

M Y C O R R H I Z A L M Y C O R R H I Z A L M Y C O R R H I Z A L !

use native species of fungi
never destroy what isn't already destroyed!
rholiforme saprophytes, mycorrhizals, endophytes

exterior root mycelium - ectomycorrhizal
interior root mycelium - endomycorrhizal (VAMs)

saprophytes: oysters! turkey tails! wood lovers! meadow mushrooms! shiitake! matsutake!
inky caps! white button! shaggy mane! king stropharia!
conocybe, agarocybe, mycena, pluteus, agaricus, phanerochaete

Endophytes: curvularia! piriformospora indica! psilocybes
mutual symbionts for plants + trees

mycorrhizals: truffles! chanterelles! matsutake! boletus!

root mushrooms!
enhance nutrient absorption for plants

- make a spore print!
- 1. collect mushrooms.
- 2. get a piece of paper
- 3. set the cap gills side down on it.
- 4. sit at least 12 hrs
- hooray!
- some yield more than others,
- keep printing till there's nothing.
- * the spores save in plastic ziplocks!
- label species, date + location. picture!

mycelial mediums!
hair, paper, straw,
cardboards, wood chips,
oil, petal waste product,
corn cobs, compost,
burlap, spent compost,
cacti, brewery waste, cotton,
yard debris, leaves,
leaves, poop,
nut shells, oils,
tea, tea waste, cloth

1 g spores = 1 billion spores!

- germinate!
- 1/4 ts. salt, 1 tbs sugar or molasses, 1 gal H₂O. boil!
- put in jar + let cool. let spores (1 gram)! cover it + stash it for a day or 2. shake a couple times a day. keep between 50-80°F in shade. it's done! add to a medium; and make them live!
- stem butts!
- 1. gather fresh mushrooms
- 2. soak card board
- 3. cut off stem butt + root
- 4. put butt between layers of corrugation
- 5. keep dark + moist!
- 6. wait + grow!
- oils, inoculated rope or sawdust works best on stumps

* Coprinus comatus (shaggy mane, inky cap) breaks through ASPHALT

* tree: mushroom
pine: boletus edulis, leccinum aurantiacum, tricholoma matsutake, pirolithus tinctorius*
fir: hydnum repandum, cantharellus cibarius
deciduous: rhizopogon parksi*
cedar + redwood: glomus intraradices*
* inedible species.

mushrooms produce spores from gills, pores, teeth or folds.
store spores in jars, bags - plastic or paper, oil - (1000, 000 spores to liter)

- get mycelium-rich spent compost from local mushroom growers.
- get spores en masse from local growers! growing room air filters

just spores on seeds before planting - both grow better together!

SELF SUFFICIENCY PAMPHLET

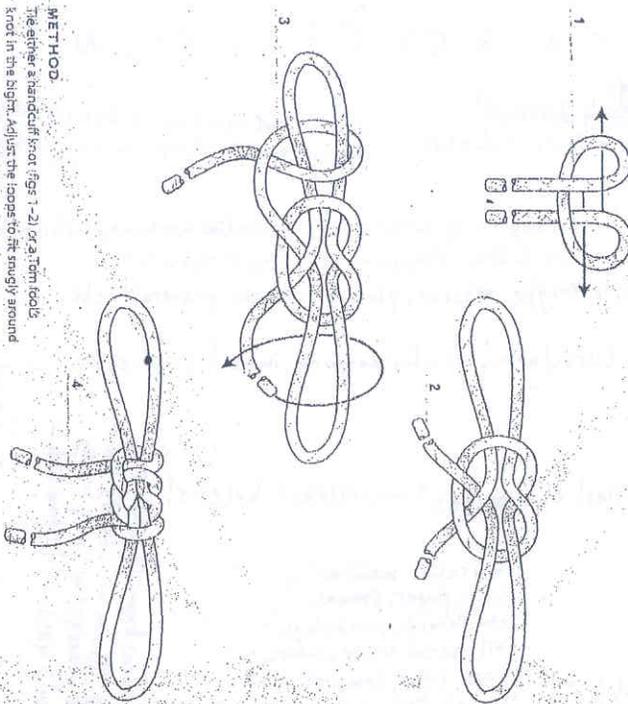
a common guide for living

plz - make copies and share

FIREMAN'S CHAIR KNOT

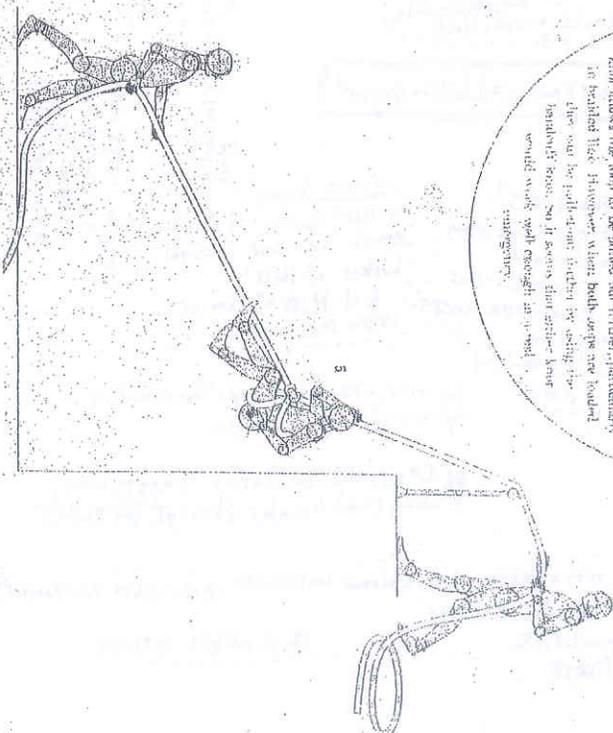
APPLICATIONS

When my two daughters were small I kept a coiled rope upstairs in their first-floor bedroom, as it was too far to drop them to the ground without injury in the event of fire. This knot, with its own adjustable (and lockable) loops, could be safely lowered them.



METHOD

The either a handcliff knot (figs 1-2) or a Tomfool's knot in the right. Adjust the loops to fit snugly around the chest and knees of the subject. Lock each one with a half-hitch (figs 3-4). The upper loop end is used to raise or lower the person, while a second rescuer on the ground holds them clear of any wall, cliff-face, etc. (fig 5).



FLOWER

L I V I N G

the variables in which life can be sustained are debatable. this pamphlet covers shelter, food, water, health and information. all subjects are rough, this is a G U I D E.

live your life the way you need to. be mindful of other living things: big, small and unseen. try to think things through over a period of time. think about the energy return on the energy invested. if it is not necessary to do something or pick something, don't. let things be, including yourself. you are a valid part of nature. listen to the land and let it be your teacher. be patient. be whole. listen.

- COMPLEXITY (diversity of parts)
- SELF-CREATION (autopoiesis)
- SELF-REFLEXIVITY (autognosis—self-knowledge)
- SELF-REGULATION/MAINTENANCE (autonomics)
- RESPONSE ABILITY—to internal and external stress or change
- EMBEDDEDNESS in larger holons and dependence on them (holarchy)
- INPUT/OUTPUT of matter/energy/information from/to other holons
- TRANSFORMATION of matter/energy/information
- COMMUNICATIONS among all parts
- EMPOWERMENT—full employment of all component parts
- COORDINATION of parts and functions
- BALANCE OF INTERESTS—negotiated self-interest at all levels of holarchy
- RECIPROCITY of parts in mutual contribution and assistance
- CONSERVATION of what works well
- INNOVATION—creative change of what does not work well

A comparison of these principles with those by which corporations operate makes the point more clearly.

EVERY SYSTEM IS INTERRELATED WITH EVERY OTHER SYSTEM. BE CONSCIENTIOUS OF MICRO COSM / MACRO COSM. RELATIONSHIPS AND CONSEQUENTIAL EFFECTS OF CHANGE.



APPLICATIONS
This is a tight bend for slippery cordage, especially useful in wet conditions.

METHOD

The interweaving (figs 1-4) is not too hard to follow, although every crossing point over and under must be exactly right. The appearance of the finished knot (fig. 5) is distinctive.

HISTORY

Retired research scientist Harry Asher discovered this knot while working systematically through derivations from the common sheet bend. It was published by him in *The Alternative Knot Book* (1989). Asher was, however, unaware that his knot was perhaps much earlier in origin. When the writer and traveller Tim Severin started to make his replica of the cow-hide boat used by the sixth century Irish monk St Brendan, he found that the wet leather thongs with which he was working were like slippery snakes, pulling out of any knot he tried. Eventually, with a lot of twisting and interlacing, he made a knot that held. As he wrote in 1978 in the *Sunday Times Magazine*: "... in a curious way, the knot looked much like the braided pectorus found in Irish manuscript illustrations. And it might have looked much like this knot too."

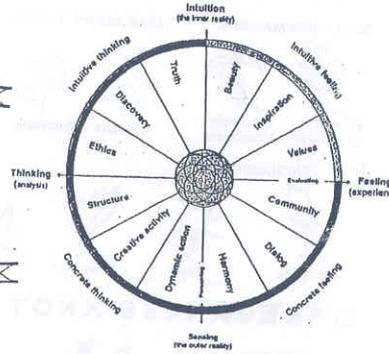
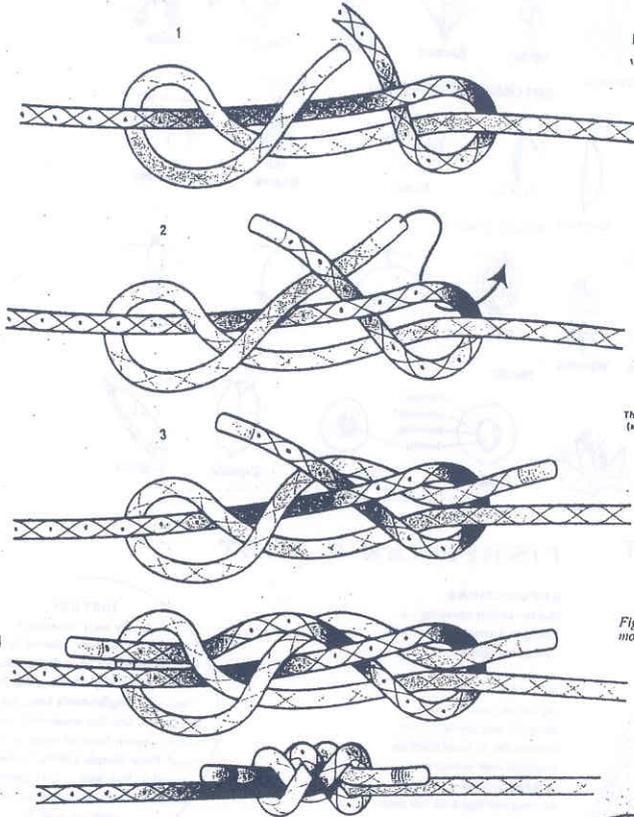
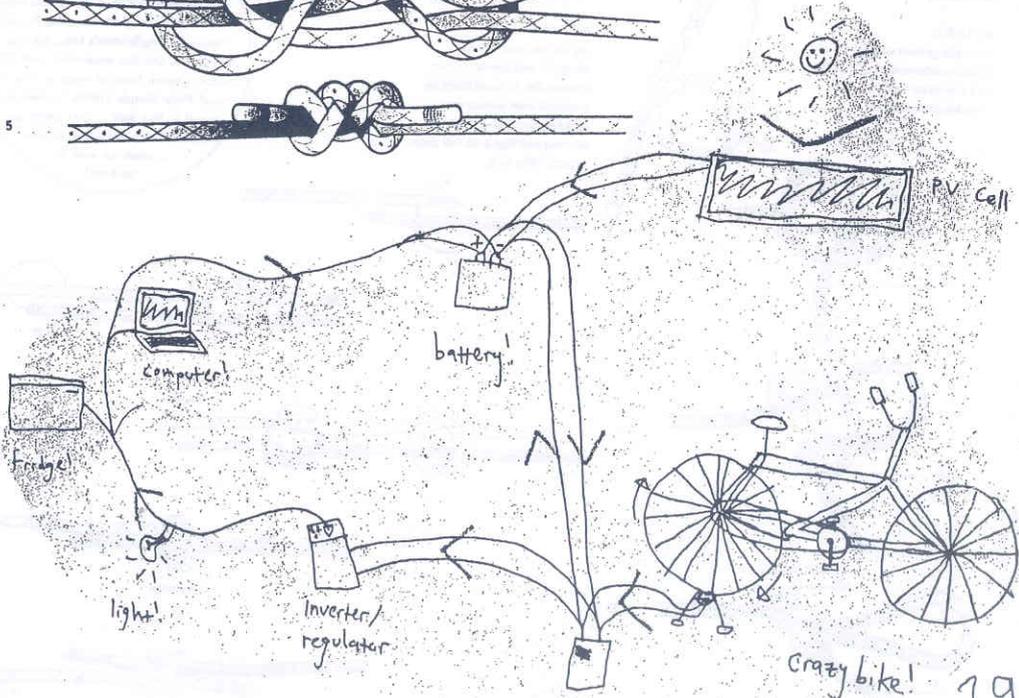


Figure 1: The optimal knowledge culture in relation to learning. The model is based on Jung's concepts.

