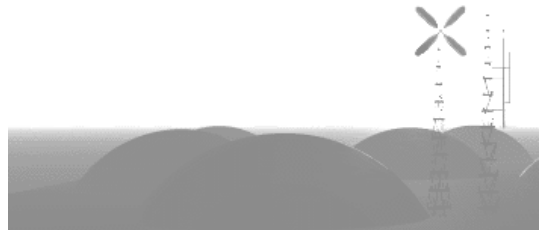


Domes

One of the more permanent housing options before, after-and even during-the pole shift, could be a dome. Wind-resistant, fireproof, almost earthquake-proof, the dome shape is widely recognized as the most economical of structures, once the initial expense of building has been accomplished. The dome has the reputation, in fact, of being almost indestructible.

The monolithic dome has been described as "probably the most disaster-resistant building that can be built, without going into a mountain, or underground". The shape can withstand tornadoes and hurricanes, although blowing debris could cut the surface membrane. A large enough object could also puncture this dome, but the puncture would be very local, and would cause little serious damage. The worst disaster for a monolithic dome would be an earthquake. It would take an earthquake many times more powerful than any that we know, to even approach the design strength of this dome. However, we must keep in mind that during the pole shift earthquakes as high as 15 Richter must be expected. Mostly fireproof, this dome can only be burned if a flame is put right up against it. Without a blowtorch, or maybe a forest fire, it would just smolder. Bodes well for weathering the firestorms that will occur during the pole shift.

As previously mentioned, the shape of the dome makes it energy-efficient, and unlikely as it may sound, the larger the structure, the more



economical it is in this regard. This shape can enclose the maximum amount of space with the least surface area, but any concrete used in the building must be reinforced to prevent collapse. Another virtue-and key, as far as we are concerned-is the suitability of such a building for hydroponics. The viability of hydroponics is dependent upon an ability to control energy costs, and the dome structure is ideal in this respect.

A continuous-form dome, partly laid into the earth, will not be cracked by the sharp jolt of an earthquake, and an oval with a bit of a plate-shape on the bottom will also settle into its pre-quake position when the moving and shaking is over, readjusting itself on loose earth. Made of metal, such a structure would protect from firestorms and hailstones. Nevertheless, an escape route of some sort may still be needed. This should be placed at or near the highest point in the structure. In the worst case scenario, if trees or other debris were to pile up against all the normal exits, this additional hatch would allow the occupants to dig or cut their way out, so that the normal doors could be cleared from the outside. In the case of a large dome, three outwardly opening doors around the base perimeter would probably be a good idea, since they can withstand more wind pressure than inwardly opening doors.

Materials: Plastic would be one way to go, but you probably wouldn't want to risk staying in it during the pole shift. If you really want something built from plastic, then take it apart before the pole shift and rebuild it, once the cataclysm is passed. Rastra would seem to be another possibility for dome construction, being resistant to almost anything that we may encounter before or after the pole shift. Much has been written on the subject of the construction and durability of domes. The advantages, apparently, far outweigh the disadvantages. It is certainly a topic worthy of research by any survival group. There is still time to take advantage of this knowledge before the cataclysms come upon us.

Geodesic domes differ from monolithic in that, whereas the monolithic dome is contiguous, the geodesic is constructed of triangular-shaped pieces. This type of construction does give great strength to the geodesic; but opinions seem to differ on whether this strength is actually any greater than the monolithic.



One of the advantages of the geodesic dome could be that it can be easily added to as needed, for growing families or communities. However, the caveat here has to do with the fact that the pieces for

geodesic construction must be so precise that unless you remember to bring very specific tools with you, it may not be possible to measure properly after the pole shift. There are, of course, kits available which can be ported to the after-time, and this would appear to be the best way to go, since only a really professional carpenter could build such a dome from scratch. There are many geodesic dome kit manufacturers available, and prices range from \$500.00 to \$18,000.00, but that may not be the highest price. The point is for one of your group to do some in-depth research before you pick your manufacturer, your price, and your kit.

Insulation

Whatever type of permanent building you decide on after the pole shift, whether it be for living or storage purposes, or something else, insulation is going to be extremely important. Fire retardation is always an essential part of insulating, and in some parts of the world, the cold climate is going to be a factor. However, of paramount concern after the pole shift will be the ability of your insulation to combat the dampness that is going to be so prevalent in the after-time.

It is not easy to recommend any particular insulating product, although the foam types seem to be widely regarded as superior. Even here, caution must be observed. On one hand there are recommendations for the spray foam type of insulation; however, you must be careful to make sure that you don't use a product that will outgas, immediately or eventually. So far, prefabricated foam sheets would seem to be best, but your group must do some serious investigating in this regard. Unless you bring enough of this product with you, a serious disadvantage will occur when you are trying to insulate.

One suggestion is natural insulation. For instance: when dealing with sudden and temporary shelters, moss was found to be a good insulator. From Tom Brown's *A Field Guide to Wilderness Survival* comes the information that: *The material doesn't make any difference, as long as it's light and airy. Use whatever you can find:*

Leaves, ferns, moss, grass, etc. These materials will insulate a structure even when wet. Then there is always straw, as has been discussed in an earlier summary, and straw bale homes were built with great success approximately 150 years ago, and are even now being recognized once more for their viable qualities.

