

EVERYBODY WANTS LUNCH  
THE ECOSYSTEM OF THE GARDEN  
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This book is dedicated to  
WES HOLLISTER  
who at the age of seventy  
took a fourteen year old boy  
(me)  
on a walk into the woods  
and opened his eyes to the  
wonders and beauties of nature.

Wes was the naturalist at  
Camp Manatoc  
in the years around 1940  
and took many Boy Scouts  
on walks through the woods.

Thank you Wes  
from 'Nature Boy'  
Manatoc Naturalist 1947 - 1950`  
and from 'Crazy Owl'  
Herbalist 1987 to now.

## ABOUT THE AUTHOR

Charles E. Hall, PhD (Wisconsin 1960), spent his 'career years' as a mathematical statistician in the heart of the Western scientific community. In 1975 at the age of 48 he predicted the onset of a cancer epidemic which would involve 30 percent of the population by 1985. He panicked and "dropped out" and went to live in a commune and grow organic food for survival. He has been near an organic food supply ever since.

As he gardened, he also studied Traditional Chinese Medicine (acupuncture, herbalism, etc.) and buried himself in the Oriental scientific method of Watching. So he watched his garden grow. For thirty years. Watching. Noticing. Seeing. Studying. Watching.

The result of his watching has become this little book. This is the accumulated experience of a naturalist, a scientist-statistician, an organic gardener and a healer. It is a gift from Nature Boy, Dr. Charles Hall and Crazy Owl to you - the reader. Enjoy it in good health.

## INTRODUCTION

This book is written to be read from first page to last page at the first reading if you can manage to do it

There are no chapters because the ecosystem has no subdivisions: it is all of a piece. Nothing is separable from the whole. So trying to decided how to divide it up makes no sense to me. At the end there is a list of topics with page numbers so you can find the discussion about the topic later.

It is hoped that you will discover a life in your garden that you did not recognize before – the network of interdependency that is called ECOSYSTEM these days.

A word I like better is BIOSYSTEM which in simpler terms is 'life system'. The biosystem is a group of living things that all eat each other to maintain their lives individually. The central core of a biosystem is the life force that is present in each member of the system and gets preserved by the members eating each other. Humans are part of the garden's ecosystem: we eat the garden to live. And when we spread our humanure back on the soil, we return the parts of life that we could not use. When we "die" our bodies get recycled somewhere on the planet. After all, we cannot leave the planet, so we are a part of the Earth's biosystem whether we like it or not.

We share our garden's biosystem with many creatures. They are all related to us, we all eat at the same table. They are our friends. Get to know them a little better.

## BEGIN HERE

In the early spring, the weather warms and the birds start migrating northward for the summer. On a nice sunny day in March or April my ear catches warble of a bird - a wren - a house wren or a Carolina wren or a Bewicks wren. I run to the edge of the garden and exclaim: "Welcome back, I'm glad to see you. Come over here to these vines and bushes and see what a wonderful nesting place we have here. And right over here in my garden is lunch: all the bugs and beetles you can eat."

A wren eats at least ten times its weight in insects a day. I can't tell you what they eat because THESE BUGS ARE NOT IN MY GARDEN. The birds ate almost all of them. I've only thought a few times about powders, sprays and insecticides, but I've never done anything to kill the bugs. If I did kill the bugs, I wouldn't have the birds. My vegetables rarely have enough bugs to bother with anyway and I eat well - called 'organic' these days.

As I have gardened, I have always been near assorted weed patches, berry patches, fence rows covered with bushes, small trees and vines, old rock walls, next to the woods, along creek beds and pond edges. Being some sort of naturalist, I noticed the birds, the wasps and butterflies too. For reasons of convenient cultivation with a six foot wide disk harrow, I cultivated my vegetables in twelve foot wide strips. Between these, I left a six foot wide strip and planted it with berry bushes, rugosa roses, strawberries and things which are perennial or grow on small bushes.

One day I decided to mow the weed patch next to the garden. So I put the mowing bar on the tractor and started around the weed patch. I got about a quarter to a half way round the patch and then it dawned on me what I was doing. How many toads and snakes had I killed? How many Field Sparrows nests and box turtles had I killed? How many bumblebee nests and wasp nests had I destroyed? The tractor stopped, the mowing bar went up and I took it back to the barn.

Never again. I learned my lesson.

Hedgerows are a necessity. They house a whole ecosystem which lives in and around a healthy garden.

This book introduces the science of **HEDGEROWS**.

A hedgerow is a border between two fields where weeds, brambles and bushes grow. Most usually it is the place where a fence has been or where a farmer throws the rocks to get them out of his field so he can cultivate easily. Often fruit trees grow in the hedgerow because this is where the farmers and boys throw their apple cores, peach pits, grape seeds, rotten tomatoes and lunch garbage. Nobody thinks much about what grows in a hedgerow/fence-row because it is a garbage heap.

Hedgerows have been part of farming since our ancestors divided the land into plots and fields: ten to fifty thousand years at least. In modern farming methods anything but profit making crops are considered dangerous. With agribusiness owning thousand acre fields, hedgerows have disappeared because they are 'inefficient' and produce no income.

Nothing worthwhile. If you travel fifty miles west of the Mississippi River anywhere between St. Louis and New Orleans you will find vast expanses of crops, corn, soybeans, grains, all without a single hedgerow. No birds, no snakes, toads, wasps or turtles here.

Just hundreds of acres with only one crop and all the bugs that eat that crop. If you have a fifty acre field of cabbages without a hedgerow of wild birds and toads, you will have fifty acres of cabbage worms and aphids and other cabbage eating insects. Then you will think you need fifty acres of poisons to harvest fifty acres of cabbage. The obvious conclusion of this logic is: don't plant fifty acres of cabbage, plant several different crops and grow back the hedgerows!

.Suppose we put in ten rows of hedgerows of bushes, blackberries and other homes for birds, turtles and snakes in this fifty acres of farm field. Then we plant five acres of oats, five acres of wheat, five acres of cabbage, five acres of carrots, five acres of tomatoes, five acres of this and of that. All in one and two acre plots. Lots of variety and not too much of anything in one spot. As the bugs arrive for lunch, the hedgerow's wild creatures will go into the patches of different crops and the wild things will have lunch on the bugs.

No poisons to buy. No equipment to buy to spray the poisons on the bugs. No gas mask to wear while spraying. All the time you would have spent spraying bugs can be spent sitting on the porch swing watching butterflies and bluebirds doing their thing in your garden.

This lesson was taught me one year when Susan, Brian and I planted 800 cabbages in a two acre plot. Soon after, clouds of aphids arrived on a warm southern breeze in April. The aphids liked our cabbages and sucked their juices dry and the cabbages started dying. Brian and Susan and I panicked. What to do? Dolomite dust? Poison?

So we sat on a power spot in the garden and meditated on a solution. Susan and I got a message about ladybugs. Brian got a message about a little black spider. Well, in about a week when the aphids were about to wipe out our cabbages, the same southern breezes that brought in the aphids brought in the ladybugs. Ladybugs find aphids very tasty so they ate them up. Then they continued their journey north to find another patch of aphids.

I learned another very valuable lesson. **WHEN THE BUGS GET NUMEROUS ENOUGH TO FEED THE PREDATOR, THE PREDATOR WILL ARRIVE READY FOR LUNCH.**

This incident doesn't really involve hedgerows unless ladybugs winter there and wake up in the spring when the aphids are ready to be eaten.

Here are some other things that do involve hedgerows.

The bird called Maryland Yellowthroat likes to eat ticks. They nest in hedgerows, raise a family and feed the kids thousands and thousands of ticks.

Toads eats almost any kind of bug. They do their mating in puddles and ponds of water where the pollywogs live and grow up into more toads. Then when the summer bugs get plentiful, the toad children move into the hedgerow. find a nice cozy place to sleep during the heat of the day, and in the cool of evening go out for lunch.

Bald-faced hornets frighten city folks. They build those nice gray paper wasp nests about the size of a football in the bushes of the hedgerow. They get hungry in the morning when most bugs are too cold to move fast and the wasps eat the bugs and feed them to their wasp children. This is my favorite wasp. They really like bean beetles. They like the flies around animal pens and cow barns. I haven't spent much time studying their diet, but a lot of it comes out of my garden.

I love to walk out in my garden and watch the birds fly out of the vegetable rows and go into the hedgerows to hide from me. I talk to them and tell them to go on eating but they are afraid I will hurt them. Little do they know how much I like them right there in the middle of my garden.

This list could go on and on but I am too lazy to watch what happens all day in my hedgerows. And it happens all night too. Stay up some night near the full moon and watch the mating dances of your friends.