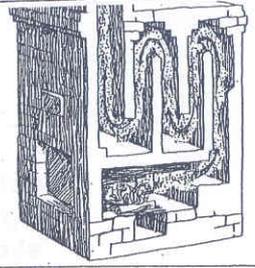


add on to this
moving and pour it on

- living
- housing
 - squattinġ-3
 - shelters -3
 - house buildinġ -4
 - straw bale juġk -5
 - figurinġ out clay content-5
 - plasterinġ juġk -7
 - buildinġ material info -8
 - comparison of house structure to plasterinġ walls-10
 - wattle and daub -10
 - earthship juġk -11
 - earth cover weights -12
 - cave dwellinġ -13
- water
 - collection -13
 - well construction -13
 - filtration and storage -14
- food
 - plantinġ -15
 - compost -16
 - mulchinġ-16
 - companiġ plantinġ -17
 - permaculture -18
 - waterinġ -18
 - sproutinġ -19
 - sprout chart -20
 - food hot bombs -21
 - dumpsterinġ -21
 - nutrition -21 and 22
 - eating habits -22
- health
 - plant identification -22
 - illness prevention -22
 - medicinal plants -23
 - health guide-24
- random awesome stuff -25 to end

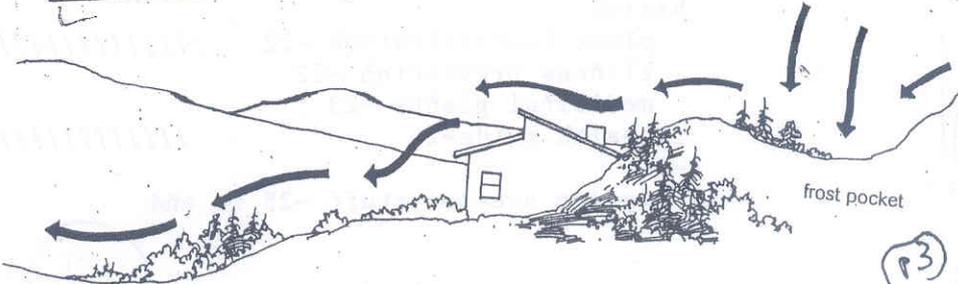
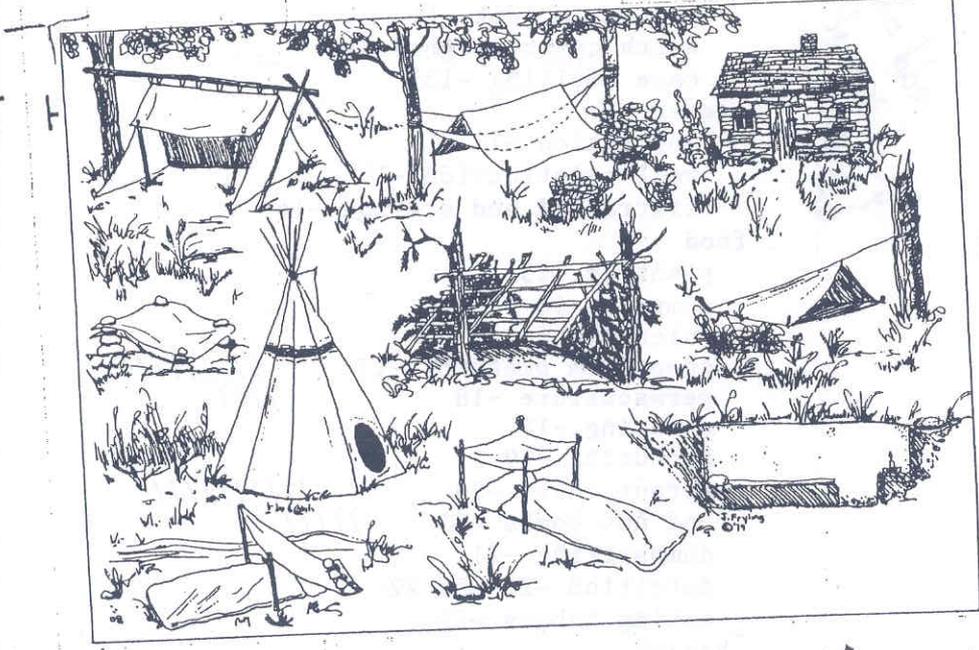
SQUATTING
 if you decide to squat somewhere, bear in mind: don't be seen going in or coming out - protect the squat for future squatters, keep the place clean or natural - whether an indoor or outdoor squat - it's just good to be considerate, if you get found don't be violent - explain something to the finders or run if it doesn't work. most public forest land area is pretty safe. most cities have co-op houses that are okay with floor sleeping or back yard camping. houses not jails is an awesome organization started in San Fran that helps people squat or finds squats to start. if you're squatting for civil disobedience and public awareness, be respectful of those just looking for a little sleep and stability. bigger cities tend to have squatters' rights demonstrations with lots of people in massive buildings - help organize or participate.
SHELTER IS FREE IF YOU CLAIM IT.
... COMPASSION BEFORE ACCUMULATION...

SHELTER



b. In a masonry heater, hot gases flow through an elaborate internal flu system, transferring heat into the masonry. Heat then slowly radiates into the room.

Source: Nicholas Lyle and Kristin Musnug



A GLOSSARY OF PLANT PARTS AND SHAPES

LEAF PARTS
 Blade, Petiole, Axillary bud

LEAF SHAPES
 Elliptic, Lanceolate, Linear

LEAF SHAPES (Cont'd)
 Oblong, Ovate, Lyrate, Cleft, Orbicular

LEAF MARGINS (SIMPLE)
 Entire, Serrate, Lobed, Crenate, Incised, Dentate

COMPOUND MARGINS
 Pinnately Compound, Palmately Compound

LEAF ARRANGEMENTS
 Opposite, Alternate, Whorled

LEAF ATTACHMENTS
 Petiolate, Scasile, Decurrent, Basal

INFLORESCENCES
 Spike, Raceme, Umbel, Corymb, Panicle

INFLORESCENCES (Cont'd.)
 Catkin, Head

ROOTS
 Fibrose, Rhizome

ROOTS (Cont'd.)
 Bulb, Tuber, Corm, Taproot

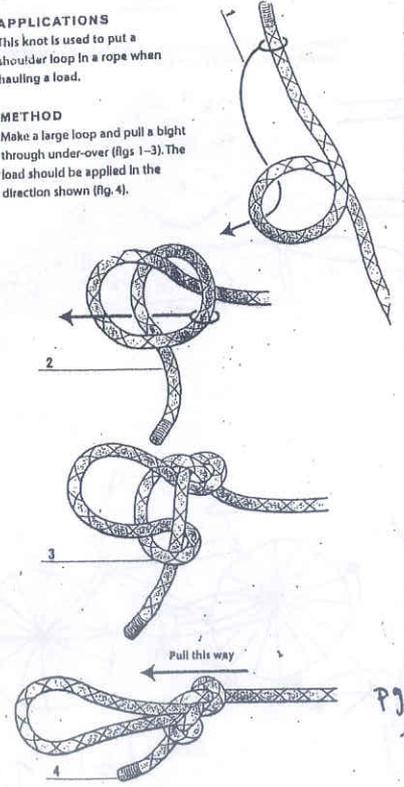
FRUIT
 Drupe, Berry, Capsule, Legume

Flower Diagram Labels: Stigma, Anther, Filament, Stamen, Petal, Perianth, Sepal, Pedicel, Receptacle, Style, Ovary, Plait

WATERMAN'S KNOT

APPLICATIONS
 This knot is used to put a shoulder loop in a rope when hauling a load.

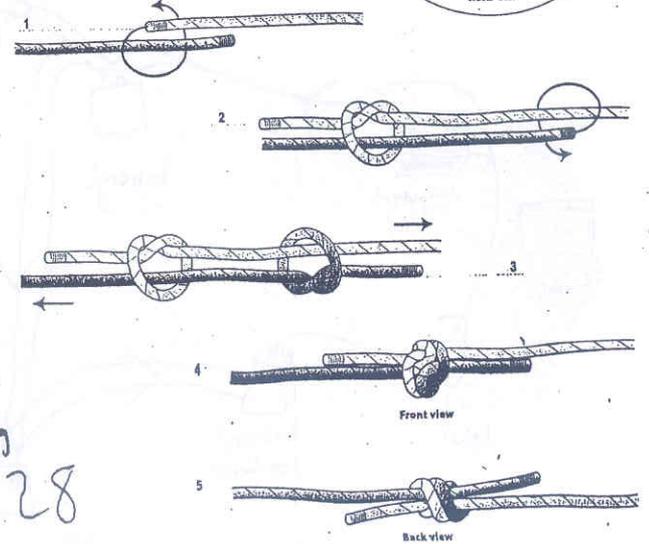
METHOD
 Make a large loop and pull a bight through under-over (figs 1-3). The load should be applied in the direction shown (fig. 4).



FISHERMAN'S KNOT

APPLICATIONS
 This is - strictly speaking - a strong and secure bend to join two similar ropes.

METHOD
 Lay the two working parts alongside and parallel to one another (fig. 1). Tie an identical overhand knot around each standing part with the other working end (figs 2-3). Pull them together (figs 4-5).



HISTORY
 In the early nineteenth century, fishermen referred to this knot as the water knot. It has also been known as the angler's knot, the English knot, the Englishman's knot, the true lover's knot and the waterman's knot. The author Captain Marryat wrote of it in his novel Peter Simple (1854): "... there is a moral in that knot ... that points out the necessity of pulling together ... when we wish to hold on."

How to Make a Moccasin

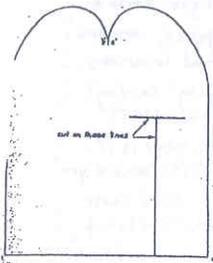


Figure 2:1

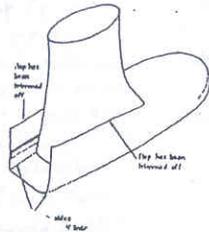


Figure 2:2

All seams can be hidden in the moccasins. Keep work fields out while sewing. Secure any leather can be close to the edge. Canvas should have 1" margin if edges are left raw.

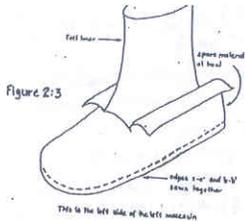
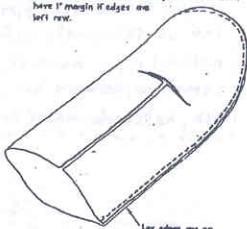
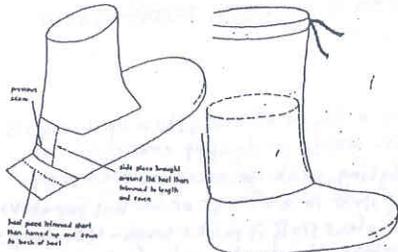


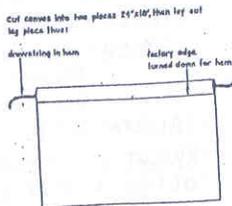
Figure 2:3

Figure 2:4



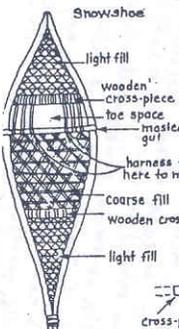
2:5

Figure 2:7



2:6

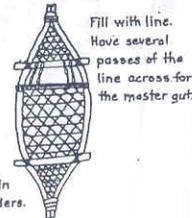
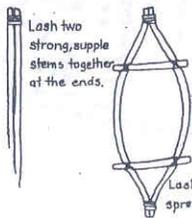
Lacing made in 11 and sewn to moccasins. Drawstring placed in hem at the top to restrain frog, not tight, fit around broader top.



A main feature of the snowshoe is the space left for the toe of the foot forward of the master gut and just back of the front cross-brace. You must provide this in your improvised shoe.



Simple but effective harness over the toe, around and secured to the master gut on both sides, then back and around the ankle to tie in front.

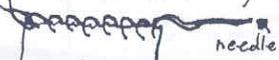


Making a Bark Whistle

Step 1: Cut a smooth green sapling stem growing in moist ground. Shape it as shown in the first sketch.

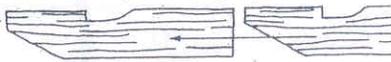
Cut through the bark only here, all the way around.

... SEWING BASICS...
 Everyone can sew! get a sewing needle and string that can fit through the hole. floss is also really good (and strong), put the string in the eye of the needle and tie the two ends of string together with a big knot (or at least bigger than what will go through your fabric). if you're sewing something where the knot wont hold, bring the needle through the fabric and then through the loop on the other side with the knot on it. sewing like:



needle

will stop edges from fraying and can bind 2 sides of cloth together. sew on the hidden side if you dont want anyone to see. keep in mind how the fabric gets pieced together, how the fabric frays, if a patch works better, how tight to stitch it, where the most wear is, etc.



Step 2: Tap with your knife handle all over the surface of the bark to be removed, vigorously enough to help loosen it but not so as to damage it. Give it a firm twist to bend then pull it from the wood.

ep 3: Remove wood as shown in the third sketch. Do not use the wind channel at the top from very large, you enlarge it later if necessary.

ep 4: Slip the bark back on the wood and give a stout tap. You will be delighted with your handiwork.

RE SOURCES
 so if you're really getting into it and need more info or have adequate space and money to, these books are unbelievably awesome.
 BUILDING GREEN: small + callahan
 WHEN TECHNOLOGY FAILS: stein
 KOEHLER'S MEDICINAL PLANTS: koller
 STEAMPUNK'S GUIDE TO THE APOCALYPSE: kirby



We used a mixture of 5 parts clean sand and 1 part Portland Cement for the pier. Many larger rocks and pieces of scrap metal were tapped into the concrete to save on cement and add to the strength of the mixture (plate 3).

... HORSE BUILDING ...
 consider your site, don't destroy already existing structures or wild life, incorporate them. draw out plans +/or sketches before building. talk to people who have built similarly and learn. think about movement through the dwelling - people movement, sun movement, wind movement, moisture, etc. consider how your area frosts and thaws - how deep? how often? consider passive solar heating or cooling for the roof and windows. run the plans by an experienced third party. if changes are made make sure that they are fully adapted to the rest of the plans. materials can be awesomely scavenged from dumpsters, construction sites, dumps, demolition sites, etc. also garage sales, flea markets, the classifieds, Craigslist and re-stores are good locations for cheap/free building materials. work parties can be an awesome way to do it.

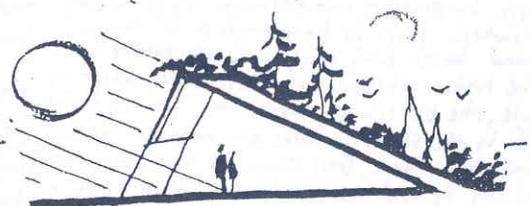
A flat cultivated roof need not be difficult to seal. With a cultivated roof the roof seal is of particular importance. It must be root-resistant so that the roof plants cannot damage it.

Pitched roofs can also be cultivated. Roofs with pitches of up to 40° can be cultivated. When they are steeper than 25° they require protection against shearing to prevent the soil substrate from slipping, and there must also be a drainpipe along the eaves.

