



# NORTHWEST PASSAGE



BELLINGHAM, WA.

APRIL 22, 1970  
SPECIAL EDITION

On this first official "earth day", Northwest Passage is proud to reprint 13 of the best environmental / ecological articles of its first year of existence. These articles concentrate, for the most part, on the reclamation and retention of a balanced, quality environment and life style for the Pacific Northwest. They cover revolutionary concepts in education as well as birdwatching. One tells you how to wash your clothes. There are technical articles and theoretic articles, electric grapes and fluoride poisoning. You'll read of local industries ruining the land that feeds them, and you'll read of the return to earth - farming at its most ecologically efficient. Some of our writers are pessimistic, some are optimistic, and collected together in this supplement they provide a concise, readable account of what's new in the fight to save our oldest friend... earth.



**special earth day supplement**  
a collection of 13 of NWP's best on environment

25¢

The Environmental Handbook, edited by Garrett de Ball

The Whole Earth Catalog, Portola Institute

I like handbooks and catalogs. They have an air of practicality about them. I have liked them ever since I was a little kid and the only people who would answer my letters were the people who advertise in *Popular Science* and *Mechanix Illustrated*. They never seemed to tire of sending me information on how to stop going bald, packets of rare postage stamps ("on approval") and ideas on how to make a million dollars in my spare time.

But I was a survival freak. The catalogs that I really dug were the ones from sporting goods firms and hardware jobbers; my favorite handbooks were about how to make money trapping furs in the North Woods and where to get mint condition Government-surplus jeeps. I spent much of my time evaluating things from the point of view of "would this thing or process work if I was set down all alone in the middle of the wilderness?" So you can see that I've been dreaming about doing the wilderness thing since I was a little kid and it is only now that I find that you are on the same trip, too. I'm glad. Two is more than twice one. And now our wilderness dream is a necessity: our planetary eco-system has escalated the stakes.

It's not just a fantasy-myth that we inherited from our parents via Captain Video, Davy Crockett, and the Cisco Kid; our wilderness dream is not just an American neurosis that must be lived out and purged from our minds before we can get on with the serious business of imperializing the galaxy and establishing the United Stars of America. It's not that at all. It's a matter of life and death. Our planet is being destroyed.

#### OUR LEADERS

The local - specialized - linear - pre-psychedelic minds of America's leaders are unable to deal with a system as global, generalized, simultaneous, and complex as the world ecosystem. Their minds were

# WHERE WE ARE NOW

by david sucher

David Sucher is co-chairman of Project Survival, the coalition of environment groups in the Seattle area. He works with the Seattle mayor's youth division, and is currently in charge of the Environmental Fair to be held at the Seattle Center on April 22nd.

created 40 years ago, before computers, atomic energy, geodesic domes, psychedelic drugs, in a different environment. They act as though they are running a general store while they are supposed to be managing a planet.

And that's the trouble. Their power is global and their mind-set is local. Everything they do, because they have so much power, reverberates throughout the global ecosystem. They make decisions every day that have a planetary dimension and yet they never think of that dimension. Their minds are even more fragmented than ours. They look at everything as if it was separate; their minds split things up. They do not integrate things. They do not understand when we say that it is all one. Because they do see that it is all one, they do not see the contradictions in their actions.

Henry Jackson probably does not understand that there is a basic contradiction between his war policies and his supposed environmental quality stance. Because they cannot see the contradictions, they are killing life on this globe as fast as it can be created. Faster, in fact.

#### DESTROYING OUR PLANET

What they are doing is destroying the planet. Can you believe that? We are destroying our earth household: throwing out the bathwater, the baby, and the tub. The planet is being destroyed. I hardly believe it myself, yet it appears to be true. Not only from the indirect evidence of the scientists but from what I see every day.

I see that we are destroying the life-support systems that we depend on. We are interfering with the photo-synthetic process on a planetary scale by our continued high use of fertilizers and pesticides in agriculture. Our transportation system is falling apart - from buses, to highways, to airports, to railroads. Our communications system is breaking down (e.g. the telephone system in New York City). Our computer capabilities are being misused. Our construction industry is using antiquated methods to produce over-priced, jerry-built shacks. Our food is filled with poisons. Our global atmosphere may not last the century. Our education system is so bad that I would vote against the school levy and not have the schools at all rather than force kids into those prisons.

Basically, the men who are running things now are not competent. Their mind-set leads them to make decisions and to adhere to policies that are not commensurate with the complexity of the system that we have. Their heads are in a place which makes it impossible for them to do the right thing. But they are nice guys. It's hard to put it to them directly that they are destroying the planet. I know some of them personally and I like them. It's hard to tell a person that you like that he is lousing things up. But he is. And he couldn't do anything else.

The political theory that our "leaders" are working under is not suited to a post-industrial, cybernetic society. Good, healthy, diverse environments cannot be designed from the top down. The problem is too complex, too fast-changing, too caught up in value systems. Environmental design must be based on community decisions-making. The problems involved in designing rich, spontaneous, alive environments cannot be answered by a bureaucrat in a distant ivory tower, whether on-campus or off. You have to be there to make the decision. The people must make the decision. A computer-based, leisure-timed, guaranteed-income society permits (even asks) every citizen to take direct control over his own life; such a society does not need people to elect representatives (because most of them must stay in the factory or in the field) to speak for the people. All men and women speak for themselves and for themselves alone.

The power brokers (and even the people themselves: scared to take power) say that the people do not know how to run their own lives. They are like children, they say. That may be true. But the only way to get out of that situation is to let them learn and experiment; let them make mistakes. They (we) couldn't do worse than is being done now. The people must be provided with access to tools and that is all.

#### TOOLS

We who are in the groove of becoming part of the bureaucracy must resist the impulse to try to run things. Our aim must be to provide people with tools so that they can form their own communities and design/control their own environments. Our long-range goal

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must be to dismantle peacefully the repressive system of social-decision making that our fathers have handed on to us.

At any rate, the wilderness - ecology - survival - community - escape trip that we are on is a logical response to a system of government and social values that kills Vietnamese, abets the starvation of Biafrans, puts down Black and Brown people, and incidentally, is killing itself and its white progeny. Welcome to planet earth, the home of the cannibals.

What we need now are catalogs and handbooks that give us access to the tools (intellectual, mechanical, social, etc.) that will let us create new patterns of existence. We need "how to survive" books.

It seems to me that we must pursue two strategies simultaneously.

#### TURNING ON BUREAUCRATS

First, we must work on the assumption that our present social order cannot save us, that the bureaucratic system of decision-making does not in practice and cannot in theory solve the environmental crisis. Appealing to the Federal Water Pollution Control Administration to enforce anti-pollution laws is a good idea but the problem is deeper. The men who run the bureaucracies are just not aware how deeply in trouble our society is. What we (I) must do is get into the bureaucracies and try to turn them on. Not so they will become sensitive, humane, lovable or so they will work (because I don't think they will) but so that the people within them will begin to realize that there are other ways of living besides as bureaucrats. We must convince them to let go, to relax, to let slip away the roles, titles and offices that they think give them their power. We must show them that they do not have any power: their roles have power and they inhabit the roles. Without their offices they are nothing except human beings. We must persuade them that it is as human beings and not as officials that they have their power and worth, and that when they escape from those prisons they call offices that we will love them. We must persuade them that a human society is a life-support system and that if they take risks that there will be people whom they can trust to support them and to help them.

The millions of men and women in America are starting to realize that they are playing an unsatisfying and suicidal game. We must give them personal, moral support so that they will have the courage to help us dismantle the bureaucracies and invent something new. We must show them that there is a place for them without their titles. Our strategy must be to work with, in, and through the bureaus of America so as to dismantle them peacefully. They will not last and it is up to us to make sure that when they fall they fall loose and not uptight. When you trip and fall but are relaxed, chances are that you will not hurt yourself. However, if your muscles are tense, you stand a good chance of breaking a bone.

#### AFTER ARMAGEDDON

We have to try to insure that when the system really falls apart (e.g. a power blackout, a massive traffic jam, an atmospheric inversion causing

massive respiratory-related deaths all in the space of two days), when the system really starts to tear we must make sure that the bureaucrats do not freak out but are psychologically prepared to accept the fact that their world is falling apart. If we ever get fascism in this country -- and I mean straightforward, unveiled military rule -- it will probably come because of the environmental crisis. The natural response to crisis that our bureaucracies are developing is to call in the National Guard. If something big goes wrong, the easiest thing to do is to call in the National Guard. If we have a crisis of crises -- one on top of the other -- what more natural thing to do than to call in the military and order a 7PM curfew for everyone? We have to turn on the bureaucracies so that they start to see alternatives. It can be done. It is being done.

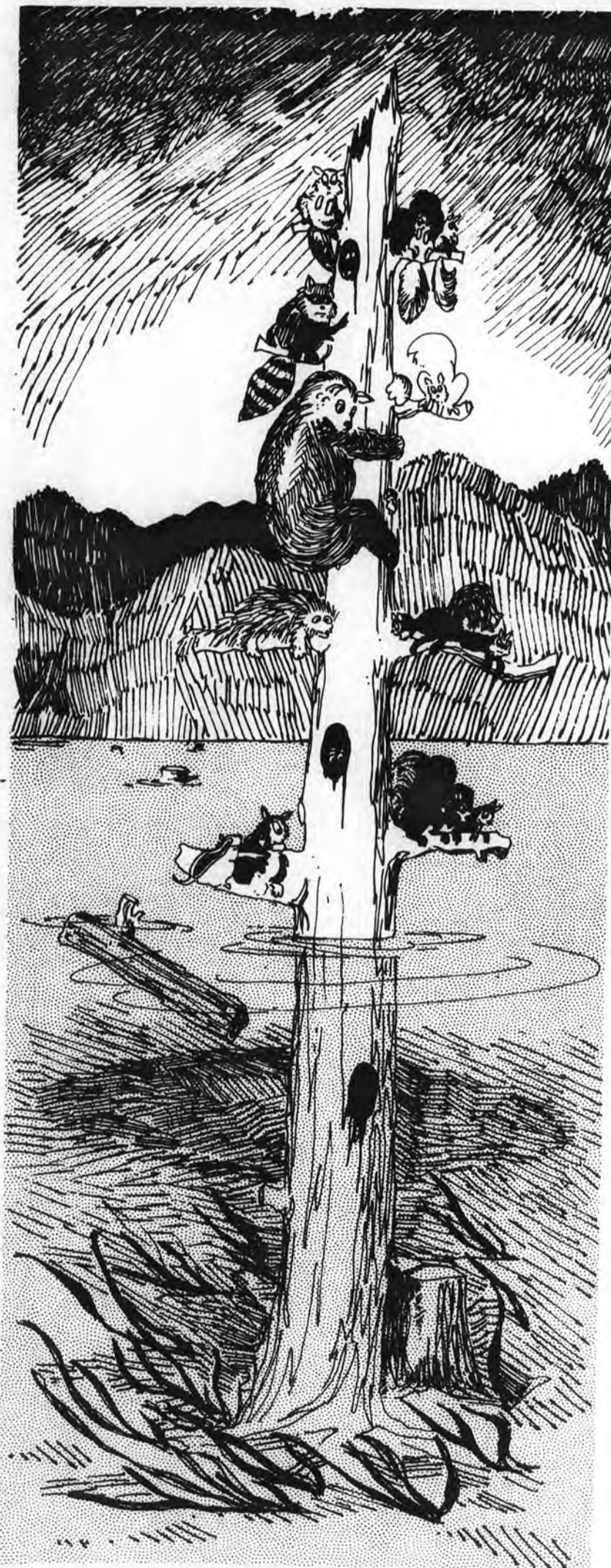
The other part of the strategy is for us to gain the skills (e.g. fixing cars, growing food organically, working with wood, developing ecologically sound power and sewage systems, seeing things ecologically, learning to live with people etc.) that we will need to live when the system breaks down to such a point that you cannot go to the supermarket to buy even poisoned food. We may be deep in the woods, in the suburbs, or in the monster metropolis itself, but we should be prepared to form communities that are real life-support systems.

Two sources of information, two "how to" books that I find invaluable are *The Environmental Handbook* and *The Whole Earth Catalog*. If you've read this far, then we are probably on somewhat similar trips, so all I think I have to do to make this into a book review is to tell you these two items have helped my head a lot and so maybe they might help yours. But briefly:

**WHOLE EARTH CATALOG** is a Sears Catalog for hippies, created by ex-Merry Prankster Stewart Brand, which will help to re-orient our common mind to ecology - evolution - survival. Contains reviews and thoughts on anything that anyone has found useful in surviving: thoughts of Buckminster Fuller, General Systems Theory, Teilhard de Chardin, Ian McHarg, cybernetics, hitch-hiking in Europe, breast feeding, best place to buy plastics, how to make domes, organic gardening, massage, hiking and camping equipment, how to make cowboy horse gear, etc. It has blown my mind, may it blow yours. Make sure you see the January issue. Arthur Godfrey is on the cover; the lead story is on "The Outlaw Area", which is probably where you live.

**The Environmental Handbook** was put together in a month so that people could have a book to refer to for April 22, Earth Day, when there are supposed to be all sorts of environmental teach-ins. This book is: 1) a collection of some good essays (People's Architecture, Cliff Humphrey, Keith Lampe, Gary Snyder, Kenneth Boulding, etc.) and 2) ideas on what to do. They have some good suggestions (a consumer goods testing service, an ecology food store, composting, returning 'no-deposit, no-return' bottles) and are asking for more for the next edition. It has a nice tone. Give *The Handbook* and *Whole Earth Catalog* to your parents to turn them on.

Northwest Passage, March 23, 1970



**CONNELLY:** Could you talk for just a moment about what the North Slope oil discoveries in Alaska are going to mean where Puget Sound is concerned and the dangers of tankers coming into our waters?

**EVANS:** I think it's going to substantially destroy much of the environment that we are familiar with now, not only the northern end of Puget Sound but all of Puget Sound plus the Cascade Mountains and much of the eastern part of the state. If the oil company figures mean anything, there will be a transformation of northern Puget Sound, with construction of refineries and the attendant smells and industrial activity. It's going to look like northern New Jersey.

The possibility of pipeline spill certainly extends all the way down to here, I mean tanker spills. One spill from a tanker with currents as they are will spread the oil to the southern reaches of the Sound. I assume any increase in economic activity is going to affect us all here and I do not think we need any more increase in economic activity.

All that apart, I have yet to deal with the impact of the pipeline on the Cascades when it goes across. Where will it cross, at the North Cascades National Park, the Glacier Peak Wilderness, the Alpine Lakes region? I don't think there is any place the pipeline can go where it will not destroy some very significant and beautiful areas.

**CONNELLY:** Do you think the political climate in this state at the moment is such that the oil companies will be able to build their pipelines, refineries, and so on? I realize that the oil people have enormous resources at their disposal, and can apply them with devastating effect when it comes to persuading or buying legislators. Do you think the conservationist pressure will be sufficient to at least head off the pipeline?

**EVANS:** We're going to head it off if I have anything to say about it. Many other people feel the same way. I think the political climate in this state has vastly changed in the past few years. The fact that they may get away with raping Alaska doesn't mean they are going to get away with raping this state or any other part of the Northwest. There are strong groups and many individuals who feel deeply about oil and its impact. They don't want it here. I am certain that all the conservation groups that I speak for as

well as lots of others will be completely opposed to any pipeline or oil development in any way, shape, or form. I think we can beat it.

**CONNELLY:** Nonetheless you have a strong "progress" mentality on the part of chamber of commerce types as well as many politicians. You have the example that even though Governor Evans pushed for the oil spill bills, he now is taking steps to get the companies to come here.

Do you think that the strength of the "progress" forces means that you will have some sort of industrial development in the Puget Sound region?

**EVANS:** Much of the conservation movement in the Northwest consists of people who have moved here from

other parts of the country to get away from the very kinds of "progress" that they talk about here. All I can say is that we don't want that kind of progress. We don't want any more of this kind of thing anywhere in the state or Northwest.

If Governor Evans is talking like that then he hasn't heard from us yet. When he does, and other people hear from us as well, they're going to change their tune a good deal. All they've heard from so far are the oil companies. We've just begun to talk on this. This progress mentality is something to be concerned about, but it's nothing that's unbeatable.

We took on the progress mentality with the national park and we took it on in the state legislature last session. We've whipped 'em every time we've taken 'em on, or almost every time.

an interview with Brock Evans

# IT'S GOING TO LOOK LIKE NORTHERN NEW JERSEY

Brock Evans, the Northwest Conservation Representative of the Sierra Club, presides over one of the most hyper-active offices in the whole of Seattle. Through the Sierra Club, Evans has been a leader in the battle for wilderness areas and the new North Cascades National Park. Currently he is battling a proposed dam on the middle fork of the Snoqualmie River.

Evans is a prime advisor to the student environmentalists of the Seattle area and the state as a whole. He is a prime mover behind the growing legislative and political activities of the conservation movement in Washington and Oregon. Recently Joel Connelly visited the Conservation Center on University Way in Seattle and spoke with Evans about various aspects of the struggle against "progress" and its wicked manifestations.

Maybe we can do it here, too. One thing is certain. We have to make the fight. If we see something that is wrong, we are going to oppose it.

**CONNELLY:** There has been talk of conservationists opposing such state legislators as Al Leland in Bellevue and Robert Perry in north Seattle, just to name a couple. Do you think the fight will be dramatically carried into the political arena as, for instance, David Brower has proposed?

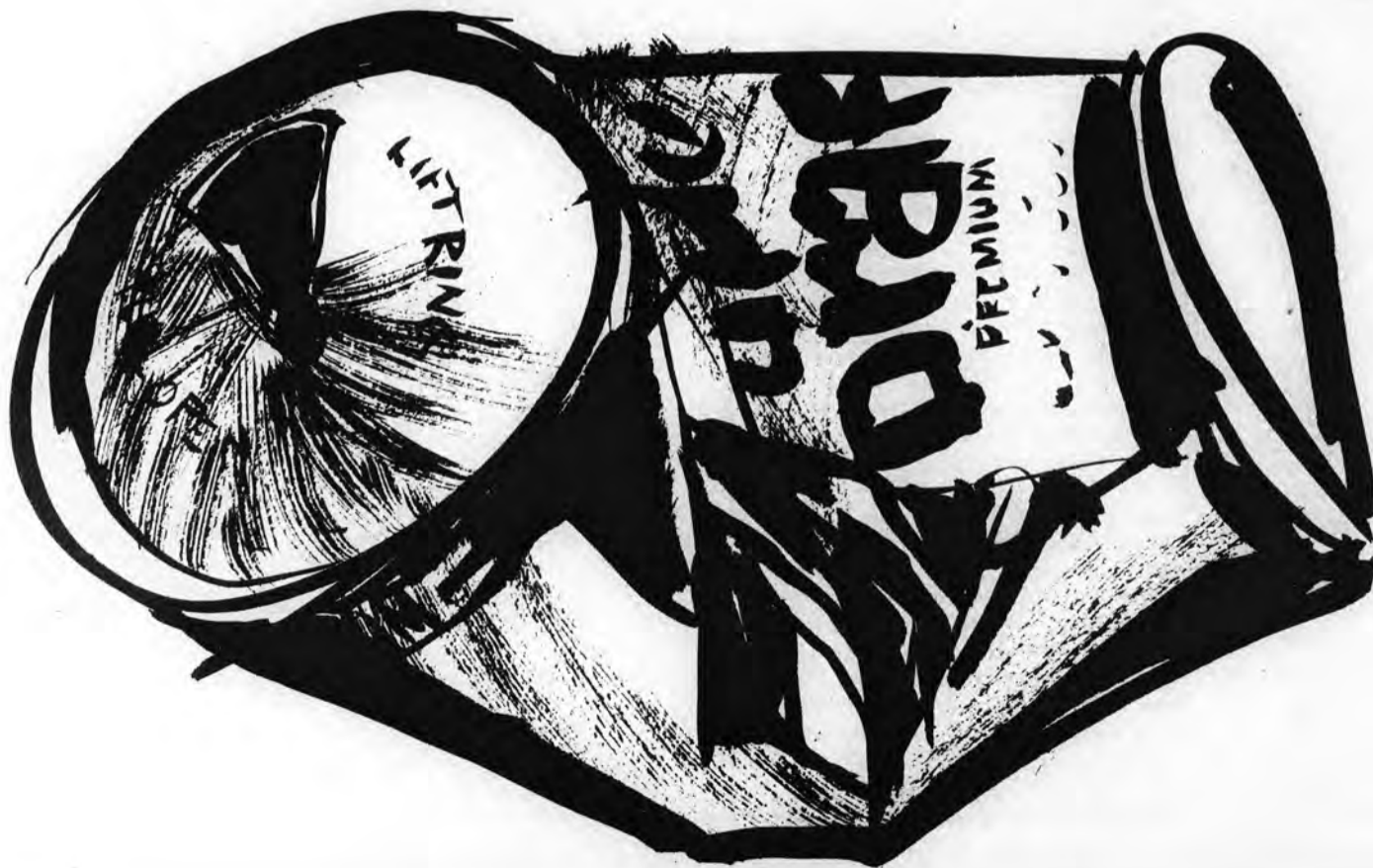
**EVANS:** Conservationists are certainly getting more politically sophisticated. We realize that if conservation is anything, it is politics. We're talking about allocation of resources between competing uses and politicians usually have to make an allocation in one form or another. So, what kind of a man holds office is of vital importance to the future of the environment.

