2 days or 1½ inches to 2 inches in 6 days
Rinse	After initial 2-hour soak, sprinkle 2 or 3 times daily

Garbanzo Beans

Garbanzo beans, or chick peas, are great on salads or mashed with garlic, vinegar and sesame seed butter for a Middle Eastern dip called hummus. They may also be slightly steamed for a hot vegetable dish. Care must be taken while sprouting as they tend to rot easily if not rinsed often or if kept in too warm a spot. By using fresh seeds and allowing plenty of air circulation, the chance of spoiling can be minimized.

Equipment	Jar or tray
Growing Time	3 days
Length at Harvest	Root ¼ inch to ½ inch
Rinse	4 or 5 times daily

Lentils

Lentils are a very high protein bean and can be steamed or used in salads, soups, or vegetable burgers. A hearty thick lentil soup and some sprouted wheat bread is an excellent meal perfect for cold weather.

Equipment	Jar or tray
Growing Time	4 days
Length at Harvest	1 inch
Rinse	2 or 3 times daily

Millet

Millet is one of the most healthful cereals known to man but has been largely neglected in the Western diet. It is a good protein food and is easier to digest than either rice or wheat. The subtle, sweet flavor is excellent in puddings, breakfast cereals, soups, breads and dips. Millet is also delicious served very slightly steamed after it is sprouted two days.

Equipment	Jar or tray
Growing Time	4 or 5 days
Length at Harvest	¼ inch root
Rinse	2 or 3 times daily

Mung Beans

These are the simplest seeds of all to sprout and will grow even under the most adverse conditions. They begin to show signs of life after only a few hours in the soak water. If kept well watered and in the dark, mungs will become exquisitely thick and juicy. These are the familiar sprouts seen in Oriental dishes like chop suey, but will make a great fresh salad, soup or dip as well.

Equipment	Jar or tray
Growing Time	3 to 4 days
Length at Harvest	2 to 3 inches
Rinse	3 or 4 times daily

Oats

Breakfast cereals, breads, cookies and soups are all enhanced by using this familiar grain sprouted. Boiled instant oat flakes are a far cry from a bowl of quick-steamed three-day whole oat sprouts. How is it that our mothers didn't know the wonder of sprouting when we were growing up? They may not have been aware of it but now there is no excuse for us not to prepare and use the fruits of the earth in the most beneficial and sound way. Don't pre-soak oats as they need very little moisture to sprout and overwatering will cause fermentation. Just rinse off once and then water with a plant sprayer. Possibly the best place to buy fresh whole oats is at a livestock feed store.

Equipment	Tray and towel
Growing Time	3 to 4 days
Length at Harvest	Main root length of seed
Rinse	Spray once a day

Peanuts

Sprouted peanuts are a real delicacy and very simple to make. They are great in salads, blended with water for milk and cheese, or just eaten plain for a snack. Like almonds, they

become quite sweet and easy to digest. When nuts are roasted most of the vitamins and enzymes are destroyed. This complicates the assimilation of proteins which usually results in their passing through the body mostly undigested. Always keep a batch going for a quick snack before going out on your next watch.

Equipment	Jar or tray
Growing Time	4 to 5 days
Length at Harvest	⅛ inch to ¼ inch
Rinse	2 or 3 times daily

Peas

Sprouted peas have a very pleasant crunchy texture and a taste similar to fresh peas picked right out of the garden. They're great in salads, in pea soup or lightly steamed.

Equipment	Jar or tray
Growing Time	3 to 4 days
Length at Harvest	½ inch to 1 inch
Rinse	2 or 3 times daily

Pumpkin and Squash

Pumpkin and squash seeds have a very high amount of protein (up to 32 percent), and when sprouted become even more usable to the body. Eat them raw as an energy snack along with peanuts and almonds, or in fresh salads and vegetable burgers. Pumpkin seeds are particularly plentiful storehouses of phosphorus and iron. Use the shelled variety for sprouting.

Equipment	Jar or tray
Growing Time	2 to 3 days
Length at Harvest	⅛ inch to ¼ inch
Rinse	2 or 3 times daily

Radish

Just a little of these go a long, long way! They are good mixed with mustard sprouts and tofu or yogurt for a very sinus-

clearing salad dressing or party dip. Usually radish is grown right along with alfalfa in a mix of five parts alfalfa to one part radish as they both require similar growing environments.

Equipment	Jar or tray
Growing Time	5 to 6 days
Length at Harvest	2 inches
Rinse	2 or 3 times daily

Rice

Whole grain sprouted rice is a dish that few people in the world have had the luck to try. Most rice today is a highly polished processed food that has all the best parts of the grain removed. Why this is done to this precious food is beyond me. The polish that is discarded is savored by health food enthusiasts for its rich source of B vitamins and protein. Nutritionally, sprouted whole brown rice is the distant opposite of polished white rice. What do you eat for anyway? The better your food, the better you'll feel and the more you'll enjoy the very next meal! Rice may be steamed or ground into breads and cereals for added nutrition.

Equipment	Jar
Growing Time	3 to 4 days
Length at Harvest	⅛ inch to ¼ inch
Rinse	3 or 4 times daily

Rye

If you've ever had a warm slice of fresh bread made from this grain you already know how great it is. Rye is just as good in a host of other foods as well. Sprouted rye makes a tasty hot cereal or can be added to salads and soups.

Equipment	Jar or tray
Growing Time	3 to 4 days
Length at Harvest	¼ inch
Rinse	3 or 4 times daily

Soy Beans

Soy beans are one of the most valuable foods known to man. It is a real protein bean, about 40 percent. They are used to replace or extend meat in the diet and are indeed the base of many vegetarian diets around the world. There are so many ways to prepare soybeans that whole books are written about them. They are used to make soy milk, soy cheese or tofu, breads, sauces, soy burgers, loafs and salads. Soy beans contain an inhibitor factor known as trypsin which prevents certain amino acid utilization. To inactivate this factor soy beans must either be thoroughly cooked or sprouted to make them digestible. Let the beans sprout four days to be certain all the inhibitors are destroyed.

Soy is a little tricky to sprout so follow these directions closely. Use only fresh seeds of high germination rate. Remove all broken, discolored or shriveled seeds before soaking for 24 hours. Change the soak water about every eight hours. After the initial soak, rinse and drain four or five times a day without leaving any beans standing in water. If four days seems a little long, as they are tending to lose their freshness, eat them right away after steaming ten minutes or mixing into vegetable burgers. Grow soy bean sprouts in the coolest part of the boat that still gets air circulation, as warmer temperatures enhance the possibility of fermentation.

Equipment	Jar or tray
Growing Time	2 to 3 days for cooked or 4 days for raw
Length at Harvest	¾ inch to 1½ inch
Rinse	4 or 5 times daily

Sunflower

Sunflower is another very versatile seed. The shelled variety is used for two-day sprouts, yogurt, cereals, breads, soups and dips. The unshelled ones are used to make beautiful salad greens.

Shelled Seeds

Equipment	Jar or tray
Growing Time	1 to 2 days
Length at Harvest	⅛ inch to ¼ inch
Rinse	2 times daily

Unshelled Seeds

Equipment	Baking pan with soil or towel
Growing Time	7 to 9 days
Length at Harvest	5 to 7 inches
Rinse	1 or 2 times daily to keep soil moist

Vegetable Seeds

This includes such plants as parsley, lettuce, okra, turnip, celery, garden cress, cabbage, cauliflower, kale, broccoli, chard, endive, mustard, Brussels sprouts and the weed seeds. All of them are good sprouted in salads and soups. The more common grains and seeds grown for food are generally much less expensive for use on a day-to-day basis, but certain vegetable seeds are delightfully distinctive and add a feisty zest to your meals. Sprouts like mustard, radish and parsley only need to be eaten in small amounts to derive their full value! Only purchase untreated seeds suitable for sprouting as some garden seeds are treated to prevent fungus growth in the ground.

Equipment	Jar or tray
Growing Time	4 to 5 days
Length at Harvest	1 to 2 inches
Rinse	2 or 3 times daily

Wheat

Wheat is our daily bread and should definitely be included on your seastead even if you have nothing else but a tiller and a first mate! Wheat is very inexpensive and stores forever if kept cool and dry in a well-sealed container. Two 50-pound sacks cost about $25 and will last a long time with daily use. By sprouting four days, wheat is changed from a very hard-to-digest, glutinous "wall paper glue" into a sweet, easy-to-digest, wholesome food. Sprouted wheat makes a delicious substitute for tuna fish when mixed with yogurt or tofu and spices. Steamed or raw with warm nut milk, it is a hearty and healthy breakfast. Ground and mixed with nutritional yeast, Spirulina algae, dried seaweed powder and herbs, it makes the best sailor's bread ever to be cast upon the waters. If only the early explorers had used sprouts they wouldn't have cared less if they ever saw the land again and neither will you. Arriving at a landfall and then experiencing the local cuisine will only make you want to get back on board to get some really good food for a change!

Wheat is very easily grown using either of two methods depending on the desired product. Use only the hard red winter wheat as it stores better and is higher in protein than the soft spring wheat. Sprout two to four days in jars for breads, cereals, salads, soups, cookies, etc.; eight or more days for grass. Wheat grass is one of the most amazing foods ever to go down to the sea, or anywhere. The dark green leaves can be chewed or made into a juice for a real rejuvenating elixir. It may take a little getting used to at first if taken straight — but so does bourbon! Think of it as a chlorophyll cocktail. For years health-conscious individuals have acclaimed this as a perfect blood and digestive purifier, blood builder, energy booster and all-around tonic. If you take any of the iron-rich supplements available in drug stores, leave them ashore and use wheat grass instead. Chlorophyll has been shown to dramatically improve the blood's oxygen-carrying ability and

hemoglobin health. It is a totally live, fresh source of vitamins, minerals and enzymes and has a place in everyone's diet, particularly if other fresh foods are not available daily. Only one or two ounces per day are needed to realize the beneficial effects on your health. Try having a green cocktail at sunset for a couple of weeks instead of a martini and see if shortening sail in a sudden squall isn't just a little bit easier. The Health Fountain Juicer is the perfect tool for extracting juice from wheat grass.

Clip grass right above the first joint so it can regrow into another harvest. Be sure to keep the trays of grass in the sun an hour a day to develop the chlorophyll. The thin blades dry out easily unless they are sprayed frequently and the soil is well-watered.

Sprouts

Equipment	Jar or tray
Growing Time	3 to 4 days
Length at Harvest	½ inch root
Rinse	2 or 3 times daily

Grass

Equipment	Baking pan with soil or burlap
Growing Time	8 to 10 days
Length at Harvest	6 inches
Rinse	3 to 4 sprays daily to keep soil and leaves moist

GROWING HERBS AT SEA

Growing fresh herbs on a small boat is no more difficult than growing sprouts in trays, that is — no difficulty at all! They are easy to grow in small pans or planters that can either be moved into the sun once in a while or kept stationary in a bright spot inside the cabin. Salt spray will damage some herbs if left on deck continuously, but a few hours in the sun and spray will not hurt them. Lots of these beautiful plants may be placed in all kinds of nooks and crannies of the boat to supply all of the most delicious seasonings you could ever want. There's a world of difference between fresh picked herbs and the old stale dry ones that most of us are used to. Imagine having a big sprout and seaweed salad with a scoop of fresh homemade cottage cheese seasoned with chives and parsley just picked from your sailing garden. Seafarer's fare doesn't have to be instant anything right out of a box or can!

The herbs listed here will grow fast and within a couple weeks small pieces may be broken off to eat. The plants may be grown in soil or hydroponically in burlap soaked with liquid plant food in the same way wheat grass and buckwheat greens are planted. Composted sprout scraps make the best soil, but practically any good dirt will do. If you don't drink the rinse and soak water from sprouts then use it to water the herb garden. A liquid plant food that is perfect for growing herbs or sprouts can be made with one teaspoon of powdered seaweed in one gallon of fresh water. Most herbs need only a little watering, so don't drown them. Herbs that I have found to be best for herb gardening at sea are listed here.

	Rosemary	
Chives	Sage	Coriander
Marjoram	Summer Savory	Comfrey
Oregano	Tarragon	Basil
Dill	Thyme	Parsley
	Mint	

FRESH FRUITS AND VEGETABLES TOO!

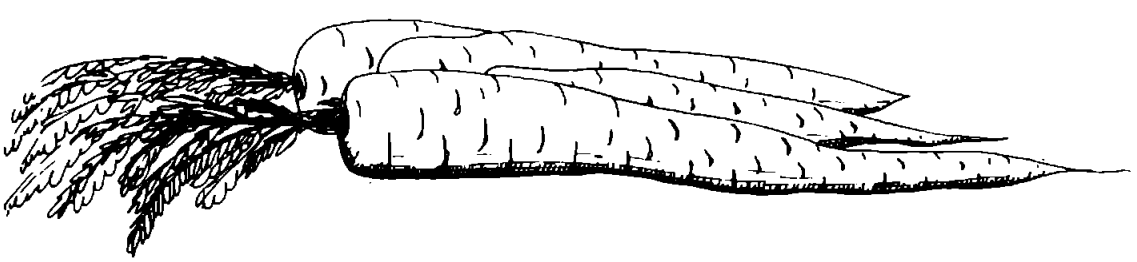
If you can put a 6 inch pot someplace in your boat, you can grow all sorts of miniature fruits and vegetables at sea. In the same space as a couple of paperback books, a strawberry plant will grow and make bunches of sweet, juicy fruit for your breakfast. Four tiny tomato plants reside quite comfortably in a large fruit juice can! Many special varieties will mature from seed in less than two months and fruit for several weeks. These plants do very well inside with only a small amount of sunshine every couple of days.

Miniature plants are hybrids, which means that they will usually revert back to a larger size when the second generation seeds are grown. For this reason be sure to purchase plenty of seeds in the event that later plants grow too big. Twenty dollars will buy enough seeds to last years and provide a bounty of fresh food while voyaging offshore.

I had the entire front cabin of my last vessel lined with racks of vegetables, sprouts, herbs and wheat grass growing under clear ½ inch lexan skylights. A most unusual craft! The garden in *La Lionesse* supplied me and two friends with all the fresh food we could eat. Most of our diet was sprouts since they only take a few days to grow and provide lots of bulk, but there were also plenty of tomatoes, cucumbers, radishes and strawberries. Every one was relished with an intensity never experienced on land! If you can't devote such a place on your boat, it is still possible to grow many plants in a much smaller space. An area the size of a small head can be turned into a "greenroom" without sacrificing too much space from other requirements. The head is only used for storage on most voyaging boats anyway. Make sure there is plenty of light and ventilation. Vents and skylights are not expensive or difficult to install. Design the tray racks to allow the maximum light to reach the plants. The indoor vegetables recommended here thrive in partial shade, but don't build the racks so close to

each other that they completely shadow those under it. If your sailing home is not large enough for a permanent garden set-up, just grow the plants in small jars or cans tucked anywhere they will fit. Place them up on deck once in a while for a few hours of sun.

I get all the seeds for my floating garden from an outfit in Oregon called Nichols Garden Nursery (address in appendix). This supplier has a huge selection of seeds of many unusual and miniature varieties. I have found them to be pleasant people to deal with and they will answer any question you might have concerning growing plants inside a house or boat.



Following is a list of plants suitable for growing on a boat that I have used in *La Lionesse* and greatly enjoyed. The plant names are as listed in Nichols Garden's catalog so it is possible to order right from them and get exactly what you need.

Baby Beet Spinel

Matures in 60 days. Eat the tops and bottoms. These can be juiced for a powerful red tonic or grated in a salad.

Carrot Sucram

Matures in 70 days. Tops and bottoms are both very good in salads and juice.

Pot Luck Cucumber

Matures in 45 days. These are real producers and will supply many juicy, crispy cucumber slices to adorn salads and sandwiches or be eaten like chips with a dip. The plant vines are only about 18 inches long and bear 6 inch fruit.

Japanese Purple Pickling Eggplant

Matures in 75 days. Each miniature bush will bear bunches of small eggplants that are great sauteed or in stew.

Tutti Frutti Strawberry

This plant is a 2 inch variety and will fit anywhere. A jar in the spice rack will hold a plant and produce a bowl of little strawberries!

Early French Breakfast Radish

Matures in 25 days. This is a fast grower that you can get in a salad in a real hurry. I eat the tops right along with the root. They both taste much the same, just the texture is different. Don't waste anything. The whole plant is loaded with vitamins A and C along with live enzymes.

Tiny Tim Tomatoes

These plants mature in just 55 days and will make many salads-worth of delicious, juicy fruit. The plants only grow to a height of 14 or 15 inches and produce lots of ¾ inch bite-size 'matoes. As with all tomatoes, the plant itself is poisonous to eat. They require more light than other plants in the on-board garden so set them out in the sun a little more often.

Germinate the seeds like you would for sprouts before planting. This will insure the best conditions for the first few days and you'll know the seeds are growing before hiding them in the soil. Because these plants are so tiny when mature, three or four may be grown together in a single 6 inch can. Use rich dark soil and water with the seaweed mixture

mentioned previously for best results. Composted seaweed and sprout scraps are great mixed with dirt for an ideal growing medium.

Growing containers should have small holes in the bottom to allow excess water to drain. Drain water is then collected and saved to use as the plant requires. By covering the top of the dirt with a piece of plastic film, water evaporation losses can be reduced to further conserve fresh-water usage.

Any plant that flowers before fruiting, such as tomato, cucumber, strawberry, etc., must be pollinated in order for the fruit to set. Butterflies and bees do this very conveniently on land, but you'll have to do it yourself at sea unless bees are kept on board! I can hardly imagine that, though I suppose Noah had them on the Ark. To pollinate the flowers sans bees you only need to gently rub some pollen from the stamen onto the pistil with a cotton swab. I always get a little tingle when doing this. Kind of erotic, isn't it? Our Mother Nature takes care of these tacky details without us even noticing, but to live on the sea we have to help her out somewhat to survive.

Another easier way to pollinate the flowers is to use a hormone spray that causes the fruit to form. It is available from most garden-supply firms under the name Blossom-set. Just spray it on the freshly opened flowers to insure you'll have plenty of fruit and vegetables without the help of the birds and bees. Remember — no pollination means no reproduction and no fruit.

Eggplant, tomato and other plants that bear fruit should be supported by small sticks or wire screen wrapped around the plant. If necessary, prune the plants lightly if they get too big for their space. This won't hurt them at all and will usually induce the plant to produce more fruit without the extra leaves to support. Strawberry runners can be cut to replant in other containers and will grow for years.

GROWING SPIRULINA ALGAE

Spirulina algae is one of the most nutritious foods on the planet today. It is an amazingly concentrated source of protein, vitamins, minerals and live enzymes. Because of its concentrated food value and digestibility, 1½ pounds of this dried food can keep you alive for a whole month. It stores indefinitely if kept dry, thus making it an ideal survival food. What other edibles do you know of that come close to this?

Vegetable seeds are easy to grow, highly nutritious when sprouted and storable for long periods of time. Sprouts would be a hands-down winner in the competition for the best seastead food source except for one detail. When you use up your supply of seeds, you're out of food. Growing vegetables to maturity just for their seeds is impossible on a boat due to the space limitations; a cup of alfalfa seed would require a small field in which to grow! Spirulina, on the other hand, replicates by cell division and matures in a matter of hours. A test tube full of the algae culture will fill a 5 gallon jug in just a couple of weeks. If a small starter culture is kept from successive batches you'll never run out of "seeds."

In outer space algae can be grown in space laboratories to provide food for the inhabitants. The algae feeds on CO2 from the ship's exhausted air supply and treated sewage. Since raw materials are in such limited supply on a space station, nothing can be wasted. It is necessary to be extremely conscious of the energy and material pathways of every life support system. Self-sufficiency in space is an obvious requirement to live in that environment. On our boats at sea, self-sufficiency is our goal and just as important as in space if we do not wish to return to "Earth" in order to resupply.

Space research has done much to aid our understanding of closed-system food production. One spin-off of this research is Spirulina growth aboard small space and sea

stations. You can grow all the food you need in clear 5 gallon water jugs aboard your sailing station. All that is needed is a small amount of live algae culture, sterilizer to purify sea-water, baking soda to adjust alkalinity and growth medium. The growth medium is a concentrated solution of rich soil and added minerals. A couple pounds of this medium will grow enough food to cross the largest sea. Imagine sailing from Los Angeles to Tahiti and arriving with more food than you left with.

To whet your appetite for learning how to grow this amazing food, purchase some Spirulina and learn to use it in some of the many tasty recipes given in the recipe chapter. Once you become familiar with it, Spirulina can complement the nutritional value and flavor of many of your favorite foods for an improved sea-going diet.

Instruction books, growing mediums and special tools for growing Spirulina are available from a source listed in the appendix. With these materials, growing your food supply at sea is about as difficult as raising a crop of yeast in a loaf of bread!

5
The Ocean Dairy

Milk has been food for humankind from the day the world's first mother nursed her first child. Millions of years later, we still have not been weaned! Milk, in some form or other, has been and always will be a vital part of the universal diet. There are hundreds of different kinds of milk and milk products, but most folks have tried only a few. We are accustomed to thinking of milk in terms of nursing mothers, or as a bovine product, but milk can also be coaxed from buffalo, llamas, goats, reindeer, yaks, camels, deer and horses. And animals are not the only milk source. In the Orient, soybean milk is common, and is consumed in vast quantities. In fact many nuts, seeds and beans make delicious nutrient-packed milks that have the additional advantage of being free of cholesterol and of animal fats.

Vegetable milks are particularly valuable at sea as a source of unsaturated fats because they don't decompose as

readily as extracted oils. In a warm environment, most prepared or extracted vegetable and animal oils turn rancid and are extremely hard to digest.

Milk is pasteurized to kill harmful bacteria but this also kills many friendly intestinal bacteria and destroys vitamins. Nut and seed milks, on the other hand, can be prepared raw because the dried seeds don't harbor the poisonous bacteria that animal milks do. However, once the seed has been made into milk by blending with water, it should be used as soon as possible like any other milk.

Yogurt, cheese and kefir are all very old, traditional preparations and have been used for ages before refrigeration as a way to preserve milk. The first yogurt and cheese were undoubtedly produced quite by accident and discovered with some chagrin by an ancient caveman a few hours after milking wild goats. When the milk clabbered and separated from the whey, he probably assumed the milk was spoiled but took a taste first before throwing it out. Not bad! It was even better than store-bought yogurt. A couple of days later, after a hunting trip, he noticed that the milk had gotten hard and tasted even better. Enter the first cheese maker in history.

The reason behind inoculating milk with certain bacteria is to make it possible to preserve it much longer than if allowed to just sour and spoil. This is particularly so with pasteurized products. Certain cheeses can be stored for years without refrigeration and are even delicious with mold and fungus permeating them, as with Roquefort cheese. Who would think that a moldy old piece of coagulated, furry milk could be so good?

On board, for a variety of tastes, textures, and nutrients, we can make our own cultured milk products every bit as good and fresh as store-bought. No kind of refrigeration is needed to make or use any of the milks in this chapter. What gives yogurt and cheese that pleasant tang is acid formed by the enzymes and bacteria in the cultured milk. When left

without chilling the tang could turn into a tongue curler, but the milk is not necessarily spoiled. Pasteurized milk, if not artificially inoculated, will rot instead of clabber because the naturally preserving enzymes and bacteria are killed when heated. Fresh milk can sit for hours without spoiling as it is totally alive and growing right in the can — even if it is slowly becoming yogurt or cheese.

It is possible to reintroduce pure live cultures into pasteurized, dried animal or vegetable milks in order to make any cultured product. The cultures themselves are packaged freeze-dried and will least at least a year if kept dry and in a cool place. Dried milk powders should be stored in double-thickness plastic or foil bags inside another air-proof container. I found that the most convenient solution in this case was a 1 gallon plastic pail with a tight fitting lid. These are available from the deli sections of large grocery stores, usually free or a dollar each. For best storage the containers should be kept in a dry part of the bilge or other cool place.

SEA-GOING MILKS AND CULTURED PRODUCTS

Whole Milk Powder

Available in most health food stores is a full fat non-instant whole milk powder. This is spray-dried at low temperature and when reconstituted makes a rich, full-bodied milk similar to the fresh pasteurized product. Full fat is necessary for some cheeses and where a creamier milk is desired. For a good rich milk, combine 1¼ cups powder to 4 cups cool water and mix thoroughly with a blender or whisk. A glass can be made with 3 or 4 tablespoons powder in 1 cup water. Set in a cool place for an hour before drinking for best flavor. Freshly reconstituted milk will last several hours unchilled but should be used, like all milks, as soon as possible to prevent spoiling.

Skim Milk Powder

Because of the reduced fat content in this milk, it is more common than whole milk among people who are trying to control their fat and cholesterol intake. Skim milk powder should be purchased in individual quart-size metal foil envelopes. Even though individual packages cost more than bulk sizes, the envelopes are much more convenient to use in the marine environment. A good alternative to the foil envelopes is to make up quart-size packages with heavy duty sealed plastic bags. Many other products besides milk can be bought in bulk at tremendous savings over smaller pre-packaged amounts. On board these bags can be sealed with a hot steel rod or knife edge.

Skim milk is used to make yogurt, cottage cheese, farmers' cheese and yogurt cream cheese and as a protein booster in breads, drinks and soups. To mix, simply combine one envelope or 1¼ cups powder to 3¾ cups water and blend thoroughly. A glass is made with 3 to 4 tablespoons powder to 1 cup water. The taste of reconstituted milk is enhanced by the addition of a little honey or vanilla extract. There are many ways to use milk in flavored drinks and these are shown in the recipe chapter.

Soy Milk

Soy milk is a tasty and protein-rich milk that is the basis of many vegetarian diets. The milk can either be drunk plain or used in any recipe calling for cow's milk. Soy beans are storable for very long periods if they are kept cool and dry in sealed containers. The best soy milk, as with any of the vegetable milks, is made with sprouted seeds for maximum digestibility.

To make this milk, use sprouts grown two days after the initial soak or beans soaked 12 hours with one change of water after six hours. Discard any off-colored beans or debris.

Grind the soaked beans as fine as possible in a meat grinder or with water in a blender. To 1 cup of dried beans, which is now 2 cups after soaking, add 8 cups of water. Bring to a slow boil for about 10 minutes, stirring constantly to avoid spilling over. Pour through a clean muslin set inside a colander over a large bowl. When most of the milk has drained out, tighten the cloth and squeeze out the remaining milk until the residue is quite dry. The pulp need not be discarded as it contains much protein and can be used to make soyburgers, cereals, gravy and bread. The hydraulic juice press is handy for extracting all possible milk from the pulp.

Coconut Milk

To make this sweet milk that is delicious plain or in luscious tropical drinks such as pina colada, either fresh or dried coconut may be used. By reducing the amount of liquid you can make a thick cream that is wonderful as a sauce or with cereal.

Coconuts are rather high in saturated fats so don't overeat them. This fat makes an excellent butter that can replace canned butter and margarine. With a blender, combine 1 cup grated meat with 1½ cups liquid. Use water or the liquid from a fresh coconut. For extra creaminess, you can use skim, soy or nut milk. After blending well, strain through a piece of muslin and squeeze until residue is dry. Put this pulp back in the blender with a fresh ½ cup liquid, blend and strain as before. If no blender is available, combine the ingredients in a sauce pan and simmer for about 10 minutes or slow cook in a thermos for several hours before straining. When coconut milk is heated the butter will separate as the liquid cools. If milk is desired just stir this back in. If the butter is to be saved, it can easily be skimmed from the top and used in place of dairy butter in many recipes. Coconut cream is also very easily extracted using the Health Fountain Juicer.

Almond Milk

This is a good tasting and nutritious sweet milk made from either dried almonds or sprouts. The sprouted nut milk is richer in vitamins and more easily digested. As with other nut and seed milks, almond milk can be made in a blender or with a grinder. Pulverize ½ to 1 cup nuts to a powder and blend or beat with 3 cups water. Strain through a piece of muslin, mix another cup to the residue and squeeze again. All nut and seed residues are valuable protein sources and should be used in cereals or vegetable burgers.

Peanut Milk

Make this the same way as almond milk. Use either sprouted or raw, dried peanuts.