Embodied Energy of Common Building Materials and Products

Material	Embodied Energy in MJ/kg (million joules per kilogram)
Baled straw	0.24
Adobe block (traditional—mud and straw)	0.47
Concrete block	0.94
Concrete (poured on site)	1.0-1.6
Concrete (precast)	2.0
Hardwood timber, kiln dried, rough sawn	2.0
Softwood timber, kiln dried, finished	2.5
Cellulose insulation	3.3
Plasterboard	6.1
Cement	7-8
Plywood	10.4
Fiberglass insulation	30.3
Steel (virgin)	32
Carpet (nylon)	148

From: Andrew Alcock, Embodied Energy Capabilities of Building Materials, Wellington, New Zealand: Centre for Building Performance Research, 1998.



- TECHNICAL SYSTEM OPTIONS:
- TEMP. REGULATION:
 - passive solar design
 - ground source heat
 - solar connection floor
 - masonry heater
 - wood stove
 - earth pipes
 - solar thermal collector
 - WATER:
 - drilled well
 - dug well
 - lake, river, stream collection
 - reservoir
 - rain collection
 - electric pump
 - wind pump
 - hand/foot pump
 - gravity feed
 - SEWAGE:
 - septic system
 - composting
 - outhouse
 - leaching pit
 - living machines
 - WALL PARTITIONS:
 - recycled materials
 - screen dividers
 - straw bales
 - brick
 - adobe
 - cob
 - woven twigs
 - mix + match
 - ELECTRICITY:
 - solar panels
 - wind turbines
 - water turbines
 - bicycle powered

- * inspect carpentry for all things interacting with the bales.
- * prepare corner guides
- * mark + place bucks for doors, etc.
- * uncover + distribute bales around the building
- * layout the whole first layer - making custom bales that don't fit and stuffing narrow spaces with strawflakes.
- * place buck frames in when needed
- * do one layer of bales at a time to keep the plan simple + easy
- * pin the bales with capped bamboo or capped stakes to reinforce walls
- * finish the walls to the top
- * trim, curve + straighten bale walls
- * install flashing and mesh
- * stitch mesh close to wall w/out touching
- * protect walls from moisture + let it sit and compress for a long time
- * get ready to plaster
- * plaster in coats - inside + outside

- Building Materials**
- Produced by socially and environmentally responsible companies
 - Produced sustainably - harvested, extracted, processed, and transported efficiently and cleanly
 - Low embodied energy
 - Locally produced
 - Made from recycled waste
 - Made from natural or renewable materials
 - Durable
 - Recyclable
 - Nontoxic
 - Efficient in their use of resources
 - Reliant on renewable resources
 - Nonpolluting

- Principles of Sustainable Design and Construction**
- Build small
 - Make homes efficient
 - Use recycled or recyclable materials
 - Recycle and compost all waste
 - Build recycling centers in homes
 - Use renewable resources especially energy
 - Promote environmental restoration
 - Create safe, healthy living spaces
 - Make homes easy to operate, service and maintain
 - Design homes to be accessible
 - Make homes affordable
 - Make homes durable
 - Build community

- NATURAL DYEING**
- BURGUNDY-RED** - sweet gum bark
 - PEACH** - red bud roots, button bush branches, eastern red cedar bark, smooth sumac fruits, rusty black haw bark
 - SALMON-PINK** - sand evening primrose roots
 - BRIGHT YELLOW GREEN** - rose vervain leaves + stems
 - OLIVE** - butterfly milkweed flower stem leaves, soft golden aster leaves + petals, blue ash bark
 - DULL GREEN** - indian paintbrush leaves + stems
 - BRIGHT YELLOW** - yarrow, box elder, red bud flower, nettle root, prairie phlox petals, cardinal willow leaves, stiff goldenrod leaves
 - ORANGE** - red bud flowers, morning star florets, green thread leaves, sassafras bark
 - BLUE** - indigo

BACKPACK

everyone's got their own knick-knacks in their pack. packing is based on how you travel and how you live. will you build a fire? bring a hatchet. are you in a city? get food locations. how are you sleeping? eating? travelling? communicating? what time of the year is it? are there amenities where you are going? do you need those amenities? is there a lot of wait time? a lot of walking? think about packing light to start. everyone likes a light pack. essentials. then look at your secondaries. first aid kits can be extremely useful, as are natural rope, hankies, a knife, a small tupperware box, floss, a pen, notebook, water container.

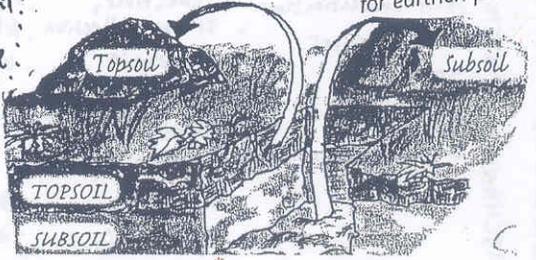
STRAW BALE OVERVIEW

Straw is not hay. hay is dried grass and is commonly feed to animals; it will degrade, rot and mold and harbor lots of living things that will eat it. straw is the dried stems of grain-bearing grass, currently considered a waste by-product; undigestible, tough, wetty. anywhere grain is harvested, so is straw. round bales don't work well, use square bales. the tighter the bale, the better. the drier the bale, the better. get more than you need and lift by the strings. bales are more fire-resistant than wood frame, loose straw is highly flammable and can be used as mulch. bale houses last a long time. let the stacked walls sit + compress for at least a week (month preferred) before building the roof or plastering the walls. frames can be load-bearing, post + beam, or hybrid - do research into what works best for you. don't overstuff your walls - they will bulge out. pinning, though helpful, is not necessary to build up sturdy walls. three-string bale dimensions are just like legos - get creative. make the walls trim before plastering. the wire mesh isn't very vital, but helps keep the plaster or cob mix on the bales. mix on the bales before plastering furthers adhesion.

C O B

is really easy to make. mix sand, water, clay-rich soil, and straw. usually starting with the soil + water on a big tarp. you gradually add straw and sand, mixing with bare feet. once the cob is tacky and malleable, not wet and soppy and not hard and crumbly. you make balls roughly grapefruit in size and put those on whatever you are making. be sure to pat it into shape and poke your fingers into the structure to weave the balls and straw together. if it starts slumping, let the mix dry a little bit and try again.

Subsoil usually contains higher levels of clay and lower levels of unwanted organic matter than topsoil. It is, therefore, usually the best source of material suitable for earthen plasters.

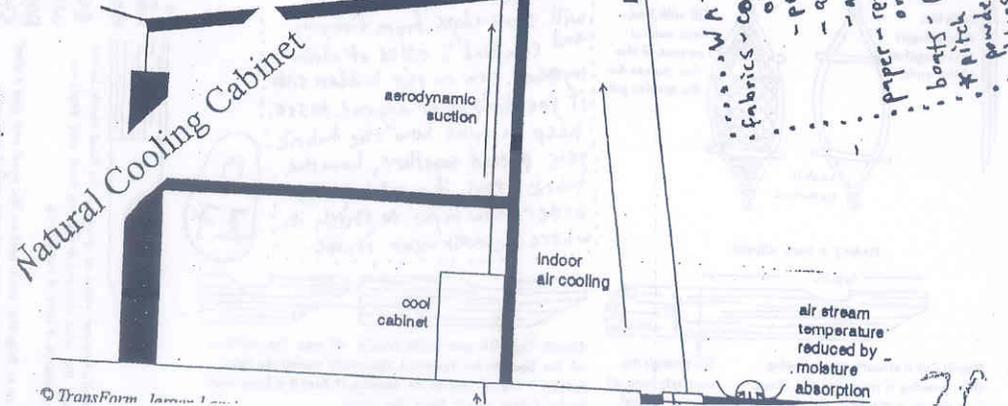


collect plants a day in advance, shred up dye parts and cover with water in dye pot overnight. an hour before dyeing, cook garment in other water and bring dye stuff to a simmer or low boil for about 10 minutes, if plant stuff is thick tough - 40 minutes. 15 minutes before the dye is ready, put garment pot on stove until steaming. once dye is ready, add the dye - 1 gallon to a quarter pound garment and bring to simmer/steam, wearing rubber gloves! squeeze excess water from garment, put in dye pot + wait half an hour as it steams/simmers, then take off heat and let cool naturally. Rinse garment clear, hang or set to dry out of direct light.

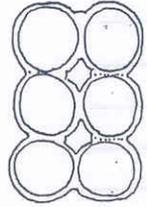
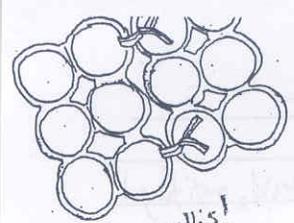
test out amounts of plant: fabric - a common starting point is 1:1. some people pre-soak fabric in solutions of tin, iron, or copper to hold color.

BROWN BAGS

- Large brown paper bags can be recycled treasures once we realize the full extent of their usefulness. Use them as trashcan liners, mailing wrappers and book covers. Uses of the versatile paper bag are endless.
- Save the money you spend on drip coffee filters by making recycled paper bag coffee filters. Cut a large circle from a brown paper bag and soak it in water. Fold the circle to make a cone, and put it into the drip coffee maker.
- If you don't drink coffee, you can use the paper bag drip method for your roasted grain beverages. Ground and roasted dandelion, chicory roots and barley all make a satisfying, tasty beverage, either individually or mixed.



- WATER PROOFING (with heat completely)
- fabrics - coat in husked oil, dry carefully
- oil is combustible, be careful
- proof with wax, rubbing it on (inside + outside)
- epoxy coat on fabric outer side
- an epoxy coat on fabric and brushed on - brittle
- any tree pitch melted and brushed on projects
- resin or wax to coat already written on projects
- melt the rubber on wax, until it sinks through
- paper - resin or resin or resin caulks wooden sailing boats
- boats - pitch, resin, or resin caulks wooden sailing boats
- pitch is made by boiling down sap and adding any wood powder or black ash - it's good for sealing any wood
- things like bowls, spoons, buckets, covers, etc.



- if building a fire, don't make a pit, make a mud and pits till all the micro flora and fauna up to 4 inches in. make a four inch high mound.
- lattices are hard to come by outside. dig a cat hole at least 6 inches deep and pack out any toilet paper or use leaves.
- what sticks are what sharpen your knives and hatchets. no need for spork-bought! look at the ground and find one that does the job.
- keep a notebook or similar pad to write in. you will find it invaluable for contacts, dreams, poems, slips of loose paper, survival notes... etc

- to extract beeswax put comb in a natural fiber bag with a stone inside. boil the bag and the wax will rise to the surface.
- have a store of medicinal plants or tinctures just in case. cover all emergent bases. dried plants stay more potent when out of sun and away from moving air. tinctures are best.

Compost Toilet

A generalized, continuous-process toilet. The baffle prevents fresh material arriving prematurely at the retrieval point.

Graphic from "Lifting the Lid", by Peter Harper and Louise Halestrap. Publisher: the Center for Alternative Technology Publications. ISBN: 1 898049 79 3 © CAT, Peter Harper.

- REPELLANTS.
- cedar keeps out moths.
- wild mint keeps out mice.
- green elder boughs repel rats.
- camphorated spirits repel mosquitos as well as citronella.
- sage leaves repel red ants.
- boiled poke root and molasses repel cock roaches typically.

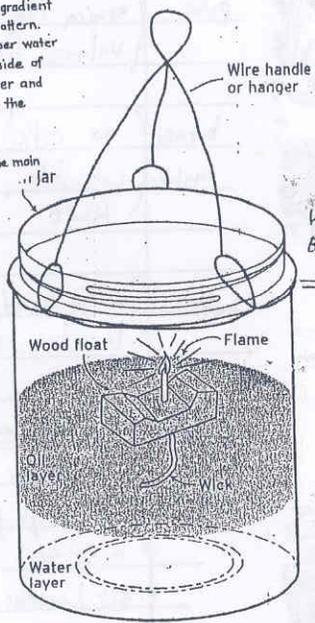
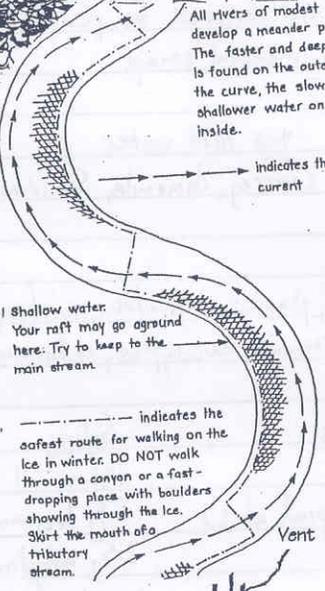
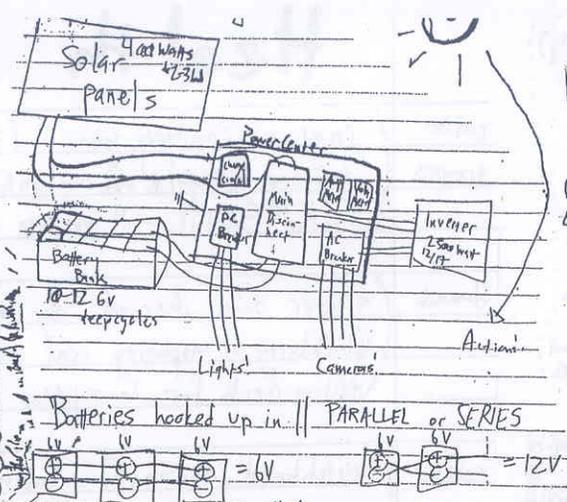
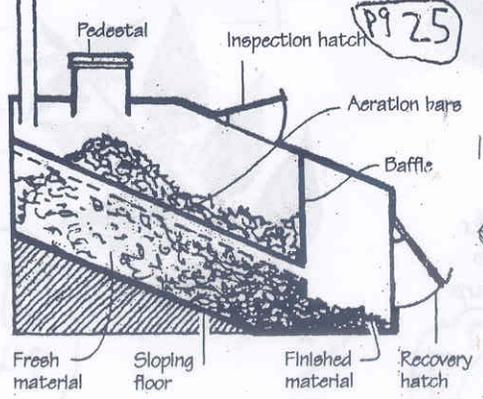


