1. CONCEPT

THE DETERMINING FACTORS OF THE EARTHSHIP IDEA

- What it means to interface
- Why we should do so

This chapter will elaborate on and develop the "independent vessel" concept as a necessary spark toward the evolution of habitat on this planet. There will be discussion of what the vessel must be capable of in order to independently support human existence. Idealistic visions will be digested into realistic possibilities.

A VIEW FROM THE STARS

Some light beings from Alcyone once sent a representative to Earth to analyze the situation there. The light being came, spent some time on Earth and went back to Alcyone and made the following report:

"Basically there were three kinds of creatures there. One type of creature was rooted in the ground. It was very evolved, relative to its host planet. It must have been very intelligent. Without moving from place to place, it took whot it needed from the air, the sun, and the ground to sustain a very long and low stress life. It dropped its by-products on the ground around it and they entered the ground and were recycled back into the creature itself. When it died, it entered the ground and became food for its offspring. It was more than a creature; it was a system. It had totally interfaced with its host planet."

The next kind of creature was also very evolved, but it had to move around to sustain itself. It also took what it needed from the air, the sun and the ground. Some of them took each other. Its by-products entered the ground. When this creature died, it also entered the ground, and all became food for the creatures discussed above. These creatures also took some of the above creatures into them for food. There seemed to be a physical exchange between both of these creatures in terms of both food and air. They each inhaled what the other exhaled. They had interfaced with the planet and with each other."

"The last kind of creature was not very well adapted to this planet. As a matter of fact, this creature may have been an alien. It took from both of the other creatures as well as the planet, and gave nothing back except by-products which made it difficult for itself and the others to continue living. It seemed to be taking over the planet like some kind of malignant growth. These creatures prolifically multiply, fight each other, ruthlessly slaughter the other two types of creatures, and ruthlessly abuse the host planet. They do not seem to understand their environment, their chemistry, or themselves. Possibly, they should be contained in some intergalactic corral to keep them from harming other creatures and planets, as well as themselves. In general, this planet was very beautiful and serene until this third creature began to multiply into such numbers that its effect has become a serious threat to the planet itself."

The situation was examined and the light beings from Alcyone decided to enter these creatures and evolve them from the inside out and awaken them to the system of which they are a part. They have the potential to interface with the planet and make it even more beautiful and wonderful than it was before they came. So it was and the project began...


PHOTOSYNTHESIS
CO2
OXYGEN
COMPOST
LIFE
ADD
H2O

A LOOK AT THE EXISTING CONCEPT OF HOUSING

It was early fall in Cincinnati, Ohio and the trees still had all their leaves. A freak early snowstorm came and the leaves on the trees caught too much of the snow and weighed them down with more weight than the branches were designed to hold. Consequently, many branches broke and they took down power lines with them. This happened in so many places around the city that large numbers of homes and commercial districts were without power. For a couple of days, people could not even buy food because the stores could not operate without power. Many people, thinking they were well prepared for such an emergency, got out their stored canned goods, laid away for just such an occasion. Unfortunately, the majority of the people in the city had electric can openers and they could not get into their emergency stash of food!

The concept of housing really has not changed much in centuries. We started with compartments to shelter us from the elements. Soon, we began to do things in these compartments that required light, fire and water and a reasonable level of comfort. To achieve this we began to bring energy and water to the compartments first by hand, and later by systems. The systems have evolved from carrying wood for a fire pit to nuclear power plants making huge quantities of power that is fed through wires to various compartments all over the planet. The systems have radically evolved; the compartment is still a compartment.

The systems, which are now centralized, have grown to be more important aspects of housing than the compartment itself. We are now dependent upon and vulnerable without these systems. When the systems fail due to some catastrophe, such as a hurricane, tornado or earthquake, people gather together in community facilities such as gymnasiums, with emergency systems. **Existing housing is nonfunctional without systems.** We build all kinds of compartments out of wood, concrete, steel, and glass. We even put them on wheels, but they are still just compartments that we pump life support into. One can easily imagine the limitations, dependency, and vulnerability of being on a life support system in a hospital. What if you found that you had to stay on a life support system for the rest of your life? Many people would rather die than live this way. *We are living this way.*

We are also dying this way. The systems give us power in one hand and poison in the other. Acid rain, radioactive waste, spider webs of power lines, polluted rivers and oceans, vanishing wildlife are all part of the "price" for the life support systems necessary to make the current concept of housing functional.


PLUTONIUM
RADIOACTIVE WASTE

A person on a life support system in a hospital has to be always within reach and "plugged in" to the various systems that keep him/her alive. So it is with our current concept of housing. This need to be plugged in keeps us from using thousands of acres of dynamic and beautiful land . Some of the most beautiful places on the planet are rendered useless for human habitation because the systems that support housing do not go there. The limitations, the dependency, the vulnerability, and the poison give us many reasons to question the existing concept of housing and ask ourselves, *"Is this really something that we want to attempt to go into the future with?"*

THE SYSTEMS OF EXISTING HOUSING

The systems that render the existing housing compartments habitable are as follows:

Electrical energy production and distribution systems:
These systems provide the electrical energy for lights and appliances and, in many cases, heating and air conditioning. Also, in some cases, the water pumping for the living compartment is dependent upon these systems. In order for these systems to keep up with the demand, they are producing seriously hazardous by-products and effects, as well as lacing the planet with a web of wires.

The price for this power, in terms of money, is high and is getting higher. These systems are owned by corporations whose aims are not always in the best interest of the people or the planet. The price for this power, in terms of ecology, is the depletion of resources which took millions of years to produce and the pollution of the delicate environment that sustains life. It is no longer safe for us to keep using systems, and their reliability is questionable as we voyage into the future.