It doesn't take a thousand years of farming to make a functional hedgerow. My garden has always had one - or maybe just a bushy weed patch nearby. To begin the process, I plan my garden so the hedgerows run north-south. This is so that the rows get sunlight on both sides sometime during the day. This is good for what grows there. How wide you make them is pretty much up to you. Mine have been six feet wide with a twelve foot wide strip of vegetables between the hedgerows. This size was chosen because the disc harrow we used for cultivation was six feet wide. There was no other reason.

Figure 1 here.

Ten feet of hedgerow and twenty feet of vegetables seems good too. Some considerations you can think about now have to do with the plants you want to grow there. For example if you want to grow raspberries or rose hips in the hedge, eight feet sounds better - then you won't have to lean too far into the hedge and get your belly scratched up when you're gorging yourself on raspberries. Grape vines should be a good six feet wide unless you wish to make arbors and shade bowers to relax in. (I would suggest fornication on the full moon in the bowers for the fertility of the garden.)

*Rosa rugosa* and *Rosa canina* are spiny and sticky. They form dense thickets of old canes so dense that birds can nest there. The fruits (hips) of these roses are the source for commercial rose hips. Whether you sell them or not, one rose hip has four times as much vitamin C as a glass of orange juice. But no matter how wide or narrow you make their hedgerow, sooner or later they will spread beyond your boundary. You can deal with that when you get to it.

Other good things you put in the hedgerows are black and red currants, gooseberries, elderberries, and *Rosa centifolia*, a popular herbal rose flower. Garden sage, oregano and other perennial herbs like parsley, thyme, marjoram (etc...etc...etc.) This is where I plant garlic and potato onions because of their August to July growth pattern. Do your own thing.

The hedgerow around the garden is another matter. Depending on where you live for the next fifty years, you may want to design this one more carefully. My last garden was way out in the boondocks. On a moonlight night the coyotes howled 360 degrees around. Dogs with wolf in their DNA howled back warning the coyotes off. Deer roamed in our

meadows. In a place like this one needs an impenetrable barrier around the garden.

Here are some solutions.

The trifoliolate orange (*Poncirus trifoliata*) grows wild at least as far north as Philadelphia or farther in warm spots. It is a bush about six or seven feet tall covered with the most sharp thorns ever. The thorns are four to six inches long and very sharp and dense on the bush. Lions, tigers and bears would not get through. Since bears were only a hundred miles away from that garden, something bear and deer proof needed to be put around the beehives and the garden. I think a two rowed hedge around the garden would be too wide for the deer to leap over and maybe too much for the bears too. The oranges from this tree are extraordinarily seedy and the fruity part is almost negligible. However the juice from these oranges is very, very tasty and when used to make something like a key lime pie, the pie is delicious beyond imagination. The peel is also used by the Chinese as an herbal.

A hedge of these bushes would take about ten years to grow but it would be permanent.

Cedar trees and catbrier (*Smilax* species) get nicely tall in a few years and with Honeysuckle vines (*Lonicera Japonica*) mixed in , after a few years the catbrier with its own fierce thorns and the honeysuckle tangle will become impenetrable to humans at least. Birds love these hedgerows. The one along the garden had at least 100 nests in it every summer.

Honeysuckle flowers preserved in honey will take down almost any fever. Just take a small jar and fill it loosely with blooms, then fill it with honey and turn it over every few hours to stir the honey and the flowers together. One teaspoon of the honey is enough, and it keeps for several years.

Don't forget the native blackberry bush - a ten to fifteen foot wide strip of blackberry is defense against many intruders. The blackberries on my farm are part of the official garden no matter where they grow. These fruits are one of Creation's most commonly eaten foods and they will grow anywhere - even in the most desolate regions and the worst trash heaps. Blackberry pie and blackberry cobbler are legendary deliciousness. There are some in my freezer right now. Leaves, roots and berry jam are excellent for kidney complaints too.

Blackberries also make fine wine.

### ODE TO A BLACKBERRY

OW!

Ouch!

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Mmmmmm!

Keeping animals out of the garden is discussed elsewhere too.

This next section - most of the book - is about the life around you and what I have observed about the ecosystem of the garden. Our very own Eden, waiting to feed us.

**BIRDS** is where we'll begin. I joined the National Audubon Society when I was in the seventh grade. The Audubon Society has been taught more kids about ecology than anyone else in the U.S.A.

Wrens of all kinds are gems. They will nest in anything: birdhouse gourds, small cans with tops off stuck in the bushes, fancy wren houses - almost anything. In a hedgerow they'll do it in the bushes. Set houses out in February and wait.

One wren eats about a thousand insects every day. When they are raising a family, they will eat four times as much. The bugs in your garden are Wren Health Food and organic at that.

The pollution we humans have created is affecting the bird population drastically. Read Rachel Carson's book "Silent Spring" to find out how. Birds need organic gardens too.

We are all related.

Maryland Yellowthroat warblers eat ticks. They eat lots of other things too, but I've watched them gobble up ticks from my porch in the early morning. Their warbling song is a delight on a warm day in spring. They nest in blackberry brambles.

Get yourself a copy of Peterson's Field Guide To The Birds and get to recognize your friends.

The latest addition to my Birds-most-wanted list is the Purple Martin. I put up my first Martin house last spring. Sometime at the appropriate time a male Martin (male birds always arrive two weeks before the females) flew by and liked the box. For several days he sat on the roof facing southwest sending a psychic message into the sky saying "Over here, over here, I've found a good one."

Then the birds began to arrive. Houseflies disappeared. Mosquitoes disappeared too. A couple of birds flew into the house to clean out the flies there. One of them actually spent the night. Martins eat almost anything that flies during the daylight hours.

Other swallows and chimney swifts are welcome too. Cliff swallows once tried to nest in the barn rafters but it was too busy for them and they left.

And then there are sparrows. Each day when I walk out in the garden about one or two hundred sparrows fly up out of the garden and into a large hedgerow. Mostly they eat weed seeds. I don't know what else they eat but they feed a lot of babies.

Cardinals feed on weed seeds in the winter. I've never been able to lure them to bird feeder, however. They like their seed organic.

Hawks eat mice and rabbits when the garden plants are small. Rabbits love bean sprouts. Bless your hawks.

Owls hang out around gardens too. Owls like mice. Mice like strawberries. Invite the owls

to dinner. Pull the tall weeds out of your berry patch so the owls and hawks can get to the mice.

Not all gardens have the same birds. My gardening experience is all in the eastern United States from Atlanta to Rhode Island and westward to the Mississippi River.

Get yourself an astrological calendar and mark the dates when you first see each kind of bird arrive. Mark other events too. Then you will begin to notice the eternal cycles of the seasons and the menses of the moon.

Last, but not least, on the list is the Kingfisher with attendant Blue and Green Herons, These birds are about water: clean, pesticide and herbicide and fertilizer free water. I have only seen these rarely in the last thirty years. They are at the top of the fresh water food chain so they need "organic" water in good supply. They eat fish and frogs and crawdads; these things cannot live in polluted water. It may interest you to know that when they started using DDT on the farm fields of Wisconsin that the fish in those streams have had so much DDT in them that boys (and men) cannot eat what they catch. This has been going on since the 1950's!

More on water later.

**SNAKES** come next but before we get into the benefits of snakes let us dispense with some Christian Church folklore about the deadliness of snakes. Not every snake with a criss-cross pattern on its back is a rattlesnake: ninety-five percent of them are rock snakes or water snakes or milk snakes or several other kinds. Even so only one third of folks who get bitten by rattlesnakes die. That is still too many. So here is something that I saw work on two dogs but no humans yet. **DAB THE SNAKE-BITE PLACE WITH VINEGAR, PURE APPLE CIDER VINEGAR** full strength not the 5% stuff. Do it every few hours or if you are still panicked do whatever else you want to do.

This came to me from a woman whose grandmother was a Native American and she used it on the dogs who had gotten bitten and were swelling up with the poison and getting very weak. After the vinegar was dabbed on the swelling the dogs were over it in two days.

Learn to know rattlesnakes, cotton-mouth moccasins and copperheads. These last, the copperheads are the deadliest. They hang around kids swimming holes. A big copperhead who lived near a swimming hole is the only snake I have ever killed. I apologized to it but I killed it anyway.

I seldom see snakes in my garden. They run away when I come tromp, tromp, tromping down the paths. They hear me coming and get out of my way.

The snakes are welcome in my garden. What they eat besides mice and baby rabbits, I don't know, but they are part of the balance of Nature there.

**TOADS** are one of your best friends. Volumes could be written about them and probably have been.

The benefits of toads in your garden are legion: they eat bugs of many kinds. Squash bugs must be high on their list. I am so happy with toads that here are two suggestion for getting them into your garden.

