

# Biologist talks of ecology problems

## Dr. Anderson uses algae as indicators of pollution

"This earth is the only earth we've got, and the time has come to make decisions about what the earth means to us," stated Dr. Daryl Jacqueline Anderson, a biologist currently doing post-doctoral environmental research with Dr. Barry Commoner at Washington University.

During an interview she made it clear that although she is interested in all pollution, her main concern centers around algae as an indicator of pollution in flow water. This stems directly from her de-

gree work which emphasized algae that grow in springs.

Dr. Anderson noted that a large part of the oxygen we breathe is evolved from the algae phytoplankton which grows on the top layer of the ocean. These algae are being destroyed by the oil slicks.

She also spoke of the algae that are being contaminated by enzymes found in new detergents on the market. According to Dr. Anderson the enzymes which are living systems in the detergents are used to break down other living systems. The

enzymes are flowing from the wash water into streams where they continue to break down algae. Her example was an enzyme used to break down fatty acids which are the main part of grease stains. These enzymes eventually drain into large bodies of water where algae containing fatty acids exist. Once in the water these enzymes act on the algae creating a break down in a natural chain cycle.

Dr. Anderson's interest also

See Algae, page 3.



Biologist Dr. Daryl J. Anderson

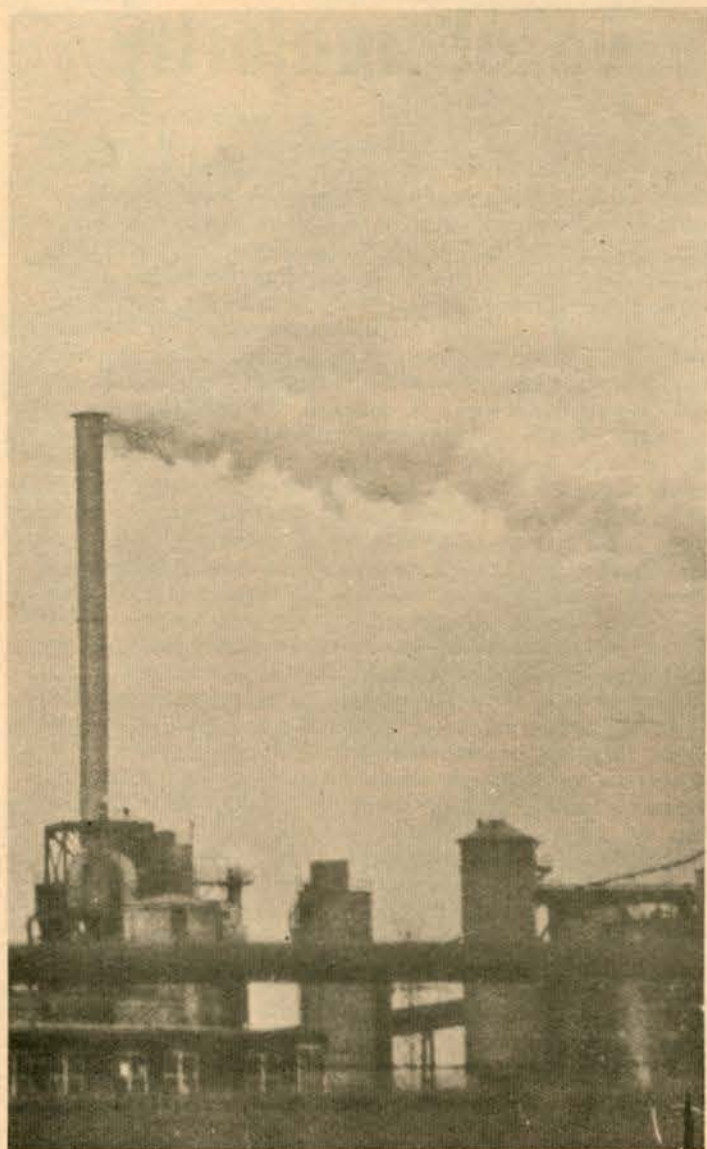
## 8 THE IBIS

THE LINDENWOOD COLLEGE

MARCH 23, 1970

## SPECIAL ECOLOGY EDITION

### Pollution continues in the St. Louis area



Factories in the McKinley Bridge area of St. Louis continue to pour smoke into the air despite repeated warnings by ecologists. This is a typical scene around every city in the United States.