Water systems:
Centralized water systems always involve electricity in some way, so the water systems are dependent on the electrical systems. This, in addition to questionable purification and treatment processes, leaves many cities with water that is undrinkable and dependent upon the power grid. In rural situations, pumped well water is almost always dependent upon the power grid and in many areas is already undrinkable due to sewage, cattle urine, or radioactive waste.

Sewage systems:
In cities, all waste water goes to the sewage systems and in rural areas, it goes to smaller sewage treatment plants. In very rural areas, it all goes into septic systems. *80% of this water could be reusable as grey water.* In most cases, this is not even considered, so we are left with massive amounts of sewage to treat. The result is extreme pollution in and

around the water near cities, and a waste of very rich irrigation water in rural areas. Again, most sewage systems depend in some way upon electrical systems to function.

Gas systems:
The natural gas systems are the cleanest and the least destructive to the planet. However, in times of catastrophe, they go out (gas lines break) quite often. The distribution of this gas is potentially dangerous and unreliable in times of disaster, and will continue to get more expensive. If the complete functioning of a home depended upon gas, this home would be just as vulnerable as those using any other system. Of course, gas must be shipped by vehicle in rural areas, which is an obvious vulnerability in times of disaster.

Food systems:
Food has become just as much of a system as anything else. The centralized food production system is definitely one of the major support systems for human habitat on this planet. The existing housing compartments do nothing toward dealing with the food needs of the human inhabitants. Food is mass produced, not with human health in mind, but with profits in mind. **Money is, unfortunately, the major objectlve of all systems.** The various chemicals used to produce more food, faster, have radically affected the quality of fruits, vegetables, dairy products and meats. (Read Diet for a New America, by John Robbins). The quality of the global waters is also beginning to affect fish. Distribution of food is dependent upon vehicles which may or may not run during economic, natural, or human-made disasters. The existing food system is, therefore, unreliable as well as unhealthy. In addition, it is so wrapped up in the monetary system, that it almost ceases to be food. Speaking of wrapped,it is also wrapped in various plastics and packaging which are a serious disposal problem. Trees and animals don't have to wrap their food; why should we? Is it because we are intelligent?

Materials Systems:
The major materials presently used for housing compartments have many factors that warrant some rethinking.
1. Too much wood is used and although this is a renewable source, trees need time to grow.
2. Many materials are made in centralized areas and have to be shipped all over the country. This is an economic and an energy factor.
3. Most materials require specific skills to use them. This renders them out of the reach of unskilled people to use.
4. There is much energy involved in the manufacturing of materials and consequently much pollution is the result of this.
5. Many new materials are unhealthy to be around. Unfortunately, this is not discovered until they have been used for years.
6. Manufactured materials tend to dictate the nature of housing. It should be vice versa.

Monetary systems:
This system obviously supports the living compartment because all other systems are made available only through this system. If one has no money, the other systems are shut off, regardless of need. People have actually died because their utilities had been shut off during the winter, due to their inability to pay bills. This puts our very survival dependent on a rather shaky and hollow economic system. Thus, the living compartment is in a very vulnerable place. **Not only do we have to deal with the potential unreliability of the various support systems, but we have to deal with the unreliability of the system which gives us access to the support systems.**

DEVELOPING THE NEW CONCEPT OF HOUSING

The above systems, plus a slap dash compartment, make up existing human habitat on this planet. A new concept for habitat must also deal with systems as well as a compartment. Since there are so many problems with the centralized nature of existing systems, and since no one really knows what our voyage into the future will bring, (relative to their continued feasibility and reliability), **we would be much better off and have more control over our lives if our new concept for housing inherently, within its own nature, provided the systems to which we have grown accustomed.**

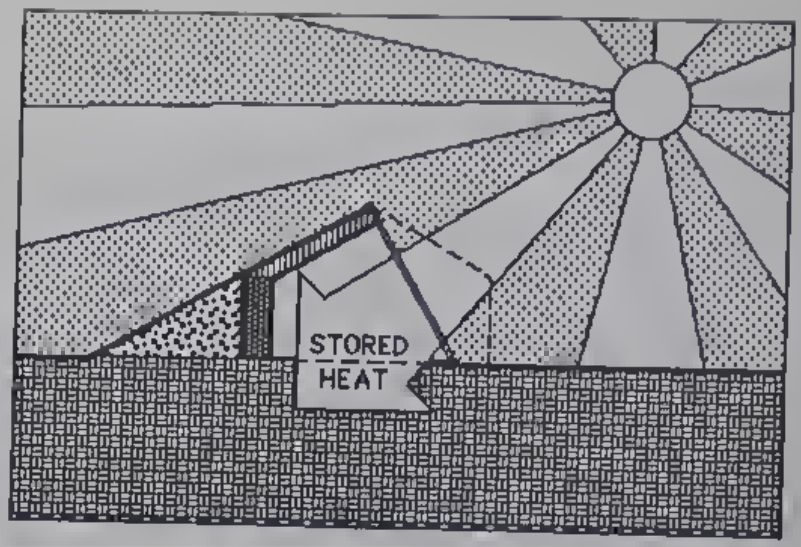
It would help if we could meet the redesign effort halfway by reevaluating our needs. This is very similar to designing a vehicle to make a voyage into space for five years. The vessel must be self-contained so our usual amount of needs must be reduced.

When one buys a house today, he/she is essentially going on a voyage on planet Earth for the next thirty or forty years. Considering the condition of the planet, (due to years and years of abuse), our vessels must now be self-contained. **Our numbers are too great for us to continue taking from the planet — we must now stand with it.**

The future must see a self-contained vessel capable of sustaining an environment for human habitat on its own, through its own interfacing with natural phenomena. This would allow the vessel to be taken anywhere — to the top of a mountain, out in the desert, to an island, anywhere.

It would be an **Earthship**.