Other Natural Insulators: Fibrous, loose-fill insulators, such as rock wool, slag wool, and cellulose are mentioned here, just as, again, ideas that are "thrown into the pot"; but I find myself unable to really recommend them. Though there will be plenty of basalt rock and probably some glass which could be ground up after the pole shift, the creation of both rock wool and slag wool depend upon your settlement being able to produce great heat, which ability may not be available to you for quite a while into the after-time. Cellulose is made up of shredded waste paper treated with chemicals, and how much waste paper will there be? Also there is the problem of working with these fibers, which are irritants to the skin, the eyes, and the respiratory passages, and one needs protective clothing when dealing with them. Special equipment would also be needed to blow such insulation into whatever building it is intended for, and batts and rolls are apparently rather difficult to make, even if your settlement should have the equipment to do this. Cheaper and easier to handle would be the tires filled with dirt, and there will likely be plenty of both around.

The solution to this problem? Well, after the moving and shaking is over and things have settled down, your group could relocate to a more temperate climate, where little if any insulation would be needed. There are going to be many such temperate zones in the after-time. If, however, you are stuck in the colder climates and cannot move, remember that the pioneer settlers did pretty well in log cabins, and if the terrain is right, you could build into the side of a hill.

Circulation

If you are heating your living space with a wood stove, for example,

you are probably going to need help with circulating the air so that your heating is more even, and you don't, for instance, walk around with cold feet while the heat at head level is oppressive. A simple way to accomplish this is a fan placed on top of your stove. This fan is powered by the heat coming from your stove, and as it spins, circulates the air and distributes your heat more evenly. It does mean bringing parts to make this fan with you to the after-time; but the fan is not electrical and should therefore be fairly easy to construct. If you are living in a cold area, this is a simple way to heat your shelter, ensuring adequate air circulation, but at best this is a short-term solution, because sooner or later the fans will wear out. This could be a good area for study by your group while there is still time. Other ideas for air circulation have been suggested, but they all concern themselves with technology which, although simple by modern standards, will seem complicated in the after-time. One of them involves the sun, and there will not be much of that after the shift.

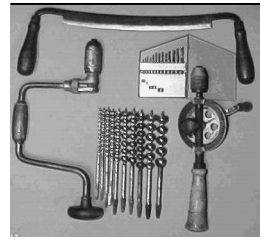
Tools

After the pole shift, civilization will have to be rebuilt from the ground up-even, it might be said, from under-the-ground-up-which means that all types of tools will be needed. The work to be done will include everything from gardening to radio repairs, making little wooden toys to constructing a shelter. And keep in mind that assembly will not be the only use to be found for tools. What about that old car that has landed near your site? There may be some useful survival aids there, and you won't be able to take it apart unless you have the specific tools to do so.

If you are sure of an abundant energy supply, then by all means bring your power tools along; but the importance of our prized modern power tools will likely fade into insignificance as compared to the essential nature of pre-power hand tools. It is not the intent of this summary to give a specific run-down of what you should take with you, for the doctrine here is very simple-bring everything. Too much may not be enough. Therefore this synopsis will be limited to a bit of advice, some cautions, and a few reminders.

If your group does not contain some experts in construction, or at least a few jack-of-all-trades, then get some! There won't be any point in taking all these tools into the after-time, if no-one can figure out how to use them. And at the risk of getting too basic, or preaching to the converted, it must be stressed that not only essential, every-day tools must be brought along, but also each variable. For example: nothing will be gained by bringing one round-shaped screwdriver, in all its different sizes. There are star-shaped, square-shaped-and possibly other-shaped-screwdrivers to consider, in all their sizes. As a total layman in such matters, one who cannot tell the difference between a chainsaw and a lawn mower, it is highly possible that I would remember to bring a drill of some kind, with metal bits. But would I remember high quality wood bits? I might also remember to bring along a quantity of nails and screws-but would I include wood screws, or "sheetrock" screws?

Some cautions—don't buy a drill with a plastic gear assembly. Our modern world is designed for obsolescence, and there won't be a hardware store around the corner. Don't forget things like rope, chains, wire, plenty of adhesives, and



waterproofers. A fiberglass ax handle seems to act as a "spring", and you could actually injure yourself when trying to work with this, as the ax has a tendency to bounce back, if the wood is very hard. Where to find them—garage sales, pawn shops, and estate sales are good sources for the more old-fashioned type tools. People tend to just throw them into boxes, and treasure-troves can be had for a mere pittance. Take advantage, and gather what you can. Don't court disaster for your group by arriving in the after-time without something crucial; for at that point, nothing can be done about it.

Gardens

Because our atmosphere will be saturated with volcanic ash, and our soil will not be good for growing things immediately after the pole shift, other methods must be found to provide your community

with enough natural produce to keep it healthy. Below are some examples of things that can be done in this regard, but you are urged, while there is yet time, to consult the extensive information contained on the Troubled times web site, or visit your local library and book stores to expand your knowledge of this subject.