1. Put old clay pots in your hedgerow. Lay them on their side and half bury them. This is

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a safe place for a toad to hide when you are in the garden. Then you get children to catch toads and put them in your garden. The children learn something valuable to their life and you fill up your toad houses.

2. Toad ponds. Every garden as large as a quarter-acre city lot needs a toad pond in the spring. Sometime in March or April, the toads will find a big puddle or pond and do their toad thing to make toad children for your garden.

If you don't have a pond or puddle nearby, you can dig a small 6 by 10 foot hole about six inches to a foot deep. If it will hold water, fill it up and wish it well. If it won't hold water put a sheet of heavy plastic over/in it and throw a layer of dirt back in the hole on the plastic. The algae and mossy stuff the polliwogs eat live in the dirt. Then fill it up with water and wait. All us kids like to watch polliwogs grow into toads.

If you already have a pond or creek or swampy place, you have been blessed by Ceres and Persephone.

Flower in the crannied wall.  
I pluck you out of the crannies.  
I hold you here, root and all, in my hand,  
Little flower-- could I but understand  
What you are, root and all, and all in all  
I should know what God and man is.  
Alfred, Lord Tennyson.

**WASPS** are the most misunderstood of insects. The insect eating wasps are a blessing in the garden. Pollen and honey eating wasps are a vital part of your garden also. A lot of people get panicked when wasps are about and start screaming and flailing things about. This can only frighten a wasp half to death and make it want to sting the person who is threatening it. If you just leave it alone, the wasp has better things to do than sting you. I have lived with several wasp nests in the same room for years at a time, let them alone and gotten stung only once every two or three years.

The Paper Wasp or Bald Faced Hornet is my favorite. They build their nests hanging in trees or in low bushes or blackberry bushes. The nest is about the size of a football and made of wood bits chewed up and made into a gray kind of paper. It has a hole in the bottom for a door and houses as many as a hundred wasps with larvae and eggs. The only way you can bother them is to kick or poke the nest and if you do bother them you will get stung twenty to forty times and that will not be fun. So .... let them be.

Put picture 3 here.

The bald faced hornet is an early riser. It gets going early when it is too cold for most bugs to move fast. They like bean beetles and flies and sometimes build their nest in the tops of barns where flies are plentiful.

Many of the smaller wasps eat pollen and nectar. They were the major pollinator in America before the honey bees were brought over from Europe. They are still the major pollinator of the carrot family (Umbelliferae). Go out and watch them work parsley, carrots and Queen Ann's Lace.

**BEES** are good for the garden too. Many of our garden vegetables are pollinated only by honey bees. Almost all of our fruit trees are pollinated by honey bees also. The Europeans brought most of their vegetables and fruit trees with them and honey bees too. The honey bee will pollinate most of the things you plant in your garden. Also this is where we get all our honey, pollen, royal jelly, propolis and beeswax.

The **PRAYING MANTIS** is an insect that eats so many bugs that when they overpopulate they eat each other. In the late 1960's the mantises were probably the first attempt to make organic gardening work. Somehow the Chinese mantis was brought into the country. The Chinese kind naturalized quickly and has almost replaced the native American kind.

A similar insect, the Walking Stick is native and occasionally seen.

A Chinese mantis egg case is attached to a twig or a blackberry stem and looks like a sand colored ball of foam.

It has a zillion eggs in it. the mama mantis hangs the egg case three to six feet above the ground, mostly on blackberry bushes, but if there are no blackberry bushes around, any twig will do.

Put picture 4 here.

I very early spring, I roam along the berry patches looking for extra egg cases. I pick one or two for the garden and some more for the orchard. I get nice long stems and stick them into the hedgerows. You stick them into the bushes with the bell side hanging down just the way you found it.

Earth spirits take care of the rest.

**EARTHWORMS** are an absolute necessity in the garden. Wormshit has more nutrients than anyone can count. Worms eat mostly algae and other soil creatures. They are abundant in any good garden soil. Worms will also eat garbage: organic garbage, I hope. Non-organic garbage will kill worms. I doubt that a worm population could survive off the supermarkets irradiated produce -- it's too dead. There are worm-growing kits available so you can feed them your garbage and let the worms transform it into worm-manure to fertilize your favorite garden. These kits are found in many gardening catalogs.

Worms also can help provide trace elements to your garden soil. Here's how. Worms have a gizzard like chickens and birds. The gizzard is kept full of small stones and when it is full of seeds and grains, the gizzard grinds itself about and the stones grind up the seeds so they can be digested. This can only happen when there is some kind of fine rock sand in the soil. If you put **GRANITE SAND** on your garden, the granite does the grinding in the gizzard. Of course, the granite sand grinds itself into a powder while it is grinding seeds. Now granite has many kinds of trace elements in it, sometimes quite a few, depending on where it came from.

It doesn't take much granite sand to keep your worms happy and your body supplied with

trace minerals.

Worms come in two kinds in my experience: big fat nightcrawlers and much smaller red manure worms. I'm sure there are more kinds than that if you are a wormologist. Nightcrawlers are big fat ones about six to eight inches long and as fat as a pencil. You can get up at dawn and collect them off lawns when you go fishing for big fish. Manure worms are 3 to 4 inches long and reddish colored. They like the edges of manure piles. They help catch small fish. I think these are the ones they put in worm farms. You don't have to buy many of them if you have a manure pile. Just put them in your compost and they will survive and populate your garden.

**MICROBES** are the things that the agriculture schools forgot. These are tiny little living plants and animals that can't be seen without a microscope. They are everywhere in all sorts of places: ponds, wood soils, rivers, toilets, flower pots, wine, milk, manure piles .... everywhere. Microbes change milk into cheese, manure into compost, and your lunch into something your blood and transport to the cells of your body for their lunch. A few microbes cause disease in our bodies, many more are necessary for good digestion and good health.

The agriculture science folks are just beginning to discover how much farming is dependent on microbes. At the same time the medical professions are discovering how much digestion depends on a good supply of good microbes in your gut. Unfortunately we are also discovering how easily the microbes in the soil and in our gut can be killed. And when the microbes in our soil and in our gut die, we and our gardens suffer from malnutrition and get sick.

When our garden is sick then our food is sick and we get sick too.

The current list of poisonous chemicals sprayed on food crops would amaze you. Peaches are sprayed every two weeks with some kind of poison. Lettuce crops are sprayed frequently with poisons, even with migrant farm workers still in the fields. Peanut fields are sprayed with Agent Orange to kill the weeds. The Agent Orange ends up in peanut butter, peanut frying oils for making French fried potatoes, peanut candy ..... etc.

Apple trees get sprayed during the summer. Then, after they are picked they are waxed to make them look shiny and pretty and the wax has a poison in it to "prevent spoilage".

The boxes that food is shipped in (apples, celery, tomatoes, corn flakes, cookies, potatoes ... etc.) are sprayed with poison to kill cockroaches. Even your favorite breakfast food has its box sprayed with chemicals that are too deadly to put in the breakfast food 'flakes'.

Ordinary white bread has had sodium propionate put in it for seventy years to "retard spoilage". This kills bread yeast mold (which produces penicillin). What does sodium propionate do to the yeasts in your gut which help digest cakes and pies for your body's lunch? More than you want to know about.

A simple list of the poisons put on food 'to prevent spoilage' could probably fill two books the size of this one.

If you think this is ridiculous, go into any chain supermarket and start reading the list of ingredients on cans of food. Start at the bottom and read up. Every time you come to an ingredient you can't pronounce or initials are used because nobody could pronounce the

word, IT ISN'T FOOD. Food names are short and common and easy to pronounce. Poison names are long and complex. How many of these chemicals are on the cans of food on a single aisle in a supermarket? Try counting them.

What do these chemicals do in your gut?

Lets put food to rest for now and go back to the chemicals in the garden.

Plain ordinary fertilizer is a chemical. It puts the soil out of balance with nitrates, potashes and phosphates. We are beginning to discover that fertilizer poisons kill many of the microbes in the soil which are useful in growing tasty tomatoes, delicious zucchini and crunchy broccoli. Agribusiness sprays on pesticide poisons to kill off bug pests and millions of kinds of soil microbes. We are now coming to realize what a disaster agricultural chemicals are to the living necessities in garden soil. It takes seven years for these chemicals to get washed out of the soil by rainwater. That's a long wait to get a good lettuce sandwich from your garden.

If you think this is not true, steam cook some organic broccoli right next to some chemically grown broccoli, then taste the difference yourself. Or juice some organic carrots and separately juice some non-organic carrots and taste the difference.

(Overweight and skinny people may not be able to do this because their taste mechanism doesn't work very well.)