One very important aspect of this new concept for housing is that it must be available to the masses. That is to say, it cannot be a multimillion dollar vessel that only the rich can afford. Everyone is entitled to voyage into the future. The concept, design, and actual method of manifestation of an Earthship must be developed with this in mind. **In addition to interfacing with natural phenomena, this concept must interface with the nature of the common person.**



THE SYSTEMS OF THE EARTHSHIP

The Earthship must, by virtue of the way it interfaces with the existing natural phenomena, provide a compartment that maintains its own levels of comfort. **The Earthship itself must be a heating and cooling system.**

Heating and Cooling system

The sun is a source of heat. The Earth itself is a battery to store heat. Earthships, therefore, must begin relating to both of these phenomena in their design.

"We" is a more appropriate concept for the future than "I"

House as Battery

Put a cast iron skillet and a tin pan on a stove and heat them both. Then turn off the stove. The tin pan will cool off in a couple of minutes; fifteen minutes later, the skillet will still burn your hand to touch it. This is because it is thicker and has more mass than the tin pan. It is a better 'battery' for holding heat.

Housing evolved on this planet out of a physical and emotional need for shelter. Early on, shelter began to involve the use of energy. Fires were used inside shelters for warmth and cooking. Then electric lights and various appliances appeared. We now have a multitude of appliances, as well as elaborate heating and cooling systems, all of which have become necessities of housing. **The current result is that now energy is as much a factor of housing as shelter.**

No one would really think of building a house that did not provide shelter. For example, can you imagine a beautiful floor plan built on the ground without a roof? This would be absurd. At this point in our evolution, we must accept the fact that energy is essential to housing; **it is just as absurd to build a house with no provision for energy as it is to build a house without a roof.**

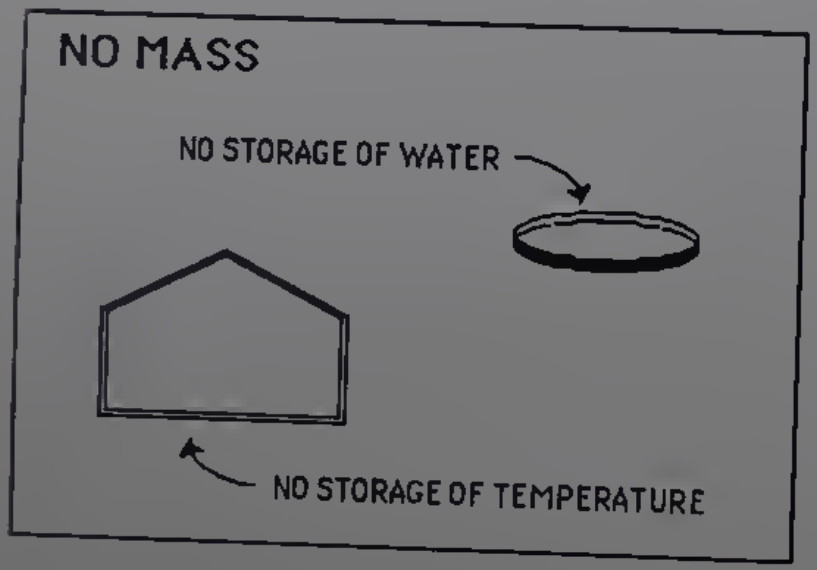
The energy factor can be broken into two categories - appliances and temperature. As will be discussed later, the electrical energy requirements of appliances can be met with immediately available technology, collected from the sun or wind, and stored in batteries for later use. Temperature can be collected and stored much the same way as electrical energy. A glass wall on the south face of a house will transmit heat to the space and the mass behind it. That space and mass, potentially the entire house, can serve as a battery to store the heat. This concept is known as thermal mass, and works well anywhere there is exposure to any source of heat.

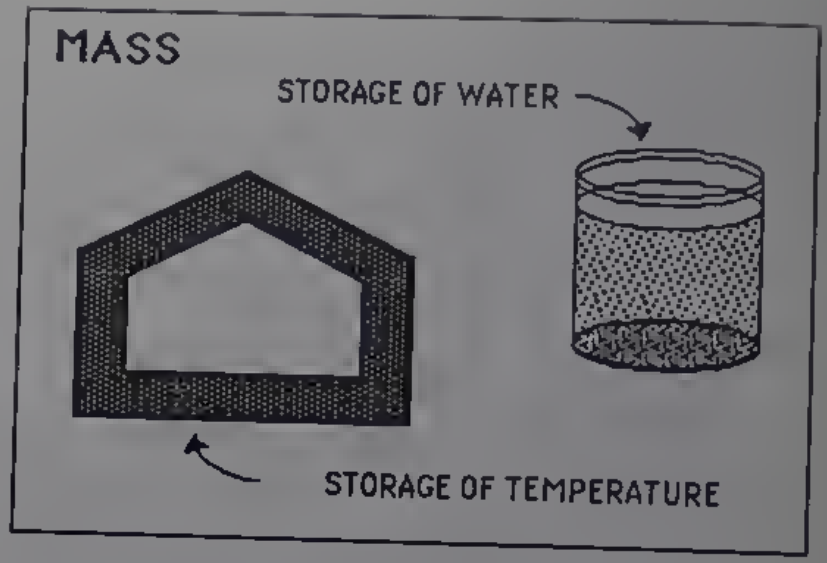
Thermal mass has been utilized for centuries by animals and ancient civilizations, but has been given up for more 'modern', 'economical' construction methods which make no provision for storage of heat.

The idea that we call a battery is really a reflection of a pattern or phenomenon upon which the entire universe is based. This is the relationship between energy and matter. All matter is actually stored energy, while all energy is actually 'evaporated' matter. **Matter itself is essentially a battery.**

In much the same way that matter stores energy, dense mass stores temperature. The more dense the mass is, the more temperature it stores. Therefore, a house or shelter made of dense mass is much better for storing temperature than a house made of thin pieces of wood. This is true regardless of the original source of temperature be it heat or cooling.