Seeds

One of the most essential things you must take with you into the after-time is a good collection of non-hybrid seeds. Save seeds from your best parent plants, guarding against hazards such as cross-pollination, which can ruin your genetic selection. Preserving seed from year to year will be important, and there are various ways of doing this, and of course, proper storage is essential.

Hydroponics

If you are well set up and have a reliable energy source, hydroponics is the way to go. There are many good reasons why this type of agriculture might be preferable, post poleshift, to any outdoor gardening. Hydroponics uses nutrient-enriched water instead of soil as a growing medium, and as an experiment conducted by Troubled Times has demonstrated, the liquid fertilizer collected from watering composted earthworm beds is an effective nutrient solution, and the acid pH can be balanced by water from soaked ashes.

Humidity and temperature, as well as the amount of light and carbon-dioxide received by the plants can be easily controlled. Because of this, and the fact that there are no “seasons” associated with indoor agriculture, crops can be grown all year round. Absence of weeds and insects make pesticides unnecessary. Pollination and

| PPM | ELEMENT | |
|------|---------|-----------------------|
| 96 | N | Nitrogen (as nitrate) |
| 48 | P | Phosphorous |
| 264 | K | Potassium |
| 132 | Ca | Calcium |
| 48 | Mg | Magnesium |
| 412 | SO | Sulfate |
| 3.0 | Fe | Iron |
| 0.5 | Mn | Manganese |
| 0.08 | Zn | Zinc |
| 0.06 | Cu | Copper |
| 0.5 | B | Boron |
| 0.1 | Mo | Molybdenum |

plant stressing will need assistance in order to increase the yield and/or produce seed. Of paramount importance in this kind of setup is to maintain the right pH balance of the water.

Indoor Gardening

If you have managed to bring some soil with you into the after-time (wood or river bank soil is best), indoor gardening with such soil is also possible. Containers such as barrels, or buckets, with a drainage hole at the bottom, could be used. Things that cannot be grown hydroponically, such as some of the tropical fruits, and certain plants, can be grown this way, provided your community is equipped to produce extensive quantities of fluoride or halide lighting.

Covered Gardens

Depending, once again, on the availability of soil, you may think about starting a covered garden, which can actually be situated outdoors. A cover can conserve moisture, protect from heavy rains, harsh winds, insects, and birds, while still allowing water, fertilizer and light to penetrate, and ventilating heat on excessively sunny days—though there will not be any of those immediately after the pole shift. Tents can be used as portable greenhouses, and can be another way to shelter gardens from the harshness of the environment after the pole shift.

Soil and Fertilizer

Outdoor gardening after the pole shift will not really be a viable option. But later, when the pollutants have stopped falling and things settle down a bit, covered and sheltered gardens may be possible. To this end, here is a description of what might be expected with regards to soil, in a non-technical settlement.

Because of the pollutants in the atmosphere there will be very little sunlight, and this will impact heavily upon the condition of the soil. There are concerns, even in our present society, about the depletion

of the soil, and when this happens in the after-time, the technological fixes available to us now, will be absent. So, it's back to basics. If your group ever gets some sort of an outdoor garden going, crop rotation, and returning all your wastes to the garden, are options that can help. It is apparently best to avoid farm land, and go to ranch land, as long as it isn't ranch land where nothing will grow on it, despite present-day technology. Even after the pole shift, improvement of your soil may be possible.

It might be feasible, for example, to gather it from another location (woodlands or river soil is best), or even, if its survival intact could be assured, bring some loam with you into the after-time, although this would be a prodigious undertaking, and there would be no guarantee that this, too, would not be rendered inferior by the after-time conditions. If you can find a copse of old-growth trees near your survival site—"old" meaning around 50 years—whether or not they are still standing, earth from around and under such trees will be more viable than, say, soil from an open field. Look particularly for trees of at least 18 inches in diameter. Also plan to obtain firewood from such a grove. This will provide you with mineral-rich ashes to use in your fertilizer. As well, the top eight to 10 inches of soil from the bank of a river would be safe to use. This type has a high amount of sandy silt.

Obviously there will be no commercial fertilizers available after the pole shift, but soil can still be replenished from many sources. An easy fertilizer would be one made of blood and bone meal. This would work very well, but does not supply potash; so add wood ash or gypsum pellets to your mix. Here, from one of our Troubled Times members, is a description of how to make such a fertilizer: "One and a third pounds of blood meal, two and a half pounds of bone meal, four pounds of wood ashes (or gypsum). This is to be spread over 100 square feet and mixed into the top one or two inches of dirt. This mix is organic and will not burn plants so it could conceivably be spread around existing plants without fear of over saturating the soil." Gypsum has several properties that make it a good substitute for wood ash, one of which is its ability to break

down heavy soil. Thus it mixes well with clay, allowing water to percolate more freely. Gypsum will be available in some areas after the pole shift, and blood and bones for the fertilizer meal will, of course, be abundant. Nothing should be wasted post pole shift, not even the blood and bones of our beloved families and friends. Some psychological barriers may need to be overcome; but to ensure the continuation and future growth of your group, the blood and bones of fellow humans, as well as dead livestock, must be collected, dried, and ground into meal for your fertilizer. Drying may be difficult, but not impossible, and the method could involve fire, which would make more wood ash for the mix. Putting these otherwise wasted products back into the earth will reduce depletion of precious minerals.