### 'St. Charles leads the way to controlling water contamination' states city's Civil Engineer

An interview with Mr. Edward Maran, former City Engineer and presently Consultant Engineer to the city of St. Charles, revealed that "St. Charles is leading the way to water pollution control."

Maran noted that the state government suggested that by 1975 St. Charles should be equipped with a secondary sewage treatment plant. By 1972 St. Charles will have completed the building of a tertiary plant, a more efficient system than the former. St. Charles will be the first community on the Missouri River to have such a facility.

It was not until after the end of World War II that the government became really concerned with pollution. At that time several towns began working on the reduction of pollution in their area. St. Charles was not one of these towns, Maran stated, but this was because the Missouri River was relatively clean at the time.

In 1956-57 a plan was drawn up for the first sanitary disposal of sewage. In 1960 the plan was found economically feasible and the city built its first lagoon. The sewage in this system is dumped into a large land trough and allowed to decompose biologically. The lagoon is still in use but the bacteria are not decomposing the waste as rapidly because of the addition of oil and enzyme detergents to the sewage.

In 1965 a primary treatment plant, designed by Maran, was put into use. All sewers that emptied into the Missouri River from St. Charles were hooked up to an interceptor line which was connected to the primary

treatment plant.

In explaining the way a primary treatment plant works, Maran said that virtually 100% of the settleable solids and 50% of the unsetttable solids are removed by means of sedimentation.

The sediment is dewatered and placed in huge incinerators with multiple hearths. The up-

per layers of the hearths are primarily for drying the sediment (sludge), and the lower layers, operating at a minimum of 1350° F. reduce the sludge to an ash that is less than 3% organic.

Since the burning is done at such high temperatures there is

See panic, page 6.

### No immediate action foreseen on student level

"We are told that before long air pollution will screen out the sun and make big cities uninhabitable; that the fragile biosphere we all live in is becoming poisonous and may cease to support life..." (Life Magazine, March 6, 1970, pg. 36).

Students on the Lindenwood campus were interviewed recently on how they viewed and how much they knew about the pollution situation that is now being brought to national attention. They agree that pollution in the air, on land, and in the water is becoming worse and that some day people will feel the full brunt of a high pollution rate.

The students tend to feel that the problem is basically industrial and that they can not be of any help in the situation. They realize that cars and cigarette smoke add a great

deal to the pollution of cities, yet they do not intend to stop driving cars or stop smoking to help things along. Many have stated that they would pay the expense of having an air pollution device attached to their cars. One LC sophomore stated, "Air pollution devices should be put on all cars and there should be much tighter car inspection in all states." The same student also said that it was "unrealistic" for her to do anything directly about pollution.

The students seem to feel that it is up to a mysterious "they" to end the ecology problem. One freshman was asked what she was going to do about the problem and she replied, "Wait until they come up with something." Another student said something to the effect that she would not give up the pleasurable things she does

See Mysterious 'they', page 3.

# Does man advocate 'genocide through pollution'?

It almost goes without saying that industry is contributing to the growing pollution crisis, but anyone who ends the argument there is only fooling himself and possibly destroying himself through ignorance.

People seem to be unaware that they are the major pollutants on this earth and the problem can only begin to be resolved when each individual realizes that he is responsible for the roots of pollution. It is man who creates the demand for petroleum products which make it necessary for oil wells to be drilled in the ocean resulting in the oil slicks now killing off all life associated with the sea. Man is blaming the crisis on an industry that exists only because he has made it a necessity to have so much gasoline.

According to recent figures, during an individual's life time he pollutes three million gallons of water, and industry and agriculture pollute about ten times this amount in his behalf. He also uses 21,000 gallons of leaded gasoline containing boron, drinks 28,000 gallons of milk and eats 10,000 pounds of meat.

