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CONSERVATION ETHICS

Ethics are usually associated with a theory, or a system of moral values. In this paper, I would like to look upon an ethic as ecological. An ethic, ecologically then, is a limitation on freedom of action in the struggle of existence. An ethic, philosophically, is a differentiation of social from anti-social conduct. These are two definitions of one thing. The first ethics dealt with the relation between individuals; the Mosaic Decalogue is an example. The Golden Rule tries to integrate the individual to society; democracy endeavors to integrate social organization to the individual.

There is as yet no ~~ehtic~~ ETHIC dealing with man's relation to land, to animals, or the plants which grow upon it. The land relation is still strictly economic, entailing privileges but no obligations.

All ethics so far evolved rest upon a single premise; that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in that community, but his ethics prompt him also to cooperate. The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, animals, or collectively; the land. This may sound simple, but just where do we show our affection? We let the soil go helter- skelter downriver; we assume the function of water to turn turbines, float barges, and carry off sewage; we freely exterminate whole communities of plants; and we have already extirpated many of the largest and most beautiful species. A land ethic cannot prevent the alteration, management, and use of these "resources", but it does affirm their right to continued existence, and at least in spots, their continued existence in a natural state.

Conservation is then a state of harmony between men and land. Despite nearly a century of propaganda, conservation still proceeds at a snail's pace. The usual answer is that we need more conservation education. One approach is to build up a mental image of land as a biotic mechanism. The "balance of nature" approach fails

to describe accurately what little we know about the land mechanism. A much truer image is the one employed in ecology; the biotic pyramid.

Plants absorb energy from the sun. This energy flows thru a circuit called the Biota, which may be represented by a pyramid consisting of layers. The bottom layer is soil. A plant layer rests on the soil, an insect layer on the plants, a bird and rodent layer on the insects, and so on up through various grpups to the apex layer, which consists of larger carnivores.

The species of a layer are alike not in where they came from, or in what they look like, but rather in what they eat. Each successive layer depends on those below it for food and often for other services, and each in turn furnishes food and services for those above. Proceeding upward, each successive layer decreases in numberical abundance. Thus for every carnivore there are hundreds of his prey, thousands of their prey, millions of insects, uncountable plants. Man shares on intermediate layer with the bears, raccoons, and squirrels which eat both meat and vegetables.

The lines of dependency for food and other services are called food chains. Thus soil-oak-~~deer~~ deer-Indian is a chain that has now been largely converted to soil-corn-cow-farmer. Each species, including ourselves, is a link in many chains. The deer eats a hundred plants other than oak, and the cow a hundred plants other than corn.

In the beginning, the pyramid of life was low and squat; the food chains short and simple. Science has given us many doubts, but it has given us at least one certainty; the trend of evolution is to elaborate and diversify the Biota.

Land then, is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals. Food chains are the living channels which conduct energy upward; death and decay return it to the soil. The circuit is not closed; some energy is dissipated in decay, some is added by absorption from the air, some is stored in soils, peats, and long-lived forest; but, it is a sustained circuit, like a slowly augmented revolving fund of life.

Waters like soils, are part of the energy circuit. Industry by polluting waters

or obstructing them with dams, may exclude the plants and animals necessary to keep energy in circulation.

We have given some attention to the energy circuit. I would now like to direct your thoughts to that segment of the circuit which to many is the conservation scandal of our generation, namely, water.

Man cannot live without water. But he also needs food, clothing, and shelter. And his existence would be extinguished most quickly of all if he had no air. Why, then is there such loud and persistent talk of a water shortage when no one talks of a air shortage? Water like air is indestructible, and in plentiful supply on this plant Earth. The water in the oceans would, if poured evenly over a dry land surface enclosing the globe, bury the land everywhere 800 feet deep. This water is salty, true. But the sun boils off billions of tons of it each day, leaving the salt behind in the sea and lifting the sweet water vapor into the sky, where the cooler air condenses it into clouds of ice crystals, which grow with time and multiply until the pull of gravity draws them to the Earth again as raindrops, snowflakes, or icy pellets of hail and sleet.

