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MARCH 1991 ©

"Had I known, I would have become a plumber." of the atomic destruction of Hiroshima.

Albert Einstein, upon hearing



The Yellow-Billed Cuckoo is a brownish-gray (with a slight greenish sheen) on the upper part of the body, and a dull whitish color on its lower body. The tail feathers are black with white tips. The top bill, and the tip of the lower bill are black; the rest of the lower bill is yellow. The female lays 3-5 eggs of a pale greenish-blue color. Caterpillars are its main food. The song is "tut-tut, tut-tut, tut-tut, cl-uck cl-uck, cl-uck cl-uck, cl-uck, cow, cow, cow, cow, cow", and may be sung in its entirety or in fragments.



In the time of your life, live---so that in that wondrous time you shall not add to the misery & sorrow of the world, but shall smile to the infinite variety and mystery of it all.

The longer I live the fewer divisions I see between gardening, the fine arts, the natural sciences, and the art of living. At least 3 things seem to unite them: Joy, Curiosity, and Love.

A child chasing a floating soap bubble, the geologist glimpsing a bright, metallic vein, and the composer creating a transparent swarm of chords are surely immersed in a joyful "is-ness". This "being here now" can unite the gardener, the dancer, and the meditator in a shimmering, quiet alliance.

The astronomer, the sculptor, and the home hybridizer of lilies refuse to dwell in the mundane, the merely adequate but instead are drawn by curiosity to discover and apply unseen principles in their quest for beauty and wonder. This desire to peek behind The Wall differentiates those who are fully alive and dreaming on their feet from those who complain and muddle through their precious years in a waking slumber, having taken hook, line, and sinker the bitter limitations offered us all as "It".

And what else but love motivates the novelist and poet to offer us their naked souls, or the botanist to traverse jungles to discover and identify wild orchids in all their haunting beauty and fragrance? The person who, year after year, decade after decade, uses new tools to grow beyond their inevitably imperfect childhood (and the wounds created then) is, in the end, giving sorely-needed love to that frightened child still within them.

I now think that, due to our tiny size in a huge universe, and the resulting colossal freedoms towering over us, we are a frail and frightened race. But we can cultivate bravery, endurance and awe so that we can enjoy the heady ride while it lasts. The grey-haired physicist, the midwife, the abstract painter, the playwright, the collector of herbs and the watcher of birds were all once shiny-eyed children. It is my hope that this magazine is, at times, a "tree house" for them to have secret meetings in, to spy on the world from as their urge to learn is exposed to a few more of the rarified colors of Love.



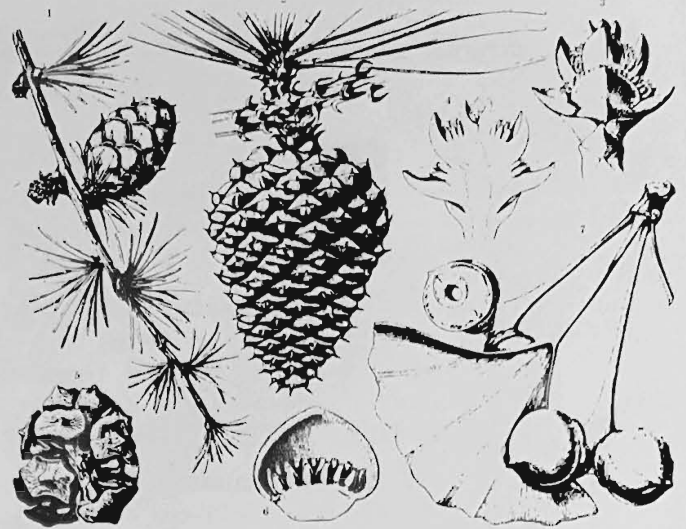
photo reprinted with permission
of The Tampa Tribune

John

cover plant: Beckmanni eruciformis

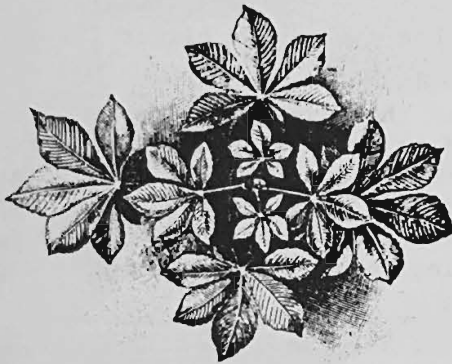


LANGSDORFFIA HYPOGAEA, from Central America



CONIFEROUS FRUITS AND SEEDS. 1. Branch of the Larch (*Larix Europaea*) with ripe cone. 2. Branch of *Pinus serotina* with ripe cone. 3. Female flower of the Cypress. 4. Longitudinal section of the same. 5. Ripe cone of the Cypress (*Cupressus sempervirens*). 6. Single carpel of the Cypress with numerous ovules. 7. Branch of *Ginkgo biloba* with unripe fruit.

When a man gets up to speak, people listen, then look. When a woman gets up, people LOOK; then, if they like what they see, they listen. Frederick



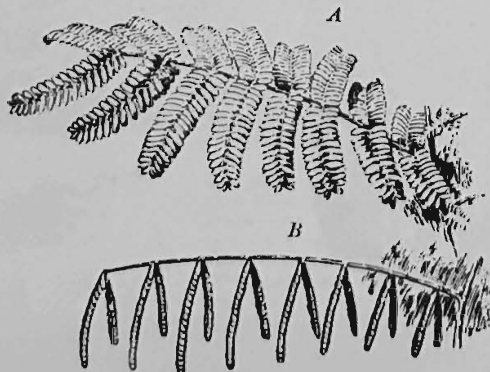
Leaf arrangement of HORSE-CHESTNUT on vertical shoots (top view).



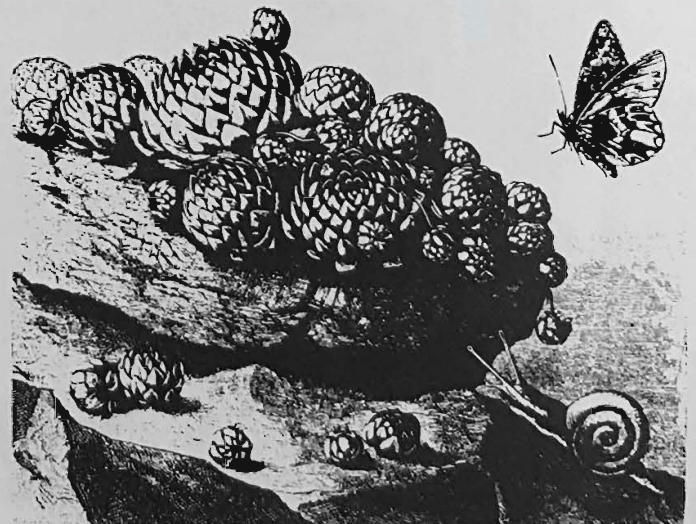
Leaf arrangement of HORSE-CHESTNUT (*Aesculus glabra*) on vertical shoots. (side view)



Leafy twig projecting laterally from the stem of the NORWAY MAPLE (*Acer platanoides*).



LEAF OF ACACIA. A. as seen by day. B. as seen at night.



SEMPERVIVUM SOBOLIFERUM. On the lower step of the rock lie five ball-shaped offshoots which have become detached from the upper rocky platform and have rolled down. The snail and the butterfly are introduced into the picture to show the true proportions of the parent plants and offshoots.

Petunias

by Leland Ballard

Myrtle Rose watched her eyes grow wide in the mirror and heard her hairbrush thump on the dresser top. She swallowed hard, spun round, faced her mother.

"You're kiddin'," she said.

"No," said Mrs. Ledford. "I wish I was, but I ain't."

"Well, what did he say? What did you say? Is he here? Is he comin' here?"

Myrtle Rose backed up and flopped down on the mess of her unmade bed. For several moments she stared at the ceiling, her hands pulling at pieces of sheet and bedspread. A breeze rustled thin cotton curtains behind her head. Chickens clucked and scratched in the petunia beds outside the window.

Shrugging helplessly, Mrs. Ledford spoke again. "Well, he said he knew he'd done us wrong, and he wants to talk to me. I told him he could go to hell. Then he said he wants to talk to you--said he was your daddy and he has a right to. Before I could tell him to go to hell again, he said he'd be here Sunday and he hung up."

Myrtle Rose sat up on the edge of the bed. Looking out the window past the dilapidated little barn and the old hog pen toward the distant swamp, she said, "He says he has a right to see me? He runs off with that slut Mavis Woods and disappears for three years--we don't even know if he's alive or dead--and then he calls up out of the blue and says he has a right?" Myrtle Rose grabbed her pillow, shook it furiously and hurled it against the wall.

"I hate him!" she shrieked. "I hate the sorry son-of-a bitch!"

"I've told you not to call your daddy a son-of-a bitch, Myrtle Rose," said Mrs. Ledford. "It ain't nice."

"Well, that's what he is, and you know it, Mama. I heard you say so enough times."

"Well, I'm thirty-four, not fourteen. I never cussed like that when I was, neither."

Myrtle Rose looked at her mother and grinned. "I heard you tell Grover Pearson the other night that if you ever saw Daddy again, you'd cut his balls off."

Stepping back, Mrs. Ledford crossed her chubby arms over her breasts, turned her toes inward, bent her knees a little, looked down at the floor. "Y-you were eavesdropping on us."

"I don't have to eavesdrop. The walls in this old house ain't made out of stone, you know. I can hear every squeak every time."

"Oh!" cried Mrs. Ledford. "Why, you little . . . I ought to--"

"Listen, Mama, if you don't want me to hear anything, you ought to go to a motel or someplace. I ain't deaf, you know--or dumb, neither."

Mrs. Ledford turned to the door. "I didn't come in here to listen to your smart mouth, Myrtle Rose. I come to tell you about your daddy."

Myrtle Rose climbed off the bed and slid her long legs into a pair of tight, faded jeans. She caught her mother by the arm and looked her in the eye. "What are you gonna say to him, Mama? What are you gonna say to my daddy on Sunday?"

Dropping her head, Mrs. Ledford said, "I just don't know, honey." Then, in a moment, she straightened, grinned, and looked directly at her daughter. "Could be I will cut his damn balls off."

"You think he'll bring Mavis Woods with him?"

For the first time since she heard her husband's voice on the phone, Mrs. Ledford managed to smile. "He said she run off with a guy who played in some band."

A pleased smile spread across the girl's face. "I hope it tore his stinking heart out."

"I don't know if that man has got a heart, honey. Listen, you go on and feed the chickens, before they scratch up any more of my petunias. I've worked too hard keepin' them plants pretty."

As Myrtle Rose flung out handfuls of scratch feed, Mrs. Ledford, down on her knees, gently patted the loose soil around the roots of her petunia plants. She'd made a petunia bed all around the house, and the flowers were just starting to bloom. If she could keep those infernal chickens out of them, she'd have petunias to brag about.

Neither Myrtle Rose nor her mother went to church Sunday; they didn't want to be gone from the house when Mr. Ledford got there.

The sun was straight overhead when Mrs. Ledford spied a cloud of dust moving up the

dirt road. She called to her daughter. Myrtle Rose flung a final handful of scratch feed at the chickens and watched it bounce off their backs like hard drops of yellow rain. The chickens flapped their wings, fanning up little eddies of gray dust, and pecked wildly at the dry kernels of cracked corn. Myrtle Rose walked across the grassless little yard to her mother, who stood, now, with her back to the road, a hose in her hand, watering the petunias.

Mr. Ledford parked a shiny new truck under the Australian pine tree in front of the house and climbed out. He snatched a red and white bandana out of his coat pocket and mopped his forehead. Straightening his thin, red tie and pulling his white Stetson hat lower down over his eyes, he walked toward Mrs. Ledford and Myrtle Rose.

A few feet from them he cleared his throat loudly. The woman and the girl turned around, carefully pretending indifference. Mr. Ledford made a little bow and tipped his hat. Greasy strands of thick dark hair tumbled down over his forehead. He brushed them aside before replacing his hat.

"Good to see ya'll," he said. "By God, you look cuter'n two roly-poly puppies!"

"I'll show you how cute we are, you sack of shit!" said Mrs. Ledford. She hooked her thumb over the end of the hose and sprayed water in Mr. Ledford's face and down the front of his navy blue suit.

Waving his arms and yelling, "No! No!" he stumbled backwards and fell down in the dirt. Mrs. Ledford kept up a steady spray on him as he struggled to his feet.

"You got the devil's nerve comin' back here, Willis Ledford. I oughta cut your damn balls off right now."

