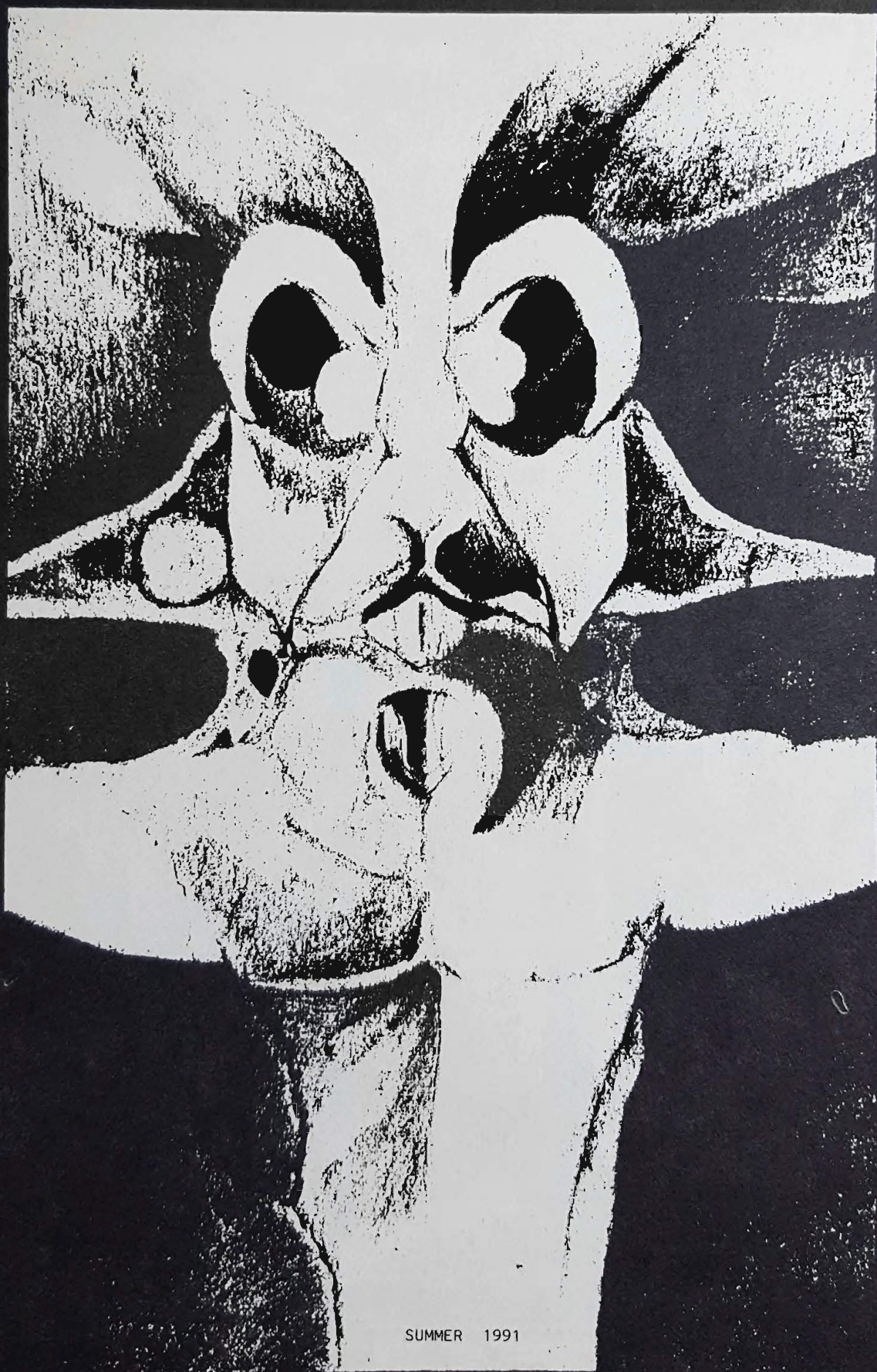


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SUMMER 1991



Human history becomes more and more a race between education and catastrophe.

H. G. Wells 1866-1946



WELCOME to the Summer 1991 issue of **THE GARDEN DOCTOR**. First, I wish to apologize for the

Spring issue coming out late; I'll do my best to insure that doesn't happen again. Secondly, rather than my usual editorial, I'm going to share with you a treatise called "Personal Intimacy", written in 1896 by Hamilton Wright as part of a larger work published under the title "Essays on Nature and Culture". It struck some pleasing, resonant chords within me, as I hope it does you. I think he may be

forgiven for occasionally using the word "men" to refer to all people, not only because that was the nature of 19th century English, and because he elsewhere refers to both men and women, but most importantly because he clearly held an expansive heart. The very best to you!

Personal Intimacy

THE delight which comes to the naturalist in his growing acquaintance with tree, flower, beast, and bird; the sense of exhilaration which the scientist feels as he passes from the lesser to the greater law and discerns an ever widening order: the thrill which stirs the imagination of the artist as he discovers a deepening beauty in the world about him;--- these are great and real resources, but they are, in a sense, the resources of a limited number of men and women. The technical training essential to the naturalist, the scientist, and the artist is beyond the reach of a multitude to whom Nature is accessible, but the weight of whose work must be put elsewhere. One may have something of each of these great knowledges, and add to it year by year until it becomes measurably adequate; but one can never master any one of them unless he gives his life to it.

There is another kind of knowledge of Nature, however, which is not only possible to most men and women, but which is, in its relation to the complete unfolding of the man by means of culture, more vital and important than any of these special knowledges. For the naturalist, the scientist, and the technical artist are men before they gain or use powerfully any kind of skill; and the enrichment and development of the personality is the matter of supreme moment with each individual. Every kind of knowledge feeds the mind, and the rivulets which contribute to the volume of the stream have their great and positive value; but the source of the stream is the spring that rises among the hills, out of the very heart of Nature. There is a fundamental personal relation between men and Nature which is a thing apart from special and technical relations; and it is through this relation that man appropriates the material and the impulse which Nature offers for his culture. Art in all its forms is powerless to give this peculiar knowledge and distinctive contribution of Nature to individual culture. No knowledge of phenomena, force, law, or beauty--- the various aspects through which Nature reveals herself---comes amiss; but there is a knowledge which is apart from these, and which a man may acquire who is neither naturalist, scientist, nor artist; a knowledge at once more intangible and elusive, and at the same time more vital, comprehensive, and fruitful in the personal development.

In association with a man of great gifts and acquirements the the richest gains we make are not specific additions to our information, but breadth of view, depth of insight, clearness of vision, re-enforcement of all that is most aspiring in us. It is the vital, not the intellectual contact that exerts the most enduring influence; it is the general force of the man, not his specific skill, that leaves the deepest impress on us. In like manner, in our intercourse with Nature, there is something which flows from the totality of her being which counts for more in our culture than any revelation through phenomena, force, law, or beauty; something which enters into us rather than adds to our informa-

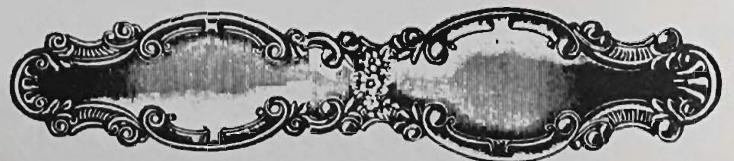
tion, and which becomes part of us. Thoreau had a knowledge of Nature in her obvious appearances and activities to which his friend and neighbor could lay no claim; but it detracts not a whit from Thoreau's achievements to say that Emerson learned more from Nature than he, and stood in more intimate relationship with her. For while the naturalist studied the world about him with senses of marvellous acuteness, the poet and thinker so allied himself with that world that it fed the very springs of his being, and gave him constant suggestion with regard to the sanest and most fruitful methods of living his life and attaining the truest self-culture.

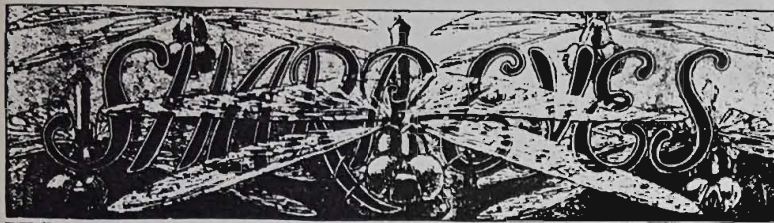
There is nothing esoteric about this fundamental intimacy with Nature; on the contrary, the very simplicity of the relation makes it difficult of explanation. It is an elementary thing, and cannot, therefore, be resolved into simpler elements. It is as simple as the intercourse of a child with its mother; and, like that relationship, it is mysterious, sacred, inaccessible to all save those who approach it in the right spirit. Like every other deep relationship, it depends somewhat on aptitude, but much more on securing the right conditions and waiting patiently on growth. It is easy to give the directions for acquiring a specific skill because a series of definite acts is involved; it is extremely difficult to suggest the method of developing a friendship into an intimacy because the stages of its growth are invisible and the means are spiritual. There are, however, habits and qualities which are characteristic of those who succeed in establishing this relationship with Nature.

They are, in the first place, very constantly in the presence and company of Nature. They not only seize, they make opportunities for getting into the woods, for loitering in the fields, for exploring the streams, for walking across the country. They seek the most secluded places; they devote hours and days to quiet meditation or observation as far as possible from the noise of men. Whenever they are out of doors they are aware of Nature; they make it a rule, at first, to take note of the sky and the landscape, of the changes of the seasons in their most elusive registry on leaf and grass, and presently they see all these things without any consciousness of meaning to see them. They constantly emphasize the world about them by constantly seeing it and meditating upon it; and so it comes to pass with them that the beautiful order of seasons, stars, flowers, and verdure which surrounds us, and which most of us barely notice, becomes a constant companionship in their most secret thoughts and in their daily occupations.

These persons form the habit, in the second place, of leaving their cares, work, interests, and self-consciousness behind them when they go out under the clear sky, along the country road, or into the deep woods. They go with an open mind; they are alert to observe, but they are above all things else ready to receive whatever truth, power, or spirit Nature has to impart. They are in the mood to put themselves in the deepest harmony with the world about them; to enter into its vast movement, and to partake of its measureless life. In such a mood much comes to a man from which he is otherwise cut off. For deeper influences are borne in upon us and become incorporate in us when when we keep silent than when we speak and act; impulses, emotions, and passions arise within us when we are with our fellows, but the truths that carry conviction and work substantial changes in us become clear to us in solitude. There is no unreality about all this, although in the formal statement it seems elusive and shadowy. The man who goes into the woods, and by self-forgetfulness becomes a part of the woods, is aware not only of a freshening of his nature and a deepening of his thought, but also of a revelation of knowledge through closer fellowship with the order and beauty which enfold him. There enters into his mind, in such moods, something more enduring than the scene about him; something to which a poet will give expression in verses which are not only touched with a beauty beyond that of words, but in which that beauty becomes the symbol of truth. The man who lacks the gift of expression will not write the verse, but he will see the beauty and be enriched by the truth. We must turn to Wordsworth for the expression of the deeper experience which waits on the open mind in closest companionship with Nature: the coming into the mind unawares not only of beauty but of truth, the discernment of the invisible order behind the visible, of the spiritual beyond the material:

".....that blessed mood,
In which the burthen of the mystery,
In which the heavy and the weary weight
Of all this unintelligible world
Is lightened: that serene and blessed mood,
In which the affections gently lead us on,---
Until, the breath of this corporeal frame
And even the motion of our human blood
Almost suspended, we are laid asleep
In body, and become a living soul:
While with an eye made quiet by the power
Of harmony, and the deep power of joy,
We see into the life of things."





...can help the hiker and taker of afternoon walks find delicious wild plants that humans and animals have eaten for many centuries. City-dwellers need not rely exclusively on hermetically-sealed, heat-treated, dyed, adulterated extruded food.



WILD GRAPE (*Vitis* species).

These ancestors of cultivated grapes bear small, sweet-tart fruits late in summer. Rich in pectin, they make fine jams and wines, but are luscious straight from the vine. The young leaves may be used in Greek cuisine.



WILD ROSE (*Rosa* species).

The fragrant pink or white petals, fresh or dried, make a memorable tea. In autumn come the red, vitamin C-rich seed-bearing "hips" treasured by wildlife and hikers. These hips are used in Scandinavia to make a hot winter soup.