Honey and Bees

If a way can be found to preserve and keep bees after the pole shift, honey would be a wonderful source of both food and healing. One of its most useful properties is that it can, if not exposed to extreme temperatures, be stored without preservatives. It contains a lot of nutrients such as 35% protein, half of all amino acids, and is also a highly concentrated source of things like carbohydrates (sugars), B-complex vitamins, and Vitamins C, D, and E. A great energizer, honey is also a healer. Its antiseptic properties guarantee its effectiveness as a salve for burns and wounds. Caution: raw honey contains spores that can cause botulism in infants.

Honey will not be the only benefit derived from keeping bees. There is bee propolis, one of the best natural antibiotics available; nectar, for energy and strength; and royal jelly, which will be an aid to women during pregnancy and nursing. Then, of course, there is bee-keeping therapy, a science in itself, only to be practiced by those in your group who really know what they are doing. The problem will be that sunlight, which is essential for the well-being of bees, will be in short supply after the pole shift, so the challenge will be finding ways for bees to live indoors, possibly in a hydroponic setting.

Fish

If your group is part of a high tech settlement, aquaponics may be the way to go. If this can be made to work, you will have prodigious amounts of high protein food. A combination of hydroponics and aquaculture, aquaponics, simply described, is a symbiotic interaction between plants and fish, where the humans feed the fish, the fish wastes feed bacteria, the bacteria wastes feed the plants, and the plants clean the water for the fish. In this setting, advantage can be taken of the nutrient-rich run-off from your hydroponics setup. If this system is going to work properly when it is needed, it is essential that you do some practising beforehand. After the pole shift will not be the time to have your first experience with aquaponics. If your settlement is not high-tech, obtaining fish will still be possible. An important fact to remember is that fish do not accumulate lead from polluted water. This means that outdoor ponds can be used to farm them. Salmon, perch, catfish, crayfish, shrimp, and carp (with certain reservations, and if treated correctly and properly filleted), are good prospects for the after-time. Care must be taken to protect your precious fish stock from the shock of the pole shift. Note—and if all else fails, there is always the old rod and tackle!

Flocks and Herds

There really is not too much to be said on this subject. Animals like chickens, sheep, goats and rabbits have obviously survived prior pole shifts, and it doesn't take a great stretch of the imagination to realize that they will probably come through this one. Some animals have been raised from the earliest times with no technology, and will serve us well in the after-time. Once things have settled a bit, these animals should be easy to handle, providing one can keep them disease-free, and their meat, eggs, milk and cheese will be most welcome at the community table.

Chickens

Can be raised for meat and eggs. There are not too many

health cautions to be aware of when it comes to eggs. Eaten raw, they can be a cholesterol hazard. The trick, according to one of our Troubled Times experts, is to cook the egg whites hard, leaving the yolks soft, as in some boiled or poached eggs. This will help neutralize the cholesterol risk.

As for the feed, chickens, like all the animals mentioned here, are pretty hardy and can eat almost anything. Eggshells can be recycled back to them in their food for calcium, helping to produce stronger eggs. They will scratch outside for bugs and worms. If you are in a more technically-oriented settlement which does have electricity, a 75- to 100-watt bulb in their coop will be helpful for heating purposes; but chickens have been around for eons, and have survived many cold winters without electricity. There is no reason to suppose they will not do so now. The only problem with chickens is that they are extremely noisy, and may attract unwanted attention to your survival site.

Goats

Are known for their ability to eat almost anything. They will provide milk and later, when facilities are available to produce it, cheese. They will bond to their herdsman so that, whether settled or on the move, your goats will be with you.

Rabbits

Have a very high reproduction level, so that there will always be meat for your stew pot. They are easy to feed, munching leftover vegetations, eating the fibrous part and recycling this bulky trash into droppings for the humus pile. Best of all, rabbits are quiet, and won't announce your presence to the world! As they will probably be kept in cages, eventually you can be fairly sure of a disease-free rabbit population.

Sheep

Will provide meat, and wool for clothing. They are hardy, will graze on sparse grass, and are well equipped to survive cold winters. Excrement from all animals will fertilize your garden.

Cattle

Beef cattle are an "iffy" option, since they are big, and therefore need a lot of grazing, which, in most areas (and particularly immediately post-pole shift) will be sparse.

Food Preservation

Food storage and preservation are going to be of paramount importance, particularly just after the pole shift, and most particularly if you are not practiced in hydroponic methods. Outdoor gardening will be impossible, and a good supply of stored food will take you beyond the actual catastrophe, and serve you well while you get both your hydroponics equipment and skills up and running. Below are a few examples of how it can be done, using both the time-honored, tried-and-true storage means, as well as modern technology.