FIGURE 34: IMPROVED OIL LAMP



P925

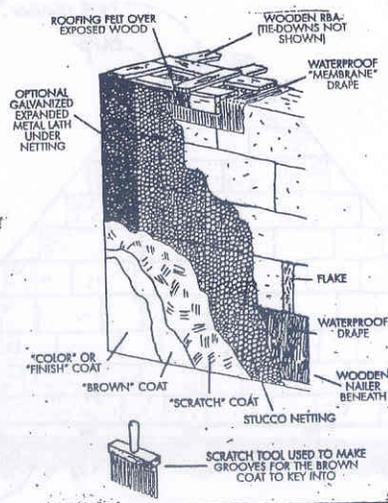
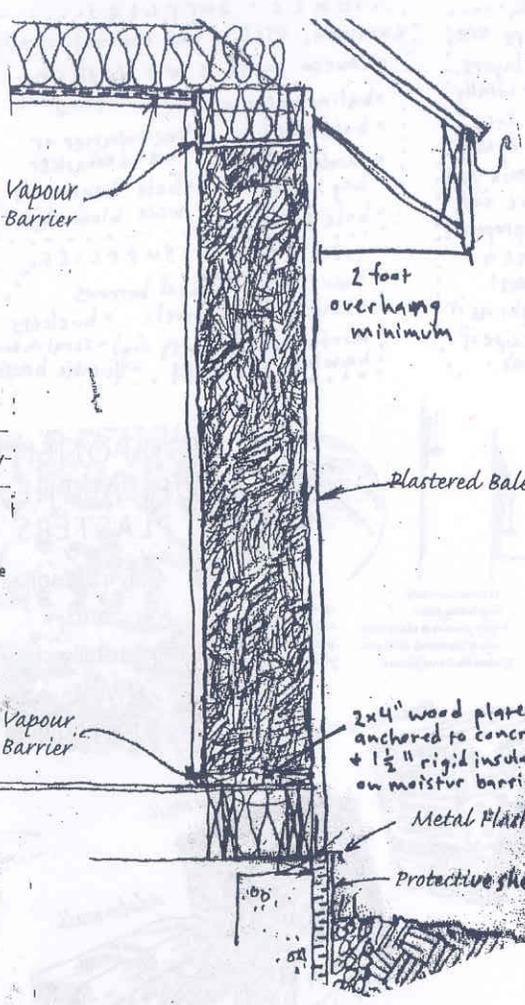


Figure 7-13. Plaster finish on a straw bale wall. Illustration from Build It with Bales by Moths Myhrman and S. O. MacDonald.

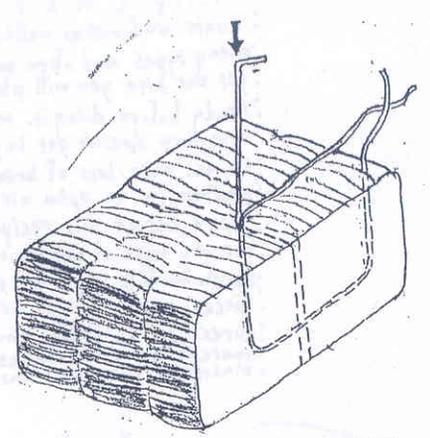
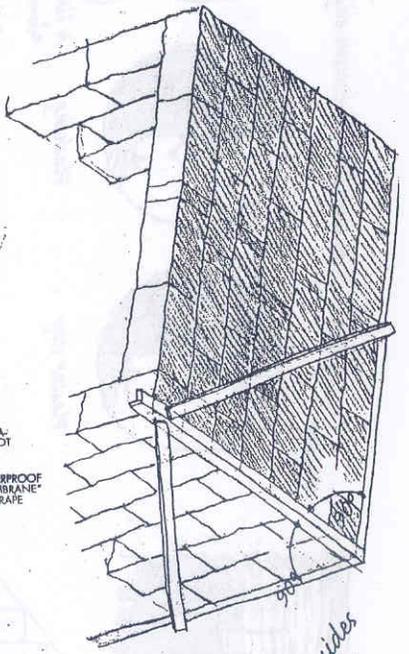


Illustration 17.5
A bale needle runs string through a bale before it is tied off and the old strings are cut.



Minimum 1/2" bale length. (Correct Method) ... are staggered. (Correct)

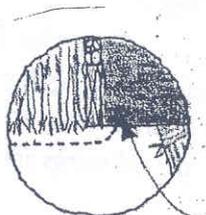
P96

PLASTER
 coats unfinished walls. there are many types and often many layers. get the site you will plaster totally ready before doing it. make sure the dust doesn't get in your eyes or lungs. take lots of breaks, mix your plaster in an open air place and get a decent mix recipe appropriate for the type of plastering. use a batch to fill in holes on least spaces, avoid direct sunlight as it cures (dries). change your recipe if there is a lot of cracks. don't plaster in freezing weather.

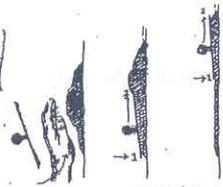
TOOL SUPPLIES
 common, useful, and optional (usually)
 • stucco meshes w → staples + staple guns
 • baling twine or wire
 • bale needles • line trimmer or weed whacker
 • garden shears or hay knife • bale beater or wide blunt object
 • bale tarps

PLASTER SUPPLIES
 • two (at least) wheel barrows
 • shovels and trowels • buckets
 • mortar boards (easy diy) • scratch tool
 • hawk • sponges • durable brush

3 good ways to establish the bottom edge of the plaster



A line on the foundation above the grade



Apply plaster to the wall by hand or trowel, or a combination of both

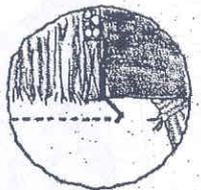


To trowel a smooth long-lasting finish
 1) Apply pressure to the trailing edge of the trowel, while you
 2) Move the trowel forward.

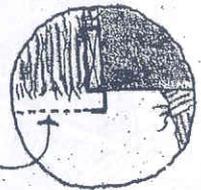


Your trowel pattern may vary depending on the look you want your wall to have.

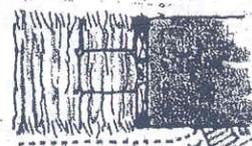
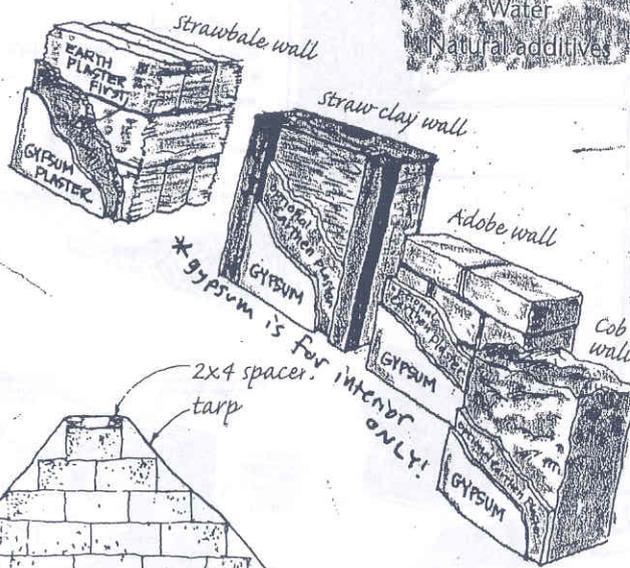
COMPONENTS OF EARTHEN PLASTERS
 Clay-rich soil
 Sand
 Fiber (usually straw)
 Water
 Natural additives



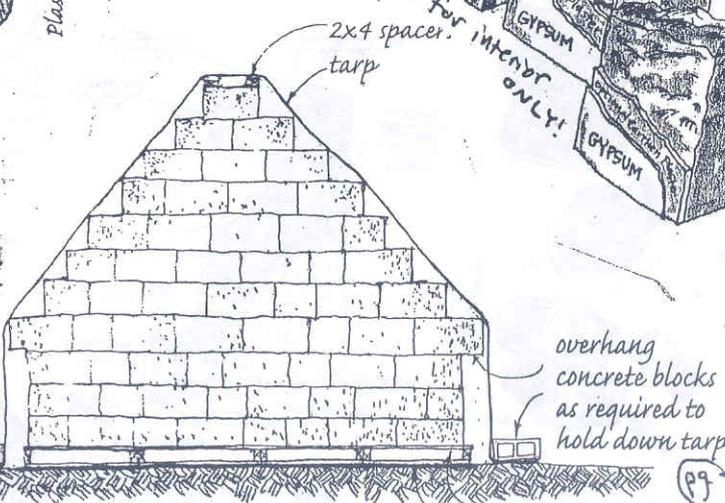
Flashing



Plaster stop



WRONG!



P9 7

Health

cuts (cayenne, comfrey, yarrow (stop bleeding))
 scrapes (tea tree + veggie oil - antimicrobial, antibacterial, antifungal)
TORMENTIL - all-purpose salve

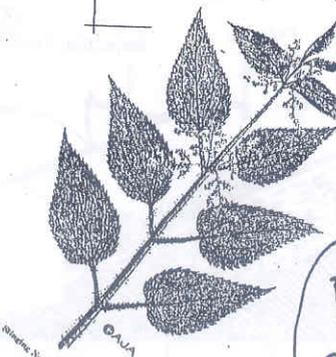
Stomach (ginger +/or charcoal for nausea)
 blackberry or raspberry leaf tea for diarrhea
 yellow dock for constipation

aches (witch hazel, arnica, St John's wort for cramped muscles)
 pains (arnica tea as compress for pain, swelling + discoloration)
 Valerian for menstrual cramps

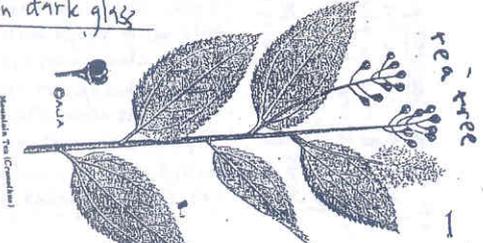
burns (no oils! yes cold water)
 rashes (calendula, comfrey, chamomile, St John's Wort, plantain, lavender tears - chills)
ALOE

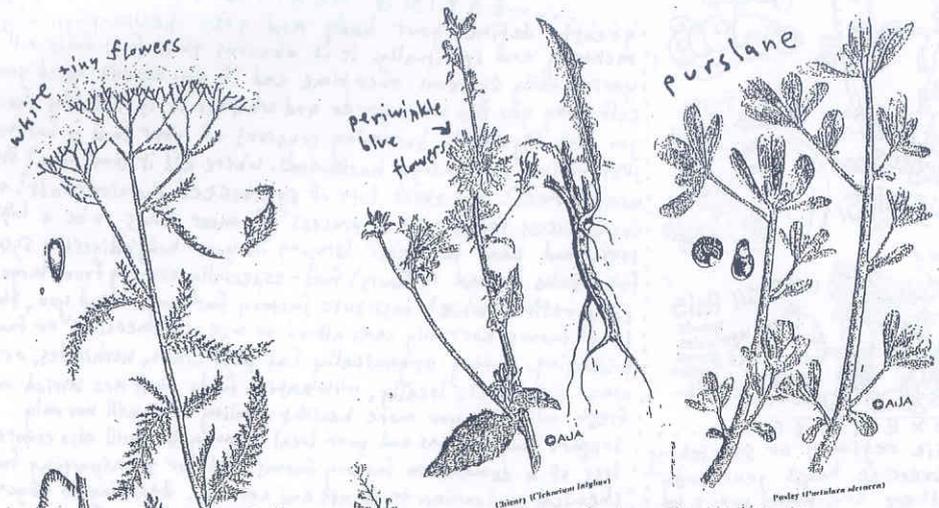
bugs! (witch hazel, plantain, grindelia, comfrey, lavender - itching)
 lavender, citronella, eucalyptus, cedarwood, lemongrass - bugs

Tinctures	Salves	Poultice Powder
1 c herb	100 ml oil	* dry herb
5 c high proof alcohol	25g bees wax	* grind into powder
* mix + seal	25g anhydrous lanolin	* save powder
* sit 2 weeks	* melt together	to use:
* strain + store in dark glass	45 ml tincture	* combine w/ water
	2g beeswax	to make paste
	* combine + warm	* apply topically
	* add tincture a drop at a time,	* cover loosely
	* store in dark glass	



P9 24





tormentil
Wild geranium (*Geranium macranthum*)

tormentil
Wild geraniums, which grow from Newfoundland to Georgia, west to Manitoba, Kentucky, and Tennessee in the East and in the West from South Dakota to British Columbia, southward into Nevada and California. Rarely throughout much of North America's Temperate Zone.

Uses: Wild geraniums were said to be the Indians' strongest analgesic; the green solution made from the powdered roots and water being especially valuable for dysentery and for internal hemorrhaging. It was also favored for drying up such sores as slowly healing ulcers. Crushed geranium roots were incised for poultices for such ailments as protruding piles and for arthritis, overexerted joints, sore feet, ruptures, and the like.

A tea steeped from the roots was perhaps the most widely used health control substance taken internally; the drinker being thought to be safe from pregnancy for at least a year.

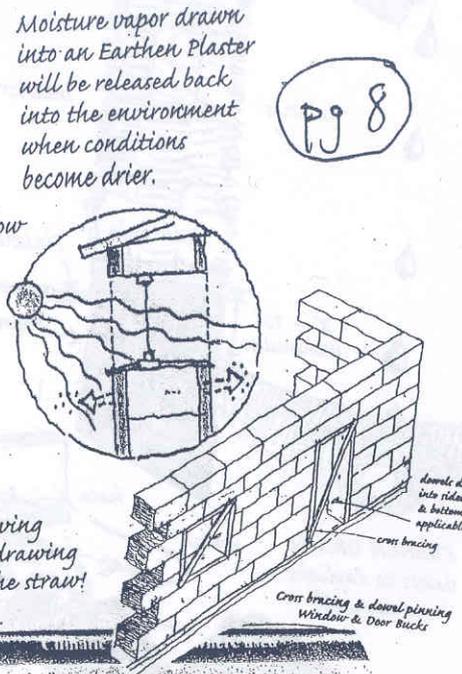
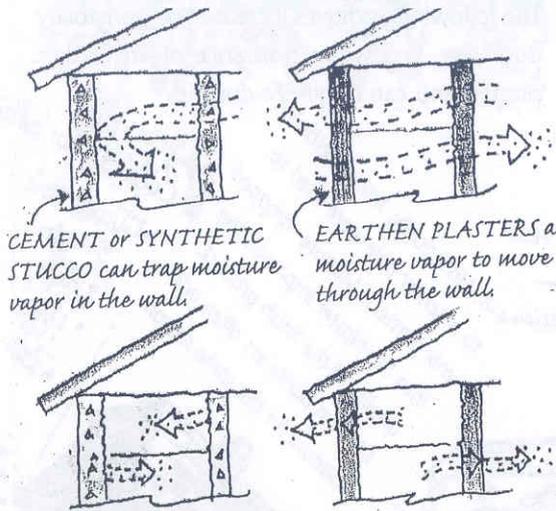
Household geraniums, incidentally, are members of the same family but are of a different, also large species known as *Pelargonium*. Root tea from the wild geranium was considered effective for delicate stomachs, neuralgia, as a diuretic, and for compresses kept damp for lumps, for bleeding wounds, infectious sores, and piles.