Willis tried to brush the wet sand off his new suit but it clung stubbornly.

"What you want to squirt me for, Lucille? I just paid a hundred dollars for this here suit, and I bought it just to come see you and Myrtle Rose in."

Mrs. Ledford dropped the hose but didn't lower her voice. "Well, you can go back to where you come from before you put it on. Do you think me and Myrtle Rose ain't got no feelin's, that you can run off with another woman and come slippin' back here whenever you take a notion. What you want, anyhow? Say it and get!"

"Now, Lucille, honey, I can't hardly talk all wet and dirty like this, can I?"

Why don't you let me go in the house and take me a shower and put on some dry clothes?"

"Ain't got no shower," snapped Mrs. Ledford. "You think me and Myrtle Rose can afford a fancy bathroom? You just stay out of my house. You ain't never goin' in that house again. That house is mine and Myrtle Rose's, and you ain't goin' in it."

"Come on now, sweetie-pie. You done ruint my new suit. I just want to go in and wash some of this dirt off of me."

For a little while Mrs. Ledford chewed the inside of her mouth and shifted her weight from one foot to the other. With the back of her hand she wiped the sweat out of her eyes. Finally she said, "Well, make it quick. And don't drip no water on the floor."

"You got the heart of a angel, honey," Willis declared. "You want to come in with me?" Seeing her grab for the hose again he added quickly, "To show me where it is, I mean."

"You know where it is, you scumbag. Don't call me honey, neither."

Willis Ledford grinned at Myrtle Rose. "You look sweeter'n a suck of sugar, baby doll. Why don't you come here and give your old daddy a big hug?"

"You keep away from me."

"Listen here, I'm gonna go clean up and then ya'll come on up on the porch and let's talk some. I got a watermelon, we can cut, too." He got some dry clothes out of his truck and hurried into the house.

Mrs. Ledford turned the water hose down to a trickle and laid it in her petunia bed. She brushed the dirt off some of the red bricks surrounding the bed and lovingly patted one of the big, purple buds. Then she picked a small green worm off a thick leaf and mashed it between her thumb and forefinger.

In a few minutes she went up on the porch and sat down in the rocking chair. Myrtle Rose plopped down in the little wicker chair beside her. They watched the chickens scratching in the yard.

In a tired voice Mrs. Ledford said, "I'm gonna kill them damn chickens if they scratch up any more of my petunias."

Myrtle Rose looked down the dirt road. "What you think he wants, Mama?"

"Probably wants to come crawlin' back home, seein' as how Mavis Woods has run off."

Shifting a little in her chair, Myrtle Rose said, "He looks pretty good, don't he?"

I mean, I ain't never seen him in a suit before. What if he does want to come back? I mean, this place is half his, ain't it?"

"Half his, hell! His name might be on them legal papers, but who's worked twelve hours a day in that crumby restaurant to make the payments? Me, that's who!"

"Remember the time Snowflake climbed up to the top of that pine tree and Daddy went up after him and he got stuck up there, too? Old Jamie Wolfe had to come out here in the fire truck to get 'em down."

Mrs. Ledford clapped her hands over her mouth to smother a giggle. "I didn't think you remembered that, honey. You weren't but about three or four. Your daddy hated that kitten after that."

"Yeah. He said every day he was gonna kill him. He never done it, though. Wonder what ever happened to Snowflake?"

"Just got old and went off to die, I reckon."

The screen door flew open with a bang and hung loosely on its hinges. Willis Ledford stepped out on the porch wearing Levi jeans and a thin cotton T-shirt with "Elvis Lives" printed across the chest. His white Stetson hat tilted awkwardly to one side.

"That door's about to fall down," he said.

"It sure ain't the only thing around needs fixin'," said Myrtle Rose.

"Never mind what needs fixin'," said Mrs. Ledford. "You just say what you come for and get on your way, Willis. Myrtle Rose and me has done fine these last three years, and we'll do fine for the next three, too. Besides, Grover Pearson promised to fix that door for me. You don't got to worry none about it."

"Grover Pearson! What's that worthless bastard been hangin' around here for?"

Hiding a smile, Mrs. Ledford said sweetly, "Well, just 'cause you didn't want me don't mean nobody else ain't."

His face burning red, Willis stomped up and down the porch. "I oughta kill that sorry shithhead. I thought he was a friend of mine."

"Maybe he was--'fore you run off like you done."

After a long silence, Willis got the watermelon out of his truck and cut three thick slices. Sitting on the rickety porch steps, he buried his face in the red meat and made loud slurping sounds. Mrs. Ledford watched him.

"You're a slob, Willis," she said.

Willis lifted his head and watermelon juice dripped down both cheeks. "By God, that's good melon. 'Member that time, Lucille, when Myrtle Rose weren't as big as a peanut and she et more watermelon than me and you put together and she got so sick we had to take her to old Doc Stone over in Flowin' Wells?"

"I never done it," said Myrtle Rose, blushing.

"You sure did, too. Didn't she honey?"

Mrs. Ledford began to rock and to look past her husband at the chickens pecking at the watermelon seeds which he spat on the ground. "Don't call me honey. Now you been here too long already. It's time you say what's on your mind and get."

Willis tossed his watermelon rind out in the yard, took out his handkerchief and wiped his face.

"Well, Lucille, I never was one to beat around the bush, so I'll say it out straight. I come to take you and Myrtle Rose back to Valdosta with me. I got me a job in a paper mill there makin' twice as much as I did in that damned pepper plant in Flowin' Wells. I got me a little house on a red hill and that new pickup yonder and two bad pit bulls. Let's put this no good place up for sale and go live in Valdosta, all of us."

Mrs. Ledford rocked faster and faster, looking first at her husband and then at her daughter. Myrtle Rose's eyes were shining and there was an eager look on her face. Her long yellow hair moved with a gust of wind and she looked a little wild.

Finally Lucille stopped rocking and spoke, emphasizing every word. "You're as crazy as hell, Willis. This right here is our home, Myrtle Rose's and mine, and we ain't leavin' it. I can't never trust you again, and you've gotta know that. The next little slut winks at you, you'll be gone again."

"No, I won't, honey. I done learnt my lesson. To tell you the truth, I been tryin' to get rid of Mavis for a long time. I was damn glad when she took up with that guitar picker and hauled ass."

"Well, we ain't goin' nowhere with you. We ain't gonna live with you. We're stayin' right here in our own house."

"Are there any cute boys up there, Daddy?" asked Myrtle Rose.

Willis Ledford grinned. "There's a pack of 'em on every hill, honey. Sometimes you can hear 'em howlin' all night."

While Lucille sat stiff in her chair and Willis sat on the porch railing, Myrtle Rose stood up and paced. After a while she stopped in front of her mother. "I think we ought to go, Mama. What do we want to stay here for? This old house is about to fall down, and we can't even grow no grass in the yard--won't nothin' grow here but them petunias and that's cause you baby 'em so. There ain't no men around here, either. I ain't got no boyfriends and you ain't got nobody but ol' Grover Pearson."

"I oughta kill that son-of-a-bitch," said Willis.

"Now you listen here, Myrtle Rose. Don't let this slick-tongued devil feed you no bull. He ain't got no house on no hill, and he prob'ly stole that pickup truck. There ain't no boys, neither. You can't believe no liar like him."

"Lucille, I'm tellin' you the truth and I swear it."

Mrs. Ledford stood up, clamped her hands on her hips. "Now you get back in that truck and hit the road, Willis Ledford. And I don't mean after a while."

"Mama, if there's boys howlin' on them hills, I think we oughta go."

"You shut up, girl, and get in the house. You, Willis, hit the road like I said."

Willis looked off past the old barn toward the swamp, then turned back to his wife. "Ya'll are my family, and I mean to get you back. The first good blow as comes through here will level this here shack. What you gonna do then?"

"I think we oughta go, Mama. There ain't nothin' for us to stay here for."

"There's my petunias!" snapped Mrs. Ledford. "I told you to get in the house. Now!"

"I want to go to Valdosta with Daddy."

"You do what I tell you to or you won't be goin' nowhere for a long time."

Tears welled up in the girl's eyes; her bottom lip fell and started to quiver. "You might just be surprised what I do," she said. Then she dashed in the house and slammed the screen door so hard the top hinge clanked on the floor and the door fell sideways.

Willis grinned. "That girl's got her ma-ma's own temper, ain't she?"

"I'll show you what temper is if you don't get out of here quick. You done turn Myrtle Rose against me and ruint my whole Sunday with your stinkin' lies and sweet talk."

"I ain't lyin', honey. I swear I ain't. And you like sweet talk if I remember rightly. You think about it; I'll be back."

Mrs. Ledford ran off the porch and headed for the petunia bed. She twirled the faucet handle, picked up the hose with both hands and charged her husband. He bolted for the truck, had the doors locked and the windows up before she reached it. As she squirted the windshield, he pressed his nose against the window and grinned at her.

"I hate you," she screamed. "You hear me? I hate you!"

When Willis backed up far enough that the hose couldn't reach him, he rolled down his window and stuck his head out.

"I love you, too!" he shouted. "I'll be back for you. You be ready."

Mrs. Ledford stood where she was when Willis drove off. She stared down the dirt road long after the shiny new truck had disappeared.

Then she turned off the hose, dropped to her hands and knees and started scratching in her petunia bed. She could hear Myrtle Rose bawling in the house. Through her tears her petunias were globby shapes. Her hands were claws digging without purpose in the earth of the bed. When she got up to go in and comfort Myrtle Rose, she was shocked to see half a dozen of her finest plants laying uprooted around the flower bed and beginning to wither in the sun.

The End

THE

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GOOD NEWS

Brassica vegetables, like turnips, broccoli, and cabbage, contain high levels of "indole glycosinolates", which several studies have shown to help suppress several types of cancers. Lloyd A. Campbell and Bogdon A. Slominski of the University of Manitoba in Winnipeg, have determined that cooking Brassicas cuts in half the amount of indoles they contain. Both men suggest eating Brassicas RAW will provide the maximum benefit. **Science News**

Vegetarians reap considerable health benefits, including a lower death rate from coronary artery disease. They also tend to have lower levels of serum cholesterol and LDL cholesterol, lower plasma viscosity, lower blood pressure, lower rates of Type II diabetes and colon cancer, plus lower incidences of lung cancer, hypertension, noninsulin-dependent diabetes, kidney disease, gallstones, diverticular disease; vegetarians also are usually closer to their ideal weights. **Journal of the American Dietetic Association.**

Rats whose diets consisted of 1-4% garlic had a 70% reduction in the number of tumors like those involved in breast cancer. The First World Congress on the Health Significance of Garlic and Garlic Constituents reports that eating plenty of garlic may also cut the rate of heart disease by lowering cholesterol, lipids, and blood clotting factor. $\frac{1}{2}$ to 1 garlic clove daily is required. **INSIGHT**

The endangered mint species *Diceranda frutescens* contains a potent, insect-repelling oil, according to Thomas Eisner of Cornell University, who found it growing in Lake Placid, Florida. **Science News**

A new fuel cell being developed by the American Academy of Science in Independence, Missouri, promises to extend the range of electric cars to 300 miles between charges at a cost at or below gasoline-powered cars. Dr. Roger Billings, president of the company, says that the fuel cell, like those that generate electricity for the space shuttle, has only 1 waste product...water, since hydrogen and oxygen are combined in the power-making process. But by using lasers and several now-secret processes, he could mass-produce the "LaserCel" and sell each unit for \$4,450. Since it measures just 18 inches in length, 12 inches in diameter and weighs less than 100 lbs., electric cars using it would weigh less and have roomy passenger compartments. The fuel cell can be recharged with tap water and household current, which at lower nighttime rates, would result in operating costs equivalent to gasoline costing 46¢ a gallon! The Pennsylvania State Energy Office will soon test a Ford Fiesta with an electric motor run by the LaserCel. **AutoWeek**



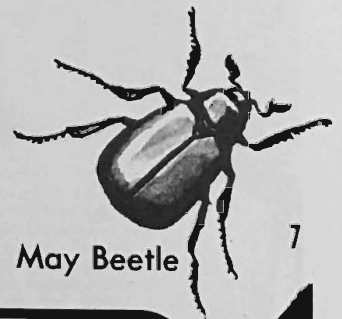
Stone-Fly



Boll Weevil



Grasshopper



May Beetle

HARRY KRISHNA'S

karmic relief

RESOURCE REPORT

J. L. Hudson Seedsman
(World Seed Service)
P.O. Box 1058
Redwood City, CA
94064 :

Sells rare plants from
around the world, open-
pollinated, unusual and
Mexican food crops.