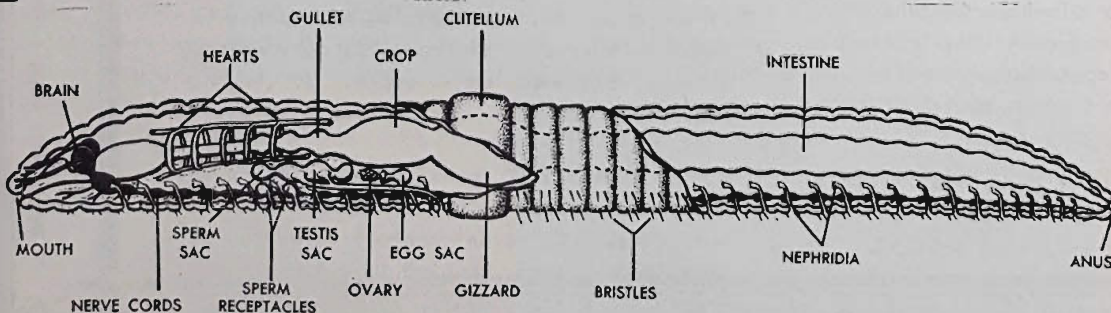
MILKWEED (*Asclepias* species).

These perennials first provide young shoots in late spring which are cooked and served like asparagus. Later, young leaves and stemmed tips taste great, and best and last, the young (2") seed pods may be steamed or simmered.

The species of earthworm called "red wriggler" is favored by both gardener and fisher, and is sold live at worm farms and bait shops.

Like all earthworms, it tunnels readily through soil and compost, eating organic matter and converting it into nutrient-rich, pH neutral manure ("castings") so treasured by organic gardeners...in one acre of healthy soil a thriving population of earthworms can produce **10 TONS** of fertile castings! Their tunnels are invaluable in aiding the flow of air and water through the soil mass down to plant roots. This "underground plowing" also serves to loosen compacted soils and to keep

them loose. At night, they surface and forage for bits of leaf, straw, manure and other organic materials, which they then take deep into their tunnels to digest. Belonging to a family of true worms called "annelids", earthworms are crucial to every healthy farm, garden, lawn or flower bed but are readily killed by insecticides, fungicides, chemical fertilizers or extreme heat, cold or drought. Burying a handful of dry dogfood every few feet in the garden will give a complete source of nutrition to



The Body of the Earthworm. Strange as it may seem, the earthworm has ten "hearts," or aortic arches. Every earthworm has two sets of sexual organs. Male organs include the testis and the

sperm sac. Female organs include the ovary and the egg sac. The broad band of the clitellum is used for reproduction. The nephridia, like human kidneys, give off waste matter.

your earthworms, who will digest it into fertilizer for your plants. Grow your potted plants in compost and add a few worms to each pot. Tell children to NEVER kill these valuable, gentle creatures.

Keep breathing. Sophie Tucker





ROCK POWDER FERTILIZER

by Erroll Flynn

I say, old chap, gardeners and farmers have, for centuries I dare say, been using, along with manures, crushed special stones to enhance their soils. You might bloody well ask what good rocks could render a petunia? Minerals, mate, minerals! Just select the correct stones and you'll have a bit of the minerals your crops virtually cry out for. Now don't go off on me thinking that gardening blokes have to spend their whole bloody lives in hard labor bashing up rocks; rock powders are often free for the taking from quarries and stone cutters, others are sold for a wee bit of change. So if you'll just read on with vigor, you'll learn how to get your own soil stoned.

LIMESTONES: These are used primarily to "sweeten" acid ("sour") soils and thus benefit most plants, earthworms, and beneficial soil micro-organisms. Calcium, which does the actual sweetening, is also a critical plant nutrient. Ordinary limestone is calcium carbonate, and is thus a natural source of this alkali metal. DOLOMITIC limestones are also very rich in MAGNESIUM, an alkali metal critical to chlorophyll formation. Powdered limestone is quite cheap, usually 5 American dollars for 50 pounds. Marble is a metamorphic (transformed by heat and pressure deep inside the earth) form of limestone, but is still rich in calcium. Gravestone cutters often discard marble dust. Apply powdered limestone lightly annually if your soil tends towards acid.

BASALT: This hard igneous (once molten deep in the earth's crust) rock comprises the bases of the continents, and is cut and polished for use in buildings. The resulting basalt powder is rich in phosphorus, potassium, calcium, iron and magnesium.

PHOSPHATE ROCK: This sedimentary (water-formed) rock is from 20% to 65% calcium phosphate, and may also contain trace elements like copper, boron, and iron. This rich source of the vital plant nutrient phosphorus (and calcium), like all rock powders, works best if turned under the soil. Avoid "superphosphate" or "triple-superphosphate" as these have been adulterated with industrial phosphoric acid, which can contribute to soil acidity and a subsequent decline in soil flora and fauna.

GRANITE DUST: From 3% to 5% potassium, a vital plant nutrient, this quarry waste product supplies many trace elements without affecting soil pH. This igneous rock, when eroded, forms the basis of many clay soils.

GREENSAND: Mined only near New Jersey, this pale green form of glauconite (a sedimentary rock) is classified as an "iron potassium silicate". But it is treasured by gardeners as a source of also phosphorus. Since it was formed beneath prehistoric oceans, it also contains most, if not all, of the trace elements found in seawater. Sprinkle it on your gardens and composts.

VOLCANIC ASH: Lava from deep within the earth is naturally pulverized by volcanic explosions into a granular source of many trace elements and potassium. Some of the world's best vineyards thrive on the slopes of volcanoes because of this nutrient-rich material. Volcanic ash is non water-soluble, and so releases its minerals slowly for years.

GYPNUM: This soft sedimentary stone is a hydrated calcium sulphate, and is used by some organic gardeners and farmers on alkali desert or beach soils to chemically displace sodium (from salt) in the soil. Some also feel that, in the long run, gypsum helps to lower the high pH of such soils while aiding their efforts to improve the texture and drainage of their soil. Spread over manure, it helps to reduce outgassing of ammonia (a valuable source of nitrogen) by converting it to stable ammonium sulphate. It thus reduces manure odor in barns and stables.

NOTE: Some other rocks, especially igneous rocks, not listed here, may contain plant nutrients. But "caveat emptor" is warranted here; High-prices, coupled to claims like "meets ALL plant needs", "triples growth rates", or "channelled to you from Atlantis" should raise your eyebrows, not your wallet.

The next time I live I wish I might be a single, white peony so that people would (as I have seen them so often do) involuntarily catch their breath at the sight of me. Ruth Stout



Margaret Head's View of the News

A forest is not just a bunch of trees, but a vast number of living things depending on each other while being mutually embraced by trees. An estimated 160 species of animals are completely reliant on the forests left uncut in the northwestern United States. Trouble is, those forests are shrinking rapidly; of the 31 million acres that Lewis and Clark walked through, only 2.2 million acres remain. Why? Clear-cutting. Ruthless, greed-motivated clear-cutting, which now, unbelievably, is being practiced by the lumber and pulp industries in the "protected" National Forests supposedly belonging to you and me. From a Cessna flying over Oregon and Washington one can see thousands of square miles of mountains and valleys completely stripped of trees, the sad sight extending to all horizons. This is not forestry but strip-mining, for the land is left bare to be further raped by erosion that carries away the fertile topsoil; natural re-growth comes to a standstill. Yet the lumber and pulp industries claim to be practicing "sustainable" logging, all the while appealing to Congress for yet more public land to plunder.

Clear-cutting of our forests is a gang rape, for while the cold-souled CEO's of these industries commit the actual violation of old growth forests, it is contemptible officials and employees of both the U.S. Forest "Service" and the Bureau of Land Management that hold the victims down. How? These "folks" use the tax dollars forcibly wrested from you and me in the first place to subsidize clear-cutting operations with roads, etc., so that 400-600 year old majestic trees can be had for as little as \$2 apiece! Some say "To hell with trees and spotted owls, what about JOBS?!" Nice try, but not only our forests but our jobs are being exported in the form of raw logs to be cut or processed by mill workers in Korea and Japan. Other workers there turn our trees into the cardboard boxes we buy their VCR's in! Another smokescreen is "But we're re-planting millions of acres", the message sprawled on two-page ads during Earth Week. SURE they are...uniform rows of hybrid trees, all of the same age and species, sprayed with pesticides and petrochemical fertilizers from aircraft, then kept free of the undergrowth and rotting logs that give shelter and food to wild creatures. These bogus "re-forestation" programs simply create autocratic tree plantations where biologically diverse old-growth forests had thrived for centuries.

That industry CEO's and government officials shamelessly defend their destruction of our forests indicates a remarkable poverty of spirit; how else could they sleep, or look in the eyes of their spouses, friends and children without crying out of shame and remorse for such a stark crime, not only against us all but the land itself and the millions of creatures they have killed directly or indirectly to boost quarterly profits and thus their own annual bonuses? Instead they deserve life-sentences of hard labor re-planting the many species of trees, shrubs and herbaceous plants they've stripped the mountains and valleys of, for they have robbed our country, planet and hearts of irreplaceable treasures.

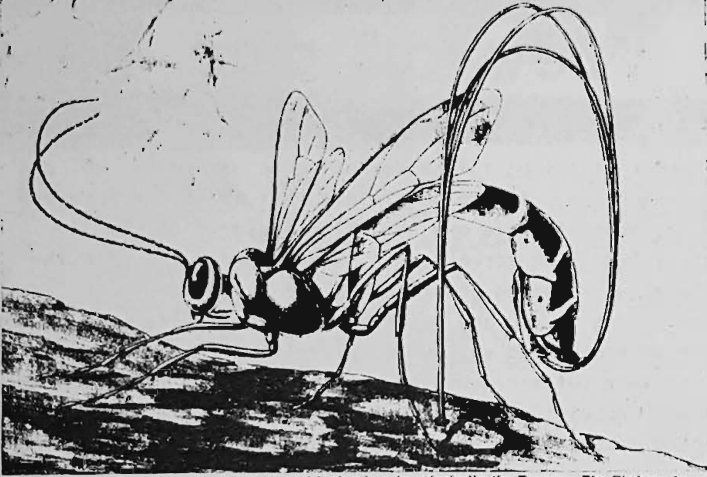
Much of China, the Middle East, central Europe, and Northern Africa were once great forests, but clear-cutting centuries ago have rendered most of these areas into vast deserts. Only old paintings bear records of those magnificent old forests that dated back to the Ice Ages and mammoths, giant deer and many other mammals also wiped out by early humans. Let's not let that happen to this continent, too! We can write our representatives to demand an end to the export of raw logs and chipped trees. Homeowners and landscapers can boycott redwood, cypress and Douglas Fir mulches, for these are the final sad remains of noble forests. Use hay mulches instead. Boycott woods like cypress, teak, mahogany, and redwood until clear-cutting stops. Hey, we got the tuna industries to nearly stop the annual slaughter of hundreds of thousands of dolphins by boycotting their canned flesh, and their switch to more humane netting practices hasn't hurt either profits nor cost their workers' jobs. We now are getting (albeit slowly) the oil companies to switch to double-hull tankers. So dammit, we can put a stop to the pointless, needless destruction of our remaining forests. Or else soon they'll be gone.....forever.

Man must cease attributing his problems to his environment, and learn again to exercise his will—
his personal responsibility in the realm of faith and morals. Albert Schweitzer 1875-1965

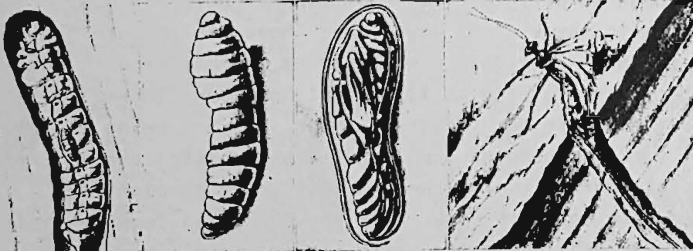
THE FRIENDLY ICHNEUMON FLY



One of the strangest of the ichneumon flies is the *Thalassa*. On the right is a male and on the left a female. Both insects are flying, and it will be noticed that the female has an enormously long ovipositor for depositing her eggs, which trails out behind her as she travels through the air.

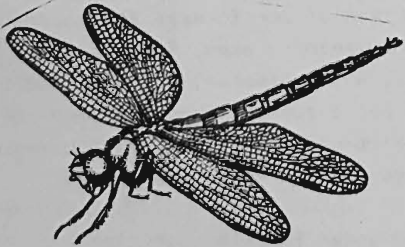


This insect is a parasite on the larva of wood-boring insects, principally the *Tremex*. The *Thalassa* bores into wood and lays an egg near the place where the *Tremex* has already laid her egg. To see the female *Thalassa* laying her egg is an interesting sight to an entomologist. The *Thalassa* curves her ovipositor, which is divided, over her back and brings it forward to bore the hole and lay the egg.