A good analogy can be made to the way a barrel stores water. If the water storing capacity of a barrel were compared to the temperature storing capacity of most houses, the 'barrel' would be 1" deep, rather than 3'-0" deep. Most houses have little or no dense mass, therefore they store no temperature.





Consequently, energy must continually be brought in via wires and pipes from outside sources to control inside temperature.

Today's better insulation helps keep this heated air from escaping, but insulation does not absorb or store heat. If houses could store heat from any source, as a barrel stores water, they would require much less energy to stay 'full.' Instead of using mass, we usually continuously heat or cool the air in our houses to control their temperature. **Air does not hold temperature.** This is like trying to collect water on a flat surface – it just runs away. Just as we must collect water in a barrel if we want to save it, we must collect temperature in mass if we want to save it.

Since we go to the trouble and expense of putting heat into a house, we should do what we can to make the house hold that heat. **Houses should be built with mass surrounding every space to allow them to truly act as batteries.**

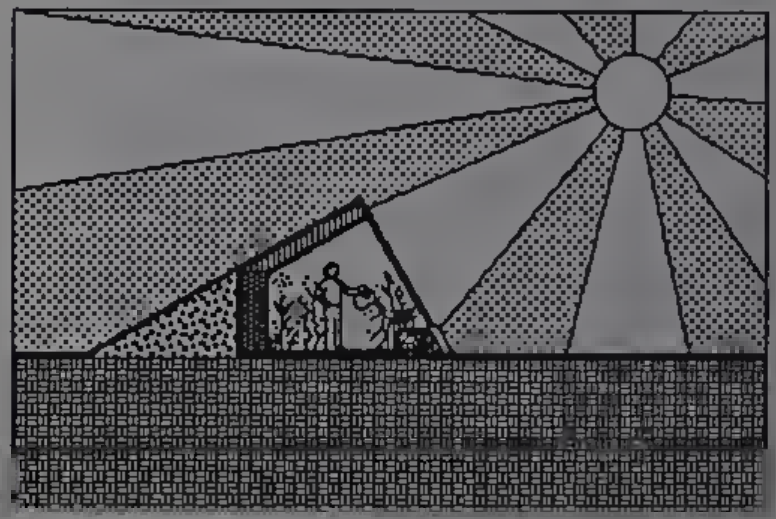
Our bodies, being 96% water – which is mass, function similarly. A certain amount of energy is put into our bodies, via food, etc. Some of this energy results in heat, which is stored in the built-in mass of our bodies; our bodies are batteries. Thus we can maintain 98° F. when the air around us is 50° F. and we consume food only occasionally. If our bodies held no heat, we would have to eat all the time, putting energy in constantly to maintain our body temperature. We would run out of food, wear out our digestive systems and have time for nothing but eating.

Housing is similar. Without mass, we are running out of fuel, taxing our energy systems, and wasting most of our time making and paying for fuel. This payment is suffered both economically and ecologically. If our houses are to hold heat as our bodies do, they must be made of mass. The more dense the mass, the more temperature it stores. The Earthship provides for this storage by wrapping every room with 3'-0" thick dense walls. It is interfacing with the earth, by aligning with the phenomenon of thermal mass.

The concept of house as battery is appropriate anywhere, regardless of solar availability. **No matter what the heating or cooling source, the battery will retain the temperature.**

Food system:
An Earthship should encounter the Earth in such a way that it provides space and environment for year round growing of edible plants, fruits, and nuts. Diets could be leaned toward what is easily produced in the environment provided by the Earthship, as the Earthship's food production capabilities are slowly evolved toward the desires of the inhabitant.

House as Greenhouse
For the inhabitants of Earthships to be independent, they will have to produce food. What will this mean in the design of the vessel?



Obviously, we need dirt; there will need to be areas with dirt floors. Current Earthships provide planters, but entire rooms and spaces will be needed to grow reasonable quantities of various types of food. For example, we will need height for growing citrus and nut trees. Major requirements of a garden must be provided within the vessel, so food production can occur year round, protected from temperature extremes and potentially bad air and acid rain. This means that a certain amount of space will be for plants, not for people. These factors are all design determinants for the vessel. **As important as a bedroom, there must be a garden.**

Electrical system:

The Earthship must provide enough electricity to light itself and to run various appliances to which humans have grown accustomed. Obviously, the cost of the components that provide this electricity would be regulated by a more efficient approach, on the part of the owners, to the overall use of electricity. The simple admission of sunlight reduces the need for daytime lighting.

House as Power Plant

The vessel must be a small, independent power station. Through wind and/or sun, it must capture enough energy to meet the electrical demands of the inhabitants in a clean way. Currently, this can be done by collecting energy from windmills and photovoltaic panels

- storing the energy in batteries, and using the energy as needed from the batteries. Photovoltaic cells have been developed to convert light energy from the sun into electricity. They have become more reliable in more areas than windmills; however, it is important to note that windmills can be made with less technology. This energy is stored in conventional electric vehicle type (golf cart) batteries. This method has already proven itself in the 'sun belt' to be an adequate solution for the requirements of home appliances. Based on what has been learned there, this method will soon be sensitive enough to provide for energy requirements in other areas where the sun must come through clouds. In the future, there may be other ways to collect and store energy; soon we will be taking it right out of the air, out of the atoms.