After seven years have passed since the garden was fertilized and/or insecticided and the poison has leached out or dissipated, someone has to put the microbes back into the soil. The microbes can't travel far (no legs) so we have to put them back deliberately.

There are several sources for soil bacteria that can be used to replace the microbes. The **BIODYNAMIC** method is probably the oldest method. I have only used this on one garden but the effect was quite remarkable. The garden was an old hayfield and very bad off. After one spraying, red clover populated the unused part of the garden; red clover is an excellent nitrater of soil and is an excellent cover crop too. The vegetables that came out of the garden were tasty and the garlic was good and naturally hot. I had eaten Biodynamic food before and I was not disappointed in the results that came from my garden.

The preparation of the Biodynamic materials is complex and very unusual. After you have tried them and experienced the result you may want to make your own. When you start using them, get your Horn Manure, compost mix and whatever else from

The Josephine Porter Institute  
Box 133  
Woolwine VA 24185.

Write them for details.

The way things work is very different. First you pour the small package of horn manure into clean, real, live water, nothing chemicalized. Then you stir vigorously for an hour; this enlivens the microbes. Then you put it in a sprayer and spray a mist over your freshly plowed garden soil. One mix is sprayed late in the day and another mix is sprayed at sunrise. The microbes settle onto the dirt and do their thing to your garden plot.

The spraying is done while you walk rapidly over your garden and the mist is so thin it would not wet the windows of your car. It is almost undetectable. It is almost unbelievable that the treatment would do anything, but the life it puts in the soil is microscopic.

Putting the Compost Mix on your compost pile does awesome things too. Some of the weeds that grew on my compost pile were huge! Your garden will be huge also.

What it does to your food is delectable. Plain ordinary recipes become delicious, fill your belly quickly and rival the best dishes by French Chefs. You'll never go back to supermarket food again!

There are several other preparations of microbial stew you can spray on the garden. You will find these advertised in ACRES USA. I sprayed one of these mixes on my garden too, just to be sure that all the bases were covered. The garden had been a hayfield for many years and had been heavily fertilized and herbicided often. It had not been messed with for about seven years and it was ready to be renewed. I did everything I could think of including fish emulsion foliar spray. You might think that all this stuff outdid the Biodynamic preparations but I don't think so. I've had Biodynamic garlic from other places that I paid \$10 a pound wholesale when ordinary organic was selling for \$2.50 a pound retail. That garlic was so strong when eaten raw that veteran garlic chewers made faces when they ate the stuff. My first garlic crop from my own garden was almost that strong.

It probably takes a couple of years before the full results can be obtained, but you will notice a big difference the first year anyway. After you have gotten the full effect of these methods, you will begin to realize how destructive chemical agriculture has been to our farmland and our food supply.

There is an added benefit to having a healthy soil and healthy plants in your garden: when plants are healthy there are less bugs that eat them. This has not been recognized by University Professors and corporations which manufacture agrichemicals. These people are not farmers : they are teachers and merchants and seldom get dirt under their fingernails. Old, successful farmers are the best authorities on farming.

Plants which are healthy have some way of limiting their destruction by bugs. It may be that they have a natural bug repellent of their own. Or it may be that predators like their bugs healthy. I would go with predators preferring healthy bugs: everybody wants a tasty, healthy lunch.

Every once in a while a **PLAGUE OF INSECTS** will happen in spite of everything you do. A plague of locusts (grasshoppers) happened in Egypt in Moses time. Again it happened when the Mormons settled in Salt Lake City. And it happened in northern Afghanistan in 2002. These were great invasions of grasshoppers which ate everything green in sight. These invasions happen every now and then. Twice, small invasions have occurred in my garden too. These were cabbage worms and potato bugs.

The cabbage worms hit my garden on the full moon in the month of Taurus in the place where I was living. On the premise that most things do not like the smell of their own dead, I picked a small handful of cabbage worms, squeezed the juice out of them, strained the juice and diluted it with about a quart of water and put it in a hand sprayer. Then I went out into the garden and sprayed all the cabbage plants.

For a day or two, the worms were gone. Then a new batch of eggs hatched, new cabbage worms appeared and I did the spray routine again. No trouble for a month. The next full moon the second wave of little white butterflies came north on the spring breezes. The cabbage butterflies laid their eggs again and I did the worm spray a couple more times and ended the pestilence.

Another invasion happened with potato beetles a couple of years later. The same procedure was used with potato bug squeezings and the spray bottle. The bugs went away.

A couple of days later I went out to the potato patch to see how the bug larvae were doing.

A few bug larvae were back but a small wasp was having lunch on them. The predator had arrived a little late but not too late. So I went away and let Mother Nature do her thing keeping the potato patch free of bugs while I sat on the porch.

Tomato worms are those big green caterpillars that gobble up tomato plants. They're frightening because they work so fast. Picking them off by hand is easy. However if you find one that has little white 'things' sticking out all over it, don't kill it. Those white 'things' are the children of a wasp that lays its eggs onto tomato worms and the kids feed on the tomato worms. The worm is being eaten alive by a predatory wasp. When you let the tomato worm live, the wasp children will grow up and lay their eggs on more tomato worms. The wasp - tomato worm populations will balance themselves in time so you can sit on the porch some more.

**WEEDS** are a very interesting part of the ecosystem of my garden. Weeds in most gardens are considered a nuisance by the gardener. Not so in my garden. Weeds give a garden variety and whether humans like it or not, variety is the spice of life which gives a garden its flavor. About half the plants we call weeds are good food.

**LAMBSQUARTERS** (also called Good King Henry or just Good Henry) are a very nutritional food. They grow in good garden soil naturally, and are a sign of pretty good balance of calcium, magnesium and phosphate. When I'm picking salad greens I always include Lambsquarters. I have a strong feeling that the seeds make a very good grain with excellent nutrition because it is first-cousin to Quinoa, the grain of the high Andes mountains. I haven't tried the seeds as grain yet, however. I would also like to dry the leaves and use them in soup in the winter. Lambsquarters are reputed to have much vitamin B-12. It would not surprise me if they had more available B-12 than most vitamin pills.

**CHICKWEED** grows almost everywhere. It is a low growing weed with tiny star-like flowers. The soil alkalai-acid balance must be right for the garden and it proliferates in cool to cold weather when most other garden things are dead. The taste is a little sour but the herbal and nutritional and herbal benefits are many. One black Grandma used it to help women with fat hips lose weight by putting it in salads. It also removes toxins from the body and is used by many herbalists for that purpose. It could be a vital part of tumor removal and cancer treatment. Chickweed increases the vitality of the blood which makes it good for the treatment of anemia, pale face and lips, and sagging energy. In the cool parts of the year, chickweed is there after lettuce has faded away. Winter salads can include a lot of chickweed out of your garden.

**MUSTARD GREENS** grow in the garden starting in late fall and surviving until spring. There are so many kinds of mustard greens that grow in Eastern U.S. almost beyond counting but they are all recognizable as mustard. They grow from plants 4 inches high to plants a foot high and with leaves in a circular rosette on the ground. And they all have leaves that look a lot like the illustration. They bloom in the spring and if you let

illustration 4 here

them go to seed (Don't pull them up.) and you will have them again next fall.

One of the edible weeds is a wild **SWEET PEA** with pink flowers. It grows in dense patches all over eastern U.S. and is a perennial vine which comes back year after year. It flowers profusely and makes pods a lot like the common garden pea. The unripe peas taste sweet and would make an easy crop. Since it is perennial, it would need to be put in a hedgerow on the edge of things.

For some stupid reason wild sweet peas have never been eaten by white folks. My mother planted some and they grew for many years but no one ever ate the first pea! Unfortunately they are very hard to get started but once established they are a free lunch forever and ever.

**DANDELIONS** are another "weed" that you would be lucky to have in your garden or lawn. The leaves in spring are an unbelievable Spring Tonic. One year when I had lots and lots of them, I ate a whole bowlful of them every night for supper with nothing but oil and vinegar for a salad dressing. For four days in succession I ate them with nothing else for supper. **WOW!** I was so energized that I felt like I was floating a foot above the ground. Much nutrition! Those dandelion greens taught me the meaning of the phrase Spring Tonic.

As an herbal the roots do marvelous things for the liver and are an essential for any herbal detoxifying program.

The flowers make good wine too.

A lot of medicinal herbs grow as "weeds" in the garden. These also contribute a few leaves to garnish winter (or summer) salads: Yellow Dock, Broad-leaved Dock, Ground Ivy, Purslane (*Portulacca oleraceae*), Narrow-leaved plantain, Broad-leaved Plantain, various wild onions and garlics (They look like chives.), Pokeweed when still small, oxalis (sour grass) and so forth, and so forth.