When dried, the roots could be ground into a purplish brown, generally chocolate-colored powder, not always, due to diarrhoea, dysentery, cholera, and the like. Some 75% of the weight of the dried leaves, too, were held to be valuable as mouthwashes for sore throats.



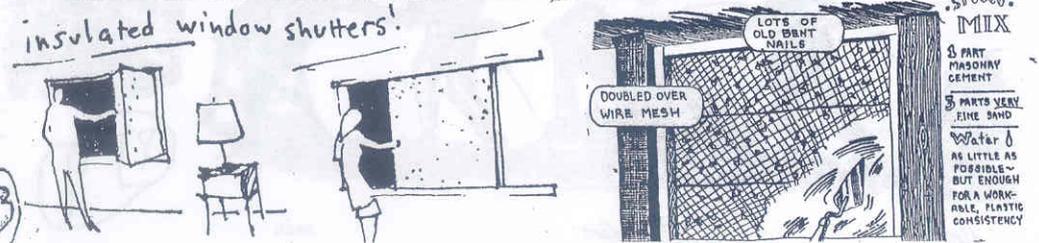
Uses: The leaves, stems, and bark are all used to prepare richly flavoured teas, which have been used for everything from diarrhoea to cholera. The fresh leaves are used for compresses, sprays, lozenges, and juices which make them especially useful in high concentrations of tannin to soothe sore throats and swellings. Infusions made from the stems are used for bleeding in the stomach, as for ulcers, and in an ointment for rheumatism. The infusions are also used as a made from the steeped leaves, stems, or bark with medicinal purposes.

Uses: The leaves, stems, and bark are all used to prepare richly flavoured teas, which have been used for everything from diarrhoea to cholera. The fresh leaves are used for compresses, sprays, lozenges, and juices which make them especially useful in high concentrations of tannin to soothe sore throats and swellings. Infusions made from the stems are used for bleeding in the stomach, as for ulcers, and in an ointment for rheumatism. The infusions are also used as a made from the steeped leaves, stems, or bark with medicinal purposes.

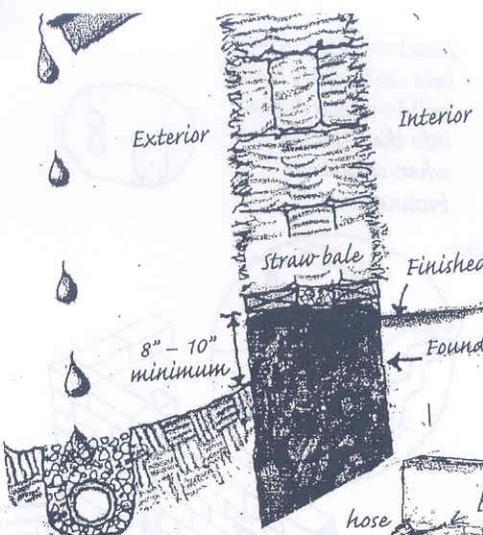


STRAW is more water-loving than CEMENT - thus straw draws moisture vapor from the cement.
CLAY is more water-loving than STRAW - thus drawing moisture vapor from the straw!

Material	Composition/Properties	Used for	Climate
Clay	Indefinitely recyclable; breathes (or throughflow); resistant to high heat and humidity; permeable; high resistance	floors; walls; roofs; dome construction	all
Plaster	Rounded clay + gravel	floors; walls	all; found everywhere but in Greenland
Adobe	clay + straw + fine gravel for blocks; brick laying	walls; vaulted constructions (parabolic); floor separation	all
Colt	clay + straw + fine gravel	floors; walls; internal fire protection for thatched roof	all
Bricks	clay; burnt; absorbs less humidity than dried compressed; more impermeable; higher tensile strength; lighter than concrete; crystalline water components are evaporated; irreversible process (lower recyclability)	floors; walls; roofs; terraces; ceilings; roofs	all
Compressed Earth	clay + gravel; compressed; high compressive tensile strength; easy to handle and produce	walls; vaulted constructions	all
Wood	Cellulose; easy to work with; good insulator; light; high tensile strength; flammable; renewable (to which degree depends on local conditions and abundance)	load-bearing constructions; roofs; walls; roofs; foundations; stairs; windows; doors; inventory	all; wood construction; below the timber line. Note in humid tropical climates, the wood can rot in elevated constructions. Rot and vermin pose problems in and require use wood only for roof construction, windows, doors (doors). Wood requires an antiseptic regulation.
Straw	Cellulose; easy to work with; good insulator; lightweight; though flammable in itself, more fire resistant than concrete when properly baled and plastered; high earthquake and wind resistance; high strength in relation to weight	walls; composite for floors; walls	everywhere where straw is naturally available; low suitability in humid tropical climates (problems with rot).
Mortar	lime + sand	foundations; walls	all
Pumice Stone	lightweight; easy to work with (soft); relatively insulating; porous (high air throughflow, breathes)	insulation (also in pulverized form in insulation)	can be used everywhere, but is not found in many places
Sandstone	lightweight; easy to work with (soft); porous	walls; foundation; inventory	vulnerable to cold and humidity, not in humid/cold climates
Granic	granite powder (also humidity in insulation); gravel	walls; foundations; inventory	all places where found



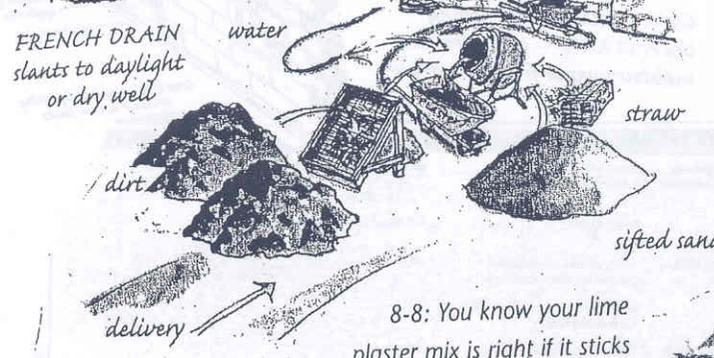
© Kaitia Hayward. Remediation of chart is authorized with invitation of author's oversight.



The following additives increase the workability, durability, and water resistance of an earthen plaster, and can minimize dusting:

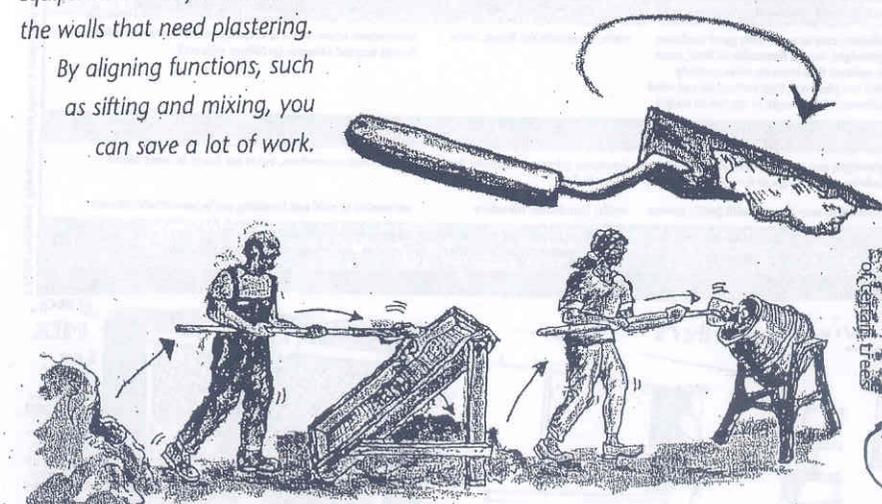
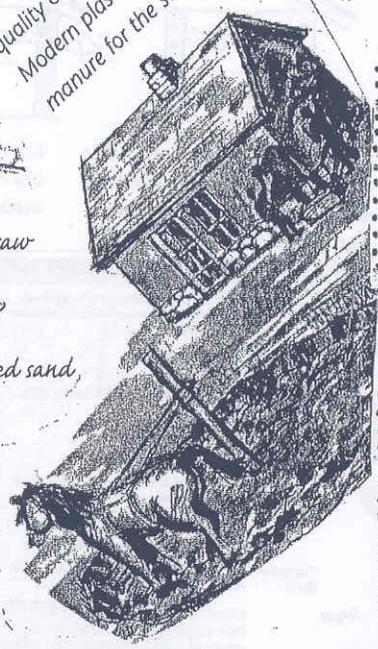
- Cactus juice
- Cooked flour paste
- Gum arabic
- Alum
- Kelp
- Lime
- Oils

8-8: Historically, horses tethered to a center pole were used to mix plasters. Manure dropped into the plaster improved the quality of the finish product. Modern plasterers often add manure for the same reason.



5-1 (a) (b): A well-organized work site is safe and efficient. Organize materials and equipment so they are close to the walls that need plastering. By aligning functions, such as sifting and mixing, you can save a lot of work.

8-8: You know your lime plaster mix is right if it sticks to a trowel when turned upside down. If it drips off, it is too wet and will very likely shrink and crack as it cures.



These additives increase the plasticity and strength of plaster by adding fiber:

- Animal hair
- Cactus juice
- Gum arabic
- Kelp
- Lime
- Oils
- Straw
- Sifted sand



EXERCISE
a basic regimen of stretching and exercise helps your body out. there are many ways to get the blood flowing and your muscles moving. let your exercise develop your body as well as your mind. let it be something you enjoy and look forward to.

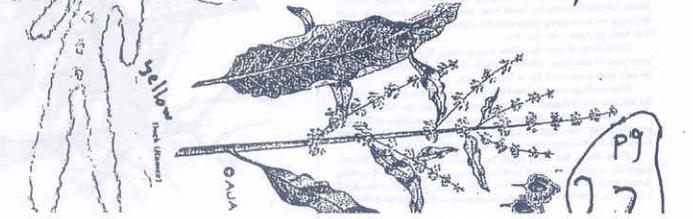
REDUCE • REUSE • RECYCLE
this can be applied not only in waste reduction but in all facets of life. first, prevent accumulation; then minimize it. re use what you have - give it new meaning, recycle it into the possibly flawed system to produce something else, only if you HAVE TO, do you use it as a fuel for raw energy or worse, dump it. there are sustainable ways to deal with weight.

PLANT I.D. ING... can be easy or hard. the best way to learn is from someone who knows. the next best is to get a local field guide, if you are starving in the wilderness, watch what big animals eat and try a TINY bit and wait for a day to see if you get sick. gradually increase the amount if you don't get sick. some parts of plants are not as edible as their counterparts. know what you can eat & don't eat potato seeds!!

EATING HABITS... greatly define your body and your health - physically, mentally and spiritually. it is obvious that fast foods kill your bodily systems overtime and if you haven't asked yourself why you eat what you do and whether it is a healthy choice, you probably should. becoming conscious of your food is not hard, just follow the energy backwards. where did it come from? how was it made? are there lots of synthesized chemicals in it? are there excess toxins used to process it? meat tends to be a highly toxic and hard to digest (staying in your body's digestive system for weeks instead of hours) food - especially coming from large corporations which institute factory farming. mind you, the local farms normally can't afford to use commercials or fancy packaging, eating organically (no pesticides, herbicides, or other chemicals), locally, with native foods that are varied and fresh will give you more health vitality and will not only support small farms and your local economy, but will also create less of a demand to factory farms, oil for transporting food, chemical production to plants and animals. deciding to boycott actions you don't believe in may seem hard at first but become routine with practice. decide what you believe in and follow it.

LEVELS OF VEG HABITS... first and most common is the omnivore. omnivores eat plants and animals and the animal byproducts (eggs, milk). next is the vegetarian. there are pesca vegetarians who eat fish only as a source of meat and vegetarians who eat chicken as a source of meat. veggies tend to eat plants and animal byproducts. their protein and iron come from dark green veggies, eggs, nuts, seeds, grains and beans. next are the vegans who don't eat animals or their byproducts. then are the raw foodists whose only rule is to never cook food - they may be omnivores, veggies, or vegans. then there are fruitarians who respect the sentient nature of plants and eat a mostly fruit and nut and seed diet. everyone has different reasons for why they eat what they do. listen to what your body says and follow it the best you can.

ILLNESS PREVENTION... it has been said that if one eats right, sleeps enough, and breathes deeply, one will never get sick. drink lots of good water to flush out toxins and eat enough fiber to vacate the bowels regularly. thinking positive thoughts also tends to lighten things up and happiness is certainly a helpful factor for staying healthy.



P99

P99

... volunteer-run non-organization that picks up donated food from local businesses and dumpsters that would otherwise get thrown out and prepares it for the community in a public space, most towns have one at least once a week (bigger the city - the more days and places there are). anyone can start one and anyone can eat their free vegetarian fare. there are a lot of resources online for locations and finding people to set up a new location where you reside. they are commonly put in high traffic parks, in front of government buildings, or in front of invading food conglomerates.

can be extremely fun. Take precautions though because it is illegal. Keep a lookout for anyone who might see. you go in or out. get in & out quickly. don't be afraid to get inside and shovel around; just watch for glass, needles, or other potentially hazardous shit. a little mold isn't bad for you, a lot of mold is. an escape bike or vehicle is a good idea, especially with large pick-ups. some people don't care that you're digging in their trash, some do. A LOT. respect their wishes, or don't be seen. bring a buddy for lookout & handing stuff to or digging. if you get caught, stay calm & be courteous if you can be. some people are just curious.