Cashew Milk

Cashew milk is an especially good tasting sweet milk that children really love. It is made the same as almond except that straining is not required if a blender is used. Cashews are softer than peanuts or almonds and seem to dissolve in the water. Be sure to use raw cashews for highest nutrition.

Sesame and Sunflower Milk

These are two of the most valuable seeds you can put on your boat. They are very high in protein and much less costly than nuts. Sesame is one of the richest sources of calcium, and when combined with sunflower and soy milk, produces a food higher in complete protein, calcium and minerals than dairy milk. Sprouted seeds make an even better milk.

Use hulled sunflower seeds and unhulled, unbleached raw sesame seeds. The ratio of sunflower to sesame may be varied to taste as the sesame milk is slightly bitter and the sunflower, bland. Make like almond milk using ½ cup sesame to ½ cup sunflower in 4 cups water. Reduce seeds to a powder using the blender or grinder. Add water a little at a time while mixing until smooth and creamy. Strain.

TABLE OF MILK VALUES

ONE CUP	Calories	Protein Grams	Total Fat Grams	Saturated Fats Grams
Skim Milk	88	8.8	.2	0
Whole Milk	159	8.5	8.5	5
Butter Milk	88	8.8	.2	0
Almond Milk	292	8.6	25	2
Cashew Milk	207	6.3	16.8	3
Soy Milk	160	12.6	6.5	trace
Peanut Milk	257	11.6	21.5	5
Seed Milk *	266	10.1	21.4	3

ONE CUP	Linoleic Acid Grams	Cholesterol Milligrams	Carbo-hydrate Grams	Calcium Milligrams
Skim Milk	0	7	12.5	296
Whole Milk	trace	27	12	288
Butter Milk	0		12	296
Almond Milk	5	0	13.3	108
Cashew Milk	1	0	10.8	14
Soy Milk	3	0	15.9	83
Peanut Milk	6	0	9.1	32
Seed Milk *	12	0	13.4	186

* ½ sunflower seeds and ½ sesame seeds

Dairy Yogurt

Fermenting dairy milk with the microorganisms *Streptococcus thermophilus* and *Lactobacillus bulgaricus* pre-digests complex nutrients into forms more available to the body. Some people who are not able to digest dairy milk at all find that they can eat all the yogurt they want. This is because the enzymes

necessary for the digestion of lactose are not present in their intestines. The bacteria in yogurt converts the milk sugar lactose into lactic acid, thus eliminating the need for this to happen in the body.

Like all fermented foods, yogurt is rich in B vitamins and friendly bacteria. These bacterial intestinal floras are present in the healthy colon and help to reduce poisonous, toxic bacteria. Without the proper bacteria serious disease can follow resulting in diarrhea, chronic constipation, vitamin deficiencies and toxemia. Regular use of fermented foods can improve this flora, and hence our health. Any fermented food must not be cooked as this would kill the beneficial living organisms.

Making yogurt is a simple process even on a boat. Start by making a concentrated portion of milk using either skim or whole milk powder. One cup powder to 3 cups water will result in higher protein and a richer, sweeter product than if the regular concentration of milk is used. Heat the milk to a gentle boil for one minute and let cool to between 105 and 110 degrees. Use a thermometer for consistently good results. It is important to heat the milk to kill any wild organisms that might affect the fermentation of the pure strain that is added. Be sure to let the milk cool to the specified temperature as the pure culture will die if too hot and their growth inhibited if too cool. The pure culture can be either packaged dried or ¼ cup of the last batch of fresh yogurt. Mix thoroughly with the warm milk and place in a pre-warmed thermos bottle or insulated cooker. Incubate 4 to 6 hours if using fresh yogurt for the culture, or 7 to 9 hours if using freeze-dried culture. Varying the incubation time by shortening will result in a sweeter taste; lengthening results in a more acidic taste. Try not to disturb the yogurt so that the whey doesn't separate from the solids. Movement of the boat will sometimes cause separation, but this can be homogenized by stirring before use. Any sweeteners or flavoring shouldn't be added until

after the yogurt has set. The yogurt will keep 7 to 9 days if kept in the refrigerator, but if left out should be consumed at the desired level of acidity.

Soy Yogurt

Soy yogurt is made just like dairy yogurt. It has a very mild taste and can be used in place of dairy yogurt in any recipe or eaten straight from the jar. Just make soy milk as previously described, but use only 5 cups water instead of 8. Boil the bean mixture for 10 minutes and then let cool to between 105 and 110 degrees. Add starter and incubate 6 to 8 hours, or until acidic enough for your taste. Seed yogurts may not get as thick as dairy yogurts sometimes so don't let it turn too acid waiting for it to solidify. If whey separates it can either be stirred back in for a thinner but stronger taste, or poured off for a thicker consistency. The whey has lots of vitamins and enzymes, and should be used in place of water when preparing other foods.

Seed Yogurt

You can make yogurt from seeds and nuts too! Depending on the type of seed or nut used, a great variety of flavors are possible. It can be eaten alone, combined with herbs and spices, or made into all sorts of dressings to liven up your meals. The pre-digested proteins are much simpler for the body to assimilate than hard, dried nuts. Raw cashews, almonds, sesame seeds, sunflower seeds, walnuts and brazil nuts are a few of the possibilities for making seed yogurt. Use of sprouted seeds is recommended for an even more nutritious yogurt.

Start by making a milk of 1 cup seeds and 2 cups water. Grind the seeds well before mixing with water. It is necessary to totally homogenize the seeds with the water as any chunks not pulverized will cause the yogurt to spoil. If made in a blender, puree the seeds for 3 or 4 minutes. Warm the milk to 100 degrees and add any of the following starters: freeze-

dried yogurt culture, ¼ cup fresh yogurt from the last batch, one tablespoon miso. If rejuvelac is used instead of water to make the seed milk, you need no starter. Place the inoculated milk in a thermos and let ferment 5 to 10 hours. The longer period will result in a more lactic acid flavor. If the yogurt should taste or smell rotten, you have either used rancid seeds, let it incubate too long or had it at too high a temperature. The ferment should be sour and pleasant to the senses. The addition of ground herbs and garlic makes this an excellent dip or dressing. Seed yogurt is not gelatinous like dairy yogurt so don't incubate too long waiting for it to gel. The resulting yogurt is very easy to digest and is a delicious source of B complex vitamins, digestive enzymes and essential amino acids.

Agar-Agar Yogurt

If you don't have yogurt starter, or wish to have a thicker, more gelatinous yogurt texture, any milk can be solidified using gelatin or agar. Agar is a form of seaweed used extensively in the Orient. It is found in Oriental or health food stores, or it can be foraged from the ocean. Agar is described more completely in the chapter on seaweeds.

To make this super, simple, quick yogurt, heat any dairy or seed milk to a simmer and thoroughly dissolve 4 tablespoons of dried agar powder per quart of milk. Pour into jars and let cool until set — about one hour. Yogurt culture may be added when the mixture has cooled to 105 to 110 degrees for the benefits of fermented milk, but is not necessary in this recipe to make milk gelatin.

Miso

Miso (pronounced *me-so*) is another popular vegetable product from the Orient consisting of fermented and aged soybeans. It is sold as a paste in 1 pound sealed packages that will store indefinitely without refrigeration. In fact, it is already aged three years before you even buy it! It tastes like a

thick soy sauce and is great as a ready-to-eat soup base, salad dressing, gravy or dip. Because this is a fermented product, and quite alive, it is used to inoculate seed yogurts and cheese. For this reason it should never be cooked, but instead added at the last moment before serving in hot dishes so that the live organisms are not killed. Like other fermented foods, miso is rich in B vitamins, beneficial bacteria and enzymes. You should get to know this amazingly handy food and include it in your sailing diet frequently.

Butter Milk

This is a cultured product that is easy to make, stores without refrigeration for several days and is most delicious. Simply make a quart of dairy milk and warm to about 90 degrees. Add freeze-dried cheese culture as per the directions on the package or ¼ cup of the last batch of butter milk. Mix thoroughly and set in a thermos in a warm spot, 80 to 100 degrees, for 12 to 72 hours, depending on your taste. The longer it incubates, the stronger it will be.

Cottage Cheese

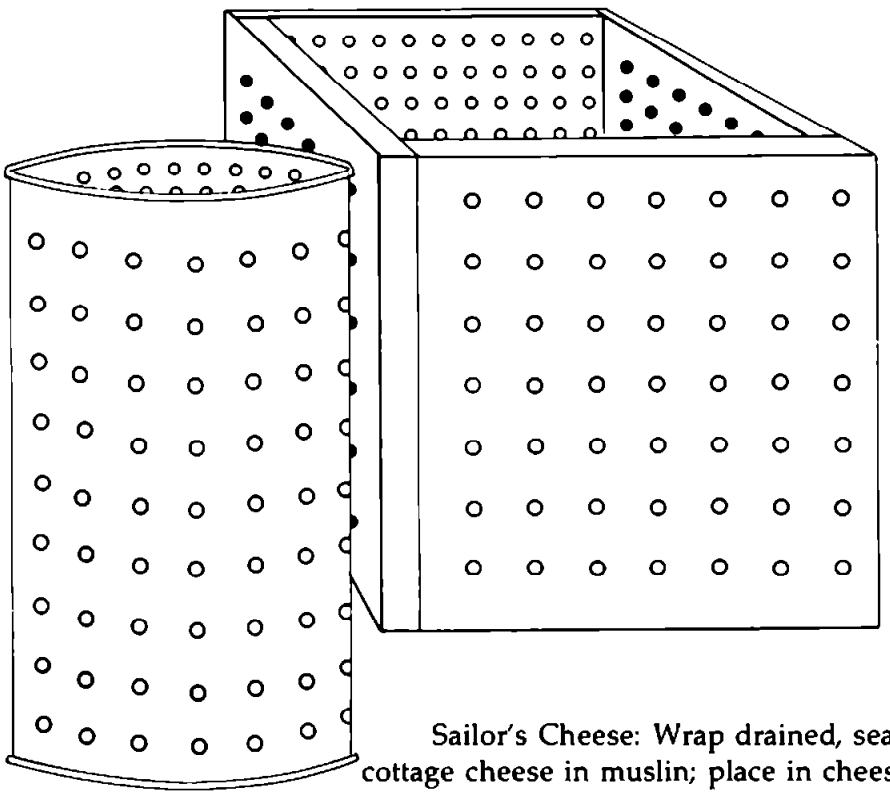
Making delicious cottage cheese is a task that only takes a few moments of work and is greatly rewarding. Just warm a quart of dairy milk to about 95 degrees and add culture. The culture can either be ½ cup of buttermilk or prepared freeze-dried culture. After half an hour dissolve ¼ tablet or a few drops of liquid rennet into ½ cup warm water and stir into milk. Let this rest for about 24 hours or until firm curds form. Stir very gently so as not to break the curds but to separate them from the whey. Pour off the liquid whey into a jar and save. Depending on your taste preference, rinse the curds gently in fresh or salt water to reduce some of the acid flavor. Vigorous stirring or handling will result in many of the curds being lost in the whey. When rinsed, pour through a muslin-lined colander to drain. Carefully pull the corners of the cloth together after most of the whey has drained and very gently

squeeze until the curds are almost dry. The cheese is then ready to eat with herbs, on a salad or just plain. The whey is a healthful ingredient and can be used as a substitute for water in many recipes.

Sailor's Cheese

This is a pleasant hard cheese that can be used a hundred different ways and stores well. White wine, dill, chives, oregano, garlic and caraway added to this cheese gives it many interesting taste possibilities. A fresh loaf of bread, a bottle of wine and some homemade cheese would make a wonderful way to celebrate your second month away from land.

Making cheese on board is a lot simpler than you might think and well worth the effort. Start with either cottage cheese or quick cheese. Quick cheese is made by warming 2 quarts of milk just about to a boil and adding either of these solidifiers to form the curds: 6 tablespoons of lemon juice or vinegar in ¼ cup warm water, or ¼ ounce Epsom salts dissolved in ¼ cup warm water. The curds are then strained through muslin to drain the whey like cottage cheese and treated in the following manner. To develop the hardness, the cheese must be pressed under pressure for many hours to squeeze out all the liquid possible. Before processing, any flavors or herbs should be added. The press may either be a can with many holes drilled or punched to allow the whey to drain out, a hydraulic vegetable juicer or the model illustrated here. Wrap the wet curds in a piece of muslin and place in the press. Place a block on top of the bag and press out the whey gently, being careful not to squeeze the curds through the cloth. A heavy brick or dive belt weight can be placed on top of the block to hold it. Gradually increase the weight for 15 minutes and then let rest this way for 12 to 24 hours. Unwrap the hardened, dry cheese and then either use immediately or let age. To age, wrap the cheese in a cloth that has been soaked



Sailor's Cheese: Wrap drained, seasoned cottage cheese in muslin; place in cheese press. Put a weighted block on top, and keep cheese under pressure for 12-24 hours. Cheese will harden as liquid is squeezed out of it.

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in vinegar to prevent harmful bacteria growth and then dip in melted wax. The wax can be applied in several layers to a thickness of ⅛ inches. Store the sealed cheese in the coolest part of the boat, probably the bilge, for several weeks before eating.

Yogurt Cream Cheese

This is a very pleasing cheese similar to a cream cheese in its texture and sour taste, but without the fat and calories that have turned most of us to self-denial of this favorite topping. To make this delicious cheese start with yogurt made from skim milk powder. After the proper fermentation time in which the milk has clabbered, pour the thick yogurt into a

muslin-lined colander and drain for a few minutes. Pull up the four corners and without squeezing, hang the bag to drain for 12 to 18 hours over a pan, sink or shower. The creamy cheese that remains may be seasoned with salt or herbs.

Seed Cheese

Seed cheese is made in much the same way as yogurt with the exception that less liquid is used in the preparation. Grind or blend 2 cups cashews, almonds, sesame, sunflower, pumpkin, etc., or a mixture of any of them. Thoroughly blend with 2 cups rejuvelac or 2 cups water to which 2 tablespoons miso are added. After fermenting 10 to 12 hours in a warm spot (75 to 90 degrees), the cheese is wrapped in a piece of muslin and hung to drain for a couple of hours. If the cheese smells rotten, then too long a fermentation period or too high a temperature was used and the cheese should not be eaten. Mix with radish sprouts, ground seaweed, herbs or spices to flavor. My favorite is cashew cheese flavored with caraway seeds.

Tofu

Tofu, or soy bean curd, is made from freshly prepared soy bean milk while it is still very hot. After the milk has been strained to remove the bean pulp, heat almost to a boil and turn off the heat. The solidifier used to separate the whey from the curds can either be ¼ cup lemon juice, ¼ cup vinegar or ¼ cup warm water in which 2 teaspoons of Epsom salts are dissolved. Gently stir the solidifier into the hot milk for 30 seconds, being careful not to break any of the forming curds. Let rest for 10 minutes without stirring and then pour into a muslin-lined colander to drain. The tofu should be pressed as with the sailor's cheese. After removing as much liquid as possible the cheese is ready to eat. Cover the tofu with fresh or salt water if not eaten immediately. The cheese should be used within 12 hours if not chilled. Tofu is rather bland and can be used in cheese cakes, puddings, salad

dressings or dips. William Shurtleff and Akiko Aoyagi's book *The Book of Tofu: Food for Mankind* is 336 pages of how to use this remarkable food and is highly recommended.

Rejuvelac

Rejuvelac is the fermented soaking liquid of grains. It is a drink, sauce base or seed yogurt starter incredibly rich in B complex vitamins, lactic acid, enzymes and friendly intestinal bacteria. Regular use will aid in the relief of constipation and other digestive tract disorders.

Wheat, barley, rye, rice, millet, buckwheat, etc., are used to make this nutritious elixir drink. Wash the grain to remove dust, debris and imperfect seeds. Soak 1 cup grain in 3 cups pure water for 16 to 24 hours. The warmer the air temperature the less time the grain should soak. Then grind the seeds in a grinder or blender and mix back with the soak water. Let this incubate in a cloth-covered glass jar at 60 to 80 degrees for 2 or 3 days. Pour liquid through a fine strainer and use. By replacing the liquid as it is used with more pure water the culture will last several weeks. If the liquid ferment that is poured off should have a rotten taste then discard it. Good rejuvelac has a slightly lemony, sour flavor. My favorite way to use this potent brew is with ginger, lemon juice and a spoonful of honey. This makes the best enzyme-aid and is so good for you that you can't help but love it!

6
Sea Vegetables

Long neglected and indeed often avoided by otherwise brave and adventurous seafarers, is the whole underwater world of seaweeds. They tangle propellors, clog waterways, catch distance log spinners, and snag fishing lines. So who would bother to take them? You would!

Seaweeds are incredible storehouses of vitamins, minerals and body-building nutrients. Some dried types of algae, which all seaweeds are, contain as much as 70 percent high quality, easily digested protein. This compares to 20 percent protein in fresh lean beef and 30 percent in canned tuna. Obviously, seaweeds could meet a good portion of your protein needs on a boat without your having to store lots of expensive processed protein foods.

People have been eating seaweeds around the world for thousands of years. The Orientals developed the craft of sea-vegetable cooking into a fine art practiced and appreciated by

nearly the whole population. The coastal peoples of Japan have, more than any other culture, devised many ways of using these plants and now pass the techniques on to us.

Seaweeds are not weeds at all as the name might suggest, but highly prized, delicious foods used by millions, including gourmet connoisseurs of fine food. Some idea of the value that is placed on these plants can be extracted from the market prices. A seaweed called nori sells for $45 per pound, dulse $20 per pound, ground kelp powder $12 per pound. The next time you're out sailing and see an island of seaweed a mile across or catch a huge mass on a trolling line, don't think of it as trash like you used to! It may not look like much, but it's good food and the money you could get for it looks the same as the money from selling diamonds.

If you would like to live on the ocean, then let go of your need for familiar land-grown foods. Why pay a farmer to grow corn that is made from fertilizer produced from expensive imported oil, then a trucker to haul it all the way to a store where somebody else makes a profit selling it to you? Why not just reach down and scoop up some of the abundant sources of food that are fairly cramming the shelves of nature's "supermarket"? All it costs is a little imagination, skill in identifying and foraging wild food, and the desire to become unstuck from the spiraling whirlpool of inflation, energy crises and shrinking world resources. Let these delicious plants into your life. Use them yourself and then harvest some for those a bit more land-bound.

At the current prices, a very profitable independent business is possible farming and gathering this practically untouched resource. There are some efforts in Japan, California and Maine to culture these plants and increase yields, but they grow so profusely in almost every part of the seven seas that anyone so inclined could make a living collecting them while sailing around the world. Sowless reaping of the bounty of the sea is ecologically sound as long as one is

careful not to overharvest or remove plants that are in the reproductive stage.

Cruise through the rest of this chapter and see how you can identify and use these remarkable vegetables of the sea to increase your awareness of how the Earth provides for those willing to live in close harmony with her.

Uses for Seaweeds

In biological terms, seaweeds are actually algae. Algae include many different kinds of fresh- and salt-water plants. They employ photosynthesis to carry out complex chemical reactions just as do land plants. Algae can be as small as a single microscopic cell or grow to incredible size, such as the Giant Kelps.

Undoubtedly you have seen seaweeds floating on the ocean and at the beach, but have you been any closer than that? Unless your diet has been restricted to rice and beans, you've probably already eaten seaweeds a couple times a week at least. All kinds of sauces, breads and dairy products are produced using extracts of various sea plants as stabilizers and thickening agents. Ingredients such as carrageenan and agar-agar are derived from sea plants and are used in such a huge variety of prepared foods that it would be almost impossible to have missed them. If you have ever eaten at a Japanese restaurant you may have had wakame soup, sushi rice wrapped in a sheet of nori and a kanten salad. A very popular seasoning found on the tables of many health food restaurants is dried kelp powder. It is a tasty substitute for salt and loaded with the whole range of the sea's minerals. There are as many ways to use sea vegetables as there are ways to use land vegetables. You just have to become familiar enough with them to know how they are utilized in many kinds of different recipes.

Besides the obvious nutritional aspects, sea vegetables have other diverse uses. Agar-agar is used every day in

biology work as an ideal medium for growing micro-organisms. Ground or liquified, kelp is an excellent fertilizer on cultivated gardens and farm croplands as it has a good ratio of available nitrogen, carbon, phosphorous, calcium and other important minerals. This is especially valuable today as the price of petroleum-based products skyrocket causing food shortages and high prices. Seaweed fertilizer will feed crops in your own on-board garden to enhance growth. Industrially, seaweeds are used in making toothpaste, chewing gum, soap, paint and clarifying compounds in the production of wine and beer.

Nutritive Value of Seaweeds

There are few plants on earth that can compare with the many types of seaweeds in protein, mineral and vitamin value. Because these plants are constantly soaked in a virtual nutrient bath, they are rich in easily absorbed minerals. The sea is a great store of all the minerals that are washed off the land by rain and erosion. Seawater is very similar to our own blood in chemical make-up except for the concentrations of various elements.

Some health-conscious individuals include a small glass of seawater in their daily diet to insure a full range of trace elements necessary to the body. Seaweeds are able to concentrate certain minerals and by choosing carefully, we are able to pick from this smorgasbord those that are most suitable for our own body chemistry. Seaweeds are particularly rich in phosphorus, calcium, zinc, iodine, iron, nitrogen, potassium and a hundred other different compounds our bodies need in various amounts.

As mentioned before, protein values are high in most seaweed species. Spirulina is a fresh-water algae that is 70 percent protein of the dry weight. This algae was known to the Aztecs in Mexico a thousand years ago and very highly prized. One and one-half pounds of the dried algae contains

sufficient protein to enable a 150-pound man to live for a month. This would obviously be an ideal survival food or ration in a lifeboat, hiker's emergency kit or hard times survival kit for your family.

If you pack nothing else in a life raft canister besides the raft and a few waterproof books, you should have several pounds of Spirulina algae packed in waterproof jars and a solar still. I know of some people in Japan who live on nothing but algae, fruit and water!

Certain red, green and blue-green seaweeds contain 20 to 25 percent protein. For comparing the value of seaweed to other foods see the chart in the chapter on storing sea-going foods. This chart lists the nutritive values of several types of seaweeds, nuts, beans, grains, milks, fish and meat. It won't take very much study to realize the potential importance of these *free for the taking* foods that are constantly around us and almost totally unused.

As rich as seaweeds are in protein and minerals, they are also fantastically high in many different vitamins. It has generally been thought that there were no sources for vitamin B-12 outside of animal foods, such as liver, eggs, milk, meat and fish. We now know that seaweeds contain concentrations much higher than any animal products. Vitamins A and D are so concentrated that it is believed that fish must absorb these vitamins in their livers by eating seaweeds either directly or somewhere in the food chain.

Some seaweeds contain as much vitamin C as lemons and are able to resist the breakdown of this super-sensitive vitamin when dried or stored, even for long periods of time. Vitamin C levels are drastically reduced in land fruits and vegetables when dried or prepared in any way. Why didn't the early seafarers from Europe know about these foods? They were dying of malnutrition eating potatoes and salt pork until their bellies burst from overstuffing while sailing through acres and acres of seaweed patches. All they had to

do was eat some of the plants that washed up on the decks to relieve their scurvy symptoms. Such ignorance caused the loss of more than a few lives in those days. Not using seaweeds today costs seafarers in diet deficiencies, missed gastronomic adventures and loss of independence from store-bought foods with less exotic names and food value.

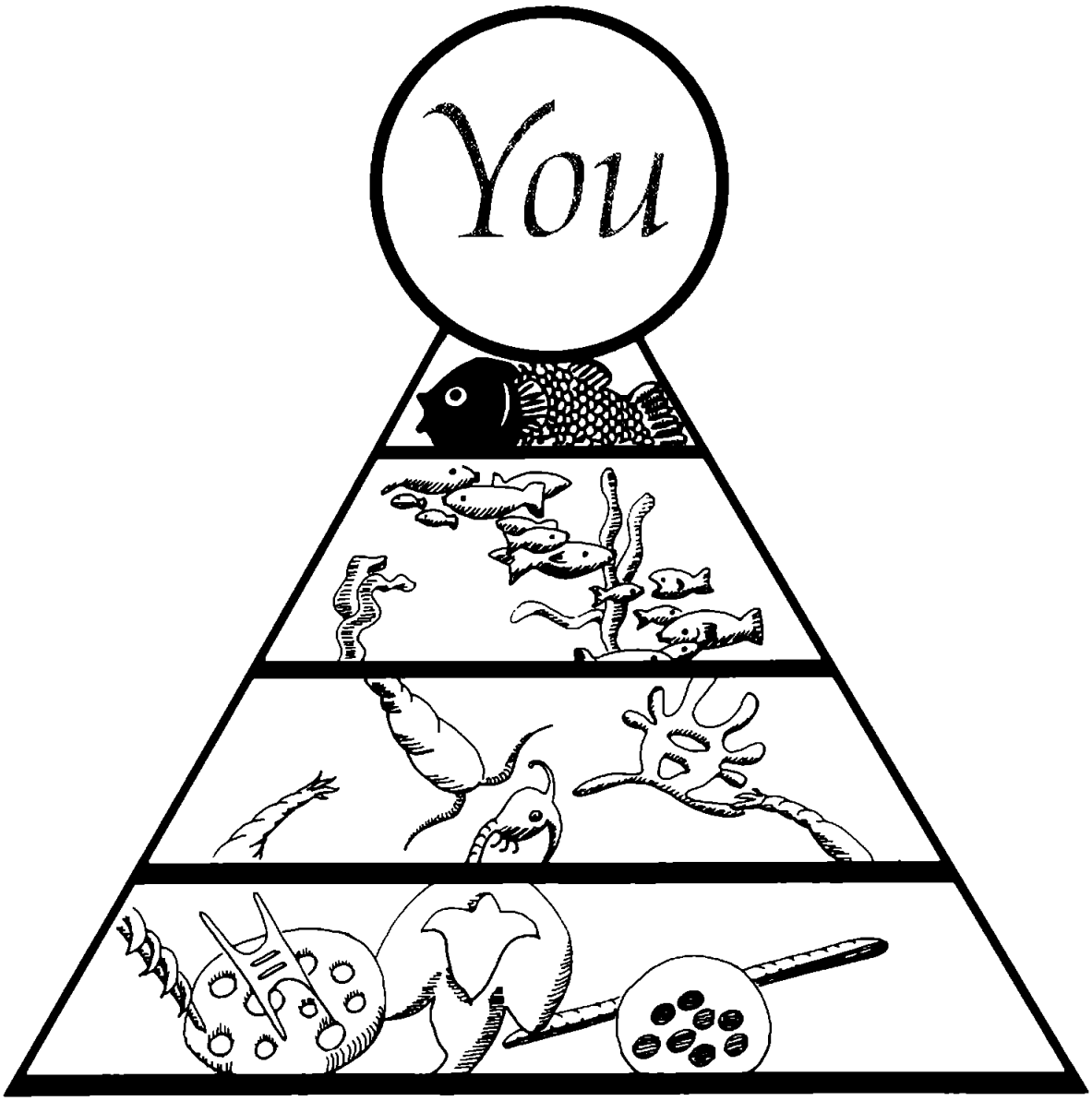
By becoming familiar with the seaweeds in Oriental restaurants and using varieties purchased commercially, you can acquaint yourself with these plants enough to encourage your hunting them. Who knows what adventure awaits the forager in hunt of an elusive *Gigartina papillata* or a feisty *Enteromorpha linza!* The most common seaweeds in the market today are cold water varieties. This is not because edible plants are not found in warm waters, but because it is the Japanese who popularized their use. Other cultures' experience with these foods are widespread and varied, but since we don't communicate much with the natives of coastal Africa and Polynesia we haven't come into the same contact with the warmer species of plants. Many types are profusely distributed around the globe, practically all of them edible, some much more delicious than others and some more common.

There has never been a record of anyone being poisoned fatally by any of the species of seaweed. A couple are best avoided as they contain compounds that could cause considerable discomfort. One in particular is *Desmarestia.* The plant contains sulfuric acid and tastes horribly of bitter lemons. Another is *Lyngbya.* This is an extremely toxic variety but is easy to avoid. The plants resemble fine, long hairs, and are frequently matted together around other seaweeds. To be safe, don't eat any plant smaller than a piece of string. This includes free swimming and floating plankton that would otherwise be handy to collect with a simple net towed behind the boat. Although many species of plankton can be valuable food sources for man when they are cultivated in mono-

culture environments, when they are collected in the open sea, there is a chance that poisonous species of plankton will be included with the edible ones. These dangerous types of plankton are very difficult to identify due to their microscopic size, so collecting plankton from the ocean is not recommended. In any case, even if you could screen out the poisonous species, it would take the finest of nets and infinite patience to gather enough plankton to make a meal. It would be far better for you to learn to identify and harvest the larger and more common edible seaweeds (Forager's Guide, page 135).