(Read Tapping Zero Point Energy, by Moray B. King) Our specific use of energy may evolve; but, today, we need energy which comes to us through wall sockets. This cannot be changed overnight. The concept of the energy producing vessel can be evolved in many ways; but, **the immediate application must start with that to which we are accustomed, and lead us to that which is more appropriate.**

Just as a generator is designed as an integral part of a car, a power generating system must be integral in the design of Earthships. The aesthetic of the Earthship is a result of the systems' requirements. Current Earthships are built and finished with earthy materials, and are buried with earth. They feel good, but their appearance is subject to performance. It will be difficult, if not impossible, to design an English Colonial Earthship. An empty wood box can be decorated as an English Colonial, but it would need power lines and systems. An Earthship cannot have these connections to the power grid. The days of preconceived ideas about what Architecture must look like are over. **Buildings, housing especially, must become interfacing vessels, evolving the preconceived ideas of style and appearance to independence and performance. Emotionally, this is another way we must change to meet the Earthship halfway.**

Water system:

The Earthship must, within its own electrical system have provision for pumping water with existing conventional methods, as well as catching rain and snow melt. An Earthship must provide its own water.

House as Water Provider

Currently, we bring water systems to houses. An Earthship can have a well that is pumped from the Earthship's independent power system. Vessels can also catch water. These systems can be built into the nature of the vessel itself, eliminating the need for an outside water system. In the future, we may discover ways to take water from the air, by condensing it; but, even now, we can pump water with power produced by the vessel. Soon it will be important to distill water for human consumption. Distillers will have to be built into the vessel. Hot water will also have to be provided by the vessel itself. Various solar hot water heaters work in many areas with current technology. Earthships must eventually produce, distill, and heat their own water.

Sewage system:

An Earthship must divide its water waste into grey water and black water, reusing both and/or delivering both to the Earth in a form which is totally acceptable to existing natural processes.

House as Septic System

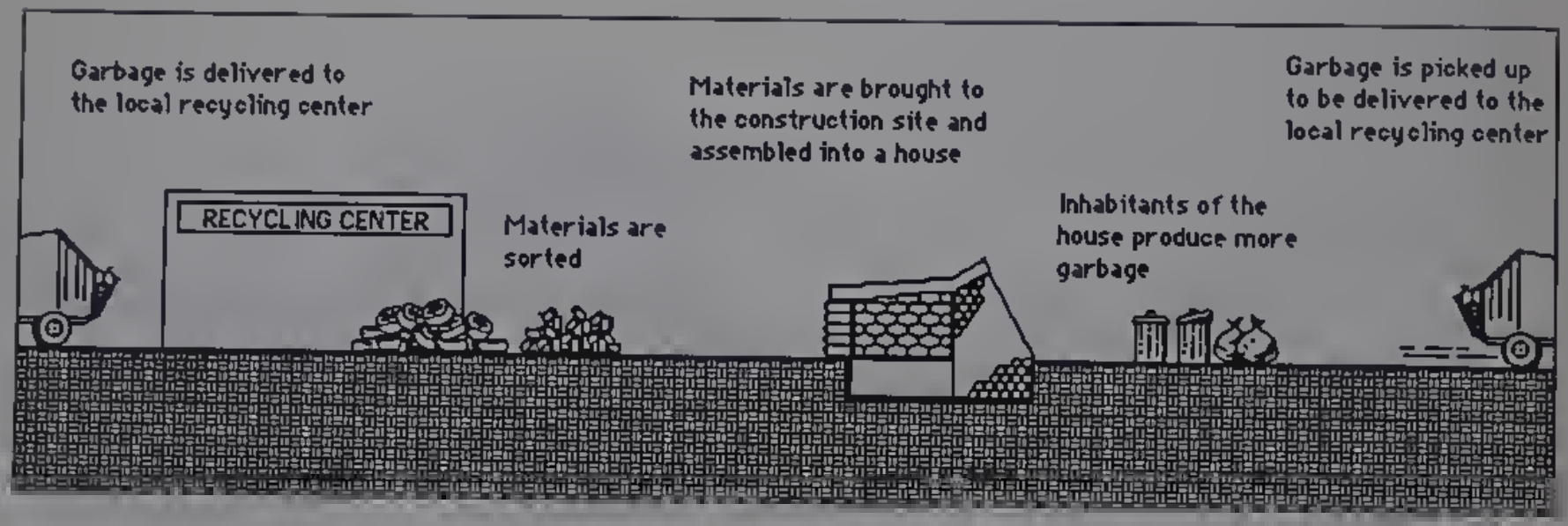
Black water comes from the toilet; grey water comes from everywhere else, (lavatories, tubs, sinks, etc.). Current systems put all grey and black water together underground in a septic tank or sewer; all of this water must be chemically treated and ends up polluting our rivers, streams, oceans, and underground, largely because of sheer volume. Then we buy chemical fertilizers for our plants. Instead, we could be using the grey water, which is right in front of us to feed our plants. There are food particles in the kitchen sink; there is protein in the bath water. Plants thrive on these things. The waste system for grey water can be tied into the garden. This can be done in many ways, but direct flow is the easiest.

When the grey water is reused, the septic tank or sewer needs become minimal because only black water from the toilet is sent to it. Current septic tanks and sewer systems are so large because they have to deal with the shower, dishwasher, clothes washer, etc... altogether. A much smaller septic tank for black water only may even be contained, or at least have a minimal effect on surrounding areas. Sewer systems for cities would also be much more manageable with only black water. The reuse of grey water would, of course, mean watching what you put down your drain - no Drano or harmful chemicals.

Gas system:
Since gas is the least offensive system in conventional housing, early Earthships that do not quite make it all the way to total independence should use gas as a back-up. This should still be for as few needs as possible.

House as Methane Plant:
Gas (methane) can be made from sewage and compost. Ideally, Earthships could produce enough gas from their compost and black water septic tanks to deal with their own gas needs. At this point, gas is only required for cooking and backup hot water. Domestic methane could easily meet this demand.

Materials system:
The shape and fabric of an Earthship must grow out of the "natural" resources of our age. This includes anything that appears on the planet in large quantities and in many areas. These materials and the techniques for using them must be accessible to the common person in terms of price and skill required to use them. The less energy required to turn a found object into a usable building material the better. Designs for Earthships must relate to the direct use (with little or no modification) of natural resources of the 21st century.