The snow that falls in the mountains may remain there for months or years before melting. The ice that packs into glaciers may stay frozen for centuries. The rain that seeps through the ground into basins of underground rock may flow back and forth over hundreds of miles for thousands of years. Ultimately, however, the fall from the clouds all returns to replenish the oceans. Day and night this great pumping system works uninterrupted, yet never empties or even much depletes the enormous reservoirs of sea. Aware of the potential of this eternally cycling engine, a mind guided by scientific principles cannot take the idea of water shortage, as an absolute, seriously.

Qualified social scientists who have examined the many so-called water shortages exhaustively agree that whatever shortage exists is not a shortage of water but a shortage of human foresight.

This paper of necessity allows for only the study of a single area. Inasmuch as the Great Lakes are pretty much in our own back yard, let us spend some time noting how we are wasting much of this great natural resource. The Great Lakes constitute the

the largest reservoirs in the world, containing about 20% of the fresh water on the face of the Earth. If you stand on the shore at Duluth, Minn., and look out over the endless expanse of Lake Superior, it seems impossible that such a vast body of water could ever become tainted. Yet the flow of industrial pollutants alone from Lake Superior into Lake Huron has been measured.by the International Joint Commission in hundreds of millions of gallons a year. The contamination gets rapidly worse as you move eastward along the chain of lakes to Mich., and Erie.

The U.S. Public Health Service is now in the final months of a six year study of all the Great Lakes, to find out just the extent of this pollution. Chicago at the southern tip of Lake Mich., has spent more than a half a century and billions of dollars developing a good water system. The city draws a billion gallons a day from the Lake, to serve 4,400,000 people. Its sewage treated to remove most of the pollutants, is channelled southward into tributaries of the Miss., so that it does not affect the Lake. But around Chicago, extending past the Ind. line only ten miles to the southeast, is a network of small, sluggish waterways-- the Grand Calumet River, the Little Calumet River, Wolf Lake, and various canals-- that serve as a drainage system for a dense industrial complex sprawling for more than twenty miles along the shore, from Chicago, through Hammond, Whiting, and Gary. Here there are ten steel mills, five oil refineries, and dozens of other plants ranging from paper mills to soap factories. Six major plants discharge a billion gallons of waste a day that includes 35,000 lbs. of ammonia nitrogen, 3,500 lbs. of phenols, 300 lbs. of cyanide, and 50 tons of oil. Much of this finds its way into Lake Mich., and there it has spoiled some of Chicago's best beaches, exterminated much aquatic life, and recently defied city water officials best efforts to provide a supply free of objectionable tastes and odors.

The same is found in the Detroit area. Aside from relatively minor contributions from Canadian communities, the Detroit area dumps 20,000,000 lbs. of contaminant materials into Lake Erie every day, in a waste flow totaling 1.6 billion gallons. About 2/3rds of this is from industry, and 1/3 from municipal sewage. Detroit gives the sewage of 3,000,000 people only "primary" treatment, which means just the settling-out of grosser solids;

standard sewage treatment today includes a "secondary" stage of chemical and biological neutralization of up to 90% of the contaminants.

Upon Mich.'s request the Federal Public Health Service came up with a 1961 report showing that some of the nation's leading automobile, chemical, and paper companies were the major offenders in the Detroit metropolitan area.

Conditions like Detroit's are repeated in various degrees at Toledo, Erie, Cleveland, and Buffalo. These conditions point to claims that the major tributaries of Lake Erie are grossly polluted. Interstate action has led to a clean up program in the Detroit area alone costing upward of $100 million just to bring detroit's sewage system up to standard. Pressures from such groups as the Fish & Wildlife Service, the Isaak Walton League, and the League of Women Voters are making water pollution reform one of their major national projects.