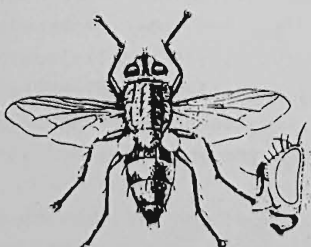


When the Ichneumon larva hatches out it attaches itself to the *Tremex* larva and feeds on it. This shows a magnified view of the *Thalassa* larva when ready to change into a pupa. In the pupa the ovipositor is curled round the body ready to be unfolded when the right moment arrives. At last the insect emerges, makes its way out of the timber, opens its wings and flies off in the way shown in the first picture, to repeat the strange life-story.

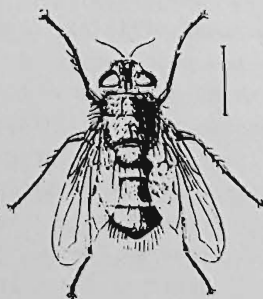
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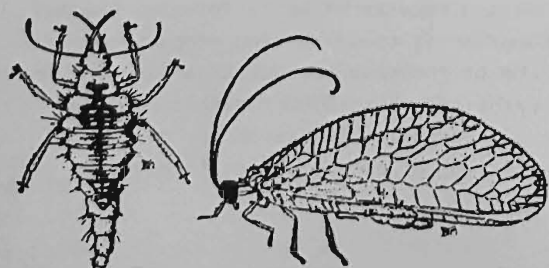
Dragonflies relish flies and mosquitoes.



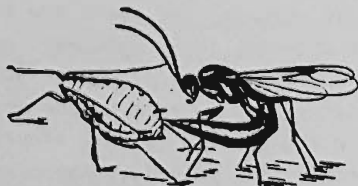
These *Exorista* flies lay their eggs on caterpillars.



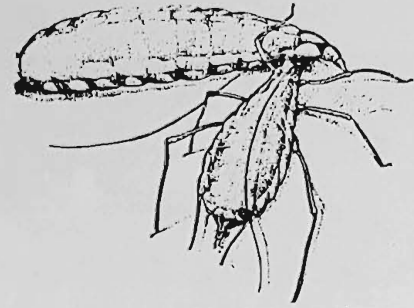
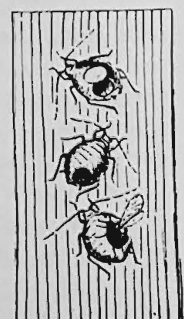
Wasps eat a great many plant bugs.



Lacewing larva, left, and adults both eat aphids, mites, mealy bugs, and other small-bodied insects.



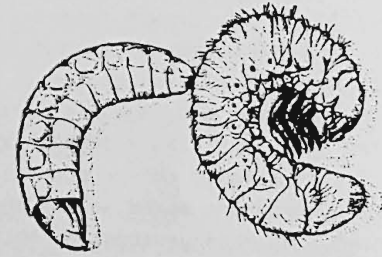
Above, the parasitic wasp *Lysiphlebus* injects eggs into an aphid. At right new wasps emerge from dead aphids.



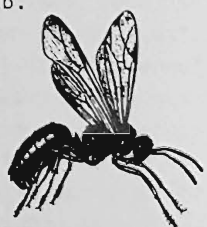
A syrphus-fly larvae, top, eating a pea aphid.



Once common, the Praying Mantis eats grasshoppers, caterpillars and other plant-eating insects.



Larva of the Robber-Fly, left, eating a white grub.



Think and you won't sink. B. C. Forbes.

Predatory insects eat plant-eating insects and so help keep them from ravaging gardens, farms and natural plant communities. Using soap sprays instead of pesticides can kill the pest and spare the predators.

submit your best poetry to: Joelle Renee' Ashley, Literary
 Editor, The Garden Doctor, 17151 Rainbow Terrace, Odessa, FL
 33556. Published poems earn the writer \$5 each.

Three cold streams come down
 from the mountains. They meet
 at the bottom and the river begins,
 running west after the sun, running
 straight. When the road was built
 the old bridges were abandoned and
 began to fall and ride the current
 like firewood on a gentle horse.

My father sold firewood
 across the river when he was ten.
 He walked by his horse, running
 his hands up and down the reins
 and thinking of his mother,
 how she stayed home, running
 her hands up and down her rosary
 as if taking her faith by the reins,
 selling her soul to God like firewood.

Dionisio D. Martinez

(Originally published in the
Iowa Review)

GARDEN PARTY

There's a blue feather on the veranda
 Where the grand lost Heron has been;
 A bicycle against the house,
 A hat in your wicker chair.
 You are dancing with your neighbor
 And will take your gloves off promptly
 If he penetrates your green eyes
 To sweet strains of Charlie Mingus
 In the rain.

Rhonda J. Nelson



A Dream of Then And Now

Astride a manta ray ascending
 from the depths of the ocean,
 a commanding form appears.
 Walking slowly through crustaceans
 the figure, parallel to the pier
 steps lightly first on land;
 consumed sacrificially
 breaking consciousness of sun and sand.

Eric Shaffer



SHARING SECRETS

Milk makes a cheap, natural plant polish if poured into a spray bottle and misted heavily all over the plant, till dripping. (Do this outdoors.) When the plant drips dry, the protein and fat content of the milk will have imparted a soft luster. Always clean a plant before polishing; small-leaved plants like ficus can be hosed off. Use a soft, soapy sponge on large-leaf plants like selloum philodendron or anthuriums.

Gardeners and/or homeowners living in tropical or subtropical regions like Florida, Hawaii, San Diego or the Bahamas, who desire a fast-growing visual screen to hide an ugly fence, etc., should consider planting sugar cane. Just buy sections of fresh, live cane at roadside produce stands and bury them horizontally at a depth of 4 inches; if your soil is acid, apply dolomite generously. Keep damp. When the shoots appear at the terminal joints running the length of the cane, begin applying mulch of some sort (hay, grass clippings, banana leaves, etc.), as sugar cane is a very rapidly growing member of the grass family, and thus needs very fertile soil. Nitrogen sources like poultry manure, fish waste, soybean meal or fresh green grass clippings are great. Soon you'll have a graceful 7'-9' tall "hedge". In midwinter it'll be ripe; use a saw to cut the canes to just above ground level and peel them to get at the sweet juicy pith. Mulch again, feed again, and in a few months this perennial will be fuller than before.

Sandspurs HATE lime of any sort, whereas most lawn grasses hate the acid soil sandspurs love. A liberal application of dolomite on a weedy St. Augustine or Bermuda lawn will benefit it while dooming the sandspurs to near extinction. Re-lime lightly annual to keep the soil sweet.

Lilac bushes prosper if their spent blossoms are removed immediately after the spring bloom phase. This step spares the bush the draining process of forming then ripening thousands of unwanted seeds. Feed at the same time with fish emulsion, cottonseed meal or manure.

You can replant the lower root-bearing 3 inches of scallions and leeks from either your garden or the grocery store... they will grow again!

After thinning a row of cabbage family (broccoli, collards, cabbage, Brussel's Sprouts, etc.) seedlings, re-plant them elsewhere in the garden but 1 or 2 inches deeper. Then water well. The deeper depth will help reduce transplant shock AND will eliminate the waste of perfectly good seedlings.

Sweet potatoes, if planted every 3 feet in a tropical or subtropical landscape, will provide a lush, beautiful (white morning-glory flowers), EDIBLE (roots and young leaves) perennial ground cover that thickens each year. They do best in a rich, sunny location with lightly-limed fertile soil, but will tolerate light shade. You can harvest the sweet roots each fall then replant a few, or just leave the groundcover undisturbed. Mowing it once a year will thicken the vines, and the bits of chopped leaves will help create a thin, fertile mulch atop the soil.

Growers of potted orchids, ferns, bromeliads, staghorn ferns, and vines should try fish emulsion instead of those peculiar blue water-soluble artificial salt-based fertilizers. Why? Fish emulsion, if made from ocean-going fish, contains EVERY known plant nutrient and is low in chlorine. It's also cheaper; one gallon of the concentrate can be had for \$10 or less. Just mix 3 tablespoons with 1 gallon of water and soak the plants every 2 or 3 months. The smell fades quickly, and your plants will go nuts! It's great for vegetable seedlings, too.

Meat-eaters: Don't throw away those chicken bones! Insert them deeply into the soil of your potted plants to provide calcium, phosphorus, iron and protein (a nitrogen source).

Thinking is the hardest work there is, which is the probable reason why so few engage in it. Henry Ford

SEX & DRUGS

by
Molly B. D'nume



There, NOW that I have your attention, you hedonists you, let's have a cozy but succinct chat about the so-called "minor" or "trace" elements. They're kinda the equivalents of the vitamins and minerals you and I need; the so-called "macro-nutrients" nitrogen, phosphorus, and potassium, are sorta like the proteins, fats and carbohydrates that comprise the bulk of our foods. Animals and plants share a need for many of the same trace elements, although it's felt by science dudes that animals also need others, like silver, cobalt, iodine, and selenium. That's why many health-conscious people like to include kelp in their diet, for it contains ALL the elements dissolved in seawater; for the same reason many organic gardeners like to use kelp meal...sort of insurance that their plants get ALL the trace elements while research freaks continue to confirm plants' need for yet another one. For instance, these guys now believe that at least SOME plants need nickel. But many soils in many locations are quite low in the known minor elements; luckily, plants need just a "trace" (hence their name) of them to grow, so bringing levels up to par is easy. Sometimes just liming terribly acid soil will liberate minor elements that had been chemically "grabbed" by the acid. Same goes for extremely alkaline soil, like in the desert southwest. But if the soil is void of them, it's up to you to add rock powders, fish emulsion, kelp meal, "accumulator plants" (these take up into their tissues specific minerals), manures, or "agricultural frit", which is made by melting mineral-bearing ores with glass, which is then finely crushed. Being non water soluble, this frit slowly releases the trace elements it contains. Some people even apply seawater to their soil once in a while since it contains all the natural elements, although all that salt raises my brows (not to mention sodium and chlorine levels in their soil). I've put together for your use a list of the confirmed "micro-nutrients", some of their deficiency symptoms, and their sources:

CALCIUM: So much calcium is needed by plants, and by the soil to combat acidity, that many consider it a macro-nutrient. Like the other secondary nutrients, it has many functions within plants. Found in bone meal, phosphate rock, limestone, dolomite, eggshells, crushed sea-shells, and gypsum.

BORON: Many soils are deficient in this non-metallic element, which when concentrated into boric acid, is used for roach & flea control. Deficiency symptoms include stunted growth and distorted stems. Sources include granite dust, clover, melon vines, agricultural frit or natural borax mineral, which should be applied VERY sparingly, as boron is toxic if over-applied. Plants need an extremely tiny amount.

ZINC: This metal is crucial to fruiting & growth. Found in corn stalks, vetches, manures, agricultural frit, some granite dusts.

COPPER: This metal is found in dandelion, Kentucky bluegrass, agricultural frit, crushed copper ore, and kelp. A lack causes stunted growth and poor color, especially in citrus.

CHLORINE: Rarely deficient, toxic if over-abundant, hence another good reason to not use chemical fertilizers, which often are loaded with it. Chlorine is found in all plants.

IRON: Abundant in reddish clay soils, iron is crucial in chlorophyll formation. A lack causes "chlorosis", a sickly-looking yellowish leaf with green veins. Contained in all plants used to mulch with, blood meal, crushed iron ore. Some people bury nails beneath favorite perennials.

SULFUR: Rarely deficient (due in part to acid rain), this non-metallic element is as crucial to plant health as human health. Leaves of cabbage family plants (mustards, broccoli, etc.) are a good source.

MAGNESIUM: Critical to chlorophyll formation (in conjunction with iron), this metal is found in all green plants and dolomite. Some organic gardeners feel comfortable using a light sprinkling of pharmaceutical-grade Epsom salts (magnesium sulfate).

MANGANESE: A deficiency of this metal causes stunted growth, poor color. An over-abundance is toxic. Found in alfalfa, bromegrass, frit.

MOLYBDENUM: This metal plays important roles in plant cell metabolism. A deficiency shows up as dying leaf edges and poor appearance. Alfalfa, frit, vetch, kelp and granite dust are sources.