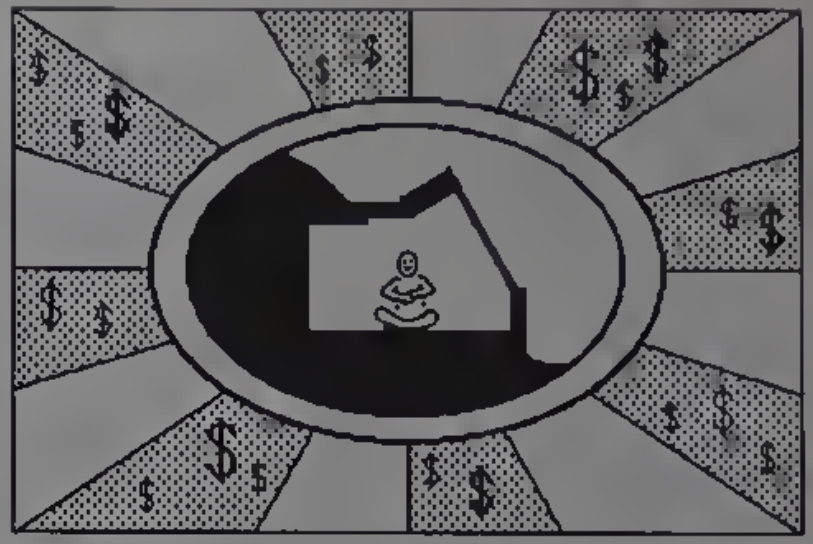


House as Assemblage of By-products

An Earthship of the future should make use of indigenous materials, those occurring naturally in an area. For centuries, housing has been built from found materials such as rock, earth, reeds, and logs. Now, there are mountains of by-products of our civilization that are already made and delivered to all areas. *These are the natural resources of the twenty-first century*. An Earthship must make use of these via techniques available to the common person. In a time when mortgage payments take up 75% of monthly income, homelessness is an epidemic, and the stress is becoming a disease, **housing must return to the grasp of the individual.**

Monetary system:
Because the Earthship itself provides all of the systems upon which the inhabitant would be spending much money , and the fact that the Earthship, inherently in its concept and design, is very accessible to the common person, the dependence upon the existing monetary system would be greatly reduced, thus reducing stress to both people and the planet.

House as a Method for Survival, (Money):
The ideal vision of the Earthship would therefore be — a vessel that provides both space and systems for humans and edible plants, independently, through its own interfacing with natural phenomena. This would reduce and ultimately remove the stress involved with living on this planet, both to humans and the rest of the planet. This concept of living, (independent voyage vs. dependent trap), could change the nature of the human mind itself. It could provide a basis and a direction for conscious evolution on the Earth.



This is a vision for tomorrow to inspire us. Now, what can we *do* today?

TODAY

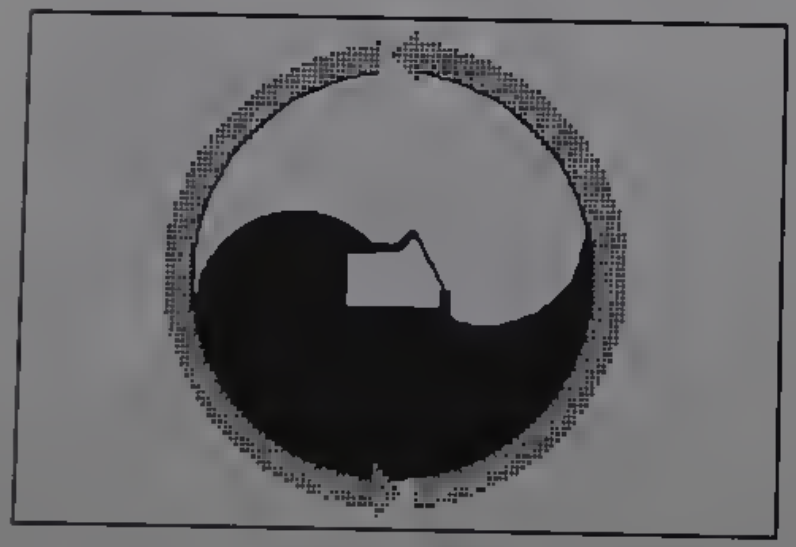
The bummer factors of existing housing are:

- it is continually increasing the need for the monstrous systems which are failing and flailing and destroying the planet
- its location is limited relative to the availability of systems
- it is non-functional without systems
- its method of manifestation contributes to the stress level of both people and the planet

An independent vessel must:

- -be able to function anywhere
- -decrease and ultimately dispense with the need for the outside systems which currently support the living compartment
- -be accessible to common people
- -grow food
- -deal with its own waste and by-products
- -make its own energy
- -make its own temperate climate inside
- -make use of the by-products of the twenty-first century

All of this must be done by interfacing with natural phenomena, without any connection to outside sources.



WHAT IS MEANT BY INTERFACING

"Interfacing" is a word which is used a lot these days. When a solar electric system or a wind powered electric system is hooked up to the existing power grid, and more power is needed than can be provided by the solar or wind electric system, it is provided by the power grid. When there is an excess of solar or wind generated electricity, it goes back to the power grid. This is called 'interfacing with the existing power grid.'

Interfacing is a dance between two systems. In the example above, the solar/wind system interfaces with the existing system and they give and take, back and forth. It is a dance, a wave, a pulse, an alignment, as opposed to merely taking from the existing power system.

Animals and trees interface with the natural phenomena of the planet. A tree grows out of the planet, feeds from the planet, dies, rots back into the planet, and its offspring feed from the rot that the tree became. It breathes the carbon dioxide given off by animals, and provides oxygen for animals to breathe. Trees and animals are active participants in the processes of the planet and each other.