The edible "weeds" in gardens varies from place to place. Sometimes a few feet can change conditions so much that different edible "weeds" are available. Try Euell Gibbons book "Stalking the Wild Asparagus" and get to know some of the edibles around you and your garden.

There is a class of plants that I like to see in my garden even though they are not all edible. Some of these are **LEGUMES**: peas, beans, vetches and clovers. These particular plants put nitrogen compounds (nitrates) into the soil and make fertilizer unnecessary. All these plants have flowers that look like pea flowers, some large and some tiny, some have a few flowers on one stem and several have a spike with many flowers on them. All of them have pods of seed similar to pea pods and bean pods, Most of them that are climbing vines have leaves that look like the diagram and these have tendrils at the end of the leaves for hanging onto bushes, strong stemmed plants, sticks, fences etc. Many of these are edible but I have not tested them yet.

Illustration 5 here

**TARE** is one of the vetches that I really like to find in my garden. It can lay on the ground or crawl over things but it never grows dense so as to kill off what it is crawling over. The flower spikes are small and purple in color. The seeds and pods are miniature peas. Since

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it is a wild plant it seeds itself and will always be in your garden. Just let it be and do its own thing.

It can also get thick enough to shade the soil and conserve dampness.

**HAIRY VETCH** and some not-so-hairy vetches are now being sold and used as green manure and are much like tare but bigger. It grows primarily in the spring and fall when ordinary vegetables have frosted out. It will seed itself, but must be weeded out from smaller vegetables because it will cover them over and kill them.

The family of legumes (beans, peas, clovers and vetches) all put nitrogen into the soil for other plants to use. Legumes are so common in the world that there must be several that are native where you are – even in the desert. Let them live among the lettuce and spinach and cabbages. The other plants will love you for it.

The native Americans utilized this manner of planting legumes with their crops. They have a special bean to plant among their cornstalks. Both are planted at the same time; the bean coming out of the ground first; the corn coming up second. A week later the bean has its first true leaves and the corn is growing slowly. Another week or so the bean has not grown at all but the corn is growing up. As soon as the corn gets tall enough the bean starts growing up the cornstalk. The bean climbs the cornstalk, blooms and makes a nice edible bean, dry or green. The native Americans never had to fertilize their corn fields, the bean did it for them. This way they could raise corn and beans in the same spot year after year. These beans are now marketed under the name of '**GENUINE INDIAN CORNFIELD BEANS**'.

The Chinese have a similar arrangement with all their vegetables. They plant a vegetable then a bean, then a vegetable, then a bean in alternation down the row. Or they can plant a row of vegetable and a row of legumes right next together then a path, then more vegetables and more legumes and another path. Planting vegetables right next to the legumes lets the vegetable roots mingle bean roots and both of them like it. Automatic nitrate in the soil.

Most Chinese beans are varieties of **SOY BEANS** and are relatively short like the vegetables. Try doing these in your garden and stop worrying about a big part of soil fertility. This was described in a book by F. H. King titled "Farmers Of Forty Centuries" subtitled "Permanent Agriculture In China, Korea And Japan". It was published first in 1911. It would appear that everyone ignored King. Rodale Press republished it recently. It is very interesting reading for those of us who want to be self-sustaining in our farming.

Other weeds that I like are the **PORTULACAS** and some of the creeping **MALLOWS**. These plants spread low and creep close to the ground. Some of them are occasionally eaten. Because they are low they cover the ground well and keep it from drying out but do not disturb the vegetables.

**CLOVERS** would seem like a good thing to grow because of their nitrate effect, but their root system is so dense that they kill vegetables. This does not stop them from being used as green manure crops.

Learn by trial and error; this method is always available when books are not.

Let weeds tell you about the fertility of the soil. For years I used **OXALIS** (Oxalis Innoxialis, botanically) or Sourgrass, a little plant with leaves like clover but with little yellow flowers. Oxalis grows in slightly acid soils and indicates a need for lime or wood ash. (Use organic

wood ash only, NO ashes from painted wood or wood treated with preservatives or plywood.) Oxalis is edible and I garnish my salads with it. You will enjoy reading a book by Charles Walters entitled "Weeds, Control Without Poisons" published by ACRES USA in Austin, Texas. Walters describes hundreds of weeds that you don't want in your garden and tells you how to control or eliminate them by adjusting the soil's mineral fertility and help your vegetables at the same time. A truly fine way to find out about soil minerals and weeds at the same time. I have a copy for reference every time I see a different weed in my garden. When you adjust the mineral fertility of your soil, the weeds just go away. Of course others come along that like the new mineral balance, but I have noticed that the new ones are often edible weeds like lambsquarters.

I have watched expert gardeners walk into a new garden, pull up a weed, stare momentarily at the root system and advise the owner what to do with his garden. Knowing weeds is a lot less expensive than a soil test kit.

A last word about weeds here. As you pull out your weeds, lay them back down on the soil with their roots exposed to sun and air so they will die. They will mulch the soil and decompose on the spot. Don't carry them out of the garden, they are part of the ecosystem and each one of them has some vital part of the nutrients of your garden in their bodies. Recycle their bodies right back into the soil where they came from. Don't waste a lot of time carrying them to the compost pile unless you have a particular reason for doing so. If you put them on the compost pile, the juices drain into the ground under the compost pile and make it very fertile there and not where the vegetables are.

Mulch and compost are essential for replacing the soil nutrients you eat out of your garden

**COMPOST** is the leftovers and garbage from the kitchen mixed with the manure of cows, horses, pigs, chickens, goats and/or other farm animals. Garbage and manure are mixed about half and half with a little good garden soil sprinkled among it. Along with the good garden soil, you can use Biodynamic Compost Mix or some other good microbe mix. Then you turn it and stir it up a bit every week or so to hurry it along. When the mess has turned into 'dirt', sprinkle it on the soil, stir it in a little with a hoe and plant on top of it.

Almost any book on organic gardening will give you more detail on making compost but these are the essentials. Sometimes the descriptions are quite elegant but the process can be made more simple by just dumping the garbage on the garden. This looks messy but the process works just the same. For myself I like the manure in my compost.

Another way of adding to your gardens fertility is to make **MANURE TEA**.

Susan taught me how to do this a long time ago and it has been a regular feature of my garden ever since. Get a 55 gallon drum of metal, stop up all the holes and cut one end out of it. Be careful of what was in it, even barrels that had foodstuff in it get painted inside with poisonous stuff. That poison can get into the tea and kill the rotting of it or maybe get on the garden and kill you.

Get the barrel over near the garden and fill it one third with manure and maybe a bucket of garbage. (Caution: don't include coffee grounds or orange peels because they are toxic to the tea.) Fill the barrel with good water almost to the top. The tea will ferment and form what the French winemakers call a 'chapeau'. Take a good stick and stir down the 'chapeau' every few days. In a couple of weeks you will have a nice tea with a lot of nitrate for your favorite plants like basil.

**MULCH** on the garden is a lot like composting. Straw (organic we hope) is spread

between the vegetables. The two most important features proclaimed for mulching are to keep weeds from growing and to create compost for the vegetables. There are more benefits than this however. **DO NOT USE HAY.** It has grass and weed seeds in it and these will germinate next year making a weed patch where your garden once was.

A good layer of mulch in a dry year keeps the moisture in the soil. This helps reduce irrigation and watering. A side note here is that spraying a mist of water over the plants in the evening is a way of watering the garden during a drought. During a drought, the dew stops happening and the water that the dew feeds the plant can be replaced by spraying.

Some folks mulch the garden heavily and grow their vegetables right in the rotted mulch. This is described more fully in a book by Ruth Stout entitled "No Work Gardening". Her methods make beautiful gardens for very little effort. I always plant my potatoes with a little organic wood ash sprinkled on the ground and about two feet of straw piled on top. Just lay the potatoes on top the soil, pile on the straw and then when it is time for harvest, roll back the straw and pick up the potatoes! Little or no digging.

When you weed the garden. Just drop the weeds on top the straw mulch with the roots exposed to the sun. The weeds then form mulch and compost and return the weeds to Mother Earth.

Never use hay for mulch. Straw comes from grain's stems and has few if any seeds left in it. Hay, on the other hand, has lots of grass and weed seeds in it. If you use hay, the next year you will have a hayfield where your garden was.

Some exotic gardeners like to return their own manure (politely: **HUMANURE**) back to the garden. This is common practice in much of the world. There are problems with this such as dysentery, hookworms, roundworms and other intestinal parasites but these can be dealt with safely. You can either use a 'hot' composting method where you make the compost pile steam up and kill the parasites or you can let it compost itself for three years or more to have the roundworms eggs die. There is a book on the ways of doing humanure composting titled "Humanure" by Joseph Jenkins. I'm going to build a composting toilet one of these days in the near future.