Pollution in any area may generate a cancerous affect making for the results of treatment questionable. The biological metabolism has been disrupted due to the accumulation of contaminants down through the years. Oxygen -absorbing chemicals have so sapped a water's supply of free oxygen, essential to the normal plant-fish-insect life cycle, that there is a 2,600 mile patch in the middle of Lake Erie equal to more than a quarter of itsarea, where the water for up to ten feet from the bottom is devoid of oxygen. White fish, and pike, once the basis of a multi-million dollar fishing industry, have vanished; in their place are inferior species such as carp that require less oxygen.

The disruption of normal processes has been aggravated by a runaway growth of algae, the plant life that in a healthy lake is microscopic; in Lake Erie, it grows like seaweed, in great swatches up to 50 feet long. The dominant type is CLADAPHORA, a coarse growth that looks as if it had dripped off the Ancient Mariner, and smells terrible. Algae growth is promoted by phosphates, which come particularly from municipal sewage. Detergents are composed of up to 70% phosphates. Millions of pounds of waste detergent pour into the lake every year. Each pound will propagate 700 lbs. of algae. The algae absorbs more oxygen. When it dies, it sinks to the bottom as silt and releases the phosphates to grow another crop of algae. Copper sulfate will kill algae in a small amount of water, such as your private swim pool. But biologists know of no chemical

that can exterminate it on a scale such as is found in Lake Erie. We should add here that new detergents are removing the unsightly suds found in some streams, but the intestinal gas producing organism, COLIFORM, usually develops from detergents; the suds do not constitute contamination.

We have noted the devastating affect of industrial affluents, improperly treated sewage, and the need of maintaining a healthy oxygen level in our lakes. We should endeavor to break down the water management of our waters into smaller segments. To better comprehend this procedure, we should have some understanding of our water-sheds in Mich., and the Great Lakes Basin. The first is a major river water-shed, composed of many smaller water-sheds--the Grand River Water-shed. This along with other river water-sheds flows into and feeds Lake Mich. As you would easily notice from a quick look at a Mich. Water-shed map, county lines have no relationship with the fluid lines of a water-shed.

The large Lake Mich. basin connects in turn at a high point(this is always the limitation of a water-shed), with each of the other Lake basins until you find an outer perimeter of high points. This last jagged outline, both in the U.S. and Canada is known as the Great Lakes Basin. It is in truth, the drainage basin of the St. Lawrence River. All lands within the Basin and the lakes drain out, and down the St.Lawrence River. The only water which comes into the basin area is that brought by the winds over the surrounding peaks. Once the water starts down the land surface to the lake below, its eventual destiny is the St. Lawrence and the Sea.

The whole basin proper is actually up on a slanting plateau. If you visualize these lakes as a series of bowls, one higher than the other, you can see the way the system works. Lake Superior is the higher, with its water feeding into Lakes Mich. and Huron which are at one level. All the water in these tow lakes does not come soley from this drainage of Lake Superior, but as the bulk is derived from the drainage of the lands surrounding the lakes basins. The drainage of the Lakes Mich. and Huron is through the narrow-- 800 feet wide-- opening of the St. Clair River where a gradual incline takes it down this river channel to a slight depression called Lake St. Clair, and thence into

another channel, the Detroit River, to Lake Erie. The total distance is about 90 miles with a gradual drop of little more than 8 feet. Here the water swings northeast to the Niagara River and picking up speed along the 35 miles drops 325 feet to Lake Ontario. Then, the lake water feeds northeast to the long St. Lawrence River down which it makes the final descent to the Sea(about a 240 ft. drop).

We have in this Great Lakes Basin a tremendous wealth of water. Some of these bowls, or lakes have been getting more than water poured into them, and like a bowl, the sludge settles at the bottom, and or around the edges. It does not all pour out. It is understandable therefore, that in the case of Lake Mich. where the main outpouring is northward through the Straits, that there is a considerable build up of sediments and waste at the sound end of Lake Mich. Fortunately, the wastes of Chicago are sent down the Miss. River, or the southern end of Lake Mich., would be far worse than we presently find it.