Humans' lifestyle, including housing, is not interfacing with the planet. We are getting further and further away from the processes of the planet. Currently, we are basically taking

from the planet, while we are not returning anything useful to the planet. Our life is on the planet, but not of the planet.

Interface: A point at which relative systems interact.

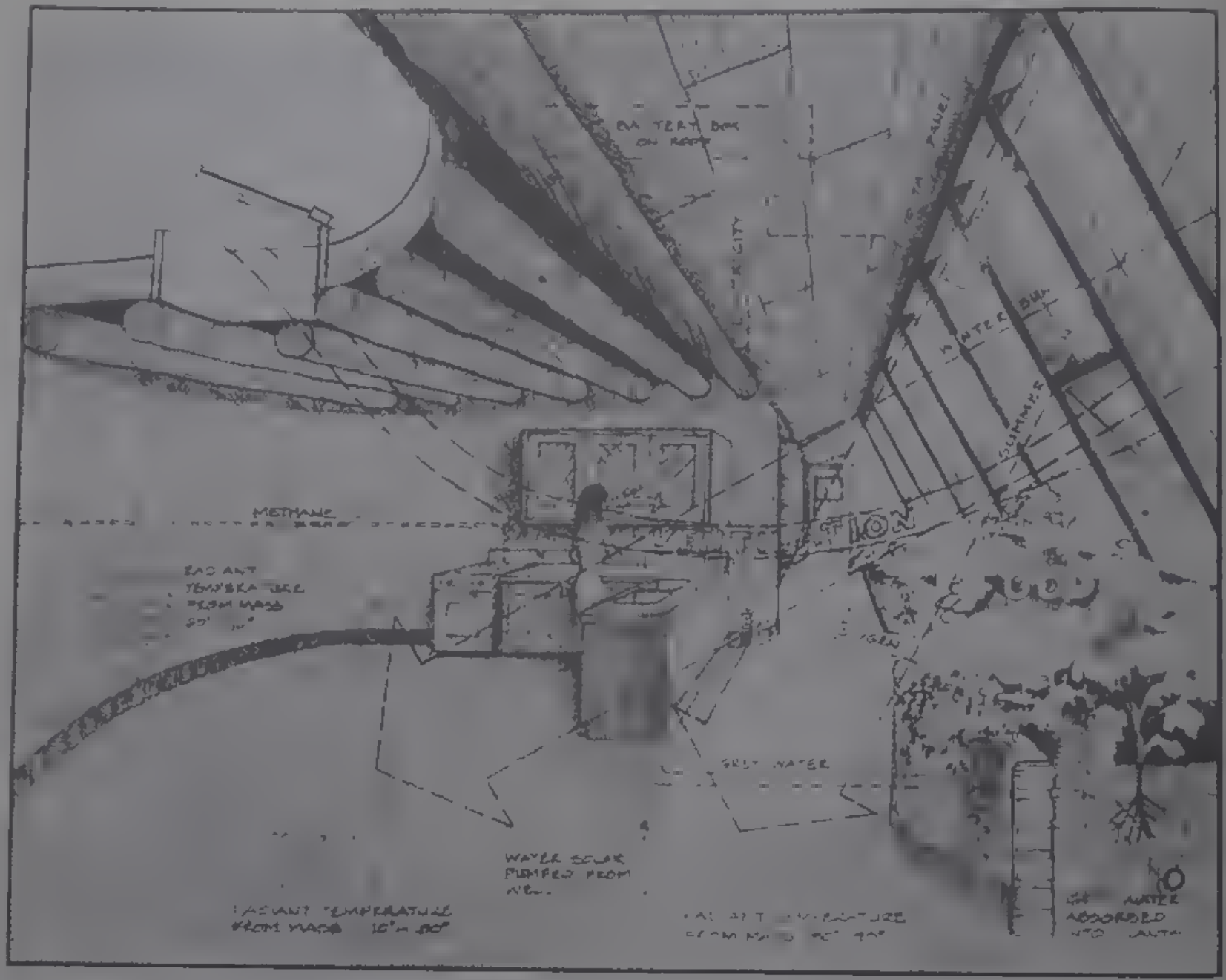
Deface: To mar or spoil the surface or appearance of; disfigure.[1]

Existing houses, due to the fact that they are totally supported by destructive out-of-control systems, contribute to the defacing of the planet. A new concept of housing must interface with the planet. By interfacing with the planet, it supports us as humans while supporting the planet as an organism. This recognizes both the planet and the relative systems. This requires aligning ourselves with the processes of the planet and reevaluating our concept of living. Housing is how we live; we may have to begin to reevaluate how we live in order to relate to a new concept of housing.

There are many existing natural phenomena which result in temperature, energy, food production, and all things we need to sustain life. We must learn to align ourselves with these phenomena - to interface with them. We must create a vessel which helps us to do this. Through interfacing with existing phenomena on site, the vessel must provide an environment which will sustain human life. This is a visionary concept, which cannot be achieved overnight. We will only be able to create a facsimile of this ultimate interfacing vessel - the Earthship. However this is the first step toward the vision of the ultimate interfacing vehicle. The facsimile interfaces with the Sun and the Earth and begins to take care of us; but we must accept the fact that it is not nearly as evolved as the vision. It is simply a step in the direction of the vision.

Our minds can move toward the truth more swiftly than our bodies and emotions.

[1]Webster's II, New Riverside Dictionary, Berkeley Books, New York, 1984.



WE CAN ALIGN OURSELVES WITH NATURAL PHENOMENA AND INTERFACE WITH THEM

THE EARTHSHIP AND ITS RELATIONSHIP TO THE CAR

The inventors of the automobile perhaps had visions of faster, smoother vehicles rolling on wheels, such as the cars we have today; however, the best they could produce with their current industry and technology was the Model T. Likewise, our current technology today makes Earthships barely functional, perhaps even crude, relative to the vision of the concept. It is only a step away from the dependent house, but it is a significant step. Future Earthships will keep evolving toward that vision, as a Model T evolved into a 1990 Porsche.