Waste not, want not.

**RABBITS** have a hard time running on straw, it slips underneath their feet and they can't get away from owls, cats, dogs and hawks who like rabbit for lunch.

**MICE** are a phenomenon all to themselves. Everything eats them: owls, snakes, cats, dogs, coyotes, wolves, etc. In spite of this, it is estimated that mice and rats eat one-third to one-half the worlds grain supply every year. **CATS** live with humans for two reasons: 1) mice and rats and 2) warm. Kitty Health food diet starts with mice and rats.

I like to watch our tomcat in the garden stalking mice and rabbits. He's a beautiful animal, sleek fur with a lustrous shine that almost glitters in the sunlight. He's three years old and in his prime. He eats the male kittens and castrates the teen-age males. Occasionally a male kitten hides out in the woods and hedgerows until it is his turn to be Tom Cat. Then he goes back home, finds the old Tom Cat and castrates him and takes over the harem. After a couple more years a new younger and stronger male cat comes along, castrates the old Tom Cat and takes over the harem. Such is life among cats.

Pussycats who live in apartment buildings live an entirely different life.

Every farm needs a cat population to keep the mice and rats under some kind of control. The cat population on a farm is mostly female cats with kittens and one Tom Cat. The frequent replacement of Tom Cat males keeps the genetics strong and keeps the cat population from inbreeding and growing six or seven toes on their feet. If you do not like the violence of Tom Cat life, every two or three years you need to bring in a new Tom Cat from a distant farm and get rid of the old Tom Cat. A healthy cat population is a necessity on a farm that raises or stores grain. A good housecat is a necessity if you have grain (not flour) in the house.

When you get your first female cat, be sure to get one whose Mommy cat taught her how to hunt mice. City pussycats do not know how to hunt and feed themselves any more and they are more of a liability than an asset.

Don't feed cats on Kitty food from the grocery store. A Tom Cat who eats wild food can terrorize a tomcat who eats from a supermarket and can kill it easily.

Enough about cat husbandry.

A six foot blacksnake or two is nice to have around to help the cats with the rodent population.

A good **CORN CRIB** for storing grain is a necessity on a farm too. The picture shows the classic corn crib design I knew as a child. It was built of narrow boards for siding with an inch or two of space between the boards so that the wind could blow through and keep the corn well ventilated so the corn doesn't mildew. The inside of the crib is lined, top, sides and bottom, with 'hardware cloth to keep mice and rats out. (Hardware cloth is a type of screening made of galvanized wire with quarter inch or half inch holes.)

Drawing 2 goes here.

**Deer** like gardens. They will eat almost anything you grow. They like beans and corn the most. The next discussion is about keeping them OUT. I've spent some time working on this problem. Sometimes, nothing works. In drought years when their forest food dries up or just doesn't grow, almost nothing will keep them from your well watered and delicious vegetables.

If you and your co-workers are vegetarian, peeing about the garden does nothing. Deer can smell a meat-eater's scent for a long way and stay away for self preservation. Vegetarians are friends not predators. Meat-eaters are predators.

One thing of the many things I have tried seems to work. Put a quarter of a pound of deer meat in the bottom of a five gallon bucket and put some large rocks on top of the meat. Then fill the buckets with water and put them around the edge of the garden. The deer smell this rotting and will stay away from the garden. Nothing likes the smell of its own dead. It is a universal danger sign.

Putting the rocks on top of the meat keeps the dogs from eating the meat out of the bucket while it rots. This has worked for me. I have watched deer walk 20 feet away to avoid a smelly bucket of rotting deer meat.

**DOGS** keep deer out of the garden too. Dog animals have eaten deer animals for millions of years. Get a hunting dog that is a mutt. Pedigreed dogs are useless. Part beagle or hound or German shepherd will have enough hunting instinct to chase the deer away.

One other thing was suggested to me and sounds good enough to repeat without trying it out first. Two strands of electric fencing six feet apart. This separation is reputed to be too far for the deer to jump across. A deer can easily jump an eight foot high fence but they can't jump across two strands six feet apart.

Another suggestion that I tried once was to spray fish emulsion fertilizer every couple of weeks and every time it rains. Fish emulsion is a foliar fertilizer (that's good) and the deer don't like the smell of it. I think it worked once for me but it was a drought year and the deer were starving and braved the smell to get at lunch.

It helps to know when the deer will be in the garden. Deer travel in a circular path every two weeks. The route is several miles long but every two weeks they repeat it. Notice when the deer are about the garden and how many days away from the full or new moon it is when they come back for a visit. The deer will return the same number of days before the new or full moon every two weeks for years.

Sprinkling and mulching bring us to the key ingredient in the ecosystem of the garden: **WATER**. Human creatures like to live near water because it feeds our gardens, wild or domestic gardens. Life is easier when we eat what lives in the lush vegetation near rivers and creeks. Our earliest modes of transportation were boats/canoes on rivers, lakes, ponds and oceans. Civilization's cities cluster along rivers. Farmers do food growing on the edges of waterways to feed folks in the cities. Witness the Nile river valley and the endless history of that place back into time.

With great regularity rivers flood. If you are lucky the rich silt-filled muddy river will overflow the banks and the rivers-edge ecosystem. The silt rots into compost and fertilizes your field. That's very nice, so don't panic. River bottoms are used to this and survive quite well. And your garden gets a fresh layer of dirt.

**BEAVERS** are a blessing to life-long farming. The dams they make create ponds and swamps for flooding. These floods create the flatlands and bottom lands we humans like to farm on. Without beavers to dam up creeks, create ponds and floods, our best farmlands would not exist.

If you want beavers. let the wild stuff grow in a wide strip along the edge of the waterway, maybe twenty to forty feet wide. Plant sycamore and cottonwood poplars along the edge for the beavers to eat and to make dams of. Whatever the beavers eat of the riverside trees, they will be quickly replaced by the kinds beavers like best. The whole balance between bottom farmland, rivers edge and beavers will come into its own if you just let it be.

We are all related.

Black and green **WILLOWS** border our creeks. The sandbar willow grows right down in the bottom of the creek-bed. These willows keep the edge of the river from eroding away and control the meandering of the waterway. If you plant Basket Willow along the edge you can grow willow wythes to make baskets with. Willows are the first trees to bloom in the spring and bees get their first taste of pollen from them. The bark of willows is a painkilling herb

(aspirin, salicylic acid) but must be used carefully.

**PONDS** have an ecosystem which is good to be near. A swimming hole is wonderful on a hot summer day. Toads begin their lives in ponds and big puddles. So do frogs and dragonflies. Dragonflies eat insects too. A lot of herbs like calamus root, peppermint, spearmint, pennyroyal (*Mentha pulegium*), cattail (pollen for wounds, root for supper) for just a few.

**RIVER EDGES** are wonderful ecosystems. Modern agribusiness is terrified of wild river edges. As mentioned before, along my river and creek edges, there is a twenty to fifty foot strip of wilderness filled with stuff.

The first is **BLACK WALNUT** trees. As food they have been used for thousands of years. They also feed the human male sexual apparatus. A tincture of the green nut hulls is a commonly used herb for detoxifying poisons from our bodies. The leaves are used also. The wood is beautiful when they die of old age.

The White Walnut (Butternut) grows only by water and is the tastiest of the walnuts but a trial to crack and get the nutmeat out. The 'English' (Carpathian) Walnut grows easily but only on hillsides.

**BLACK RASPBERRIES** like sandy spots along river edges too.

The **MUSCADINEE GRAPE** with large purple thick-skinned fruits grows only along creeks and river edges. It is good enough eating and has been domesticated as the Concord grape. Last but not least, according to Thomas Jefferson, it is one of the great wine grapes of the world. I have made it and I agree with T J.

**SWAMPS** are the bane of civilization. Cities that are built near swamps drain them. Malaria was once thought to be a disease caused by breathing bad air (mal aria in Latin and Italian) from swamps. Actually a mosquito that lives in the swamp carries the microbe that causes the problem. "Swamps" are not good in the minds of most Europeans.

Putting up a purple martin biordhouse will solve the mosquito problem.

However, swamps are an ecosystem humans can live in/near if we try. Many medicinal herbs grow in swamps. The territory covered by a swamp was once a pond behind a beaver dam and some day after enough floods will become a floodplain farm.

Food grows in swamps too. **WILD RICE** likes six inches to a foot of water (actually, this is a form of wheat.) When the rice/wheat is growing it harbors catfish for lunch. When the grain is ripe, people and wild geese harvest it. As a young man, I remember seeing Horricon Marsh in Wisconsin covered with vast numbers of Canada geese eating the wild rice. Bread and goose for the harvest festival.