Plants found in polluted waters, whether it be oil, industrial or sewage pollution, are best avoided. Seaweeds do not concentrate minerals or chemicals found in the water if they are not specific to their growth; however, pollutants cling to the plants and are difficult to remove. Large concentrations of mercury that have been found in tuna are not present in seaweeds. Fish store these poisons by eating fish that eat other fish that all contain unusually high levels of mercury. The same situation exists in the production of meat and dairy foods. The animals absorb insecticides and harmful radiation from the environment and pass this along in a concentrated form in eggs, meat and milk. A new law is about to go into effect that requires dairies to state the level of radioactivity in their milk products. It is quite clear that by using foods closer to the bottom of the food chain, we are able to minimize the collecting of high levels of obnoxious pollution in ourselves.

It seems strange and coincidental that the largest organisms on the planet, whales, eat some of the smallest, plankton. It takes many pounds of plankton to feed a single fish. Taking food from the bottom of the chain is more efficient for whales and also for humans. It takes over a half ton of plankton to produce three cans of tuna fish. The obvious benefits to the hunger problem this planet faces by eating these lower organisms directly are clear.



Ocean Food Chain

10,000 pounds of plankton support 1000 pounds of plant-eating animals, which support 100 pounds of meat-eating animals, which support 10 pounds of tuna, which supports 1 pound of human flesh. Why not eat from the base of the chain? Man can choose. Fish cannot. On land, the protein yield per acre of Spirulina algae is 35 times that of soy beans, 70 times that of corn and 700 times that of beef.

Gathering Seaweed

Individualities of distribution and gathering techniques are given in the separate listings of species; however, there are some points shared by all. With the exception of a few unattached floating types, most seaweeds grow from the ocean floor or other vegetation to prevent being washed ashore or into environments not suited to their growth. Harvesting of these attached types can be done by diving and cutting or simply by taking them at low tide when they are uncovered. Sharp knives and scrapers are essential as some of the fastening parts of the plants are rather tough. Hip waders are handy in cold waters where the plants are just submerged at low tide.

I have collected bags of plants just by picking them off the beach after high winds and waves have pulled them from offshore rocks and deep water. Many edible plants can also be found drifting thousands of miles from their original location and frequently are just as fresh as if picked off the sea floor. Remember that seaweeds do not use roots as do land plants to take up nutrients. Sea plants can live for months drifting if they remain inside environmental parameters suitable to their growth. Whether plants are found on the beach or floating, they are perfectly good to eat as long as they are fresh and look good.

Preparing Seaweeds for the Galley

Now that there are bags of strange-looking delectables on the deck of your boat, what's next? How do you transform what yesterday was a clump of weeds clinging to a rock into a really unusual and satisfying meal? The first thing is to remember how lucky you are to be able to reap the bounty of nutritious foods the Earth has provided for those that go down to the sea. It's all right here. The best food in the world, perfectly grown by a master gardener and delicately prepared by you, the master chef!

Now that you are in the proper reverent mood, take knife in hand and make like the voyaging gourmet! The tough attaching holdfasts and the central stipe are removed first, leaving the tenderest parts of the plant for use. Frayed outer tips and edges can be cut away along with any parts where tiny shellfish have secured themselves. A good rinsing in clean salt water will wash off any sand and debris.

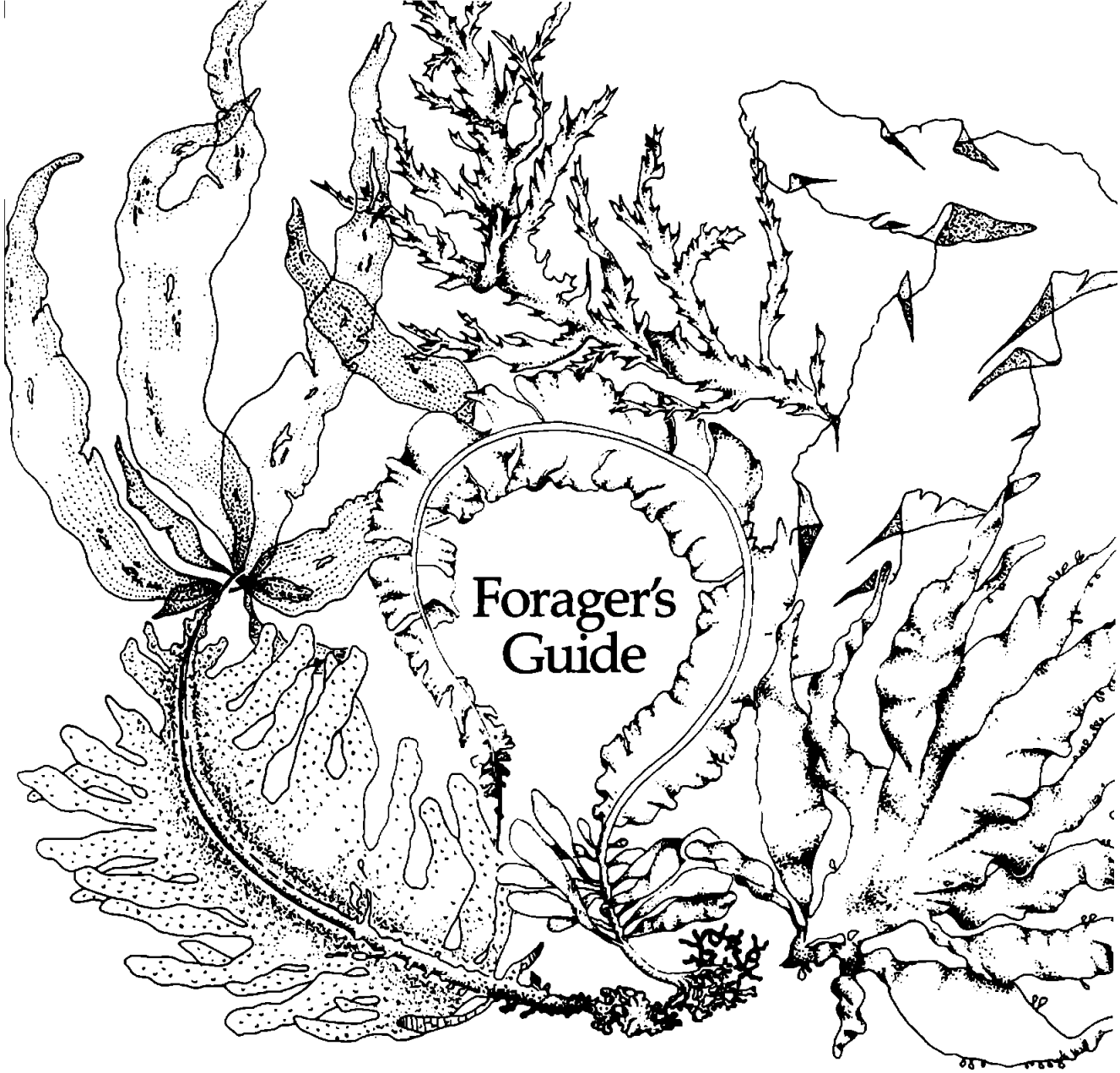
Do not soak the plants in fresh water for long, except in cooking liquid, if it is to be consumed. The plant tissues, being more permeable to fresh than to salt water, will absorb more water than normal which will break down cell walls. This releases nutrients which are wasted if the liquid is discarded. Whether the plants are used immediately or prepared for long storage, a quick fresh-water rinse will suffice.

Preserving

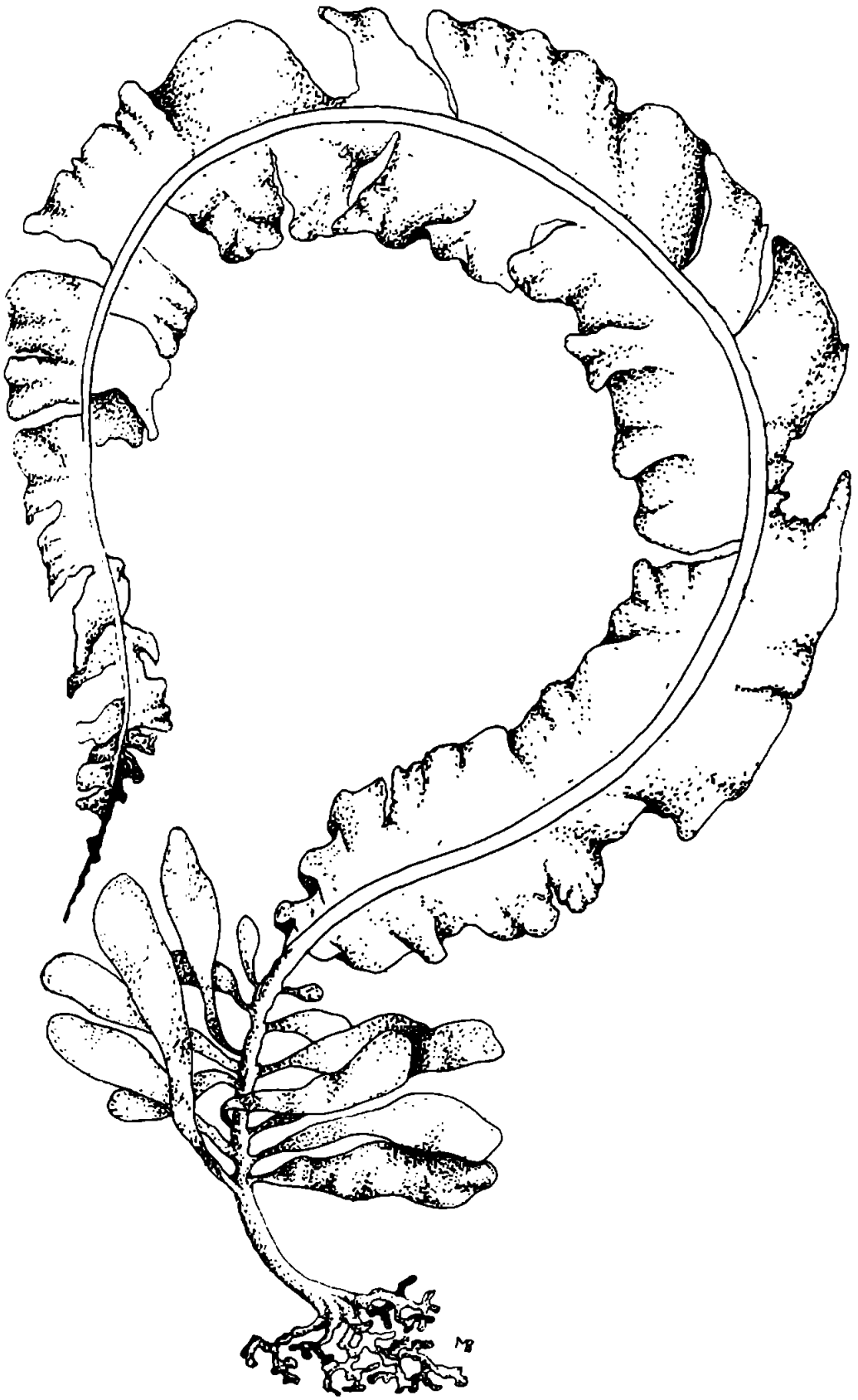
If not used right away the plants may either be kept in a net over the side of the boat if at anchor or dried for long-term storage. When properly dried, vitamins suffer only minimal losses and remain quite stable for long times. Details of drying seaweeds are given in the food preserving chapter.

Serving

To prepare dehydrated plants for use, they should first be soaked to return them to their original texture. As when using the fresh plants, a quick fresh-water rinse rinse will remove excess salt. If soaked longer, the soak water should be used in other preparations like soup, dips, etc. Dried nori sheets, laver, dulse and kelp need not be soaked before eating. They are chewy and delicious eaten dried and raw. A seasoning may be made by grinding the crisp plants into a powder to sprinkle on everything from soups to salads. It adds a wonderful taste of the sea to any dish while supplying essential trace minerals. Rehydrated sea vegetables are added raw to salads, chopped in soups, steamed or baked. Some of my favorite recipes are given in the recipe chapter.



Following is a guide to the preferable edible sea vegetables that can either be foraged or bought commercially. By becoming familiar with some of these readily available plants you will be able to use the many other sea vegetables in similar ways. There are many species not mentioned here that are just as good, but space does not allow their insertion. By studying other seaweed guides specific to the areas you will be cruising, you should be able to identify the hundreds of other edible and delicious plants that can be foraged and prepared like the representative examples given here.



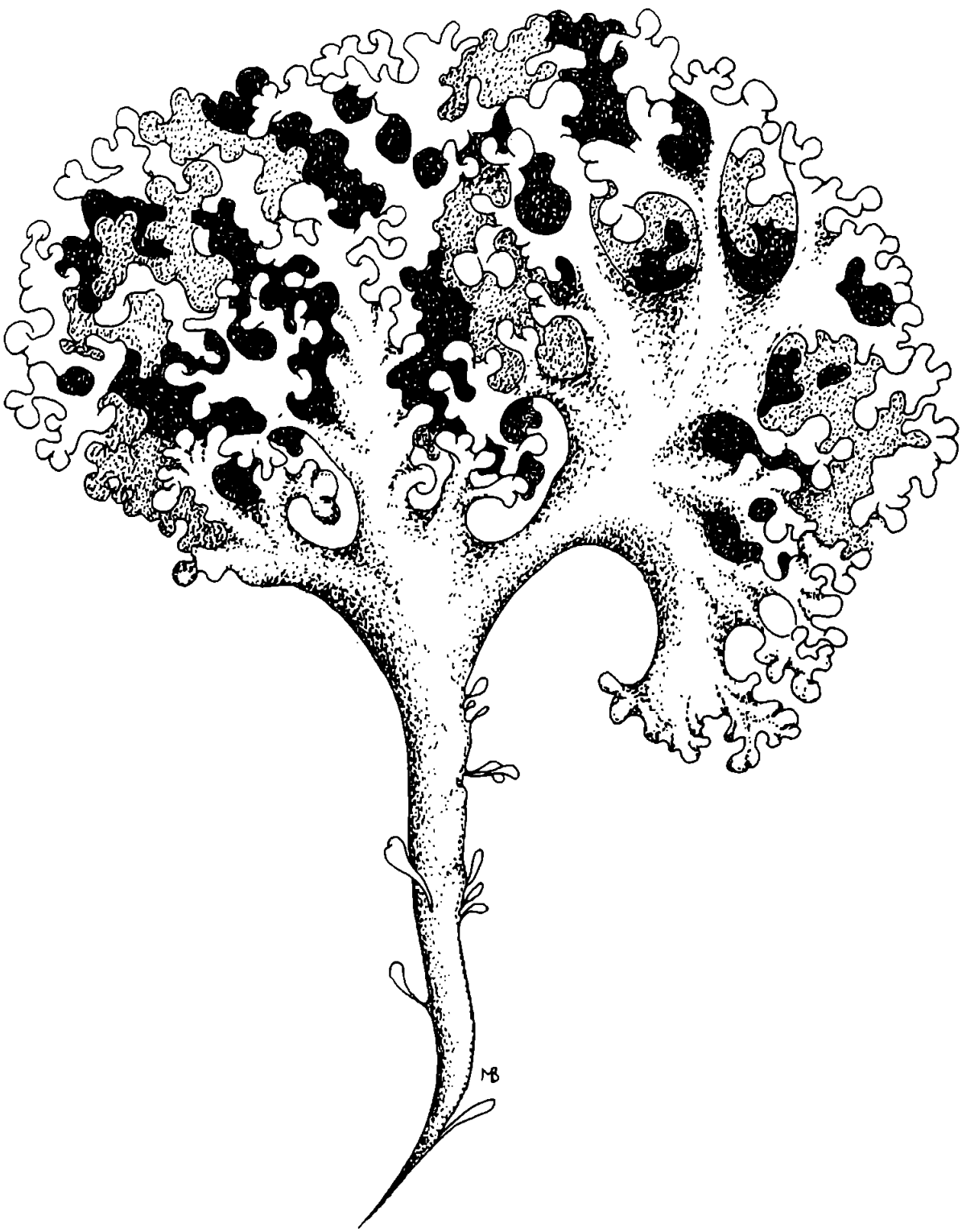
Alaria esculenta
Tangle, Edible Kelp

Description
Brown algae. Obvious midrib extending the length of the 8-10 inch wide, 10-20 foot long leaf. Color varies from dark brown to light olive green depending upon the depth from which the plant is harvested.

Habitat
Found below the low tide mark, always submerged and attached to rocks in exposed locations. This species grows from the North Temperate to Subfrigid Zones in the Atlantic Ocean, but other species of this genus are found in the Pacific Ocean in similar zones. When harvesting, leave the first three or four feet next to the holdfast to facilitate speedy regrowth.

Uses
The fresh midrib sections are deliciously sweet and crunchy when chopped into raw salads. The remaining leaf should be dried and later rehydrated for use in soups or steamed as a vegetable dish.

Sources
Not commonly sold commercially in the U.S., but sometimes labeled and sold as wakame.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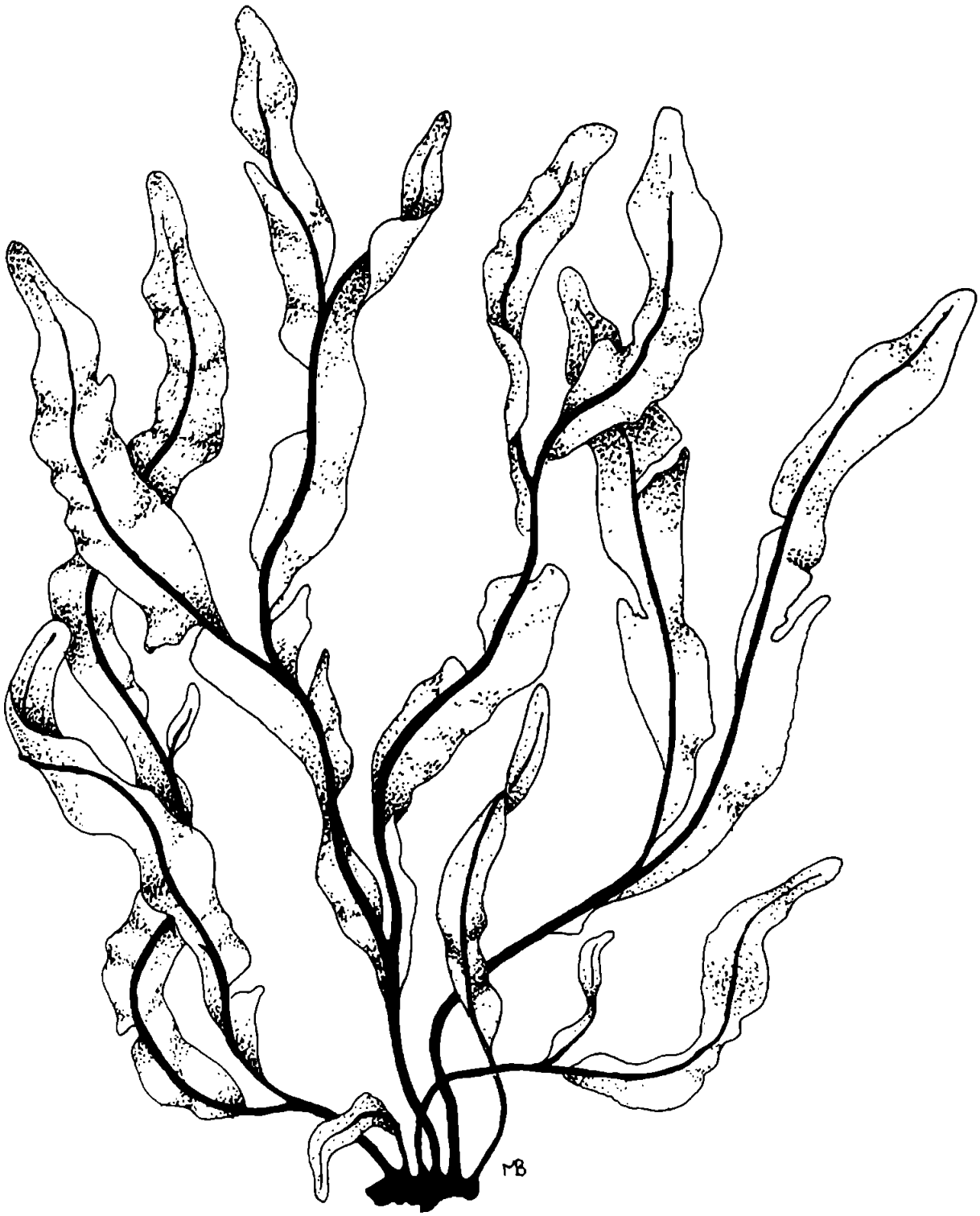
Chondrus crispus
Irish Moss, Carrageen

Description
Red algae. The color of these plants ranges from reddish-purple when grown in shaded areas, to light green and white in exposed locations. It is a bushy plant that grows to about 6 inches in height and 4 inches in width, often forming dense colonies that completely cover large rocks.

Habitat
The plant grows in the North Temperate Zone of the Atlantic Ocean from the low tide mark to near three fathoms. *Chondrus crispus* can usually be found on rocks and debris in calmer pools and bays.

Uses
Carrageen is a gelatinous extract processed from the plant and employed extensively as a stabilizer and emulsifier in hundreds of different food and industrial products. Aboard a boat you can make a gelling agent, similar to agar-agar or gelatin from fresh or dried plants. Blend cleaned plants with water in a blender and then simmer for a few minutes to disperse the gel. Strain the liquid and add to chopped fruits, vegetables, etc. The plant is also chopped into chunks in soups or steamed as a vegetable dish.

Sources
Sometimes sold as agar-agar or kanten in Oriental or health food shops.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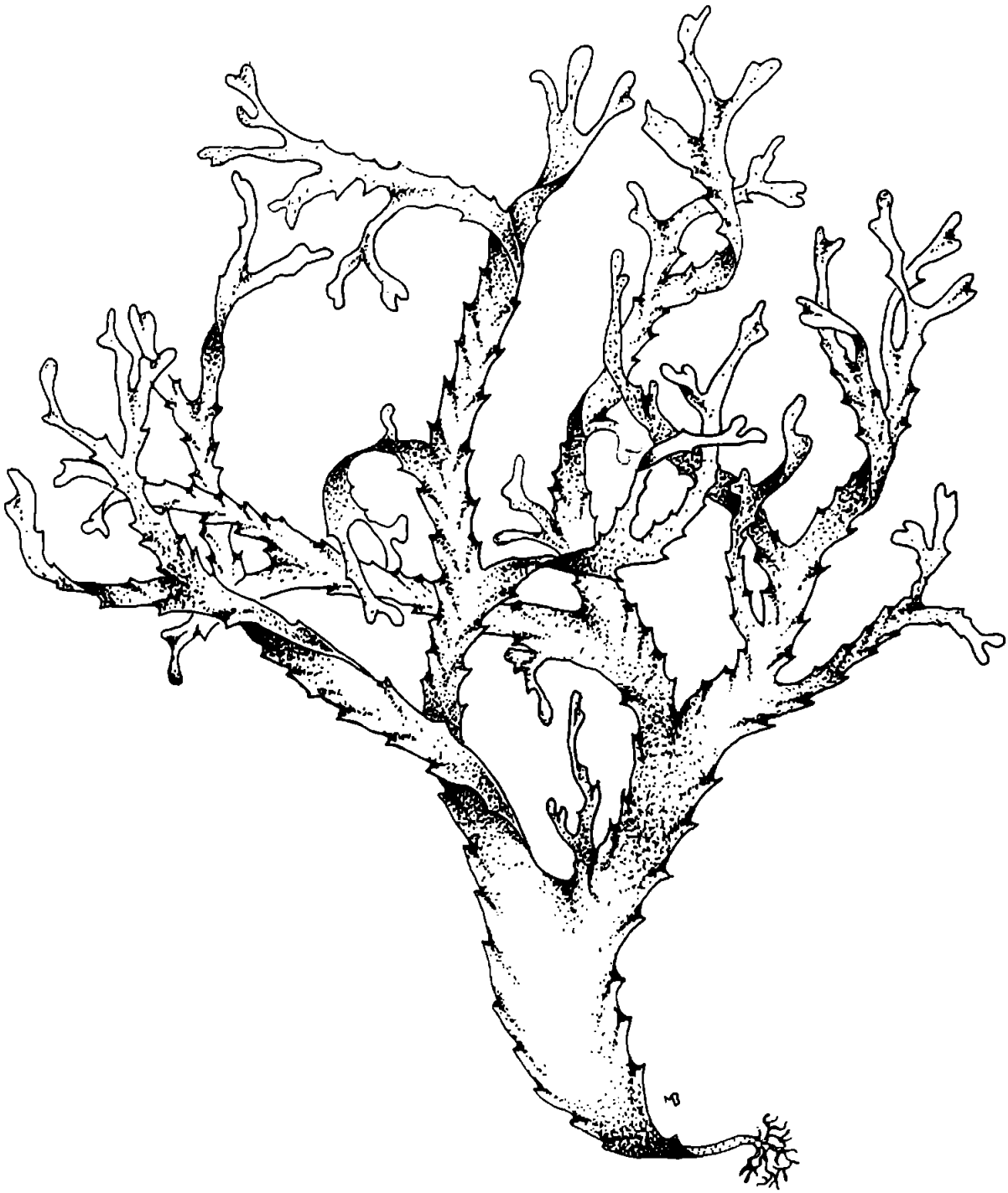
Dictyopteris membranacea
Limu lipoa

Description
Brown algae. Bushy plant with very thin 12 inch long by 1 inch wide flat leaves attached to obvious central veins.

Habitat
Grows on rocks at and a little above the low tide mark in Tropical and Subtemperate Zones.

Uses
Employed extensively in tropical Pacific areas either dried or fresh in soups and as a vegetable dish.

Sources
Generally unavailable in the U.S., but plentiful in Hawaii and throughout Polynesia.