Considering how the population is hitting a potentially disastrous high, these figures reach a frightening level. Dr. George Borgstrom, a man greatly interested in educating people to the crisis at hand, points out that even if the available food in the world were evenly distributed to its 3.5 billion inhabitants, there would exist a state of international hunger. Yet no one seems to realize that the over-

population can only be blamed on individuals who refuse to see the problem. If the population of the world does not starve itself to death it will destroy itself by pollution.

One of the basic solutions to ending pollution would be to control current population growth and eliminate unnecessary propagation. This decreasing of population can only be set on an individual basis, however, and the religious attitude on abortion and birth control it appears as though genocide through pollution of the earth's elements is being advocated.

Bringing this situation close to home it becomes evident that students on the Lindenwood campus are not ready to accept the problem as one they have created and only they, as individuals, can halt. The students interviewed for this issue spoke of the problem as if industry were totally responsible. They seem to ignore the fact that they are using enzyme-active detergents, non-disposable bottles, plastic and aluminum containers, and gasoline which are all part of the massive junk yards cluttering the countryside and the polluted air filling our lungs.

It is high time that each person look at himself as a lethal threat to nature and future generations. We hope that on April 22nd this campus, as well as all other campuses, will show that we are not going to allow our lives to be ended and we will not continue this ignorant and apathetic stance on the fate of our earth.

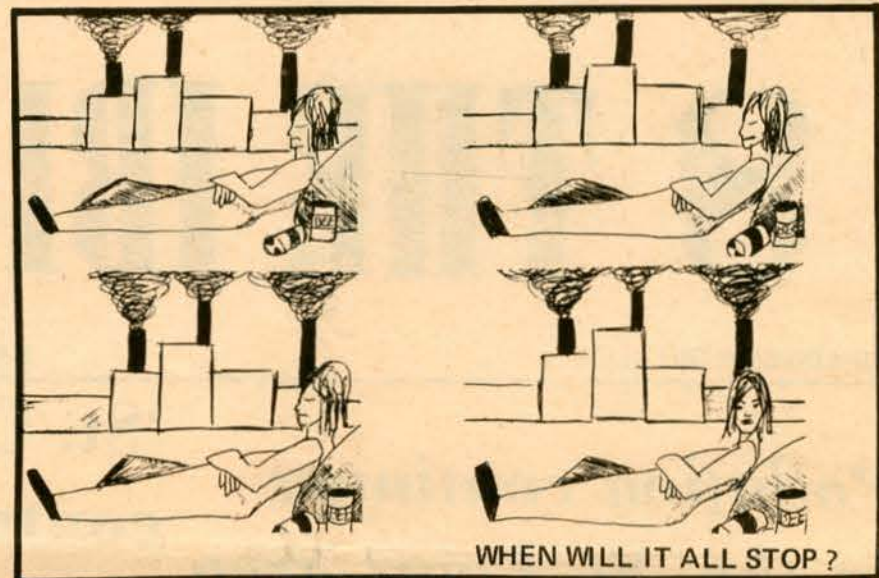
## 'Shall we surrender to our surroundings...'

When considering viable solutions for the growing pollution of our environment, some attention should be paid to the government and its role. Individual responses to the problem of pollution are necessarily important in our governmental system which, finally, has the ability to construct, on both state and local levels, a sound, nationwide program. This fact has been recognized by President Nixon, who, in his State of the Union Address in January stated, "The great question of the 70's is; shall we surrender to our surroundings or shall we make peace with nature and begin to make reparations for the damage we have done to our air, to our land, and to our water?" This acknowledgement is a first step toward a solution, but it must be followed up with concrete action.

There are a variety of areas in which governmental action is necessary. There is a need for federal standards for industry to prevent the damage to air and water supplies now being caused by industrial wastes; for the automobile industry to correct the problem of carbon monoxide wastes; for the use of harmful chemicals on crops and in water supplies to be ended; for more efficient disposal of the 165 million tons of solid waste deposited by Americans each year. These standards can be enforced by joint action of the federal and state governments. In the area of over-population, a major cause of pollution, the federal government could offer tax compensations to families or individuals who have no more than a given number of children and set up a national program for distribution of birth-control information and services. It is also possible for Washington to work with cities in finding more effective urban-renewal projects and look into the possibilities of building totally new cities for relocation of the overflowing urban population.