We're realizing all these things and certainly there's going to be an increase in activity. There was conservationist activity in the last two elections with varying degrees of success. We are limited by amounts of funds, but we have bodies of workers who can go out and push doorbells. I do not know how successful we shall be. Since this is already called "the decade of the environment," a lot of politicians are going to try to jump onto the bandwagon. We aren't going to let them unless they really mean what they say. We already know who our friends are, and who they are not, in the state legislature and other bodies as well. So, we'll be in there pitching.

**CONNELLY:** I am one who has fled to this country after breathing the smoke of Gary, Indiana and trying to swim in Lake Michigan. I remember during the McCarthy campaign driving from Boston to Washington D. C. and never really leaving the city or strip-city environment. Do you see a solid buildup of the Tacoma-Seattle span as well as the danger of such a buildup in the entire Vancouver B. C. - Portland span? Do you see a Los Angelization as far as spreading suburbs are concerned in the Seattle area in particular?

**EVANS:** It's upon us already. I don't think you can go anywhere in the Seattle - Tacoma area without having a solid block of houses sprawling around you. The Portland - Vancouver - Bellingham area still has a few open spaces, but every time I go north to Bellingham, it's worse and worse. It's sickening to look at the side of the road.

So certainly there's a danger. I fly a



lot and every time you fly over King County you can see more and more of this stuff spreading to the mountains. That's why we're fighting so hard on the Snoqualmie dam issue.

We want to keep a green belt in King County, not to mention keeping a green belt in all the other counties. This is one of the most serious things that threatens the Puget Sound region. We don't want it to be Los Angeles and we're going to have to get the right people elected to be sure that it doesn't.

**CONNELLY:** We have, particularly with some politicians, the idea of "controlled progress." On one hand these people try to prevent oil spills through legislation, but they try to get the oil companies to come in. This is the philosophy of making people build taller smokestacks or put shrubbery around the refinery.

Do you see some of the enthusiasm for the conservation movement being dissipated on this theme, or do you think the movement will focus itself not on having flower plants around factories, but on preventing the factories from coming in to begin with?

**EVANS:** The latter case, I am sure. I don't think many of us buy this flower pot philosophy or theory. Most people I know and deal with all the time say we've had it up to here with progress and now let's talk about the environment.

The people who talk about prettying things up are people who were never too much in the movement, people who have come in later and said, "Let's be reasonable and rational about these things" to use their terminology.

To me, the most reasonable, most rational thing you can possibly do is to say, "Let's stop all this development right now, and talk about the quality of life." I do think that's the direction in which the conservation movement is going, especially because of the great numbers of young people in it who don't have a stake in the current economic system. They aren't locked into houses and cars and anything else yet. So they have a chance to change life styles and even more reason for not buying this progress mentality we've been hearing about all the time.

**CONNELLY:** In the Midwest, where as often as not you cannot breathe the air and sometimes the neighborhood river is a fire hazard, you have a broad-based movement. Housewives are leading the battle against Con-Edison in Chicago, for instance. Here in the Northwest, activity seems to be centered with academicians and the young. Do you feel we have a broad-based movement here or that it is expanding to bring in, say, lower middle-class groups?

**EVANS:** I think you already have a pretty broad-based movement here. It doesn't have the survival connotations of the examples you gave. I think for one example the State Labor Council is a member of the Washington Environmental Council and lobbied with us and helped us down with the legislature.

I think as you cut across your sportsman organizations contain what we refer to sometimes as working class people. They're getting more and more into the fight. Apart from the universities and the professional people, you have these people. It's not so much survival-oriented as ecology and habitat-oriented, because most of us who live here somehow appreciate what we're losing in the mountains and our open spaces and green belts.

It's my impression from evaluating the strength of the conservation movement and its impact around the country that we're at least as strong here in the Northwest, and particularly in the urban Northwest, as you are



anywhere else in the country. There's at least as much activity here as elsewhere.

**CONNELLY:** It would seem to me from studying federal proposals that there may be a philosophy of treating the most severely affected areas first. If there a danger of the Northwest being short-changed because this region is not as bad off as areas of the Midwest and East?

**EVANS:** All of these things depend of course not on the logic or rationality of anything, but on the politics of the given situation. President Nixon may want to give funds to a certain area, yet we may have Senators and Congressmen who have the influence to get the funds here. For survival-type things or for cleaning up hopelessly forgotten environments, there may be more money coming in.

However, we argue that we still have a chance here not to make the mistakes. We find that to be an appealing contention when we go East. Let's save some places we've got. People in New York want to save places in the Northwest, clean virgin places. I don't really know. You've raised a valid point, but the answer depends on the politics of each given situation.

**CONNELLY:** I would like to question you about Richard Nixon's discovery of the environment. Do you feel the man is genuine in his rhetorical commitment, or is he using this as just one more political football due to the public's concern with it?

**EVANS:** I think it's the latter case, and all you have to do is look at the record of what really has been done with the words spoken on things.

The latest word was the special environmental message which came out



a week or so ago. The day after the message was given in which he said we have to preserve more recreational areas, the Administration endorsed the National Timber Supply Act which in effect is a giveaway of the forests to the loggers. It will destroy a great deal of the recreation that we now have in public forests.

You go back a week or two before that, when he gave his State of the Union message he talked about the environment and proposed his 37 point environmental program, he talked about \$10 billion to fight water pollution. When you look at it closely, it was only \$4 billion of federal money, with \$40 million or so to be spent the first year. The rest will be matched by everybody else.

So it is really a meaningless kind of program in many ways. It was only a small token gesture. Throughout the Nixon records you get the old double shuffle. You have words spoken one way and then the proof in the pudding comes out somewhat differently. The performance in the oil matter with Santa Barbara was a good example of the double shuffle. Hickel said the pollution was terrible, yet the drilling still goes on.

The actions in Alaska have been to let the drilling go ahead and the pipeline go ahead. These examples are repeated over and over again. The Everglades business is the only major thing they've done that's had some real meaning. The airport was stopped, but even here they jumped around from position to position.

I don't know what to expect from



Nixon. I don't think he's being honest, but I'll applaud anything he does if he does it. I'd just like to see something accomplished.

**CONNELLY:** Do you think the current surge of conservationist enthusiasm will accelerate in the coming months and next few years, or do you fear it will die down and to some extent go on the record books as another "fad"?

**EVANS:** The conservation movement has all the attributes of a mass movement at present. I suppose like with all such movements you have people involved for the excitement of it who aren't really committed to the ideals or the necessity.

There may be one factor which distinguishes this movement from others, and that is in the field of the environment, once you lose something, you cannot get it back. It's gone, probably forever. When a forest is cut or a river dammed or a lake polluted, it takes at least many many years to clean something up and it's gone as to opposed to what it was.

This is something we live with every day of our lives. We see the deterioration that's going on around us. That may distinguish it from something that is very real and very important like civil rights, but also necessarily abstract and something you can win maybe next year or the year after. If you lose in the environment, you've lost for good.

I feel because of this combination in

factors that the movement will have to get stronger because the environment is going to deteriorate more and more



without it. Things will become intolerable, and people don't want that.

**CONNELLY:** In order that the environment be saved, people will have to make sacrifices of things they presently view as conveniences and in some cases necessities. Do you see them as willing to do so? Then too, in regard to the industries which are some of our leading polluters, will they do anything they are not forced to do?

**EVANS:** I don't think the industrial people will do anything they are not forced to, if their past stands are any example. As far as people making sacrifices, I think you have to put sacrifice in terms of paying for something, enduring higher prices or more taxes or whatever. I can't predict what will happen here.

I expect it's like everything in human nature. When the crisis is urgent enough, people will -- just like during the second World War. Everybody rationed things and sacrificed things for a common cause. Well, here all I know is that there was a Gallup Poll taken last fall which said something like 75% of the people would pay more to have a cleaner environment, that including more than 60% of those with incomes less than \$5,000 a year. If that poll means anything, people are already willing to pay more. I certainly am willing to have less standard of living to have a decent environment and I feel many people are.



Northwest Passage, March 9, 1970

## an interview with Derek Mallard

Derek Mallard, president of the Society for Pollution and Environmental Control (SPEC), in British Columbia, speaks out on the Canadian situation with an eloquence of language and thorough knowledge of subject matter. His particular attention to the HUMAN environmental needs of the present and future coupled with the fact that SPEC has been a leader in the field of providing information to Canadians on the more technical ecology aspects such as land usage and development, oil transportation problems, detergent pollution, the plight of the fisheries, and many more, all adds up to make Mallard one of the leading figures in the Canadian movement.

In this interview, Mallard launches a broad attack on the current situation of environmental development by "local politicians, industrialists, and the real estate fraternity" and suggests specific alternatives to such a situation. The appeal of his approach has not been without results as SPEC has grown from a nucleus of five dedicated people to an active membership exceeding five thousand over the course of the last year.



# THE CANADIAN CONSERVATION SCENE

**KATHMAN:** Do you see any essential differences on the Canadian environmental front as opposed to the United States environmental scene? Are the government and populace more or less enlightened than in the U.S.?

**MALLARD:** That's a difficult question to answer since I am not familiar with the American situation. Purely personally, I would think we have the same sort of problems north and south of the border. One advantage that the American population would appear to have is that the legal constitution is such that, as compared with the Canadian under British law, there is greater opportunity to take legal action in the United States against those people, industries, and organizations that pollute our environment than presently exists in Canada.

**KATHMAN:** Would you describe the overall goals of S.P.E.C., both long range and immediate, and how you expect to achieve them?

**MALLARD:** Well, as the name of the society implies, the Society for Pollution and Environmental Control, we are concerned not only with the pollution of our environment, but with other problems related to human environment, such as the development of human environment, in many cases by politicians and the real estate fraternity -- people who, in many cases, are unfitted to plan and develop human environment, people who are unfitted by training and experience. And so, therefore, we must obviously concern ourselves with this type of environmental development.

Many of us have the attitude that our present political and administrative systems are completely decadent and obsolete in light of today's expanding population, together with expanding technology. Whereas at the moment our environment is being planned and developed by the industrialists, by politicians, and by the real estate fraternity, we have to aim for that situation whereby people with training and experience develop our environment and, of course, assisted by those fellow citizens who actually have a regard for their fellow men.

Although we're not a political organization in terms of existing political party structures, we obviously are a political pressure group, since under the present systems there have to be changes in legislation at least in order to control pollution.

We're not, at this juncture, considering the development of a

political entity, although naturally if any of our members decide to seek political office on purely an environmental ticket, we would give them massive support. As a matter of fact, in the Vancouver area at this moment, we do have three S.P.E.C. members who were elected into aldermanic positions in two of our local municipalities purely on environmental tickets.

**KATHMAN:** What have you found to be the best organizational methods in terms of mobilizing people into an effective political force?

**MALLARD:** Well, looking at it from our present point of view, the first thing that one has to do is to educate the general public to the present facts of life that we have massive pollution and deterioration of our environment. The next course of action is to educate the public as to why the deterioration has occurred.

Having enlightened them to points one and two, there is a possibility, then, that many people will realize that the existing system is inadequate, and it is probable that, with assistance, they may then develop new ideas towards systems that will be to the benefit of the population as a whole rather than to the very small minority that exists at the moment.

**KATHMAN:** I understand that about 60% of Canadian industry is American owned. Doesn't this present quite a problem to the environmentalists who are trying to tame polluting industries?

**MALLARD:** I don't think I can enter into a discussion upon the political and economic situation resulting from the majority of industries either being dominated by American capital or mainly owned by American parent companies. But if we have or develop adequate legislation in Canada at federal, provincial, and municipal levels, then no matter who owns or finances such industrial development, they will have to comply with the law.

So obviously we have to enlighten our politicians as well as the public to the fact that we have a problem of deterioration occurring. We must also have adequate legislation that will deal with our municipal organizations. For instance, as far as sewage treatment is concerned, we have situations, at least in British Columbia and other provinces, where municipalities are supposed to deal with the human sewage disposal problems and these are not being dealt with adequately at the moment.

**KATHMAN:** Canada is unique in that it doesn't seem to be suffering from overpopulation. Are there currently any programs underway to make sure Canada doesn't make the "foetal" mistake?

**MALLARD:** There doesn't appear to be any evidence at the moment that Canada is really concerned about overpopulation. In other words, it has not instituted any particular programs to limit the population.

But to state that Canada does not have an overpopulation problem is incorrect, since most of our population is concentrated along a narrow strip just north of the Canadian-American border. For instance, the lower mainland, Vancouver, has a population density which is greater than the population density of Holland, which in itself is supposed to be an overpopulated area. This population density will increase, again because there is lack of adequate planning, or rather there is planning by local politicians and the real estate fraternity.

Just outside of Vancouver we have the magnificent Fraser Valley, which is an extremely rich agricultural area. In extrapolations of population growth together with residential and industrial expansion, it would appear that within twenty years this rich agricultural area will have been usurped by this typical residential and industrial expansion. In other words, we are planning to obliterate the few agricultural areas that we have left in British Columbia.

In the Okanagan, which is our rich fruit growing area presently, orchards -- peach orchards, plum and apple orchards -- are being bulldozed, a few acres each each, to make way for this expansion of population. In talking to some of the farmers in this area, their attitude is: "So what; we can always lose a few acres, but it doesn't matter, really, because we can always import fruit from California." Whereas in California, the extrapolation of population growth is such that, according to an investigating team at the University of California at Davis, by 1980 California will have insufficient fruit to export beyond its own borders.

**KATHMAN:** Does Canadian economic structure offer an alternative course such as "controlled growth" or a "non-growth" economy for the future?

**MALLARD:** It seems that the uncontrolled growth in the U.S. has been followed closely by similar growth in Canada. There is a complete

lack of planning or planned economic development, and I'm afraid that I have to be rather pessimistic in this regard. With the culture very often dictated by Madison Avenue, we probably won't be able to control this growth.

After all, we have a new culture that has developed and is developing from propaganda emanating from Madison Avenue or similar avenues, that promotes this sort of growth and, until we stop it and begin to look at life realistically, from a human environmental point of view, it will continue.

We've got to change our philosophy. We've got to consider the development of a quality environment rather than an increasing standard of living. Because there's no doubt that increasing affluence is certainly going to bring about increasing effluents.

**KATHMAN:** Does S.P.E.C. have an affiliation or alignment with the large labor unions in Canada?

**MALLARD:** No, we have no alignment with them, or affiliation, but we are talking to them in many areas and suggesting to them most strongly that they put environment on the bargaining table. There are indications, at least at the local level, that this may be contemplated in the near future; however many of these unions have a very large bureaucratic structure which may prevent their relationships with organizations such as ourselves from becoming meaningful.

**KATHMAN:** Getting back to the matter of growth, especially in the Fraser Valley, could you comment upon the present provincial government's dissolving of the Lower Mainland Regional Planning Board?

**MALLARD:** Well, the government decided that this planning board should be disbanded and would be represented by a series of regional districts throughout the province, including, of course, several to deal with the lower mainland as opposed to the original single unit. The government in British Columbia is indicating that the original plans as advocated by the Lower Mainland Regional Board are being followed through even now, although there is some doubt whether this is in actual fact occurring. Examination of the Lower Regional Planning Board and its proposed development for the lower mainland does pose some questions in that British Columbia, apart from the

continued on page 75

# THE ELECTRIC GRAPE & GREENHOUSE EFFECT

by steve overstreet



One might paraphrase Mark Twain and say that "Ecology is like the weather; everyone talks about it, but no one ever does anything about it." Though such a remark might be considered well and pungently said in the proper and/or academic and/or cocktail party circles, it would still be somewhat inaccurate. The truth of the matter runs more like this -- not only are more and more people talking about ecology these days, but they are also changing the weather as well. This process works in somewhat the following manner.

We, and all other animals, breath in oxygen gas and breath out carbon dioxide. Green plants in turn take in carbon dioxide, use it with solar energy to form plant material, and as a by-product of this photosynthetic process, release oxygen. Thus plants and animals theoretically exist in a balanced cycle, giving off the proper waste products and taking in their proper gases. However, man has now entered the picture in his typically heavy-handed manner. Man is a goal-oriented creature, and as such, he constantly labors. However, instead of

just breathing, and using the resultant energy that oxygen releases from his own and/or his domestic animals' muscle, man has found certain expedient shortcuts, and put them into widespread use. Man extends his own muscle capacity through the utilization of heat energy, which he in turn converts to mechanical energy (through steam and internal combustion engines) or into electrical energy through mechanical means. In any event, to get this energy, man primarily burns fossil fuels, principally coal and liquid petroleum.

Now, as we all know, one of the primary products of any combustion is CO<sub>2</sub>. By burning the vast quantities of fuel available, and doing this as rapidly as is technically and socially possible, man has poured a presently huge and ever increasing supply of CO<sub>2</sub> into the atmosphere. At the same time he is doing this, he has been cutting down untold numbers of green photosynthetic plants and whenever possible, rapidly covering more and more denuded ground with concrete and asphalt, which almost eliminates the possibility of even chance growth,

Thus, as time goes on, the imbalance of diminishing O<sub>2</sub> and increasing CO<sub>2</sub> goes on. As the CO<sub>2</sub> builds up in the atmosphere, it eventually begins to demonstrate one of its more interesting properties, that of holding radiant heat within our atmosphere.

Soon, it has been postulated by remarkably cool scientific people, this atmospheric heat will increase so much that our planet will irreversibly warm up to finally melt the Polar Ice caps. This will cause the oceans to rise by between 200 and 400 feet, because it will release water now held in the form of Polar Ice. This will of course flood our coastal areas whereby most of our cities and prime agricultural land are presently located.

This heating of the planet by trapping sunlight in the CO<sub>2</sub> saturated atmosphere is called "The Greenhouse Effect."

I learned about the Greenhouse Effect while I was in Honours Biology. It was also during this time that I got a significant insight into our society by an insignificant joke that runs like this: "What is purple and hums?"

The answer: "An Electric Grape."