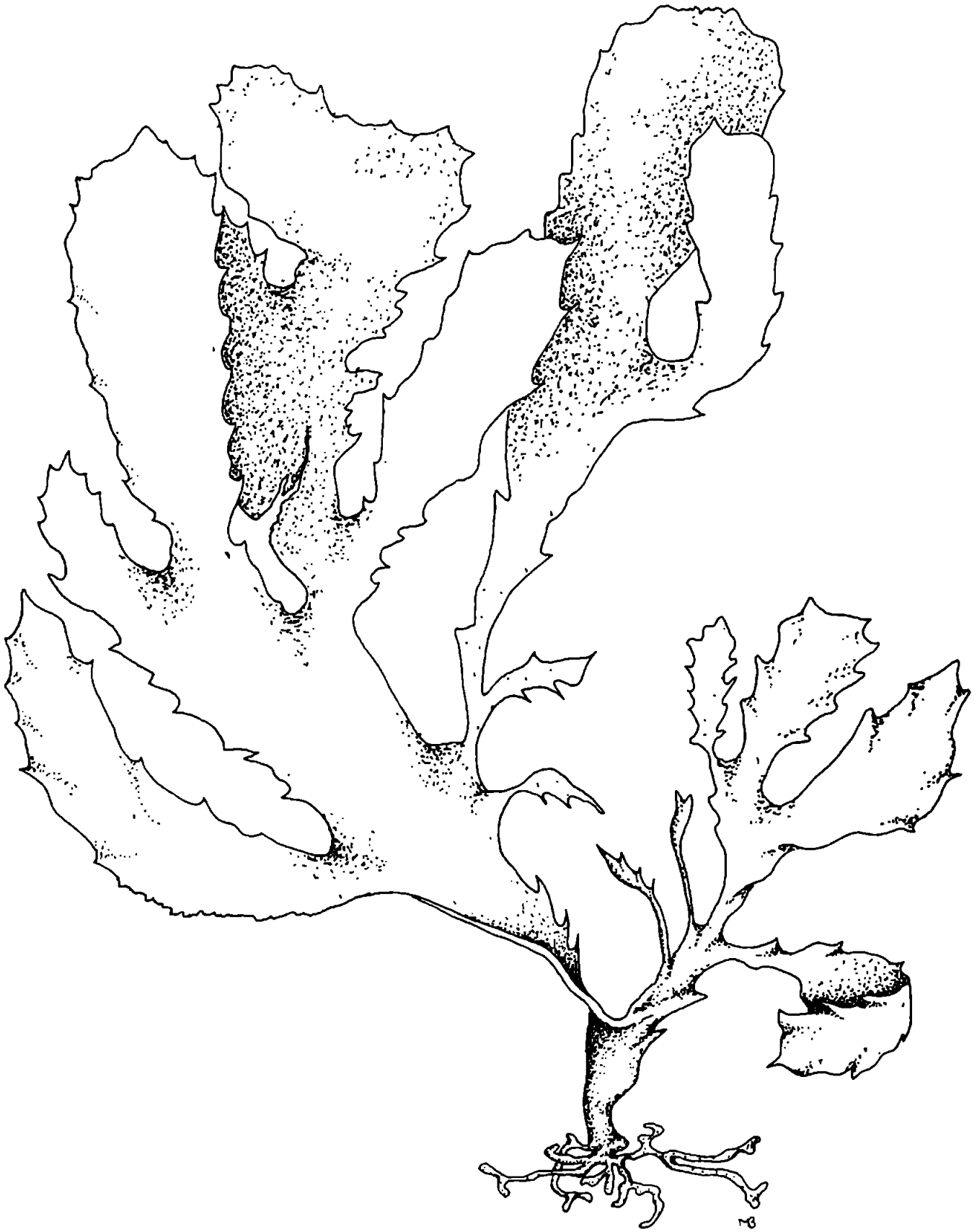


Dictyota ciliolata

Description
Brown algae. Plant reaches a height of about 6 inches with blade segments ¼ to ½ inches wide. The blades are toothed on the margins and have no midveins.

Habitat
Subtropical and Tropical Zones. Frequently found in shallow water growing on rocks as well as drifting.

Uses
Cooked dried or fresh in soups and vegetable dishes.



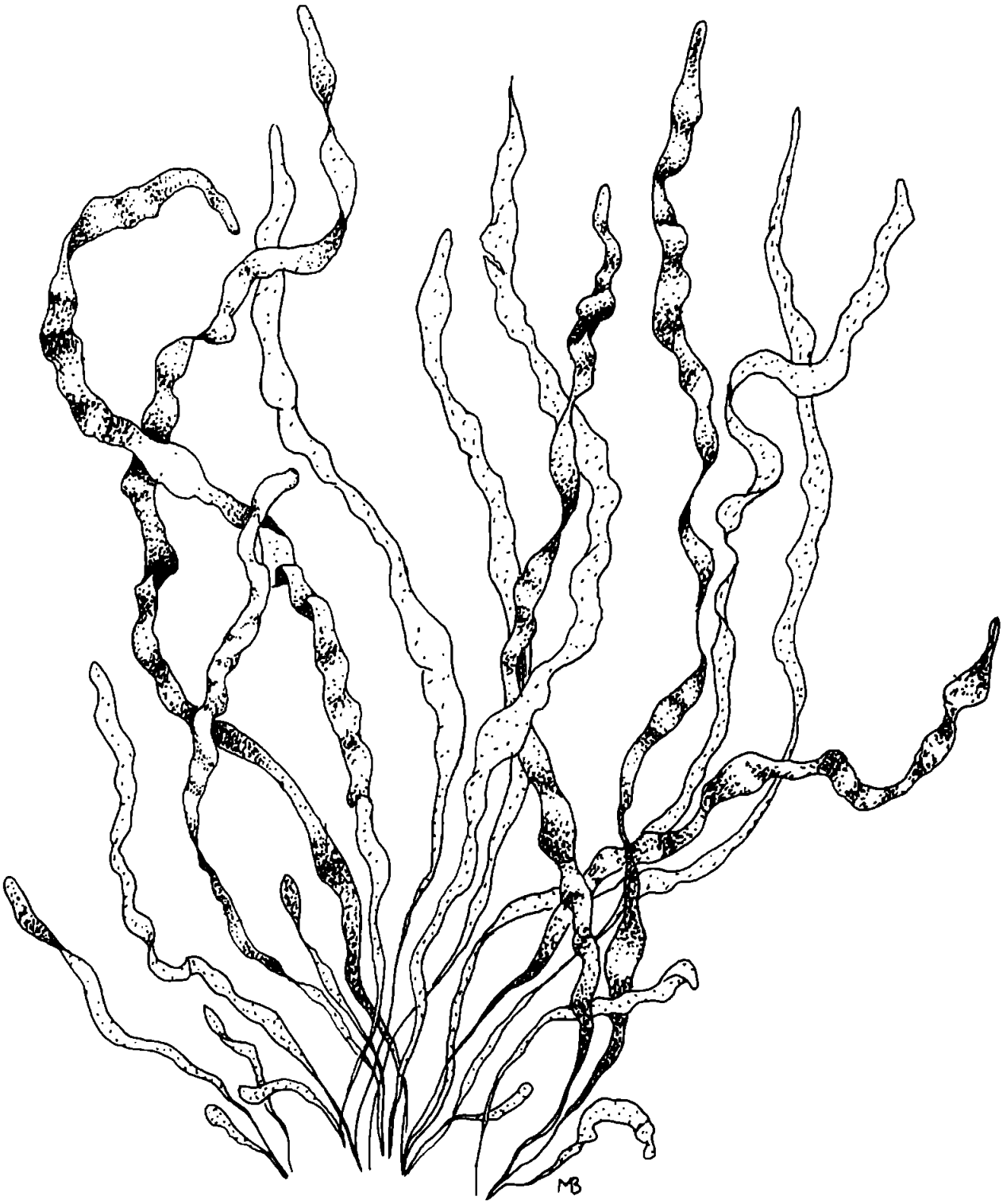
Eisenia bicyclis
Arame

Description
Brown algae. Branched blades 12-14 inches long and 2 inches wide attached to a round central stipe.

Habitat
Grows on rocks below the low tide mark in Temperate and North Temperate Zones.

Uses
Delicious chopped into soups or as a vegetable side dish.

Sources
Widely available in Oriental and health food stores.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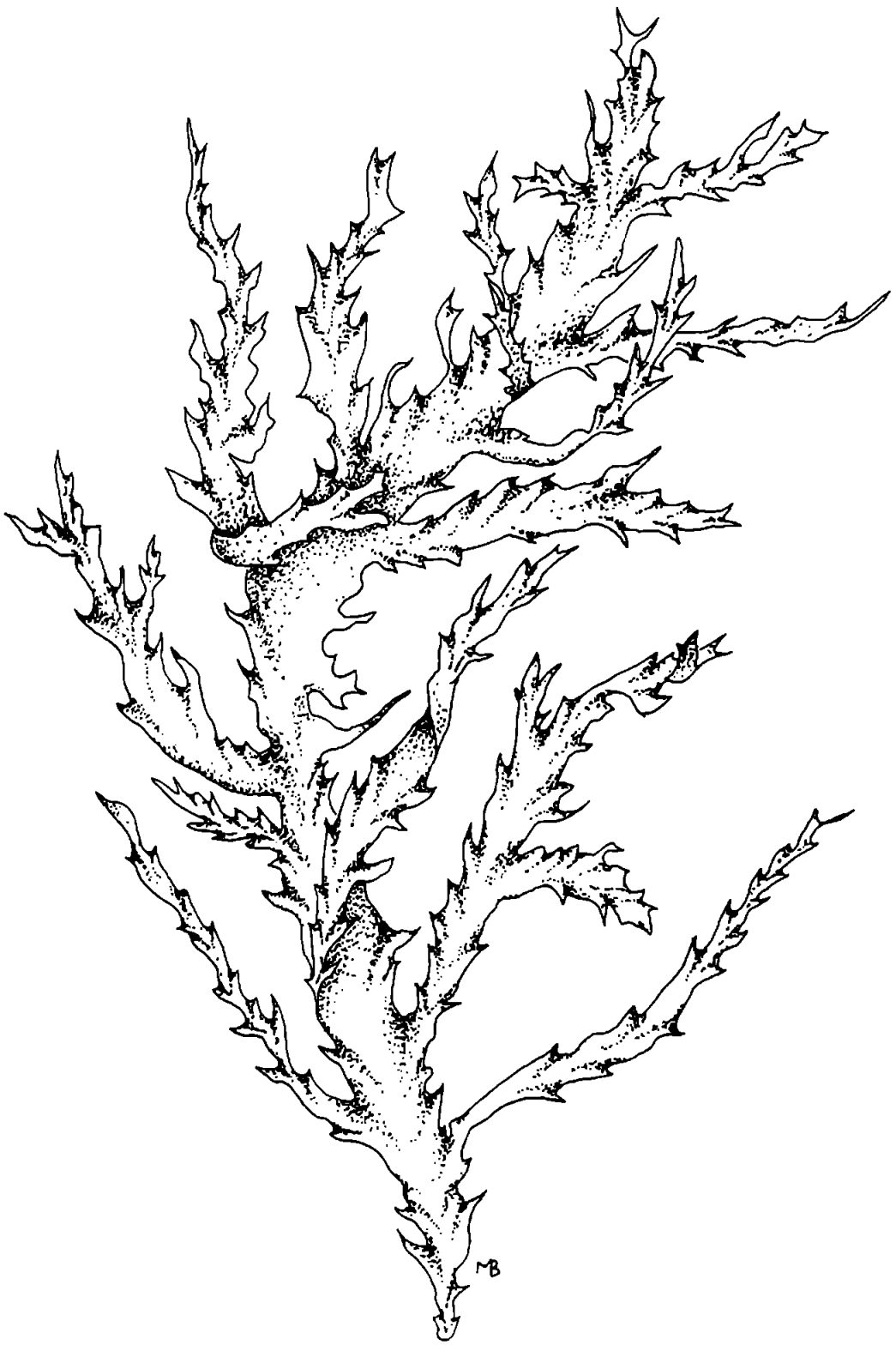
Enteromorpha intestinalis
Green Nori

Description
Green algae. Plants are 1-3 feet long with several 1 inch wide gas-filled hollow tubes constricted at intervals and resembling a section of intestine.

Habitat
Found all over the world from the high tide mark to just below the low tide mark growing on rocks and other debris.

Uses
May be eaten raw or cooked in soups and vegetable dishes. Makes a delicious topping on salads when toasted and crumbled. The dried plant is frequently pulverized to a powder for use as a mineral-packed seasoning.

Sources
Popular in Hawaii and the Orient but not found in U.S. markets.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Halymenia floresia

Description
Red algae. Very soft and gelatinous texture with a color ranging from light pink to reddish-purple. Plants are profusely branched from the flat main axis and commonly grow to a length of 14 inches by 12 inches wide.

Habitat
Often found drifting on the open sea or attached to rocks in deep water (2-7 fathoms) from the Tropical to Subtropical Zones.

Uses
Prepared dried or fresh in soups, salads and vegetable side dishes.

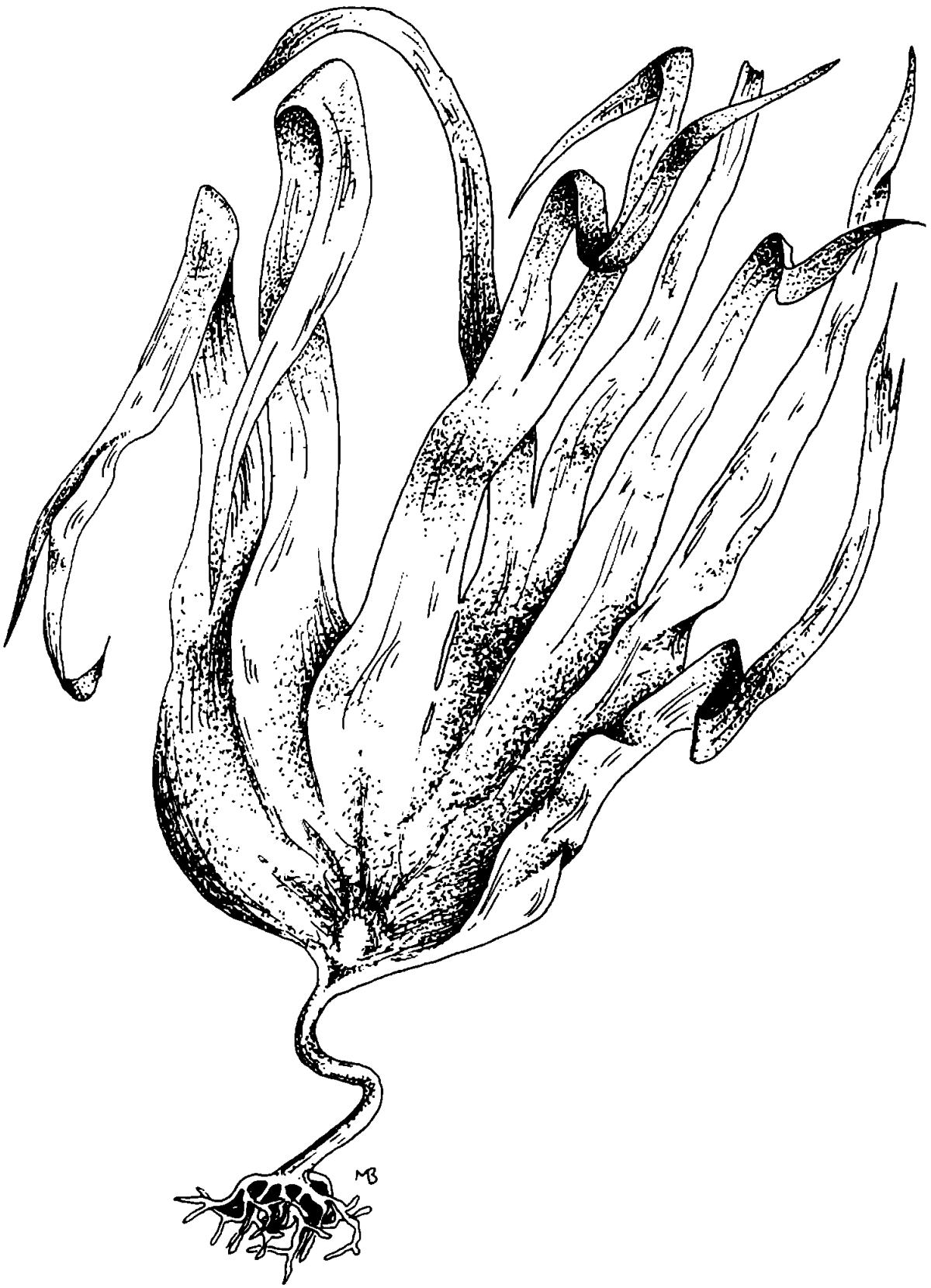
Hizikia fusiforme
Hijiki

Description
Brown algae. Many swollen cylindrical blades branching from a central stem. Blades usually pointed on the end and where it attaches to the branch.

Habitat
At or below the low tide mark in Temperate to North Temperate Zones.

Uses
This is a very popular vegetable in the Orient and has found a place in many different recipes. The dried or fresh plant may be sauteed, steamed or boiled for a vegetable dish, chopped into soups or made into tea. The taste of hijiki is similar to arame with the latter being a bit more mildly flavored.

Sources
Found in practically all Oriental and health food shops.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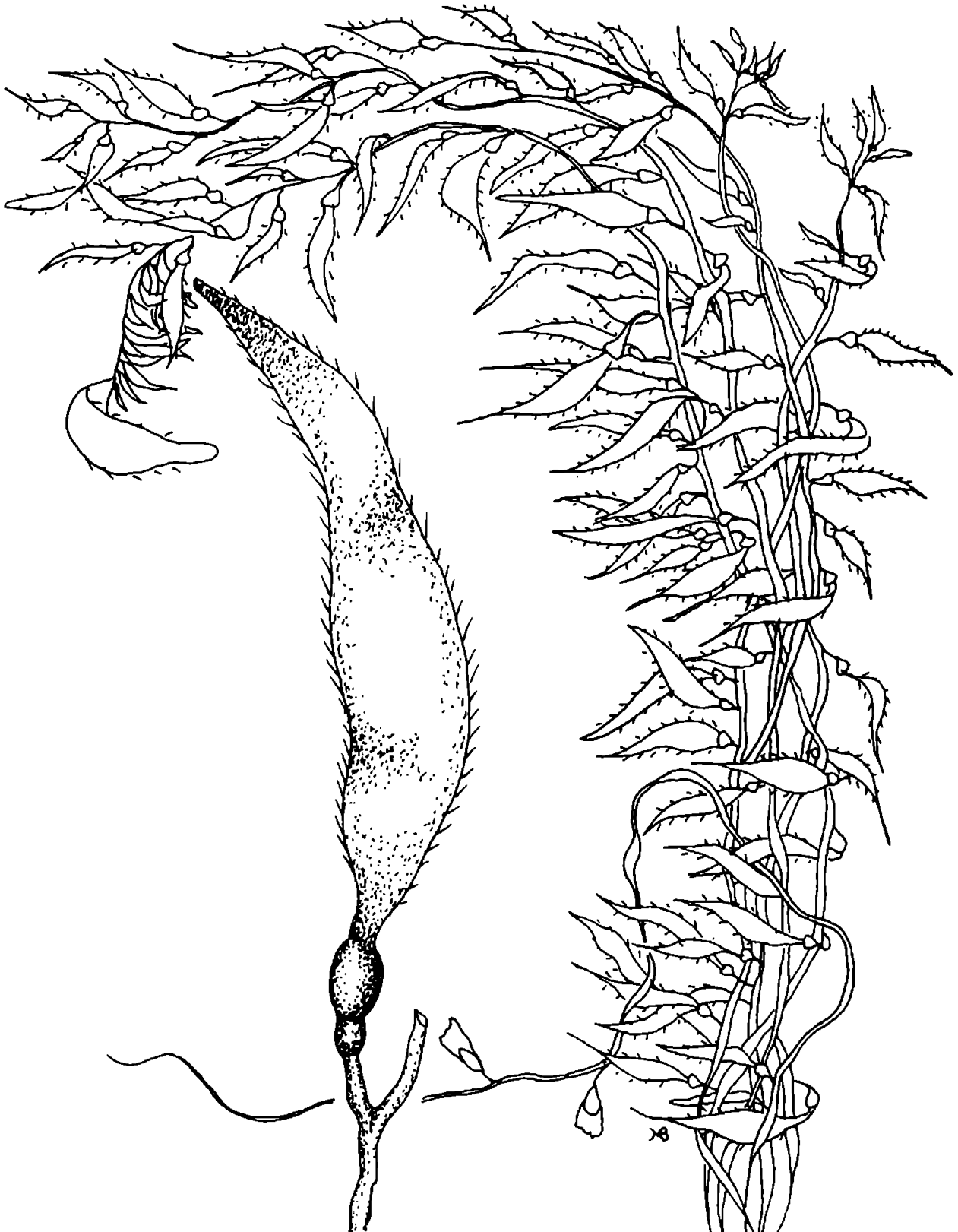
Laminaria digitata
Kombu, Horsetail Kelp, Tangle

Description
Brown algae. When the plant is mature it is fan-shaped, approximately 2-3 feet in diameter and composed of many flat, narrow segments. The flexible stipe that attaches the plant is round at the holdfast but flattens out where it joins the blades.

Habitat
Found in cold waters between the Temperate and North Temperate Zones of the Atlantic Ocean just below the low tide mark.

Uses
The tenderest fronds are cooked in soups or prepared as a vegetable side dish, usually after drying.

Sources
In America, this seaweed is frequently labelled and sold as kombu in many Oriental and health food stores.



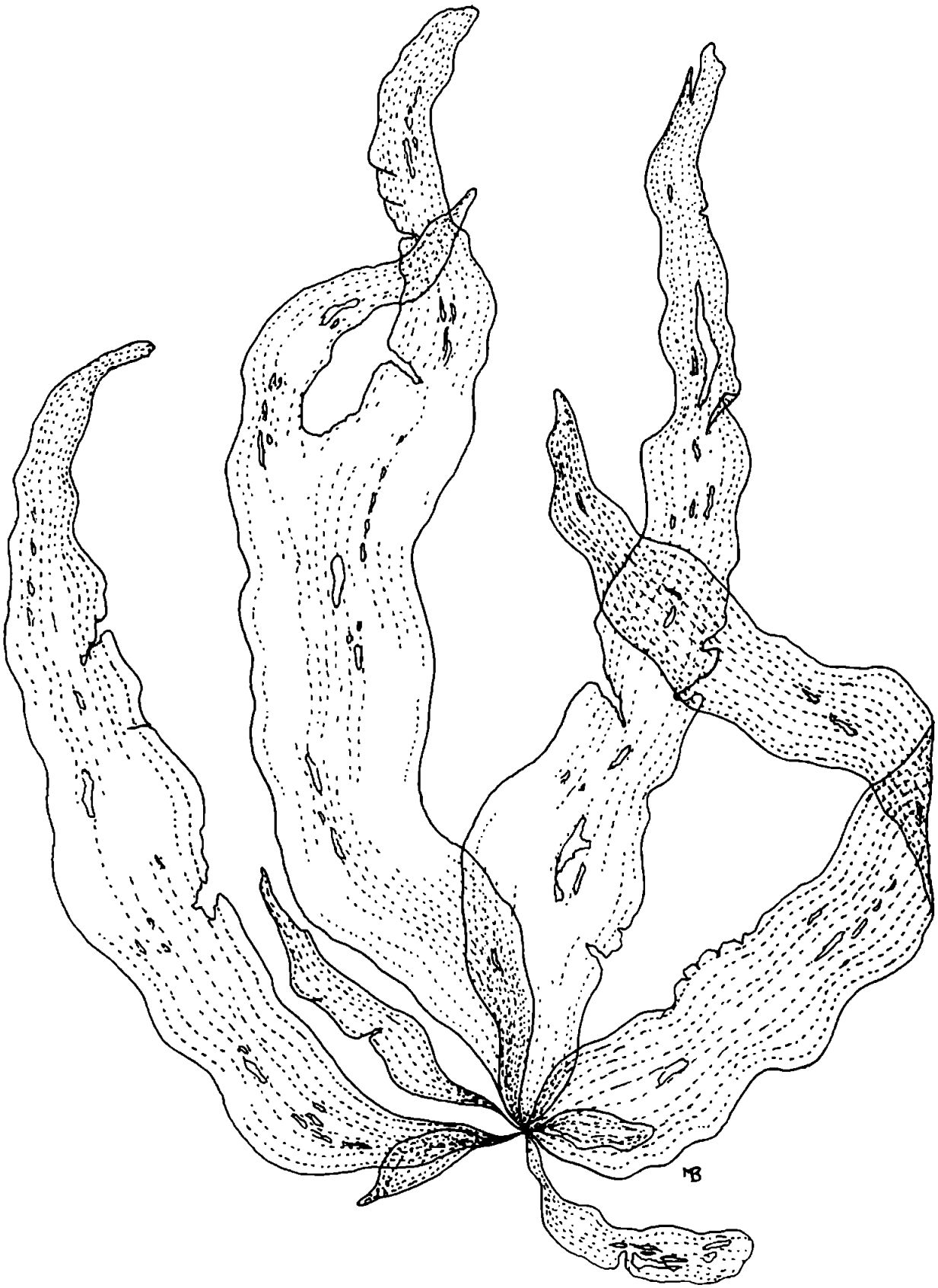
Macrocystis pyrifera
Giant Kelp

Description
Brown algae. This is a huge seaweed that grows up to 200 feet long with a central stipe of several inches in diameter, sometimes reaching 3 feet or more near the holdfast.

Habitat
Grows from the sea floor at depths of 60-90 feet, frequently reaching the surface. Found below the low tide mark in the North Temperate Zone of the Pacific Ocean. Frequently found free floating and on beaches after stormy weather.

Uses
Usually dried and ground into powder or flakes to be sprinkled on soups, salads, etc., as a seasoning. Makes a perfect high vitamin and mineral substitute for salt when powdered.

Sources
Available in most Oriental and health food stores in powdered form.

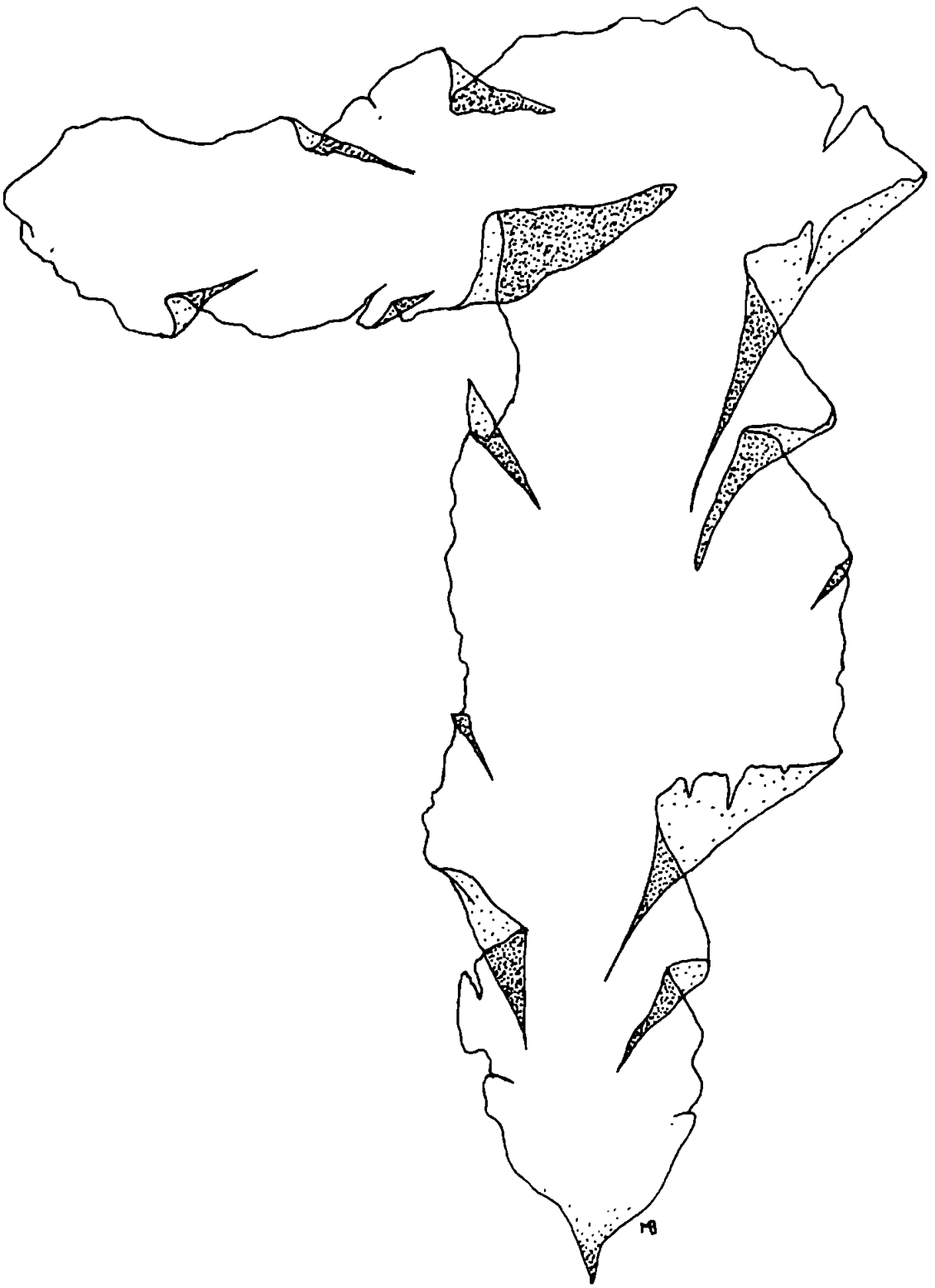


Petalonia fascia

Description
Brown algae. These plants have flat, membranous blades that grow 14-18 inches and attach next to the holdfast. Their color is light to dark brown depending on the intensity of the sunlight reaching them.

Habitat
Grows on rocks in shallow water between the high and low tide marks all over the world.