In the period since President Nixon's speech, there has been very little time for governmental action although two significant programs have been introduced: Mr. Nixon proposed a program that would establish waste-treatment plants in cities throughout the United States at a cost of \$10 million. But this program has come under attack by ecologists who claim that the chemicals to be used will be as harmful to the water as is the present waste problem. The other proposal was made by Secretary of the Interior, Walter Hickel, who advocates establishing a task-force similar to Vista and the Peace Corps, which will work toward educating the public about the growing problem of pollution. This is now awaiting congressional approval.

The major concern now should be the forcing of the problem of pollution and its control as a major governmental priority so that it will continue to work for solutions. Time is a primary factor in pollution control; ecologists are predicting the end of our environment as it is now if serious measures are not begun immediately. This is an issue we can no longer ignore, expecting it to work itself out, and it is important that we, the public, begin to put immediate pressure on our government, as well as ourselves, to correct it.



## Silent minority-vocal majority

In the area of ecological pollution, it is becoming increasingly apparent that the silent majority is now becoming more and more vocal. All across the nation, from dinner tables to college dorms to club speaker rostrums, the cry is raised "What are we going to do about our environment?"

Today, man is beginning to realize that no one is unaffected by ecological problems, and this realization is extremely beneficial. We desperately need to try, each in our own individual way, not to pollute the water, air and land. The farmer needs to know that he is upsetting the balance of nature through his use of anhydrous ammonia to increase the amount of nitrogen in the soil. He needs to know that when the rains wash part of that ammonia away it is polluting the streams and rivers. Is this upset of nature's balance and the resulting pollution enough of a threat to cause the complete banning of this ammonia? Is there some way of using it without causing such great distress to the ecology? There are scientists studying these questions, they have been studying them for years - let them continue - grant them more money for research, but do not use your money for a campaign to "Ban Anhydrous Ammonia" until you are absolutely certain that there is no way to employ it safely.

The key here is to employ existing factors of the pollution problem, such as anhydrous ammonia, with redeeming features made in these factors. Now that the masses are becoming concerned we must be careful. Before we are swayed to a course of action we must check the record of those coaching us. An incompetent leader, one who would eliminate all germs from the American water supply, could bring as much harm to us as the original polluters. The first Americans, the Indians, were unable to resist the European diseases because they had never had any exposure to germs and even the slightest disease among the foreigners could become a fatal epidemic among the Indians. In this same vein, any new innovations designed to eliminate the present pollution problem could cause a backlash much the same as happened to the Indians.

Be concerned with your environment - but don't merely be concerned on a vocal or semi-conscious level. If you feel that it is necessary to have better pollution controls on automobiles find someone who is working toward that goal, check to be certain they are seriously involved with their work and support them. Perhaps you would rather get the proper background training and invent your own pollution control device guaranteed not to cut down on mileage. This is fine, but please don't merely use "You know, they really should invent a better pollution device for cars..." as a means to start a conversation at a party.

## 8 THE IBIS

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# Letter to the Editor

## Crisis due in part to detergents

Dear Editor:

Should you be running special editorials in observance of Earth Day, we do hope you will include a reminder that the phosphates in laundry products are one of the chief contributors to water pollution. That means that every person, from the student who washes out a batch of underwear to Mother who does a full-scale wash, is morally responsible for the future of our waters. And until proper sewage facilities are set up and detergent makers have revised their formulas to exclude phosphates, everyone must simply go back to the soap and water way of washing.

Aileen Gutheridge  
Theodore R. Sills, Inc.

Editor's Note: The following editorial accompanied this letter from Miss Gutheridge. We feel it is information that must be passed along.

Our world dies a little every



### Algae

'..there are no fences in the environment'

Cont. from page one.

includes the algae in the soil which is an intricate part in the nitrogen cycle. These algae are being contaminated by wastes and are not producing the correct amount of proteins.