Canning

It will certainly be possible to take some canned foods with you into the after-time; but remember, as soon as the can is damaged, so is the product inside it. Cans particularly should be kept in cool, dark places, since food will deteriorate more quickly if stored in hot cans. Canned food can last a long time, but caution is advised; for example, rotate your cans and use the oldest ones first, so that you go into the after-time with the most recent canned products. Some acidic foods, like tomatoes, need to be carefully watched, since the acid will eat into the cans. Canned food, from a nutritional point of view, can last for quite a long time (no time is specified here because there seem to be differing opinions about exactly how long) but after that time it may not taste as good as when first packed.

Freeze-Drying

Like canning, this will obviously have to be done before the pole shift, but will be well worth the effort. To reconstitute

freeze-dried food, add boiling water to it or, if you are in a high-tech settlement, add cold water, and microwave. One of the great benefits of freeze-drying is that the reconstituted product often looks and tastes pretty much like the original.

Salting

Salting, especially for meat, is a tested technique. Moisture is drawn out by the salt, and an environment which is hostile to bacteria is therefore created. If the meat is salted in cold weather so that it does not have time to spoil while the salt takes effect, it can last for years. The ancient technique of salting is briefly described in John Steinbeck's *The Grapes of Wrath*: "Cut meat into small salting blocks. Pack the salt in. Lay meat piece by piece in kegs (wooden barrels), making sure the pieces do not touch each other. The meat is laid out like bricks, and salt is pounded into the spaces".

Pickling

Although pickling is not widely used today, it is still a viable storage method. It uses the preservative powers of salt combined with the preservative qualities of acids, such as acetic acid, found in vinegar. Acids inhibit the growth of bacteria. Just an example: to make the pickles that are used on your hamburger, cucumbers are soaked in a 10% saltwater brine for several days, then rinsed, and stored in vinegar. This preserves them for years.

Vacuum Packing

This is a really good way to store food. A little caution must be used, though. One of the Troubled Times members has experimented with this, and reports that while elbow macaroni, for instance, was still good after eight years, other things (such as peanuts in salt and oil) will go bad after only a few years. A vacuum pack is similar to—but not exactly like—a seal-a-meal bag. Absolutely anything can be stored this way, from batteries to clothing, to food. When the bags are packed and your goods safely stored, drop them into 30-gallon Rough Neck containers, then label the containers and seal with duct tape. They can be

used for hydroponics growing at a later time.

Pasteurization

This applies, of course, mainly to liquids. This may be good for the after-time, if you are not sure that your stored products are still viable. Pasteurization is achieved by boiling food or liquid at very high temperatures, which does sterilize the food, and which kills certain—but not all—bacteria, and disables certain enzymes. Unfortunately, though, the taste and nutritional value of foods treated in this way are greatly diminished, and this method is more or less a compromise.

Alcohol

As a preservative, this will certainly kill bacteria.

Dehydration

This is another excellent way to store food for a long time. Some products, like powdered milk and soup, dried fruits, vegetables, and meat, instant rice, and pasta, would be great to take with you into the after-time. Powdered sauces would add taste and variety, and for the sake of morale, should probably be included. Soup and milk are particularly easy to dry, and will last for years.

Diatomaceous Earth

This is the hard shells of sea creatures, the sharp edges of which can tear up an insect from the inside out. It is not harmful to humans or large animals, since the pieces are too small to do any damage if ingested. If you are planning to can or bucketize your food for storage, mix in a cup of diatomaceous earth. It is particularly good for storing grain, because it will keep your product pest-free. Do not use it in soil, since it will slice up your earthworms; and do not use it near flowers, since it will cut up what few honey bees we will have left.

Heavy Duty Buckets

A great way to store food. These buckets can be found thrown out by some restaurants, and can be cleaned with bleach, then air-

dried for a day, rendering them good as new. They have rubber-sealing tops that close tightly. One of our Troubled times group has tested this by dropping a bucket filled with stored food from a third-floor window. He reports that sometimes the tops became dislodged, but everything inside was fine, and undamaged. Particularly good, of course, for storing dried foods such as grains and beans.

Plastic Containers

It is said that water stored in a plastic container has a shelf life of approximately six months, or a year. If you must use plastic containers, be aware that it has been scientifically proved that plastic "leeches" some of its properties into the food within it. Since no-one is exactly sure which plastics are guilty of this, they must all be suspect. There are various methods to kill bacteria, one of which is to put a little chlorine into the water before you drink it, if it has been stored more than six months. Your stomach will thank you, even if your taste buds don't! Read about the merits or otherwise of plastic containers before you decide to use them, and be aware that a plastic container may not survive the G-Force of a pole shift unless uniformly supported on all sides.

The Ice House

Finally, unless you are in a high tech settlement, refrigeration is not likely to be available. Do what our forebears did—build an ice house!

Choice Foods

If there are any doctors around after the pole shift, an apple a day will do more than keep them away! The pectin in apples will help to lower blood pressure and is a cancer fighter, and there are other common foods which, under the right circumstances, can be grown after the catastrophe and which can also help humanity in its fight against diseases. Some of these are listed below; but because it is impossible to list everything here, recommended books on this

subject can be found in th book list.