When you think about it, an Electric Grape is a frightening thing simply because it is a technological, scientific and engineering possibility in this day and age. It also happens that we live in a culture which is obsessed in actually developing anything technologically possible--be it an electric toothbrush, a moonshot, or an artificial re-arrangement of a given DNA molecule. In such a society an Electric Grape could become a highly desirable consumer item. For one thing it is useless. It is just a small thing that hums, presumably by using the energy cell of an electric wristwatch. It is so detached from the real world in which we live--it toils not nor does it spin usefully, nor does it make one iota of difference. All it would do is enable a certain number of engineers, salesmen and others to be gainfully employed in the manufacture and distribution of this product. In turn the product itself would be every bit as vital as the lives of those spent in creating and cost-accounting it.

Worse yet--you begin to realize that

*continued on page 22*

# eco- notes

[Editors' Note: It is the intention of the Passage in this regular feature to point out short items of ecological or political - social note which readers may not have run across previously. If you have items, send them to "Eco-Notes".]

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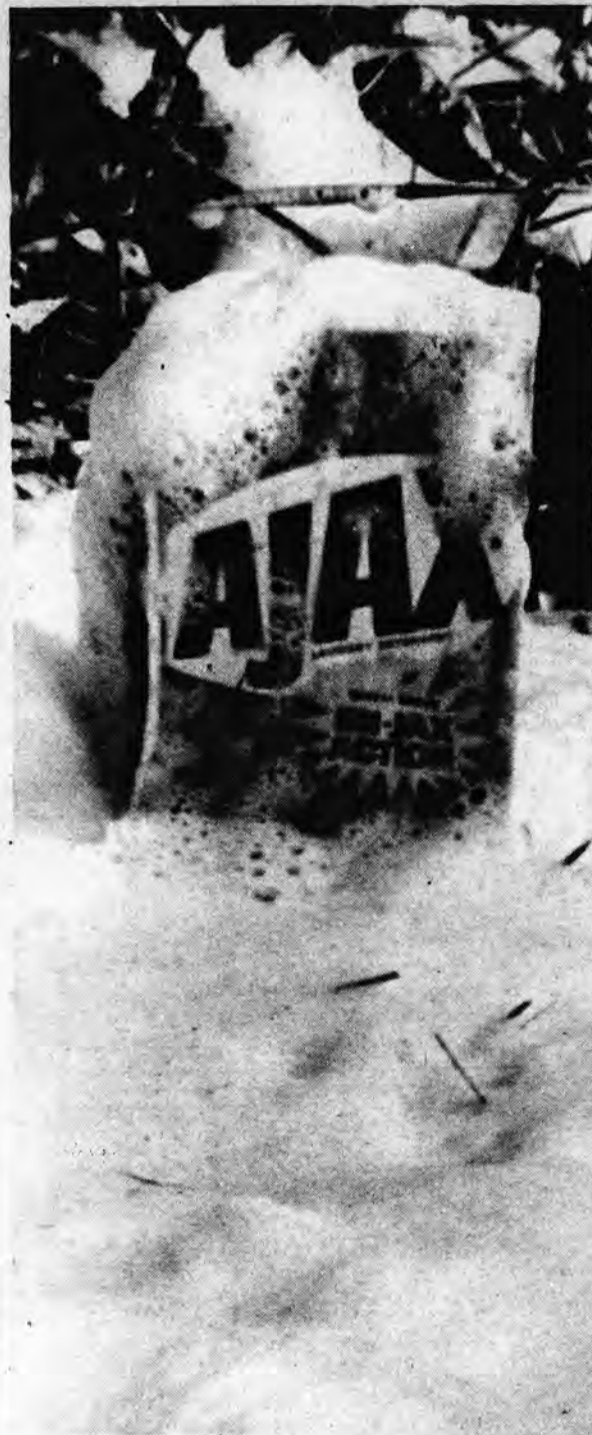
Give the Man a Pollyanna Lollipop Department: Joseph Entrikin, manager of the Whatcom County Development Council -- the group which tries to lure more industry to the area -- recently was quoted at a meeting saying: "A nuclear plant is one of the finest things you can have. No problems. No casualties. The only thing you get is an increase in water temperature." In addition to overlooking some mighty deadly problems (see next item), "only" getting an increase in water temperature can be a serious ecological disaster. So much so, in fact, that the federal government recently denied Florida Power & Light Company the license to run atomically heated water into Biscayne Bay near Miami because just a degree of two of extra - heated water would mutate marine life and alter the eco-cycles of the area.

\* \* \* \* \*

A decision is expected this week from the Puget Sound Air Pollution Authority on whether the Tacoma copper - smelting plant can build a 1,100-foot smokestack as a temporary pollution curb. By building the high smokestack, the factory will escape the ground-level pollution standards; instead, the polluted air will exit at a higher level and travel greater distances as it disperses. A research physician -- Dr. Warren Winklestine, chairman of the department of epidemiology at the University of California -- testifying against the high - smokestack, said that in addition to being linked with two types of cancer, heart attacks and strokes, research has found that air pollution also results in an overall increase in the death rate. Arsenic concentrations have been found in damaged plants in the smokestack fallout area. An increasing number of patients are reported by King County medical officials to be seeking treatment after experiencing a "wind from the smelter."

\* \* \* \* \*

The Defense Department plans to transport 700 rail cars of deadly nerve gas from Okinawa through Washington, to Hermiston Oregon. Protest has mounted from state officials, scientists, and worried residents along the transport line, but the Army still plans on proceeding with the shipment. The New Republic reports that the nerve gas train must travel nearly 300 miles along the edge of the Columbia River, with the greater part of the trackage under rock cliffs often hundreds of feet high and from which large boulders regularly bounce off when weakened by storms. One train was lost in the gorge recently when it struck a huge rockslide; two 750 - pound boulders recently dislodged near Lyle, Washington. A scientist reports that a single bomb containing the nerve gas contains five million lethal doses, more than enough to wipe out the entire population of Oregon and Washington. The scientist -- Dr. Gordon Kilgour, chairman of the chemistry department at Portland State University -- is asking for detoxification of the bases while enroute, which he says is not impossible, unless the Army has come up with a whole new range of gases we know nothing about.



## Detergent Dilemma: 'Whiter than White, Greener than Green'

by melissa queen

"WHITER THAN WHITE" OR "GREENER THAN GREEN"?

Well, I finally reached the saturation point on detergents -- ignorance saturation. It had always been something of a trauma to buy laundry soap -- trying to choose between BOLD, ACTION, FLASH, and WOW!

And then along came "biodegradable". The war cry rang out Buy Biodegradable! But no one would tell me what biodegradable meant. Even the dictionary was no help; the word doesn't appear in Webster's 7th New Collegiate. So I went guiltily along buying what I thought to be non-biodegradable soap, because I could find none marked "biodegradable."

And then, just as the war cry was dying down and the guilt pangs were letting up, along came "phosphate pollution" and the news that rapid

"eutrophication" was the greatest threat to our lakes and other inland waters. Well, that made me mad -- not the pollution, but the fact I couldn't understand the words and the processes that were involved in an issue that seemed so vitally important.

So I started nosing around -- asking questions, keeping my ears and eyes open for some glimmer of understanding. And the most surprising item I came across is the fact that non-biodegradable detergents were outlawed by the federal government three years ago next July. Which means that our supermarket shelves are in fact filled with biodegradable detergents. Thoroughly confusing, no?

Soon I found someone who could define biodegradability very simply. The term refers to the ability of a substance to be decomposed by biological organisms. And it seems that biodegradability is not an either/or proposition. It describes, rather, a continuum that ranges from slow to rapid biodegradability. Some substances are difficult to break down -- such as plastics and DDT. Others decompose quickly, and soon re-enter the natural cycle that releases their elements to be used again in another life process.

The importance of rapid biodegradability is clear. Substances that biodegrade slowly lock up their elements in the decomposition process for a longer period of time, thereby preventing their use. It's as if we put all those elements in a trust fund for use only at a much later time.

The development and growing use of detergents was a boon in this regard. Detergents decompose much more rapidly than do soaps. They don't hang around in our lakes and rivers as long in their natural state, but instead break down quickly to re-enter the natural life cycle.

The only catch here is that detergents contain a high proportion of phosphates. They perform several functions in detergents -- they soften the water, suspend the dirt particles and enhance the "surfactant" action. As it turned out, however, phosphate - filled biodegradable detergents, in addition to producing "whiter than white" clothes, created "greener than green" lakes and rivers.

Particularly in the Great Lakes region, the waters became choked with plant life. The water turned with algae; beaches were clogged with rotting plant material; channels and shorelines became constricted with waterweeds. Phosphates are a plant nutrient, and their high concentration in detergents had stimulated a massive growth of algae and waterweeds.

We had begun to feed our water plants with detergents. And as the plants multiplied, desirable fish species began to die. The decaying algae removes oxygen from the water, depriving the fish of this vital element. Thus our human wastes upset the balance between the plants and the animals and the water in our lakes and rivers.

All of which brings us around to the Pollution Probe conducted by a research laboratory at the University of Toronto. The Probe analyzed many of the soaps, detergents and cleaning agents marketed in Canada to determine their phosphate content. The results of their investigation are published here in full.

Laundry soaps, you'll notice, are markedly lower than detergents in their phosphate content. They are, as a result, much less harmful to the plant and animal life that makes up the ecosystem of our lakes and rivers. We would be well advised to make the switch from detergents that jeopardize this ecosystem and begin to use the soaps that will help to keep it in balance.

In switching to a laundry soap, it might be necessary for you to use a washing soda at the same time. This method certainly produced good results before detergents hit the market. If hard water makes the use of soaps impossible, the next best thing is to use a low-phosphate detergent.

The results of the Pollution Probe have been available for over six weeks now. When they were released, the analysis for each product was sent to the manufacturer for his comments. Thus far, there have been none. So, while you're waiting for your next load of clothes to come out of the dryer, you might drop your soap or detergent manufacturer a note asking him about phosphates in his product.

Ask about research that may be in the works to find a safe phosphate replacement, such as NTA (nitrilotriacetate) which has replaced a large amount of the phosphates in some products now being sold in Sweden. Find out what kind of public relations material is sent back to you. You may discover that the manufacturer is a verbal polluter also, forcing hollow words into inquiring minds.

For there are many questions still to be answered. Soap is not the best answer to washing clothes -- it decomposes relatively slowly. Detergents filled with phosphates don't seem to be the answer either, judging from their effects on our fresh water lakes. And we still don't know very much about the interaction of detergents with salt water ecosystems. Presumably the effects are not so great, but maybe that is only because there is so much more salt water



that the effects are not quite as visible. There will undoubtedly have to be legislation which will regulate the kinds of waste products that we continue to dump into the waters of the earth. Before legislation can be sensible, however, all of us will need to learn a great deal more about all the natural life process that take place on the earth and the inter-relationships between them.

And the educational process will take time, which we all know by now is precious. Consumers can help speed up that process, for in our profit-oriented society, consumers really are all powerful. If we simply refuse to buy those products that we know to be harmful to the environment, the effects will begin

to be felt in the corporate offices of Colgate - Palmolive, Proctor & Gamble, and Lever Brothers.

Another alternative, of course, is to wash our clothes less often. We do have quite a fixation with clean clothes in this country, you know, an obsession that dates back to the old "cleanliness is next to godliness" maxim. The soap manufacturers have certainly capitalized on that one, and perhaps it's time to let them know that we will decide for ourselves how clean we like to have our clothes, thank you just the same. I think I could stand a little less of both "whiter than white" and "greener than green".

Northwest Passage, April 6, 1970

PHOSPHATE ANALYSES

Pollution Probe analysed the following cleaning agents in a University of Toronto laboratory. Here are the figures we obtained for phosphate content measured as PO<sub>4</sub><sup>-3</sup>.

The estimated error on the percentages is plus or minus 10% of the figure shown (95% confidence limits). This means that if, for example, the figure is 40%, we feel that the actual value could lie anywhere between 36% and 44%.

PRODUCT	% PHOSPHATE	MANUFACTURER
<b>HEAVY DUTY LAUNDRY DETERGENTS</b>		
Amway Trizyme	52.5	Amway Corp.
Bio-Ad	49	Colgate Palmolive
Peri	47	Sep-Ko Chemicals
Cheer	44.5	Proctor & Gamble
Oxydol	44.5	Proctor & Gamble
Tide XK	43.5	Proctor & Gamble
Drive	41.5	Lever Brothers
All	39	Lever Brothers
ABC	37.5	Colgate Palmolive
Sunlight	37	Lever Brothers
Amway SAB	36.5	Amway Corp.
Fab	36.5	Colgate Palmolive
Arctic Power	36.5	Colgate Palmolive
Ajax 2	36	Colgate Palmolive
Omo	35	Lever Brothers
Duz	35	Proctor & Gamble
Bold	32.5	Proctor & Gamble
Surf	32.5	Lever Brothers
Breeze	32	Lever Brothers
Amaze	27	Lever Brothers
Bestline B-7	27	Bestline Pro. Inc.
Explore	26	Witco Chemical Co.
Maleo Laundry Detergent	25	Maleo Products Inc.
Wisk	10.5	Lever Brothers
Tend Maskintvatt (Swedish)	8	AB Helios

PRODUCT	% PHOSPHATE	MANUFACTURER
<b>LAUNDRY SOAPS</b>		
Instant Fels	9	Purex Corp.
Lux	less than 1	Lever Brothers
Maple Leaf Soap Flakes	less than 1	Canada Packers
Ivory Snow	less than 1	Proctor & Gamble

PRODUCT	% PHOSPHATE	MANUFACTURER
<b>AUTOMATIC DISHWASHER COMPOUNDS</b>		
All	45	Lever Brothers
Finish	43	Economics Labs.
Calgonite	42	Calgon
Cascade	36.5	Proctor & Gamble
Amway Automatic Dishwasher Compound	34	Amway Corp.
Swish	29	Curley Corp.

PRODUCT	% PHOSPHATE	MANUFACTURER
<b>LIGHT DUTY COMPOUNDS (Laundry &amp; Other Uses)</b>		
Dreft	34	Proctor & Gamble
Zero	7.5	Boyle Midway
Explore Liquid	less than 1	Witco Chemical Co.
Bestline Liquid Concentrate	less than 1	Bestline Products Inc.
Nutri-Clean OLC	less than 1	Con-Stan Industries

**LIQUID DISH DETERGENTS**  
All liquid dish detergents tested were less than 1.00% phosphate.

PRODUCT	% PHOSPHATE	MANUFACTURER
<b>MISCELLANEOUS</b>		
Calgon (water conditioner)	75.5	Calgon
Amway Water Softener	73.5	Amway Corp.
Solvease	23	Russel Chemical Corp.
Snowy Bleach	22.5	Harold Schafer Ltd.
Spic and Span	21	Proctor & Gamble
Mr. Clean	6.5	Proctor & Gamble
Ajax All-Purpose	6.5	Colgate Palmolive
Arm & Hammer Sal Soda	1	Church & Dwight
Fleecy	less than 1	Bristol Myers
Javex Bleach	less than 1	Bristol Myers
Whistle	less than 1	Bristol Myers
Jet Spray	less than 1	Economics Labs.
Lestoil	less than 1	Noxema
Downy	less than 1	Proctor & Gamble
Dutch Bleach	less than 1	Purex Corp.
Lawsons Borax	less than 1	Bristol Myers
Pinesol	less than 1	Cyanamid

**NOTE:**  
The term "biodegradable" on a detergent box has nothing to do with phosphate content. All detergents are biodegradable. If someone tries to sell you a "non-polluting" detergent, demand the truth about phosphate content before buying.



# eco- notes

In the December 16 edition of the Passage, Michael Kerwick, quoting from the journal Nuclear Safety, reported persistent leakage in the atomic waste-tanks located near Hanford, Washington. Now come reports that ducks containing abnormally high levels of radiation have been recovered by the Atomic Energy Commission near the Hanford Works nuclear facility. The ducks, which apparently fed in waste-water trenches at the plant, would give a person five times the maximum radiation safe for humans if eaten immediately after shooting, said an AEC spokesman. The spokesman said the trenches will be covered or partially filled to reduce the water surface area. He also said that the overflow from the trenches does not flow directly into the nearby Columbia River. Sure does make a fellow feel better, doesn't it, to know that the radioactively contaminated water is not flowing directly into the Columbia River.

\* \* \* \* \*

Optimistic Development Department: Researchers from the U. S. Bureau of Mines have developed a rudimentary process for converting ordinary garbage into crude petroleum. The Bureau says that if the same yield as that produced in their first experiments can be duplicated on a mass scale, it would be equal to just over one barrel of oil for each ton of garbage. Think of the possible ramifications: we're drowning in surplus garbage while supertankers and offshore rigs continue to spread ecological death and destruction in their race to deliver the oil.

\* \* \* \* \*

Nature reports in its most recent issue that circumstantial evidence has been found linking impotence and the use of certain herbicides and pesticides, among them DDT. In the British Medical Journal report, the investigative team found that four out of five farm laborers who had used these chemicals complained of difficulty in achieving and maintaining an erection, having previously been perfectly normal in this respect. One case involved an agricultural worker who for three years complained of impotence, nausea, and indigestion which started each year in March and lasted for six weeks -- precisely the time of year when he used insecticides and herbicides.



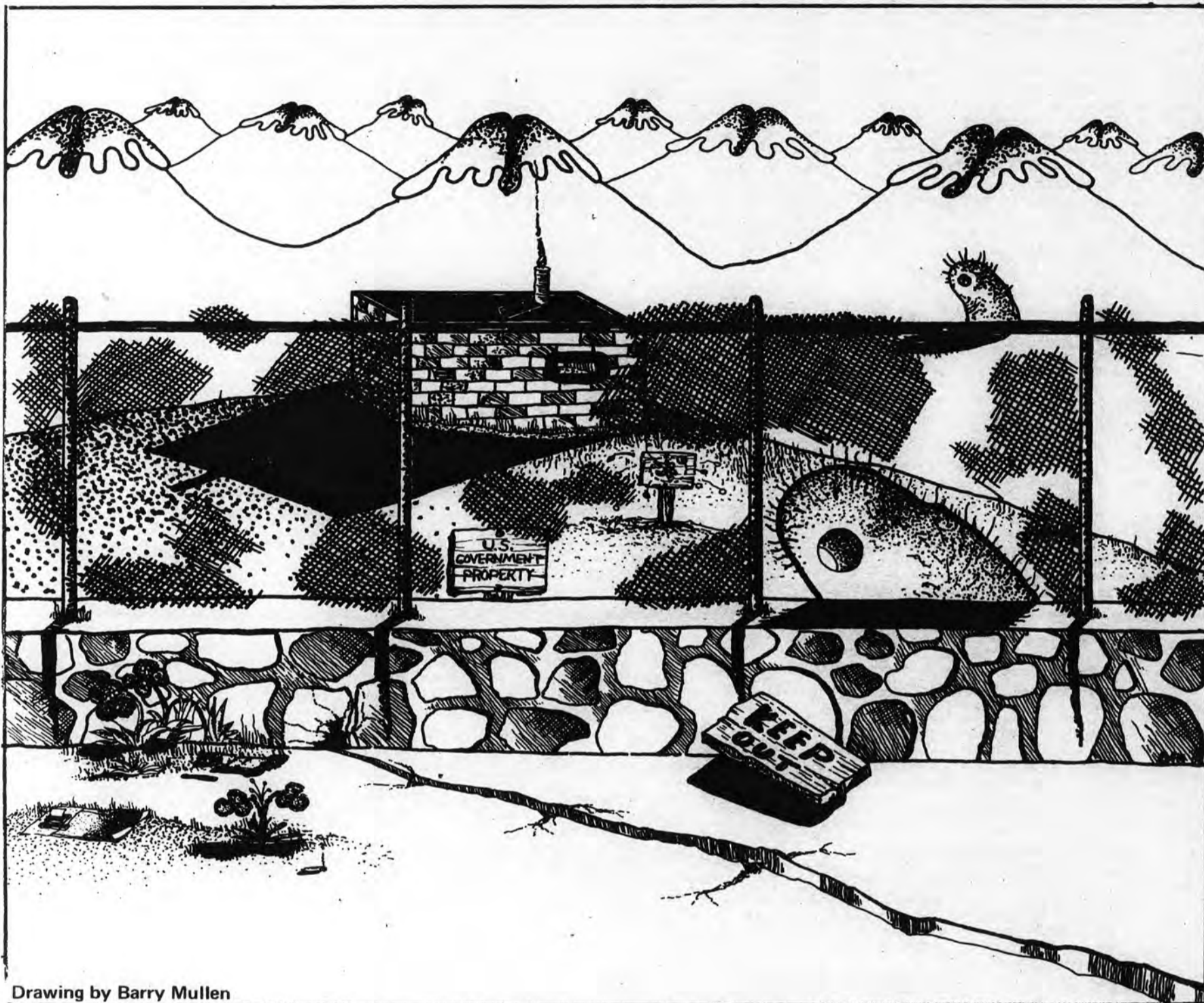
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Alaskan Indians and Eskimos are suing to stop the proposed North Slope oil pipeline. They are taking the case to court both on ecological grounds as well as prior-ownership grounds. The Interior Department has agreed to defer issuance of any permits for construction of the 800-mile-long pipeline until the April 1st hearing.