Garden of Delights
2018 Mayo Street
Hollywood, FL 33020 :
Rare fruit trees and
plants. Catalog \$1.00,
refundable.

Fiddymment Farms
5000 Fiddymment Road
Roseville, CA 95678 :
Pistachio trees, seeds.

Blueberry Hill
RR #1
Maynooth, Ontario
Canada, KOL 2S0 :
Low bush blueberry plants

Barney's Ginseng Patch
Rt. 2 Box 43DS
Montgomery City, MO 63361 :
Ginseng root & seed, plus
some herbs and planting data.
Catalogue \$2.

Caprilands Herb Farm
534 Silver Street
Coventry, CT 06238 :
Approx. 100 herbs, seed &
plants, books & crafts.

Beersheba Wildflower Gardens
Beersheba Springs, TN 37305



Tansy Farms
RR1 5888 Else Road
Agassiz, BC
Canada VOM 1A0 :
Live herb plants, 250 varieties,
Free price list, catalogue \$2



We have a garden of our own
All gay with flowers fresh and fair,
And every dainty blossom sown
We tend each day with loving care.
And many a posy sweet we pick
For little children who are sick
And dwell in streets of brick and stone,
With no sweet gardens of their own.

TODDLER FODDER

Children growing up in modern cities often have no idea where their food comes from, beyond saying "the grocery store". Growing the seeds of vegetables and fruits in pots of compost kept moist and in full sun can change that. Try the seeds of citrus, melons, apple, dates, peach, plum, grape, pomegranate, kiwi, strawberry, tomato, raw hot peppers, popcorn, lentils, pumpkins & other raw, live foods. Transplant the baby plants into the garden when climate permits. The children will soon learn that ultimately, food comes from soil, not boxes, cans, or microwavable disposable containers.

"Your bowels are not what they seem..."
Twin Peas

Too many people consider intimacy a license
for cruelty. Margaret Head

Soil pH

by
Al Klein

1-2-3-4-5-6-7-8-9-10-11-12-13-14
acid alkaline

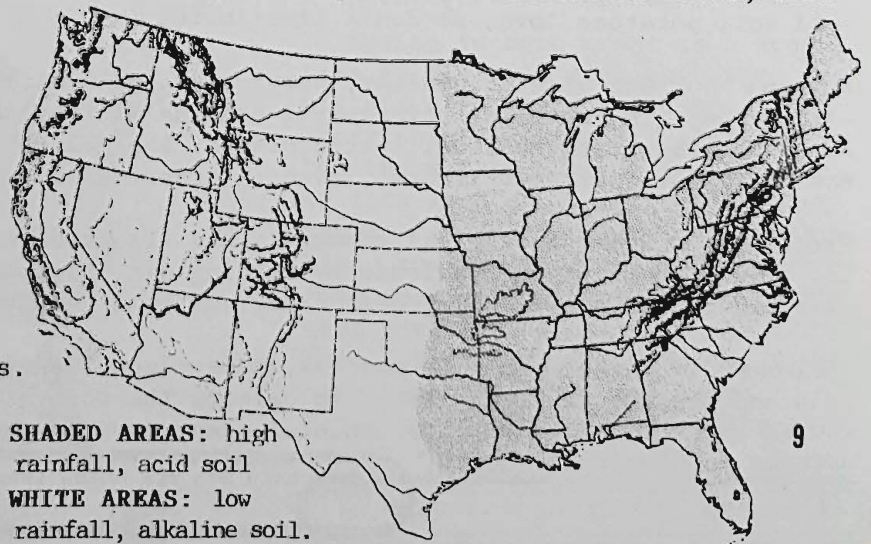
The relative acidity (sour) or alkalinity ("sweet") of soil is referred to as "pH" (power of Hydrogen) and is represented on a scale of 1 through 14. The low numbers are acid, 1 being the most acid. White vinegar has a pH of 3.5. A pH of 7 is neutral; most plants and beneficial soil critters prefer a pH of 6.5 (barely acid) to 7. Numbers above 7 are quite alkaline, 14 being most so. Several factors influence soil pH.

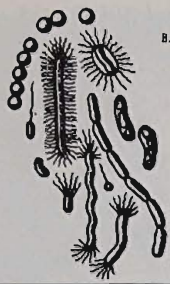
The amount of rainfall an area receives is a prime determinant of pH. 24 inches or more of rain annually usually results in acid soil, because ALKALINE minerals like calcium, sodium and potassium are rinsed out. Rain itself is acid, especially these days. High rainfall also encourages

the decay of organic matter, a process which generates natural acids, like humic acid. The shaded areas on the map below show regions of acid soil in the U.S. (and up into Canada and down into Mexico). These areas match almost exactly those on a rainfall map! Note the alkaline soil in the dry, desert regions. This correlation is true all over the world: High rain, acid soil, with very few exceptions. Acid soils discourage most plants and most beneficial soil organisms, have a sour taste and smell (go ahead, try it!), and will turn LITMUS PAPER pink if the soil is dampened with distilled water. Highly acid soil chemically "locks up" plant nutrients, liberates toxics in the soil like aluminum and heavy metals, and can also encourage the growth of disease-causing organisms. Only blueberries, camellias, potatoes, cranberries, gardenias and several others prefer acidity. To learn the exact pH of your soil, call your Agricultural Extension Service and ask for their procedures. Excess acidity is easily corrected: use alkaline materials like eggshells, bone meal, ground oyster shells, hardwood ash or best of all, dolomitic limestone, which is rich in acid-neutralizing CALCIUM, plus MAGNESIUM, which plants use in conjunction with iron to form chlorophyll. Dolomite is natural, safe (many people take dolomite tablets as a calcium-magnesium supplement), is non-burning, and is cheap at feedstores and agricultural supply outlets. 30 pounds per 1,000 square feet of acid soil will raise the pH 1 point; double the amount to achieve the same gain on heavy, clay soils. Once proper pH is achieved, a light annual sprinkling of dolomite on lawns, fruit trees, vegetable and herbal gardens, roses and most perennial flower beds will keep your soil "sweet", which will help insure fertility and a good, loose soil structure. Avoid "quicklime" as it can burn plants or their roots, kill beneficial soil organisms, and destroy valuable nitrogen compounds.

The soil in low-rainfall areas is usually rich in alkaline minerals and thus can be too "sweet" to grow many cultivated plants. Alkaline soil, if dampened with distilled water, will turn litmus paper blue, indicating a pH above 7. Just turn under a LOT of organic matter, especially acidic ones like peat, oak leaves, bark or sawdust, pine needles, cottonseed meal or a "green manure" crop like alfalfa, rye, barley, or sugar beets, all of which tolerate alkalinity. A pH above 9 may require a light dusting of powdered mineral sulphur. A deep (12"-18") mulch and deep, frequent waterings will help natural acids to form and to rinse out the salts. Renew the mulch CONTINUALLY.

Whether acid or alkaline to start, healthy soil has a balanced pH of 7. Funny that in both soil and our lives, balance fosters health and growth.



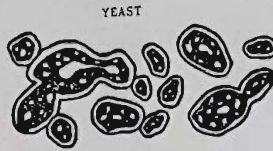


BACTERIA

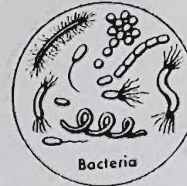
DIRT SQUIRTS



Algae



YEAST



Bacteria



FUNGI

Organic gardeners, above all else, seek to create healthy, fertile soil by fostering the growth of beneficial microorganisms by keeping soil pH close to neutral, and by adding the foods of these organisms, namely, complex, undecomposed organic materials such as food wastes, manures, and fresh plant material. As the organisms digest these materials, they release the simpler compounds of nitrogen, potassium, and phosphorus that plants absorb through their roots and use as "food". Decomposing organic material also forms "humus", the dark, spongy soil component that loosens heavy clays, binds loose sandy soils, retains moisture, and provides a home for vital microorganisms. When these organisms die, they too are decomposed by others; nothing is wasted in a balanced, soil micro-community. Here are its main members:

Bacteria: These one-celled creatures not only decompose fats, carbohydrates and proteins in organic matter, some species are crucial in keeping Earth's atmosphere from becoming toxic due to the accumulation of carbon monoxide, methane, and ammonia. **HETEROTROPHIC BACTERIA** feed on organic matter, produce natural soil antibiotics, infect pest organisms, (*Bacillus thuringiensis*, sold as "Dipel" or "Thuricide" is an example), and in some cases cause plant disease. The nitrogen-fixing **Rhizobia** bacteria that live in the roots of legumes like peas, clover and alfalfa also belong to this group; rhizobias allow these plants to transfer inert nitrogen in the air into the soil as growth-enhancing nitrates. **AUTOTROPHIC BACTERIA** feed on carbon dioxide by oxidizing ammonia, nitrates, carbon monoxide, hydrogen and other chemicals in the air and soil. One type, the Azobacters, runs the entire Nitrogen Cycle of the planet; they too add nitrogen to the soil. The autotrophs are either **aerobic** (oxygen-loving) or **anaerobic** (oxygen-hating). Without the autotrophic bacteria, the air would become poison, the soil infertile.

Fungi: These primitive plants contain no chlorophyll, and so must feed on decaying organic matter. They constitute the greatest bulk of microorganisms in healthy soil; there can be MILES of fungal threads (called "mycelium") in 1 cubic foot of healthy soil. Some fungi can cause plant diseases, but most either secrete disease-controlling, natural antibiotics, or, like the fungus **mycorrhizzia**, help plant roots absorb vital nutrients. Like most beneficial soil microorganisms, fungi prefer a warm, well-aerated, composty soil fairly rich in calcium (and thus non-acid) and of a constant moistness.

Actinomycetes: These contain characteristics of both bacteria and fungi, and feed on sugars, starches, and cellulose. Thus they enhance soil fertility while producing antibiotics like streptomycin, neomycin, and aureomycin. One type can cause potato scab but hates the acid soil potatoes love, so don't lime there.

Algae: One acre of healthy, humus-rich, pH-neutral (7.0) soil can contain 1 TON of algae cells. They are the main, chlorophyll-bearing microorganisms; algae need the same conditions as do the fungi and most cultivated plants. The "blue-green" algae, now called "cyanobacteria", are efficient "nitrogen-fixers", even in desert soil.

Protozoa: Every biological community has its predators, and these one-celled animals are it. They help maintain a balance by feeding directly on the organisms listed above; they can also control disease-causing organisms, and some feed on organic matter.

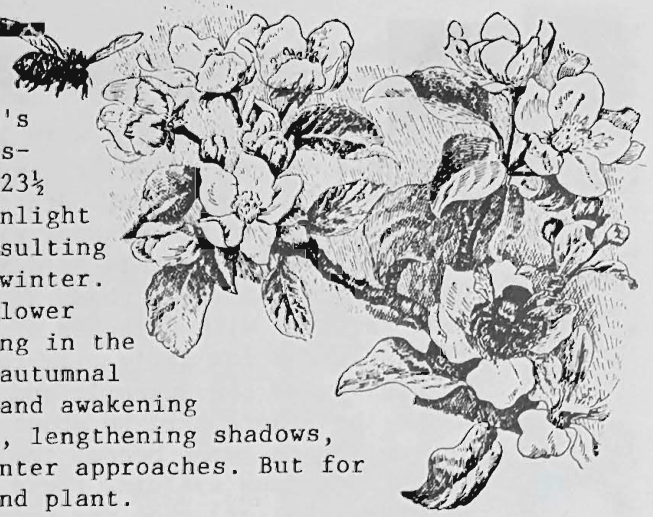
Viruses: These seemingly useless, malevolent life forms can cause disease in plants, animals and people. But they also help balance the soil bio-community. Viruses are also what causes white variegation in ornamental plant leaves, and are responsible for the multi-colored streaks in Rembrandt tulips.

"Even mean men are often sweet when they are teaching".