**CATTAILS** also grows on the edges of swamps, the root is a potato-like vegetable. The pollen off the cattail flower is used to stop the bleeding of wounds.

The big birds like herons, egrets and cranes come north to beautify our swamps in the summer.

**SPRINGS** of clean, clear water are a requirement for rural living. With the current clean water crisis in big cities, those of us who have clean clear spring-water may someday sell

our water to city folks so they can survive in the city.

Hopefully, your spring will be uphill from any privies (shit houses) and any sink/laundry drainage. These drainages pollute and repollute any spring or water source downhill from them. Dysentery and round-worms are the first in the illness parade.

If your house or privy is uphill from the spring, move them somewhere else. This sounds drastic but moving the house/privy is easier than moving the spring.

Clean water is becoming very scarce in the U.S.A. I drank a cupful of tap-water from a city recently and had diarrhea for four days. Never again. Twenty five years of drinking from springs has ruined my gut for city water.

If you live in limestone country, look for an exposed vein of shale. There may be some water on top of the shale. Or go find a local dowser, they will find water. Or the ruins of an old cabin will direct you to an old spring, since the folks who lived in the cabin needed water too.

A good water source, spring or creek, uphill from the garden is a real blessing in a dry year. Easy irrigation.

**BOXING IN A SPRING** is something you will need to do if you want to use the water for yourself. The method of doing this is ultimate simplicity. Enlarge the hole the water comes out of -- carefully -- very carefully -- lest you lest you destroy the spring itself. When the hole is about one to two feet square, make a box of wood (oak preferred) to put in the hole. Be sure to put a hole in the box big enough to let the water into it. Then make another hole just big enough to put your water pipe into it. Then put the box into the spring hole, hook up the water pipe, put a lid on the box, fill around the box with dirt and you are in business with water.

Decorate your spring with stonework and maybe a large catch-basin. It is going to serve you well for years, so be good to it.

There are many ways to open up springs and other veins of water. Your local farmers hardware store will help you find the equipment. An experienced dowser will help you find where the water is on your farm.

After you have everything ready to be planted, you are ready for planting by the **MOON SIGNS**. All the events in your garden arrive and depart by the **ASTROLOGICAL CALENDAR**. The ebb and flow of sprouting, blooming, fruiting and dying follow the seasons of the sun and the phases and transits of the moon. The sun and the moon in their travels through the zodiac activate subtle forces within us all: animal, vegetable and mineral. These forces are like a web which holds us all together and has awe-inspiring effects on our lives.

I believe that Stonehenge in England was built by and for farmers. The pillars themselves are positioned for filling in the astrological calendar. And letting us know what is in the foreseeable future in gardens (and elsewhere).

There are four Stonehenges on the planet. One is in England, one is in the Tigris-Euphrates valley in Iran. One is in northern India. The last (?) one is in Indonesia. The last two were discovered by Europeans in the early 1960's. They were built in ancient times, very ancient times, and are basically stone calendars.

The Great Pyramid in Egypt is a calendar as are some of the pyramids of Central America.

Archaeologists will have a hard time believing that farmers built these calendars but most of them are too busy digging up bones to plant a garden.

When birds and toads and natural events happen in your garden/farm/suburban house lot, mark them on your astrological calendar for a few years.

When you have done this for a few years or so you will become amazed at how regular life on this planet is. The flowering of trees follows the solar cycle with amazing regularity. Even the years when frost kills the crop are cyclical. Plants follow the lunar cycle within the solar cycle: sprouting, blooming, seeding and dying on schedule.

My first lessons were from a Jewish herb grower who learned it from his father, who learned it from his father, etc. etc. etc.

My best lessons were learned from Louise Riotta who wrote a book titled "Planetary Planting". This book saved the wisdom of the ages in book form. After gardening this way for twenty-five years I will never go back to random planting again – all my mistakes failed. Also, I have seen people with very green thumbs who refuse to believe in planting by the signs get the urge to plant when the calendar says it is time! These folks were not psychic, they just resonate to the cosmos along with their garden.

Garden vegetables have been planted randomly for so long that some of their responsivity to the zodiac has vanished. However, they do better when you get with the program. Herbs and weeds, however, have still got their faith in the moon. If you plant herbs in the wrong sign you will get next to nothing.

I have found only one small improvement to Riotta's book. She talks about planting one vegetable at time. An improvement is to realize that each botanical family of plants follows the same rule. The carrot family, the umbels, are planted on the waning moon when the moon is in Earth or Water signs. The beans and peas, legumes, are planted during the waxing moon when the moon is in an Earth or Water sign. Peas are planted early, and beans a month later when the soil is warmer. The cabbage family, crucifers: broccoli, cabbage, cauliflower, bok choy, etc., all like the waxing moon at the same time as beans but some of them do better in early fall weather than in spring.

Don't waste your time with the Julian calendar. It was created at the whim of Augustus Caesar and messed up by a Pope named Julian. It is worthless for anything except dating checks for banks.

There is another way of 'planting by the signs' used by the Biodynamics people. This method utilizes the positions of the planets as well as the sun and moon. From this I know nothing so get your information from them. They publish a planting calendar every year for your use.

Harvesting vegetables by the moon is something everyone knows. When you see a ripe tomato: eat it! Then go in the house and mark it down on the calendar and put a note in your book of records so you will know what is happening when you get hungry for tomatoes next year.

**HARVESTING** of dried foods like dried beans, peas and any kind of grain must be done

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when the time is right. To harvest too soon is to get unripe seeds which will rot before you get to eat them. To harvest too late is to let the seed fall on the ground in an attempt to plant itself.

Harvest grain when the first heads begin to nod over. Do it when the moon is in a 'dry' sign: Aries, Leo, Sagittarius, Aquarius, or Gemini. Illustration 6 here.

This is because the grain will plant its own seed, with the help of hungry birds, in the next "wet" sign: Pisces, Cancer, Scorpio, Taurus, Virgo, Capricorn or Libra. If you don't do it then, the birds will help the grain out of the heads onto the ground and eat a lot of it. The birds and plants know when the moon is right for planting whether you notice or not.

Beans, peas and legumes are a little different. The plants have pods that dry out and when the seeds are dry, the pod bursts, bangey-bang, and throws the seed five feet away. The trick is to get the pods after the seed is dry and before they burst. There is usually a week between drying and bursting to give you plenty of time to get the harvest in. Again, harvest in a dry sign because the pods will pop open in a wet one.

These rules be most useful when you have vegetables which have not had the natural cycles bred out of them. Hybridized and commercialized seeds have been planted and harvested willy-nilly for so long that the moon cycles have been bred out of them accidentally. They have been bred for machine and chemical agriculture and money and not much else.

Another tip on which kinds of seed to buy (organic, of course). I like to buy old-timey varieties because they are genetically closer to the wild and usually more robust and resistant to disease and bugs and have more nutrition in them. Agribusiness was ruining our food plants long before genetic modification came along. [This GMO stuff scares the s—t out of me.] Remember the attempts to breed a cubical tomato that would pack nicely into square boxes? Kidney beans have been bred to all become ripe on the day when the combine was rented. This, unfortunately, is not a joke.

These old time varieties are staging a popular revival among organic gardeners.

Another consideration is that different varieties grow better in different soil types. This can happen on different fields within the same farm sometimes.

For instance, potatoes are very fussy about soil, climate, etc. I start out gardening in a new place by getting my seed potatoes where other older farmers get theirs and use the variety they use. You can always try something different on a smaller plot and choose the kind that grows best to plant next year.

My first year in a new garden I usually plant several varieties of everything, old-timey kinds. The varieties that do best get their seed saved and make next year's crop. Sometimes I have been very pleased. I tried a new kind of bean one year which did extraordinarily well. So the seed got saved but the next spring the seed I missed or dropped, sprouted and grew before I could plant the saved seed! What a surprise! Mark the sprouting date on your astrological calendar.

Humans have been saving vegetable seeds for 40,000,000 years. Now with agribusiness messing with the genetic structure, this is becoming a necessity again. If farming is to survive on this planet for 40,000,025 years, farmers are going to need to start saving seeds again. The old-time varieties are available today because some farmer saved his seed and gave it to an organic gardener who gave it to you.

After your harvest is made, you are going to need a place to store stuff until you eat it. For 50,000,000 years folks have been storing their harvests in **ROOT CELLARS** and caves. Warehouses are a modern invention. Cave dwellers just put the harvest in the back of the cave. So can you, if you have a cave nearby.

My father merely dug a large hole in the ground, threw in the cabbages, potatoes, carrots, sweet potatoes and parsnips into it and covered it back up with dirt. Dig the food out as you need it.