\* \* \* \* \*

Now We've Heard Everything Department: Supporters of Judge G. Harold Carswell for the Supreme Court are arguing that there are too many "superior" judges on the Supreme Court and now it's time that "mediocrity" was represented; that was the gist of the statement by Sen. Roman Hruska of Nebraska. Sen. Russel Long of Louisiana phrased it another way; he said there was "brilliant... upside-down thinking" on the Court and recommended a straight forward "B student or C student" like Carswell. Sen. Philip Hart of Michigan said "It's the first time I've heard that argument -- and I hope it's the last -- that we should look for mediocrity when we staff the Supreme Court of the United States."

# ATOMIC POLLUTION



Drawing by Barry Mullen

by michael kerwick

And on the day man was first set upon the earth, it was beautiful. And he saw the spacious meadows around him and said, "Let us build our houses, villages and cities on these green meadows". And when no meadows remained man said, "It is good".

And on the second day man beheld the rivers, lakes and seas. And he said, "Let us hurl our waste into the waters so we may be clean". And when pollution had ruined all the waters man said, "It is good".

And on the third day man watched the wildlife that abounded and he said, "Let us kill the animals for food and clothing and sport". And when all wildlife became extinct man said, "It is good".

And on the fourth day man viewed the verdant forests and said, "Let us cut down the trees and grind them up for our own use." And when no tree stood, man said, "It is good."

And on the fifth day man gazed at the heavens and said, "Let us burn out fifth and pour it into the air." And when the skies filled with smoke and

dust that burned his eyes and shortened his breath, man said, "It is good."

And on the sixth day, man said, "Let us make weapons to destroy those who are different from us." It was done. And man said, "It is good."

And on the seventh day, man rested from his labors. And it was quiet. For none walked upon the face of the earth. And it was good.

Atomic plants for Kiket and Samish Islands? And why not? It is good.

\*\*\*\*\*  
Well now, who really cares what's going on until you find it happening in your own back yard? Well, a lot of people. Me included. But what's getting me all so uptight is the fact that there IS something happening in my back yard. Why yesterday I found a cat all balled up that looked like it'd been breathing too much tuna fish. (GP smoke.) That set me to wondering. If that cat lying there all sprawled out prostrate on the ground can be affected by a little tuna fish smell, what's going to happen to it when it eats a radioactive tuna fish.

Yep, it's possible because I read the other day that there are three nuclear power plants proposed for our own Northwest Washington area.

Now I'll be, I come to find out that trucks with loads of gravel are already rolling down off of the Sneer-oosh Road out onto Kiket Island near Deception Pass where Seattle City Light plans to situate a nuclear generating plant. I wonder why Seattle City Light would come all the way up here to buy Kiket Island from Gene Dunlop, a Skagit County power buff, when they could situate their reactor either in, or nearer to, Seattle and save on transmission costs? Why not put it where the old gas works stand on Lake Union? Could it be that it poses some threat to a heavily populated area? (Sounds like an old proverb I once heard: "Put it in the country where it will kill less people.")

I also discovered that Snohomish PUD is going to build a reactor of their own on land adjacent to Girl Scout Camp Kirby on Samish Island. According to Mrs. Audree Kajfas, director of the Samish Council of Campfire Girls, which governs Campfire

Girl activities in Whatcom, Skagit, and Island counties, the utility has obtained an option to buy the land. You'd have to have a board loose in your attic to want to situate a nuclear reactor next to camp Kirby. I do imagine the prospect upsets a number of people including those whose childhood remembrances go back to their campfire days at Camp Kirby. Mrs. Kajfas reports that her council will hold a board meeting with an organization of concerned citizens known as the Committee to Save Camp Kirby. Afterwards a policy statement will be made. It is expected they will take a strong stand against the PUD project. A united position may be formed with the Committee to Save Skagit Bay, a group organized in opposition to the Kiket Island power plant.

**Lo!! And Behold!!! Our own neighbors at Puget Power are shuffling their feet in the same parade, and have a reactor in mind for the Cherry Point area. Apparently they acquired land even before Intalco began buying theirs. Now, who could imagine something more insidious than the**

chemical pollutants Intalco emits? Well, I couldn't until I discovered that Edward Teller was even more concerned about the dangers of atomic power plants than he was about his own invention - the H Bomb.

What is an atomic power plant? Well, it's some sort of contraption powered by a nuclear reactor that runs a turbine that produces electricity. There are different types of reactors, boiling water reactors, fast breeders, sodium-graphite reactors, homogeneous reactors, etc.... You can be sure that each type of reactor is associated with radioactivity and one hell of a lot of heat.

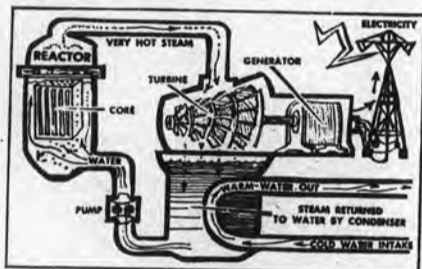
Let's look at the operation of a nuclear power plant: in each type of reactor, electricity is generated by steam which is produced either directly or indirectly through heat exchangers by the heat from nuclear fission.

In a boiling water reactor the fuel used is uranium oxide which is formed into pellets. These pellets are packed into long, thin walled tubes called the "cladding". These tubes make up the fuel rods. Each fuel rod is approximately one-half inch in diameter and twelve feet long. There are thousands on them in a reactor.

The fuel rods are assembled into fuel elements which in turn are packed into a container called the reactor core.

Control rods, dividing the fuel elements, absorb neutrons released through fission, thereby controlling the rate of reaction. A moderator of heavy water is used to reduce the speed of the neutrons emitted during fission in order to restrict them to the core area.

Water pumped through and around the fuel rods in the reactor is called the primary coolant. The heat it gains from the fissioning fuel is used to generate steam which then drives turbines that generate electricity.



### Boiling Water Reactor

In the fast breeder reactor, no moderator is used to slow the neutrons produced by fission. Instead the fuel elements are surrounded by a blanket of "fertile" elements, such as uranium 238, itself not fissionable. The neutrons produced in the chain reaction are absorbed by the fertile blanket, which results in the breeding of new atomic fuels. In the case of uranium 238, fissionable plutonium would be produced.

Dr. Teller says that "for the fast breeder to work...you probably need something like half a ton of plutonium. In order that it should work economically...it probably needs quite a bit more than one ton of plutonium. I do not like the hazard involved...(It) can release enough fission products to kill a tremendous number of people...if you put together two tons of plutonium in a breeder, one-tenth of one percent of this material could become critical."<sup>1</sup>

### RADIOACTIVE DISCHARGE

Reactors are able to contain over 99% of their fission products, but AEC standards allow 0.5% in gaseous and liquid states, to escape into the immediate environment. The question

is whether any level of radioactive contamination is safe. The 0.5% of radioactive effluent released is dissipated in the immediate biosphere, only to be concentrated as it ascends the food chains.

A study of the Columbia River, whose waters are used to cool the giant reactors at Hanford Atomic Works in eastern Washington, revealed that the radioactivity of the water was relatively insignificant while the radioactivity of the river plankton was 2,000 times greater. The radioactivity of the fish and ducks feeding on the plankton was 15,000 and 40,000 times greater respectively. The radioactivity of young swallows fed on insects caught by their parents near the river was 500,000 times greater. Also, the radioactivity of the egg yolks of water birds was more than a million times greater.



Another study of Columbia River water revealed the presence of Zinc-65 in a concentration of 220 picocuries per liter. The isotope was also found in sizable concentrations in the bodies of people who consume beef and milk from cattle pastured on land irrigated by the Columbia, and even higher concentrations in those who drink the river's water.<sup>2</sup>

The Columbia River is already termed the world's most radioactive stream. It is well understood that radiation causes cancers of all sorts, including leukemia, shortening of life span, thyroid disorders, intra-uterine and infancy deaths, weaknesses in body processes, increased susceptibility to disease, brain damage, sterility, and mutations.

As a result of criticism focused on low-level radioactive wastes particularly liquid wastes, during normal operation, the Minnesota Pollution Control Agency (MPCA) decided that standards were too lax, and announced in February that it will limit radioactive discharges from nuclear reactors to levels considerably below those currently allowed by the Atomic Energy Commission.

Special consultant to the MPCA was Ernest C. Tsivoglou, professor of sanitary engineering at Georgia Tech, who was chief of radiological water pollution control, U.S. Public Health Service, from 1956 to 1966. "Tsivoglou says the AEC standards neglect the problem of multiple sources of radioactive pollution. He recommends that radioactive discharges be more severely curtailed so that there is more room to develop additional nuclear facilities...without endangering the public. Tsivoglou argues that radioactivity should be minimized so as to leave a reserve capacity in the environment in case of nuclear accidents, the resumption of nuclear weapons testing, or new findings concerning the dangers of radiation."<sup>3</sup>

Investigators found that nuclear reactors and associated fuel-processing plants were responsible for the increase of Iodine 131 in cattle in wide areas of the western U.S. Tsivoglou recommends that charcoal filtration of gaseous effluent be required to remove radioiodines which tend to concentrate in milk. The Northern States Power Company of Minneapolis terms these precautions as "unnecessary" and "arbitrary" because of the added expense involved in maintaining Tsivoglou's suggested standards.

Even if it is possible to set standards which will protect humans from radioactive hazards, they may not protect smaller organisms. "There is very little information on the population and genetic effects of continuous exposure of natural communities of aquatic organisms to low levels of radioactivity."<sup>4</sup>

### SPENT NUCLEAR FUELS

Every so often, radioactive spent-fuel must be removed from the reactor core. It must be transported long distances to reprocessing plants where radioactive poisons, including plutonium are removed to leave a purified uranium fuel for re-use. A ton of spent fuel in reprocessing will produce from forty to several hundred gallons of waste. This substance is a violently lethal mixture of short- and long-lived isotopes, which produce so much heat that it will boil for several years.

After reprocessing, these extremely dangerous wastes are then transported to and stored in huge steel concrete-walled underground tanks. Two of these perilous substances, strontium 90 and cesium 137, continue to radiate for over 1000 years. In the words of AEC Commissioner Wilfred E. Johnson, we are talking of periods "longer than the history of most governments that the world has seen." These containers store anywhere from 300,000 to 1,000,000 gallons. Dr. Joel Snow, nuclear physicist of the University of Illinois, states that "a single gallon of waste would be sufficient to threaten the health of several million people."<sup>6</sup>

Of 200 such storage tanks in the U.S., 151 of them are situated in Washington State alone. Eighty million gallons of highly radioactive waste are presently stored in these giant tanks. Some of these tanks are known to be leaking their poisons. One tank at Hanford developed a leak from a 2-foot bulge near the bottom. It drained 60,000 gallons into the ground before discovery, the AEC has acknowledged. This occurred only five years after its construction. Two more have been found to be leaking and others are suspect. In 1968 the AEC spent \$2,500,000 to replace failed or failing tanks at Hanford.<sup>6a</sup>

### THERMAL POLLUTION

The tremendous amounts of heat produced by atomic fission must be removed to prevent a meltdown of the core. The most widely used method of cooling atomic plants is the once-through condenser cooling system through which large volumes of water are passed. The water has to be taken from a natural body of water, such as a river or lake. After the water passes through the reactor core it is returned to the body of water from which it came 11 to 23 degrees F hotter than it was on intake. This process causes a significant change of overall temperature in the body of water used for cooling purposes.

Thermal pollution greatly effects immediate aquatic communities. An example of the dependence of an animal on suitable water temperatures can be described by the effects of temperature on the life processes of Pacific salmon. "These fishes thrive within temperature ranges that fall between about 38 and 65 degrees F, depending upon the species of fish, acclimation conditions, stage in the life cycle, age and season of the year. Both above and below these ranges are temperature zones in which salmon can exist but only at the expense of such processes as growth, migration, feeding, and maturation. Depending on duration of exposure, season, condition, life processes, and other factors, Pacific salmon can be killed at temperatures beginning in the range 56 to 77 degrees F. Gradual temperature changes are tolerated much better than sharp changes at all temperature levels."

The waste heat of power generation in some cases might be used to increase production of fish and shellfish, such as trout and oysters, but more waste heat is expected to be produced by nuclear power plants than can be used effectively by aquaculturists in both controlled and natural environments. "In the warm season of an unusually hot, dry year when the water reaches its maximum temperature from atmospheric heat alone, a further rise of 2 or 3 degrees F, might be sufficient to kill some forms of aquatic life."<sup>5b</sup>

If plant expansion continues at its present rate, by 1990 more than half of all the river run-off in the U.S. will be required for cooling. Various cooling system designs, including cooling ponds and cooling towers, are available to direct waste heat into the atmosphere rather than into the water. These systems would eliminate the risk to aquatic communities, but to date the power companies have resisted the cost of such devices.

No one knows what long range effects these systems will have on the ecology. Considerable amounts of water vapor released into the atmosphere may bring an increase in annual rainfall. Simply by its nature, this type of activity would be classified as air pollution and come under the regulations of the Northwest Air Pollution Authority. It has been suggested that atomic power plants be situated in arid waste lands, such as east of the Cascades, where increased rainfall would be beneficial to land use.

### ATOMIC ACCIDENTS

"A disturbing number of reactor accidents have occurred with sheer luck playing an important part in averting catastrophe, that seem to have been the product of incredible coincidences. On October 10, 1957, for instance, the Number One Pile (reactor) at the Windscale Works in England malfunctioned, spewing

# the domino theory of SWALLOWS

by annette gerlinger

I'm hoping you'll try, at least once, the touching art of swallow watching. It is free and can be pursued almost anywhere in the great outdoors. Swallows are one of the original masters of flight. If you find yourself enjoying this pastime the following may be expected to occur:

- 1) On every parabola the swallow makes an insect disappear. Good, you say, as this makes for less population density in the insect world.
- 2) Where there are swarms of air-borne insects there are usually swallows. Consider, if a winged bit of protein lures swallows to your vision, they are serving an end.
- 3) If there were no bugs would there be any swallows?
- 4) If you care that there would be no swallows were there no bugs, read the labels on insecticide cans, thoughtfully.
- 5) Soon you may find yourself beginning to tolerate insects, feeling that the swallows are apt justification for the minor inconvenience.
- 6) One day you will find yourself unarmed against the approach of a bug. Closer inspection will reveal that the bug is quite fascinating and seems to be lacking in evil intentions.
- 7) Now you like swallows and this one particular bug. You are anxious to discover other bugs, other birds. Your world is enlarging.
- 8) You no longer purchase bug "bombs", insecticides, pesticides. Your grandmother has recommended citronella and you like the smell. You've been told by a hip ecologist how ladybugs will eat rose-loving aphids and you're ordering a colony for the lady next door.
- 9) You've read somewhere that penguin livers show high concentrations of DDT and you're wondering "How"? The birds and the bees have become meaningful of life itself. You are understanding balance, tolerance, and the ay of the world. You have a special filter on your eyes now.
- 10) You're studying birds now, and are disappointed to find that "Birds of Vietnam", published 1968 is not adequate due to the exclusion of species collected north of the 170. Napalm is a chemical manufactured by Dow. You know it kills people, and defoliates jungles; it also kills birds and has been known to have the same deleterious effects on human life as DDT to insects; it also causes hardening of the soul.
- 11) You are beginning to understand. Having grown to love swallows, you have learned to tolerate bugs. You may soon learn to appreciate life in all its forms, and colors.
- 12) Swallows are good for the growth of pleasure. Caring about anything other than power, money, and war is.



If after giving swallows a fair try (there are 75 species) you do not like them, do not despair. The same principles may be applied to any one of the 8,500 species of living birds in living color. Anyone wishing a swallow guide, phone 734-9419. If all attempts fail there is always the Tibetan Kite Society.

Northwest Passage, October 7, 1969

# Georgia Pacific Poisons

by chris condon

Biojournalist Chris Condon, a former Passage writer and editor, is currently in the process of preparing an ecological magazine for the San Francisco Bay Area.

One of the greatest potential hazards to the safety of the Bellingham community lies in Georgia Pacific's chlorine production plant. Chlorine, a highly toxic, often fatal gas is produced by separating raw sea salt (sodium chloride), by electrolysis, into its chemical components thus releasing the chlorine gas where it is cooled to its liquid form and used in the production of bleaches, cleaning fluids, explosives, and poison gases.

The great white heap of material next to the green buildings and labyrinth of pipes are the raw sodium chloride and the chlorine plant respectively, and within the walls of that building are guarded industrial processes the nature of which are vitally important to the public safety of Bellingham.

It became clear that if we were to discover the nature of the chlorine plant we would need expert help, so Northwest Passage contacted David T. Mason, Ph.D., Department of Civil Engineering, University of California, Berkeley, who agreed to conduct a personal investigation of the plant.

After several weeks of investigation, Dr. Mason made his results available to Northwest Passage and contained therein were some highly unexpected and startling results.

In the handling of the chlorine gas itself the safety precautions are so

thorough that nothing short of a major earthquake or sabotage would present any danger. Presumably officials at G-P have taken into account the fact that geologists predict a major earthquake on the west coast within the next ten years.

The major danger to public safety and to the local ecology lies in the discarded raw materials of the sodium chloride separation itself. The essence of the separation technique involves the bombardment of the dissolved sodium chloride with an electric current, or stream of electrons traveling from a positive pole (graphite anode) to a negative pole (mercury cathode). The chlorine then is released in its gaseous form at the graphite anode and the sodium combines with the mercury whereupon the sodium mercury combination is then separated into sodium hydroxide and mercury which is then re-used. (See Dr. Mason's report for a complete description of the process.)

Unfortunately this mercury, a highly toxic element, is lost in the process to the tune of "very much less" than one pound of mercury per ton of chlorine produced according to plant officials, a figure which has been verified independently by NWP. Dr. Mason, in his report, estimates that the loss "is in the order of one flask (76 pounds) of mercury per day", about half of which is lost in vaporous form into the plant area and downtown Bellingham and half into Bellingham Bay.

Seventy-six pounds of mercury per day is almost fourteen tons of mercury per year. Seven tons into the bay to enter the marine environment which by the plankton-invertebrate-little fish-big fish type of food chain can concentrate toxic substances to very dangerous levels by the time it gets to third and fourth-level predators like seals, sea gulls, salmon, and man.

And seven tons into the plant area and the terrestrial Bellingham environment subjecting citizens and especially plant workers to day-by-day, year-by-year exposure to a cumulative, non-bio-degradable poison not only through direct contact in breathing but through absorption by cultivated plants through the soil in people's farms and gardens.

Mercury, like DDT, is a non bio-degradable substance, save for the

fact that unlike DDT, mercury does not decompose at all since it is already in elemental form whereas DDT has a half life of about 34 years.