Spirulina

Is actually a blue-green algae that has been living on the planet for 3.6 billion years, and has been a source of food for many cultures. 60% protein, it has been known to assist recovery from malnutrition. Also contains beta-carotene, and is rich in iron, and vitamin B12; has more calcium and magnesium than other foods, and is another immune system booster.

Onion

Insects will be everywhere in the after-time, but help is at hand! The juice of the onion is a good way to ward off these biting pests. Grated onion has been used externally to treat rheumatoid pains. On cotton wool, onion juice can be used to treat earache and toothache. Urinary infection and infections of the airways succumb to treatment with honey and onion. Onion lowers the blood pressure, stimulates the digestive tract, and heals wounds, eases coughing and colds. Rich in vitamin C, and other vitamins and minerals. Caution: If you don't have much light for growing, do not try raising onions. The more growing light that an onion has, the healthier it's going to be; with much less light the plant will be not so healthy, a lot less tasty, and less medically useful.

Cabbage Family

Eating vegetables from the cabbage family reduces the risk of cancer.

Potatoes

Mashed Potato used topically can draw out toxins from boils. Raw juice improves functions of digestive system and alleviates constipation, heartburn, and gout, and diluted in warm water and taken in the morning, alleviates peptic ulcers. Raw slices applied to the skin can relieve eczema, and alleviate red, puffy or swollen eyes. The skins, cleaned of all pulp after boiling, can be used as a dressing for burns.

Pineapple

Can be an effective treatment for high blood pressure, clotting, heart conditions, stroke, and much more, including the core, as it is enzyme-rich in bromelain. Bromelain treats angina breaks down the atherosclerotic plaque that is implicated in atherosclerosis; inhibits abnormal blood clotting, thus can prevent thrombosis; helps to prevent and treat cardiovascular diseases; helps to dissolve foreign proteins (antigens) that are responsible for many allergies; interferes with the growth of many forms of cancer. Taken in the right dosage per day can: accelerate the healing of bruising; reduce the inflammation associated with rheumatoid arthritis; alleviate the edema and inflammation associated with wounds.

Although it is admitted that this is a tropical fruit and will not grow in certain parts of the world, one could always dehydrate some pineapple before the shift, or, better still, grow it hydroponically, since its medicinal qualities are so many and varied.

Beets

Beetroot juice alleviates anemia, constipation, disorders of the bladder, and many kidney disorders, lumbago, ailments of the nervous system, and amenorrhea (which is suppressed menstruation). Beetroot stimulates the production of red blood cells and helps to prevent gallstones. Prevents—and possibly reverses—some forms of cancer, improves the function of the liver, and alleviates jaundice and gout.

What does all this indicate? It means that you don't have to fall victim to all kinds of nightmare diseases since, with a good hydroponics setup (gardens will not do well immediately after the shift) you will have a weapon with which to fight back. You can increase your armory by doing further research on this subject before the cataclysms are upon us, and in this regard a visit to the library would be in order.

Low-Light Foods

Sprouts are fast-growing, easy to store, and will be a welcome addition, a few weeks after the pole shift, to the canned and dried supplies which survivors will no doubt be consuming. Some recommended seeds are: alfalfa, mung bean, lentil, sunflower, wheat, radish, and broccoli. They don't need much growing light; they are packed with vitamins, and are another good source of amino acids. They must be kept in a cool, dry place. No light is required to sprout these seeds, just a moist, warm, disease-free environment. A couple of ideas from Troubled Times members:

- When storing seeds, put some cinnamon in each storage container. Cinnamon has been found to inhibit the growth of mold and bacteria, thus giving the stored seeds more than three times the germination capacity than the two years they otherwise seemed to have.
- Spray or wash any seeds intended for storage with colloidal silver, and allow them to air-dry (don't put them in the sun). Where mold and bacteria are concerned, the inhibiting properties of colloidal silver are quite amazing.

Though mushrooms are of little nutritional value, they do have a lot of flavour and would certainly be a welcome addition to what could otherwise be a dull meal. However, there seems to be no single test—other than eating them—to distinguish between the safe mushrooms and the poisonous ones, so at first glance, avoidance of these fungi seems to be the safest bet, unless there is someone in your group who knows what to do in this regard. What could make the risk worth taking—if much caution is used—is the fact that mushrooms do contain Vitamin D, which will be in scarce supply after the pole shift. The need for caution, however, cannot be overstressed.

Vitamins

After the pole shift there will be no running to the store to obtain

milk or orange juice. Milk and orange juice—and other nutritious substances—may be possible after a while; but before that, we will have to make do with whatever we can find. Since vitamins do have a long shelf life it will be a good idea to stock up on supplements which can take you to the time when your group has attained a measure of self-sufficiency. The list below does not include dairy products such as milk or eggs, the meat of large domesticated animals such as beef or sheep, or long growth cycle foods such as fruits and nuts which require mature trees. Where these items provide vitamins and minerals, more easily grown foods prove to be equal if not superior sources of vitamins and minerals.