NUTRIENT COMBINATION... like plant companions, nutrients work better in your body when combined with others. simply put, the foods that grow well together are best eaten together. if you are eating things that don't grow from the ground, some good pointers are. don't eat calcium with iron - they cancel each other out; drink water with water soluble vitamins - especially B and C. eat fatty food with fat soluble vitamins - also with iron and minerals. try to balance out the simple carbohydrates, complex carbohydrates, fats and proteins - all are needed, but each body is different.

- about 3/8 cup fluid measure
- about 1/4 cup dry measure
- 3/4 ounces of milk or yogurt
- slightly more than 1 cup leafy vegetable
- 3/4 cup root vegetable
- 5 1/2 ounces nuts, seeds
- 2/3 cup of sliced fruit
- 1/2 cup cereal grain, uncooked
- 7 tablespoons cooking oil
- 5 tablespoons honey, molasses

BE WELL
listen to your body. play. eat. sleep. breathe.

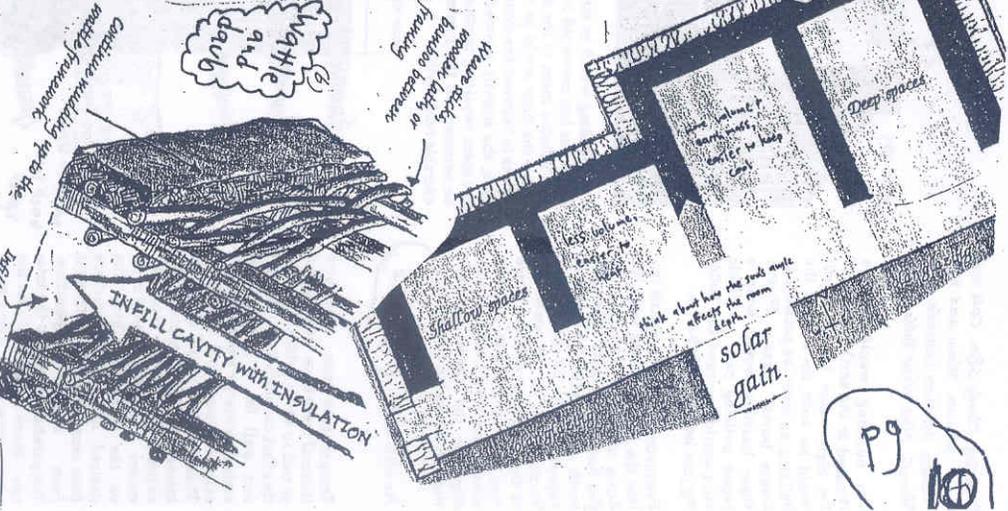
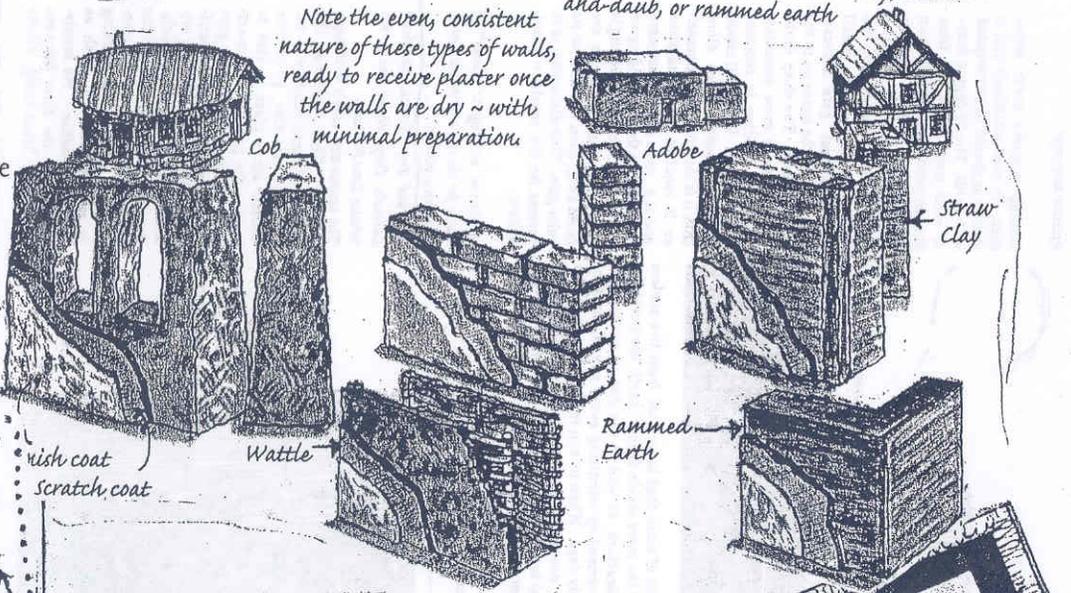
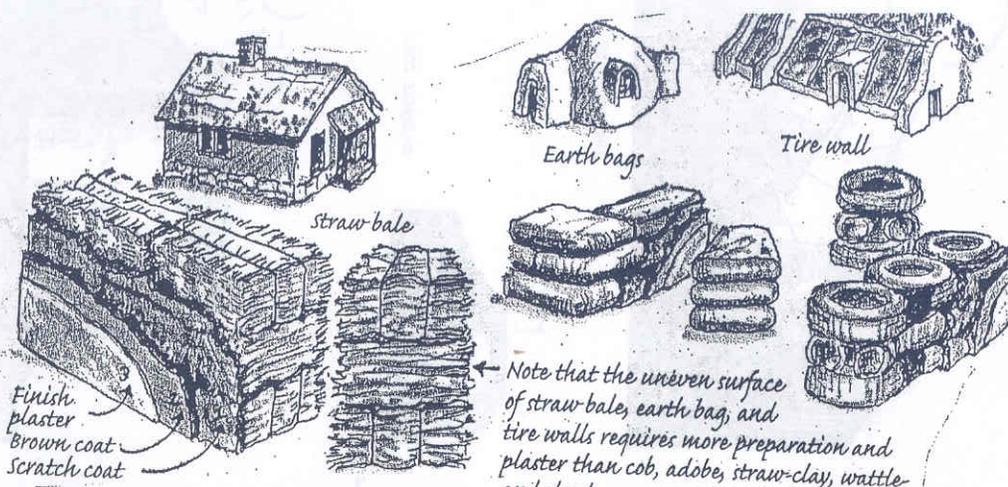
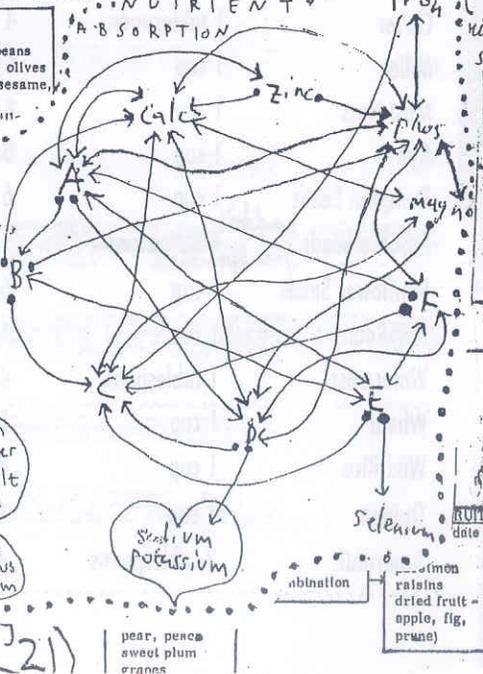
HUMAN NUTRITION

- A. dark green leafy veggies, orange veggies & fruits
- B. complex whole grains, nutritional yeast, nuts, seeds, beans, nori
- C. citrus fruits, dark green leafy vegetables, red veggies & fruits
- D. sunflower sprouts, mushrooms, seaweed
- E. nut & seed oils, especially peanuts, almonds & sunflower
- F. hempseed, wheat, kelp, dark green leafies - esp. turnip greens & arugula
- G. peppers, dark fruits, lemon juice
- H. calcium - almonds, kelp, nutritional yeast, seeds, figs, oats, legumes
- I. iron - kelp, molasses, whole grains, nuts, seeds, raisins, almonds
- J. potassium - kelp, dates, figs, garlic, avocado, banana
- K. selenium - whole grains, garlic, mushrooms, molasses, beer, nuts
- L. zinc - whole grains, nuts, ginger, seeds, beans, legumes
- M. fats - banana, avocado, nut butter

PROTEINS
nuts (most)
grain cereals and beans
soybeans, peanuts, olives
seeds (sunflower, sesame, pumpkin)
sprouts / alfalfa

poor c except acid f
2 phos. 5 calc. 2.5 mag. niacin
1 D. 10A

ACI
grr
le
or
plr
poms
sour plum
tomato



Prevailing Cloudy Skies, Cold and Damp Winters, Warm and Wet Summers, Northern Latitude, Low Altitude, High Water Table.

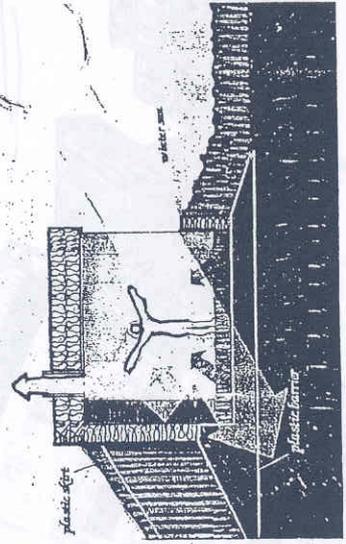
The building would not be recessed in the earth because of the high water table. Earth would be built up around the building as much as possible to create burial mass. Plastic vapor barriers would wrap a raised building pad, a plastic skirt would surround the building just below finish burial.

Perimeter insulation would isolate the interior mass from the damp cold earth down to about five feet below burial. Here at earth temperature is stable at approximately 58 degrees F. Vertical glass on the south side of the building would maximize very low winter sun. Higher winter sun would still be welcome in the space to store warmth for cooler, cloudy days.

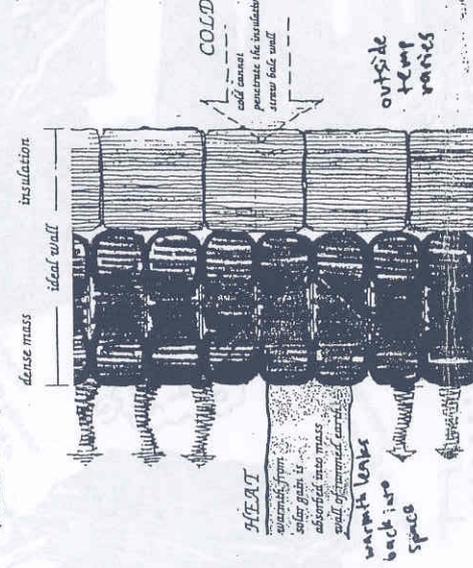
99

An Ideal Wall

Temperature can transform thermal mass from warm to cool or cool to warm while it has little effect on insulation. The perfect wall for a shelter that embodies energy would incorporate both mass and insulation. Thermal mass would be on the inside to initially "capture" the desired temperature from any source. Insulation would occur on the outside to keep the desired interior temperature from escaping and to separate it from outside temperature. Temperature stored in the interior dense mass stabilizes the temperature of the living space creating comfort in that space.



This building would be built of mass that is isolated from the surface dampness but connected to the more stable deeper earth temperature. The isolated mass of the structure as well as the deeper earth mass under the floor would be warmed by admitting every ray of sun that shines in between the cloudy days. When no sun is shimmering on winter days, the slightly warmed, deeper earth temperature would stabilize the space requiring minimal back up heating. Very little cooling would be necessary in the summer and this would easily be handled by the operable roof skylight.



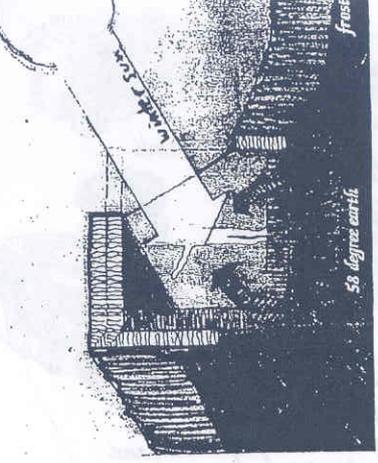
Necessity buildings

Cooling requires earth exposure. To most effectively cool a shelter, it should be surrounded with earth. The 58 degree deeper earth mass is not far from the temperature of the human comfort zone. Because the surrounding earth mass tends to stabilize the temperature in the living space, only a small amount of heat gain is necessary to bring the space up to the comfort zone. The deep earth temperature is more accessible when the building is recessed into the earth. When soil conditions and water tables allow this, it is the preferred approach as it requires less insulation and is a more simple, economical structure than a building on the surface. Where no heating is required, buried buildings are faced away from the sun for no solar gain. This discussion is in reverse for the southern hemisphere.

A thermal building is "tuned" to reach for the sun and/or the Earth as climate requires.

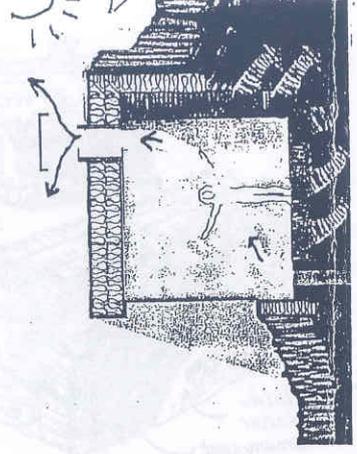
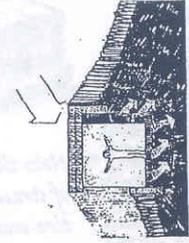
Hot and Dry climate, Southern Latitude, Deep Water Table, No Winter, Low Altitude.