Robert Bligh

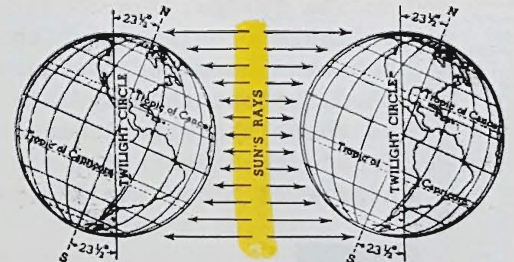


Spring comes to our (northern) hemisphere as autumn comes to the southern hemisphere. Why? During this part of the earth's journey around the sun, the northern hemisphere leans TOWARDS that star due to the 23½ degree tilt of the earth; as a result, sunlight strikes our half of the planet more directly. The resulting warming of the air, soil and water brings an end to winter. But south of the equator, that same tilt causes the lower half of the earth to lean AWAY from the sun, resulting in the sunlight striking at a strong slant, which triggers autumnal cooling. As our days grow longer and trigger growth and awakening all around us, our southern friends see shorter days, lengthening shadows, and a slowdown in growth all around them as their winter approaches. But for you and me, spring is coming, so it's time to plan and plant.



In regions where snow is common and the ground often freezes, early spring is the time to plant cold hardy crops like peas, snowpeas, fava beans and corn salad as soon as the ground has thawed. Mulch can act as an insulator that blocks the sun's thawing heat, so some gardeners rake it back to expose the soil. They replace the mulch later when the seedlings are up. Others lay down sheets of clear or black plastic, old windows or even upside down wide mouth jars to trap solar heat. Try to recycle here; carpet outlet dumpsters are often brimming with huge sheets of discarded clear plastic. Snowy-climate gardeners also use early spring to refine garden plans, to look for sources of spoiled hay and other organic "waste" materials valuable for building soil fertility. Hopefully they'll slow down long enough to enjoy the fragrant, golden flash of forsythias, the waxy sheen of Dutch hyacinths, and the hopeful emergence of crocus, Siberian squill and snowdrops. The joy that can come from seeing tree buds swelling, hearing the return of birds, and smelling fresh life in the air is impossible to capture in words. But it is an ephemeral confirmation of the value of living that snowy climate folks are rewarded with for having endured another winter.

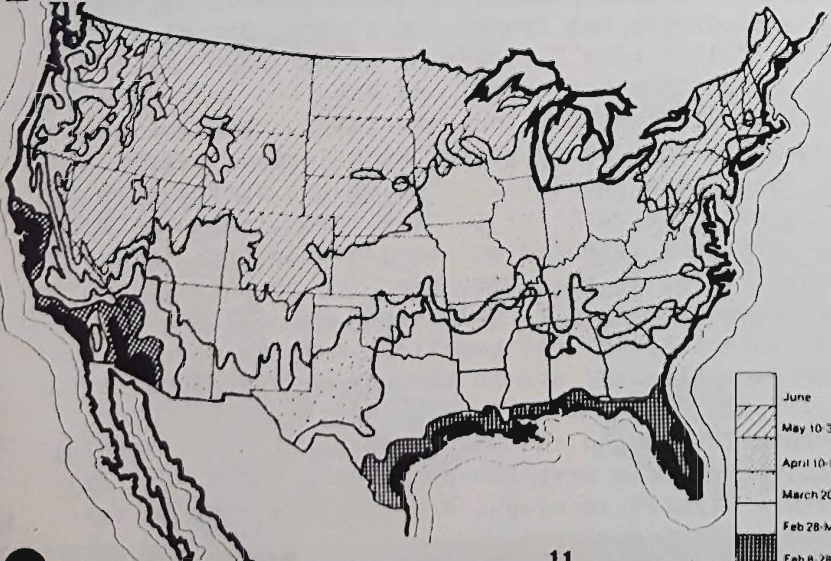
In mild climate areas where the ground never freezes and snow, even frost, is very rare, spring witnesses the final wave of production from the "winter" (cold hardy) vegetables and annual flowers, such as carrots, all the Brassicas (turnips, broccoli, mustard, radishes and the many other members of the Crucifer family), peas, salad plants like lettuce and rocket, plus flowers like snapdragons, alyssum and calendulas. All these can tolerate a sudden frost, but not the stifling heat of summer in the mild climate areas. Hence they are grown in the winter there. By the end of March gardeners here will have planted the Frost Tender plants like squash, corn, okra, and others whose edible portion contains seeds, so that



June December

these plants can mature somewhat before the REAL heat sets in. In Florida and other hot, humid regions this is important to do.

Spring in both areas is a good time to fill old milk jugs with a mixture of 4 heaping teaspoons of Ivory Soap Flakes and 1 gallon of hot tap water. Store a few gallons of this soap spray for controlling aphids, mites and other tiny pests. Time, too, to feed the soil, with fish emulsion, or feed-grade cottonseed meal, soybean meal or alfalfa meal (all 3 from feedstores), Ringer Lawn Restore, horse manure or a "green manure" cover crop like rye, annual vetch, or red clover.



[Diagonal lines /]	June
[Diagonal lines \]	May 10-30
[Horizontal lines]	April 10-May 10
[Vertical lines]	March 20-Apr 20
[Dotted]	Feb 28-March 10
[White]	Feb 8-28
[Dark shading]	Jan 30-Feb 8

Be wary of conclusions. Ruth Stout

To keep your seeds viable till planting time ALWAYS store them in tightly-sealed jars or baggies in your fridge.

O

IN YOUR SEED PACKET WITH 1 BEET JUICE FINGERPRINT WRITE: SESAME (*Sesamum indicum*). This drought-tolerant annual is native to Africa and tropical Asia, and has been cultivated for centuries, both for its seed and the flavorful oil contained therein. Once frost danger has passed, plant the seeds $\frac{1}{4}$ inch deep in loose, fertile soil in a full sun location; highly acid soil should be "sweetened" with crushed dolomitic limestone. Space the seeds about 2 inches apart in rows 12 inches apart. Mulch the soil between the rows with 6 inches of hay, grass clippings, or some other plant-based material. Water the row daily till the seedlings are 1 inch tall. After that water every 7 to 10 days, as the juvenile and adult plants are quite drought tolerant. In 3 to 4 months the plants will be about 18 inches tall and topped with lavender or white flowers, which later become the seed-bearing flattened pods. Sesame pods shatter when fully ripe, thus spilling their seeds onto the ground; pick the pods (over a bowl in case they shatter) when the pods begin to lose their green color and turn a yellowish shade. The harvested seeds may be eaten raw or roasted. Since sesame in bloom is quite attractive, it looks fine in flower gardens as well as vegetable gardens.

O

IN YOUR SEED PACKET WITH 2 BEET JUICE FINGERPRINTS WRITE: SHOGGIN TURNIP (*Brassica rapa*). All turnips originated in Asia as ancient farmers crossbred wild brassicas to enlarge the then barely swollen tap root. "Shogoin" is a modern Japanese non-F1 hybrid with a dense, fine-grained white root, which is fine eaten raw or cooked. The large leaves make a fine cooked green, and their large mid-ribs may be chopped, dropped into a colander, quickly blanched with a flood of boiling water, then packed tightly into wide-mouth jars. A hot mixture of vinegar, salt, and honey is then poured over the chopped mid-ribs till the jar is full. Seal immediately, let cool, then store in the fridge. The result is a crunchy, sweet-and-sour relish. Turnips are an easy, reliable crop good for children and beginners. They tolerate frost, but not extreme heat and humidity, so gardeners in Florida and other subtropical or tropical areas should plant them in late fall through mid-winter. Planting instructions are the same as those above for Sesame. In snowy climate areas plant 1 week before last expected frost, then again in late July for a fall crop; in these same areas, unharvested turnips will bloom the following spring, then go to seed, like any biennial.

O

IN YOUR SEED PACKET WITH 3 BEET JUICE FINGERPRINTS WRITE: THAI HOT PEPPERS (*Capsicum species*). This tropical perennial, like all peppers, is treated as an annual in temperate climates, as it is a cold-sensitive plant that grows best in full-sun warm weather. The bright red, face-explodingly hot fruits are rich in vitamins A and C. Start your seeds in a shallow tray filled with 2 inches of rich, loose soil. Cover the seeds with $\frac{1}{4}$ inch of soil, keep moist (but not soggy) and keep the tray in a warm, full sun location so that the seedlings will not get long and leggy. When they are about 3 to 4 inches tall, transplant them to a sunny garden with loose, enrich soil **AFTER ALL FROST DANGER HAS PASSED**. Space them about 12 inches apart. Sprinkle them with the natural caterpillar-killing bacteria *Bacillus thuringiensis* (sold as "Dipel" or "Thuricide" POWDERS) to protect them from cutworms and armyworm caterpillars; no creatures other than caterpillars are killed by this bacteria. The peppers form after the petals of the white and yellow blossoms drop off. Full-sized but **STILL GREEN** pods are also **INCREDIBLY HOT!** A powerful insect killer and repellent may be made by just buzzing mature pods with some water in a blender; strain through a fine cloth, bring to a simmer, then add a spoonful of Ivory Soap Flakes to each quart of "Hot Pepper Death Spray" to help it adhere to both leaves and the target insect (aphids, scale, young caterpillars and grasshoppers, mites). To save the pods for the kitchen, dry them for a week in the sun, then store tightly in clean, dry jars. Be sure to take seeds from several pods to plant the following season.

A

s I said in the last issue, sometimes a severe cold front manages to reach the subtropics and tropics. If you are caught off guard and don't initiate the freeze damage prevention plan I discussed, you'll need to know how to heal a cold-ravaged mild climate landscape.

TROPICAL TOPICS

by Dr. Jack A. Randa



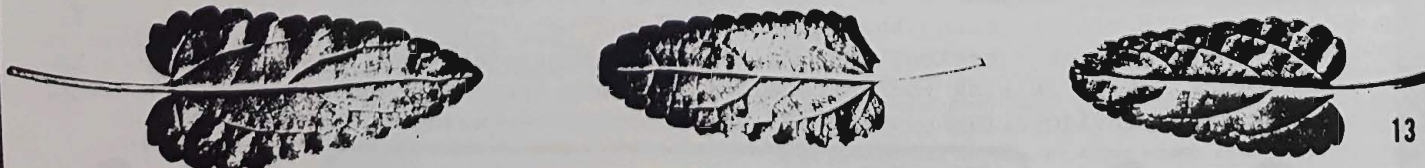
As soon as you see new growth emerging from the surviving base of each woody branch or plant, you'll know the plant survived. When this new bit of growth reaches a few inches in length, and frost danger is assuredly past, use your loppers or pruners to cut off freeze-killed stems just up above where the new growth is sprouting. After extreme freezes this line above which one makes their cuts may well be at or close to ground level. Use this pruning approach on hibiscus, avocado, citrus, jatropha, gardenia, plumbago, poinsettia, allamanda and other woody tropical and subtropical perennials. In the case of non-woody foliage plants like elephant ear, canna, banana, ginger, selloum philodendron, or cassava, just cut the entire plant back to near ground level, for once their foliage is damaged it cannot repair itself. So just start the plant all over by cutting it back severely. All this pruned-off dead tissue is valuable organic matter, so leave it on the ground beneath the plants where it will serve as a sub-layer of new mulch.

Feeding the soil supporting freeze-damaged plants is ESSENTIAL, as spring will usher in a phase of rapid growth; without sufficient soil nutrients the new leaves and limbs will be smaller, less vigorous, and of poorer color and health. Right on top of that layer of pruned-off dead limbs and leaves, broadcast HEAVILY a $\frac{1}{4}$ inch thick layer of a granular organic fertilizer like soybean meal, feed-grade cottonseed meal, Ringer Lawn Restore, alfalfa meal, fish meal, kelp meal, dried poultry poop, or flax seed meal. It would then be advisable to apply a 12"-18" thick layer of a nutrient-rich mulch, such as horse stall cleanings, sugar cane waste, hay, grass clippings, tree grindings (free from most tree-trimming company trucks in the neighborhood) or some other plant-based "waste" material. If your soil tends towards acidity (and it likely does in a high-rainfall subtropical or tropical region), broadcast a thin but visible layer of powdered dolomitic limestone over the entire landscape bed, avoiding acid-lovers like ixora or gardenia or azalea. All that mulch is going to release quite a bit of humic acid as it decays; the dolomite will compensate. By midsummer, say July or so, it's a good idea to drastically cut back (to 12 inches) rapid-growing semi-woody perennials like pentas, plumbago, widow's tears and tropical sage. Once again, bury the fallen leaves and branches in a $\frac{1}{4}$ inch layer of nutrient sources and another 12 to 18 inches of mulch. Do this annually, freeze or no freeze, and you'll have thick, spongy, humus soil and a vibrant tropical garden.

Special thanks to Solange Gignac and The Denver Botanic Gardens Library for many illustrations.