Noted below are vegetables and fruits that can be grown hydroponically or have a short growth cycle, or protein sources from aquaculture that can be nourished from algae grown in sewage effluent or with garbage scraps, which is simply nature's way.

Vitamin A

Vitamin A is fat soluble. Abundant in fish and fish oils and in animal fats, especially in the livers. Can be manufactured by the human body from components in fruits and vegetables, especially from beta-carotene found in yellow and green leafy vegetables. Carrots are an excellent source of beta-carotene.

Vitamin B

The B Vitamins are water soluble. Thiamin is most abundant in cereal grains but beans and legumes are a close second. Riboflavin is most abundant in animal hearts and livers followed by soybeans and vegetables such as sweet potato. Pyridoxine and related compounds are most abundant in cereals, followed by fish and fowl and then yellow and green vegetables. Niacin is abundant in cereals, fish and fowl and stewed rabbit, liver, mushrooms, and vegetables such as peanuts, peas, soybeans and potato skins. Cyanocobalamin is abundant in clams and oysters, liver, and cereals. Folic acid is abundant in beans and legumes, brewer's yeast, cereals, and liver.

Vitamin C

Vitamin C is water soluble, and is destroyed by heat or exposure to oxygen or alkaline substances. Abundant in cranberries and quite high in broccoli, cauliflower, cabbage, kohlrabi, and sweet red or green peppers, tomatoes, and melons, especially where these fruits and vegetables are eaten raw. The new buds in the spring from a pine tree when boiled will make a good tea that can treat scurvy. Scurvy grass is also high in Vitamin C.

Vitamin D

Vitamin D is fat soluble. Vitamin D is manufactured by the human body in adequate supplies with no more than 15 minutes a day exposure to ultraviolet in sunlight. Cloud cover or pollutants in the air interfere with ultraviolet penetration, and during winter or in urban areas, exposure to sunlight often does not suffice. Cereal grain bran, liver, meat, and eggs contain Vitamin D.

Vitamin E

Vitamin E is fat soluble. Abundant in wheat germ oil, sunflower seeds, peanuts, kale, and sweet potatoes.

Vitamin K

Vitamin K is fat soluble, and is found in the leaves of all plants.

Calcium

Abundant in soybeans and other beans, oysters, and fish, and quite high in amaranth, sesame seeds, broccoli, kale, turnip greens, spinach, pumpkin, leeks, mustard greens, okra, parsley, and collards.

Copper

Highly abundant in oysters and abundant in crabs, liver, sesame seeds, peanuts, lentils, beans and peas, mushrooms, potatoes, rice and cereal grains, and fish.

Iodine

Found in algae and seaweed, where it is extracted from sea

water. Iodized salt should be stocked in preparation for the pole shift for those living inland.

Iron

Abundant in soybeans, bulgar wheat, lentils, liver, spinach, sunflower seeds, pumpkin seeds, squash seeds, and sesame seeds.

Magnesium

Abundant in spinach, Swiss chard, navy beans, peas, peanuts, beet greens, broccoli, okra, and leeks.

Potassium

Abundant in carrots, beans and lentils, Swiss chard, beet greens, cauliflower, kohlrabi, and potatoes. Potassium is key for maintaining proper nerve and muscle function and helps your cells maintain proper fluid levels. Adults need about 3500mg of potassium daily. However, since potassium overdose can be a problem, it is not recommended that you take potassium supplements.

Zinc

Zinc is found in great abundance in oysters, and is abundant in poultry, cowpeas and black-eyed peas, beans, and peanuts.

Once again, the surface of this subject has not even been scratched or dented by what is in this summary. This is just an example of what can be used in the after-time to improve the chances of your group's survival.

Besides the plants and foods mentioned above, things like kelp, moss, mushrooms, algae, and alfalfa are good sources of vitamins and minerals, particularly alfalfa, which sometimes grows down to 40 feet below the Earth, and can extract vitamins and minerals unreachable by other plants. Oxalic Acid in foods such as spinach and rhubarb, and Phytic Acid contained in things like dried beans and peas can have a somewhat "depressive" effect on the absorption

of their own calcium. Such foods, however, do not interfere with the absorption of calcium from other substances eaten at the same time. Wheat bran, on the other hand, can actually block calcium assimilation from other foods.

The Pine tree has long been a source of vitamins, and also has many medicinal qualities. Scotch and White Pine are best in this respect, the most useful parts being needles, inner bark, and sap. Spruce tea can be made by steeping fresh evergreen needles in water, and this drink is as potent as orange juice. New needles can be chewed. Pine needle and evergreen tea are high in Vitamin C, and will prevent (or cure) scurvy. Caution: Large amounts of evergreen tea can be toxic, and it should never be taken by pregnant women. Rose hip fruit contains more vitamin C than most of our cultivated food crops, including citrus. It keeps well, and can be harvested in winter. Other sources of Vitamin C include blood (obtained by eating raw meat), broad-leafed (garden) sorrel, and watercress.