(continued on
page 14)



We are here to add what we can TO, not to get what we can FROM, Life. William Osler 1849-1919



GOOD NEWS

A "predatory" fungus, *Gliocladium virens*, is being cultured, dried, then spread into fields to control pest organisms. **Science Digest**

The Mexican weed *Bidens pilosa*, which sprouts in corn fields in much of Mexico, controls fungal and nematode enemies of corn IF it is cut back 15 days after the corn sprouts, then every 30 days until harvest. Left unchecked, it steals nutrients from the corn, but the monthly pruning suppresses it while allowing the roots to secrete compounds deadly to soil-borne corn pests. For a very long time traditional Mexican corn farmers have observed this relationship between the two plants. A U.S. weed that belongs to the mustard family, *Brassica kaber*, can be employed in the same manner. **Francisco J. Rosado-May, University of California at Santa Cruz.**

Costa Rica has set aside 25% of its land area as protected national parks. As a result, representatives of every type of ecosystem in the country are protected. **PBS.**

Sugar cane waste, called "bargasse", is now providing 10% of Brazil's electrical needs by being burned at power plants. This follows the use of the bargasse to manufacture ethyl alcohol, which powers the majority of Brazil's cars! While the burning of biomass fuels releases carbon dioxide, it is of current origin, not the prehistoric carbon contained in coal and oil. **PBS.**

The Volvo LCP is a fully producible 4 passenger car that, when cruising, gets 100 miles per gallon. It can run on diesel, sunflower seed oil, corn oil, or olive oil. It achieves this mileage due to a combination of lightweight, an aerodynamic design, and a 3 cylinder engine. **PBS.**

U.S. industry's \$8.5 billion spent controlling water, air and solid-waste pollution during 1985 yielded corporate sales totalling \$19 billion, with profits at \$2.6 billion, while generating 167,000 jobs. The greatest sales and profits stemmed from controlling air pollution, while the greatest number of jobs were created by efforts to deal with solid waste. This analysis, conducted by the Treasury Department's Jonathan D. Jones and Robert M. Wendling and Roger H. Bezdek of the Washington, D.C. consulting firm Management Information Services, does "not lend support to the widely held belief that environmental programs generally hurt the economy by crippling industries and increasing unemployment." **Science News.**



Life is to enjoy, not just endure. By hanging a hammock, or putting a favorite lawn chair beneath a tree, we can create a place of respite and relaxation that daily invites us to just stop and be. Even just 15 minutes each afternoon or morning spent feeling the center of ourselves, or noting the sounds a tree makes as it intercepts a breeze allows us to cultivate a calm center to steady us in our busy, challenging lives.





comes to our Northern Hemisphere as winter settles in below the equator. This is due to the tilt of our home planet on its axis as we journey around the sun. Curiously, the Earth is actually FARTHER away from the sun during our summers here north of the equator! The heat differential between the northern and southern hemispheres is the "pump" that drives global air and ocean currents which are in turn modified by the earth's rotation, the continents and ocean floor topography. For the gardener and farmer, this process brings the summer growing season and life-giving rains. The season of abundance is an annual blessing brought about by a vast planetary dance.

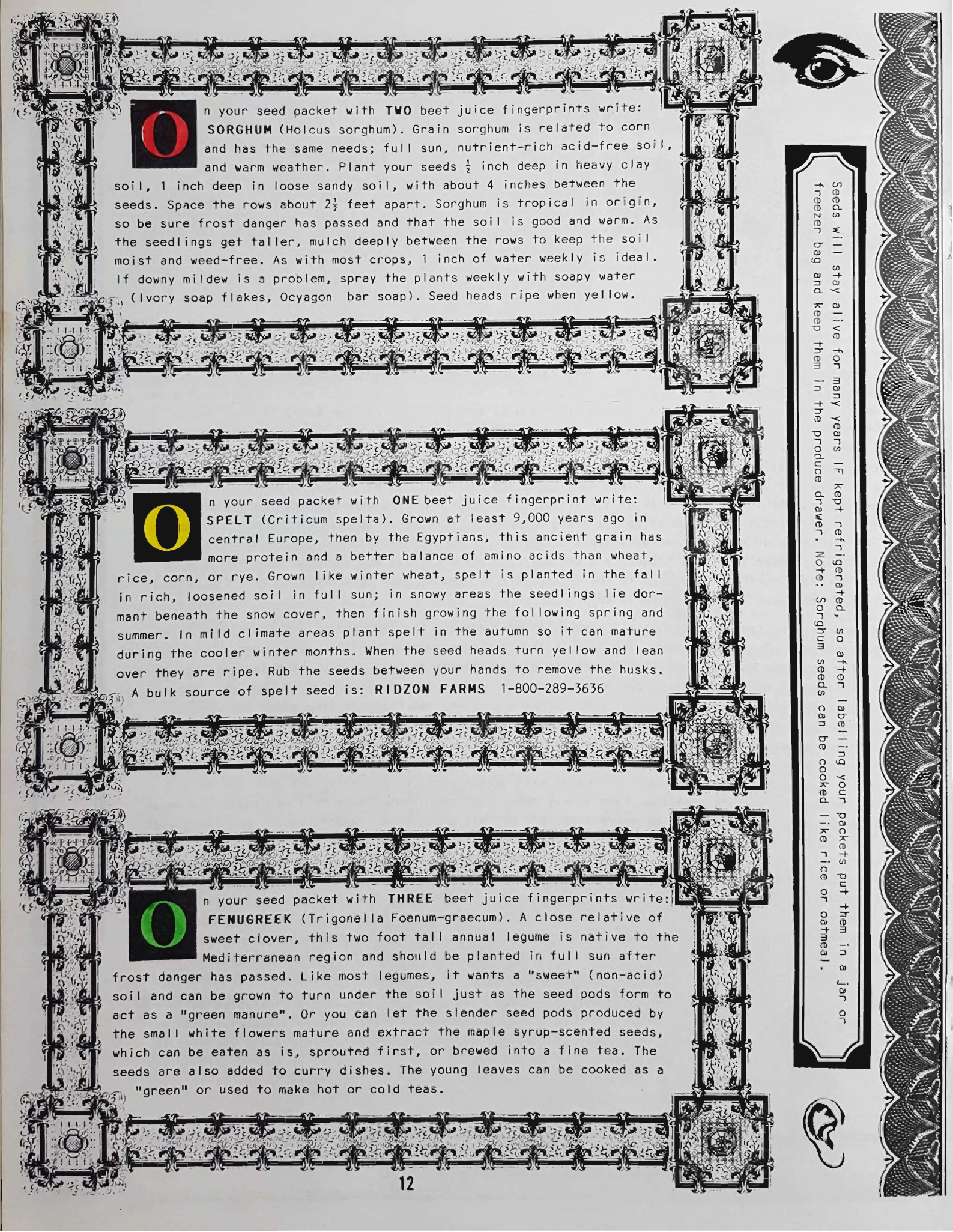
To reward our soil for giving us this bounty, we must feed it with organic materials that in turn feed soil organisms that create fertility by digesting these materials. Rather than thinking "It's time to feed the roses, veggie garden, lawn, etc.", think in terms of feeding the ENTIRE soil mass around your home or on your farm. A Spring, Summer, and Fall feeding is in order in snowy climate regions, but you can add a Winter feeding if you live in a mild place like Hawaii, Southern California, St. Croix, or Florida. Non-vegetarians can liberally sprinkle on their soil things like fish emulsion, fish meal, meat-and-bone meal, blood meal, bone meal (sounds like a Vincent Price movie, doesn't it?), feather meal, leather dust, fish scraps (from docks, seafood restaurants), or dry dog food pellets turned under the soil. Vegetarians have things like soybean meal, alfalfa meal, feed-grade cottonseed meal, flax seed meal, perhaps manures, kelp meal, compost, organic grass clippings, hay mulches, cannery waste (bean pods, corn cobs, etc.), or some other plant-derived waste materials. Since many soils are deficient in the "trace" elements, people of both persuasions should consider a light sprinkling of agricultural frit once a year. To feed your lawn cheaply, rely primarily on fallen clippings being digested by microorganisms and earthworms into compost; leave the bag off your mower, especially since clippings buried in landfills release the Greenhouse gas methane. If your mower is a back blower, you can cut up a bleach bottle and use some wire to rig a deflector plate to direct the clippings to the ground. And by keeping your beds and lawn well-fed, you will in turn keep your trees well-nourished.

Treat yourself to lots of bouquets all summer, as most annuals and many perennials bloom more often if spared the task of ripening seeds. The same is true for many vegetables like beans, okra, squash and peppers; the more you harvest (and thus thwart the plants efforts to make seeds, which is the whole reason they bloomed in the first place) the more new fruits will be formed. Sounds cruel, but this process extends the life of the plant. If caterpillars become a problem, use Dipel or Thuricide (see Ch-Ch-Ch-Changes, page 23); for aphids, spider mites, thrips, downy mildew, black spot on roses, scale, mealy bugs, sooty mold on gardenias or citrus, or freshly-hatched pest insects use a soapy water spray using a few tablespoons of soap flakes (Ivory Soap, Kirk's Castile or Octagon bar soap rubbed against a cheese grater) dissolved in 1 gallon of hot water. For a problem with grasshoppers or crickets look hard for Nosema Locustae spores, a predatory protozoa that slowly makes the area inhospitable to these pests. Japanese beetles can be controlled with "milky spore disease". For all around pest insect control you can't beat having many birds visit your property daily; attract them with sources of water here and there, plus you can scatter bread scraps (discarded in vast amounts by bakeries and grocery stores) around the yard. Most of the beneficial (predatory) insects have a foul taste to birds (just as most predatory mammals are not eaten by meat-eating humans) so their presence in your gardens, lawn and farm will offer you a hassle-free, effective, SELECTIVE, esthetic means of controlling pest insects. Seek to make your yard a balanced ecosystem where predators keep plant-eaters in check. This harsh system has maintained Planet Earth for billions of years and has yet to be improved upon by human efforts to use artificial poisons, which ultimately worsen the problem while poisoning wildlife and water supplies.

People who grow much of their own food organically are rewarded with safe, fresh vegetables while re-learning the subtle intimacies of nature's annual cycles obscured by living totally enmeshed within our "advanced" closed-off civilization. If supper is a process that begins by going into one's own yard to sever eggplants, corn and squash from plants that were seeds in your palm just a few months before, one cannot help eating that meal without feeling a pleasure absent when eating processed foods. By bringing joy into the daily life process, into each essential act, we can savor life NOW, not in some eternally delayed future moment. In the summer garden we can find subjective treasures as important as food itself.

Be not afraid of life. Believe that life IS worth living, and your belief will help create the fact. William James 1842-1910





On your seed packet with **TWO** beet juice fingerprints write: **SORGHUM** (*Holcus sorghum*). Grain sorghum is related to corn and has the same needs; full sun, nutrient-rich acid-free soil, and warm weather. Plant your seeds $\frac{1}{2}$ inch deep in heavy clay soil, 1 inch deep in loose sandy soil, with about 4 inches between the seeds. Space the rows about $2\frac{1}{2}$ feet apart. Sorghum is tropical in origin, so be sure frost danger has passed and that the soil is good and warm. As the seedlings get taller, mulch deeply between the rows to keep the soil moist and weed-free. As with most crops, 1 inch of water weekly is ideal. If downy mildew is a problem, spray the plants weekly with soapy water (Ivory soap flakes, Ocyagon bar soap). Seed heads ripe when yellow.

On your seed packet with **ONE** beet juice fingerprint write: **SPELT** (*Criticum spelta*). Grown at least 9,000 years ago in central Europe, then by the Egyptians, this ancient grain has more protein and a better balance of amino acids than wheat, rice, corn, or rye. Grown like winter wheat, spelt is planted in the fall in rich, loosened soil in full sun; in snowy areas the seedlings lie dormant beneath the snow cover, then finish growing the following spring and summer. In mild climate areas plant spelt in the autumn so it can mature during the cooler winter months. When the seed heads turn yellow and lean over they are ripe. Rub the seeds between your hands to remove the husks. A bulk source of spelt seed is: **RIDZON FARMS 1-800-289-3636**

On your seed packet with **THREE** beet juice fingerprints write: **FENUGREEK** (*Trigonella Foenum-graecum*). A close relative of sweet clover, this two foot tall annual legume is native to the Mediterranean region and should be planted in full sun after frost danger has passed. Like most legumes, it wants a "sweet" (non-acid) soil and can be grown to turn under the soil just as the seed pods form to act as a "green manure". Or you can let the slender seed pods produced by the small white flowers mature and extract the maple syrup-scented seeds, which can be eaten as is, sprouted first, or brewed into a fine tea. The seeds are also added to curry dishes. The young leaves can be cooked as a "green" or used to make hot or cold teas.