Since the outlines of water-shed areas cross political divisions, our problems and their solutions involve the finding of ways and methods to work harmoniously with other residents of the same water-shed. Our own Grand River Basin encompasses several counties, hosts of townships, and municipalities.

This paper has endeavored to give you some necessary background. There is practically an endless amount of material to point out the seriousness of the way in which we mis-use this free natural resource. We have a water ethic, as well as a land ethic. Most of the water crises today are man made. However, it must also be pointed out that there is a strong growing recognition of the water problem, as evidenced by many municipalities, including Chicago, and voluntary efforts on the part of many industries(including sereral in the Holland area), to correct our wastefullness. There is also evidence of better cooperation between political sub-divisions in a water-shed, as it is impossible for one municipality, or one township, or one county to along effectively attack pollution in one stream, or in one water-shed. Law enforcing officials are, and will be given more power to enforce existing laws. New bills are now in the state

legislative stages to give more teeth to correct pollution. Pres. Johnson has recently sent a long special message to Congress outlining a vast program to combat pollution.

Much study is also being given to various corrective measures. Attention is given to Secondary Treatment of sewage, which would allow for re-cycling of water into drinking water systems. Forced introduction of oxygen in streams by aeration has been effective in some areas. Lower priced methods of desalination are being given great emphasis. The old comination drain which handled storm waters, and sewage is rapidly being corrected by separate sanitary and storm sewer lines. Underground storage is being investigated and tried, which would permit for a more orderly use of rains. We now let the streams swell from a heavy rain, and then just let it run off. Here too, vegetation, plants, and trees in many instances should be spared the bull-dozer, as they silently perform great aids in soil retention of moisture. In this latter connection, the recent action of Council and the Garden Club has set aside a local area which will eventually provide an excellent area for of plant and animal study, not only by local schools, but by anyone desiring a walk through an area where NATURE will have a free hand.

As this paper approaches an adjournment-- I say adjournment, as the subject under discussion is and will be of eternal concern to man, I would like to slide in a side-line which is tied to conservation, and which is also all about us. This is always with us if we only care enough to develop an awareness of this god-given pleasure. I refer to bird watching. Aside from the function of birds in the biotic pyramid, there is also the respect and admiration the casual or the serious minded bird water develops from observing bird life. I am unable to put down my feelings as well as found in Leipold's "A Sand Lake Almanac". I quote: "One swallow does not make a summer, but one skein of geese, cleaving the ~~mruk~~ MARK of a March thaw, is the spring. A Cardinal, whistling spring to a thaw but later finding himself mistaken, can retrieve his error by resuming his winter silence. A chipmunk, emerging for a

sunbath but finding a blizzard, has only to go back to bed. But a migrating goose, staking two hundred miles of black night on the chance of finding a hole in the lake, has no easy chance for retreat. His arrival carries a conviction of a prophet who has burned his bridges. A March morning is only as drab as he who walks in in without a glance skyward, ear cocked for geese. I once knew an educated lady, banded by Phi Beta Kappa, who told me that she had never heard or seen geese that twice a year proclaim the revolving seasons for her well insulated roof. Is education possibly a process of trading awareness for things of lesser worth? The goose who trades his is soon a pile of feathers!"

I trust this paper may develope within us a greater awareness of the consequences when we do not show intelligent management of all the elements within the energy cycle. Each of us can lend support to cleaning up affluents from Holland's wastes. We may have a voice, or a connection that would improve wastes coming from Holland's industry, or it may mean lending support when the City contemplates "secondary" treatment of municipal sewage, or the extensions of Sanitary sewer lines. Nationally, we must institute long range programs, with supporting research, for man to properly manage our natural resources. Again, this may mean individual financial support, but it will pay off. Too often, men is careless with the things which are free.

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Ecology- Biology dealing with the mutual relations between organisms and their environment; or a pattern of relations between organisms and their environment.

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