Fearing that not enough people realize the seriousness involved in the upsetting of a natural cycle, Dr. Anderson expressed special interest in seeing that the populace is properly informed. She feels that most people if they learn the facts would become active in trying to solve the environmental problems. Dr. Anderson emphasized that "the problem is going to get worse if nothing is done about it now."

Dr. Anderson's reply to the question "Will technology help stop pollution or must there be a total reversion back to a natural state free from industry?" was that technology can help, but it is not yet apparent that it will help.

Monsanto, Dr. Anderson pointed out, was polluting the air with sulphur dioxide. Through research the company was able to find a way to convert this dangerous gas into

time you wash out a batch of underwear in the bathroom sink with one of the high phosphate detergents. These phosphates are the chief cause of our present water pollution problem, according to a recently completed five-year study of pollution in Lakes Erie and Ontario by the International Joint Commission, the U.S.-Canadian water regulating agency. The phosphates speed up the growth of algae. The algae in turn rob the water of oxygen which fish and plants need to stay alive.

Only national awareness and immediate action by every concerned citizen can stem the tide of pollution until such time as detergent formulas are changed and improved sewage systems constructed.

Individual efforts must be directed to switching back to the old methods of laundering . . . using soap flakes or powders in combination with water-softening washing soda. According to laundry product test-

ing by United States environmental engineers, soap products and washing soda each contain less than one percent phosphates, and when the two are used together they produce a good wash.

The major hang-up is locating the soap and soda. Although both are staples on supermarket laundry supply shelves, they're so vastly out-numbered by the high-phosphate products that it takes some searching and reading of package ingredients to find them. To further add to the confusion, those who have grown up in the detergent generation do not realize that a detergent is not a soap. So check labels and buy only products that won't pollute our waters.

### Mysterious 'they' Students see action as 'unrealistic'

Cont. from page one.

now, even if it would mean the saving of her future children and their children, and possibly her own future.

An LC senior said that the ecology problem could only be solved through long and strenuous research. Others feel that research should be used to find a way to make all those enjoyable polluting pleasures less harmful, rather than doing away with them altogether. Students are of the impression that pollution is caused by and will be ended by someone else.

Another student on the campus stated that she could see how an apathy towards the pollution problem could develop. "It hasn't hit home yet so why should they do anything about it." Two attitudes towards ecology were discovered on the LC campus. The first is that whereas everyone knows of the danger, it has not effected anyone directly and therefore it is not worthy of immediate action or attention. What will happen in the future is really of no concern now. The second point of view is; how can one person do anything to greatly alter the situation?

sulphuric acid, a sellable product.

"We fail to see that the government and industry are made up of people. They must be informed so they will not pollute any longer and can help to clean up the mess they already have," stated Dr. Anderson.

She made it clear that "there are no fences in the environment, so every community has a pollution problem even if it is not situated in or near a large city."

Dr. Anderson received her Bachelor of Science degree from Western Michigan University in Kalamazoo, Michigan. Her major was Biology and secondary education. After graduating she attended an N.S.F. Institute at the University of Texas where she received her Biology Teacher's Certificate. She then came to Washington University in Clayton, Missouri where she worked on her Ph D in Botany.

She also teaches a class on environmental problems at Webster College. Next fall Dr. Anderson will be joining the Lindenwood Biology Department.

## April 22 is to be the date for LC Ecology teach-in

Lindenwood College plans to participate in the nationwide environmental teach-ins to take place April 22nd. Dr. Patrick F. Delaney, Chairman of the Biology Department, has organized a series of group discussions for that day. Current problems concerning pollution will be discussed by the groups.

Beginning at 9 a.m. on the 22nd interested faculty members, students, and administrators are encouraged to bring and

present their ideas on the growing environmental contamination. Dr. Delaney is also inviting citizens of St. Charles to come to the discussions.

After a lunch break there will be an afternoon session with Dr. Daryl Jacqueline Anderson as the guest speaker. Small groups will form after her lecture and the discussions will continue. These plans are tentative and anyone who is interested is urged to contact Dr. Delaney.