RATTLESNAKE ROOT is a species of *Stachys* (also called "Betony") and belongs to the Mint family. It is a common weed in central Florida, but unless one digs up the tubers, pictured above, you're stuck with it. In March the pale lavender flowers appear above the leaves (pictured below) and the tubers enlarge; Native Americans savored them raw. Yuppies pay \$7 per pound for them under the misnomer "Chinese Artichokes". But Florida gardeners can get theirs for free while controlling this acid-tolerant perennial.





The seeds of **Dandelions** (*Taraxacum officinale*) were brought to North America by European immigrants who treasured this relative of lettuce as a nutritious, fine-tasting vegetable, which promptly escaped their gardens and colonized the continent. In spring the young leaves are added to salads, and later the mature leaves make a fine, cooked green; both are very rich in Vitamin A and iron. The roots can be dried, roasted and ground for use as a coffee substitute, just like those of Chicory, a close relative. Dandelion flowers have long been used to brew a spring wine. So if you don't want them in your lawn, don't poison them, but use a long knife blade to sever the long root down deep, and pull up the whole plant (this is easiest after a good rain). Rinse well, then prepare for the table. Hybrid varieties, offered in some catalogs, produce larger and more succulent leaves.

PESTICIDES DO THE DARNDEST THINGS

by Bart Sinkwetter

Strawberries are routinely sprayed with 70 different pesticides registered with the EPA. Thirty-nine of these are frequently detected in the harvested fruit. 60% of strawberries sampled contain residues of one or more pesticides, and 86% of imported strawberries have been shown to have residues. **Pesticide Alert**



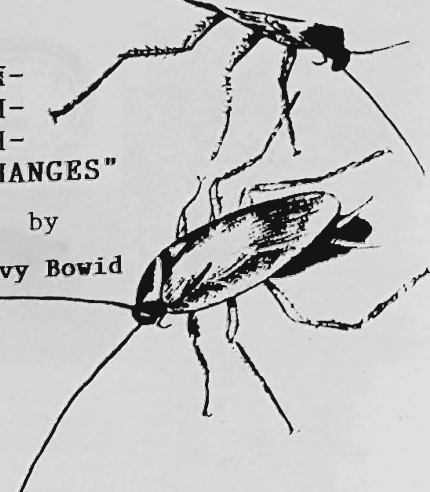
GREGORY PECS SEZ:

P.Y.O.W., (Push Your Own Weight), is an exercise regimen involving pushups, sit ups, deep knee bends, lunges, handstands, pull-ups, chin ups, and inverted sit ups rather than relying on expensive sets of elaborate equipment. Being able to readily maneuver one's own body weight insures a balance of strength and agility while helping to foster vital flexibility. P.Y.O.W. can be done in the home, in a motel room, while jogging, and with no equipment other than a horizontal bar, or even a low-growing tree branch thin enough to grip. If your daily jog takes you to a playground with bars, you can incorporate "inverted sit ups" into your regimen. Hang upside down by your knees, fold your arms across your chest, then use your abdominal muscles to draw your torso up till your forehead touches your knees; this flattens your stomach while using gravity to draw your internal organs to their youthful position high in the body cavity. That persistent bulging belly, and that nagging backache, at last can vanish. Start P.Y.O.W. with a daily workout of **10 PUSH UPS, 10 SIT UPS, 10 DEEP KNEE BENDS, 10 PULL UPS, and 10 TOUCH TOES.** As your strength and flexibility go up, add another 10 reps to each, then another 10, and so on, till you are daily doing 50 of each. **100** of each exercise, done daily, will appreciably enhance and sculpt your musculature while raising your metabolism and thus burning up calories. A P.Y.O.W. workout is an invigorating knowing of, and friendliness with, one's own body.



In these golden years of the 20th Century, organic gardening and living is coming into fashion, no longer considered a spacey oddity. The fame of pesticides' danger is widespread; my column will help you make the switch.

"CH-
CH-
CH-
CHANGES"
by
Davy Bowid



Ah roaches. They've been here since long before the dinosaurs, but somehow that doesn't add any charm to crunching one beneath your shoe, or

to seeing them scatter at 4 a.m. when the kitchen light goes on. So what's an organic guy or girl to do to get rid of these prehistoric pests.?

DON'T FEED THEM! Sweep the kitchen floor daily to whisk up bits of food. Keep the stove-top and counters wiped clean for the same reason. Dirty dishes left out are a smorgasbord for roaches. And to keep them from getting into open containers of dry pet food, cornmeal, flour and cereal, keep these dry foods in large-mouth 1 gallon jars, which many restaurants throw out by the dozen. They may either be glass or plastic. Olives, mayonnaise, mints and other strong foods may have been in them, so a good cleaning will be needed to remove the odor. Just ask the waitperson if they could check for some when they're in the kitchen. And to keep roaches from feeding in your pets' food bowls, set them in a shallow pan of water; roaches won't (successfully) cross this "moat" to feed. In fact, the moat may serve as a trap.

Those little boxes of old-fashioned boric acid roach tablets really work! Containing 40 percent boric acid and 60 percent bait, these big white tablets can be tossed behind and beneath the fridge and stove, set up in the corners of the cupboards and the cabinet below the sink, placed in the garage or tool shed, or any other places roaches hang out. In a few days you'll see dead and dying roaches here and there. Be sure that kids and pets don't eat the tablets; even though boric acid is used as an eyewash and despite boron's role as a vital micronutrient for humans, animals and plants, it is toxic if consumed in large amounts. Insects are very sensitive to it, so a low dose kills them.

In tropical and subtropical regions, roaches live outdoors, in mulch, palm and banana fronds, beneath boards and in compost heaps. And while geckoes living in the house and garden will readily eat roaches and help you control them, some people find reptiles as repulsive as roaches. So make traps using Gatorade jars with an inch or two of water and rotten food at the bottom. They'll climb up, fall in and drown. Set several around the yard.

Hemp.

Cannabis sativa. NATURAL ORDER: *Urticaceae*—*Nettle Family*.



CANNABIS (Greek and Latin for Hemp) is a common and well-known plant, naturalized in waste places in the United States. It came originally from Persia and the East Indies, where the natives make an intoxicating beverage from it. In some States it is largely cultivated for the fiber of the stalks, and when properly prepared is manufactured into the coarser grades of toweling and ropes. It grows quite tall and erect, branching at intervals, having foliage that is sharply cleft and palmate, giving the whole plant a light, airy appearance. The flowers are green, and the seeds are crowded up and down the summits of the branches. It is very appropriate for sowing along fences, and is admirable for forming screens to shut off unsightly objects in a rear yard. In the fall, the seeds attract the dear little birds, which sometimes visit them in large flocks, after the frost and late season have exhausted other sustenance.

2 entries from a 19th century English herbal

Currant.

Ribes rubrum. NATURAL ORDER: *Grossulariaceae*—*Currant Family*.



BOTANICALLY named from a misapplied Arabic word, and vernacularly from Corinth in Greece, with which it has no special connection, while even the qualifying Latin epithet, *rubrum* (red) is a misnomer, as not only red but white currants are included, it must be confessed this excellent shrub has been unfortunate in its godfathers. It is, however, quite familiar to everyone, or if not they have missed one of the blisses of childhood in lying under its branches to pluck the bright, gleaming fruit hanging like strung rubies in such clusters and bountiful abundance, filled with a healthful and agreeable wine-like juice. The flowers are a delicate green, and would be pretty if of some brilliant tint. The yellow Currant, that grows wild in Missouri and Oregon, is grown as a garden shrub, for the bright and cheering flowers that appear so early in spring-time, and like the robin, are among nature's earliest harbingers of her awakening, and of earth's returning joy.

We can chase happiness by achieving, or we can happily achieve. Margaret Head 1953-

readers digested

Dear John- Loved your magazine so... I'm giving them to some friends as Xmas gifts. Enclosed is the list of 6 people. Also a check for \$108. Hope your Holidays are wonderful. Letty Weisbart, Englewood, CO

Yours is definitely the most entertaining & thought provoking gardening periodical I've received. Billie Jo Secrist, Juneau, AK

Here is my renewal check for \$18. It's refreshing to have the price on something come down rather than go up! I have used information from each issue of **THE GARDEN DOCTOR**- I've planted garlic for the first time following your directions - I've especially appreciated the recipes for boric acid spray to control fleas & other insects. As a member of our local Franklin County Earth Team Recycling group I appreciate the "Green Cleaners" article. Following the advice in your articles has saved me this renewal price many times over. Thank you for sending me **THE GARDEN DOCTOR**. Sincerely, Maree Brooks, Ottawa, Kansas

Dear John, Just lovin' **THE GARDEN DOCTOR**, looking forward to a "New Year" of it. Thanks! Happy Trails- Kathy Moore c/o Earthway Herbs, Ratliff City, Oklahoma

Dear Doctor; We just received our second issue of TGD and are enjoying it very much! I've been showing it and telling friends about it in an effort to drum up some business for you since I think TGD is a publication worth having around. As soon as my wife and I get moved into our new home, we'll be sending for a few gift subscriptions as well...I also understand that you make regular visits to Florida and, for a fee, will provide garden & landscape consultations. As I said we are just moving into a new (old) house and want to extensively landscape in as natural a way as possible. We are interested in turning much of the yard into wildlife habitat as possible, while of course, keeping it reasonably attractive looking. So we are looking for someone to advise on trees, shrubs, flowering plants, etc...Thanks and keep up the good work! Jack Gartner, St. Petersburg, Florida

Dear John, What is Seseli gummiferum? Ethel Schlegel, Bath, PA. It's a member of the carrot family. John.

Dear John, We moved. And now that we're all settled in I'd like to submit my subscription renewal form to you. Thank you very much for the price break! (I would still renew even without it.) I would also like to send a gift subscription to the office of the Clallam County Agricultural Extension Agents' Service. I believe that there are alot of master gardeners there that could benefit very much from your esteemed publication. I enjoy **THE GARDEN DOCTOR** immensely; couldn't get along without it. It's educational as well as humorous and entertaining. By the way, I think Margaret Head and I were cast from the same mold. Her opinions reflect mine identically and who else in the world could put it the way she does? In your editorials you open up and show us the gentle, vulnerable side of John Starnes, which makes me feel as though I know you as a friend. Please, please don't take out the ~~many teenay~~ quotes and the ~~aprsdn usop~~ lettering, and whocaresaboutprosperspacing! All these things are what makes your magazine so special and unique. Ya can't please 'em all. I hope by giving this gift subscription, that I have helped **THE GARDEN DOCTOR** reach it's goal of the 400 reader threshold. John, good luck to you in the future with all aspects of your life experience. You are truly one of the world's special people. Sincerely, Melinda Menne, Sequim, WA. Thank you very, very much, Linda, for your kind, ongoing support of me and my "baby". John

Dear Sir, Thank you for your interest in using three of my illustrations in your publication. You may do so. Please credit my illustrations under my copyright. By the way, farmers and the avian descendents of dinosaurs may have things a lot better than usually thought by the end of the next century. Computer power is rapidly increasing towards infinity, so humans will probably become obsolete, and most may download their conscious minds into robotic systems and take off into the galaxy. It will be a transforming evolutionary event equal to the movement of life onto land. Only those who prefer to maintain a simpler life, farming and so on, will remain. So gardening should continue to flourish. Sincerely yours, Gregory S. Paul, Baltimore, Maryland.

Living vicariously is living precariously.
Margaret Head 1953-

Concepts like bad luck, Predestination and Fate are merely laziness and fear in drag. Margaret Head

Unconditional loyalty to a loved one who, inadvertently or not, would destroy you, is not love but a slow, baroque suicide. Margaret Head 1953-

BEYOND FRUGAL

Character consists of what you do on the third and fourth tries. James Michener

Perhaps the greatest tragedy of the so-called "Reagan Revolution" was the idolatry of appearances over substance. His "economic expansion" created the appearance of prosperity by spending the incomes of future generations, the same coke-and-mirrors trick relied upon by Uncles Boesky and Milken as they maneuvered low-quality corporate paper into personal fortunes. To such a mindset, debt is invisible, therefore not real. But for 8 years, most Americans enjoyed being spoiled and collectively bounced on Grandpa Reagan's knee; few noticed the cucumber in his pants pocket as he flashed the national credit card in front of our eager eyes. So now in 1991, as Boesky and Milken sit in jail while the actor-turned-President accumulates millions of dollars from speaking engagements, the rest of us are faced with a recession, S & L failures, the threatened collapse of banking, insurance and pension systems, a national debt measured in the TRILLIONS, rising blue AND white-collar unemployment, depressed real estate markets, a diminished industrial base (due to reduced R & D during the 80's), and an even greater dependence on Middle Eastern oil. In other words, the decade-long national credit binge has led to a hangover we're just beginning to feel...what goes yup must come down.