It may be possible to erect a UV-B light within your residence to increase the intake of Vitamin D. The main role of Vitamin D is to help absorption of calcium, and this vitamin will also prevent the occurrence of rickets, a disease mostly affecting young, growing bones. Trace minerals such as selenium are also important. Water used to cook food is high in vitamins and minerals, and should not be discarded, but used for soups, etc. Small, frequent meals allow the body to absorb nutrients more efficiently. Absorption of vitamins and minerals can also be aided by eating foods in the right combinations.

Protein

In the after-time it will be necessary to overcome some of our psychological barriers regarding food, if we are to achieve a healthy diet. For example, in the quest for protein, bugs will have to be consumed, as well as snakes and frogs. Large snakes are preferable. The "rib eye" tenderloin can be removed along the spine. If it

is necessary for survival (and if calcium is needed) one could boil the rest of the carcass in a stew to soften the bones. Smaller snakes would not be much of a problem. Frogs' legs, considered a delicacy now, could become essential to good health after the pole shift. Frogs are easy to raise, and would probably do as well in indoor lighted tanks as in outdoor sunlight, particularly since sunlight will be scarce for the first few years. Caution: the skins of frogs are poisonous, and since it would be possible for some of the poison to leech into the meat, it would probably be best to stick entirely to the legs. If kept in a clean, safe, and healthy environment, rats can also be a good protein source.

In the vegetable department, legumes are an excellent source, the soybean having highest protein content. If it can be adapted to your area, amaranth is another winner; but the prize probably goes to buckwheat, which not only has an extremely high protein content but is rich in potassium and phosphorus, and also contains 50% more vitamin B than wheat.

Amino acids are just as important as are vitamins and minerals. They are involved not only in protein synthesis, but are key to other biological processes such as the forming of neurotransmitters. There are 20 amino acids, and of these, eight are classed as essential and needed by adults to maintain good health. These are: phenylalanine, valine, threonine, tryptophan, isoleucine, methionine, lysine, and leucine. The 12 non-essential acids can be manufactured by the body from other substances, although children, to be healthy, do require the addition of histidine and arginine. Situations can occur where non-essential acids suddenly become necessary, such as in the case of a physically traumatized adult, where arginine is required in order that optimal reparation can occur. Amino acids are found in foods such as meat, milk, eggs, fish, mushrooms, plants, brewer's yeast, cashews, beer, chocolate, potatoes, cola drinks, peanuts, barley, serials, peas, etc., many of which will be available in the after-time. As with most of life's essentials, too much can be as bad as not enough; and negative effects can occur if a healthy balance is not maintained.

Herbs

Herbs will play a great role in our future in the after-time. For those of us who are on medication, the likelihood is that there are herbs out there that can replace the drugs we now take, which will not be available after the pole shift. Below are just a few examples of what can be done with herbs. This is a vast subject, and much information is at hand. It would certainly be advisable to have several people in your group make a study of herbs and their uses, and have stocks available against the time when modern medical supplies have run out.

Stomach Ailments

Can be dealt with very nicely by using slippery elm. A blessing for ulcers, especially if coupled with a digestive herb. Small intestines and colon can also benefit from the use of this herb. Slippery elm tea can help with dysentery, which will probably be very prevalent after the pole shift.

The Heart

Fresh hawthorn berries are great for the heart. Cayenne works on heart attacks, stroke and shock. Cayenne tincture and powder also increase circulation.

Liver and Gallbladder

Milk thistle and barberry can protect against liver damage, and diseases such as hepatitis. Bitter herbs stimulate the digestion, stimulate the liver, and promote the secretion of bile which flushes the gallbladder.

Kidney and Bladder

Parsley and juniper berries can increase the flow of urine and destroy bacteria in the kidney and bladder. Even kidney stones can be dissolved.

All Purpose

Garlic can destroy practically anything that ails you, from athlete's foot to ear infections and everything in between. A garlic oil can be made that can be used either internally or externally.

Burns

Aloe is the miracle healer in this regard. It has been known to bring dead tissue back to life. Best species is aloe vera, but in a pinch, use any plant you can get.

Depression and Related Problems

St. John's Wort is a natural anti-depressant. No side effects have been noted with low dosages, but this herb can be toxic if used improperly. If you are taking this, make sure you have a list of foods that must be avoided since St. John's Wort is a MAOI (monoamine oxidase inhibitor), and could cause hypertensive crisis. Therefore, caution must be exercised in its use.

Antibiotics

Golden seal is a natural antibiotic. Parsley and Oil of Oregano also have antibiotic properties.

The Immune System

Herbs such as Echinacea will boost the immune system, a "must" after the pole shift, when at least for a while, infection will be rampant.

Blood Pressure

The kudzu root can reduce blood pressure.

Diabetes

Steevioside, which is an extract of Steevia, can stimulate insulin secretion, and Gymnema and Asian Ginseng enhance pancreatic function. It is reported that the Jerusalem Artichoke can act as an insulin substitute.

Antioxidants

Pine and grapefruit seed are antioxidants, and pine has antiseptic and anti-inflammatory properties.

E. Coli

Cinnamon is effective against this.