A side note on carrots and parsnips: leave some of them the ground until early spring. As the freezing and thawing periods heave them part-way out of the ground, just pull them out of the ground and eat them. Yummm. No city person has ever eaten anything that good! Leaving some carrots, parsnips and cabbage in the ground is a necessity because they do not bloom and seed until their second year. They are biennials.

If you don't have a cave, build one; it's called a root cellar. You can dig a neat hole in the side of a hill or down into the ground about 6 to 8 feet wide and as long as you need it to be. Make it about 6 or 7 feet up and down. Wall up the sides with cement blocks or rock/mortar to keep small varmints from burrowing in and eating up your harvest. Make a vermin-proof door. Put a slanting or peaked roof on it with cedar logs or black locust or, best of all = mulberry: these woods will last 20 to 40 years or more. Cover the logs with water-proof material like galvanized tin or stainless steel or just plain roofing tar paper. Then pile over this a foot or so of dirt and top it off with a layer of sod grass.

Build shelves and bins inside and fill it up. Then eat it empty.

Self sustaining farming is reviving after a hundred years of agribusiness. This way of feeding ones self/family/community is almost as old as bellies to digest it in. The Yellow Emperor's Classic Of Internal Medicine, Chinas oldest medical text, advises us on page one: Eat the delicious food that grows around you , and do not send for far away delicacies" This was written about 2936 BC. About 2,000 years later, Pythagoras, the Greek mathematician and herbalist, said the same thing. The Hare Krishna Cookbook quoted him recently. The first Hippies echoed this advice saying: "You are what you eat." In consideration of the food pollution of our times, I might expand that a little: "You are what you eat, disease and all."

Strawberries in January are a delicacy from Mexico and are probably irradiated with Cesium 127 to keep them looking pretty and not spoiling. rotting strawberry in you box gaurantees that your food has not been irradiated by leftover cesium from an atomic bomb. Bananas and oranges and lemons make your body cold in January. Strawberries in July from your own garden are a feast.

Food is not he only thing you can do with a root ceellar. Root cellars are a place to grow **YEAST** – baking yeast. Throw some old potato peeling in a corner or bin and sprinkle some yeast over them . A week or so later you will have a fuzzy/hairy growth of yeast. Make bread.

If you make wine, this can be done in your root cellar because the yeasts for bread and wine are very similar. If you make cheese, you will need to make another cellar for aging it because each cheese has a different yeast and yeast is half the process of ripening cheese. If you make sauerkraut or other fermented vegetables you should have a third, smaller, cellar because the yeasts in these things are all peculiar. See Sanford Katz little book "Wild Fermentation". Miso making requires its own cellar or hut because its yeasts are different than our Western varieties. In our heritage of fermented foods, each demands its own cellar. So build a new cellar every year or so until you get tired of eating what goes in and out of them.

Root cellars are cute fallout shelters too.

Then, when everything is going along nice, there will come a **YEAR OF PRUNING**. These years happen every so often in a cyclical fashion. The year will contain a weather element which is harsh and kills off all the half-dead stuff in the forest and field and garden. Maybe there will be an early spring, warm and nice and after a month of this a frost will come that kills everything by having several days of consistent freezing temperatures below 28 degrees Fahrenheit. Or maybe there will be a six week drought early in spring. Or maybe a driving storm with 60 to 80 mile an hour winds. Or maybe an intense ice storm which breaks branches and fells older trees. Or a plague of locusts or Japanese beetles happens.

These kinds of events are very hard on everybody/everything so we need to provide for them or we will get pruned too. Fortunately, Mother Nature gives us warning signs to let us know when these things are likely to happen.

**WOOLLY BEAR** caterpillars help predict some of these events. The Woolly Bear is a common caterpillar about 2 to 3 inches long and covered with 'hair' fuzz about three-sixteenths of an inch long: black fuzz on the ends and orange fuzz in the middle. These little caterpillars predict, in a general way, the frost times of this years autumn and next spring. If the weather is normal, the Woolly Bear will have three black body segments at each end and orange in between. If the autumn frost is to be early, only two front segments will be black. This signals that there may be an early frost-- although the frost may not happen but the temperature may get very low for a few days. If the Woolly Bear two black segments on the rear, there is likely to be a late spring, about a month late. If there are four black segments on the rear, there may be an early spring but there is also a danger of a late 'killing' frost where everything gets going early but a late frost kills all the new growth.

Some care must be taken in the looking process. If you pick up the little bear it will roll up and you won't be able to tell which end is front and which end is back. Put the Woolly Bear back on the ground and soon it will uncurl and crawl away. The front end moves forward, Woolly Bears can't walk backwards.

Woolly Bears come into your sight sometime around early September. Being able to predict killing frosts six months in advance is a very useful knowledge. That fall you will want to double the amount of seeds you collect since your first planting in the spring may get frosted out. When this happens you will need to plant your spring garden twice, so collect twice as much seed or you will go hungry.

I've been observing and using Woolly Bears for twenty five years and never found them wrong. Some entomologist (bug watcher) was able to verify this "scientifically" but the Woolly Bear didn't care and just keeps on doing its thing. One fall when I was living in

Lexington KY. the orange part was sprinkled with black hairs. This was new to me and I was curious about what the Bear was telling me. That winter, Lexington KY had a very fierce ice storm in mid-February that completely shut down the city for a week. The Woolly Bear knew this would happen five months in advance.

The progression of years also seems to have a three year **RAIN CYCLE**: wet, dry and normal. The cycle probably has a different order where you are so you will have to observe carefully and keep some records to find out what happens where you are. It seems to me that the cycle is controlled by how early or late the new moon happens in the month of Aquarius. Whether this is relevant or not, I don't know, but the farmer needs to know. Some vegetables and grains like dry years and some like wet years. In wet years you need to harvest grains as soon as it ripens or lose it to rain. Likewise, in a dry year you need to get your irrigation ready to water your garden unnaturally. You will need to mulch a lot too.

These cycles control what you put in your root cellar and what you will eat.

Other observable events predict the weather also.

If the winter is going to be harsh, the **SQUIRRELS** will make big **NESTS** of leaves to live in. Big nests are warm. Skinny nests get cold in winter storms. Squirrels are clever that way.

In spring, the **ROBINS** travel north and south with the cold weather. If a warm spell of several days is on its way, the robins move northward. If a cold snap is on its way, the robins move back south to keep warm. Robins are clever that way.

**ANTS**, lowly creatures that they are, predict rain during the summer. Two days before a rain, they will bring a lot of soil to the top of the ant hill to make sure they don't drown in the water. It may not rain every time, but if it does rain, they are ready. If they are not ready, they will drown. Ants are clever that way.

If you have beehives, in the fall the worker **BEES** will drive the drones out of the hive into the cold night air two days or so before the first frost. Bees are clever that way. Pity the poor drone!

The native Americans may not have had an astrological calendar to plant by but they planted corn in the spring when the **ALDER** bush's leaves are as big as a mouse's ear. I checked this out one year when I had Alder bushes growing near the garden. Sure enough, when the bush's leaves were as big as a mouse's ear, the calendar told me to plant corn! Alder bushes are clever that way.

This is a very short list of things that foretell weather cycles. Time-seasoned and successful farmers have the best information on this subject. I knew one who was seventy five years old and couldn't read or write but he knew more of this lore than entire University faculties. So find yourself an old farmer or farmer's wife and learn from them. You will not regret it.

**BUG REPELLANTS** are a nice thing to know about too. Plant some English Pennyroyal in wet place near your garden or on the edge of a creek. When you go to the garden, pick six inches to a foot of the stems and rub it all over your body. No bugs for four hours. Sweet Basil leaves will do it too. I like to work nude in the garden and these things work for me. Also, after you have eaten organically and stopped putting poisons in your body, your smell will change and the bugs will not bother you as much either.

**GETTING TO KNOW YOUR GARDEN.** Get up some morning about a half hour before dawn and go sit in your garden for a couple of hours. Be quiet and still so the ecosystem can ignore you. Watch what goes on. Your garden will come to life before your very eyes.

Pick a nice warm day.

Be still and the creatures will accept you as one of them.

Actually, you can do this at almost any time of day but each time will be different. Each phase of the moon will be a little different than the last. Each season will be different too.

People have been doing this for fifty million years. From this, the science of farming was born.

Now it is your turn to do it.

#### MY GARDEN

A Garden is a lovesome thing, God wot!  
Rose plot,  
Fringed pool,  
Fern'd grot--  
The veriest school  
Of peace; and yet the fool  
Contends that God is not--  
Not God! in gardens! when the eve is cool?  
Nay, but I have a sign;  
'Tis very sure God walks in mine.

Thomas Edward Brown

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