The automobile was an invention and a vision; however, this vision was limited. The inventors did not envision the planet filled with millions of cars emitting carbon monoxide, or cities filled with traffic jams, making life so unhealthy one could barely walk down the sidewalk. The car has evolved to the point where it could be the wrong thing now, due to fumes, noise, pollution, the dependency on oil, and the stress it puts on the planet. The concept of moving along in a capsule may be fine, but there needs to be a new kind of vessel. The concept of a gasoline fueled vessel must be evolved beyond the dependency on gasoline, the emission of pollutants and the noise.

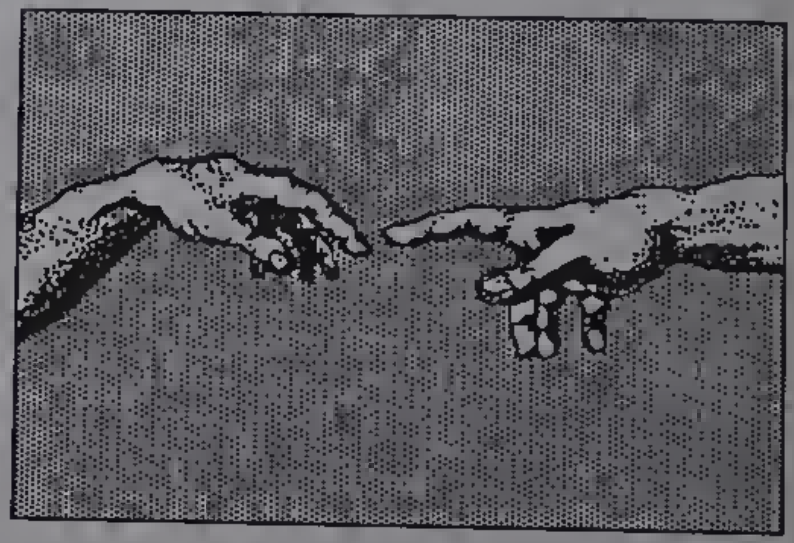
Likewise, the house must be developed into a new kind of vessel. It is merely a package now - an empty box. If there were only a few of these houses scattered around the planet, there wouldn't be a problem. But, when an idea or vision is taken relative to people, who keep multiplying, it too must be multiplied. Simply multiply each invention times 1 billion. If Henry Ford had taken the Model T times 1 billion, he would have thought of the pollutants, and the gasoline dependency as problems. Existing housing has similar problems - it requires a massive amount of energy and sewage systems which in turn pollute the environment. This housing times 1 billion is going to kill all of us and make our planet uninhabitable.

Next, consider the concept of the Earthship times 1 billion. It is interfacing with the planet, not stressing it. Compare this to multiplying a tree times 1 billion; there is no real problem. If we are going to interface, we must look to trees, animals, rivers, etc. to see the rules of interfacing. If we are to design a vessel which won't backfire in the future, it must be looked at on a mass scale. We must envision what it would be like to live in the midst of Earthships, which emit no pollutants, deal with their own waste, are partially covered with earth, and require no outside systems. This is like standing amongst 1 billion trees, instead of 1 billion cars. Our

current housing and automobile situation shows the shortsightedness of our vision. The concept of the Earthship is prepared to evolve; it has a broader vision. The way in which a tree interfaces with the earth is the format for how the independent vessel should evolve. We must begin *leaning toward this vision. (*See A Coming of Wizards, Chapter 6, Michael Reynolds) It cannot be done overnight; but, **if we lean in that direction, we are participating in our own evolution and giving ourselves a chance for survival.**

EVOLUTION OF OUR LIFESTYLES RELATIVE TO THE VESSEL

It is probable that, even if we did have the ultimate interfacing vessel available to us now, we wouldn't be able to survive in it. We would have to evolve our living habits toward what the vessel could provide. For instance, our diets would change. The vessel could not produce packaged microwave dinners and other processed foods, so we would have to lean our diets toward what it could produce - fruits, vegetables, and grains. The Earthship will continue to evolve to be able to produce more foods, as we continue to lean toward a new diet. Current Earthships do provide growing spaces for plants, with the living spaces for people. These growing spaces are easy to care for because they are in the "path of everyday living". But because they cannot supply everything, we must supplement the vessels with grocery stores. Ultimately, as both we and the Earthship evolve, we will be able to grow all of our own food, and reduce or dissolve our need for packaged foods. This is true of all needs. As we "lean" our lifestyles toward what the Earthship can provide, we evolve the Earthship toward what we need. Someday we will meet.



The evolution of our lifestyles will affect all aspects of living. It is already affecting the lives of people who live in Earthships. These people have discovered that we usually use a tremendous amount of electricity. To match that existing 'need,' a very large solar power system would be needed. Rather than spend the extra $300 for each extra solar panel, most Earthship owners try to evolve their electricity consumption to meet the capacity provided in a reasonably sized and priced system. This is not a radical change; it usually means turning off unnecessary lights, using less appliances, staggering the use of the appliances one does use, and generally being aware that the supply of electricity is limited. We tend to think of our electrical energy as being unlimited, but the truth is that our consumption is taking from the planet in a radical way. In the Earthship, we will constantly be evolving toward lowering our consumption, while the vessel continues to be able to provide more.

The purpose of this book is to develop a vision based on a revised concept of housing on this planet. The Earthship is an immediately available step in that direction. It is becoming more and more evident that we need a revised concept for living. We are facing crises in energy, water, air, and food quality. We must respond with the design of the human habitat. **It must now be a vessel, that will float on the seas of tomorrow.**

JUST AS MOSS GROWS ON THE NORTH SIDE OF TREES,
PEOPLE WILL FLOURISH ON THE SOUTH SIDE OF MOUNTAINS