Uses
Fresh or dried plants may be chopped into soups, mixed in salads or cooked as a vegetable dish. It is often chopped and blended with water to form thin sheets similar to nori. Cut into larger pieces, it is used like wakame in many different recipes.



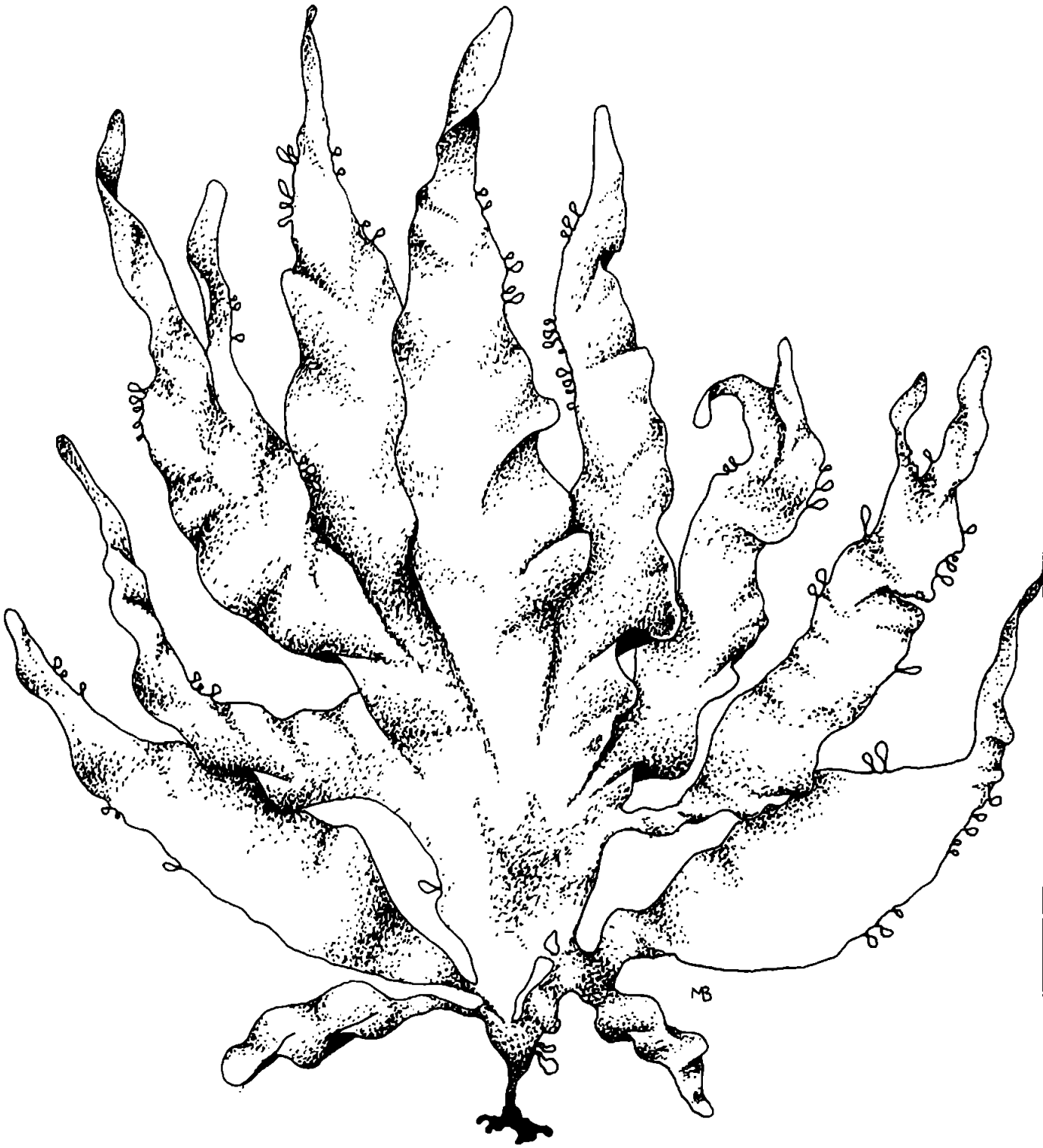
Porphyra tenera
Nori, Purple Laver

Description
These are sheet-like, tissue thin plants that grow about 12 inches long. When young, the plants are light pink but change to purple or brownish-red as they get older. In a fresh, wet state the plants are gelatinous and slippery.

Habitat
Species of *Porphyra* are found from Subtropical to Arctic waters world-wide. They attach to other seaweeds and rocks at and a little above the low tide mark.

Uses
The plants are delicious fresh in soups or chopped and dried to make thin sheets. These sheets are used just like crepes for wrapping around rice and salads for many interesting dishes. When blended thoroughly in a blender and then simmered for a few minutes with water, a gel will form similar to agar-agar or gelatin.

Sources
Widely available in Oriental and health food stores as thin sheets.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Rhodymenia palmata
Dulse

Description
Red algae. Color ranges from reddish-purple to almost black. Blades are very mucilaginous and slippery, growing about 1½ inches wide. The whole plant reaches a length of 15-20 inches and about 6 inches in width.

Habitat
Grows between the high and low tide marks and into deep water from the Temperate to Subarctic Zones.

Uses
This versatile plant is employed extensively around the world in many ways. May be eaten fresh or dried, raw or cooked, in salads, soups, stews and vegetable dishes. Toasted over a low flame and then crumbled, it adds a crunchy taste of the sea to soups and salads.

Sources
Available in practically all Oriental and health food stores.

Turbinaria turbinata

Description
Brown algae. This is an odd looking seaweed with many pyramid-shaped inflated leaves attached to a central axis. Grows 12 inches or more from well-branched holdfasts.

Habitat
Found throughout the Subtropical and Tropical Zones between the upper tide mark to below the tide mark on rocks and other debris.

Uses
The softer leaves and central axis may be chopped fresh or dried into salads and soups, or cooked as a vegetable dish.

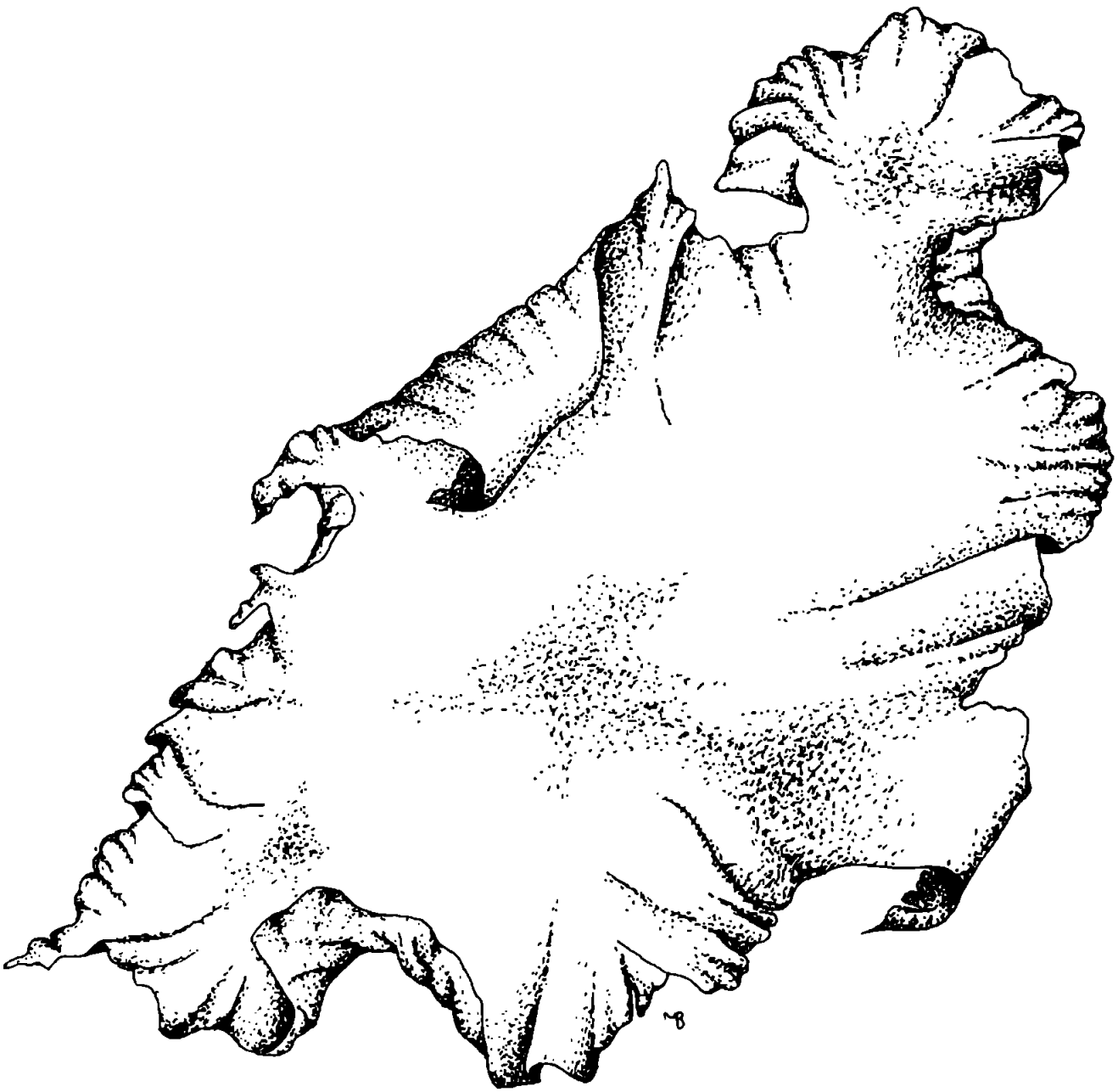
Sources
Generally unavailable in the U.S., but found in tropical Pacific markets.

Sargassum fulvellum
Gulfweed, Mojoban

Description
Brown algae. Color ranges from light gold to dark brown. Obvious central stipe with many toothed leaves and round air bladders.

Habitat
Various species are found throughout the world free floating or attached to rocks below the low tide level. Huge masses of these plants are commonly encountered drifting with the currents in the Bahamas and Sargasso Sea. When cruising in the Caribbean, more likely than not this is the seaweed that is always fouling the distance log and fishing line.

Uses
May be eaten fresh in soups and other cooked dishes, or raw when dried. Makes a delicious seasoning powder similar to powdered kelp.



Ulva lactuca
Sea Lettuce, Green Laver

Description
Green algae. These plants look much like the regular leaf lettuce that grows on land. The blades are extremely thin and transparent, reaching a length of as much as 20 inches when mature.

Habitat
Found in all zones at or near the low tide mark in quiet shallow pools. While usually attached to rocks, these plants can frequently be harvested hundreds of miles from shore and are perfectly edible if they look fresh.

Uses
Fresh or dried in salads, soups, sautees, etc. Very good dried and eaten raw.

Sources
Available in many markets in the Orient, but rare in the U.S.

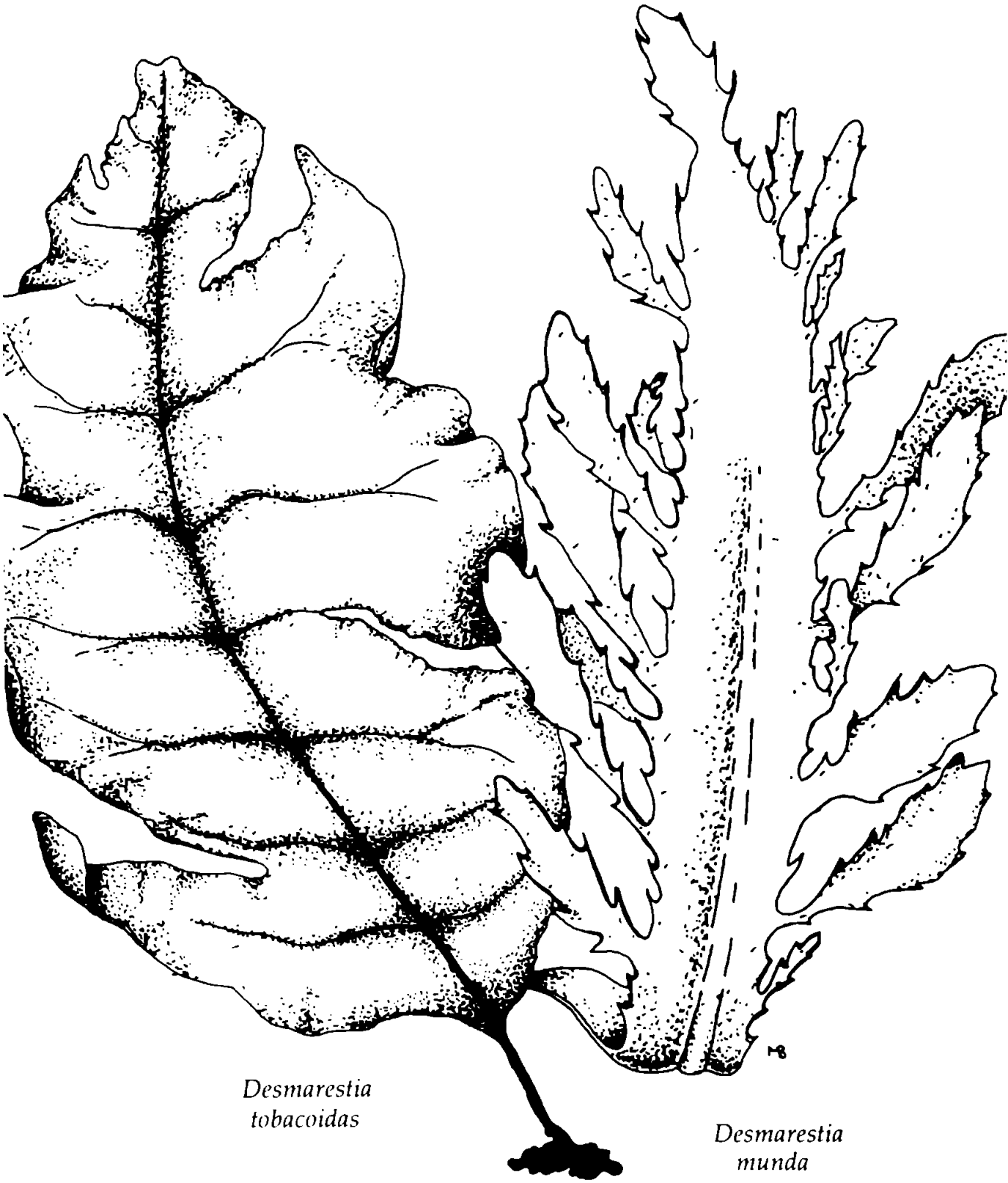
Undaria pinnatifida
Wakame

Description
Brown algae. Plants are 3-4 feet long and 15 inches wide when mature. The deeply segmented blade is attached to a very pronounced midvein.

Habitat
Found growing on rocks at or near the low tide mark in Temperate to North Temperate waters.

Uses
After the tough midvein is removed, the plant may either be used fresh or dried in soups, salads and vegetable dishes.

Sources
Wakame is available in most Oriental and health food shops in the U.S.



Desmarestia tobacoidas

Desmarestia munda

Desmarestia

Description
Brown algae. This genus is one of a very tiny group of inedible seaweeds. Identification is simplified by the fact that sulfuric acid contained in the plant will bleach anything it comes in contact with after a short while. If you happen to taste this plant, the pungent sour lemon flavor will make your mouth turn inside out and leave little doubt as to its undesirability. The various species have a single erect stipe that branches from both sides.

Habitat
Found below the low tide mark from Temperate to Arctic waters around the world.

7
Preserving Food

Here's what to do with that 20 pound stalk of bananas you paid $1.50 for in Jamaica, the valuable seaweed you collected or the basket of pineapples that are getting ripe all at once only one week from Panama on the way to Tahiti. Dry this produce and enjoy really delicious meals for the length of your longest passage. Even if sailing around the world non-stop, you can still eat those great papayas and oranges you dried before you left port 25,000 miles ago!

By purchasing or foraging fruit, vegetables, fish and seaweeds when they are cheap, and then drying them, you can save a lot of money over buying canned food. And money is not all you'll save. Food is severely cooked when prepared for canning in order to kill any harmful bacteria that could cause it to spoil, but not only the bacteria is destroyed. In fact, up to 65 percent of the vitamins and most of the digestive enzymes are as well. Much of the protein is either destroyed

or inactivated. What do you eat for anyway? To live, eat live food. Beans won't sprout out of a can of pork'n beans soup because the "germ of life" is killed. Canned food is not live food and does not support live bodies.

Foods preserved by canning usually are loaded with salt, sugar and preservatives. When you buy cans you have to pay extra for these goodies that are known to cause all kinds of illness. There were no can trees in the Garden of Eden so leave them out of *your* paradise too.

DRYING

When foods are gently dried at 120 degrees F, the life energies are not extinguished and a seed will still germinate. All drying does is slow down the normal processes of fermentation and enzymatic digestion to a harmless dormant state. Life cannot function efficiently when no moisture is present as the cell walls become almost impermeable to bacteria. You can either leave in the juice and kill the bacteria by heating, or dehydrate the food to make it really difficult for them to thrive. Dried foods contain practically all the vitamins found in the fresh food and can be brought back to their natural juiciness and flavor by soaking in water.

Almost everyone likes raisins and dried apricots, but how about chewy chunks of dried pineapple or crispy banana chips? Just about anything may be dried if done properly in the right equipment. You can eat your fill of mangos, then dry the surplus for use months later. The lobsters picked up on an offshore coral head in the Bahamas can be saved for a night of eating enjoyment much later. In addition to showing pictures of your cruise to friends back in port, why not serve them some of your adventure too? Pineapples, oranges, melon, papayas, seaweeds, fish, vegetables: almost everything is delicious and easy to dry.

The advantages of having a drier are not only for food preservation. Many foods can be prepared in a drier instead of an oven. Let the sun work for you to make tortillas, flat breads, crunchy granola and chips that can be stored or eaten any time while using no fuel at all.

When waiting in port for crew, parts, weather, etc., earn money by drying fruits to sell to fellow voyagers and markets in other areas not so well endowed with fresh fruit. With very little effort or money you could dry and store large quantities of dried herbs, fruits, seaweeds and fish to sell in ports thousands of miles away. We all know the high price of these products and their heavy demand. Why not sell dried foods to postpone into the future the need for taking a shore job and growing barnacle stalactites on the boat's bottom?

With space at a premium on cruising boats, dried foods are real gems. Twenty pounds of tomatoes dry to one and one-half pounds. Four pounds of bananas become one pound. Instead of heavy cans, you have light packages that will fit anywhere. A year's worth of food is storable even on a very small craft. The loss of water is easily made up by rainfall, solar distillation and tank storage.

Think of how much room is allotted to cases of juice, soda and beer. And money too! The best drinks on the seven seas are made by just soaking dried fruit in water for several hours. Sugars, flavors and vitamins leach into the water and make a fine refreshing drink that hasn't been cooked to death and then embalmed with artificial preservatives and synthetic sweeteners. Just let go of sugary chemical sodas, plastic potato chips and canned gourmet bean dip. In their places have fresh juices, vegetable chips made in the solar drier and fresh yogurt and herb dip for a healthy homemade mid-ocean delight. Dry as much as you can and store it. Excess can always be traded or sold for a profit along the way. Everybody has to eat!

Why a Drier?

Simply setting sliced fruits and vegetables out in the sun will dry some of them some of the time, but don't expect consistent or quick results. The best drying and preserving is done at a temperature of 110-120 degrees F, at low humidity, and as quickly as possible. The ocean environment is not the most ideal one as the high humidity prevents fast or thorough drying. If foods take too long to dry they may become moldy and start to spoil. For best results a proper drier is necessary. You want to avoid having trays all over the deck for days, rain and flying sea gull bombs falling on the food and having to move the food in and out every night for the four or five days it takes to dry in the open air.

A good drier should maintain a steady, even temperature of 120 degrees F in an enclosure heated by the sun. Heat alone, however, is not all that is necessary. Ventilation is needed to carry off the moisture driven from the food. Natural convection currents are formed which cause air to enter at the bottom and exit at the top. With no heat the food doesn't dry; with high heat and no ventilation the food steam cooks and stays soggy. By adjusting vent flaps for the proper temperature, it is possible to create perfect drying conditions, even on the ocean with a heavy sea running and spray in the air. The enclosure protects the food from insects, birds and ocean spray. See the detailed description in the tools chapter for an ocean-going solar drier. Build your own if you wish or buy one. Either way it's a good investment that will return your money many times over, and that will supply you with just about the best food anywhere.

Storing Dried Foods

There is no reason why dried apples stored in a proper container shouldn't last 15 years without the use of BHT, sodium nitrate or sulfur dioxide to enhance the color or preserve the "freshness." All these chemicals are added to

foods to give the producer higher profits because they reduce the necessity for proper handling, packaging, using the best raw materials, etc. By using good produce that is carefully dried and packaged, you can get around all these chemical gimmicks and have some really good food years after the day you spent in the jungle picking wild papayas or bringing that 60 pound grouper to the surface.

Most properly dried foods will store indefinitely if kept dry, cool and in a dark place. Moisture, warmth, oxygen and light create a perfect environment for microbes to do their damage. As soon as the food is dry it should be prepared for long-term storage if not to be used soon. First wrap the item in plain parchment paper or a brown paper bag and tape shut. The paper will absorb any moisture in the food or air, as well as prevent light damage. Then seal the wrapped food in a heavy-duty plastic bag and store in an airtight can or plastic pail. Wrapping the food in paper will also prevent the food from coming in direct contact with the plastic. Polyethylene is supposedly inert when in contact with food, but for long storage I prefer no contact at all. More packaging details are in the food storage chapter.

Doing it the Dry Way

Drying times vary according to the amount of water in the material, the thickness, weather conditions, packing density in the drier, etc. Fruits will dry in less than two days, breads and cereals in a few hours and fish in one or two days. Don't rush it. Remember, temperatures over 120 degrees will just reduce the value of the food. Use ripe fruit and vegetables — washed, peeled and seeded where necessary. Fish should be absolutely fresh caught and very clean, cleaner than you would want them for cooking. Pack the trays loosely so that air will circulate freely. Plastic wrap or parchment paper is put on the rack for really juicy foods, bread and cereal batters, and leathers. Do not use wax paper as the wax will melt in the hot

drier. After a few hours, when the food is more solid, the paper or wrap is removed to facilitate speedier drying.

How do you know when it's done? Sweet fruits should be tough, spongy and bend when bent — not necessarily break, though if sliced very thin and dried longer they can be made crispy. Vegetables should be crisp and powder when rubbed. Items like fruit and vegetable leathers are as the name implies — tough, pliable and leathery. No evidence of wetness or moist pockets in the food should be present when cut in cross section and inspected. Compare the texture to the familiar dried foods you've had before. You can't overdry if the temperature is kept under 120 degrees, so don't worry about that. Just make sure the food is dry enough so as not to cause mold three months later. More specific information is given in the individual listings concerning preparation, drying times and procedures.

By dipping fruits such as apples, bananas, pears, etc., in lemon juice before drying, discoloration due to oxidation can be reduced. This hardly affects the taste at all and will keep fruit much fresher looking.

FRUITS

Apples

Keep the doctor away for good by drying up plenty of apples to munch on everyday. Be certain that you don't leave the peel on, as nutritious as it is, if the apple is waxed. It is easy to determine this by scraping the skin with a fingernail or knife. The wax will come off in flakes the same way it will with a candle. Wax helps to preserve the apple by preventing the absorption of air and water through the skin, but who wants to eat candles?

Slice into ¼ inch pieces and dry until they almost break when bent. To make apple juice from the dried apples, just blend ½ cup apples with 2 cups water and strain. The pulp is

good so don't waste it. For apple sauce, blend ½ cup apples with ½ cup of water.

Apricots

Same as peaches.

Avocados

Avocados are not the best fruit to dry as their high fat content tends to spoil easily. Properly dried, however, they will last at least a month in case you have several that would spoil otherwise. Slice ¼ inches thick; dry until hard. They should be harder than most fruits and should break when bent. To make guacamole, blend ½ cup dried avocado with ½ cup water. A little lemon juice and yogurt will lighten the dip to a more soft and creamy texture. Herbs such as onion, garlic and cayenne pepper give it that south of the border touch.

Bananas

Here's where your drier can really do some good for those insistent snack attacks that simply won't go away! You can't eat just one of these — that is unless you happen to be in the middle of the ocean when you run out! Bananas should be nicely ripe before drying. "When they're flecked with brown and have that golden hue, then bananas taste the best and are the best for you!" When ripe, the starch is all converted to sugars that are very digestible and good for a quick energy zap instead of a candy bar.

Bananas are good dried several ways. Here are three:

- **Chips** — Slice as thinly as possible, about ⅛ inch, and dry until crispy like potato chips. I have never met anyone who could eat just one handful at a time if more were available!
- **Slices** — Cut a little thicker than for chips, about ¼ inch. Dry until almost hard, but not so they break when bent. These are a little chewy and great on cereals, pancakes and fruit salads.

• **Logs** — Cut the banana lengthwise into quarters and dry until chewy and not too hard. These will not store as long as the chips because of the higher moisture content, but are different and very delicious.

Berries

All kinds of berries can be dried and will really sparkle in your morning cereal or fruit smoothies some day when the memory of gathering the fresh fruit is long forgotten. Boysenberries, blackberries, mullberries, blueberries, raspberries, strawberries, cranberries or whatever you have are best dried when they are not crushed or overripe. Larger berries such as strawberries, cranberries and blueberries should be cut in half to shorten the drying time. Others can be left whole if they are small and have no tough skin that would prevent moisture escaping from the inside. Dried berries are great blended into a sauce or mixed with fresh yogurt after presoftening.

Coconut

Fresh whole coconuts don't store well sometimes as the juice ferments causing the shell to split from the pressure. You can get coconuts free anywhere in the tropics and dry them very easily. Break the shell with a hammer and remove the meat by prying with a spoon. You may want to remove the brown skin, as it is mostly cellulose and indigestible, before grating the white meat rather fine. Dry until almost crisp and tough. Coconuts are somewhat fatty with almost no water and will dry in little time. The dried coconut may be used in leathers, sprinkled on cereals, fruits, and cookies or made into cream and butter. A coconut cream pina colada is hard to beat at sunset!

Grapefruit, Oranges, Lemons, Limes

These fruits can be gathered or bought very cheaply and will add *real* tang to your seafaring diet. The peel can either be left

on or removed, depending on your taste. Dried peel is delightful grated in yogurt, sauces and pies.

Remember that anything bought commercially in the U.S. is probably waxed, dyed and heavily coated with preservatives. Producers treat the incredibly nutritious peel as if it was just another plastic wrapper. Why does an orange need to be dyed anyway? Can't we just accept the cold, cruel reality that many oranges are naturally green when ripe and have brown patches? Madison Avenue has decided that oranges should be orange so as not to confuse uninformed consumers. Uniformity is the path to higher profits. But you can't eat the skins of fruit from these "trees of greed."

Many of the fruits and vegetables found in the "less progressive" areas of the world are usually more natural. If the peel is to be eaten, grate and dry separately from the juicy inside. Cut the fruit into ¼ inch slices and dry until tough without any pockets of juice left in the sections. Leave the imitation orange drink alone and make the best instant juice from the dried citrus on board your craft. Just blend ½ cup dried citrus with 2 cups water and start the day off with a glass of liquid sunshine!

Grapes

Because of their tough skin, grapes should be cut in half to shorten the drying time. The seeds are full of minerals and protein so just leave them right in. Due to the high amount of sugar in grapes, they take a bit longer than other fruit. Dry fairly hard.

Leathers

Leathers are fruits or vegetables that have been ground or blended into a thick sauce and then dried to a thickness of about ⅛ inches. These sheets are rolled up in parchment paper and will store for years. All your slightly overripe and odd pieces of fruit can be turned into leather. Try all different blends!

The basic procedure is to puree the fruit with as little liquid as possible and spread ⅛ inches to ¼ inches thick on sheets of paper or plastic wrap in the drying trays. The corners are pulled and taped up so that the sauce doesn't leak onto the tray. After five hours or so, the paper can be very gently pulled away, leaving the leather on the tray to continue drying. When making leathers and other foods requiring the use of paper or wrap, only cover half the tray so as not to prevent efficient ventilation.