Seeds will stay alive for many years IF kept refrigerated, so after labelling your packets put them in a jar or freezer bag and keep them in the produce drawer. Note: Sorghum seeds can be cooked like rice or oatmeal.

A

frican violets seem to be plants a person either hates or loves. My grandmother loves violets. She's grown multitudes in the eastern exposure of her bedroom and breakfast nook. They

thrive for her. My mother--her daughter--hates them. This probably stems from the fact that they curl up their leaves and die for her. It's a mutual case of hatred and she takes it personally. I love violets. They brighten my winters and impress my friends. But then, I've learned their needs and they don't intimidate me. More than any other popular houseplant, African violets have an undeserved reputation of being temperamental, difficult to keep in bloom and requiring a great deal of work. On the contrary, I have found them to thrive on benign neglect as long as their basic requirements are met.

The two main factors in violet culture are light and pot size. Light is the single most important factor in plant bloom. I grow some of my plants under fluorescent lights. One day, one of the tubes burned out and because I could not find the proper type and size tube for replacement, the plants remained in the dark a week. Within that amount of time they dropped every flower and were showing severe distress. Forget to water violet (within reason); never fertilize them, and they may not thrive, but they will survive. Withhold light and they die. Most plants you see at shows or for sale in plant shops are grown under lights. The quality, quantity and direction of light rays can be controlled to produce those abundantly flowering perfect specimens. The set up is relatively easy-- a shop light will do, or something fancier for display if you're so inclined. You will need one warm white and one cool white (or one cool white and one gro-lux) positioned about one foot above the plants and left on ten to twelve hours per day-- African violets do need at least eight hours of darkness daily to process their food. This arrangement is even easier if the fixture is hooked up to a timer. However, if this type of thing isn't feasible for you or if growing under artificial lights seems offensive, these guys grow beautifully in sunny windows or bright areas. In my experience, east or west exposure is the best. The plants receive the light they need and their leaves aren't roasted by direct sun in the hottest part of the day. Personally, I favor an eastern exposure for my violets. Morning light seems to have a different quality that the plants prefer. A southern exposure will work too as long as the sunlight is not too much for the foliage. Grayish, bleached leaves are usually indicative of too intense light levels. If this happens, place a sheer curtain between the violets and the glass, or move the pot further from the window. Although they will grow there as a foliage plant, north windows usually do not supply enough light to keep violets blooming, unless you live next door to a reflective surface, like a neighbor's white house. Symptoms of too little light are elongated leaf stems and the loss of the flat "platter" shape of the plant. Leaves reach up trying to find sufficient light.

Next to proper light levels, pot size is what determines a plant's health and blooming ability. Unfortunately, the first thing most people do upon receiving an African violet is repot it into much too large a pot and the plant immediately curls up its roots and begins the dying process. Violets should be grown in containers 1/3 the plant's diameter. I know some of you cannot tolerate pot bound plants, but believe me, violets want it that way. Think of it as making their roots feel secure. They need to fit snugly into their pots in order to bloom.

AFRICAN VIOLETS

by

Dianna Marlowe



There are other considerations in violet culture, of course. Water for instance. Luke-warm water is best, but as Thalassa Cruso says, "Plants need water, not therapy". Don't worry about it too much. There are three methods to deliver water to your plants. Top watering is most familiar, but you should be careful not to drip water onto the foliage. The water is trapped in the tiny hairs on the leaves and evaporates into ugly little lime circles. Bottom watering doesn't get spots on the leaves, but over time a crust of salts will accumulate on the soil surface and rim of the pot. This can burn the leaves, so a thorough top watering every now and then is a good idea. Wick watering--where a woven wick is run from the pot to a reservoir-- is the most convenient. It does not spot the leaves and the plant takes only what it needs without having to stand in excess water. However, it also needs to be paired with an occasional top watering for the same reasons as bottom watering.

Sooner or later most violets develop second crowns. A crown is the point on the plant where new growth starts. Single-crowned violets bloom much more profusely than multiple-crowned ones and you will need to decide whether or not you want to separate them. The best way to go about separation is to remove the plant from its pot and separate the crowns by gently pulling them apart or, using a sharp knife if you must, being careful to cut so that both plants will have a decent amount of roots attached. Then replant into the proper size pot and water well. Protect the new plants from too intense light for a couple of days and you should be all set.

I fertilize my violets about once a quarter with a very weak solution of fish emulsion. Avoid high-nitrogen fertilizers-- they produce beautiful foliage, but few flowers. I have not found fertilization to be as important as other factors in violet care.

African violets require an annual repotting when first purchased. As violets grow,(cont.)

they lose their lower leaves. This is only natural, but pretty soon you have a plant with a long stalk and a tuft of leaves at the top, looking much like a palm tree. To avoid this, remove the plant from its pot when it is completely dry and work enough soil out from the bottom of the root ball to fit it deeper into the same pot. Now position the plant back into its container so that the lower leaves just touch the rim of the pot. Add soil and tamp it down to make sure that the violet is securely in place. Water well and, again, protect it from intense light for a few days. Be careful. Repotting violets in this way can stress them enough to kill them. A plant with a three inch stem is not a good candidate for quick recovery, because a great deal of soil has been removed from the root ball in order to fit it properly into its pot. So if you are going to do this, do it regularly-- before a stem of any length has a chance to form. If this makes you nervous or if your plant already needs to be potted into a mailing tube to accommodate its stalk, don't worry. Violets do not require this ritual to thrive. I have a ten year old plant that I've never attempted to repot. As long as it is healthy and continues to bloom, if it wants to coil around on its six inch stem like a snake, it's alright with me. It is certainly not a show quality plant, but it is beautiful and anything I'd do to it now would only harm it. So it's up to your own personal taste whether you want to repot.

I hope this has cleared up some of the mystery about African violets. I believe they are suffering from somebody else's delusions of godhood. However, they do have certain specific needs; you can't force them to be something they're not. They will not perform well in adverse conditions and they do not "get used" to improper treatment. By following these guidelines and being aware of their reactions, you should be able to determine their requirements, like any other houseplant. So, enjoy them to the extent that you have energy. You can grow exhibition specimens for sale or long-legged snakes like the one I mentioned.

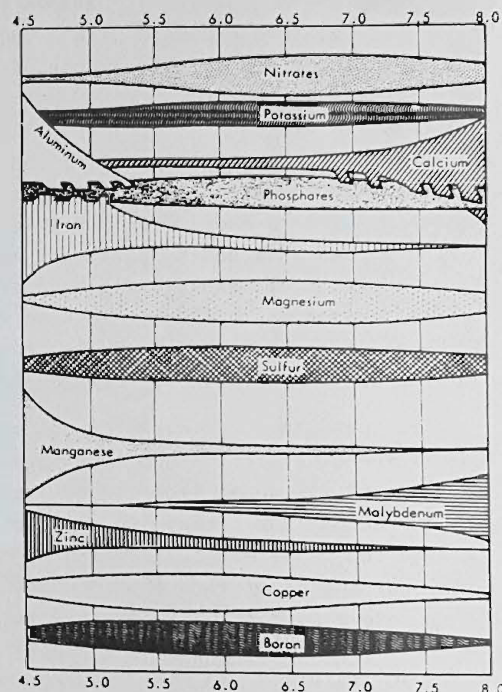


Dianna Marlowe is a many-faceted woman long committed to organic gardening. She has served as President of Front Range Organic Gardeners, based in Denver, Colorado.

The diagram to the right demonstrates that a pH of 6.5 (barely acidic) results in the greatest availability of the various macro- and micro-nutrients; excess alkalinity (lime) and excess acidity both tend to chemically "lock up" these crucial plant nutrients. The known list of these is shown below; notice that 7 of these are metals: Ca, Fe, Mg, Mn, Cu, Zn, and Mo.

Notice that a pH of 4.5 (quite acidic) results in the massive availability of aluminum (toxic both to plants and animals) and of manganese, which in TINY amounts only is a crucial plant nutrient.

continued from page 9



Element	Symbol	Ion or molecule
Carbon	C	CO ₂ (mostly through leaves)
Hydrogen	H	H ⁺ , HOH (hydrogen from water)
Oxygen	O	O ²⁻ , OH ⁻ , CO ₃ ²⁻ , SO ₄ ²⁻ , CO ₂ (mostly through leaves)
Phosphorus	P	H ₂ PO ₄ ⁻ , HPO ₄ ²⁻ (phosphates)
Potassium	K	K ⁺
Nitrogen	N	NH ₄ ⁺ , NO ₃ ⁻ (ammonium, nitrate)
Sulfur	S	SO ₄ ²⁻ (sulfate)
Calcium	Ca	Ca ⁺⁺
Iron	Fe	Fe ⁺⁺ , Fe ⁺⁺⁺ (ferrous, ferric)
Magnesium	Mg	Mg ⁺⁺
Boron*	B	H ₃ BO ₃ , H ₂ BO ₃ ⁻ , B(OH) ₄ ⁻
Manganese	Mn	Mn ⁺⁺
Copper	Cu	Cu ⁺⁺
Zinc	Zn	Zn ⁺⁺
Molybdenum	Mo	MoO ₄ ²⁻ (molybdate)
Chlorine	Cl	Cl ⁻ (chloride)

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cover drawing:
"Catfish Skull No.4"
 by Mary Staudt

Better lean freedom than fat slavery. Unknown

BAD NEWS

Some diamond mines in South Africa coat conveyor belts with fat taken from the bodies of animals; the fat acts as a selective adhesive that plucks diamonds out of crushed, rinsed ore. **National Geographic. PBS.**

The U.S. government is now incurring just under 1 billion dollars A DAY in new debt! **National Public Radio.**

Since colonial times, nearly 100 million acres--an area the size of Minnesota, Wisconsin and Michigan's Upper Peninsula COMBINED--of wetlands have been destroyed in the U.S. Each year, another 400,000 more acres are lost. **Ducks Unlimited.**

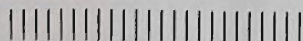
High-nitrogen fertilizers have been implicated by researchers in water pollution and the reduction of methane uptake by vital soil microbes. Sharon B. Hornick of the USDA's Agricultural Research Service in Beltsville, Md., reports that some vegetables grown with these fertilizers contain significantly less vitamin C than those grown without the fertilizers. **Science News**

More than 250,000 U.S. Vietnam vets have made bonafide claims to the courts and the Veteran's Administration that they have suffered serious health consequences due to exposure to the herbicide Agent Orange sprayed on them during the war. In addition, these vets have 64,000 children suffering from congenital disorders and birth defects, a rate FAR higher than the base population. **Robert De Niro**, speaking for **The Brandie Shieb Children's Fund.**

One of Agent Orange's active ingredients, 2,4-D, is commonly used by lawn "care" companies to suppress weeds. Many weed-and-feed fertilizers contain 2,4-D....look for a very long chemical name which contains a "2", a "4" and a capital "D". **THE GARDEN DOCTOR.**

The House Committee on Government Operations has charged that Reagan Administration officials "obstructed" a study of Vietnam vets exposed to Agent Orange. The Centers for Disease Control, based in Atlanta, was to have conducted the study, but the House reports says that the administration "had secretly taken a legal position to resist demands to compensate victims of Agent Orange exposure." **Science News**

Only 0.4 percent of India remains as wilderness. **Science Digest**



In the 1950's and early 1960's, ads like this one prompted millions of people to douse their lawns, gardens, homes, even each other with toxic pesticides like DDT, chlordane, lindane, dieldrin and many others.