## Biologist Delaney hopes to point out man's growing crisis

Dr. Patrick F. Delaney, Chairman of the Biology Department at Lindenwood, has a two-fold understanding of the problem of pollution, viewing it as both a citizen and a biologist. Dr. Delaney's more scientific outlook has led him to organize the Environmental Teach-In scheduled for April 22, during which he hopes to make those present at the meeting more aware of the growing problem of pollution.

When asked how he thought the LC campus could help in ending pollution, he responded by saying that a demonstration would not relieve the situation, but that it is necessary for each student to realize what he can do. Dr. Delaney made no recommendations for the alleviation of pollution, but said that only the citizen could have any bearing on the problem. Because the means to the ending of pollution will be costly, the citizen's role will be in the

realm of tax payment.

One instance brought up by Dr. Delaney was the youth's disapproval to pollution. Concerning the oil slicks off the coast of Santa Barbara, he said that the youths probably would not have complained if the oil had not gotten on their surfboards. Yet this slick is one of the biggest and most publicized factors of the pollution problem. The question that should be asked is why was the oil out there anyway. Dr. Delaney said that the concern of the youth was irrelevant in that they would continue to contribute to the problem by driving cars and littering the countryside with beer cans.

According to Dr. Delaney, courses would make people more aware of the dangers of pollution. Further, he stated that inconvenience will have to be tolerated because certain privileged must be given up to put an end to the growing hazards of pollution.



Dr. Patrick Delaney, Chairman of the Biology Department at Lindenwood, who has organized the Environmental Teach-In scheduled for April 22.

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## St. Louis - St. Charles pollution

### visible to everyone

All photographs in this supplement were taken by Louise Lysne in and around the St. Louis area.

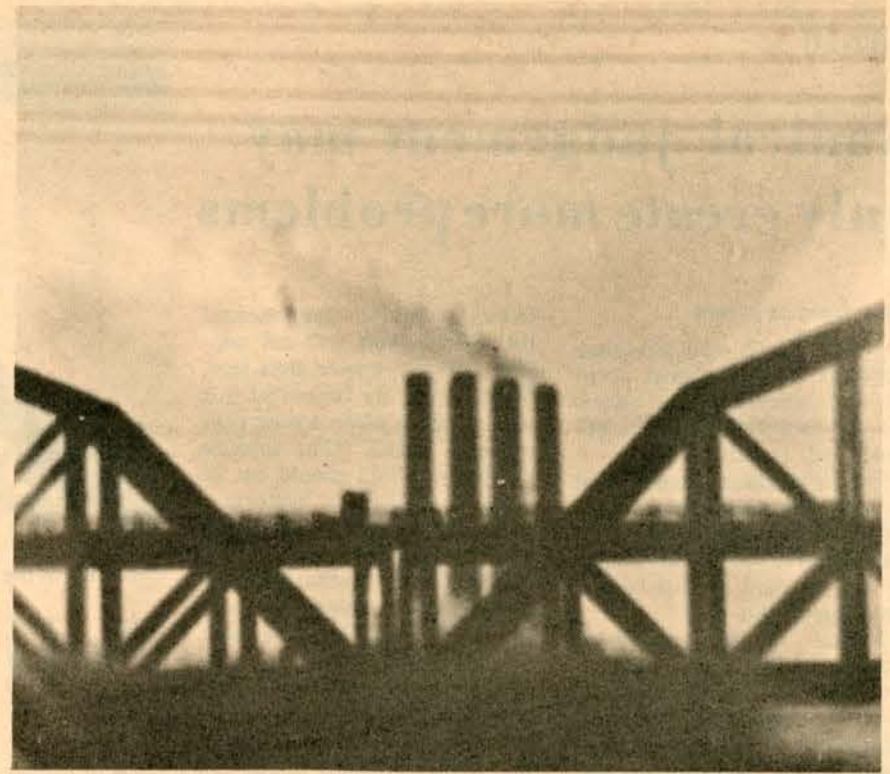


EACH YEAR AMERICANS DISCARD 7 MILLION AUTOMOBILES, 20 MILLION TONS OF PAPER, 48 BILLION CANS, 26 BILLION BOTTLES AND JARS.