Fourteen tons per year of any poisonous substance discharged into the environment, NWP feels is sufficient grounds for investigations on the part of the Whatcom County Health Bureau, the Northwest Air Pollution Authority, the Action for Conservation Club, etc. Furthermore, we feel that it is now incumbent upon Georgia Pacific to reveal accurate information, which we are certain it has, on exactly how much mercury is lost into the bay, the air, the plant area. Where and at what levels mercury finds itself in local ecological systems and at what levels is mercury toxic to animals, plants and man.

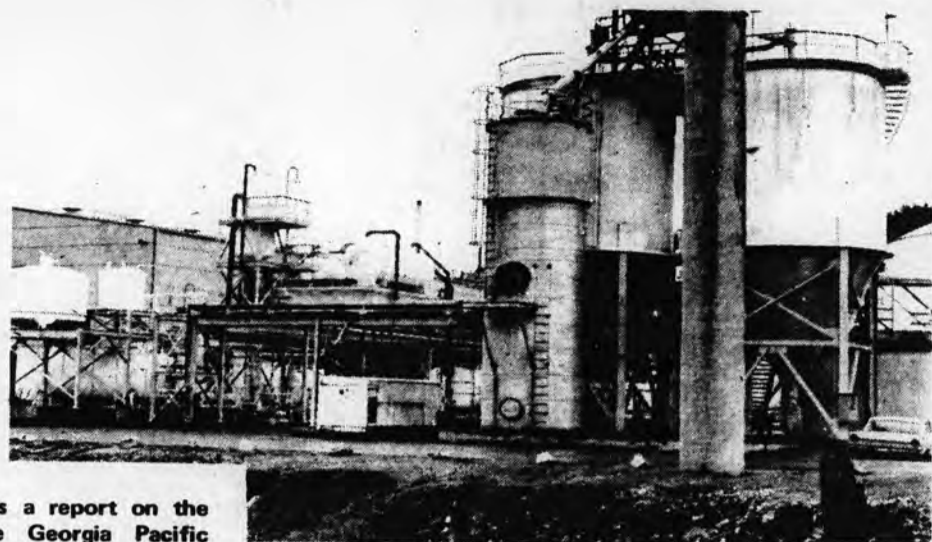
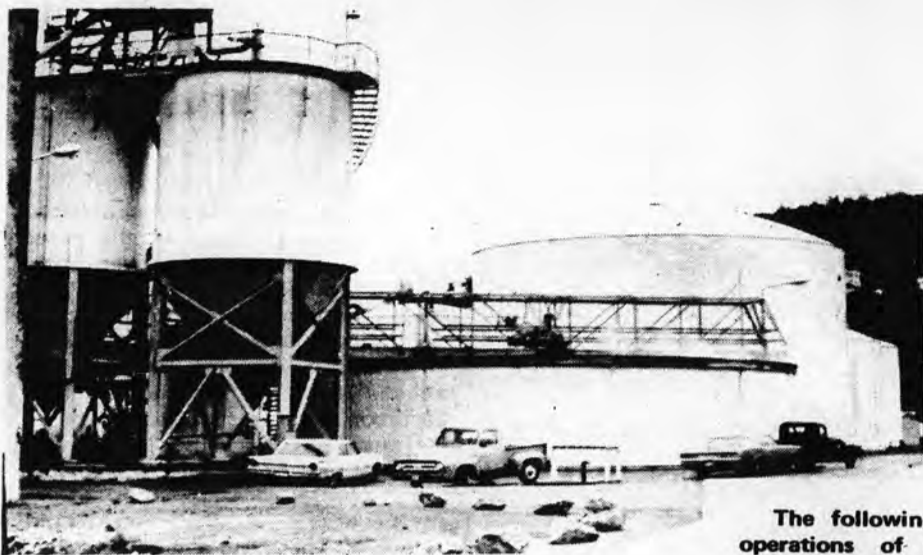
But above all, the public must demand that Georgia Pacific, which is the same company leading the rape of the redwoods in Northern California, stop its wanton exploitation and pollution of the environment for corporate profit. Georgia Pacific and corporations like it abuse land and natural resources because they regard them as commodities belonging to man, rather than land and natural resources being part of a community to which we belong where man has the right to use, but not to abuse, the products of nature.

Northwest Passage, September 23, 1969

Georgia-Pacific  
digs deeeep  
for profits  
a quarter-mile  
be- lowww its trees!  
... this land works  
twice as hard for us.  
GEORGIA-PACIFIC  
knows  
where it's  
gro- wing  
in the energy business.

from "Violence and Glory, Poems 1962-1968," by James Schevill (The Swallow Press, 1969).





The following is a report on the operations of the Georgia Pacific chlorine plant in Bellingham, prepared for Northwest Passage by David T. Mason, Ph.D., formerly with Western Washington State College and now with the Department of Civil Engineering, University of California Berkeley.

# Chlorine Plant Operations

## How The Chemical Is Released

by david mason

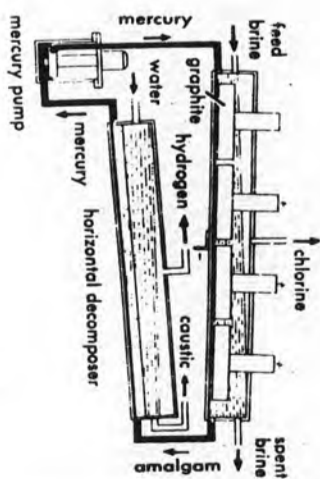
Raw solar salt, water and electricity are the primary ingredients used by the Georgia Pacific Chlorine Plant in the manufacture of chlorine gas. The products besides chlorine itself are hydrogen (used in the steam plant powering the pulp mill) and caustic soda solution (used internally and sold). The process involves first the purification of the solar salt, removing calcium and magnesium by precipitation with excess carbon dioxide (from the pulp mill fermenter) in aqueous solution. The calcium and magnesium carbonates, along with coprecipitated chromium, aluminum and vanadium etc., are discarded into the Bay. The heated saturated salt solution, after acidification with HCl, is cooled, using 3 to 4 million gallons a day of water, and pumped to electrolytic cells.

Here, in 52 cells in series, 155,000-160,000 amperes of current are consumed in the two reactions: at the graphite anode, chloride ions are stripped of their excess electrons and converted to chlorine gas, while at the mercury cathode electrons are transferred to the sodium ions, making them sodium metal which immediately amalgamates with the mercury. The chlorine is conveyed off to drying towers and compressed to the liquid form for shipment by tank car, or barge (or use in the pulp bleaching

process). The sodium-mercury amalgam is exposed to water in the presence of graphite in a counter-current decomposer. Here the sodium reacts with the water forming sodium hydroxide (caustic) and hydrogen, and freeing the mercury to be recirculated into the electrolytic cell.

Unfortunately, mercury is lost in this process. Each of the 52 cells has a vestibule where the re-circulating mercury enters it; although these (approximate 2 foot square) pools of mercury are covered with a few centimeters of water, some loss occurs here. The discharged hydrogen gas is mercury saturated. Cooling and transfer to the "hog fuel" burner of the pulp mill no doubt condense most of the mercury, but some may be discharged with the plume of smoke rising out of the pulp mill's main stack. The caustic is cooled and filtered to recover the mercury and purify the bi-product. A number of traps and cooling devices are used to catch the mercury at several stages in the process, but there are inevitable losses of this toxic heavy metal to both atmosphere and water.

A mercury cell for producing chlorine.



A regular program of urinalysis monitors the mercury levels in chlorine plant workers. Only on rare occasions do human levels of mercury reach a danger point, but worker health is a major concern at the plant because of the potential exposure, both to persons involved in everyday production maintenance and to welders and other workers who may be infrequently exposed to high concentrations of mercury. (Since mercury vapor condensing on a metallic surface will usually amalgamate with that metal, weakening and corroding it, repairs are frequently necessary. Welding heats the affected metal, releasing a concentrated mercury vapor.)

Supervisory personnel at the chlorine plant estimate that "very much less" than a pound of mercury is lost per ton of chlorine produced, but because of the expense of the mercury, this loss makes replacement of the mercury "one of the major cost items" of chlorine production. As chlorine plants go, the one in Bellingham is rather small, producing only about 133 tons of chlorine per day. It has, therefore, been estimated that mercury loss is in the order of one flask of mercury per day. A flask of mercury weighs 76 pounds, and costs about \$520 at current prices.

Of this total estimated loss, about half is presumed by plant officials to be lost as vapor, and half to be discharged with cooling and wash waters into the Bay. One would suspect those marine forms hardy enough to survive the oxygen depletion and toxic effects of the pulp mill effluent might be subject to yet another environmental stress from the mercury.

Because of the cost of this mercury

loss, and of course the attendant pollution of air and water with an insidiously poisonous chemical, G-P is deeply concerned with recovering as much of the mercury as is economically possible. Chlorine plants in Scandinavia have recently come under fire in their countries because of the pollution dangers, and G-P has been studying their methods of mercury recovery. (See "Industrial Water Engineering," June 1969, p. 24.)

Another adjacent chemical installation produces sodium chlorate. The process is an industrial "secret," and it is not known if mercury is involved in this electrolytic conversion.

Due to the well-known hazards of chlorine gas, G-P takes considerable pains to ensure safety. In the event of a power failure, steam powered turbines would suck any chlorine within the process lines through a caustic trap. Presumably the monitoring and controlling systems for this "fail-safe" project are also independent of electrical line failures.

Despite mollifying statements of G-P management, the public should be made aware of the extent and distribution of the mercury presently lost in the manufacture of chlorine. No doubt tests of the local atmosphere and marine environments show where the large loss of mercury is eventually lodging. Is it the sediments of Bellingham Bay, the inter- and sub-tidal invertebrates, the fish, the homes and gardens of Bellingham and Whatcom County? Seventy-six pounds of mercury, although small in volume because of the extremely high density of this metal, is a lot of a highly toxic substance to be discharged each day into the Bellingham environment. Where is it going, Georgia Pacific?

Northwest Passage, September 23, 1969

'Pollution Control'  
at Georgia-Pacific:

# 20-Ton Toxic Mercury Escape

[Editors' Note: Last week, the Georgia-Pacific Corporation took out an expensive full-page ad in the Bellingham Herald entitled "Pollution Control: A Progress Report." (For some reason, they have not sought to advertise in the Passage.) Nowhere in that "report" — which is mostly a collection of pictures of equipment — is there any mention of the tons of toxic mercury being emitted into the air and water.

Mr. Hill Williams, Science Editor of the Seattle Times, asked the State Water Pollution Control Commission for comment on recent Passage articles dealing with G-P's mercury emissions. Williams received a reply from the Commission and wrote a memo to his City Desk which he later submitted to Professor David Mason for comment. What follows is Dr. Mason's response to that memo, which he has agreed to make public through the Passage.]

Dear Mr. Williams:

Thank you for your interest in Bellingham's mercury pollution problem. Your inquiry apparently served to elicit a company-estimated figure of 35 pounds of mercury lost per day from Georgia-Pacific's Bellingham chlorine plant, a value I was unable to get the local Georgia-Pacific engineers to divulge. I had calculated my estimate from the production engineer's figure for mercury use per ton of product and his figures for chlorine production. Either his estimates or my calculations were in excess, or the present figures that Georgia-Pacific is giving the Water Pollution Control Commission are somewhat low.

Georgia-Pacific makes these present estimates upon the amount of mercury they need to add to their electrodes. Supposing the plant in operation only 80% of the time for the last four years, this is still over 20 tons of mercury lost into the environment of Bellingham during the plant's operation. One third of this is supposedly lost to the air — over ten pounds of mercury a day drifting through the streets of Bellingham.

Two-thirds of this Georgia-Pacific estimates was discharged into the Bay and your informant suggests it rests as the metal in G-P's log pond. In the fluctuating and oxygen-poor conditions of the pond there is good evidence that metallic mercury, and this ion in turn may then be combined with one or two methyl radicals, with a phenyl group (quite likely in the log pond, since much of the brown waste liquor and natural leechings of wood are rich in this radical), or with a methoxy radical.

Although metallic mercury is toxic, especially when in the vapor state in air, the transformations to the organic mercury compounds which occur in muds and water render the mercury much more toxic. In fact, the Japanese disaster (Minamata, Kyushu, 1953-1960, where several hundred people were disabled or died) is directly attributed to eating fish containing methylated mercury. Similarly the Swedish problems were due to organic mercury compounds picked up by organisms; however, the methyl mercury itself may be transferred to the atmosphere to the atmosphere by volatilization.

Methyl mercury is particularly insidious as a poison because of its ability to penetrate cell membrane barriers. One target organ is the brain, where mercury accumulation often leads to visual impairment, lack of muscular co-ordination, and

disintegration of brain tissue. Often non-specific poisoning symptoms appear first: fatigue, headache, and irritability. Numbness of limbs, slurring of speech and emotional disorders may follow.

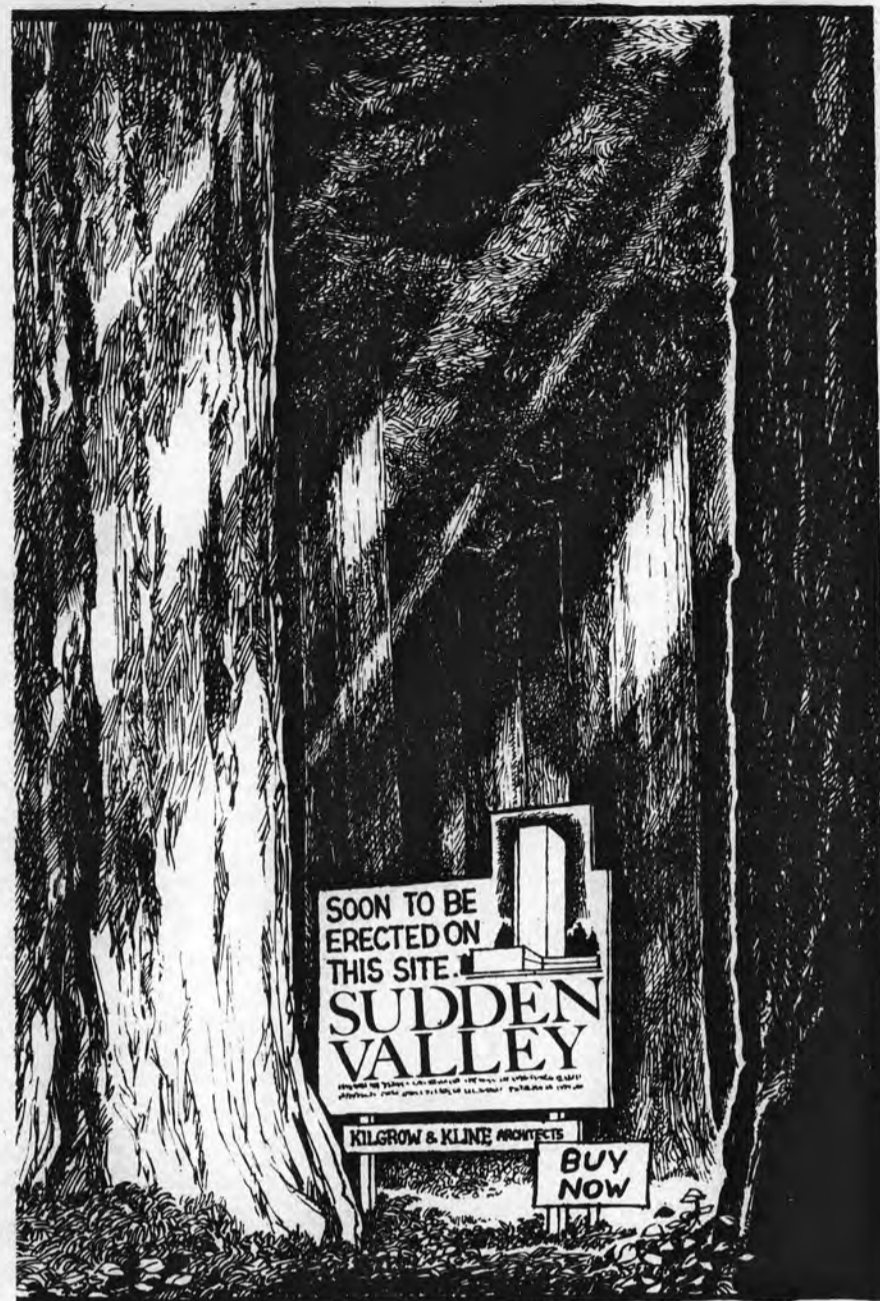
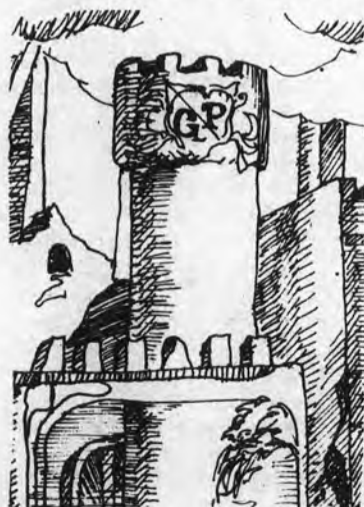
Your contact at the State Commission in playing down the figure of 25 pounds of mercury in 5 million gallons of water (both per day) perhaps is unaware that this concentration, 0.6 parts per million, is well in excess of that found to be lethal or harmful to phytoplankton. Thus, the levels of mercury released could easily adversely affect photosynthesis in the Bay even after significant dilution. Surely G-P has looked at the few hardy estuarine organisms which still manage to survive near their factories. They owe full disclosure of this information to the public. For concise data on these topics I would refer you to the May 1969 issue of *Environment* (Volume 11); to the book "Chemical Fallout" edited by M.W. Miller and G.C. Berg (1969); and to the Federal Water Pollution Control Administration's report "Water Quality Criteria" (1968, p.87-88).

I am afraid that the soothing approach of your Water Pollution Control Commission engineer may be covering up a potentially lethal source of danger in Bellingham. Five tons of mercury a year is a lot for Georgia-Pacific to expect a sensitive estuarine environment or the people of Bellingham to take. The first symptoms may be fatigue, headache, and irritability....

Sincerely,

David T. Mason, Ph.D.  
Assistant Professor of  
Ecological Engineering  
University of California  
Berkeley

Northwest Passage, April 6, 1970



## mallard continued

lower mainland, is scantily populated.

There are many wonderful areas in B. C. that could support quite progressive towns and cities. Many of us wonder why we cannot establish boundaries on certain areas of development and commence new towns and cities in other areas and, of course, each one of these with established boundaries of growth so that one would have a series of reasonably sized communities, but bounded by healthy, natural environments to which all people could relate without having to travel many miles through sickening, frustrating traffic.

The regional concept in British Columbia at the moment is relatively new, and it is rather difficult to estimate how successful it will be, one of the greatest problems being that, in many cases, these regional districts are not staffed by people whom one would call, in the broadest sense, environmentalists.

This is all the more reason why we must develop programs in the schools to acquaint young people with the environmental problems and additionally create departments of environmental studies at the university level; so that we can produce competent people to operate within these regional district concepts or whatever other systems we may develop to deal with pollution, urban development, transit systems, and so on.

Northwest Passage, March 23, 1970



# eco- notes

More than 161,000 acres of trees are in various stages of death or decay as a result of air pollution in California, according to the U. S. Forest Service. Residents around the San Bernardino and Angeles National Forests first began noticing trees turning yellow in 1955. Seven years later, a scientist established the cause as smog. The tree damage extends from the famous Torrey Pines near San Diego in the South to the Monterey Pines in the North to the trees of Palm Springs 114 miles to the east.

Edible vegetation is also suffocating: it is no longer profitable to grow lettuce and spinach in the Los Angeles basin, due to the high loss rate; yields of citrus fruits have been cut in half; flower growers have been forced to move. The same picture is increasingly true in many areas of the East Coast. According to the Forest Service, their research shows "there is little time left for application of effective air pollution controls."