The spaces are small with high ceilings. This increases the amount of mass relative to air volume. It also gives the warmer air a place to rise to leaving the potential of maximum cooling in the lower part of the space which is surrounded by cool mass. Clearing is oriented away from the sun resulting in no solar gain to warm the mass. Only the cooling phenomenon occurs. The building is recessed into the Earth as much as possible. No insulation under the floor between earth and living space allows



radiant heat

directional cool



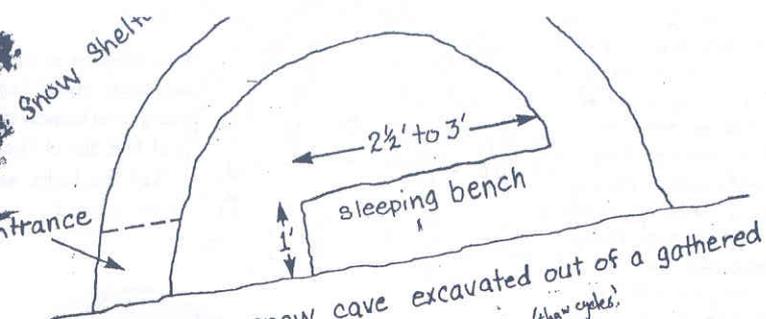
SPROUTING CHART

Seeds	Quantity	Soaking Time	Sprouting Time	Yield
Alfalfa	3 tablespoons	4 to 6 hours	5 days	3 cups
Anise	3 tablespoons	4 to 6 hours		1 cup
Most Beans	1 cup	8 to 10 hours	3 to 4 days	3 to 4 cups
Buckwheat	1 cup	4 to 6 hours	24 hours	2 to 3 cups
Chickpeas	1 cup	10 to 12 hours	2 to 4 days	3 cups
Corn/	1 cup	8 to 10 hours	2 to 3 days	2 cups
Fenugreek	4 tablespoons	4 to 6 hours	3 to 5 days	1 cup
Flax	Kind of jellifying 1 tablespoon	5 to 7 hours	2 days	1 cup
Green Peas	1 cup	10 to 12 hours	2 to 3 days	2 cups
Lentils	1 cup	6 to 8 hours	2 to 3 days	2 cups
Mung Beans	8 to 10 hours	1 cup	4 days	3 to 4 cups
Mustard	1 tablespoon	4 to 6 hours	3 to 5 days	1 cup
Onion	1 tablespoon	4 to 6 hours	4 to 5 days	1 cup
Oats	1 cup	8 to 10 hours	1 to 2 days	2 cups
Radish	1 tablespoon	4 to 6 hours	3 to 5 days	1 cup
Barley	1/2 cup	8 to 10 hours	2 to 3 days	1 cup
Cabbage	1 tablespoon	4 to 6 hours	4 to 5 days	1 1/2 cups
Chia	1 tablespoon	4 to 6 hours	3 to 5 days	1 1/2 cups
Clover	1 tablespoon	4 to 6 hours	4 to 6 days	2 1/2 cups
Millet	1 cup	6 to 8 hours		1 1/2 cups
Most Nuts	1 cup	8 to 12 hours	do not sprout	1 1/2 cups
Rye	1 cup	8 to 10 hours	2 to 3 days	2 1/2 cups
Pumpkin Seeds	1 cup	6 to 8 hours	1 to 2 days	1 1/2 cups
Sesame Seeds	could get sprouted	1 to 2 days		1 1/2 cups
Sunflower Seeds	1 cup	6 to 8 hours	5 to 8 days	1 1/2 cups
Soy Beans	1 cup	10 to 12 hours	4 to 5 days	2 1/2 cups
Watercress	1 tablespoon	4 to 6 hours		1 1/2 cups
Wheat	1 cup	10 to 12 hours	2 to 3 days	1 1/2 cups
Wild Rice	1 cup	8 to 10 hours	4 days	1 1/2 cups
Quinoa	1 cup	4 to 6 hours	2 to 3 days	2 1/2 cups
Amaranth	3 tablespoons	4 to 6 hours	24 hours	3/4 cup

PT 20

...SPROUTING.
 Sprouts are awesome. They are tiny, super nutritious, and easy peasy to grow. In any clean container, pour water into it, pour the seeds or beans in and let it closed for a certain amount of time. Where the seeds can wake up in a dark place. Dump out the water (or drink it, water plants, cook with it...) then rinse the little guys with one or twice a day till it sprouts. Hoo Ray! Sprout

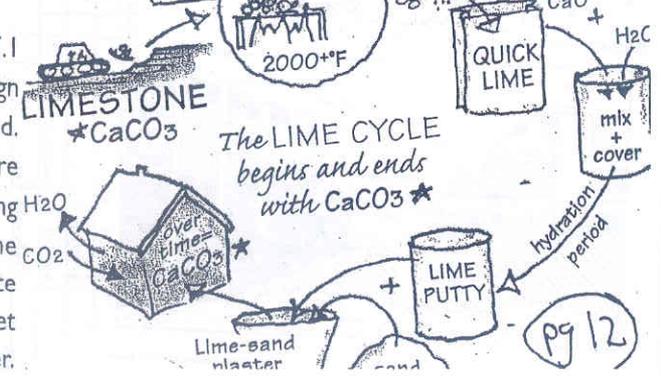
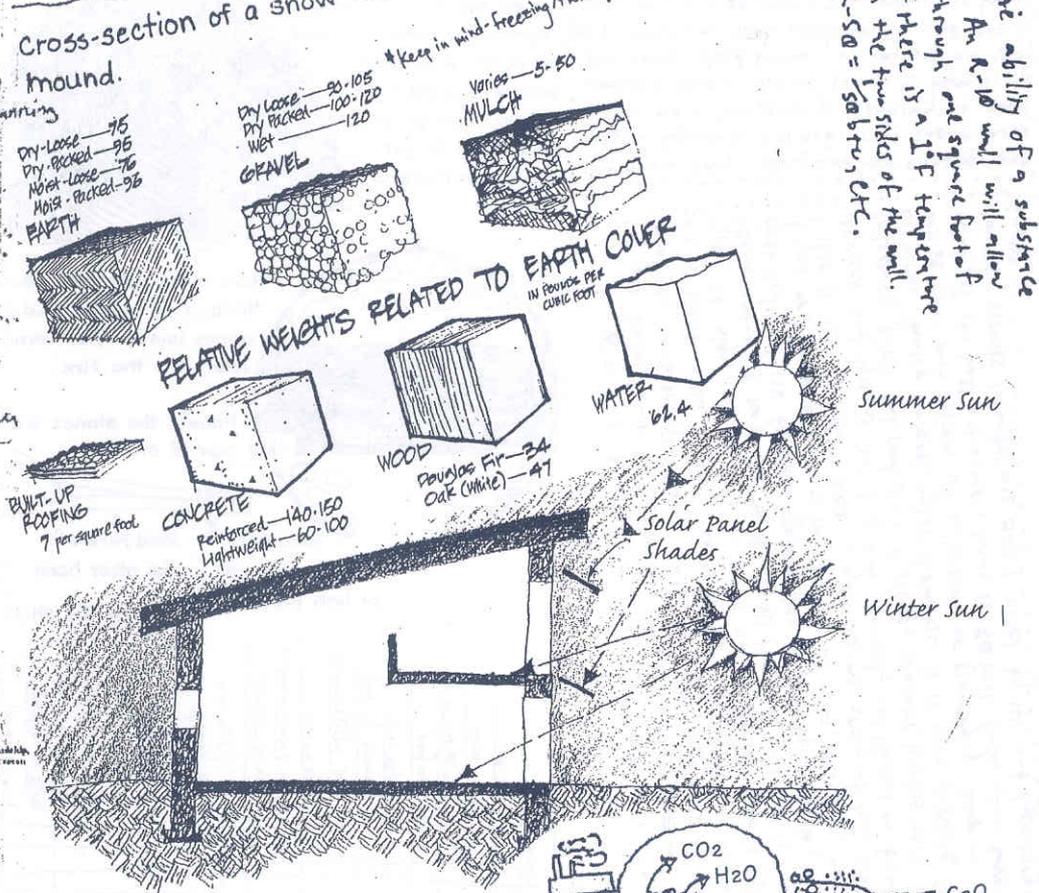
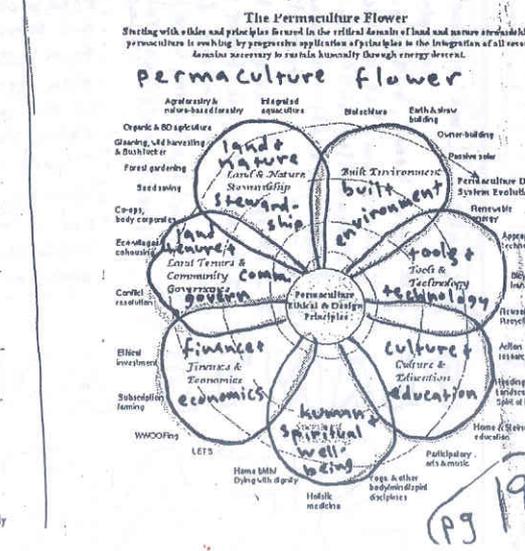
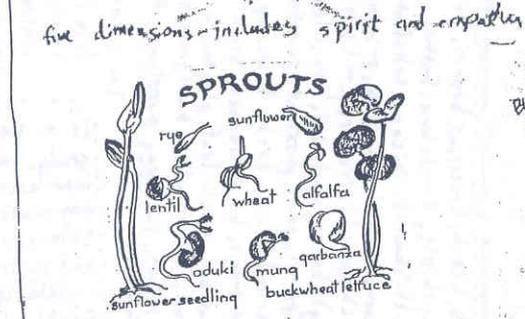
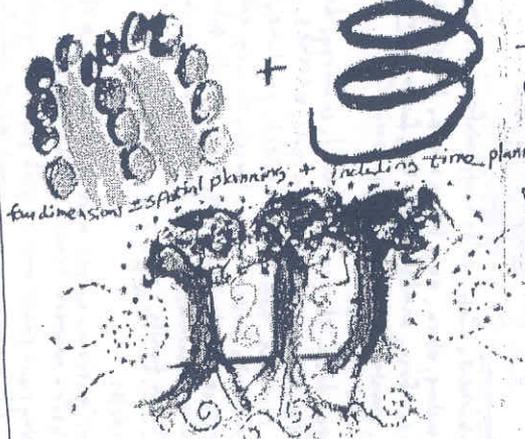
AGRICULTURE - 5 dimensional



R-VALUE is the ability of a substance to resist heat flow. An R-10 wall will allow 1/10 of one Btu through one square foot of wall in an hour if there is a 1°F temperature difference between the two sides of the wall. R-30 = 1/30 Btu, R-50 = 1/50 Btu, etc.

18. GARDEN PROBLEM GUIDE

Symptoms	Possible Cause	Possible Cures
Dying young plants	Fertilizer burn Disease (damping-off)	Mix fertilizer thoroughly with soil. Treat seeds; don't over-water.
Stunted plants pale to yellow	Low soil fertility Low soil pH (too acid) Poor soil drainage Shallow or compacted soil Insects or diseases Nematodes	Soil test for fertilizer recommendations. Soil test for lime recommendations. Drain and add organic matter. Flow deeper. Identify and use control measures. Soil test for treatment recommendations.
Stunted plants purplish color	Low temperature Lack of phosphorus	Plant at recommended time. Add phosphorus fertilizer.
Holes in leaves	Insects Hail	Identify and use control measures. Be thankful it was not worse.
Spots, molds, darkened areas on leaves and stems	Disease Chemical burn Fertilizer burn	Identify, spray or dust, use resistant varieties. Use recommended chemical at recommended rate. Keep fertilizer off plants.
Wilting plants	Dry soil Excess water in soil Nematodes Disease	Irrigate if possible. Drain. Soil test for treatment recommendations. Use resistant varieties if possible.
Weak, spindly plants	Too much shade Too much water Plants too thick Too much nitrogen	Remove shade or move plants to sunny spot. Seed at recommended rate. Avoid excess fertilization.
Failure to set fruit	High temperature Low temperature Too much nitrogen Insects	Follow recommended planting time. Follow recommended planting time. Avoid excess fertilization. Identify and use control measures.
Tomato leaf curl	Heavy pruning in hot weather Disease	Don't. Identify and use control measures.
Dry brown to black rot on blossom end of tomato	Low soil calcium Extremely dry soil	Add liming material. Irrigate.
Misshapen tomatoes (catfacing)	Cool weather during blooming	Plant at recommended time.
Abnormal leaves and growth	2, 4-D weed killer	Don't use sprayer that has previously



ALLIUM - chives, garlic, leeks, onion, shallot

- BEEF -** beet, chard, mangels, oraches, quinoa, spinach
BRASSICA - brussica, broccoli, brussels sprouts, cabbage, cauliflower, collards, kale, kohlrabi, mustard, radish, rutabaga, turnip
CUCURBIT - cucumber, gourds, melon, pumpkin, squash, zucchini
GRASS - barley, corn, millet, oats, rice, rye, sorghum, wheat
MINT - basil, peppermint, spearmint
MIGHT SHADE - eggplant, pepper, potato, tomato*
PARSLEY - carrot, celery, cilantro, coriander, fennel, parsley, parsnip
PEA - bean, compe, fava, garbanzo, lentil, pea, peanuts, runner bean*
SUNFLOWER - artichoke, cardoon, endive, lettuce, salsify, sunflower

- UNMATCHED**
 ♡ brussica, beet, parsley, sunflower
 X pea
 ♡ pea, allium, brussica, sunflower, cucurbit
 ♡ allium, beet, nightshade, mint, pea, sunflower
 ♡ beet, grass, parsley, pea, sunflower
 X night shade
 ♡ brussica, cucurbit, nightshade, pea
 ♡ brussica, night shade
 ♡ allium, grass, mint, parsley, pea
 X cucurbit, sunflower
 ♡ allium, cucurbit, nightshade, pea, sunflower
 ♡ cucurbit, grass, nightshade, parsley
 X allium
 ♡ brussica, cucurbit, parsley, beet, allium
 X night shade

*exceptions: tomato ♡ allium, mint, parsley X brussica, potato runner beans. X allium, beet, brussica, sunflower ♡ grass

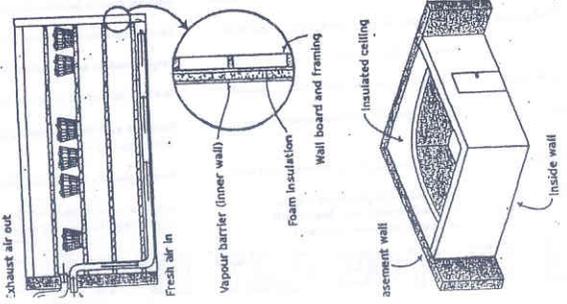
EAT STUFF!