**NEW CHEMICALS
MAKE GARDENING
MORE FUN,
MORE REWARDING**



700,000 acres of the Everglades have been converted to sugar cane fields. Over 100,000 TONS of artificial fertilizers are applied to these fields annually; run-off into the rest of the Everglades is resulting in both suffocating algae blooms that kill off fish and aquatic insects, AND, a population boom of cat-tails, whose vast numbers choke out native plants and restrict the flow of water and the movements of wildlife. **PBS.**

Gross agricultural mismanagement around the Aral Sea (it's actually a lake) in the Soviet Union has cut it off from the rivers that once fed it. Two-thirds of the lake have dried up in the last 3 decades; windstorms whip up clouds of salt and pesticide-laden sediments into toxic clouds that poison the land, livestock, and that afflict Uzbek citizens with gastritis, throat cancer & typhoid. **TIME.**





Wew! Being a hot subtropical peninsula, Florida poses unique difficulties AND possibilities for gardeners

and homeowners. The humid heat, the poor, acidic soils, 5 billion bugs and fungi, the occasional record-breaking cold front-induced freeze, the spring dry season, salt spray, acid rain, the summer monsoon season...all these things can make the the Florida gardener dream wistfully of moving up North. But this new column will periodically address the problems and promises of organic gardening and landscaping in the land named for flowers.



Floridata

by Sally Hassy

From root divisions or tubers you can grow **CASSAVA** (Spanish "yuca"), **SWEET POTATOES** (eat the leaves as a cooked green as is done in Asia), **TARO, BANANA, PLANTAIN, SUGAR CANE, WHITE TROPICAL YAM** (*Dioscorea* species), **YAM BEAN** (*Pachyrhizus erosus*), **PINEAPPLE**, plus the other tropical roots sold in the produce section of Cuban and Vietnamese specialty food shops.

One problem veggie gardeners face in Florida is the godawful summer heat and near 100% humidity; even the heat-loving crops like squash, tomatoes and peppers bite the big one unless planted in late winter so that they can mature in late spring. After harvesting the last of these, Florida gardeners can grow crops that Michiganders can only dream of...tropical food plants! These plants, of course, GLORY in the steamy caldron that Florida becomes each May; some are well-known, others are, to us Americans, quite exotic. From seed try growing **OKRA, CUCUSA** (edible gourd, *Lagenaria longissima*), **ROSELLE** (a tart-fruited hibiscus), **YARD LONG BEAN, EDIBLE VIETNAMESE MORNING GLORY** (cooked greens from wet ground, even standing water!), **VELVET BEAN, HYACINTH BEAN, PIGEON PEA** (gandule bean), **FIELD PEAS, BLACK-EYE PEAS, JICAMA, EGGPLANT, BIRD PEPPERS,** and **CHAYOTE** (plant the entire fruit purchased from the produce market).

Since most of Florida is truly subtropical, you should have enough time for most of these crops to mature. Remember too that the soil in most of the Sunshine State is quite acidic, sandy, low in humus and low in both the macro AND the micro nutrients. So it's usually a good idea to lightly sprinkle dolomitic limestone on your soil annually, and to quarterly apply liberal amounts of **FISH EMULSION, SEAWEED, MANURE, ORGANIC GRASS CLIPPINGS, SOYBEAN MEAL, ALFALFA MEAL, KITCHEN WASTE** (daily), **FISH WASTE** (from seafood restaurants or docks), or some other decayable organic material, preferably free ones. Since the "Minor" or "trace" elements are usually quite deficient in Florida soil, the fish-based fertilizers are recommended, as would be **AGRICULTURAL FRIT**. It's a good idea to mulch deeply (8"-10") between all your plants to add humus and cool the soil. No more barren summer gardens, I promise, ya!!!

JUST SAY NO



TO SLUGS



Slugs are mollusks related to clams, oysters, and octopi; they are basically a snail with a tiny internal (vs. external) shell. And they can so ravage a garden that (in their more desperate moments) organic gardeners will lust for metaldehyde slug bait. Slugs LOVE to live in the deep mulch we rely on, so what's a soul to do?

- PET CHICKENS OR DUCKS.** Just 2 or 3 of these birds, if liberated from a factory farm, will gratefully de-slug your yard.
- HAND PICK** slugs at dawn or dusk and drop them into a jar of soapy water; compost them when dead.
- NUCLEAR WASTE,** if sprayed onto your garden, will not only kill your slugs (to say the least), but will eliminate your need for a porch light at night.
- VINEGAR** sprayed directly on slugs (but not your plants) will quickly "fry" them and help acidify overly alkaline soil.
- YEAST** mixed with water and poured into shallow pans set deep into the mulch will lure slugs to a Chappaquiddick-style demise.
- TOBACCO DUST OR TOBACCO TEA** sprinkled on seedlings will kill slugs quickly but can surely endanger earthworms, so think twice or thrice.

Thanks to Michael Holland of Carrboro, North Carolina for selling his lightning article to **THE GARDEN DOCTOR**: as payment he chose 4 old back issues (vs. \$20). He has been a great promoter of this magazine. Now some of you may wonder why an organic gardening and environmental magazine would feature a story about lightning. Well, lightning helps keep soil fertile AND plays a crucial role in renewing the oxygen we breathe! How? All plants require nitrogen to grow; our atmosphere is mostly inert (highly resistant to combining with other elements) nitrogen gas, which plants can't use directly. But the extreme heat of a lightning bolt oxidizes (combines with oxygen) nitrogen into soluble nitrates, which the falling rain dissolves and carries down to the sea and land, where plants, including oceanic plankton, can thus grow and release oxygen. Without the millions of planetwide lightning strokes that occur annually, soil and ocean fertility would plummet, as would the growth rate of plants. Oxygen levels would drop. Thus, lightning is a vital link in our planet's crucial nitrogen, carbon, and oxygen cycles that life itself helps maintain.

Author Michael Holland is a second year graduate student in materials chemistry at the University of North Carolina at Chapel Hill. Last year he worked with NC Senate Vote '90 to support Harvey Gant in his bid to unseat Senator Jesse Helms. 1991 will be the third year that he helps to organize the North Carolina Lesbian & Gay Pride March to be held in the state capitol city on the last Saturday in June. Michael is a vegetarian who lives with two roommates, two cats & a bunch of houseplants.

Lightning either frightens or fascinates most of us. Few of us understand this natural phenomenon. In the simplest terms, lightning is the discharge of a build up of static electricity between a cloud and the ground. Because the discharge occurs in a very short time, about 5 hundredths of a second (50 milliseconds), it is difficult to tell what's happening with the unaided eye. What we see as a quick flash actually occurs in a number of steps and can happen in more than one way.

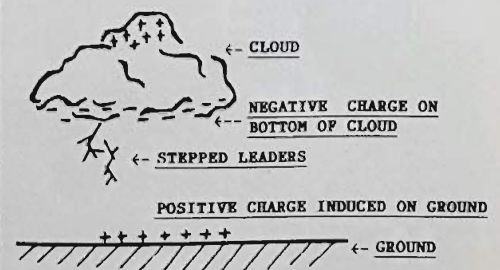
For lightning to occur, there needs to be a separation of charge between the bottom of a cloud and the ground below. Static electricity, the familiar clinging of socks to clothes just out of the dryer, is due to the separation of electric charges on different surfaces. This charge is measured in a unit called coulombs. In the case of lightning this charge is 10's of coulombs, millions of times greater than that in your socks. As a result of this charge separation, a potential of 100 million volts builds between cloud and ground (remember your household current is at 110 volts).

Because lightning is the recombining of this separated charge, a path for the charge to flow through the atmosphere must be established. Multiple stepped leaders shoot out of the cloud, trying to reach the ground, each lasting about 1 millionth of a second. These are too fast to see one at a time, but occasionally you can see these stepped leaders in the lightning that sort of flashes but doesn't strike the ground. Attachment occurs when a stepped leader makes contact with the ground and a low impedance path is established. The other scenario is called a dart leader in which one step leader connects directly to the ground.

Once a path is established, a return stroke from the ground to the cloud occurs. This takes place in a millisecond and heats the air to about 54,000 degrees Fahrenheit, creating a plasma. This heating causes an enormous pressure difference--thunder. Because the speed of light, produced by the plasma, is faster than the speed of sound, you see the lightning then hear the thunder. The old wives tale that lightning never strikes twice in the same place is not true. Numerous return strokes can occur along the same path without repeating the step leaders. If you watch lightning carefully, sometimes you can see the subsequent strokes. Not all lightning has more than one return stroke, however.

The process as just described is for the most common form of lightning--negative lightning-- in which the bottom of the cloud is negatively charged and the ground is positively charged. A more powerful lightning in which the bottom of the cloud is positively charged with a single dart leader and a single return stroke is called positive lightning. Positive strokes are far more destructive to surrounding electronic equipment because they sometimes carry as much as eight times the current of average negative stroke. Additionally, lightning is classified as hot or cold depending upon how quick the strike is and how much energy it contains. Lightning can occur from cloud to cloud as well as cloud to ground.

How many thunderstorms do you get a year? Try finding out from your local meteorologist what your area's ISOKERAONIC factor is. That's the mean annual days with thunderstorms. Tampa, Florida has one of the highest at 95. Florida leads the nation in thunderstorms. Anchorage, Alaska is at the bottom of the list with a factor of less than 1. Did you know that many engineers and scientists are interested in lightning because it can damage sensitive electronic equipment without actually striking the equipment? Another reason for research into lightning is that a nuclear bomb blast looks electromagnetically like lightning. However, the effects of a blast equal to that 1 meter away from a lightning bolt will cover an area the size of the central U.S.



readers digested

Dear John, Please extend my subscription for another year. I also want to send a gift subscription to my friends David & Lisa Beadle (coupon enclosed). They're sort of depressed about the economy in Massachussetts, so how about some articles and words of wisdom on alternatives to our present system based on mass hallucinations that money has value. How 'bout an economy based on dried beans- for instance. Think what that could do for farmers & home gardeners! It would do a lot to curb unnecessary purchases, too. I mean, just how many dried beans could you tote to the mall at one time! We look forward to the next year's issues (and seeds). Keep up the great work. **Pat Bush, Reidsville, North Carolina**

Dear John, The longer I receive THE GARDEN DOCTOR the more friends I think of that I'd like to send it to. However it also means that the longer I have to forget who I've already sent it to. This might be happening to others also. Would it be possible for you to check your subscription list and make sure this person isn't already receiving "The G.D." and if so please return my check? The person is Martin Wolf in Charlottesville, VA. Enclosed please find check for \$18 for that purpose. Please send the crude funny version not the censored one. You and Martin have very compatible humors.

Another consequence of lengthy subscription is reading repeat information. Sometimes it makes me want to cancel, then I realize that a new subscriber like my friend Martin (who is from Michigan like me and who has only recently moved to Virginia) would like to see your list of plants and when to plant in the different zones because he's never lived where the winter is mild and spring is early and summer is a bitch that most plants in the garden can't tolerate. So I'll filter through the repeat stuff for the highly usable new tips like that hay and straw aren't sprayed even by the most unconscious commercial farmers. I've had access to free mulch (hay/straw) for 10 years and never used it for fear of being unorganic in my garden. Thanx. **Bruce Worman, Southfield, Michigan.** (Thanks Bruce, not only for sharing this magazine with so many folks, but for addressing my dilemma of how often to repeat data for the benefit of new readers; It is a tightwire I walk with each issue. Also, hay and straw usually tests quite free of pesticide residues (even if grown unorganically), hence Ruth Stout's advocacy of deep hay mulches. However, I've planted large patches of alfalfa in my back yard (which looks more like a farm), not only to enrich my soil with nitrogen, but also to create my own source of KNOWN organically-grown mulch. It's an imperfect world composed of greys, instead of black-and-white; shoot for the palest shade! **John.**

The universe is change; our life is what our thoughts make it.
Marcus Aurelius Antoninus A.D. 150

"Evil is ignorance" Socrates

Colorado Native Plant Society
Box 200
Fort Collins, CO 80522

National Wildflower Research Center
2600 FM 973 North
Austin, TX 78725

Pepper Gal
10536 119th Street
Largo, FL 34643:
Many varieties of hot & sweet peppers. (SASE)

Ledden & Sons
P.O. Box 7
Sewell, NJ 08080:
grains, cover crops & vegetables.

Tampa Bay Review
5458 N. Rivershore Dr.
Tampa, FL 33603:
Semi-annual 55 page magazine full of fine poetry, prose, and drawings. Subscriptions cost just \$8.

HARRY KRISHNA'S

karmic relief

RESOURCE REPORT

Peace Seeds

2385 S.E. Thompson Street
Corvallis, OR 97333:
open-pollinated varieties,
most organically grown.

Paw Paw Everlast Label CO.

P.O. Box 93-C
Paw Paw, MI 49079:
Permanent garden labels.

Foothill Agricultural Research

510 W. Chase Drive
Corona, CA 91720:
Biological pest control organisms.

North Country Organics

Box 107
Newbury, VT 05051:
Biological pest controls,
soil amendments, natural pesticides.