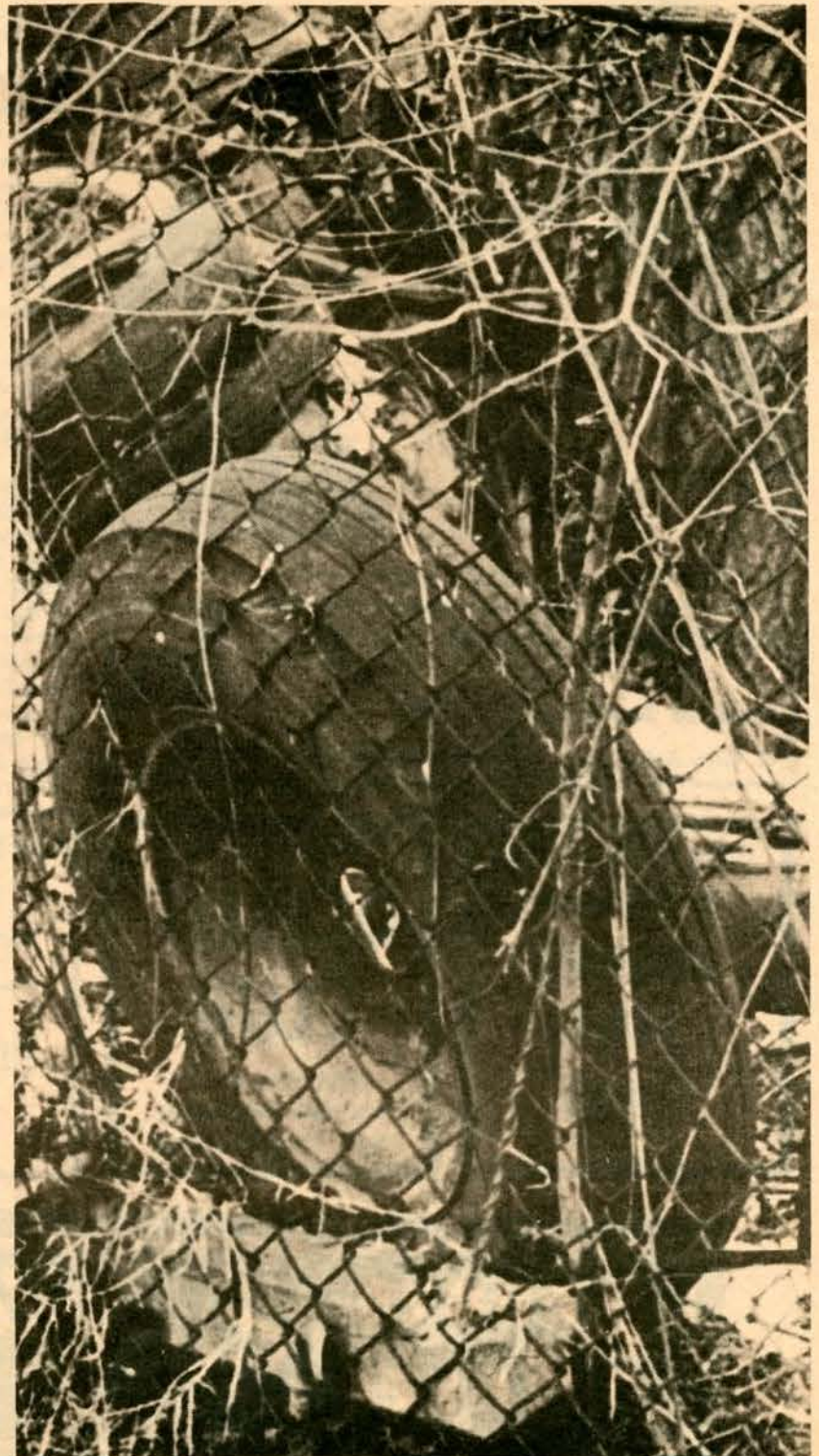


# Cleaner Air From a Cleaner Engine

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"WE ARE VICTIMS OF OUR OWN TECHNOLOGICAL GENIUS" - PRESIDENT NIXON.



**Panic**

**Radical judgement may only create more problems**

Cont. from page one.

no odor. All fly ash and other particles in the exhaust given off are washed away before the air is released to the atmosphere, Maran assured.