There is no better time than now to start practicing good economic sense by eliminating deficit spending in our own personal budgets. And by saving 10% (or more) of each week's net income we can build up cash reserves, as Native Americans once saved dried foods all summer to ease the hardship of winter. Saving FIRST instead of hoping to save what's left over each week (odd how there is nothing EVER left over) enables one to begin immediately the ascent to prosperity, instead of dreaming vainly of winning the lottery. ...Wealth is not how much you make, but how much you SAVE, for it is cash ASSETS that make possible such fine freedoms as travel, financial peace of mind, or quitting a hated job to start one's own business. In short, SAVING FIRST is nothing more (or less) than PAYING YOURSELF FIRST. Each time your income rises, increase your savings rate, aiming for the 20% the average Japanese worker practices. Self-employed folks who save 40% or more can enjoy the luxury of taking a few months off each year, a clear demonstration that saving one's own money is not the act of self-denial so many people perceive it to be. Below are some ways you can "increase your savable income" today by reducing expenses. Notice too that many of these steps are environmentally friendly.

1. GROW A SUSTENANCE GARDEN as your main source of food. Fresh produce from a large, low-care, deeply mulched organic garden can turn the rice, potatoes, or pasta you purchase in bulk amounts into healthy, delicious, low-fat CHEAP meals, including stir fries, soups, casseroles and stews. Food is a core human need, and to produce most of it in your own yard not only liberates your budget but offers a priceless peace of mind. People with large gardens rarely go hungry.
2. VIETNAMESE AND THAI FOODSTORES sell soy sauce, spices, sesame oil, incense, nori, canned seafood, and bulk rice at astonishingly low prices.
3. USE A CLOTHESLINE INSTEAD OF A DRYER.
4. RESTAURANT SUPPLY HOUSES and warehouse style grocery stores are a good place to start practicing the Mormon's tradition of buying food in bulk and storing it. Dried beans, rice, oatmeal, vegetable oils, sugar, pet food, flour, honey and canned goods all can be purchased cheaply in large containers. You'll save much money per pound, quart, and gallon, you'll beat inflation a bit, and your cupboards and pantry will be reassuringly full.
5. DUMPSTER MINING is gaining acceptance as an eccentric but resourceful middle-class hobby that can furnish a home, keep it clean and fill one's closets for next to nothing. The ultimate in recycling, mining the dumpsters behind furniture, paint, carpet, department and clothing stores to extract the pre-refined resources to be found in abundance there can GREATLY reduce one's need for money. Similar to panning for gold, dumpster mining (colloquially referred to as "dumpster diving") is a guerilla response to life in a cash-based society where cash is often scarce. Items found usually bear tiny imperfections, or in the case of food, are simply expired (read the dates on the ENTIRE cases of cottage cheese, etc.). And the dumpsters in upscale apartment complexes and condominiums can overflow with all types of household goods when a tenant divorces or moves to another state. There is no shame in honest, resourceful work, but to make the best use of your time, check productive dumpsters when on the way home from work, or some other errand. You can save THOUSANDS of dollars mining dumpsters, and at the same time rescue perfectly good resources headed for the landfill. Invest all that money saved in a money market fund and watch the dividends pile up!



God forgives those who invent what they need.
Lillian Hellman

SHARING SECRETS

Smokers beware: Much cigarette tobacco is infected with the often fatal tobacco mosaic virus, which READILY attacks tomatoes. Touching your plants after smoking can infect your garden...Another good reason to quit.

Many of the Nuke-Yer-Lawn companies are now offering what they call "organic" lawn care programs. But either they are often lying or GROSSLY misinformed, for often their idea of "organic" is simply reduced use of artificial poisons, or heavy use of "natural" poisons (like pyrethrins adulterated with piperonyl butoxide). Or instead of purely petrochemical fertilizers they'll use SOME poultry manure or cottonseed meal. What next, just a "little" nuclear waste to control weeds? One can only wonder how they sleep.

A cheap source of neat tropical plants is your local Vietnamese or Thai grocery store. There you can buy exotic tubers of taro, white yam, chayote, and others. Rather than eat them, GROW THEM, either in large pots full of compost or in your garden if you live in a very mild area like south Florida, Central America or the Virgin Islands.

An easy way to turn living sod into veggie garden is to lay a sprouted potato every 12 inches in rows 12 inches apart. Cover the entire new potato garden with 12 inches of hay, pine needles, dry grass clippings, etc. When the potato plants emerge and reach a height of 6 to 8 inches, cover the entire area AGAIN with 12 more inches of mulch. The mulch will choke out the grass while decaying and providing the potatoes the acidic,



compost they require. When the plants flower, then begin to yellow, harvest your potatoes, then, if you wish, turn the hay and spent vines under to enrich the soil. Or use the Ruth Stout method and simply mulch again. To replant your next crop of veggies just use your hand to pull back the mulch and expose the soil where you wish to plant. Note* If you live in a snowy climate region, wait till 2 weeks before last anticipated frost to plant the potatoes. In peninsular Florida and similarly mild areas, plant your potato-based lawn-eradicating garden in very early fall or late winter to avoid the extreme heat potatoes hate.

Horseradish leaves, buzzed in a blender with water then strained, can make a powerful deterring or killing spray for use in controlling aphids, thrips, mites, baby caterpillars, and other small pests

The organic gardener relies heavily on birds to help control pests, not just in the veggie garden but also lawn areas, flower gardens, shrubs and trees. To attract birds give them several places to drink and bathe. Even a garbage can lid or old dish pan is fine if set flush into the soil. Pedestal bird baths look nicer, especially the cement (vs. those plastic) ones. Change the water every 3 days in summer to avoid breeding mosquitoes. Also, the old bread rescued from commercial bakeries' dumpsters, or bought cheap at bakery thrift stores, will draw birds if scattered all about the yard. Birds poop while eating...free fertilizer and insect control, too!



BABY I'M A MAIZE

by Paula Cartney

That would be something, to look at your garden and see a scene from the heart of the country...sturdy, green rows of corn. Oo, you could have fresh sweet ears to eat at home every night. You'd smile away at them showing off their silks like a long haired lady. But too many people think corn is hard to grow. So let's curl up in the back seat of my car and review this American native.

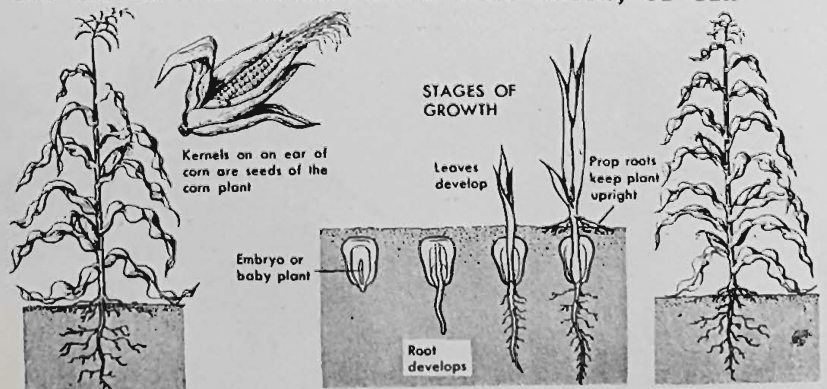
Corn, also known as "Maize", is botanically classified as "Zea mays". Bred through simple hybridizing efforts by ancient Native Americans from a primitive wild grass into a giant bearing large-seeded "ears", this frost-tender annual has several requirements: 1. Full sun. 2. Fertile soil of a neutral pH (low acid) 3. Frost-free weather 4. Steady moisture 5. Warmth.

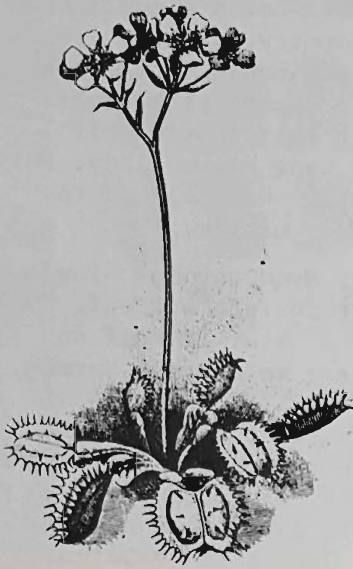
Choose a full sun location, and enrich the soil with nitrogen-rich nutrient sources like fish emulsion, feed-grade cottonseed meal, soybean meal, poultry or sheep manure, alfalfa meal or : Thickly sow a "green manure" crop like rye, alfalfa, field peas, or vetch 6 weeks prior, then turn that cover crop under the soil where microorganisms will decay them and release their nutrients, especially the nitrogen corn needs so much of. Corn likes calcium, so if your soil is quite acid, broadcast a thin but visible layer of powdered dolomitic limestone before turning the soil. In snowy regions, wait till frost danger has passed before planting. In very mild regions like much of Florida or the Bahamas, plant the corn seeds in late winter (Late February, early March) so the plants can mature before extreme heat and humidity sets in. Corn is a wind-pollinated crop, so group your rows into blocks to insure the ears will not be missing rows of kernels...long, thin rows isolated in the garden will experience poor pollination. In light, sandy soils, plant corn seeds 3"-4" deep. In heavy clay soils, try a 2" depth. Plant the seeds 12" apart in rows 30" apart. Water the area deeply, then give it about 1" of water every 5-7 days to keep the soil moist down deep.

When the seedlings are 8" high, apply a 4" thick layer of mulch between the rows to help keep the soil moist and fertile...use hay, grass clippings, bush trimmings, palm fronds, and other available plant materials. When the plants are 2 feet tall, mulch again with 8" more of plant waste, then broadcast a heavy feeding of feed-grade cottonseed meal or dried manure, or mix 3 tablespoons of fish emulsion in 1 gallon of water for each plant. Corn is a hungry member of the grass family, so focus on feeding it for vigorous growth. Give the corn patch 1" of water every week if the sky does not. And to control corn earworm, spread 1 pound of powdered "Dipel" or "Thuricide" on every 100 square feet of corn patch; both are tradenames for the naturally-occurring bacteria Bacillus thuringiensis, a virulent killer of caterpillars, but nothing else. A pet dog, a scarecrow, fake owls, and disposable pie plates hanging on strings from tall poles have all been employed to discourage crows and racoons.

Sweet corn is ready to harvest in about 80 days, when the silks begin to shrivel and turn brown. Pull back a husk to expose the kernels, shove a fingernail into one, and if a sweeey milky juice squirts out, it's ripe. Try an ear raw, right there in the garden! If the kernel is leathery and shriveled, wait till all the ears turn a dry brown, harvest, and use your hands to rub off the dry kernels and store in jars. Add them to soups for a chewy, sweet touch. Field corns are harvested when the whole plant is brown and dry. The dry seeds can be fed whole to animals, or ground into cornmeal or grits for humans. Many useful items come from the harvest; the silks of sweet corn, if dried in the shade and stored in jars, make a fine hot tea said to soothe the urinary tract. Corn cobs make a fine compost if they are buried in the soil. And if chopped up, the leaves and stalks make a fine mulch, or can be added to the compost pile.

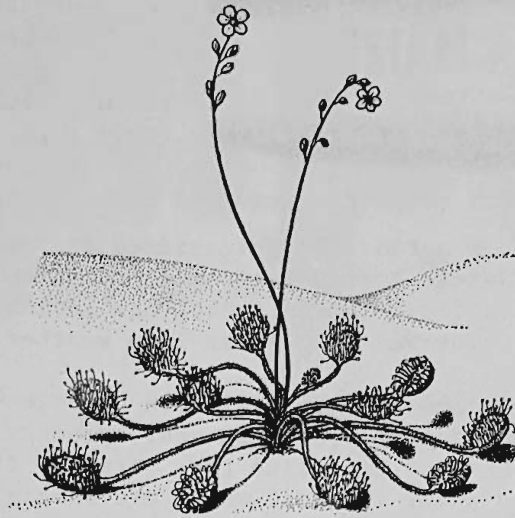
Corn depletes the soil, so grow it in a new area each year, and grow legumes like beans, peas, vetch or alfalfa where corn grew the previous season, as they ADD nitrogen to the soil. Turn the mulch under the soil to add humus, but always re-mulch garden areas. Try popcorn, "Indian" corn, or blue corn. You'll be a-maized!





The Venus Flytrap.