North American Kelp Cross Street

Waldoboro, ME 04572:
Several kelp products including a kelp meal and kelp fertilizer.

Plant Finders of America

532 Beaumont
Fort Wright, KY 41044:
Will seek out "any plant in cultivation". Fee refunded if quest unsuccessful.

ANAL-RETENTIVE GARDENING TIPS:

1. ALWAYS grow flowers and vegetables in perfectly straight rows, with an even number of plants in every row.
2. ALWAYS color coordinate your flower beds with your bathroom tissue, drapes and napkin holders.
3. ALWAYS use petrochemical fertilizers instead of manure, fish emulsion or compost.
4. ALWAYS use insecticides, herbicides and fungicides to keep your yard free of "extraneous" living things.
5. Cover as much of your property as possible with a monocultural lawn, then spend EVERY weekend manicuring it.
6. Post at least 2 "KEEP OFF THE GRASS" signs on your lawn.
7. Grow ONLY F1 hybrids.
8. Allow only plastic birds to roost in your gardens.
9. Hand water and weed DAILY instead of deep-mulching your vegetable and flower gardens. See mulch as "messy".
10. Send a photo of your yard to Jesse Helms and wait breathlessly to get it back, autographed.



A proper cut.—The healing tissue arises from the side of the wound, not from the hard wood.



A well-covered wound. The pruning was properly performed, and stub being left.

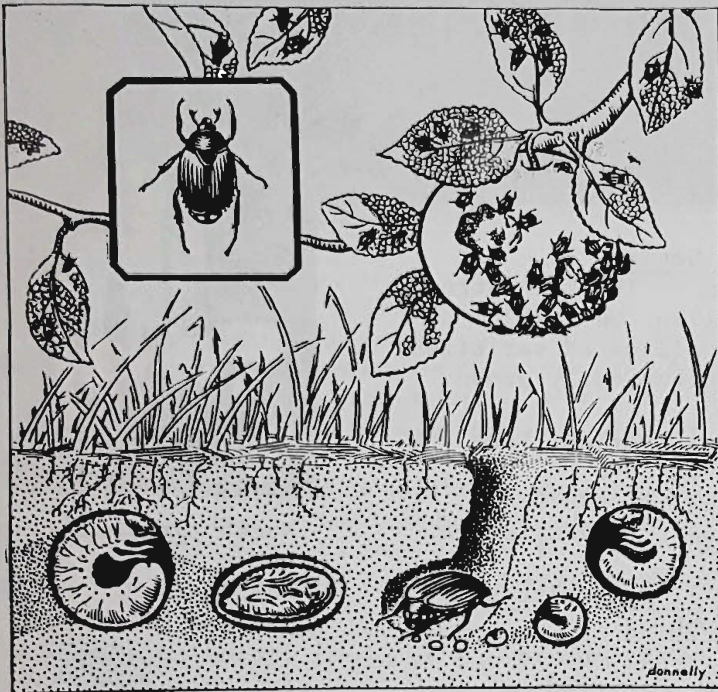


The stub is longer than necessary, although the fault is not a serious one. It will heal well if the old wood is kept healthy.

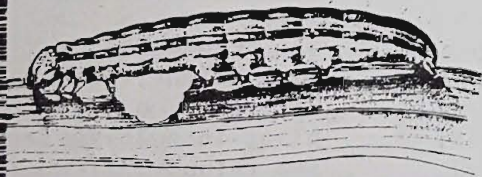


Common fault in pruning. This wound cannot heal until the stub rots away, and by that time the tree may be irreparably diseased.

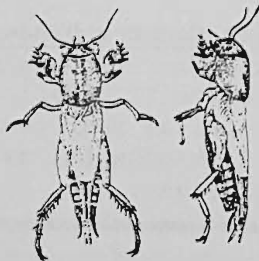
When removing a limb from a tree leave a 1 or 2 inch stub to speed healing.



LIFE CYCLE OF THE JAPANESE BEETLE. Below the ground (left to right): mature grub (late spring); pupa; beetle laying eggs (summer); developing grubs (late summer and fall).



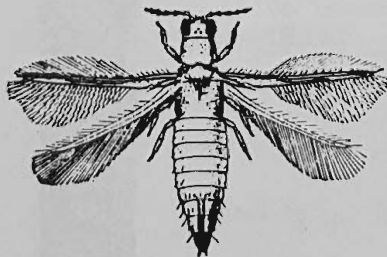
The Armyworm feeding



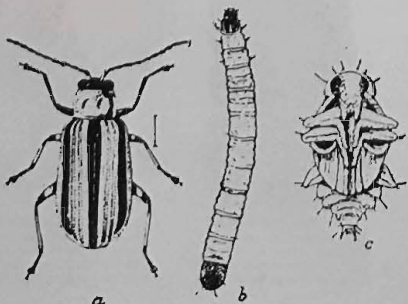
The Mole Cricket



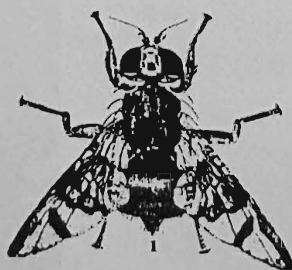
Southern Green Stinkbug



The Citrus Thrip

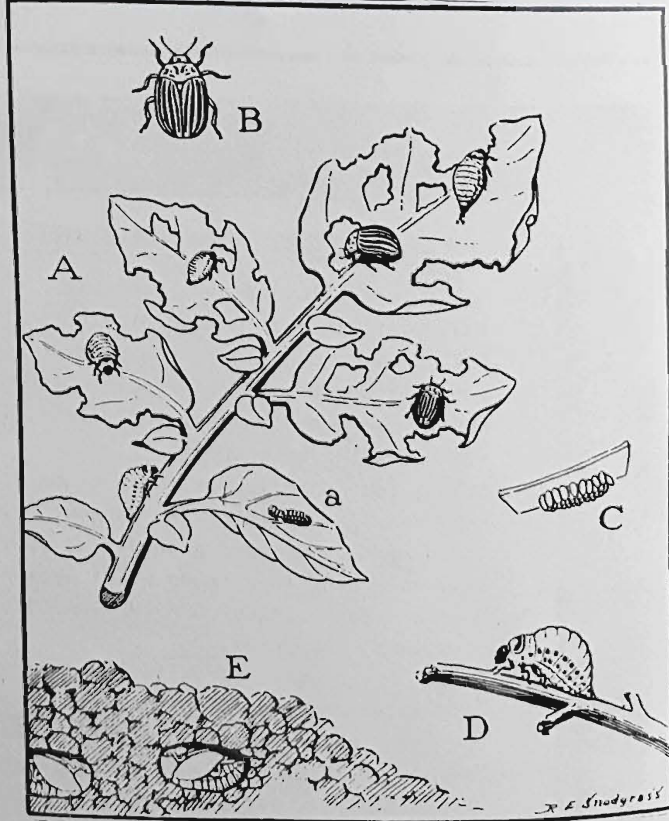


Striped cucumber beetle
a. Adult b. Larva c. pupa



The Mediterranean Fruit Fly

PLANTS are always the first link in any food chain, the second being plant-EATERS, the third comprised of predators who eat the herbivores. In farms and gardens, plant-eating insects and mites can destroy crops or reduce yields if their numbers are not controlled by birds, predatory insects, parasitic bacteria, nematodes, fungi or viruses. The farmer and gardener can employ all these, along with soap sprays. Better to feed the soil, as pests generally attack plants weakened by drought, poor nourishment, or the use of chemical fertilizers that can induce weak, juicy growth the bugs find appealing.



The Colorado Potato Beetle: A. Potato leaf with feeding marks and eggs, larvae and adults; a. eggs on underside of leaf; B. adult; C. eggs D. larva E. pupa maturing beneath soil

The young man who has not wept is a savage, and the old man who will not laugh is a fool.
George Santayana 1863-1952

MULCHING WITH COMFREY

by Dr. Herb Avore



Comfrey (*Symphytum officinale*) is a perennial member of the Borage family that grows best in areas where the ground freezes each winter (this gives the rootstock a period of dormancy). It thrives in rich, clay soils of a neutral pH, loves full sun, deep mulch, and has long been used as a medicinal herb. Rich in calcium, potassium, phosphorus, trace elements, vitamins A & C, and allantoin (a healing compound), it is also claimed to contain vitamin B-12, although this has yet to be verified. Livestock and chickens love the fresh leaves, which may be dried for a nutritious winter tea. Young comfrey leaves make a substantial cooked green.

But gardeners and farmers shouldn't overlook using fresh comfrey leaves as MULCH! The plant thrives if cut back twice each season to a height of 8 inches; each cutting provides massive amounts of mulch, for comfrey gets big (3-4 FEET high & wide) in cold winter regions. The big, hairy succulent leaves also make a great "green manure", may be added to your compost pile, and if you "buzz" some in your blender with water make a fine food for potted plants. To grow comfrey choose a full sun spot, plant a root division 6 inches deep every 3 feet, mulch between them with 10 inches of hay or leaves, and water deeply twice a month. Due to its size and rate of growth, comfrey also makes a good landscape "filler". But its tenacious roots will survive a direct nuclear hit; planting comfrey is a commitment! For that reason you can use mass plantings of it to choke out thistle and other invasive perennial weeds. Each summer tall flower stalks appear bearing pale yellow or blue flowers; bees love them. The flowers are also good sprinkled on a salad. Clearly, comfrey can play an important role in a low-input, permacultural farm or garden.

A. UESNEL

A. GIRALDON

This is not an incredible garden success story, nor is it a "how-to" article, it is simply a story of joy. The joy of pulling out a couple of small, forgotten, succulent carrots in the middle of winter or finding two perfect, pink potatoes when you didn't know there was anything there.

I am, at best, a mediocre gardener. Now mind you, it is not for lack of enthusiasm or lack of trying, but my gardens just don't seem to produce more than a mouthful here and there. Those mouthfuls are great though, and my tastebuds get a chance for a small tap dance a couple of times a year.

I live in a small house, on a busy street in Ft. Worth, Texas. I have four small raised beds in a back yard that gets too much shade. The squirrels have a penchant for digging up the beds, looking for pecans that fall from the huge tree that is providing the too much shade. Often these beds look much like mini land mine fields instead of gardens.

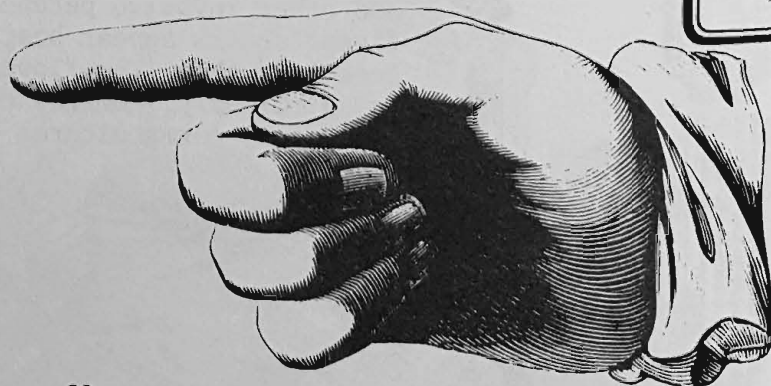
I am good at making these beds look great though. I have bricks in between each bed and a little fence running round them to keep Homer the dog out. There are a couple of little statues and of course a bird feeder. I have been at it for four years. Bringing in dirt, digging, adding compost and squealing with glee when an occasional worm is discovered.

I save all of my kitchen waste, I gather leaves from neighbors (I haven't had to buy a plastic bag in years), and I have a cute little compost bin on the side of the house. I do everything strictly organic and of course I peruse all of the politically correct magazines on the subject. All of this to little avail. Amiably labelled as "your non-producing garden" by my lover, he enthusiastically supports my efforts and allows me to drag him around for viewing of each baby as it appears and starts to grow. This is of course prior to these precious ones being lunched by an ardent bug or a curious squirrel.

Is it all worth it? You bet. There are always a few plants that survive disease, pestilence and my lack of skill. They miraculously survive and make it to my mouth. And then sometimes, like today, while prepping for spring planting, I find four little topless carrots that had managed to grow unbeknownst to me. They were met with my arduous delight, promptly washed and eaten while I savored their unique sweetness. I, in all of my inept splendour, had experienced the universal joy of savoring one's own produce. The joy that can be no different whether experienced from the humblest or the most splendid garden.