Some yogurt and chopped nuts rolled up in a sheet of leather makes a great crepe. Seeds, nuts and grains added to the wet sauce before drying will make delicious fruit and nut bars for a good instant breakfast. A few of the many possible recipes are given in the recipe chapter, but don't be afraid to try anything, like fish leather, lobster leather, seaweed leather, etc.

Mangos

Mangos are without a doubt my favorite fruit and I consider them to be personal gifts from the gods. They taste a bit like peaches, papaya, strawberry and cantaloupe all combined into one beautiful fruit. Some people are allergic to the sap on the skins of mangos and develop a bad rash, but this can be avoided if you're susceptible by using rubber gloves when cutting away the skins.

These juicy fruits should be cut into ¼ inch slices after the large seed is removed. Thin slices will store longer, but thicker sections are chewier and may be eaten without pre-soaking. Eat these to your heart's content knowing that you are one of the privileged that get this close to paradise!

Melons

Cantaloupe, honeydew and watermelon are dryable and delicious. After removing the seeds and rind, slice into ¼ inch pieces and dry until tough but not hard. Watermelon rind is rich in chlorophyll, vitamins and minerals so it shouldn't be

wasted. Enjoy the rind juiced in the fruit press or blended and strained. Watermelon seeds are also loaded with protein and may be sprouted.

Papaya

These are so good when dried and may be had for practically nothing in many tropical countries. Remove the rind and seeds; then either cut into ¼ inch slices or logs the size of a quartered banana. The slices should be dried until hard, while the logs should be tough and chewy. These are as sweet and delicious a snack as you could find anywhere for any money. Feast heartily!

Peaches

Peaches are similar to mangos and are treated the same way except that the skin is left on after a good wash. They may also be dried by cutting in half, removing the stone, and laying on the racks skin side down. Drying in halves takes a little longer than thin slices.

Pears

Pears are prepared the same way as apples.

Pineapple

There is a whole art to determining when pineapples are fit for eating. When not ripe enough, the acids can eat a hole in your mouth. If too ripe, they start to ferment. Pineapples should be fragrant, slightly soft, usually a golden yellowish-green color, and the central leaves should pull out easily. Any oversoft spots indicate a bruise, or worse yet, an overreaction to chemical ripeners. Commercial pineapples, mostly from Hawaii, are picked green and then injected by a syringe with a chemical to standardize ripening periods. This processing makes good sense to company shareholders to increase profits by reducing spoilage, but I prefer unembalmed food. This injection is detected by finding one particularly ripe spot on an otherwise not quite ripe fruit. By the time the rest of the

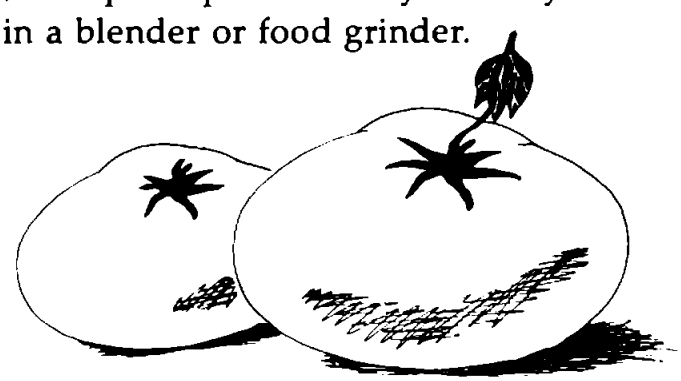
pineapple is ripe, the one spot is usually almost rotten and turned to alcohol. Pineapples from Mexico and Puerto Rico are generally excellent. The very best come fresh from the field, picked ripe and eaten immediately. You just haven't any idea what a pineapple really is when you buy them thousands of miles from where they are grown.

The whole pineapple may be used with the exception of the bottom stem. The skin is made into leather after it is washed and ground to a sauce. The core is good to chew on while preparing the rest of the fruit. The flesh can be eaten fresh or dried, and the leaves with the top ½ inch of the fruit grown in a little soil will give the solo sailor a plant to talk to!

To prepare, slice the skin off leaving as much of the flesh as possible. Remove the eyes and cut across the fruit into ¼ inch thick disks. Cut out the core to make a donut-shaped ring. The slices should be dried until rather hard, tough and chewy. They reconstitute very well, almost exactly like the fresh fruit. A great drink is made by soaking the fruit for several hours in cool water.

Tomatoes

Dried tomatoes are real goodies and may be used in all kinds of recipes. Tomato chips are made by slicing the fruit ¼ inches thick and drying until hard and crispy. Always keep a towel or pan under the drying tray as very juicy fruits drip a bit when they get warm. A very convenient powder for making instant sauces, soup, catsup and paste is easily made by crushing the dried slices in a blender or food grinder.



VEGETABLES

Fresh Beans

Green beans, snap beans, snow peas, etc., are best dried by cutting lengthwise and then diagonally into ½ inch pieces. Dry until they are hard and snap when bent. Beans are excellent in soups, whole or powdered.

Beets

Beets can be cut thin, about ⅛ inches, and dried very crispy to resemble potato chips. Be sure skin is clean or peel before slicing.

Cabbage

Remove wilted outer leaves and shred as for cole slaw. Place in drier ½ inches thick to dry until tough and chewy —almost crispy.

Carrots

Dried carrots are a crispy and sweet snack that are right for munching anytime. Wash very well or peel. Carrots may either be grated and placed in the trays ½ inches thick or cut into ⅛ inch diagonal slices. Dry these slices until crispy. Rehydrated carrots are good in salads and soups, or made into juice by mixing ½ cup carrots with 1 cup water. Blend and strain.

Cauliflower

Cauliflower chips are nice for dips and snacks or mixed into vegetable soup. After washing, cut the individual flowers into ¼ inch slices and dry until hard, but not quite crispy.

Celery

Be sure to start with fresh, unwilted celery for best results. Cut into thin slices ¼ inch thick. Dry until the slices are hard and will break when bent. The leaves are also good dried, preferably ground into a powder.

Corn

Corn is a real "staff of life" food. Just shred the corn from the cob and let dry until almost hard and crisp. To make the healthiest corn chips or tortillas, grind the fresh corn or blend to a thick mash, add some chile pepper and herbs, and spread on parchment paper ⅛ inches thick. For tortillas, make into 6 inch round disks and dry to a soft leather. For chips, spread ⅛ inches thin and dry until very crispy.

Cucumber

Cucumber is the queen of the vegetable chips. Their large diameter makes them ideal for scooping up gobs of thick, creamy chick pea and tahini dip or yogurt cream cheese. Commercial cucumbers are almost always waxed. You can feel the slimy, greasy skin and this should not be eaten. If waxed, scrape off the skin and cut diagonally into ⅛ inch slices. Dry until they're very crispy and snap easily when bent. If desired, sprinkle a little salt or other seasoning on the chips when they're wet to add extra flavor.

Herbs

Because of their fine nature, herbs should be dried on a small mesh screen set in the drier tray. This will prevent small seeds and leaves from being lost. Pack loosely and dry until quite crumbly. All kinds of herbs can be grown right on your boat or picked free on shore. Check the farming chapter for instructions on how to grow these menu perker-uppers.

Greens

This includes beet tops, chard, collard, watercress, spinach, kale, etc. After washing, cut into 1 inch square pieces and dry until totally crisp and crumbly. These are best powdered for use in soups, sauces and seasonings.

Mushrooms

Mushrooms are excellent dried and are great in mushroom and barley soup, gravies, stews, dips, etc. Use only nice

looking fresh ones. Cut into ¼ inch slices and dry until tough and leathery, almost crisp. Smaller mushrooms may be left whole and placed on the tray upside down.

Onions

This staple usually stays in pretty good shape when left fresh, but it's a good idea to have some dried if perchance the fresh ones don't make it to the next port. After peeling the outside skin, slice into ⅛ inch pieces and dry until they break when bent. Dried onions can be used as is in salads and soups, or powdered for a seasoning.

Peppers

This includes sweet green and extra hot chile peppers. They are excellent dried and add that right touch to all kinds of Mexican dishes. Unfortunately, green peppers grown in the U.S. are practically always waxed. Buy them from an organic market or from imported produce as these usually are not waxed. Slice in half, remove the seeds and cut into ¼ inch pieces. Dry until hard and crispy, breaking when bent. Chile peppers may be ground to a powder when thoroughly dry.

Potato, Sweet Potato, Winter Squash, Pumpkin

All kinds of possibilities exist for these foods. One way is to peel and then either cut into ¼ inch slices or grate before drying until hard. With this method, the vegetable must be cooked before eating. This is convenient when making soups and mashed potatoes. Another preparation is to slice into ⅛ inch pieces and steam for five minutes before drying to make ready-to-eat chips. A delicious leather is made by mashing the steamed vegetable and spreading ¼ inches thick in the trays. Don't throw out the pumpkin and squash seeds as they are 25 percent protein. Just spread them in the trays and dry until hard. They must be shelled like sunflower seeds in order to eat, or better yet, sprout the unshelled seed for easier digestion and increased vitamins.

Seaweeds

Because of the differences in textures, uses and moisture levels of the various seaweeds, there are several methods for drying these plants. These directions are the traditional ways in which seaweeds have been prepared throughout the years in many different countries. The plants are always well-washed to remove any sand, debris, small shells, etc., before drying. It is usually preferable to rinse the plants quickly in fresh water before drying to remove salt on the plant surface, but this is a matter of taste and may be omitted. Most seaweeds can be eaten raw after they are dried. In many cases drying makes the plant more palatable than if eaten raw when fresh. Properly dried, seaweeds will last for years if stored in an airtight package. Use the dried plants powdered for a seasoning, toasted whole, sprinkled on salads, wrapped around stuffing like a crepe, or steamed for a hot vegetable dish.

- **Powder** — Dry small pieces of leaf or ¼ inch slices until crumbly and then pulverize in a grinder, mortar and pestle, or blender. Package in an airtight container to keep the powder free-flowing.

- **Flat Sheets** — Nori sheets are the Japanese answer to the Mexican tortilla and French crepe. Fresh seaweed is pureed with a little water and spread as thinly as possible in the tray to dry until nearly crispy. This is almost like a fruit leather except not quite as thick. When dry, stack the sheets like paper and store in an airtight package. Use seaweed sheets cut 6 inches square to wrap fish, sprouts, cheese, rice, etc., into a roll. Many crepe recipes can be adapted to use this way. A crouton-like ingredient for a fresh salad is made by gently toasting the sheets over a low flame and crumbling into bite-sized chunks. While any seaweed could be prepared in sheet form, laver is the only species sold commercially in the U.S. like this.

• **Dried Whole and Plugged** — Leafy sheets are cut into pieces 12 inches x 3 inches and dried until tough and chewy, but not crisp. The leaves are then rolled up very tightly, like a cigar, and packaged. To use, simply cut or shred what you wish to eat off the end. Seaweeds that are prepared in this way include *Sargassum fulvellum, Undaria pinnatifida, Rhodymenia palmata, Laminaria digitata, Alaria esculenta* and *Ulva lactuca.*

• **Dried Crispy** — These varieties are simply cut into pieces 1 inch or 2 inches wide if flat leaves, or ¼ inch slices if thicker, and then dried until crispy. *Eisenia bicyclis, Hizikia fusiforme, Chrondrus crispus, Halymenia floresia, Turbinaria turbinata, Dictyota ciliolata* and *Dictyopteris membranacea* are usually stored this way.

FISH

Lean, light-fleshed fish is best for drying. Fatty, dark fish doesn't store as well because the fats tend to become rancid. Lobster, shrimp, conch and crab all dry satisfactorily and are easy to prepare. I have dived over coral heads in the Bahamas where you just couldn't believe the number of lobsters poking out of every ledge and where 40 pound groupers came out from behind forests of seaweed to check out this strange two-legged fish. But how much can you eat in a couple of days? One 40 pound grouper will supply protein for a long while if dried and packaged properly.

Don't assume you'll catch fish by trolling in the deep sea. Catching fish in the middle of the ocean is not something to count on at all. Many transoceanic sailors report not catching any fish at sea, so get a supply while near shore or over reefs. With good tackle, it is usually possible to hook dinner, but nothing beats the direct approach of meeting your prey face to face. You can always come up with something by skin diving with a spear.

Your craft should stock the tools necessary for under-

water foraging — fins, masks, snorkels, spears and heavy-duty leather work gloves. For lobster use a heavy three-prong gig on the end of a five foot pole. This tool is illegal in some places but there is nothing more effective, quicker or safer if you're hungry. With a gig like this you come from above and pin the lobster with the gig while reaching down to grab it with the other hand. It always seems that lobster and moray eels share the same dwellings, so don't be too brave and reach your hand way inside a hidden shelf. That's an easy way to loose your fingers for an eel's lunch.

For spearing fish, a Hawaiian sling is a very effective, super-simple tool consisting of a long, thin steel shaft with a barb on the end, a round wooden handle with a hole drilled to accept the shaft, and a heavy piece of surgical tubing to act as a spring. These can be made cheaply and with practice are an effective food-gathering tool. A friend on his first dive with a sling like this came up with five spotted groupers which we sold in a village for $25. Everybody has to eat; always have, always will. Fishing is an old, old profession and you can easily make a good living in the right place.

To dry fish for long storage you must clean them right away. Remove all traces of blood and entrails. Fillet, remove the bones and cut across the grain into ¼ inch slices. From this point you can do several different things. I have tried all of these and they all work well, so it's just a matter of taste. Soak the fish in a solution of 1 cup salt to 1 gallon water for 2 hours, soak in a marinade of soy sauce and herbs for 2 hours, or dry plain with no soaking. If fish is dried in a proper solar-heated drier, salting is not necessary as the fish dries quickly with no spoilage or mold appearing. If simply left in the open air, drying is often very slow and the fish must be heavily salted to retard bacterial growth. Do yourself a big favor and use a good enclosed drier. You'll spend less energy, get more nutritious food, and not throw away food that took too long to dry in the open air.

The fish should be thoroughly dry and hard with no impression left when the fish is squeezed tightly between the fingers. I have found that steaming lobster and shrimp ten minutes before drying results in a better tasting product. Thinly sliced dried lobster chips are a treat not soon grown tired of!

Dried fish and lobster may be blended with water or yogurt for a fantastic dip, cooked in soups, sprinkled into salads or made into patties mixed with fresh seaweed and sprouts. Dried fish doesn't have to be cooked before it is eaten if you prefer it that way.

PICKLING

Before refrigeration, the pickling of food was practiced much more than it is today. Pickled fish is a real treat that you can easily make on a boat, with only a few materials, in little time. When properly prepared, pickled fish will stay fresh and delicious for weeks or months depending on the pickling solution employed.

Traditionally, a blend of herbs, spices and salt in a base of vinegar has been used around the world to preserve the summer's catch for the long, cold winter. The following recipe is one my father used for years. It has become quite famous in the shad fishing areas of central Florida. This recipe works for about any kind of fish or lobster that you happen to have. The only reason that herring is such a popular pickled fish is because it is very cheap. Much better results can be had with grouper, mackerel, snapper and other tastier varieties. This procedure will keep fish without refrigeration for two to three weeks if kept reasonably cool.

Fish must be cleaned very well, as when drying, to prevent any off-tastes in the finished product. Cut the fish into 1 inch chunks with no bones and place into 1 quart glass jars. A solution of 1 quart 5 percent vinegar to ½ cup salt is

added to 1 quart fresh or salt water. This solution is poured over the fish, completely covering it. Leave it like this for between five to eight days depending on the temperature. A warmer temperature will require less time. If the flesh should begin to turn a little brown, then continue with the rest of the processing immediately. Now rinse the fish in cool, clean fresh or salt water and let soak for six hours. After this soak, pack the fish into clean jars into which a couple slices of lemon and onion have been added along with the final pickling solution.

Pickling Solution for Fish

1 cup vinegar (5 percent)
1 cup fresh or salt water
6 cloves
8 bay leaves
¼ teaspoon dry mustard
½ teaspoon coriander seed
¼ teaspoon cayenne pepper
½ teaspoon honey
½ teaspoon dill seed
2 tablespoons agar powder

Simmer this mixture a few minutes until the agar is completely dissolved. The agar will make the spices cling to the fish, making it much more tasty than if the liquid was to simply drip off. This quantity is for one quart of fish.

To make pickled fish last indefinitely, use 15 percent acetic acid vinegar in place of the 5 percent for the final spice solution. This will completely arrest the growth of any harmful bacteria that might otherwise spoil the fish. Before eating add 4 cups of water to the solution a few days ahead of time to dilute the strong vinegar taste.

PRESERVING EGGS

There are many purported ways to store hen fruit for long periods of time on a boat. Some methods advertise that with certain procedures and prayers, the eggs can be stored for as long as two years. I have found this to be totally untrue on a seagoing boat. Maybe the person responsible for that

information enjoyed his eggs "a la sulfur" instead of souffle. For one thing, a boat is not the best place to store eggs as the constant movement causes the yolk and white to slosh, aiding in their breakdown. However, by following these simple directions, you can be assured of good quality eggs for up to five months.

The real crux of the situation is to start with absolutely fresh, unwashed and preferably fertile eggs. What do I mean by fertile? Most eggs produced in the U.S. today are more of a manufactured product in a flimsy package than anything else. The hens are kept in cages about two inches larger than they are, fed antibiotics and synthetic food, and artificially induced to lay more eggs by speeding up their biological clocks with cranked-up cycles of artificial day and night. This procedure results in an egg that is reflective of the energy put into it. Thin shells, lack of vitamins and sterility are assured. On the other hand, hens that are allowed to move about on the ground, eat a variety of food, mate with the roosters and sleep when the sun goes down will make an egg with a stronger shell, superior storing qualities and that is nutritious. Eggs produced this way usually have a darker yolk and taste better than their jailed and drugged counterparts.

In foreign countries, especially in the tropics and less developed nations, you can be rather sure that the eggs are produced from chickens allowed their freedom, while in the U.S. you'll have to get them from small farmers. The advantage of getting them right from the farmer is that it is possible to get eggs that were laid last night. Unfortunately, in some markets in the third world, there is little concern for freshness and when bought eggs might already be a month old.

Be sure to buy eggs that have not been washed. Even though they may be prettier without the dirt, dung and straw stuck on them and more presentable to the typical squeamish consumer, washing removes a very valuable natural coating that seals the egg against bacteria and air. The whole idea of

preserving eggs is to perform this sealing, so don't defeat your purpose by starting out with eggs that have been prettied up, allowing the deterioration process to start. Also, don't buy eggs that have been refrigerated. When warmed after refrigeration they won't keep nearly as long.

Get all your eggs back to the boat and examine each one in front of a candle or light in the dark. When holding the egg with the pointed side up, if more than ¼ inch of light shows through the top you were sold unfresh eggs. These may be eaten right away but don't attempt to store. Make sure that there are no fine cracks in the shell as these will allow bacteria to enter and spoil the egg in time.

Now you can start to think about how to preserve the eggs for storage. Keep in mind that stored eggs are never equal to fresh ones, so when you arrive in Barbados from the Canaries, don't hesitate to enjoy the local efforts and renew your supply. Because of the wide availability of eggs around the world, it should never be necessary to store them for more than eight weeks.

Waterglass Treatment

This is the standard treatment and eggs stored this way will usually be good for three months. Boil a solution of 1 part sodium silicate to 9 parts water, either fresh or salt. After dissolving, allow to cool and pour over the eggs that have been packed tightly in a gallon size plastic or glass jar with the small end of the egg down. The smaller the size of the container the better. If even one egg cracks, the whole batch may be ruined.

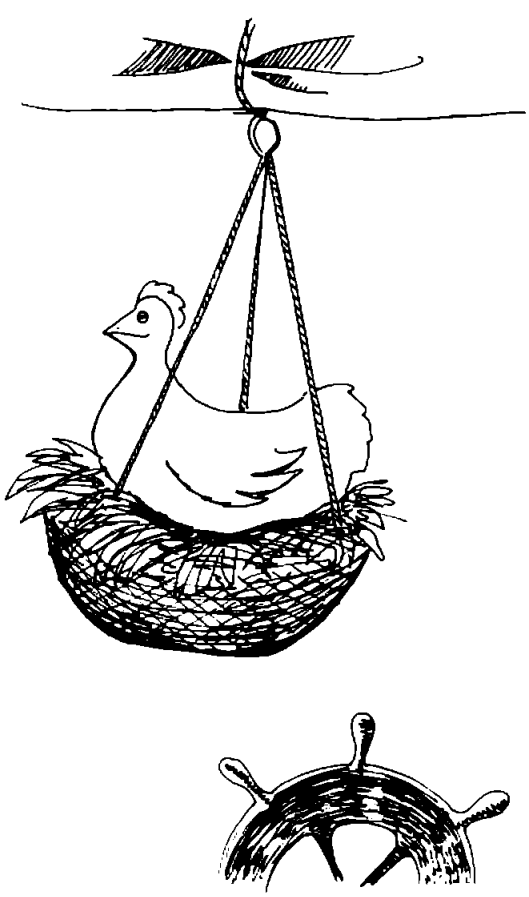
Eggs in Lime

This method is almost as good as the waterglass treatment and uses materials that are easier to find. Bring to a boil a solution of 16 parts water to 2 parts lime and 1 part salt. When the mixture is dissolved to a thin cream, allow to cool and pour over the eggs as in the waterglass directions.

Paraffin Wax or Vaseline

A less satisfactory method, but suitable for one or two months, is to coat the eggs with liquid paraffin or vaseline petroleum jelly. You can either drip a candle over the eggs or melt the wax in a double boiler. Allow the wax to cool a bit before dipping the egg for a moment to coat. They are then placed in a tray pointed end down with dry sand packed around them.

When using any egg stored these ways, break each egg into a container separately before adding other ingredients. This way they can be individually inspected to eliminate spoiled ones that would contaminate other ingredients. Of course you could always just keep a hen on board to lay eggs in a gimbaled nest!



Make thee an ark of gopher wood; rooms shalt thou make in the ark, and shalt pitch it within and without with pitch. And every living thing of all flesh, two of every sort shalt thou bring into the ark, to keep them alive with thee; they shall be male and female. And take thou unto thee of all food that is eaten, and thou shalt gather it to thee; and it shall be food for thee, and for them.

— Genesis

8
Food Selection and Storage

In this chapter several valuable foods are discussed that are recognized as being *musts* in the heart of a good long-term, offshore food storage program. The reasons for a complete storage inventory are manyfold. You don't know how long you will have to eat from your own stores before being able to regularly forage food; stored food is better than money in an emergency economy; really good, basic food doesn't cost nearly as much as the manufactured products passed as food in grocery markets; and it's nice to know that you could live on the ocean a thousand miles from land, for months at a time if necessary, without having to return to shore for anything.

Because of the cost and impracticality of storing meat products, instructions are given on how to combine vegetable proteins to insure that you will get plenty of high quality, complete protein in your diet. By just following a few simple

rules, you can enjoy foods free of cholesterol and saturated fats that will make you feel a lot better and reduce the chances of high blood pressure, heart attack, cancer and many other products of our modern "high" standard of living in this part of the twentieth century. If you think that a diet without meat would be boring, just try it for a while. Use the recipes in this book and your own imagination to see what an incredible world of new flavors await to be discovered.

After living on the ocean for years on small boats, it occurs to me how little of everything is really needed to carry on this kind of life. It is possible to become perfectly accustomed to getting along on hardly any water, fuel, electricity, contrived entertainment, etc. How much better shape the world might be in today if more people were able to experience this training in minimal expense living and find out how little they *really* needed to live any lifestyle they desired. It's amazing that the average per capita use of fresh water in the U.S. is 50 gallons per day. This is for the toilet, dishwasher, shower, sink, food manufacturing and other direct and indirect uses.

Right now there are probably lights on in your house that are not being used. On a boat, the threat of dead batteries keeps your attention to this detail honed to a fine edge. I am horrified when I think of America's continued and expanding dependency on foreign fuels and domestic nuclear power, while a huge portion of the society continues to leave lights burning, drive alone 50 miles to work, and then pay farmers not to grow grains that could be turned into alcohol fuel.

While living ashore preparing for a life at sea, how can you determine how much of what will be needed for a year per person of the foods and materials best suited to the ocean environment? First of all, by studying this book you can learn what foods and tools are best. Second, include these materials more and more in your present everyday life so you can find out how to use them, and so you can get a feel for what

you like and dislike. Third, use dried fruits and vegetables instead of fresh, reconstituting if you like. Get to know the seaweeds available at health and Oriental food stores. Gradually do away with all foods that are not suitable or available in the ocean environment. This includes fresh meats, soda pop, bulky and unnutritious foods. Fourth, keep records of the exact kinds and amounts of foods used in a given period of time. Keep an accurate log of exactly how much wheat, rice, juice, sprouting seeds, peanut butter, cereal grains, honey, fish, etc., is eaten. It should be possible to get a really good idea of how much it *actually requires* to feed your family so you can have the security of *knowing* there is enough food stored for a long while. Fifth, cut way back on the use of fresh water. Determine consumption by drinking and using water from gallon jugs instead of right out of the tap. Use the bottled water to grow sprouts, make soups, drinks, and so on. Use vegetable cooking water and sprout rinses in soups and other liquid needs in preparing foods. Count every drop. Remember that water is absolutely essential to life and how rare it sometimes is in some places. You can learn to use but a fraction of your normal daily consumption, without rationing, by just being more aware of its value. See how little is really needed and how much you've wasted this precious commodity in the past. Florida yachtsmen get a rude awakening when they learn what it costs to fill their water tanks in the Bahamas where water is very scarce. Twenty cents a gallon is not uncommon and really sets the mind to wondering how to keep from wasting it. When figuring your water consumption, only count water usage that must be fresh. Salt water is able to fulfill many requirements, such as dish washing, bathing, steaming foods, etc., and need not be counted.

The following is a list of premium foods ideally suited for extended storage and nutrition on small voyaging boats. With these amounts stored, one person could live for a year with the addition of fresh water, some dried fruit for extra

calories and minerals, and clean air. By carefully substituting similar items with the given ones, a huge variety of meals can be prepared from a very few basic ingredients.

STORAGE FOODS

Food	Pounds Per Person Per Year	Amount Per Person Per Day	Protein in Grams	Calories
Dry Skim Milk	18.5	22.7G	8	88
Bee Pollen	6	7.5G-1tsp	1.9	25
Spirulina Algae	6	7.5G-1tsp	4.5	30
Nutritional Yeast	12	15G	7	60
Alfalfa Seeds	6	7.5G	2.6	27
Wheat Berries	100	125G	15.3	412
Sunflower Seeds	30	37.4G	9	209
Sesame Seeds	25	31G	5.5	174
Buckwheat Seeds	40	50G	6	165
Mung Beans	20	25G	6.5	85
Kelp Powder	4	5G	.35	
TOTAL	267.5 lbs		66.65G	1275

The alfalfa, mung, buckwheat and sunflower seeds should either be sprouted three days to make milk, dips and vegetable loafs, etc., or grown longer for salad greens. Wheat is best sprouted for breads, cereals, salads or grown for wheat grass juice. Dry milk can be made into cheese, yogurt, fluid milk and included in other recipes to fortify the protein value. Bee pollen is eaten alone or sprinkled on cereal and fruit. Spirulina algae and nutritional yeast are mixed into soups, sauces, dressings, drinks and bread. Sesame seeds may be made into butter, milk, yogurt or dressing. Kelp is a vitamin and mineral seasoning — best to forage your own.

These foods contain more than enough of all the essential amino acids, vitamins, minerals, active enzymes, friendly bacteria, carbohydrates, fats and fiber for the vigorous life of the offshore sailor. Extra calories can be supplied

from fresh or dried fruits, or starches. This list has been compiled after years of careful study, and used by me and my crew for long periods of time. We have found these to be the best foods for the least money packed into the smallest space. You might pay more, get foods you are more familiar with or prefer, or store what a gourmet food book recommends, but you won't get the quality and range of solid nutrients available in this selection.

By all means store a quantity of other dried foods and a few choice canned goods if you wish to round out this selection to suit personal preferences. By keeping this survival assortment aboard you will feel a whole lot more assured of being able to eat no matter what situation the world comes to.