\* \* \* \* \*

It's About That Goose Department: Louisiana's Lt. Governor Aycock after hearing of Interior Secretary Hickel's postponement of federal offshore oil leases in the Gulf of Mexico after recent massive oil-disasters there: "We have had pollution from oil in South Louisiana for 20 years. But now we are suddenly beating our breasts about it. We are in effect killing the goose that laid the golden eggs."

\* \* \* \* \*

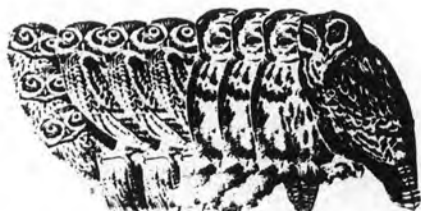
Further Optimistic Developments: California recently enacted the Porter - Cologne Act, a tough law under which water - polluters can be fined up to \$6,000 per day. Action is presently planned against a sugar company, a resort and three cities . . . The Wall Street Journal, that eminently Establishment newspaper, recently ran a 16½-inch front - page story singing the praises of organic farming and organic gardening and downplaying the benefits to be derived from chemicalized food - production. . . In England, antibiotics have been used extensively in production of livestock. It was found that, as a result, consumers were developing diseases resistant to antibiotic therapy. An order has now been issued banning the use of antibiotics in livestock production. (Unfortunately, there is no similar legislation in the United States.)

\* \* \* \* \*

Pollution Regarded as Normal Fact of Life Department: Ever take a good look at the U. S. Food Stamps distributed by the state welfare agencies? On one side of this Socialist Realist art form, there is a farm pictured with the words "Agricultural Abundance." On the other side, with the words "Healthier Families," you will find the typical modern American family -- father, child, and mother wearing a dress that comes down halfway between her knees and her ankles -- standing in front of a factory. Pouring out of the factory smokestack is a dark spiral of toxic waste products. No wonder it's difficult to change people's attitudes about the environment. Pollution is merely the price we pay for "Healthier Families". Didn't you know that?

\* \* \* \* \*

A recent report of the President's Panel on Oil Spills predicts that we can expect a Santa - Barbara - scale pollution incident once a year by 1980, if offshore oil development continues at the present rate. Judging by the recent developments in one month off the coast of Louisiana, Newfoundland, Alaska, Florida and elsewhere, it looks like a rosy optimistic prediction.



# INTALCO SUED FOR FLUORIDE POISONING

by michael kerwick



5 - week old stunted calf on Barci farm near Intalco.

Upon hearing rumors of cattle dying near Ferndale, I decided to visit the farm of Paul G. Barci who recently filed suit against Aluminum Corporation for \$664,000 in damages. The farm is located on the Unic Road just east of the Lake Terrell Road. When I arrived I could find no one at home, so I decided to wait. While passing the time I happened to look around a bit and noticed several interesting things.

The farmhouse is situated at the top of a rise from which all of Bellingham and the Nooksack River Basin can be viewed in the distance to the east. To the West and kittycorner to the Barci property I could see the storage tanks and towers of the Mobil Oil Refinery. To the North of the refinery and across the Lake Terrell Road, a blue haze drifted southward from what I assumed to be the pot lines of Intalco. The farm itself appeared to be very well

managed. I knew that Mr. Barci had been chosen Whatcom County Farmer of the Year by the Soil Conservation Service, and I could see why. An extensive drainage ditch, about a mile long, had been dug the entire length of the property. Just up the rise from the ditch a tree-lined pond had been formed, and above the pond, near the house and outbuildings, many tall evergreens were retained, forming a park-like atmosphere. The practice of deep plowing was evident by the patterns in the worked fields.

## FLUORIDE POISONING

It wasn't long before I heard the drone of a tractor and Barci and his son appeared from behind the barn. I greeted them and identified myself as a reporter from Northwest Passage. I had but only begun to



explain what the Passage was when the younger Barci pointed to a steer which was about to drink from the water trough. The cow lapped at the water and paused each time as if it were trying to subdue some sort of irritation. Paul explained that his herd was afflicted with fluoride poisoning.

The cow's teeth had come in contact with fluoride absorbed by the grass grown on the farm. The result was abnormally worn and brittle teeth, appearing almost as if they had broken off. This accounted for the unusual watering habit, for as soon as the teeth came in contact with the water the cow experienced pain.

I asked Paul, Jr. about the rumor I had heard, and of course it turned out to be greatly exaggerated, but he did say that he had one of his cattle slaughtered and an autopsy was performed by a vet in Custer named Mr. Piovesan. Piovesan found that the bone structure of the animal had been attacked by fluorides resulting in a condition known as bovine fluorosis. One peculiar symptom of bovine fluorosis, besides brittle teeth, is lameness. Deposits collect in the legs of the cattle due to the poisoning, which greatly impairs their mobility. As a result, some of the afflicted animals I viewed could only slide around on their knees.

#### STUNTED GROWTH

Aside from the general inactivity and poor health of the cattle, the most noticeable condition I saw as I walked through the herd was the stunted growth of some of the cows. The cattle that Barci had on the land three years ago had reached full growth, but the ones he bought as calves two years ago have only reached a portion of their normal growth. Calves born to these cattle show the same symptoms, and some, five week old calves look as if they were just born. In addition, they suffer from malnutrition. Their affected mothers produce very little milk as a result of their difficulty in drinking and eating.

By the time we had finished our tour of the herd, my first impression of a peaceful and lovely setting had changed into one of appalled disgust and a feeling of hopelessness. I looked once again at the blue haze drifting on the lazy afternoon breeze as it floated through some nearby trees. It was then that the Barci took me over to get a closer look at their Douglas Fir and Western Red Cedars.

Upon close inspection I could see the reddish tipped needles characteristic of an excess of fluorides. I remembered reading somewhere that conifer trees were highly susceptible to fluoride poisoning. Some trees were already dead and others nearing that point. Paul, Jr. felt that every tree for miles around would be extinct within five years.

Not only were the evergreens affected, but the Barci's pear trees had stopped giving fruit two years ago. Tests of hay grown on the Barci farm showed fluoride levels far in excess of the range generally accepted as the danger level, thereby rendering the feed worthless.

#### INTALCO MOVES IN

Paul Barci bought his farm in 1932 when he was 46 and his son a youngster of 6. The farm at that time consisted of six cleared acres, with the rest lying in a tangle of brush and second growth trees. The Barcis over the years have cleared nearly 400 acres, transforming it into top quality pasture land. Needless to say, the Barci's blame their present situation on Intalco. According to Paul, he has lived next to the Mobil refinery for fifteen years and it has had no effect on the productivity of his farm. He had noticed some abnormality in his cattle when Intalco began processing aluminum ore four years ago, but it wasn't until the aluminum plant opened pot line No. 3, reaching its present status as the largest U.S. aluminum reduction plant, that symptoms in the cattle reached their worst.

While air pollution effects of such operations as pulp mills, petrochemical plants, and steel mills are widely publicized and well known, the problems associated with the aluminum smelting process are generally not too well recognized by the average citizen. There are apparently two reasons for this. First, there are relatively few aluminum plants in the United States. Washington has only six plants. Second, the fluoride pollutants emitted by the smelting process are generally undetectable by the senses.

The aluminum reduction process is essentially an electrolytic process in which current is passed through a pot of aluminum ore in a liquid state. Aluminum collects on the negative electrode and forms an ingot. Cryolite, the material used to dissolve the aluminum ore, is rich in fluorine and a considerable amount of fluorides are given off during the process in the form of vapors. The vapors are drawn upward from the pots by huge fans and then passed through scrubbers which have the effect of "washing out" a large portion of the fluorides and other pollutants as the air from the pot lines passes into the outside world. The fluorides that are not washed out are emitted into the surrounding air and are soon dispersed to extremely low concentrations. However, various forms of plant life have the effect of retaining and reconcentrating in their plant tissue the fluoride from the air they use. This concentration is carried further by the grazing animals which live on these plants. Thus, while the local air may contain far less than one part per million of fluoride, pasture grass may have 50 parts per million. This is considered toxic for cattle usually resulting in bovine fluorosis.

## A Bad Day at the Barci Farm

HAVOC

Aluminum plants have a long history of creating havoc in surrounding agricultural communities. These conflicts have generally been smoothed over by the aluminum industry, which has adopted the policy of making private damage settlements with affected farmers. In this way the problems are kept both out of court and out of the public view. Intalco has up til now been successful in following this policy, but Paul Barci is not prepared to sell out. He has fought zoning laws and attempts to increase taxes on his land successfully. Now he has gone on the offensive and has filed not only a suit for damages, but also seeks a permanent injunction against the way pollutants are emitted by the plant. In Paul, Jr.'s words, "Either they shut down or clean up."

Strangely enough, at present there are no standards in effect governing emissions from the Intalco Plant. The State Air Pollution Authority has pre-empted control over aluminum plants, and is presently in dispute with the Local Authority as to just who has the right to dictate aluminum plant emission standards. As it stands now, the Local Authority has the standards but doesn't have the power to enforce them, and the State Authority has the power but doesn't have the standards drawn up yet. Anyway, as it appears now, if you want to buy your neighbor's property, erect a small aluminum production process consisting of some homemade set-up, and smoke him out. It's perfectly legal.

Northwest Passage, April 20, 1970



# eco- notes

The Federal Government recently announced that it was considering strict anti-pollution regulations to combat airplane exhaust fumes. The airline companies, seeing what was coming, countered with a voluntary plan for correcting the problem and said they would spend between \$8,000 to \$12,000 per plane to eliminate the black exhaust trails. What now comes to light is that the black exhaust fumes, while creating something of a visibility hazard over airports, are not the true dangers, since they are composed mostly of harmless water vapor, soot and unburned hydrocarbons. More dangerous are the invisible emissions of nitrogen oxide, the truly toxic gas poisons which are a natural by-product of high-temperature burning. The FAA official heading the investigations denied the obvious charge that the anti-smoke program is merely a salve to an aroused public, eliminating only superficial pollution while the airlines are still being allowed to dump less apparent but more dangerous gases into the air. There is similar suspicion about the new "clean" gasoline for cars.

\* \* \* \* \*

Officials from the Washington State Pollution Control Commission have reported that fish kills due to polluted water have doubled in 1969 over the previous year. One reason for the doubling is the notorious lack of preventive enforcement legislation. The Commission can only fine someone or some company for causing fish deaths after they occur (and only up to a maximum of \$100 per day), and even then the Commission must establish beyond a doubt the source of the pollutant; of course, it is almost impossible in many cases to say exactly which company or factory dumped what into the waters since so many are dumping the same thing. Unless there is preventive legislation, the situation will only get worse; says Harry Tracy, Commission biologist, "We have more industry and more people, and that means greater potential for fish kills."

\* \* \* \* \*

A listing of some frightening facts compiled by Robert Bendiner of the New York Times:

1) The Interior Department reports that more than 15 million fish were killed last year by municipal and industrial wastes in America's rivers, lakes and streams. For ten miles south of Albany the fish of the Hudson River are not affected since there aren't any more of them; they disappeared long ago, unable to survive in water so deadly that it can sear the paint off a ship's hull;

2) Several urban rivers, like the Cuyahoga which runs through Cleveland, are thick enough with inflammable wastes to be considered fire hazards;

3) Because of the ignorant and greedily irresponsible way coal and iron were mined in the U. S. for more than a century, two million acres of land, in 28 states, are cracking, subsiding, and sinking into the ground, occasionally taking houses and cars with them; another million acres will go by the end of the century;

4) There is an underground fire discharging noxious gas into the atmosphere which has been burning since Christmas Eve, 1915;

5) A recent analysis shows that simply by walking the streets of his city for one day, a New Yorker breathes the toxic equivalent of about two packs of cigarettes.

\* \* \* \* \*

The U. S. Public Health Service reports that deaths from lung cancer occur in large metropolitan areas at twice the rural rate, even when allowances are made for differences in smoking habits. In New York City, one of the world's filthiest and most air-polluted cities, pulmonary emphysema is the fastest growing cause of death. "On the autopsy table, it's unmistakable," says one of New York's medical examiners. "The person who has lived in the Adirondacks has nice pink lungs. The city dwellers' are black as coal."

\* \* \* \* \*

The U. S. Government, in addition to spending between \$25 - 30 billion each year to fight the Vietnamese, has paid more than \$28 million in taxes to South Vietnamese landlords. The figure was revealed by the General Accounting Office, the watchdog accounting service of Congress, and, in typical governmental understatement, declared that the practice was "inappropriate." In addition to being a morally reprehensible practice -- paying the taxes of the very landlords who are oppressing their own people -- it is clearly against congressional policy. After having been discovered, the State Department said it would investigate and promised a "careful review" of the GAO recommendations to cut it out.

# The Green Revolution ..

An expert in the field of urban planning outlines not a plan to restructure American cities, but a viable method by which the ghetto dwellers can escape the virtually hopeless slums, the suburbanites can abandon the increasingly anti-human rat race of middle-class "prosperity", and otherwise alienated Americans can begin constructing new communities for the new age.

This plan is predicated on a return to the land -- a Green Revolution -- and the formation of self-subsistence co-operative communities, where production is based on human need rather than capital, and where modern technology will serve those needs rather than visa-versa. These are the roots of the Green Revolution.

There are two segments of American society which are, today, more alienated from the majority outlook than any groups have been in the history of this country. One of these is the group that is frustrated by

therefore what is needed in America today is some kind of alternate or sub-system that will let average people, who are not professionals, technicians, or income-property owners, have a decent standard of living, a voice in

yourself; b) consume most of what you produce; c) produce a surplus to exchange for what you need, but cannot produce yourself.

For the person who is not educated as an executive or professional, or trained as a technician, basic independence and security depend now, as in the early days of this country, on having access to productive land. Not land for speculation and a one-time profit, but land for use, land which will continue to supply a family's basic needs for years to come: the homestead.

life used to be all hard work, without much social life except for church on Sunday or the occasional barn dance, or fair. And each family lived alone, often with no neighbors closer than a mile.

Country life today can be very different, especially if we plan and build a community rather than going to the land as individual families.

Nearly every advantage of urban living is today available to people outside the large cities: employment is becoming dispersed, good schools are most often found in small



**MODELS  
SUBSISTENCE**

SCALE 1"=100'

By arranging the five acres as shown, and establishing a building line here, each family's remaining four acres could be combined with those adjacent for larger scale cooperative farming operations.

being "locked-into" the establishment scene, and the other is frustrated by being "locked-out."

In the first group are those white, usually middle class, aware people (young and old), who find it increasingly difficult to find meaning, individuality, and control over their destinies in the homogenized, computerized, bureaucratized, corporatized society. Relatively small in numbers, this is, potentially, a very influential group.

The second group are America's oppressed minorities, the black, the Indian, the Puerto Rican, the Mexican, and the white rural poor: mountain people and migrant workers. These minorities are now demanding that the integrity of their cultures be respected. They are demanding that personal and economic justice be rendered. And they are demanding control over the affairs of their own communities.

Unfortunately, the demands of these minorities are being made, and are expected to be satisfied within the framework of an urban techno-economic system that puts profits ahead of human needs; a system that would replace people by machines, not because it is more humane to do so, but because it is cheaper, and because the corporate profits are greater.

It is probably unrealistic to expect the existing economic system to undergo any radical changes in the foreseeable future that will benefit the people of the rural and urban ghettos,

the life of their communities, and still not be completely at the mercy of an economic system that continually declares working people to be surplus and disposable.

Industrial exploitation takes place when such things as money costs, profits, techniques, "the process", or such vague generalities as "progress" or "advancement" take precedence over basic human needs and human potential.

Industrial exploitation is capable of being greatly reduced, however, by the application of the principle of self-sufficiency. This principle is as applicable on a national basis as it is on an individual basis. But under the influence of a scientific technology and a materialistic philosophy, western civilization has come to ignore this principle as a basis for community and national life.

It is with this in mind that the following idea is presented as an alternative to urban poverty, unemployment, welfare, and low-wage salary. The idea is not new and is quite simple. But because we live in a society which worships "bigger" as better and "newer" as best, we need to take another look at an old, tested, workable idea.

The principle of self-sufficiency is simple and ancient. Mankind has practiced it for most of his time on Earth. It is still practiced to one degree or another by probably 75% of the world's population. It is this: a) produce most of what you need

We have been told by the farm experts and the agricultural economists that the small farm, the family farm, is obsolete, that it can no longer compete. And they are right if we are thinking of "competing". But if we are talking about "supporting", the small farm will still support; it will support, in fact, better now than at any time in history, because we can use our advancing technology to make things work better at this truly human scale. This is the basis for the "green revolution".

But instead of going to the homesteads as individual families, as was done a hundred years ago, the disadvantaged members of minority groups could go as a group, start as a community, with all of the advantages of pooled resources and know-how, of mutual self-help and support. These groups need not be large--30 or 40 families in each-- but a number of such groups might locate in the same general area. The exact number of families in each group would depend, finally, on the size of the parcel of farm land which could be purchased, since an average of about five acres per family would be needed. But what are the advantages of this small, self-help community? Why would a family want to leave the excitement of the city for the quiet country?

There are a number of advantages, but first it's important to understand that the country life our grandparents lived is a thing of the past. Country

## FOOD PRODUCTION What is needed: family

### Basic Foods

Flour, cereals.....	400 lbs.
Milk.....	400 gals.
Potatoes, sweet & white.....	10 bu.
Dried beans.....	1 peck
Tomatoes, citrus fruit.....	10 bu.
Leafy, green, yellow vegs.....	585 lbs.
Dried fruits.....	75 lbs.
Other fruits and vegs.....	1400 lbs.
Butter and oil.....	165 lbs.
Sugar/honey.....	200 lbs.
Meat and poultry.....	620 lbs.
Eggs.....	145 doz.

### Livestock

Chickens - 25 layers, 25 capons (from 75 chicks) or turkeys, ducks or geese  
Milk goats - 2 (or 1 cow)  
Pigs (optional) 2 each year Bees (& equipment)

communities, shopping centers are dispersed, entertainment and world events, as they happen, come to the home via television, and the telephone puts one in instant contact with friends, businesses and services wherever they are located. And for those aspects of city life which can not be moved, or which we need only seldom, the automobile and good, fast highways go anywhere, any time.

Country life need not be based only on farming either. Every year hundreds of manufacturing plants move out of the large cities into small cities, towns and open country, making industrial employment

# The Land For Life

by ernst i. gayden  
Lecturer in Urban Planning  
University of Washington

available to country people.

The advantages of the small, cooperative community would be these:

- 1) A chance to own productive land with like-minded people.
- 2) Democratic control over your own community.
- 3) The opportunity to live in safe, pleasant, healthful surroundings.
- 4) The opportunity to build your own home with the help of friends and neighbors.
- 5) You produce for yourself first--and

work and craftsmanship can have real meaning; and where life can be lived in harmonious contact with the natural, living environment.

Location: prime consideration in locating the community will be the availability of good-quality agricultural land in the necessary quantity. Optimally, the climate should be mild, with a fairly long frost-free season, and 30 to 40 inches of annual precipitation, or adequate water supply for small-scale irrigation.

Location within commuting distance (30 miles) of a city of

several ways in which the community could be laid out, beginning with the way one five-acre homestead could be arranged, then how several homesteads could be along a lane, and lastly, how several communities could develop in the same locality.

## How To Do It

We might divide the job of making the green revolution into three parts: 1) getting the people together who are interested in creating the new community; 2) seeking necessary funds and locating the land; and 3) making the transition to the new way

as in the past. For example, Title V of the Housing Act of 1968 encourages private groups and states to form development corporations which may, with Federally guaranteed financing, acquire land for the establishment of "new communities." Federal programs already exist which will assist in meeting the problems of roads, water and sewerage systems, recreation development, watershed protection and rural housing.