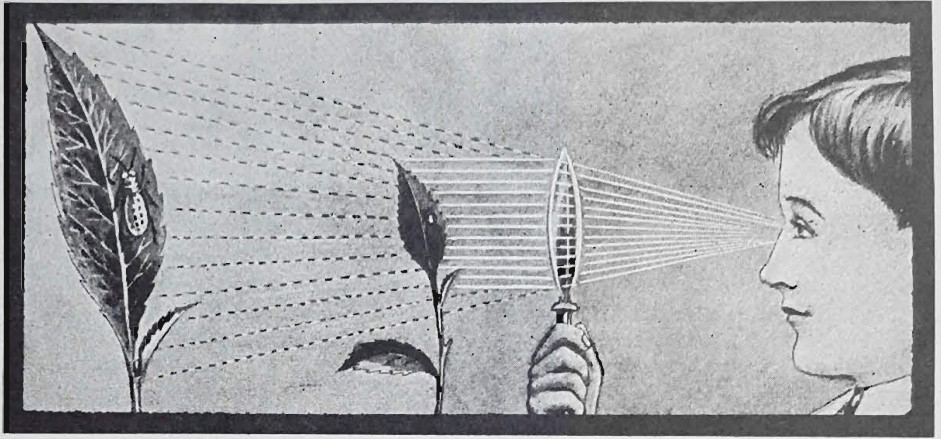
Chris Baker
3207 Azle Avenue
Ft. Worth, Texas 76106

Thanks Chris, for selling your story to **THE GARDEN DOCTOR**. I enjoyed it a lot. I share my yard in Denver with two squirrel families, but they almost NEVER eat my crops because I feed THEM scraps I put in a hanging pot suspended from a tree. Baked goods rescued from a dumpster are their mainstay, not my garden. In shade try leafy crops like mustard. Good Luck! John Starnes.



TODDLER FODDER

As modern children get further insulated from the rapidly disappearing natural world, it's important we help them fully appreciate what's left. A magnifying glass is a simple, inexpensive tool that can provide a child countless hours of joyful investigation; tree bark, a fallen feather, the wings of a dead butterfly or dragonfly, the center of a rose, the skin of a soap bubble, the contours of a seashell, ordinary sand, a piece of stone.... there is wonder in all these things when viewed through a strong magnifying glass. Purchase one at a laboratory supply house, or possibly at a good office supply shop. One with



a glass (vs. plastic) lense works best and is more difficult to scratch. Storing it inside an old sock will help protect it from scratches and dust. To amaze both children AND adults, go into a windowed room on a sunny day, and hold the magnifying glass so that it faces a bright window about 6-8 feet in front of you. With your other hand hold a white piece of paper vertically BEHIND the lense so it can act as a projection screen. By moving the paper closer to or further from the magnifying glass you'll create a focused but INVERTED image of the window, including trees, etc., outside it. Explain that the lense in your eye does this also, but your brain conceptually reverses that inversion, else the whole world would appear upside down! And if a solar eclipse comes one day, use the magnifying glass to focus an inverted image of the sun on a non-glossy white piece of posterboard so that this celestial event can be watched safely. Some hikers carry such a glass, as it can be used to focus the sun's heat on tinder and start a fire. Show your child how to clean the lense with vinegar and a soft flannel cloth.



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

Hey, are your oak trees draped with the filmy webs of tent caterpillars? Cabbage worms nuking your broccoli and collards? Cutworms clear-cutting those emerging beans? Sod webworm moths fluttering up from your lawn when you walk through at dusk? Should you panic? Drag out chemicals-from-hell? Naw. Just reach into your fridge and pull out your trusty bag of *Bacillus thuringiensis*.

Sold under names like "Dipel" or "Biotrol" or "Thuricide", this naturally-occurring bacteria kills caterpillars of all kinds, but is harmless to people, pets, beneficial insects, earthworms, even Right Wing Neo-Nazi Conservatives.

Four pounds of the powder (avoid the liquid versions: they contain petroleum distillates) covers up to 3,000 square feet and costs as little as \$4. You can lightly sprinkle the powder directly on your lawn or plants, or mix 1 cup of it in 1 gallon of bottled water and use this as a spray. Either way, when a caterpillar bites an infected leaf, his digestive tract is paralyzed within 20 minutes; hence he quits eating your plants. A few days later he dies and splits open, releasing the billions of new bacteria that have been incubating inside his body cavities. Hence one application is often all that's needed in an organic garden; the bacteria become endemic to the garden's bio-community. Nicknamed "BT", this bacteria comes in a few natural strains; "San Diego" kills elm leaf beetles and Colorado potato beetles. "Israeliensis" kills mosquito larvae in standing water. "Kurstaki" kills caterpillars. If the retailer has stored the bags in a hot shed or truck, you may purchase dead bacteria. You'll know if yours are alive in a few days due to the cessation of caterpillar havoc; store the live powder in your fridge and they'll live for many months. BT's fame is spreading!



PHUKINAY!!

In 1984, Charlotte and David Knutzen of Whittier, California, grew an 8½ pound lemon that was 29½ inches in circumference. **Guinness Book of World Records.**

That a single tomato plant had produced 16,897 tomatoes was reported by the Tsukuba Science Expo in Japan on February 28, 1988. **Guinness Book of World Records.**

In 1960 a temperature of 127 degrees below zero was recorded in Antarctica. **It's A Fact**

The name of the pesticide used in "COMBAT" Roach Control Bait Trays is: Hydramethylnon [tetrahydro-5, 5-dime-thyl-2 (1H)-pyrimidinone(3-[4-trifluoro-methyl) phenyl]-1-(2-[4-(trifluoromethyl) phenyl]ethenyl)-2-propenylidene)hydra-zone] !!

A locust eats its own weight in plant tissue (and its dead or dying companions) every day. **Nature, PBS**

Professor F. J. Francis of the University of Massachusetstts grew a philodendron, over a period of 31 years, to a length of 1,114 feet! **Guinness Book of World Records**

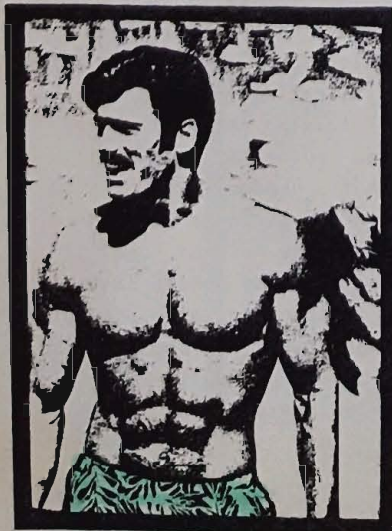
A fully mature sunflower just 2.2 inches tall was grown in 1983 by Mrs. Emily Martin of Maple Ridge, British Columbia, Canada. She used bonsai techniques.

"Underground" is the only word in the English language that begins and ends with "und". **It's A Fact**



RECOMMENDED READING by *Dolly Llama*

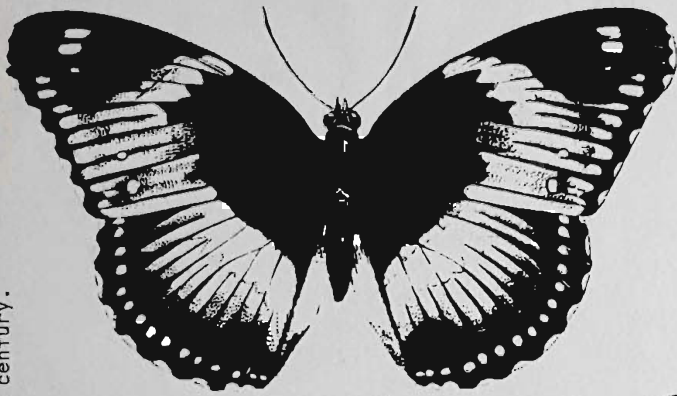
Hey gang, have I got a good read for you... **"Learned Optimism"** by Dr. Martin E. P. Seligman. Ultimately, it's optimism that prompts the gardener to plant a baby fruit tree or a seed, and it's optimism that can form the basis for a victorious life in spite of the inevitable, ongoing difficulties. This book is not a "Have a Nice Day, Smile-Be Happy" pop psychology book, but a rather technical exploration of 25 years of research linking a pessimistic "explanatory style" of interpreting life events and depression, failure and ill health. The book asserts that we can use established "cognitive therapy" techniques to substitute an optimistic "explanatory style", not only to end chronic depression, but also to finally dismantle the self-defeating, self-perpetuating emotional survival mechanisms we learned as young children, thus breaking the "stuck record" aspect of neurosis. Life is hard enough as it is without daily creating our own inner set of roadblocks. Though a bit dry, this book could help you prime the pump of self-mastery and joy.



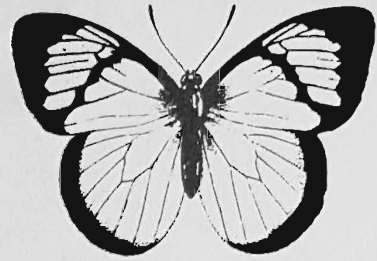
GREGORY
PECS
SEZ:

Switching to a "vegan" (totally vegetarian, i.e. no dairy, eggs, honey, etc.,) diet can help you reveal those muscles you've worked so hard to develop. Why? Vegan diets are VERY low in fat, so that persistent 1 inch thick layer of subcutaneous fat will gradually thin. Also, in men, there is a documented link between a thick pad of abdominal fat and the risk of heart attack, so a lot more is at stake than appearances, although a flat tummy and narrow waist does wonders in re-shaping the male (or female) torso. Contrary to popular belief, a well-rounded vegan diet supplies all the protein you'll need, even for full-blown body-building. Read Keith Aker's **"A Vegetarian Sourcebook"** for the specifics of a healthy, low-fat, vegan diet that helps our planet too!

In England & the U.S., butterflies were called "flutter-by's" until the turn of the century.



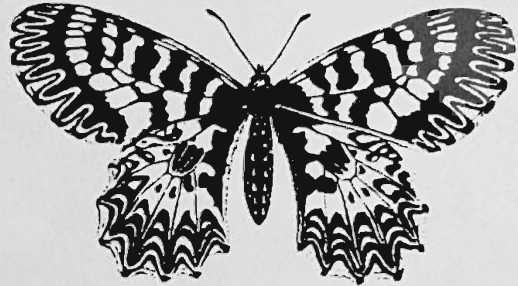
Nymphalidae



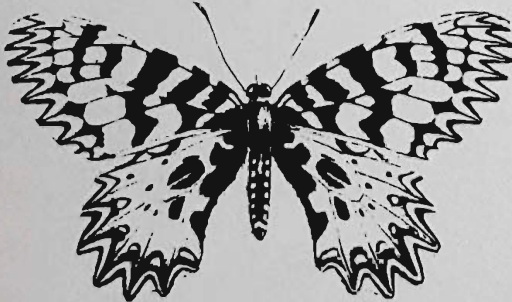
Anthocaris Pirene



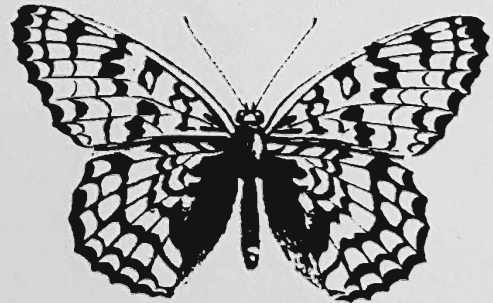
Tiger Swallowtail
(*Papilio turnus*)



Zerynthia Polyxena



Zerynthia Hypsipyle



Melitea Phoebe



Swallowtail
(*Papilio asterias*)



Monarch
(*Anosia plexippus*)

I understand. Charney Gardner

Koo Koo Ka Choo
The Realties

DANG!

We just LOVE getting THE GARDEN DOCTOR, the world's ONLY hand-signed, hand-colored magazine with 3 FREE PACKS of seeds inside every quarterly issue. No pesky advertisements, just 28 fun-and-fact filled pages dedicated to organiculture, environmental stewardship and personal betterment! And it makes a great gift to give to ALL our favorite people. PHUKINAY!...
SUBSCRIBE TODAY!!!

Gee, I like the free issue we earn when we give a subscription or when a friend subscribes on our form!

My heavens! Our yard has NEVER been so lush and colorful and brimming with organic veggies!

Golly! I like all the neat pictures!

Whee! My grades have gone up!



subscription form

Send just \$18 TODAY to: THE GARDEN DOCTOR, 1684 Willow St., Denver, Colorado 80220. ph. (303) 388-4731