(*Dionaea muscipula*), is the archetypal carnivorous plant, with its toothed leaves that quickly snap shut on an insect or your fingertip if two of the three trigger hairs inside the trap are stimulated. It has been learned that these trigger hairs stimulate cells at the fold in the trap leaf and cause them to suddenly swell, thus snapping the trap shut. Insects are drawn to the inside of the trap by a maroon tint and nectary glands. Boggy areas in the eastern U.S. are the world's sole home for these plants, which, like all other carnivorous plants, need a highly acidic (pH 4-4.5) wet and spongy organic soil of low fertility. Decaying peat or sphagnum moss is ideal; such soils are low in nutrients, especially nitrogen, and so the traps digest protein-rich insects to obtain nitrogen and other nutrients. Bright light, high humidity, and cool temperatures are vital for the best health of this plant, which sends up a white-flowered stalk from the low rosette of trap leaves each spring. Rare in the wild due to collectors and loss of habitat, the Venus Flytrap should be obtained only from reputable seed firms or native plant houses.



The Sundew, (Drosera species),

is distantly related to the Venus Flytrap but occurs around the world in several different species. Their traps also grow in a low rosette, but their leaves bear extremely sticky tentacles, each tipped with a clear, sweet-smelling adhesive which also contains strong digestive enzymes. After a doomed insect gets stuck to a trap leaf, the tentacles slowly reach toward the center of the leaf, which then slowly engulfs its prey and digests it.

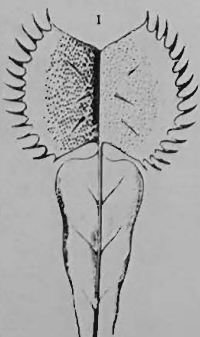
While the different species of Sundew vary in color, size and distribution, all grow only in swampy areas of a low pH, bright light, and high humidity. All species also send up a tall flower stalk each spring, that bears small, pale blossoms that later form seed pods. Seeds may be germinated in damp sphagnum moss.

As in the Venus Flytrap, the Sundew's trap leaves slowly unfold after the prey is digested, to again wait for another insect, centipede or other small critter. After three or so captures, each trap leaf shrivels and dies. It is best to not gather sundews in the wild, as they too are becoming quite scarce due to the ongoing draining and spraying of wetlands.

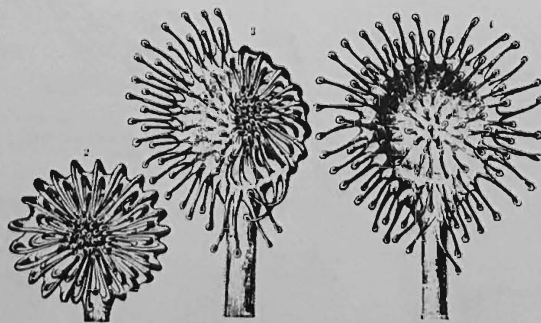


The Pitcher Plant,

(*Sarracenia species*), like all carnivorous plants, can be fed bits of meat or small nuggets of dry pet food. Each trap leaf is a tall tube with slippery insides lined at the top with downward pointing hairs that prevent drowning bugs from escaping the digestive liquid filling the base of each leaf. Native only to the eastern U.S., pitcher plants of differing species bear variously-shaped "pitcher" leaves. It, too, can be grown in a bog terrarium.



Venus's Fly-trap.





A SENSIBLE LAWN

by
Monica Ulcher



Okay, okay, I admit it... I LIKE having SOME lawn around my home. But the Huge All-American Lawn consumes vast amounts of water, petrochemical fertilizers, and is the one thing that will drive an organically minded person to periodically douse their patch of the planet with a whole spectrum of toxic chemicals the Nazis could only dream of. Sadly, in many communities, to not be slave to a hungry, monocultural green slab of sod calls into question your economic standing, self-respect, loyal-

ty to God, country, property values and family (in that order). Perhaps such a lawn is a phallic symbol of Our Conquest of the Great American Wilderness. The classic lawn is a latecomer in history, showing up first on wealthy estates in the 1700's after Western culture put the newly-invented reel mower in the hands of black slaves working as groundskeepers hence the association of respectability with pristine lawns. Fitting that 3 centuries later the lawn is the slavemaster. But it's time we redefine something so financially and ecologically draining. Since most people endure a grudging love-hate relationship with their lawns, I will periodically address in The Garden Doctor how we can convert the Green Week-End Tyrant into something that we AND our home planet can better live with.

The first thing to do is to fire the Nuke-Yer-Lawn company that bills you to periodically poison your property. Their concoctions are toxic to beneficial soil organisms responsible in part for soil fertility. Hence your lawn is "addicted" to their "service". Just as someone dying of cancer can look "healthy" by maintaining a dark tan, your lawn can be forced to look healthy (i.e. "green") by giving it high doses of soluble fertilizers high in nitrogen and iron. After weaning your lawn from Agricultural Crack, call your State or County Agricultural Extension Service (in the blue pages) to learn if the soil in your area tends towards acidity or alkalinity. If your soil is acid, annual applications of powdered dolomitic limestone are in order, from 25-50 pounds per 1,000 square feet of lawn. Dolomite also provides the critical nutrients CALCIUM & MAGNESIUM. Alkaline soils will have their pH slowly lowered due to the natural, mild acids formed as both fallen clippings and organic fertilizers decay and release their nutrients. Some of these fertilizers are: DRIED POULTRY MANURE & SHEEP MANURE, LEATHER DUST, FEATHER MEAL, SOYBEAN MEAL, FEED-GRADE COTTONSEED MEAL, MEAT-AND-BONE MEAL, ALPALFA MEAL, RINGER'S LAWN RESTORE, FISH MEAL, COMPOST, KELP MEAL, MUSHROOM SPAWN, BREWERY WASTE, FISH EMULSION, FLAX SEED MEAL, BONE MEAL, BLOOD MEAL, GREENSAND, ANIMAL TANKAGE, WOOD ASHES (alkaline in nature), SUGAR CANE WASTES; look for other ground-up organic waste materials produced in your area, except for processed human sewage, which is all too often contaminated with industrial heavy metals like cadmium. If you live in a snowy area, a SPRING, MID-SUMMER, and FALL FEEDING is usually sufficient. In mild, snow-free areas a fourth WINTER feeding is a good idea. Vegetarians will likely wish to avoid fertilizers made from slaughtered animals, and so can rotate their use of plant-based fertilizers to insure complete nutrition for their soil.

Mow your lawn every 5 days when it's growing rapidly, to a height of 3 inches, to help crowd out and shade out the weeds. Since beneficial organisms in an organic lawn quickly digest fallen clippings into a nutrient-rich compost, be SURE to leave the bag off your mower. Thatch is a problem only in chemically-addicted lawns. Setting bags of grass clippings out for the garbageperson is like setting out bags of fertilizer, and grass clippings buried in landfills are a major source of the Greenhouse Gas methane. Give your lawn 1 INCH of water every 5-7 days. Use 4 soup cans in each sweep area of your oscillator or sprinkler system to determine how long it takes for that inch of water to be dispensed; run the sprinkler for 1 hour, then pour the water in 3 of the cans into the 4th, use a ruler to measure the water in it. Divide that number by 4 and you'll have your average hourly flow rate. Oscillators usually take 3-4 hours to put out 1 inch of water. Sprinkler systems vary greatly. Water at night or early morning to reduce losses to evaporation. The myth that "night watering causes fungus" arose from owners of Nuke-Yer-Lawns. Organically-maintained lawn experience far fewer disease and insect problems if well-nourished and teeming with beneficial organisms. These deep, infrequent waterings conserve water while training your lawn to have a DEEP root system, freeing your lawn from that OTHER addiction; frequent, shallow waterings. In future issues I'll discuss ways to convert your lawn to a polycultural one that requires even less water, feeding and care. After all, why pamper grass you can't even smoke?!



BLACK
WALNUT

SASSAFRAS



GINKGO



HONEY
LOCUST

BAD NEWS

HE ALWAYS "BLEW UP" WHEN ...

The U.S. dumped 87,000 containers of radioactive material in the Gulf of Mexico, the Pacific and Atlantic Oceans between 1946 and 1970, much of which will remain lethal for 240,000 years. Let's hear it for "Nuke-Ya-Ler" power.
facts drawn from *It's A Fact*

In Beijing, China, the water table drops by up to 6.6 FEET annually. As a result, one third of the city's wells have dried up.

TIME, 8-20-90

One in five adult Americans when asked says that the sun revolves around the earth.

National Science Foundation

The U.S. is responsible for 29% of the world's total emissions of ozone layer-destroying chemicals. *Garbage*.

Only 3 percent of Europe is left remaining as wilderness.

Heather Spalding, J. Michael McCloskey, Sierra Club

In the last 50 years, Australia's koalas have dwindled from several million to just 400,000. Their numbers continue to drop due to human destruction of eucalyptus forests (eucalyptus leaves are their ONLY food) and to an epidemic of the venereal disease chlamydia, which results in the harmless mammals developing infertility, blindness, pneumonia, and secondary infections. Up to 40% of all native koalas are now infected. *Australian Koala*

Foundation

Ronald McReagan in his 8 years, cut research and development for energy efficiency and renewable energy by 40%. He also rolled back the CAFE requirements that mandated greater gas mileage in new cars, which has resulted in a greater dependence on foreign oil while increasing the emission of tailpipe pollutants. During the same 8 years his policies resulted in a doubling of the U.S. debt load.

Since 1970 poachers have killed off 95% of the world's black rhinos, leaving just 3,800 scattered about in small herds that are highly vulnerable to further poaching and transmissible diseases. *Breakthroughs*

Quack Asian doctors will pay a poacher \$24,000 for just one rhino horn. *Breakthroughs*

For every acre of the tropics that is reforested, ten more are cut down.
United Nations survey

Higher levels of ultraviolet light entering through the seasonal ozone "hole" in the stratosphere over the Antarctic threaten the polar food chain by reducing photosynthesis in phytoplankton from 35 to 75%.
Sayed El-Sayed, Texas A&M University, Osmund Holm-Hansen, Scripps Institution of Oceanography, La Jolla, CA/

Of the world's 17 species of primate, 14 face extinction. Of the 3 NOT threatened, only 1, humans, are increasing in number. *It's A Fact*

Poverty of course is no disgrace, but it is damned annoying. William Pitt

Wild birds have fewer and fewer places to live, feed and breed as human settlements spread into plains, forests and wetlands. Forests that remain are too often made into monocultural "tree farms" by the pulp-lumber industries and the so-called "Forest Service", who reduce diversity and remove the dead limbs and trees that house and feed so many birds. Nuke-Yer-Lawn companies render yards deadly to songbirds by partially poisoning the insects they eat. But by recycling scrap lumber or bleach bottles and other discards into homemade bird houses and feeders, we can provide a bit of respite to these singing, feathered descendents of the dinosaurs. Why bother? First, they were here FIRST, second, they help control pest insects, weeds and rodents, and third, their very presence enriches our daily lives. A hacksaw, a few nails, a hammer and a tool to make the entry hole, plus the measurements given here is all you need to provide homes for bird families.



phoebe



flicker



tree swallow



bluebird

Table 1.—Dimensions of nesting boxes for various species of regular box-inhabiting birds and the height at which they should be placed above the ground

Species	Floor of cavity	Depth of cavity	Entrance above floor	Diameter of entrance	Height above ground
	Inches	Inches	Inches	Inches	Feet
Bluebirds	5 × 5	8	6	1½	5-10
Robin	6 × 8	8	(¹)	(¹)	6-15
Chickadees	4 × 4	8-10	6-8	1⅛	6-15
Titmice	4 × 4	8-10	6-8	1¼	6-15
Nuthatches	4 × 4	8-10	6-8	1¼	12-20
House wren	4 × 4	6-8	1-6	1	6-10
Bewick's wren	4 × 4	6-8	1-6	1	6-10
Carolina wren	4 × 4	6-8	1-6	1⅛	6-10
Violet-green swallow	5 × 5	6	1-5	1½	10-15
Tree swallow	5 × 5	6	1-5	1½	10-15
Barn swallow	6 × 6	6	(¹)	(¹)	8-12
Purple martin	6 × 6	6	1	2½	15-20
Song sparrow	6 × 6	6	(²)	(²)	1-3
House finch	6 × 6	6	4	2	8-12
Starling	6 × 6	16-18	14-16	2	10-25
Phoebe	6 × 6	6	(¹)	(¹)	8-12
Crested flycatcher	6 × 6	8-10	6-8	2	8-20
Flicker	7 × 7	16-18	14-16	2½	6-20
Golden-fronted woodpecker	6 × 6	12-15	9-12	2	12-20
Red-headed woodpecker	6 × 6	12-15	9-12	2	12-20
Downy woodpecker	4 × 4	8-10	6-8	1¼	6-20
Hairy woodpecker	6 × 6	12-15	9-12	1½	12-20
Screech owl	8 × 8	12-15	9-12	3	10-30
Saw-whet owl	6 × 6	10-12	8-10	2½	12-20
Barn owl	10 × 18	15-18	4	6	12-18
Sparrow hawk	8 × 8	12-15	9-12	3	10-30
Wood duck	10 × 18	10-15	3	6	4-20

¹ One or more sides open. ² All sides open.