Another potential source of financing may be some of the big trust funds or foundations which are interested in helping to solve the problems of the rural and urban poor.

A third source of possible help might be, in some of the western states, the large timber companies, who hold large tracts of land, some of which might be quite suitable for these purposes. These might be available on a long-term (99 years) lease arrangement.

Lastly, we must not discount the possibility of obtaining the right, from the Congress, to establish new communities at suitable locations on Forest Service or Bureau of Land Management lands.

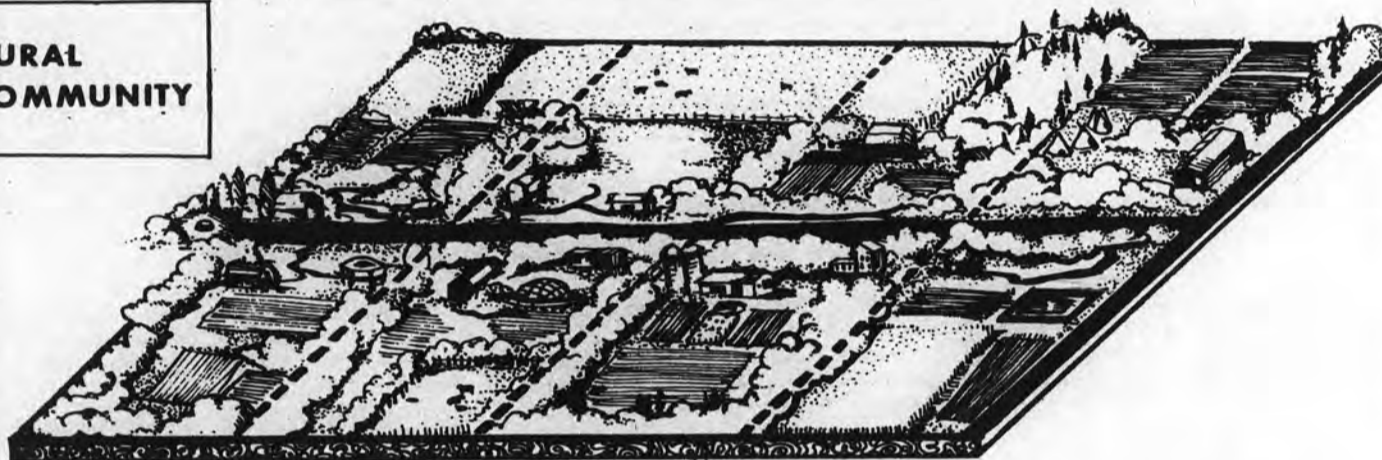
In none of the above arrangements would it be necessary for the new community to actually own the land, as long as a long-term lease was available, giving the community full rights of use, and the security of renewing the lease as long as the community was in existence.

The last step in this process involves the group's ability to make the transition. This means there must be people in the group who possess the skills and knowledge to get the homesteads laid out, gardens started, wells dug or drilled, and water lines laid, and houses built. This latter would be greatly helped by architects who could develop some simplified building systems. What is needed is a system that would allow people with only average skill at carpentry to erect their own homes, and yet produce flexible designs to meet different needs. Much of the skill and knowledge could be gained by the members in group classes between the time the group formed and the time the land was purchased and ready.

If the organization and planning for this kind of "intentional" community proved successful in just a few places, the way would be opened for the eventual escape of millions of Americans from frustrating poverty and meaningless lives in our overgrown cities. And perhaps, if the urban poor find "a way out" that really works, the urban not-so-poor may begin to see the value of seeking "the possible" instead of simply following the trends. It seems to be worth trying.

Northwest Passage, August 19, 1969

## RURAL COMMUNITY



ON THE HOMESTEAD  
of five for one year

SCALE 1"=400'

5 acre farmsteads laid out along a lane of approximately 1680 feet

Land	
Grain for livestock .....	1 1/2 acres
Alfalfa .....	1/4 acre
Pasturage .....	1/4 acre
Corn/wheat .....	1/4 acre
Veg garden, orchard, flowers .....	1 acre
House, barn, sheds, etc. ....	1/2 acre
<b>Total (minimum) .....</b>	<b>4 acres</b>
Base costs (other than normal furniture and appliances)	
Land	
Bldg. material for house (3 br., 1460 sq. ft.); or mobile home, delivered	
Bldg. material for other bldgs.	
Well and pump	
Septic system	
Tools and implements	
Livestock	
Seeds, plants, trees	
Sewing equipment, loom (optional)	
Kitchen and canning equipment (including freezer)	

80-100,000 persons, minimum, preferably with a college or university, is important. The region should also provide good hunting and fishing opportunities, for enjoyment and for food supplementation for those so inclined.

Livelihood: Basic sustenance, for most families, would be obtained from intensive, small-scale agriculture and some livestock. Cash income could come from several sources: a) Regular or part-time employment in the nearby town or city. b) Individual enterprises, such as pottery, weaving, painting and sculpture, cabinet-making, specialty horticulture, bee-keeping, professional consulting, etc. c) Group business, such as a small toy or furniture factory, electronics parts assembly, public recreation facilities, etc.

There may be many other ways of securing cash income, limited only by the interests and ingenuity of the residents.

Organization: The community could be built on land provided by "The Foundation". After the community is settled and the school is established, the members of the community could decide if the land should remain in "trust" or if the community should own the land as a cooperative (non-profit corporation). In either case, all decisions affecting the land and the community as a whole should be arrived at democratically.

The accompanying diagrams show

of life, making it work.

The first part of the job is the crucial one. Obviously, there must be enough people who understand the new chance this proposal offers, and who want to try to make "a way out." The idea will need a lot of exposure, discussion and planning before the group would be ready to move on to the second part.

The second step is a) finding the land on which the community will be built, and b) finding the sources for financing the land and the housing.

Each year in the United States, many thousands of acres of farmland are on the market for sale. Certain states seem to have a greater supply and at lower prices; Michigan, Wisconsin, Arkansas, Missouri, New York, Vermont, Pennsylvania and Oregon are such states. The catalogs of two national firms, United and Strout, specializing in rural property, are very helpful here.

Once the general location for the community is decided upon, local farm realtors can be contacted. The county agricultural agents can provide information about local soil, water, and weather conditions, which will aid in making the final selection. Sources of money for financing would be looked for at this same time.

There is a rapidly growing interest in the area of new towns and cities for America. New rural communities should also be a part of this interest and any new programs that evolve. Thus financing may not be as difficult

you live within your means.

6) Work for yourself - at home - or at nearby jobs.

7) A chance to give your family new meaning by working together for common goals.

8) A chance to use spare time for self-improvement and finding new ways to make a better life.

9) Another advantage would be the chance for the community to provide its children with a new kind of education, where the values of home and school can reinforce one another; where individual self-realization and self-sufficiency are possible and yet where cooperation is natural; where

# REVOLUTION IN ENVIRONMENTAL EDUCATION

by bernard weiner



## Turning On Teachers, Students To Nature

[Editors' Note: Many politicians and educators talk a good anti-pollution, pro-environment campaign while others are actually going out and doing something concrete. The following article reveals one man who is attempting to start an environmental revolution in the nation's public school system -- and it's working. Its present base of operations is the Northwest Washington area, based in Bellingham.]

Two simple equations. Equation No. 1: teachers held form attitudes in children; teachers (like most other professionals) are basically ignorant of ecological concepts; therefore, students emerge into adulthood making decisions with horrendous consequences for the fate of the Earth.

Equation No. 2: furnish present and future teachers with an ecological orientation; have them pass on these insights to the students in their charge; result, a generation which will make more intelligent decisions with regard to the environment.

Sounds like a great short- and long-range scheme -- especially if you believe, as many do, that "long-range" in this case means that we may have only one generation left to prevent the total destruction of our planet's life-support system. But is anybody trying to implement this vision?

Thankfully, the answer is "Yes."

William Stocklin is an energetic middle-aged crew-cutted guy who feels the ecology issue to his bones and, wanting to ensure that his five kids have a decent life to lead, doesn't really feel like pulling punches when talking about the Northwest Environmental Education Center, which he heads.

The eventual goals of the program? "Nothing less than a wholesale change of attitude that will influence behavior. To stimulate a sensitivity and appreciation for ecology. To teach people that the water that comes out of their taps is a highly - complex life - and - death matter: they have to know about the back-up, the water-shed, the water cycles, and understand the consequences of a deliberate or accidental foul-up."

What about the "political necessity" of compromising to attain these goals through the current education system? "We're not interested in playing those old games. Hell, I don't think we can afford to compromise. The stakes are too important. If opposition is there, we'll just have to go around them -- or through them. We just can't wait anymore for everyone to come along."

For an Establishment type, Stocklin has equally blunt things to say about current educational practices: "Education now is bits and pieces, specialization, a failure to integrate knowledge. Kids go through the academic ritual: a bit of science, then a bit of history, then math. Nothing is ever tied together."

"The present education approach to the environment is to take a kid and put him inside a classroom for 12 to 15 years, with a textbook! And then we expect him to understand his relationship to the environment and the relationship of everything else. Jes..!

"We need a complete overhaul of the present academic program. We've got the best 'textbook' and 'visual-aid materials' right outside that school window! We need floating classes. We need pools of teachers. We've got to move students and teachers around."

"Here's a kid in Anacortes who, with the proper teacher, just may learn a bit of marine biology, but who will learn nothing about the logging areas around Sedro Woolley only a few miles away and vice versa. Switch 'em, bus 'em for field trips."

"Or teachers who've been in the same school district for 10 or 15 years. How can we expect them to know anything outside of their little spec? Switch 'em, move 'em. Schools and school districts are merely administrative units, not sacred institutions."

The Northwest Environmental Education Center -- which Stocklin now directs after several years in a smaller, similar program in the Peninsula School District -- has a two-phased approach:

Phase One, already in operation, takes place on a 600-acre waterfront tract on Whidbey Island called the Northwest Outdoor Education Laboratory, where public school teachers can bring their students for ecological field - tripping. Already more than 8,000 students have participated from 21 school districts in the Northwest Washington area.

Phase Two, now in the works, involves the re-training of public school teachers to give them an ecological orientation to life. Teachers get 5th-year credit for taking the courses (mostly at Western Washington State College), so -- whether done with the bait of a credit-carrot or not -- the teachers absorb the attitudes and, presumably, pass them on to their students. Already, more than 500 teachers have signed up for the courses, not all of them science teachers.

The broader part of Phase Two involves the construction of an environmental educational curriculum for the public school system.

In this, as in so many other environmental issues, Washington once

again leads most states. The NEEC is the only program like it in the state, and probably one of the few in the nation. At present, it covers the five counties in Northwest Washington plus the northern part of King County. Twenty-one of the 37 school districts participate in and support the program, but (for unknown reasons) not its home-base of Bellingham.

Stocklin sees the program here as a "potential model" for the rest of Washington and eventually perhaps for the entire U.S. "We have the ecological diversity in Washington -- mountains, rivers, deserts, rain forests, oceans. We can provide environmental educational guidelines for other parts of the country and save them years of time and labor."

A recently proposed Congressional bill, the Environmental Quality Education Act, calls for a coordinated, nationwide effort to bring this kind of ecological curriculum into the public school system. It also calls for the development of model programs which could be duplicated in other states. The Northwest pilot project in Washington could very well be the model of which Stocklin speaks.

Even so, several members of the State Legislature hold reservations about the approach of this and other environmental education programs. At a recent Olympia hearing at which Stocklin was grilled, Burlington Representative Duane Berenson and others complained that all this education stuff might eventuate in the state's having to spend money.

To which Stocklin replied to this reporter, almost in disbelief: "My God, they're worrying about spending some money now, and we're talking about saving the future! Their lack of foresight is amazing. Furthermore, it won't necessarily have to cost very much. We simply have to re-evaluate our educational priorities, and throw out the deadwood programs that have been there since the beginning of time and which have simply grown in a type of empire-expansion."

Also, he notes, spending some monies now on protecting the environment might save the state untold billions later since some of the pollution and natural destruction which the state must now help clean up will be obviated.

Teacher education -- both pre-service and in-service -- will take place at eight ecologically varied locations in the state: the Whidbey Island Outdoor Lab, Rockport State Park - Sauk Mountain, Deering Wildflower Acres, Shannon Point Marine Science Center, Cypress Island, Foulweather Bluff on Hood Canal, Skagit Valley, and the Silverton - Waldheim Outdoor Lab.

The NEEC -- currently working with a grant from the coffers of State Superintendent Louis Bruno (who apparently digs the idea) -- is really just beginning its program this year, hoping to expand in 1971 after attaining the capital funding necessary to implement

the curriculum its various planning committees are coming up with.

The first statewide symposium to establish guidelines for an environmental education curriculum will be held at WWSC in early May, with noted environmentalist Ian McHarg in attendance.

(Interesting sidelight: Many months ago Stocklin proposed a nationwide conference to help plan an environmental curriculum for the public schools. Forty-three of the fifty state superintendents of public instruction expressed support and said they would come. HEW and HUD in Washington, D.C. said it was an interesting idea but they couldn't help out. Just the other day, HEW and HUD announced that they will be sponsoring a nationwide summer conference on the subject! Looks like the old Bureaucratic Steal the Other Guy's Thunder trick.)

The institutions sponsoring and participating in the NEEC program are -- in addition to WWSC and its newest cluster college, Huxley -- four community colleges (Everett, Skagit Valley, Edmonds, and Shoreline), and the 21 public school districts in the Northwest Washington area.

One man, one idea, one right time in history -- It's Happening!

Northwest Passage, April 20, 1970



WILLIAM STOCKLIN

We've got the best  
textbook and visual-aid  
materials right outside  
the school window.

David Clarke, Chairman of the Department of Political Science at Western Washington State College, is a long-time student of futuristic prospects. With this article discussing the possibilities for an experimental community in the Northwest, Dr. Clarke is making his first appearance in Northwest Passage.

**T**he Environmental Handbook is a powerful collection of essays. It leaves one excited, angry, and frightened, and desperately motivated to do one's part to save our world while there is yet time. But, scanning through my notes, I discovered that the ideas I had found most important were also ideas which led me to discard all my initial impulses for activity. Garrett Hardin, for instance, points out that the environmental problems facing us have no technical solution, while Keith Lampe warns that our system, once shocked into a full realization of the threat, will automatically respond by mounting massive technical programs at all levels.

Symbolically speaking, survival lies not in mounting massive programs to replace existing automobiles with smog-free ones; it lies in renouncing the automobile altogether. The list of things we must stop doing is a long one: stop driving cars, stop flying in jets, stop speculating in land, stop having third and fourth babies, stop striving to raise our levels of production and consumption, stop fighting wars. This list of new no-no's is endless, and the temptation to wag the moralizing finger is almost irresistible. But massive moral exhortation, Hardin goes on to remind us, makes people feel guilty, and guilty people behave irrationally in order to avoid anxiety. The problem facing us will not be solved by stimulating people to behave irrationally . . .

Yet the no-no theme keeps recurring. Kenneth Boulding tells us we must shift from our present "cowboy economy" (reckless, exploitative, romantic and violent) to a new "spaceman economy" in which production and consumption are stabilized at a minimal level. And Garrett de Bell asserts that "growth for the sake of growth is the ideology of the cancer cell." Yet our culture is almost incurably growth-oriented. How do people behave, when all they want to do, all they know how to do, and all they feel they ought to do, becomes wrong and forbidden overnight?

While a very few will undergo a conversion experience and change dramatically, and some will carry on as before but in a guilty and inhibited manner, the vast majority will deny the problem and ignore the new imperatives. But as the troubles get worse and lean on us more insistently, a situation of cultural stress will develop. More and more people will register in their bones the incompatibility between the things which our traditional values impel us to do and the things we must do if we are to survive. They will, as it were, cliff-hang into a new culture. They will be dead-ripe for dramatic personality change. But the distance between dead-ripeness for change and the successful completion of the needed change is a very long one, and there is no general agreement as to the direction in which we must move.

Lynn White indicates the real size of the problem when he points out that the cultural roots of the environmental problem lie in the Judeo-Christian tradition and go back over 2000 years. "What we do about ecology," he says, "depends on our ideas of the man-nature relationship. More science and more technology are not going to get us out of the present ecologic crisis until we find a new religion, or rethink our old one."

The discovery of the direction in which we must move is the same thing as finding a new religion or rethinking the old one. It is to define, for our culture, styles of life and ultimate goals which maximize the health and beauty of the environment, and also articulate

and satisfy the religious needs of individuals. Renunciation of our present exploitative, consumption-oriented emotional habits only becomes possible when the energy involved is invested in new goals.

Many ideas for such new goals are in the wings, but the work of translating them into usable cultural patterns still remains to be done. In my opinion it could best be done in experimental communities specifically charged with the invention of such patterns and the testing of them out in practice. This could well be the goal of a satellite college attached to W.W.S.C.

#### NEW COMMUNITIES

Such a college would be located in a remote valley some twenty miles distant from Bellingham, on a large site of 100 - 200 acres. It would be charged to develop and groom its environment and construct buildings and utilities of an adequate but simple sort. It would farm its land, although without attempting to be self-sufficient in food. This college would further be charged to develop a meaningful community life on an income per head of only 25% of the average for Whatcom County. The educational task would be deliberately slowed. Students would graduate in eight years instead of four, faculty would be on half time (and half pay). The community would not be too large, two or three hundred at the most, of whom two thirds would be students and one third faculty, staff and their families.

Core academic studies would include phenomenology of religion, philosophy of history, ethics, psychology, drama, art and music. Practical studies would include home economics, forestry, farming,

carpentry or whatever combination is needed to generate the skills to run the community. The community would deliberately try to evolve into a model capable of being copied, and would cater to a large and continuous stream of interested visitors. Its conscious purpose would be to offer to the culturally cliff-hanging individual both a direction in which to change and the techniques by means of which to accomplish the change. The typical task of graduates would be to start other such communities up and down the country.

It is impossible to say in advance what things would constitute the highest rewards in such a community. They would have to be discovered in experience. Before life in a close and relatively permanent community of this sort could begin to be successful and rewarding, it would be necessary to develop techniques through which each individual could reach a level of emotional maturity much higher than that which is usual today.

This task alone is surprisingly hard. For six years I was tutor at a college in Switzerland similar to, but smaller than, what I am suggesting here. The courses lasted nine months and enrollment was limited to some twenty-five students from all over the world who lived, together with the small staff, in a converted hotel building in a small village 4000 feet up in the mountains. This group of some 30 people formed an intense community. We were together 24 hours a day for nine months, as towns were too remote to escape to.

Each year I noticed that we passed through four main periods. First came a honeymoon period. The students arrived full of hope and sense of adventure, and were at once inspired by the beauty of the late Alpine summer. They were typically between twenty and thirty years old, and

mostly still single. Boys and girls would quickly pair off, and all was idyllic. The second, or anxiety - paranoia phase, would set in in a week or two as the novelty began to wear off, the weather broke, and the work began to get serious. People got depressed and irritable, and began to find the close community rather a strain. The psychological tricks and games which had worked so well in the wide society of the big city, where we were able to keep the different and conflicting aspects of our lives effectively isolated from each other, broke down in this primary group. After a week or two of tensions and quarrels and scowling faces, the third, or therapeutic phase would begin. Students complained in their tutorial hours that they felt anxious, threatened, hunted; that there was no privacy, that their religious faith had been subverted, that they felt depressed or scared, and wanted to leave.

Every year a few quite serious cases of mental disorder would emerge at this phase, and getting through it was a worrying business. For two out of the six years we had a competent therapist in residence whose presence enabled the students to go very deeply into questions of emotional growth. Spontaneous groups would quietly work all through the night and emotional crises were frequent. This therapeutic process would spread through the community, and as more and more people deepened their understanding of psychodynamics and saw more clearly how they would change and the directions in which they wanted to go, the therapeutic phase would slowly give way to the fourth, or tranquillity phase. All the skeletons in the cupboards had been cleaned out, people knew each other, helped each other, and felt secure. Also the end of the course was drawing near, when the strain of continuing psychological growth and adjustment would be removed. Each year we were curious to know how long the therapeutic phase would last in a permanent community.