The limited size of a small sailing vessel simply won't allow storage space that is not utilized to its maximum potential. The same volume that is allotted a box of corn flakes could contain five pounds of seeds that when sprouted, grows into a mountain of fresh salad greens. Enough Spirulina algae to survive for three months will fit into the same box. Don't bring fluff onto your tight little ship. The right foods will prevent sickness as they'll keep you strong and clear-headed–all the while supplying barterable goods if necessary.

Don't just pack stored food into a couple of containers and forget about it. To keep everything fresh, rotate these supplies as new ones are acquired, especially the milk. Even though these foods will last years, it is best to use them as fresh as possible.

COMBINING VEGETABLE PROTEINS

By combining nuts, seeds, grains, beans and other vegetable sources of protein, it is possible to greatly improve the amino acid ratios to compare with animal protein. Most vegetable foods are lacking in one or more of the eight essential amino acids that the body is not able to synthesize.

By correctly complementing one food's excess amino acids with another's deficiency in the same meal, you can be assured of a high quality, complete protein every bit as nutritious as the protein in eggs, milk, meat or fish. The extra bonus for our health is that vegetables don't have any cholesterol at all and much of the fats are unsaturated in many cases.

The limited meat protein resources on a boat can be greatly extended by the use of vegetable proteins. All kinds of dishes using dried milk or soy bean flour in the recipe will enhance the value of complemented vegetable proteins to completely do away with the need for meat in the offshore sailor's diet.

In the following chart, each group has similar amino acid structures, deficiencies and surpluses. Eat foods from each of the groups together at the same meal for most efficient utilization of the available nutrients

GROUP A	Grains (wheat, buckwheat, rice, oats, etc.) Nuts (walnuts, almonds, cashews, etc.) Seeds (sunflower, pumpkin, squash, sesame, etc.)
B	Beans (soy, mung, chick pea, lentil, lima, etc.) Seaweeds (wakame, arame, nori, etc.)
C	Spirulina Algae Nutritional Yeast Bee Pollen

Foods in Group A complement foods in Group B; by eating foods from *both* groups at the *same meal,* you will furnish your body with the complete proteins it needs to maintain good health. Many of the recipes in Chapter 9 will fill the bill admirably. The foods in Group C are all complete proteins in and of themselves. By including them in your meals, they will enhance the nutritional value of foods from Groups A and B. Because of this, and because they are easily stored, they are highly recommended as a regular part of the seafarer's diet.

STORING GRAINS, SEEDS AND DRIED FOODS

When storing dried food the important concerns are temperature, humidity, atmosphere and insects. Storage containers include plastic one-gallon water and milk jugs, heavy five-gallon plastic pails with sealable lids, four-gallon imported olive containers, special stainless steel soda beverage cans used by bars and restaurants, one-gallon, wide mouthed plastic and glass jars, and enameled tin cans. Many of these items may be had free by checking with supermarkets and restaurants as they are used for shipping foods and then frequently discarded. Anything is usable so long as it provides an air seal, is strong, and prevents insects and moisture from entering.

The smaller sizes might be preferable due to the ability to spread out the risk of contamination and ease of finding places on the boat to store small containers. Many insects can eat right through plastic bags so don't rely on them alone for any kind of security against infestation. Heavy containers that may be stored away from engine heat and bilge water are the best way to go for bulk storage. By keeping about one month's supply in handy small jars, you eliminate the necessity of opening the main containers very often.

Packing calcium chloride or silica gel in the containers will absorb any moisture and preserve the food much longer. Calcium chloride, otherwise known as dehydrating salts, can be acquired from several industrial suppliers at a minimum cost. Silica gel may be dehydrated and used indefinitely by heating in an oven or low flame. It is blue when dry and red when saturated with moisture.

For long-term storage it is important to kill molds and insect larvae that exist in practically all seeds and dried foods when bought. This may be accomplished by freezing for two days or by filling the containers with an inert gas. Place a piece

of dry ice wrapped in a small towel into the bottom of a container and fill with the food you wish to store. Do not cover tightly with the lid because as the ice evaporates, it builds up pressure. After the ice has completely vaporized and replaced the original atmosphere, seal the container tightly before any air is able to re-enter.

All the major suppliers of grains and dried foods stored for survival purposes use inert gas packaging, but buying from them is very expensive and unnecessary. You can make your own inert gas-packed sealed tin cans identical to the major commercial suppliers and save hundreds of dollars. By using enameled cans along with a small hand-powered canning tool, it is possible to make the most secure and preserving container you could put on a boat. This tool is only about the size of a grain grinder and weighs 12 pounds. To do this, you simply pack the food into the can with a small piece of dry ice wrapped in a paper towel. Partially seal the lid leaving a small opening for carbon dioxide gas to escape. Coat the small opening with a thin coating of vegetable oil. When bubbles stop forming, indicating the dry ice has totally vaporized, finish sealing the can without allowing air to leak back in.

Another possible system is one that I used extensively in the Caribbean for packaging dried fruit to sell back in New York. It is very easy and does not require the sometimes difficult task of finding dry ice or canning equipment. Freezer storage bags are handy for several reasons. You can buy rolls of them from many different sources, they can be cut to size thus reducing wastes, are easy to use, and seal perfectly by melting with a hot knife edge. A vacuum package is formed by sealing the bag completely except for the last ⅜ inches, inserting a thin tube and then sucking vigorously with your mouth to remove all the air. While holding the bag shut with the fingers, remove the tube and seal. A hand-powered

vacuum pump is very handy to remove the most air possible and is small enough to fit in the hand.

For even more secure storage you could also carry a small bottle of compressed nitrogen or carbon dioxide to provide an inert gas-filled package. These small cylinders cost only a few dollars, are refillable practically anywhere and will supply enough gas for hundreds of packages. After evacuating as much air as possible from the bag, refill with the inert gas to displace the small amount of remaining air you couldn't quite remove. The package may either be stored this way or the gas removed for more compact storage. With the inert gas you can be assured of removing practically every bit of bacteria, mold and insect-supporting oxygen.

Special heavy-duty zip-lock bags with two locks are available and are superior to the light-weight single-lock bags found in grocery stores. The advantage of the zip bags is that they may be used over and over again. Heat-sealed bags are reusable as well, but because they must be cut open, ½ inch is lost every time the bag is used. This isn't really a big problem if the bag is not reused often. The best system might be to have some of each. The heat-sealed bags for long storage, and the zip bags for intermediate storage. Either way, don't skimp on packaging!

Seal only the amount that can be used in a short while in each bag. This way there is no food left in an opened bag under less than ideal circumstances. When all the air is removed, 20 pounds of dried papayas can be stored in one-pound units using no more space than a 20-pound bag. Packages should then be stored in a plastic pail or other solid container to prevent their being ripped or punctured. Also, remember that rats do get aboard occasionally and can chew through a bag a lot faster than a heavy-duty pail.

Table of Food Values

PER 100 GRAMS

Food	Calories	Carbo-hydrates Grams	Total Fat Grams	Saturated Fat Grams	Protein Grams
BEANS					
Mung	340	60.3	1.3	trace	24.2
Chick Pea	360	61	4.8	trace	20.5
Lentil	340	60.1	1.1	trace	24.7
Peanut	564	18.6	47.5	10	26
Soy	403	33.5	17.7	3	34.1
FISH					
Grouper	81	trace	.4		19.8
Herring (canned)	194	trace	12.4		20.7
Lobster	84	.5	1.9		16.2
Mackerel	183	trace	12		18.7
Sardines (canned)	167	1.4	8.7		20.7
Shrimp	82	.8	.8		17.8
Tuna (canned)	194	trace	10.8		24.4
GRAINS					
Millet	327	72.9	2.9	1	9.9
Brown Rice	360	72.9	1.9	trace	7.5
Rye	334	73.4	1.7	trace	12.1
Wheat	330	69.1	2.2	trace	14
NUTS					
Almond	598	19.5	54.2	4	18.6
Cashew	561	29.3	45.7	8	17.2
Coconut (dry)	662	23	64.9	56	7.2
Black Walnut	628	14.8	59.3	4	20.5
MEATS					
Av. Beef Cuts	290	trace	22	8	23
Ham (canned)	274	trace	20.6	8	22.1
Chicken (canned)	191	trace	8	4	29.8

PER 100 GRAMS

Food	Calories	Carbo-hydrates Grams	Total Fat Grams	Saturated Fat Grams	Protein Grams
SEEDS					
Pumpkin	553	15	46.7	8	29
Sesame	563	21.6	49.1	7	18.6
Sunflower	560	19.9	47.3	6	24
SEAWEEDS					
Dulse		44.2	3.2	trace	25.3
Kelp		40.2	1.1	trace	7.5
MISCELLANEOUS					
Spirulina Algae	400	25	5	trace	60
Nutritional Yeast	280	35	trace	trace	50
Bee Pollen	322	41	6	trace	25
Eggs (one large)	163	1	11.5	2	13

PERCENT OF RECOMMENDED DAILY ALLOWANCES (U.S. RDA) SELECTED FOODS

Nutrient	Spirulina Algae (7.5g)	Bee Pollen (28g)	Yeast (15g)
Vitamin A	1125	2	trace
Vitamin C	trace	2	trace
Vitamin B-1 (Thiamine)	11.25	35	631
Vitamin B-2 (Riboflavin)	16.8	35	525
Vitamin B-3 (Niacin)	3.75	15	262
Calcium	.75	10	1.12
Iron	18.75	10	3.5
Vitamin B-6 (Pyridoxine)	.75	10	450
Vitamin E	5.6	10	trace
Vitamin B-12 (Cyanocobalamin)	225	170	182
Phosphorous	5.62	10	20.2
Magnesium	2.25	10	6.2
Zinc	.75	10	17
Biotin	.75	4	6.5
Pantothenic Acid	.75	4	10.4

Source: *Composition of Foods*, USDA Handbook No. 8

9
Seafarer's Recipes

The foods we eat and the air we breath are our most direct link with the environment around us. By sailing in the clean ocean air and eating pure nutritious foods, we saturate ourselves with the highest environment possible. Highest environment is conducive to highest existence, far beyond basic survival. Food is nothing more than stored solar energy that we are able to release and put to work in a controlled and directed fashion. It can be squandered pitifully by cooking in such a way that destroys much of the vital power contained within the molecular structure, or it can be carefully prepared to manifest all the potential body fuel possible. Pure food is indeed pure light and when it enters our body we refract it into the spectrum of fuels that power our life.

Because of the size and resource limitations of a small boat at sea, it is more important than ever to be especially careful with the materials stored on board. Water, fuel and

food are dear, and should be treated as such. The following recipes are the result of years of studying how food is best prepared for most efficient digestion and utilization of crystallized light energy in the human energy transformer. Most of them do not include any cooking as heating food frequently destroys valuable enzymes and vitamins while making protein assimilation difficult.

The more alive the foods you eat are, the more alive you'll be! When foods are eaten in their most nutritious and natural state, much less is required by the body to do the same amount of work as foods insensitively prepared. No other animal on the Earth cooks his food before eating, so why should you? Think of the savings in stove fuel, clean-up time, food costs and health that may be realized by reducing the amount of cooked foods in the diet. Since you have to start somewhere to learn and practice this higher awareness, there is no better place than on a boat at sea and no better time than now.

The preparations of meat and fish have been purposely omitted from most of these recipes as they are covered very well in many other seafood cookbooks. I can assure you that I have used all these recipes countless times, sometimes while on the beam ends, sometimes in a quiet anchorage, but always as a deep-sea blue water roamers' favorite fare.

Practically all of these recipes are made from dry ingredients but can be easily adapted to fresh products. Feel free to experiment with and change any recipe to more closely fit with your own preference. Recipes are only maps into unfamiliar territories and are not intended to be rigid course lines, so deviate all you want to!

Oils

Olive oil is the first choice for use in salads, dressings and sauces. Just about any recipe will benefit from its distinctive, delightful flavor. Raw, cold pressed oils are best and store

very well. Most oils will not turn rancid if kept in cans well sealed against light and air in the coolest part of the boat. Canned margarine and butter are available and will store many months, but they are much higher in saturated fats than are the liquid oils. To make an oil hard it must be hydrogenated. This has been found to be a major cause of heart and circulation diseases. Choose polyunsaturated oils such as corn, safflower, sesame, etc. Cold pressing seeds in order to extract the oils reduces the damage to vitamins and lessens the possibilities of rancidity.

Herbs and Spices

For special flavors, make up a batch of mixed herbs to use liberally in these recipes. A good Italian seasoning mixed herb blend is 1 tablespoon each of rosemary, paprika, thyme and sage with 2 tablespoons each oregano and basil.

Vegetable and Seaweed Powders

Make these up in a blender or grinder from all kinds of vegetables and foraged seaweeds. Use these seasonings wherever you can to take advantage of their abundance of active enzymes and vitamins. Sea 'n land vegetable powders will add zesty flavors to anything and are a good substitute for salt. An instant bouillon broth can be made by dissolving 1 teaspoon powder into 1 cup hot water. This also makes a good quick soup base.

Cooking Liquids

Fresh-water cooking liquids should never be thrown away as they are filled with valuable vitamins and minerals leached out of the food. Soups, broth, dressings and sauces can be made from the liquid or simply drunk. Seawater is usually used for steaming in order to save fresh water at sea. All grains, beans, fish and vegetables may be cooked this way instead of boiling in fresh water.

Nutritional Supplements

Bee Pollen

Flower pollen is actually the male sperm of a plant. When a grain of pollen is placed on the flower stamen it fertilizes an ovule in the ovary, which then grows into a seed. In some plants this seed is surrounded by a juicy mango or grows into a huge redwood tree. The whole potential of the plant is contained within the pollen grain and ovule cell, just as a sperm and egg are the seeds of a mighty civilization of men. The pollen is packed with all the enzymes, vitamins, sugars, minerals and amino acids necessary to structure a new plant. These nutrients are what makes pollen one of the most highly prized foods in the world.

Honey bees derive most of their nutrition from this part of the plant. They manufacture honey for its carbohydrate value, while using pollen for their sole source of protein. Pollen is collected as the bees enter the hive and walk over a comb which brushes off the pollen stuck on their legs. Most hives are kept for the honey and not the pollen. This means that the bees are allowed to keep all the pollen to eat instead of using the honey. If pollen is collected, the bees eat honey resulting in a diminished honey yield. The pollen is vastly more valuable to humans for food than is honey, but the honey is easier to sell to a ready market.

Pollen is deliciously sweet and is good sprinkled on cereal and fruit, blended into all kinds of shakes and drinks, mixed with milk and yogurt, or just eaten straight out of the jar. You can find bee-collected pollen in most health food stores and some mail order outlets. Buy it in bulk for added savings.

Nutritional Yeast

Yeast is a versatile and potent food that is 50 percent protein by weight. With its mild cheesy flavor you will find many uses for it. It is my favorite topping on popcorn, steamed vege-

tables, soups and dips, but yeast is good mixed in practically anything. Nutritional yeast is not active as is baker's yeast. If you ate the live plants they would consume nutrients instead of supplying them. The yeast is grown in huge vats and then gently heated and dried. This heating kills the yeast and destroys many of the enzymes, but much valuable protein, minerals and vitamins remain that we can assimilate. It is especially abundant in the B vitamins and can provide your diet with many times over the recommended daily allowances. Use yeast moderately as it is a very concentrated food. One ounce, or 2 heaping tablespoons, is a good daily intake. This amount contains 15 grams of complete protein that is 87 percent digestible.

Some producers supply yeast in sealed tin cans that are perfect for storing on a boat. It will stay fresh and delicious for years this way. Purchasing in bulk and repackaging in smaller amounts is possible and much cheaper.

Spirulina Algae

Spirulina algae is a natural, complete food and is 70 percent easy-to-digest protein. Because algae is not heated in processing, it is abundant in the active enzymes and radiant life force energy necessary for complete assimilation. Algae forms the base of the entire world's food chain to supply all other organisms with the nutrients and oxygen for their growth. Why not get in at the source yourself to enjoy this incredible wealth of raw materials for a healthier life?

You can mix Spirulina in sauces, dressings, soups, and drinks or sprinkle on salads, vegetables and steamed rice. Its flavor is mild so it can easily be combined with almost anything. Like bee pollen and yeast, a little Spirulina goes a long way so use in moderation.

JUICES, DRINKS, SMOOTHIES

Smoothies are fresh shakes made from fruits, nuts, juices and sprouts pureed in a blender to a thick and creamy consistency. They are enjoyable any time as a whole meal or as just a snack. Fresh juices squeezed with the Health Fountain Juicer or hydraulic press can be made from any of the sprouted greens and by far are the healthiest cocktails you could ever drink. Fresh green juice builds the blood and helps purify the whole body. It's easy to add water to seeds for instant sprouts or soak dried fruit for a refreshing instant drink that is loaded with natural vitamins and enzymes. When making any recipe calling for dried fruit or nuts, always soak them for several hours to soften. The soak water may either be drunk or combined in other recipes as it is usually tasty and always nutritious.

Green Juice

Wheatgrass juice is the king of the green chlorophyll juices. A couple ounces a day is a good tonic and the best health insurance you could have. Its strong taste may be diluted by mixing with other vegetable juices such as alfalfa and buckwheat. I never got used to vodka *or* wheatgrass juice, but it's easy to rationalize drinking grass juice! Blend green juices into soups, sauces and dips until you can enjoy it straight.

The hand-powered Health Fountain Juicer, described in the Survival Tools chapter, is the best tool available for extracting the juice from wheatgrass. Electrical juicers are not acceptable, as the grass will totally clog the high-speed shredding mechanisms. With a pair of scissors or a sharp knife, cut the wheatgrass when it is about 7 inches tall or 12 days old. Slowly feed the grass through the juicer with the adjusting nut set fairly tight for maximum juice extraction from the pulp. Since wheatgrass juice oxidizes rapidly, use it while it's absolutely fresh.

Pinealfa Cocktail

1 cup alfalfa sprouts
½ cup pineapple chunks
1½ cups water

Blend and strain. The pulp is like a sauce and very good.

Bloody Mary

2 tbsp tomato powder
½ cup radish sprouts
1 cup water
1 clove garlic
1 tbsp soy sauce
2 tbsp lemon juice
pinch of black pepper

Blend or shake well.

V-4 Juice

1 cup alfalfa sprouts
1 cup buckwheat greens
2 cups water
2 tbsp vegetable powder
½ cup dried apples

Blend and strain. The pulp is good eaten plain or used in a dressing or sauce.

Carrot and Apple Juice

½ cup dried apples
½ cup dried carrots
1½ cups water

Blend well and strain.

Lemonade

4 cups water
honey to taste
½ cup lemon juice or
2 tbsp dried lemon powder

Date Thing

½ cup banana
¼ cup apples
¼ cup dates
1½ cups water

Soak everything and blend.

Spicy Cider

¼ cup dried apples
1 cup hot water
1 tbsp dried orange powder
pinch of nutmeg and cinnamon

Blend and strain. Makes a wonderful morning drink.

Banana Dak

½ cup pineapple chunks
½ cup banana
1½ cups water

Soak fruit in water 30 minutes and blend.

Pina Colada

½ cup dried pineapple chunks
2 cups coconut cream

Soak pineapple in coconut cream for a few hours until soft, then blend to a smooth cream. This is probably the best you've ever had and a far cry from the canned mix! If you've got ice and rum ...!

Mango'd Banana

1 cup dried mango
½ cup banana
2 cups water
2 tbsp orange powder

Soak fruit in water until soft and blend to make ambrosia fit for the gods.

Rejuvelade

1 cup rejuvelac
2 tbsp lemon juice or
1 tbsp powder
1 tbsp honey
1 tsp ground ginger

Mix well and drink. This is a delicious way to drink rejuvelac and is packed with helpful intestinal bacteria and enzymes.

Breakfast Smoothy

½ cup apples
¼ cup raisins
1½ cups water
½ cup banana
½ cup cashews
2 tbsp nutritional yeast
1 tbsp bran
1 tsp honey

Soak fruit in water for a few hours, then blend with other ingredients to a smooth cream. This is a complete breakfast in a glass.

Green Cream

½ cup cashews
1 cup alfalfa sprouts
¼ cup dates
¼ cup sesame seeds
¼ cup pineapple chunks
1½ cups water

Soak nuts, seeds and pineapple several hours or overnight. Right before serving, blend with sprouts to a thick cream.

MILK SHAKES

When making any of these tasty and delicious meals, any of the milks shown and described in the milk chapter can be used. Soy, dairy, seed and nut milks are all very good and work well in these recipes.

Fruit Milk Shake

1½ cups milk
2 tsp honey
1 dried banana
¼ cup dried mango, papaya, pineapple, etc.

Soak fruit in ½ cup water until soft. Blend soak water and other ingredients until creamy smooth. As with other milk drinks, this could be considered a complete meal for a quick breakfast or lunch.

Yogurt Shake

½ cup yogurt
1 dried banana
1 tsp honey
¼ cup dried mango or papaya soaked in ½ cup water

Soak fruit a few hours and puree with other ingredients.

Milk of Iron

½ cup raisins
1½ cups milk
1 tsp honey or molasses

Puree in blender until smooth.

Vanilla Milk

1 cup milk
1 tsp honey
½ tsp vanilla extract

Mix with blender, shaker or whisk.

Carob Milk

1 cup milk
1 tsp honey
¼ tsp vanilla extract
2 tsp carob or chocolate powder

Mix well. Carob tastes very much like chocolate, but is much easier to digest.

Banana Milk

1½ cups milk
1 dried banana
sprinkle of nutmeg
1 tbsp molasses
½ tsp vanilla

Blend until creamy.

Nutty Banana

1 cup cashew milk
1 dried banana

Puree in blender until smooth.

Fruit Nog

1 cup orange juice
1 cup milk
¼ cup dried mango or papaya
¼ tsp nutmeg

Soak fruit a few hours in juice and puree to a smooth cream.

Coconut Ginger Milk

1 cup coconut milk
¼ cup apples soaked in milk
¼ tsp powdered ginger

Blend until smooth and strain.

Golden Milk

1 cup milk
1 tbsp honey
1 tsp nutritional yeast
½ tsp vanilla extract

Shake or blend until smooth. This high protein and B vitamin milk is great on cold and hot cereals.

Yogurt Manna

1 cup yogurt
2 tbsp Spirulina algae or dulse

Stir well. This is good right out of the bowl or as a salad dressing.

Tomato Yogurt

3 tbsp dried tomato powder
1 cup yogurt

Stir until well mixed. Add a little water for a thinner drink.

Milk of Ambrosia

¼ cup cashews
1 cup water
¼ cup soaked dates
1 banana

Blend well to a thick cream.

Yogurt Buzz

1 cup yogurt
¼ cup bee pollen

Stir well and let rest for 10 minutes for the pollen to soften. Stir again to dissolve the pollen. This is absolutely the best!

Fruit Yogurt

1 cup dried fruit
½ cup water
1 cup yogurt

Soak fruit until soft and then blend with other ingredients.

Coconut Cashew Milk

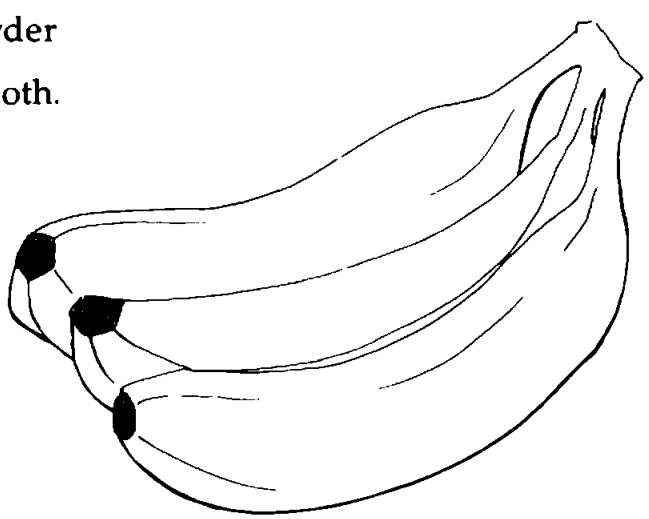
1½ cups coconut milk
¼ cup cashews

Blend until smooth.

Carob Coconut Milk

1 cup coconut milk
1 tsp carob powder

Blend until smooth.



DIPS, SAUCES, AND DRESSINGS

Many of these recipes can be interchanged by adjusting the consistency with more or less liquid. Don't think that "sauce is sauce and dip is dip and never the twain shall meet." One recipe may either be dip, dressing, soup or sauce by varying the thickness. Let your imagination go as wild as the wind driving you to paradise!

Tofu Spread

1 cup tofu
2 tbsp yeast
1 tbsp miso
¼ cup chopped radish sprouts
2 tbsp oil
1 clove garlic

Blend to desired thickness.

Hummus

1 cup mashed garbanzo bean sprouts
½ cup oil
½ cup ground sesame seeds
2 tbsp soy sauce
¼ cup radish sprouts
2 tbsp lemon juice or vinegar
3 cloves crushed garlic

Mash thoroughly to a heavy dip, adding radish sprouts last.

Guacamole

¼ cup tomato powder
2 mashed avocados
½ chopped onion
1 tbsp kelp powder
3 tbsp lemon juice or vinegar
½ cup radish sprouts
1 clove garlic

Mash well and serve.

Nut Dip

1 cup cashews
1 cup alfalfa sprouts
1 cup water
2 cloves garlic

Grind nuts to a powder. Blend other ingredients to desired thickness.

Lobster or Fish Dip

1 clove garlic
1 tsp grated onion
1 tsp mustard
1½ cups tofu or yogurt
½ cup fish or lobster
4 tbsp wine or lemon juice

Use dried or fresh fish or lobster. Blend to a thick dip. This is really the best you could ever imagine! Just try to beat this with canned dip.

Fruit Seed Spread

3 tbsp nuts
2 tbsp coconut
3 tbsp sunflower seeds
2 tbsp chopped dates
2 tbsp honey

Grind nuts and seeds in blender or grinder, add honey.

Halvah

1 cup sesame butter
½ cup honey

Stir together. Makes a wonderful sandwich spread.

Tropical Nut Butter

1 cup cashew nuts
½ cup orange juice

Blend to a smooth spread.

Roasted Peanut Butter

2 cups lightly roasted unsalted peanuts
2-4 tbsp oil

Grind the nuts in a blender or grinder to a powder. Slowly add oil to the desired consistency.

Miscellaneous Nut Butters

Butters can be made from many kinds of nuts and seeds including the following:

sunflower seeds	pumpkin seeds
cashews	walnuts
almonds	sesame seeds

Make just like the peanut butter. For an even healthier and more easily digested butter, sprout the seeds and nuts before grinding.

Miso Nut Butter

1 cup nut butter or nut sprouts
¼ cup miso paste

Grind sprouts until smooth and add miso. Add water to desired thickness.

Pineapple-Avocado Butter

1 avocado
2 tsp lemon juice
2 tbsp yogurt or tofu
½ cup dried pineapple soaked in water to cover

Blend to a thick spread.

Apple 'n Date Spread

12 pitted dates
½ cup sunflower seeds
¼ cup dried apples, soaked in ½ cup water

Blend to desired thickness.

Pineapple Mango Jam

½ cup dried mango
¼ cup dried pineapple
½ cup pitted dates

Grind fruit and add water to desired thickness.

Miscellaneous Jams

Blend fruit leathers with just enough water to make a thick paste.

Catsup

1 cup tomato powder
1 cup water
3 tbsp onion
½ tsp oregano
pinch of black pepper

Blend to a thick sauce. To make paste, just add less water.

Cashew Mayonnaise

½ cup cashews
1 cup water
1 tbsp dulse powder
1 cup oil
4 tbsp lemon juice or vinegar
1 tbsp onion
pinch of cayenne pepper

Blend until well mixed and creamy.

Tofu or Yogurt Mayonnaise

1 cup tofu or yogurt
4 tbsp oil
2 tsp soy sauce
3 tbsp lemon juice or vinegar
¼ tsp black pepper
½ cup alfalfa sprouts

Blend until creamy.

Italian Dressing I

1 cup yogurt or tofu
1 tsp mustard
2 tsp mixed herbs
3 cloves garlic
2 tbsp soy sauce

Blend with a little water to desired thickness.