BIRDS IN THE GARDEN

NAME, DESCRIPTION AND FRUITING SEASON

- Dogwood, Gray,
Cornus racemosa
To 10 ft.; flowers white; fruit white.
July-November
- Dogwood, Prairie,
C. bayleyi
Shrub to 10 ft.; with reddish branches; fruit white.
- Dogwood, Red-osier,
C. stolonifera
Shrub to 10 ft.; with dark crimson branches; flowers white; fruit white or bluish.
June-December
- Dogwood, Roughleaf,
C. asperifolia
Shrub to 15 ft.; with reddish-brown branches; fruit pale blue.
June-September
- Dogwood, Silky,
C. amomum
Shrub to 10 ft.; branches purplish; fruit pale blue.
June-September
- Elderberry,
Sambucus canadensis
Shrub to 12 ft.; flowers white; fruit purple-black.
June-August

KNOWN TO BE EATEN BY

- ruffed grouse, flicker, downy woodpecker, olive-backed thrush, red-headed woodpecker, robin, bluebird, catbird, sharp-tailed grouse, bobwhite, grosbeak, cedar waxwing, kingbird.
- flicker, catbird, hermit thrush, ruffed grouse, bobwhite, olive-backed thrush, robin, bluebird, brown thrasher.

LIST OF PLANTS TO ATTRACT BIRDS

NAME, DESCRIPTION AND FRUITING SEASON

- Hackberry,
Celtis douglasi
Shrub or small tree; fruit brown.
July-January
- Hawthorn, Black,
Crataegus douglasi
Small tree; fruit black, shiny.
July-November
- Hawthorn, River,
C. rivularis
Shrub or small tree to 20 ft.; fruit dark red becoming black.
July-November
- Honeysuckle,
Lonicera ciliosa
High-climbing vine; flowers orange and scarlet; fruit red.
July-September
- Honeysuckle,
L. conjugalis
Small much-branched shrub; flowers dark red; fruit red.
August-September
- Honeysuckle, Utah,
L. utahensis
Small shrub; flowers yellow; fruit red.
June-August

KNOWN TO BE EATEN BY

- band-tailed pigeon, hermit bird, evening grosbeak, road-runner.
- solitaire, pine grosbeak, black-headed grosbeak, hermit thrush.
- olive-backed thrush, pine grosbeak, spurred towhee, hermit thrush, solitaire.



In 1974 an agave plant in Berkeley, California produced a flower spike 52 feet tall. **Guinness Book of World Records, 1990**

PHUKINAY!!



The uncharged subatomic particles called Neutrinos can penetrate a wall of solid lead, even if that wall IS 5,878,000,000,000 MILES THICK! **National Research Council of Canada**

One cubic mile of seawater contains: 14 tons of tin, copper and uranium, 47 tons of iron and aluminum, 1 ton of silver, 400 pounds of chromium, and 40 pounds of gold. **It's A Fact.**

Approximately 90% of earth's insect species HAVE NOT been identified. **E. O. Wilson, Harvard University**

If burned as fuel, the junk mail received by Americans EACH DAY could heat 250,000 homes. **National Wildlife Federation.**

A large, malodorous leaf-eating bird in South America called the Hoatzin (pronounced "Hwatsin") is startlingly reminiscent of the prehistoric proto-bird Archaeopteryx in that its young possess clawed fingers on each wing, allowing the peculiar baby birds to easily climb trees. Don't get TOO excited though; the Hoatzin has neither a toothed beak nor a long reptilian tail. BUT it does have a small sternum and weak flight muscles.

In 1980 Bobby Rackley of Rocky Mount, North Carolina grew a collard plant 35 feet tall and 59½ inches wide. **Guinness Book of World Records, 1990**

Researchers at the University of Wyoming have discovered that some plants, like the Rocky Mountain weed *Thermopsis montana*, use microscopic outer cells as tiny "lenses" to capture and focus ambient light deeper into the leaf where green photosynthetic tissues manufacture food for the plant. These tiny lenses become more convex in shady conditions, thus gathering and re-directing what light IS available until direct sunlight returns. Researcher Greg Martin concludes that some leaves can thus gather 26 TIMES MORE LIGHT using these lense cells. **Science News**

The energy saved by recycling a single glass bottle (versus making new glass from raw materials) can operate a TV for 3 hours. **National Wildlife Federation.**

Male snakes have TWO penises, and can use either one while copulating, which last 3 hours. **NATURE, PBS.** (Gee, two heads ARE better than one!).

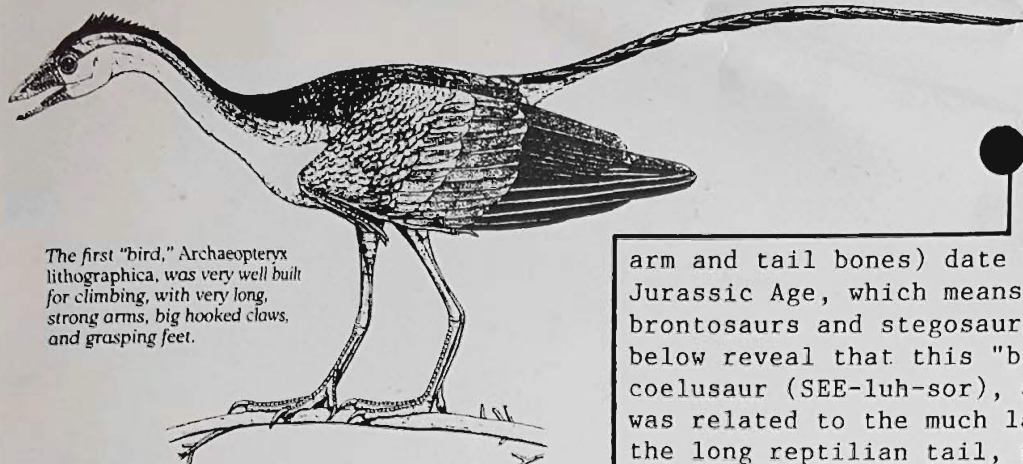
Just 1 birch tree bearing 200,000 leaves may in one day transpire 900 gallons of groundwater into the air. **It's A Fact.**

The *Puya raimondii* plant can produce a flower spike 8 feet in DIAMETER and 35 feet in height. It contains 8,000 white blooms. **Guinness Book of World Records, 1990.**

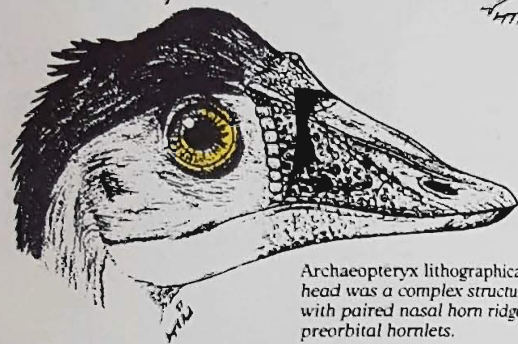
Papaya plants can change sex due to flucuations in temperature or moisture.

The three-horned gecko can catch an insect several inches away using its long sticky tongue in just 115 Milliseconds! **University of California in Irvine**

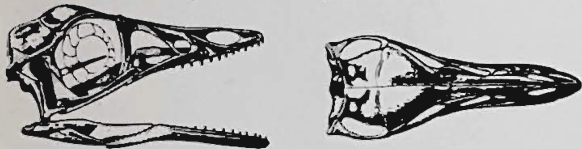
I am an optimist. It does not seem too much use being anything else.
Sir Winston Churchill



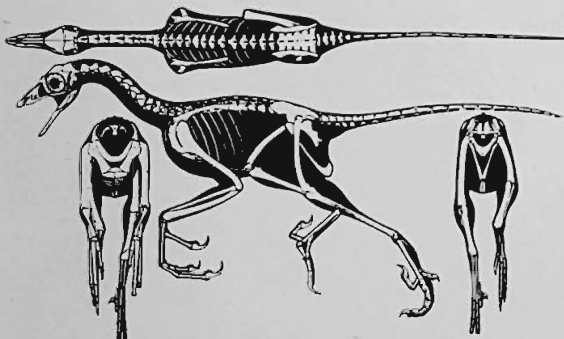
The first "bird," Archaeopteryx lithographica, was very well built for climbing, with very long, strong arms, big hooked claws, and grasping feet.



Archaeopteryx lithographica's head was a complex structure, with paired nasal horn ridges and preorbital hornlets.



skeletal views of Archaeopteryx



skeleton of Struthiomimus, a relative of Archaeopteryx and the coelusaurs.



Special thanks to Gregory S. Paul for donating the drawings of Archaeopteryx, taken from his fine book "Predatory Dinosaurs" copyright 1988 by Simon & Schuster, New York, NY

The birds in your yard are all likely descendants of the proto-bird **Archaeopteryx**. The oldest known prehistoric bird, its fossils (which clearly show the imprints of feathers around the

arm and tail bones) date back 100 million years to the Jurassic Age, which means this bird flew past herds of brontosaurus and stegosaurus. The skeletal illustrations below reveal that this "bird" was, in fact, a feathered coelusaurs (SEE-luh-sor), a small, running dinosaur that was related to the much larger Tyrannosaurus rex. Note the long reptilian tail, the toothed beak (many types of coelusaurs had toothed beaks), the well-developed hands and arms, the long, strong legs excellent for fast running. As in other coelusaurs, many of the bones were hollow; a lighter skeleton made flight possible. The head was dinosaur-like, bearing two tiny nasal horns. Were it not for the feather imprints, paleontologists would identify its fossils AS those of a coelusaurs, the similarities being so great. In fact, re-examination of coelusaurs fossils suggests many species had short feathers on the arms and bodies; did feathers evolve from scales? After all, both are composed of the protein keratin, and both have a radial structure. Perhaps certain coelusaurs experienced mutations that gave them elongated scales with feathered edges, serving to help trap body heat while helping the creature "row" through the air while making the final lunge for its prey. This would give an edge to the coelusaurs, who could then mate with othered "feathered" coelusaurs, reinforcing the new characteristic until a new species evolved, namely, **Archaeopteryx**. One thing is clear, Archaeopteryx was a modified dinosaur, hence, its modern descendents like robins, chickens and hawks, are that also! Even today, birds' legs and clawed feet are covered in reptilian scales, looking much like a miniature Tyrannosaurus foot. On a chicken wing one can see the exposed "thumb" of the original reptilian hand; it even has a vestigial claw! The other fingers have long since been compressed into the wing tip. In modern birds the breast bone (sternum) has enlarged greatly to support huge flight muscles (the "white meat" of a chicken). Archaeopteryx had a small sternum, and so was likely a poor flyer by modern standards. In today's birds the tail bones are much shortened into a stump that supports a fan of feathers, whereas on Archaeopteryx the feathers were in a long row on each side of the long lizard-like tail. It is also interesting to note that the developing jaws of all bird embryos in the egg contain dormant "tooth buds" that, except in vary rare cases, fail to sprout into teeth. Nonetheless, the genetic potential for birds with toothed beaks persists to this day! It is as if today's birds are simply more "bird" than dinosaur, whereas **Archaeopteryx** was more dinosaur than "bird". Imagine a flock of feathered coelusaurs perched on the back of a grazing brontosaurus (like modern cattle egrets). What color(s) was that ancient plumage? Did proto-birds sing, or still possess a reptilian hiss? Remember these questions, and **Archaeopteryx**, next time you see a bird in your gardens...Birds will never seem the same again.

"Isn't nature WONDERFUL?" Pee Wee Herman

Behold the turtle. He makes progress only when he sticks his neck out.
James Bryant Conant

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Life is like a deck of cards. The hand that is dealt you represents determinism; the way you play it is free will.
Jawaharlal Nehru 1889-1964

Snow is a hybrid of wish and lament.
Yoko Ono