The end of the course was always a great bereavement to all of us. People whom we had grown to know well and love all disappeared in the course of a single morning, never to return. It taught me that communities have to be permanent. The human values we were seeking to discover and actualize take years to cultivate, and cannot be cultivated at all if we keep moving around and breaking up all the little daily ties of our friendships. Also, beyond a certain point, maturation is a group process as much as an individual one, and needs the shared memories and shared experiences which slowly build up a group culture.

Another discovery we made is that once the therapeutic work is well under way, the group needs to grow in a religious dimension, and indeed, does so spontaneously. Most people today are spiritually empty and are driven to seek the illusion of being filled by continually increasing their level of material consumption, or by travelling around the world gluttoning new experiences. All these compulsions must go. One of the new religious dimensions most earnestly to be sought is the mystical awareness of self and others and the supporting environment as one thing. A defect of the Swiss experience was that we did not groom our environment. We had no land, and in any case a single year is insufficient time to grow to love a supporting environment. The college I propose here would be better in this respect.

This, then, is my response to the challenge of the Environmental Handbook: to propose a new and different kind of cluster college, which shall be a kind of nursery garden for new cultural patterns. In a decade or so we shall be needing such patterns in a desperate hurry. Now is the time to start evolving them.

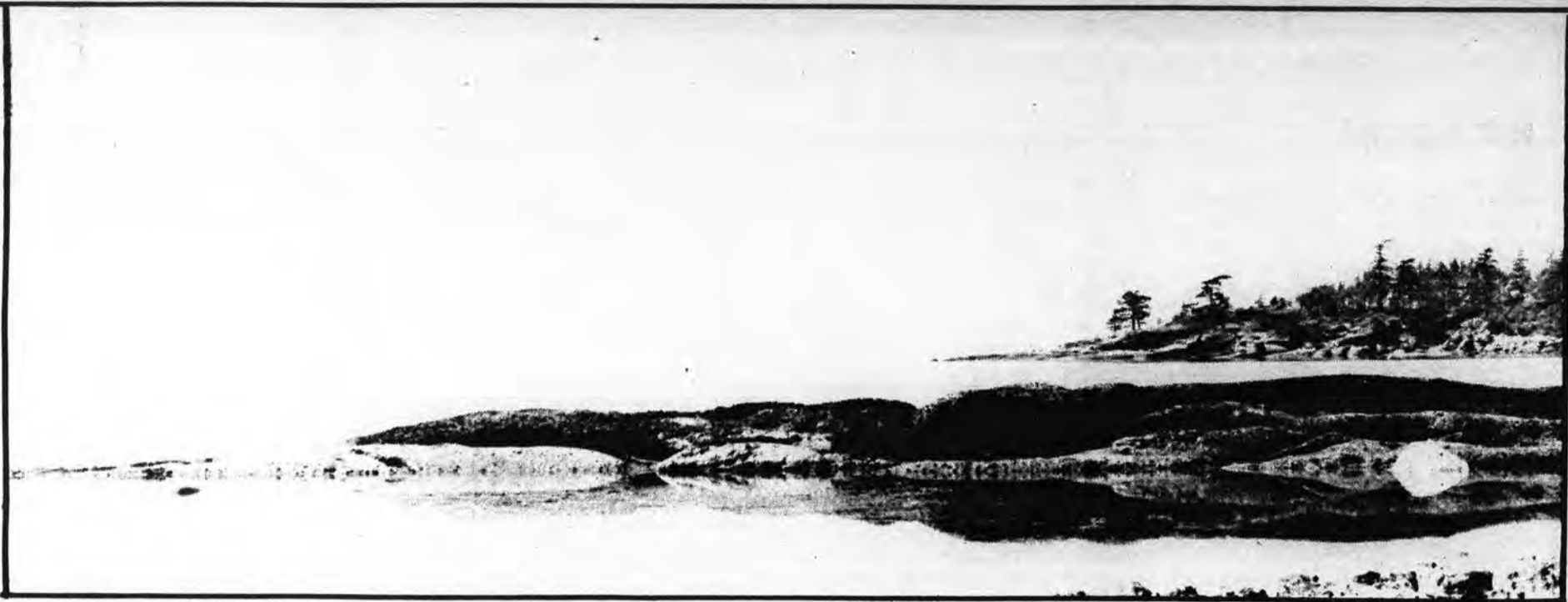
Northwest Passage, April 20, 1970



## A Modest Proposal

by david clarke

## An Experimental Community In The Northwest



## greenhouse continued

if your talents run to diddling around with an electric grape there is a place for you in our world of science.

Ninety percent of all I have seen in "scholarly"

really Electric Grapes...despite the fact that purple prose is definitely absent. Besides reading Electric Grapes, I saw them, I was lectured to by them, and I spoke to some of them on occasion. Now that I think of it, most professors seemed to turn purple and hum dangerously in my vicinity a lot of the time. They did not, and probably do not, enjoy being confronted with the questions of an overly enthusiastic as well as overwhelmingly socially unskilled student. I now realize that my error lay in the fact that when it came to Biology I acted more like a holy roller than a potential candidate seeking to become a certified and legitimate participant in respectable High Church circles. I now realize that I should have more earnestly learned my catechism--the phyla, the Krebs Cycle, the diagramming of Rhodophyte and Clinorchis life cycles and so on. I didn't worship the same idols as the others; I never kissed a Bishop's ring, all the while murmuring the proper niceties about the current Cardinal Bellarmine.

But there was one thing I did know...that after I was able to expound the catechism of my discipline, showing that my reflexes were conditioned well enough to earn me proper certification, that I could then pick up a fairly secure, mediocre paying job, somewhere, sometime. And I also knew that someone would be interested in me only if I were of use to the building of his version of an Electric Grape.

It was then that I switched to Sociology.

Now we all know that Sociology has its fair share of fools and knaves. However there seems to be much hope for them. I liked them primarily because they did not have too much of a tendency to treat words solely as objects. Then too the sharper of them at least had the grace to be uncomfortable using the discipline's pretentious jargon, and pseudo-scientific methodology. These actions and attitudes were not overtly evident in the exact and biological sciences since they dealt with a form of language whereby words were objects. For instance if the biologist brought the subject of the Zygomatic Arch up in casual conversation, there was little chance for idle speculation as to what was exactly on his mind. One could not approach a discussion of the Normative view of society in quite this

manner, since one began to experience linguistic and semantic difficulties very quickly.

However the conflict of language and attitude was even more subtle, and even more flagrantly obvious. One concrete example I can use concerns a biology professor I once had. He insisted that on his exams there was one and only one answer to the question "What is Life?" It was expected that one wrote quickly, neatly, and accurately that life was "That which contains DNA and replicates."

Such a question, answered with such finality, betrays a rather dry, rigid Einstellungen or mental set. I came to feel that this answer actually exhausted that category called life for this particular professor. To him all life was simply an assortment of quivering gobs of DNA; and all tampering with it, so long as it was done in the name of Science, could only be good.

He, and most of his kind, were not so generous to Rachel Carson and her "Silent Spring." To these people such a thing as DDT and other pesticide abuse wouldn't exist, since it was a proven product of - and used in the name of--enlightened science. And science in those days was a word which brought up a different image than it now does. This was the science which we knew less of, since no great scientist since Huxley had attempted to communicate with the layman, until Rachel Carson came along. She shook a lot of trees, and dumped a lot of people out onto the ground to interact with the environment--and lo, it was found to be as she wrote of it.

To me life is more than replicating DNA. It is a complex interaction, and

like the fluid language of sociological definition it changes to accommodate new and unique circumstances. It is purposeful and dynamic, yet doesn't exist to function in the same manner as that detached, lonely thing we call a Zygomatic Arch. It certainly doesn't have the perfection and finality of a biological or chemical examination. And, I'm also afraid, it really can end like the birds in "Silent Spring".

As a humanist, in the classic sense of the term, I am convinced that man is not irredeemably imprisoned in his genetic DNA, a la Desmond Morris and Robert Ardrey. I feel that man is a cultural as well as a biological being, and, furthermore, that his self-imposed though sometimes unintentional cultural pressures often turn him into either a beautiful or bestial thing, rather than his innate "biological programming". In other words I have more hope for us than does Ardrey who feels that annihilation, like salvation, is in its own way pre-ordained. To him I would point out that it is our evolving culture, not our genes which are destroying us through destruction of our environment.

So, as I see it, our problems center on our culture and environment. How can we change one and preserve the other? By emulating the Weathermen? No! But we might begin by contemplating the greenhouse.

We have previously seen that the greenhouse "effect" can kill us. Let us see why that "object" called the greenhouse can be useful to the biological organism and its eventual and ultimate environment.

A greenhouse is a place of nurture. One sets out a seed, and since there is

more warmth there than in a harsh, exposed, often critically cold environment, the seed can germinate with a lower probability of lethality. When the sprouted seed is strong enough it will flower and fruit--sometimes more quickly and spectacularly than a seed left out in the open. This will illustrate the importance of phenotypic as well as genotypic growth of any seed worthy of germination.

Early flowering might bring out bees, which will fly and multiply, causing other and later seeds to eventually become fertilized, and flourish to assure the continuance of the following generations.

To such a seed, which we might call "Green Power" a greenhouse could be likened to a womb. And, a person working with a greenhouse might well be likened to the midwife, once spoken of by a much abused writer of the Nineteenth century...but then it might become a potpourri of many inartistically mixed metaphors. Instead, we shall go on and state some of the goals of this column.

We shall review books, discuss politics, and sometimes transcribe interviews. Policy will be set so far as feedback and self-indulgence of particular and fanatic whim will dictate. Protest meetings called by citizens trying to save their environments--plural and serial singular--shall be covered and rendered into cliché-ridden opinion. In short this column will be a greenhouse where we shall nurture and tend thoughts, hopes, and fears that most people above ground give rhetorical and nominal attention to concerning our environment and its very real dangers. We shall be concerned with things that are purple, that hum, and go bump in the night. Sometimes we will be pessimistic, sometimes optimistic, but always we will try and keep a balanced perspective, and yet avoid being on the fence. We will try and see our environment in regional terms, calling on the Canadian conservationists for information, advice, and their latest list of No-No's. You will know as soon as possible what the rest of the underground are up to, so far as conservation and expressing love for our environment, and ultimately ourselves, is progressing.

Well, there it is. Let's get on with it. But let us also remember that though we're not going to get out of this world alive, it's up to us to see that those following us can get INTO it and stay long enough to enjoy it as much as we do.



## atomic continued

fission products over so much territory that authorities had to seize all milk and growing foodstuffs in a 400-square-mile area around the plant. A British report on the incident stated that all of the reactor's containment features had failed. And, closer to home, a meltdown of fuel in the Fermi reactor in Lagoona Beach, Michigan, in October, 1966, came within an ace of turning into a nuclear "runaway." An explosive release of radioactive materials was averted, but the failures of Fermi's safeguards made the event in the words of Sheldon Novick in *Scientist and Citizen*, "a bit worse than the 'maximum credible accident.'" <sup>7a</sup>

In all there have been some 270 accidents involving nuclear reactors since 1945. In 1957 the AEC issued a study known as the Brookhaven Report that attempted to assess the probabilities of a "maximum credible accident" and the potential consequences. Some of its findings were stupefying: From the explosion of a 100-200 megawatt reactor, (somewhat smaller than the 1000 megawatt proposed for Samish Island) as many as 3,400 people could be killed, 43,000 injured, and as much as 7 billion dollars of property damage done. People could be killed at distances up to 15 miles and injured up to 45. Land contamination could extend over far greater distances: agricultural quarantines might prevail over an area of 150,000 square miles, more than the combined areas of Oregon and Washington. <sup>7b</sup>

Of prime concern here are not only component and instrumentation failures but also human causes. The ease with which havoc can be raised by simple acts of sabotage cannot be overlooked. Only a conventional explosion, which ruptures the reactor mechanism and its containment structure, would be needed to create a Brookhaven type "maximum credible accident." With the abundance of revolutionaries and

psychopaths, it seems that extensive safety measures should be taken, but many manufacturers and utility operators have resisted the idea of producing "redundant safeguards" on the grounds of excessive cost.

Reactors and storage tanks are also vulnerable to natural catastrophes such as earthquakes. Near Bodega Head in California, a local group effected cancellation of Pacific Gas and Electric plans to situate a reactor squarely over the San Andreas Fault, an area of known seismic activity. Dr. David Pevear, professor of geology at Western Washington State College, says that the West Coast of the U.S. will experience a major earthquake sometime in the near geologic future. Just when and where is an uncertainty, but there is no doubt in his mind that one will definitely occur. The siting of atomic power plants in areas of high earthquake potential should be viewed with undivided concern.

"Despite the AEC's own assertion that as much as \$7 billion in property damage could result from an atomic power plant catastrophe, the insurance industry...will put up no more than \$74 million, or about one per cent, to indemnify equipment manufacturers and utility operators against damage suits from the public. The federal government will add up to \$486 million more, but this still leaves more than \$6 billion in property damages to be picked up by victims of a Brookhaven-sized accident. And no insurance company - not even Lloyds of London - will issue property insurance to individuals against radiation damage." <sup>7c</sup>

Reactor safeguards and stricter regulations are due to fall short of reducing the danger from atomic power plants. The utility operators and the government oppose such measures, in their attempt to make nuclear generation of electricity competitive, because of their prohibitively high costs. Technical difficulties with respect to the adequate containment of radioactivity also add to the problems. And, as with other forms of pollution, perfect policing of the



atomic power industry is unachievable. Glen F. Hallman, Control Officer of the Northwest Air Pollution Authority, can attest to this fact.

There is no doubt that new power sources are needed. Our conventional fuel reserves are dwindling, but so are our sources of low-cost uranium. There is a good chance that new sources of conventional fuel will be found to carry us well into the next century, but means for developing new reactor fuels have become technological disappointments. Low-cost uranium fuel reserves may run out before the turn of the century, and problems with the sodium-potassium cooled fast breeders may not be solved for 10 or 20 years, too late to recover the lost fuel.

**The only answer is to develop alternative technology. Atomic energy**

is proving to be a technological blunder. New forms of power generation can be explored. Solar energy, tidal power, heat from the earth's core, fuel cells or magneto-hydrionic devices or even thermonuclear fusion could provide alternatives if we spent money in these areas.

We are finally learning, particularly with respect to the automobile, that we have accepted highly inadequate technologies. We need to progress and build machines that don't destroy us or our ecology. We need to look beyond the almighty dollar and realize that we can't accept anything short of the best technology possible.

1. Independent Citizens Research Foundation for Study of Degenerative Diseases, Inc., *The Independent, Danger From Atomic Power Plants*, March 1969, p. 6.

2. Battelle Memorial Institute, Hanford Atomic Products Operations Calendar Year 1967, Radiological Health Data and Reports, September 1969, p. 410.

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4. D.A. Wolfe and T.R. Rice; *Considerations on Safe Levels of Radioactivity in Aquatic Environments*, to be published in *Scientia*.

5. (a) W.S. Davis, "Conditions for Coexistence of Aquatic Communities with the Expanding Nuclear Power Industry," *Nuclear Safety*, Vol 10, No. 4, July-Aug. 1969, p. 296.

5. (b) W.S. Davis, *Ibid*, pp. 296-4-5.

6. Elsie Jerard, *We the People and Nuclear Power*, Jan. 1969, p. 3.

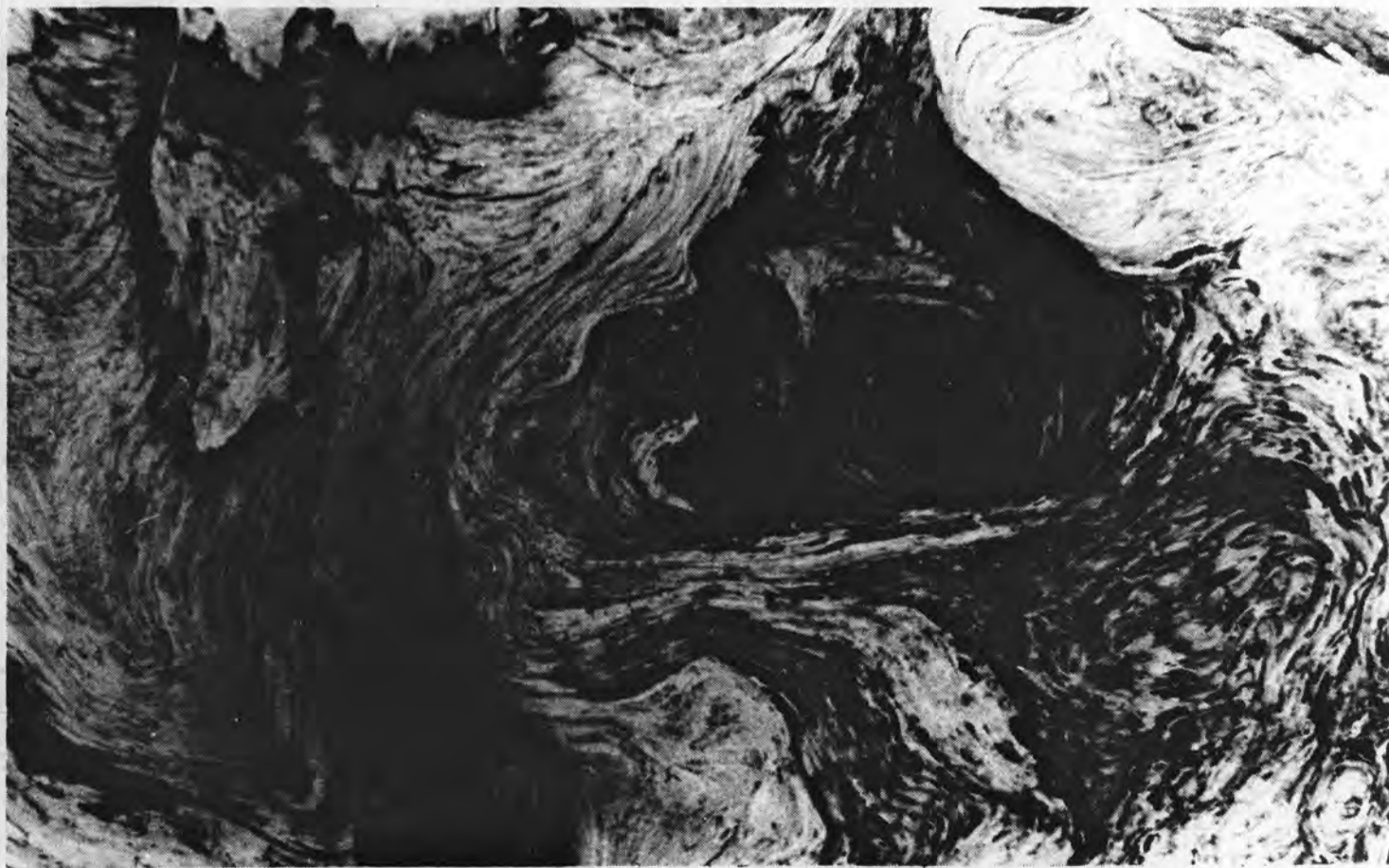
6. (a) Elsie Jerard, *Ibid*, p. 4.

7. (a) R. Curtis and E. Hogan, *The Myth of the Peaceful Atom*, *Natural History Magazine*, Volume LXXVIII, No. 3, March 1969, pp. 2-3.

7. (b) R. Curtis and E. Hogan, *Ibid*, p. 2.

7. (c) R. Curtis and E. Hogan, *Ibid*, p. 7.

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