- DISEASE STOPPERS: alliums, nasturtiums, comfrey
- PEST STOPPER: catnip, elderberry, mint, nasturtium, horseradish, manigold, flax, tomato leaves, tea!
- QUICK SPREADERS: black berries, lamb's quarters, horse radish, mint
- GOOD GREEN MANURE: flax, spinach, lamb's quarters
- grass increases other plants' oil production & vigor
- nasturtiums are a spicy flower that grows best in poor soil - High in Vit-C!
- stinging nettle is super nutritious and highly fibrous, can only be eaten after boiling!
- potatoes are very prone to illnesses and pests
- pot compost and elderberry close together to speed up decomposition
- dried nettle help preserve & ripen apples

AVERAGE SEED STORAGE TIMES

Seedable 1 Year	2 or 3 Years	4 or 5 Years
Asparagus	Beet	
Bean	Cabbage	
Carrot	Cauliflower	
Corn	Cucumber	
Corn	Eggplant	
Corn	Lentils	
Corn	Mulmudon	
Corn	Pumpkin	
Corn	Squash	
Corn	Squash	
Corn	Turnip	
Corn	Tomato	
Corn	Wormwood	

FIGURE 18a: BASEMENT ROOT CELLAR



NO BLACK CISTERNS

glass containers may be better than plastic!
 keep in mind: pressure of hot water!

Corrugated roofing

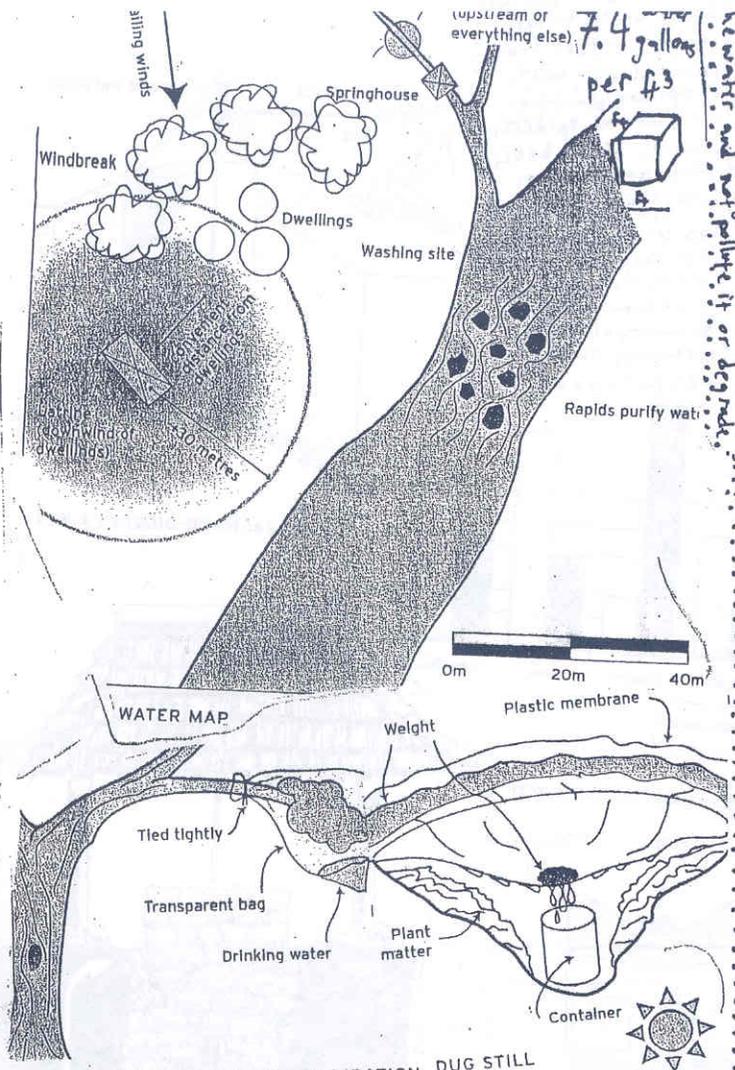
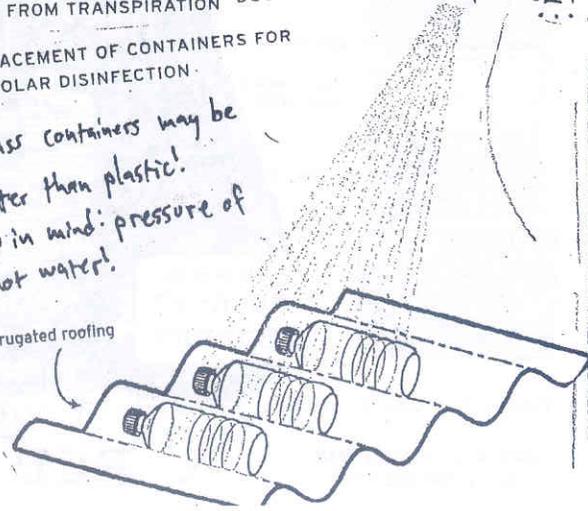


CHART 1: EFFECTIVENESS OF WATER TREATMENT METHODS

METHOD	SALTS	PATHOGENS	ODOR & TASTE	TURBIDITY
STRAINING	X	X	X	X
ALUMINUM	X	X	X	X
STORAGE	X	X	X	X
BUILDING	X	X	X	X
SOLAR DISINFECTION	X	X	X	X
CHLORINE	X	X	X	X
DISTILLATION	X	X	X	X
SLOW SAND FILTER	X	X	X	X
RAPID SAND FILTER	X	X	X	X

KEY: X ineffective, X somewhat effective, X very effective
 For a more detailed comparison, see: (1981) Tropical Brief 408

... WATER FILTRATION AND STORAGE E...
 When one decides to collect their water, filtering and storing becomes sort of necessary, there are two types of filtering that need to happen: bacterial and viral. Bacterial filtration is relatively easy - first filter out the chunky stuff like leaves and algae with a cloth or coffee filter. If you think, then you can distill the water, or use various other methods (that tend to not be as effective). In the past years (at least 30 years) a system of plant filtering has evolved and proven itself. It's not only for individuals, but for small towns en masse. Water can also be filtered through varying sized rocks and sand, to filter out tiny bits of viruses, the water must be exposed to UV light for an extended period of time (if using the sand or a short flash if using a concentrated UV light). If your water comes from a well or stream, test the safety of the water - or store water for extended periods of time, never use black cisterns, use food grade containers or build one out of plastic or underground - there are many options for creating cisterns. Make sure the walls will hold the water and not pollute it or degrade.

in pots, milk cartons, paper boxes, cut up water bottles or plastic containers, glass jars for sprouting, cup bags, plastic bags, news paper, paper bags, wind, pollination, planters, cinder blocks, trees, vines, bushes, compost, veggies, fruit, native plants, nuts, companion planting, bugs, worms, spiders, humus, birds, bees, sun, rain

lots can be done outdoors, but don't go ripping out what's already there to plant something else. Be wary of quick spreading plants!

Sprouts & herb gardens do well indoors, hanging gardens with tomatoes or strawberries are also good. Homes are warm!

BE CREATIVE AND ADVENTUROUS!

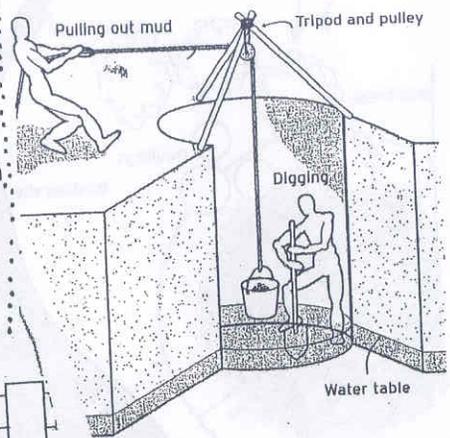
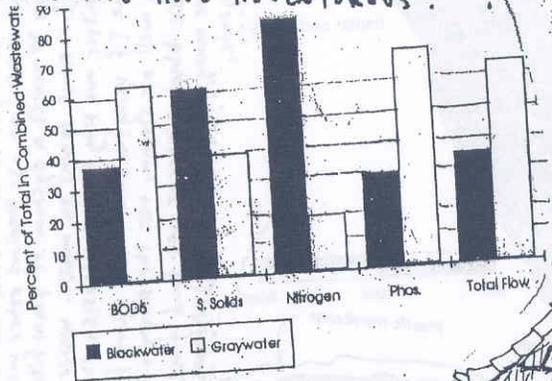


FIGURE 2a: HAND-DIGGING A WELL

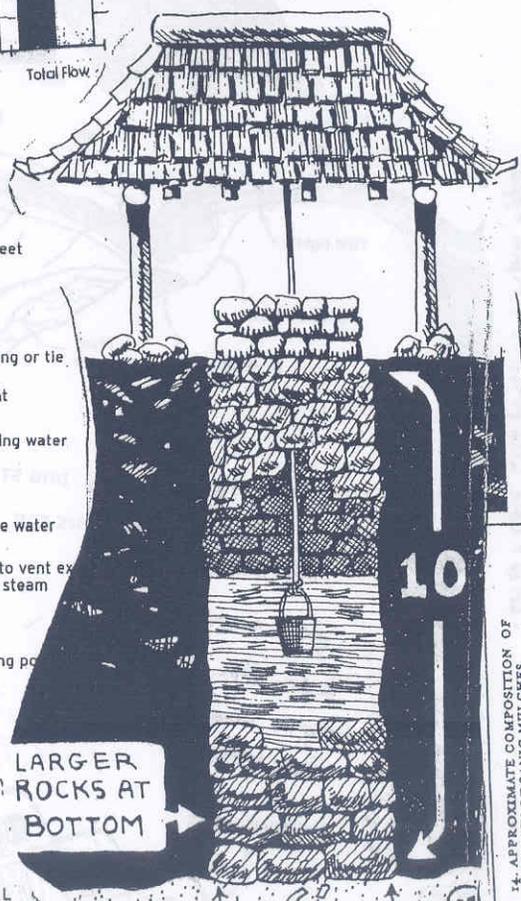


FIGURE 9: STOVETOP STILL

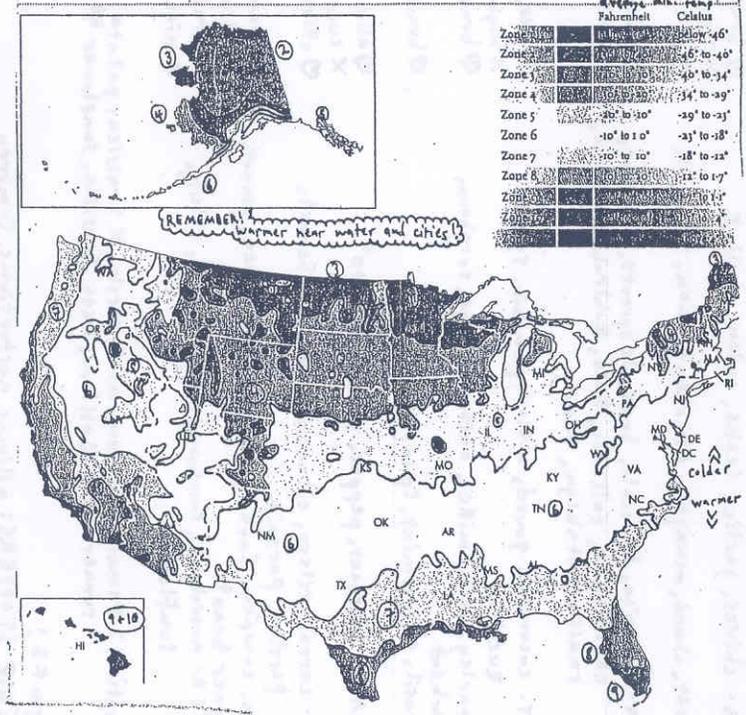
Based on version from RYAN Foundation Handout #655.

COMPOST is basically layers of: alive green stuff, dead brown stuff, dirt, air, moisture. the more you turn it, the more air it gets, add lots of earth worms! keep it warm with a cover if you want, it should generate its own heat if its working. when it stops stinking and starts to look like dirt, its done

The botanical name refers to the genus + species. Sometimes the species is sub categorized into sub species (ssp) and varieties or variety (var). If a cultivated variety was selected, the name is in 'Name' and if an x appears, that variety is a hybrid.

plant hardiness is the temperature range a plant can live at, optimally or otherwise. Shelter, bodies of water, cities are often warmer than inland, open and spaced out. plants are given a zone range setup by the USDA that is sort of helpful.

PLANT HARDINESS ZONES



14. APPROXIMATE COMPOSITION OF BULKY ORGANIC MULCHES

Material	Nitrogen (N)	Phosphorus (P)	Potassium (K)
Alfalfa hay	2.5	5	2.0
Bean straw	1.2	3	1.2
Corn straw	1.6	2	1.0
Olive pomace	1.2	8	1.5
Peanut hulls	1.5	1	1.5
Past	2.3	4	1.2
Sawdust (chip)	1.6	1	1.3
Timothy hay	1.0	2	1.5
Winery pomace	1.5	1	1.5

13. MULCHING MATERIALS

Material	Pro	Con
Straw/Hay	Cheap; generally available; adds organic matter	Can contain weed seed, insects and/or disease
Leaves	Readily available; generally free; rich in nutrients	Can mat down or be too acid for some plants
Grass clippings	Easy to get and apply; good source of nitrogen	Can burn plants; may contain weed seeds
Pine needles	Attractive; easy to apply	Large quantities hard to collect; may be too acid
Wood shavings	Weed and disease free; easy to apply; available	Can be acid; tends to tie up nitrogen in soil
Manure	Great source of fertility and organic matter	Should be well-rotted; expensive to buy; usually contains weeds
Newspaper	Easy to get and apply; earthworms thrive in it	Decomposes very fast; must be weighted down
Plastic	Total weed control if opaque is used; warms soil for early starts; heavy plastic can be used more than one season	Expensive, unattractive; adds nothing to soil; must be weighted down and cleaned up in the fall

FOOD IS FREE IF YOU LET IT BE