Italian Dressing II

1 cup oil
4 cloves garlic
1 tbsp yeast
½ cup water
½ cup lemon juice or vinegar
4 tbsp soy sauce
3 tsp mixed herbs

Sesame Dressing

½ cup alfalfa sprouts
1 tbsp soy sauce
¼ cup water
½ cup ground sesame seeds
1 tbsp lemon juice or vinegar

Blend until smooth.

Garlic Dressing

4 cloves garlic
1½ cups oil
1 tbsp mixed herbs
¼ cup lemon juice or vinegar

Blend. This is good on just about everything from salads to steamed vegetables and toast.

Sprouted Almond Dressing

1 cup sprouted almonds
2 cloves garlic
¼ cup oil
1 tbsp honey
1 tbsp soy sauce

Blend to desired consistency.

Miso Dressing

1 cup yogurt or tofu
¼ cup oil or water
2 tbsp miso paste
¼ cup lemon juice or vinegar

Blend, adding water if necessary.

French Dressing

¼ cup tomato powder
½ cup oil
2 tbsp soy sauce
1 clove garlic
1 cup water
1 tbsp honey

Blend, adding water to desired thickness.

Yeasty Olive Dressing

2 tbsp yeast
½ cup olive oil
1 tsp mixed herbs
2 cloves garlic
¼ cup vinegar or lemon juice

Blend. Has a delicious cheesy flavor.

Green Sauce

½ cup oil
1 tbsp Spirulina algae
½ tsp mixed herbs
2 cups alfalfa or buckwheat greens
2 tsp lemon juice or vinegar

Blend with a little water if necessary to desired thickness.

Sea Vegetable Sauce

1 cup tofu or yogurt
1 tbsp mustard
¼ cup dried seaweed
2 tbsp lemon juice or vinegar
1 tsp soy sauce
1 tsp chopped onion

Mix or blend. Delicious as a salad dressing, dip or sauce on seaweeds.

Curry Sauce

½ cup oil
1 tsp curry powder
2 tbsp lemon juice or vinegar
2 tbsp ground sesame or almonds

Blend to desired consistency.

CEREALS

Thermos Bottle Cookery

For hot cereal first thing in the morning with the rising sun, fix this up before you close the galley for the night. In the morning just pour the cereal in a dish and eat! The vacuum bottle cooks the grains nicely and slowly for best nutrition. By using a thermos bottle you also save at least 40 minutes of stove fuel over boiling grains. Experiment with this method for all kinds of dishes such as soups, sea vegetables, fish, beans, etc. The following chart shows several grains with the approximate water requirement. Depending on the moisture content of the grain, the exact amount of water may have to be adjusted to your tastes.

One Cup Grain	Cups of Water
rolled oats	3
ground corn	4-6
ground wheat	2-4
whole wheat berries	2
rye berries	2
buckwheat	2
millet	2½
brown rice	2½
ground rice	4-6

Pour boiling water into a wide mouthed thermos along with the grain. Mix thoroughly and seal tightly. All the grains are good cooked whole, cracked or ground into a flour for cream-style cereals.

Rice and Fruit Cereal

1 tbsp honey
½ cup yogurt
3 tbsp nuts or seeds
3 tbsp shredded coconut
1 cup pre-cooked brown rice
1 cup chopped soaked fruit

Mix and serve. Cook the rice at night in the thermos to make this up quickly in the morning.

7-Grain Seafood

2½ tbsp wheat grains
2 tbsp rye
1 tbsp millet
2 tbsp sesame seed
1 tbsp brown rice
2 tbsp flax seed
1 tbsp buckwheat
2 cups boiling water

Pour water over grains in wide mouthed thermos and let cook overnight. In the morning add sunflower seeds, almonds and fruit.

Sprouts and Fruit

½ cup 3-day sprouts
(wheat, rye, barley, oats or rice)
¼ cup soaked dried fruit chunks
¼ cup nuts and seeds

Soak fruit overnight. Mix with seeds and sprouts in the morning.

Best Granola

Granola is made with just about anything you happen to have on hand. In this recipe, add to or make any substitutions as you wish.

2 cups rolled oats
2 cups sprouted wheat
½ cup sesame seeds
½ cup sunflower seeds
½ cup pumpkin seeds
½ cup peanuts
½ cup sliced almonds
½ tsp cinnamon
½ cup coconut shreds
1 cup chopped dried fruit
½ cup yeast
¼ cup bee pollen
½ cup honey
¼ cup oil
½ cup water
1 tsp vanilla

Grind the sprouted wheat with a food grinder and mix with other dry ingredients. Coat well with wet ingredients. Spread onto solar drier trays ¼ inch to ½ inch thick. Dry until crisp, turning often. Store in an air tight jar. Granola may be used as a cereal, pie crust, fruit topping or plain as a cure for the midnight munchies!

Flakes o' Wheat

2 cups sprouted wheat
¼ cup oil
1 tbsp honey
½ cup water
3 tbsp yeast
½ cup milk powder
½ tsp salt

Put wheat sprouts through food grinder and mix with other ingredients. Roll between two sheets of plastic wrap as thinly as possible, about 1/16 inches. Remove top layer of wrap and dry in solar drier until hard enough to remove bottom sheet of wrap. Let dry until crispy. Put into bag and crumble to desired coarseness and seal. When serving, add chopped dried fruit and nuts to taste. The best to you each morning!

SALADS AND SANDWICHES

You can grow beautiful fresh green salads on a boat light years from land and never have to weed another garden in your life! How can anyone live without the fresh living plants of the Earth in their diets? I can't and neither can you. A big salad can be an entire meal and will insure your getting all the vitamins, bulk and nutrients needed to live healthfully in one of the most envigorating environments on this particular planet. Try tortillas and seaweed sheets wrapped around spreads, loaves and salads instead of bread for a change.

Sprout Slaw

1 cup sunflower greens
1 cup alfalfa sprouts
1 cup buckwheat greens
½ cup soaked pineapple chunks
½ cup raisins
1½ cup yogurt

Chop greens and mix with other ingredients.

Bean Salad

1 cup 3-day bean sprouts
1 cup chick pea sprouts
6 tbsp olive oil
¼ cup lemon juice or vinegar
¼ cup chopped onion
1 tbsp finely chopped mint

Mix everything in a bowl and let marinate for an hour before eating to mix flavors.

Tostada

¼ cup lentil sprouts
½ cup buckwheat greens
2 tbsp chopped onion
1 6-inch tortilla or bible bread
½ cup dressing

Mix sprouts with dressing and place in folded tortilla or bread.

Sea Salad

1 cup alfalfa sprouts
1 cup sunflower greens
1 cup mung bean sprouts
½ cup nuts and seeds
1 cup buckwheat greens
1 cup 3-day wheat sprouts
1 cup chopped soaked seaweeds
½ cup chick pea sprouts

Toss and serve with your favorite dressing. Use any of these ingredients in any amount you wish. Chunks of onion, tofu, cheese, fish, etc., are great in salads.

Aspic

2½ cups boiling water
1 cup alfalfa sprouts
½ cup chopped onion
¼ cup vegetable powder
1 tsp mixed herbs
1 cup finely chopped sunflower greens
3 tbsp agar-agar
3 tbsp honey
2 tbsp lemon juice or vinegar

Dissolve the agar in the water and let cool a bit. Add remaining ingredients and allow to gel. Serve on a bed of sprouts and seaweeds.

Cheese Salad

½ cup wheat sprouts
½ cup yogurt
1 tbsp minced onion
1 clove garlic
1 tsp mixed herbs
1 cup crumbled tofu or cheese
¼ cup chopped radish sprouts
1 cup buckwheat greens
1 cup alfalfa sprouts

Toss lightly and serve on a bed of alfalfa and buckwheat greens.

Seaweed Crepes

1 cup buckwheat greens
1 cup alfalfa sprouts
1 cup bean sprouts
several sheets nori seaweed
1 cup salad dressing or sauce

Place greens on sheet and top with dressing. Roll into a log like a crepe. Sunflower seeds, rice, tofu, shrimp, etc., are delicious rolled up with the greens.

Pizza

½ cup tofu or cheese
¼ cup tomato paste
1 tbsp minced onion
1 tbsp olive oil
1 6-inch tortilla or bible bread
1 clove crushed garlic
1 tsp mixed herbs

Place tofu or cheese on bread and cover with a sauce of the remaining ingredients. This is delicious raw or may be lightly heated by placing in a covered pan on the stove. Top with alfalfa and buckwheat greens.

Sprouted Tabbouleh Salad

¼ cup tomato powder
¼ cup olive oil
2 tsp mixed herbs
½ cup chopped onion
1 cup 3-day wheat sprouts
½ cup dried or fresh parsley
5 tbsp lemon juice or vinegar
½ cup dried or fresh chopped mint

Mix well and let marinate two hours. This spicy Middle Eastern dish is good alone or on a bed of salad greens and a dressing.

SOUPS

Simmering soups for hours on the stove is an unnecessary waste of fuel and nutrients. By sprouting beans and seeds about ½ inch, cooking can either be eliminated or greatly reduced. Sprouting provides much more of the original vitamins and enzymes than if the food is cooked at high temperature. The use of a thermos vacuum bottle preserves life-giving energies of food as well as by cooking gently and slowly over a long period of time. This also drastically reduces stove fuel consumption over long boiling methods. Use the thermos to cook unsprouted grains, seaweed, fish, potatoes, etc., and add ingredients like sprouts, miso and Spirulina algae shortly before serving in order to preserve the latter's high live enzyme content. Remember that many dips and sauces make wonderful soups with little modification to the recipe. Some of the soups shown here are not cooked and are great cold or made with hot water for a cool weather meal.

Wakame Pea Soup

1 cup pea sprouts
5 cups boiling water
1 cup white wine
2 tbsp chopped onion
1 tsp mixed herbs
1 cup chopped, pre-soaked seaweed — wakame, dulse, kombu, etc.
2 tbsp ground sesame seeds
black pepper to taste

Blend pea sprouts, wine, sesame seeds, herbs, onion, and 1 cup water until creamy. Add the seaweed and the rest of the water into a thermos and let slow cook for 1 hour. This is a delicious thick soup good for breakfast, lunch or dinner. Put a handful of alfalfa or buckwheat greens on top right before serving if you like.

Gazpacho Bueno!

¼ cup tomato powder
½ cup onion
4 cups water
¼ cup olive oil
2 tbsp mixed herbs
pepper to taste
1 cup dry white wine
2 cloves chopped garlic
1 cup chopped alfalfa sprouts
1 cup chopped buckwheat greens

Mix gently and let sit for a few minutes to blend flavors.

Thick Bean Soup

2 cups water
¼ cup onion
1 clove garlic
2 tbsp vegetable powder
4 cups sprouted beans (lentil, mung, lima, peas, etc.)
1 tbsp mixed herbs
black pepper to taste

Grow sprouts to about ½ inch or 3 days. Blend 1 cup sprouts with water and stir in other ingredients. Wine is delicious used in place of 1 cup water in any recipe.

Nut Cream Soup

½ cup cashews
1 cup water
2 cups sprouts — bean, lentil, alfalfa, buckwheat, etc.

Blend until smooth and top with a few alfalfa and buckwheat sprouts.

Spirulina Soup

¼ cup Spirulina algae
1 tbsp seaweed powder
2 cups water
1 tbsp soy sauce
1 tsp mixed herbs

Blend or mix well and top with a handful of green sprouts.

Forager's Soup

6 cups boiling water
1 cup tofu or fish
½ cup white wine
1 cup fresh or soaked seaweed
2 tbsp tomato powder
2 tsp mixed herbs
1 tbsp chopped onion

Use dulse, nori, wakame, arame, kombu, etc. Chop fine and add to other ingredients. Let slow cook in a thermos for 2 hours. This is a wonderful soup and may be adapted many ways.

Burger Soup

1 cup hot water
2 tbsp miso paste
2 tbsp onion
½ cup radish sprouts
1 cup vegetable or fish burger
several sheets nori seaweed

Cut nori into 4 inch squares and wrap around the burger to make several 2 inch long logs. Mix water with the other ingredients, pour over the rolls and sprinkle with green sprouts. This is a hearty, complete meal sure to be enjoyed!

Sea Vegetable Stew

4 tbsp miso paste
4 cups boiling water
2 tbsp yeast
2 tbsp Spirulina algae
1 cup chopped sea vegetables
1 cup chopped tofu or fish
½ cup bean sprouts
2 tbsp chopped onion

Put everything except the sprouts, miso and Spirulina into a thermos and cook 1 hour. Add remaining ingredients right before serving so as to not destroy their sensitive enzymes and vitamins. Top with a handful of radish sprouts.

ENTREES

Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in which is the fruit of a tree yielding seed; to you it shall be for meat.

— Genesis

Sushi Rice

2 tbsp soy sauce
¼ cup dried shrimp
4 tbsp vinegar
4 tbsp honey
½ tsp ground ginger
2 cups cooked brown rice
several sheets nori seaweed
½ cup crumbled cheese or tofu
¼ cup finely chopped almonds
½ cup 3-day bean sprouts

Soak shrimp in the vinegar, honey and soy sauce until tender, about 1 hour. Mix with other ingredients and roll up in the nori sheets like crepes. If you wish, top with your favorite dressing and serve on a bed of green sprouts.

Hijiki

2 cups boiling water
2 tbsp chopped onion
2 tbsp dried carrots
1 cup hijiki or arame seaweed
1 tsp mixed herbs

Place everything in a thermos and cook for 1 hour. This can be served plain or is even tastier with chopped nuts and sauce.

Pea Patty

½ cup grated carrots
2 cups sprouted peas
½ cup tofu or cheese
1 clove garlic
½ cup chopped sunflower greens
½ cup chopped buckwheat greens

Grind peas in food grinder and mix with other ingredients.

Black Beans and Rice

1 cup brown rice
¼ cup olive oil
2½ cups boiling water
2 tsp mixed herbs
3 cups 2-day black bean sprouts
2 tbsp chopped onion
1 bay leaf

Place everything but the bean sprouts in a thermos to slow cook for 5 hours, or until rice is tender. When cooked, add bean sprouts and let cook 30 minutes more to tenderize bean sprouts. Serve with a topping of alfalfa sprouts.

Sea Sprout Burger

¼ cup lentil sprouts
¼ cup bean sprouts
1 tbsp soy sauce
1 tbsp kelp or dulse
1 tsp mixed herbs
1 cup tofu or cheese
1 cup chopped sunflower sprouts
2 tsp chopped onion

Mix everything together to form a stiff burger. Eat as is or scoop onto a bed of salad greens and top with your favorite dressing. May add sliced almonds, peanuts, sunflower seeds, etc. Make it your way!

Noodles

1 egg
pinch of salt
1 cup 3-day buckwheat sprouts
1 cup 3-day wheat sprouts

Grind sprouts and stir in egg. Add water if necessary to make a thick dough and let rest for 15 minutes. Roll between 2 pieces of waxed paper or plastic wrap as thinly as possible. Dry in the sun or warm place for 1 hour and then cut into ½ inch wide strips. Cook noodles in boiling water for 6-8 minutes or cook with other ingredients in a thermos bottle.

Chop Suey

½ cup oil
½ cup chopped onion
½ cup sliced radishes
1 cup hot water
2 tbsp yeast
1 tbsp soy sauce
pinch of pepper
2 cups 2-inch mung bean sprouts
½ cup crumbled tofu
1 cup chopped sunflower sprouts
1 cup radish sprouts

Saute onion, tofu and radish sprouts in oil for 2 minutes. Dissolve yeast in water and add with other ingredients to saute mix. Cover and let cook 2 or 3 minutes until everything is tender. Delicious served hot over brown rice or noodles.

King of the Sea Burger

¼ cup tomato powder
½ cup alfalfa sprouts
1 tbsp yeast
2 tbsp oil
2 tsp mixed herbs
1 cup chopped sunflower sprouts
1 cup 3-day wheat sprouts
1 clove crushed garlic

Grind wheat sprouts in food grinder and add to chopped green sprouts. Stir in remaining ingredients to form a stiff patty. Consistency can be changed by adding water or yeast as desired. This is a real favorite of mine and tastes not too different from canned tuna. When you realize that the tuna fishing industry is responsible for the death of thousands of porpoises each year, and the outrageously high levels of lead poison in canned tuna, maybe you should reconsider its use as a protein source. These and other burgers may be baked or lightly grilled; however, they are delicious uncooked and much more nutritious.

BREAD, CHIPS, COOKIES AND LEATHERS

All kinds of foods that are usually baked in an oven may be made in a solar food drier to save fuel. While it may not be possible to make six-inch thick loaves of bread like you can in a regular or solar oven, many delicious varieties of flat breads, wafers, cookies, chips and leathers are easy to prepare. Review the procedures for making leather in the food preservation chapter as many of these recipes are made similarly. Because of the low temperature employed to prepare foods in a solar drier, vitamins and enzymes are not damaged as they are with the higher heat of a regular oven.

Fruit and Sprout Wafers

1 cup 3-day grain sprouts — buckwheat, wheat, rye, etc.
1 cup fruit chunks

Blend the sprouts and fruit with just enough liquid to puree into a very thick sauce. Spread ¼ inch thick on tray and allow to dry almost hard.

Corn Chips

4 tbsp onion
2 cloves garlic
1 tbsp oil
¼ tsp cayenne pepper
2 cups ground dry or 3-day sprouted corn
1 tsp salt

Blend with enough water to form heavy sauce. Spread as thinly as possible on drying tray. These should be dried until crunchy. Try adding vegetable and seaweed powders for interesting variations on the corn chip theme.

Tortillas

Use the corn chip recipe only don't dry as long. Tortillas are good when they are soft and leathery. Spread the corn mixture about ⅛ inches thick into 6 inch circles on the drying tray for the best Mexican food wrappers around.

Bible Bread

2 cups 3-day wheat sprouts
1 tbsp vegetable powder
¼ cup yeast, Spirulina algae, or powdered seaweed

Grind the sprouts in a food grinder and mix with the other ingredients. Various herbs, chopped nuts and fruit may be added for different tastes. Spread ⅛ inches thick into 6 inch circles on trays. Dry until rather tough and leathery, not hard. This is the most nutritious bread in the world and loaded with live enzymes, vitamins and protein. Its delicious flavor will easily convince you that an oven is not necessary to make great bread on a boat, or anywhere. All kinds of different sprouted grains may be used instead of, or in combination with, the wheat. Buckwheat and rye are both especially good.

Sesame Crunch

2 cups sesame seeds
½ cup honey
1 cup sunflower seeds or nuts
¼ cup hot water

Stir together and spread mixture ¼ inches thick on tray. Partially cut into squares before drying crispy and hard. All mixtures containing honey or fruit are best dried for the initial few hours on plastic wrap to prevent sticking. By adding some chopped fruit to this recipe, other textures and tastes are possible. Put a few bags of sesame crunch and survival wafers in your life raft survival ration kit for energy and protein needs.

Banana Coconut Leather

3 bananas
1 tbsp lemon juice
3 tbsp grated coconut

Blend to a thick sauce and pour in dryer ⅛ inches thick. Dry until tough and chewy.

Pineapple Banana Leather

1½ cups pineapple
3 cups bananas

Blend and pour into drier ⅛ inches thick. Dry until tough and chewy.

Sweet Potato Leather

¼ tsp ground cloves
½ tsp cinnamon
1 cup steamed sweet potatoes

Blend with enough water to make a heavy sauce. Pour into drier and dry until tough and chewy.

Tomato Leather

1½ cups tomatoes
seasonings to taste

Blend and dry until tough for leather or until crispy to make powder.

Soup Leather

Puree any thick soup or stew to a thick sauce. Pour into trays ¼ inches thick in 2 inch round wafers. Dry until hard. These wafers are a delicious snack plain or reconstituted back with water to make an instant soup.

Lobster Leather

1½ cup steamed lobster

Puree with just enough water to blend. Dry until very tough. Any fish, crab, conch, etc., may be made into leather the same way. The thinner the sauce is spread on the tray, the faster it will dry. Fish or lobster leather is great wrapped around fresh sprouts and yogurt.

Fruit Candy

1 cup dried fruit
½ cup nuts or seeds
¼ cup bee pollen
½ cup shredded coconut
¼ cup honey

Put fruit, nuts and seeds through a food grinder and mix with honey and pollen. Roll in coconut.

Sesame and Banana Crunch

1 cup banana
1 cup sesame seeds
1 tsp lemon juice

Mix mashed or pureed banana with the seed and spread ¼ inches on tray. Allow to dry until very crisp. These are really outrageous any time with the only problem being that you might run out!

Yam Date Bars

½ cup finely chopped dates
¼ tsp ground cloves
½ tsp ground cinnamon
½ cup chopped almonds or sunflower seeds
1 cup steamed sweet potatoes

Blend sweet potatoes with enough water to make a thick sauce. Stir in other ingredients and pour in tray ⅜ inches thick. Dry until chewy and tough.

Survival Wafers

½ cup yeast
2 tbsp oil
1 tsp soy sauce
½ tsp mixed herbs
¼ cup Spirulina algae or powdered dry seaweed
1 cup rye or wheat 3-day sprouts
¼ cup ground sesame seeds
¼ cup ground sunflower seeds

Grind sprouts, sesame seeds and sunflower seeds together in food grinder. Mix with other ingredients and some water, if necessary, to form a thick dough. Spread on drier ⅛ inches thick and dry until hard. This is a delicious snack or survival food that is good any time.

Coconut Granola Bars

½ cup rolled oats
3 tbsp chopped almonds
3 tbsp grated coconut
3 bananas — soaked dry or fresh
1 tbsp lemon juice

Blend fruit to a thick sauce, adding water if necessary. Mix with oats and nuts and pour ⅜ inches thick in drying trays. Dry until chewy, not quite hard. Stir in various kinds of seeds and nuts for other combinations.

Fruit Bars

½ cup oats
½ cup mango, papaya, or apple cut into small pieces
1½ cups pineapple
3 bananas

Use fresh or reconstituted pineapple-banana leather with enough water to make a thick sauce. Stir in oats and fruit pieces. Pour ⅜ inches thick in drying trays and dry until chewy.

PIES, PUDDINGS AND FRUIT SAUCES

These tasty and nutritious desserts will satisfy the most demanding sweet tooth with no sugar and empty calories. The pie crusts shown here are easy to make and need no baking. Just mix the ingredients and pat tightly into the pie pan. By varying the consistency, puddings and sauces make good pie fillers.

Granola Crust

1½ cup granola
2 tbsp honey
¼ cup oil or coconut butter
½ tsp cinnamon

Coat dry ingredients well and pat into pie pan.

Fruit and Nut Crust

½ cup ground nuts
½ cup coconut shreds
1 cup dried mango, banana, papaya, raisins, dates, etc.

Put everything through a food grinder, adding a little honey if necessary to hold the mixture together. Pat tightly into pie pan.

Sesame Seed Crust

½ cup ground oats
½ cup coconut shreds
1 cup sesame seed butter
½ tsp vanilla extract
2 tbsp honey
2 tbsp oil

Knead into dough and pat in pan. Dry in drier if desired.

Mango Pie

2 cups water
2 tbsp agar-agar
2 cups soaked dried mangos
1 tbsp honey

Boil water and dissolve agar-agar. Let cook a bit, then blend wth mangos and honey. Pour into pie shell and let cool until set.

Sweet Potato or Pumpkin Pie

¼ cup honey
1 tsp lemon juice
2 tbsp agar-agar
½ cup dates
¼ tsp nutmeg
2 cups soaked dried sweet potato or pumpkin
1 cup almond or cashew milk
½ tsp ground ginger

Heat nut milk and thoroughly dissolve agar. After cooling a bit, blend with other ingredients and fill pie shell. Sprinkle with grated coconut and let cool until set.

Low Calorie Cheesecake

½ cup honey
1 cup cashew milk
2 tbsp agar-agar
3 cups tofu or yogurt cheese
1 tsp vanilla extract
2 tsp lemon juice or rind

Heat milk, honey, vanilla and lemon juice almost to a boil. Dissolve agar-agar, let cool, and add yogurt or tofu. Blend well and pour into pie shell. The best and have all you want!

Banana Pudding

½ cup ground nuts or seeds
1 tbsp honey
1 cup fresh or soaked bananas

Blend with just enough water to form a heavy sauce.

Banana Flax Lax

¼ cup flax seeds
1 banana

Soak seeds for 8 hours in 1 cup water. This will turn very gelatinous. Blend with banana right before eating. Flax seed has a gentle laxative effect, so be careful!

Banana and Raisin Pie Filling

1 cup raisins
1 tbsp honey
½ tsp nutmeg
1 cup bananas
1 cup water or nut milk
2 tbsp agar-agar

Heat milk or water almost to a boil and dissolve in the agar-agar. Let cool a bit and blend with other ingredients. Pour into pie shell and let cool until set.

Fruit Creams

Blend any dried or fresh fruits with yogurt or nut milks for a really thick, creamy pudding.

Fruit Sauces

Blend any dried or fresh fruit with just enough water to puree. Try fruit sauces with sprouted nuts and seeds for extra flavors and nutrition.

Appendix A
Suggested Reading

1. Seasteading

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3. On-Board Gardening

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4. Seaweeds, Wild Foods, Algae

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Taylor, William R. *Marine Algae of the Eastern Tropical and Subtropical Coasts of the Americas.* Ann Arbor, Michigan: University of Michigan Press. 1960.

5. Health Care and Nutrition

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Henderson, John. *Emergency Medical Guide.* New York: McGraw Hill. 1978.

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Sam Andy's Food Storage Guide and Cookbook. Sam Andy Dehydrated Foods, 1770 Chicago Avenue, Riverside, California 92507, or from local distributors of Sam Andy Foods.

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Kulvinskas, Viktoras. *Survival into the Twenty-First Century.* Woodstock Valley, Connecticut: OMango Press. 1975.

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Mathewson, Stephen W. *Manual for the Home and Farm Production of Alcohol Fuel.* Berkeley, California: Ten Speed Press. 1980.

Mother Earth News Handbook of Homemade Power. Mother's Bookshelf, PO Box 70, Hendersonville, North Carolina 28791.

Rose, P.R. *The Solar Boat Book.* Aqual-Sol, PO Box 340968, Miami, Florida 33134.

Appendix B
Resource Guide

to Survival Tools and Materials

Airborne Sales
8501 Steller Drive
Culver City, California 90230
Catalogue of surplus gear.

Ampair Products
Aston House, Blackheath
Guildford, Surrey
GU48RD, England
Water and wind power generators.

Arrow Head Mills
PO Box 866
Hereford, Texas 79045
Bulk sprouting seeds and grains.

Burpee Seed Co.
311 Burpee Building
Warminster, Pennsylvania 18974
Miniature vegetable seeds.

Erewhon, Inc.
3 East Street
Cambridge, Massachusetts 02141
Dried seaweeds, fruit, vegetables, seeds and grains.

Farmer Seed and Nursery Co.
Faribault, Minnesota 55021
Early maturing and miniature vegetable seeds.

Jaffe Bros.
28560 Lilac Road
Valley Center, California 92082
Bulk dried seeds, grains, fruits, vegetables, etc.

Nichols Garden Nursery
1190 North Pacific Highway
Albany, Oregon 97321
Miniature vegetable seeds.

Perma-Pak
40 East 2430 South
Salt Lake City, Utah 84115
Storage foods.

Regent Marine & Instrument, Inc.
1051-B Clinton
Buffalo, New York 14206
Water-powered generators.

Sam Andy Dehydrated Foods
1770 Chicago Avenue
Riverside, California 92507
Storage foods.

Solar Energy Co.
PO Box 649
Gloucester Point, Virginia 23062
Wind generators.

Surplus Center
PO Box 82209
Lincoln, Nebraska 68501

Survival Inc.
PO Box 4727
Carson, California 90749
Good line of storage foods, survival tools and books.

Vita Green Farms, Inc.
PO Box 898
Vista, California 92083
Non-hybrid garden seeds.

Voyager's Industries
PO Box 708
Jensen Beach, Florida 33457
Collapsible solar-powered tools: water stills, ovens, food driers, hot water heaters. 12 volt food blender, hand-powered hydraulic fruit and vegetable juicer, hand-powered food processing equipment, remote paging intrusion, bilge flooding, fire, gas vapor and anchor dragging alarms. Food storage equipment. Survival foods: Spirulina algae, bee pollen. Sailing self-sufficient books, sprouting seeds, water, wind and solar-powered generators.

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