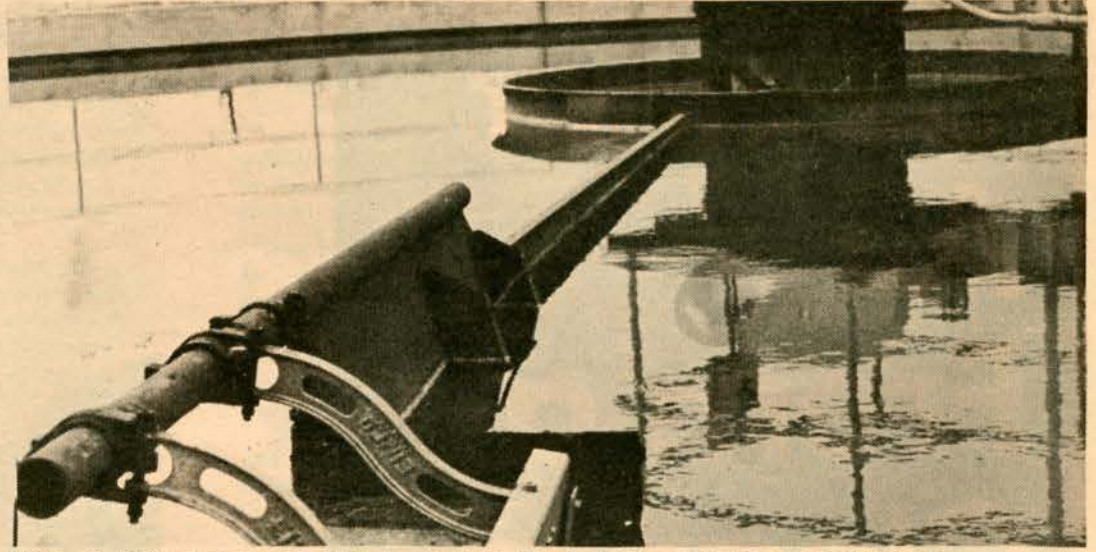
The incinerator was designed to meet the strictest air pollution control requirements, St. Charles was the first community in Missouri to have an incinerator of this type.

Maran is extremely distressed by the newcomers to the field of preserving the balance of nature. For years, he pointed out, civil engineers have been quietly working to halt pollution. Today there are suddenly thousands of people calling themselves ecologists.

These people are informing citizens that they may have only

twenty years to live because the environment will not support life any longer than that, Maran said. He fears that this will create a panic among people and stated, "The solution to this problem should not be done in a state of hysteria - it should be done judiciously and by those who know".

Maran sees another disaster if a panic is created and people act irrationally. The point of cleanliness could be overstressed and a germ-free state would exist. This would lower the resistance to germs and the country could easily be infected. Maran feels that radical judgment will only create another problem. He thinks that the pollution problem should be handled quietly and by experts.



Close-up of the sludge pool which is part of St. Charles' water pollution control system.

**Pollution in the U.S. greater than in foreign countries**

During interviews this past week, many of the foreign students here on campus stated that pollution is less a problem in their own countries than in the United States.

Concerning pollution in the

**London's '56 Air Act now shows results**

London passed a Clean Air Act in 1956 and, according to *U.S. News & World Report* (Dec. 15, 1969) figures, by the end of 1970 76% of London's area will be smokeless.

The Clean Air Act of 1956 was passed because of a disastrous smog that blanketed London in December, 1952. This smog resulted in the deaths of an estimated 4,000 Londoners due to bronchial and cardiac problems.

The act itself established smoke-control zones and restricted the sale and burning of smoke-producing coals. The elimination of this coal-produced smoke resulted in the disappearance of 90% of London's air pollution.

London weather conditions have changed because of the crackdown on pollution. The infamous London fog has significantly been reduced and London claims that in the past seven years there have been no major smog coverings. Londoners can now boast a 4 mile visibility range in comparison to the 1.4 mile visibility range of 1958.

St. Louis area, Claudia Dammert stated that while she was staying here last summer there were days when she couldn't go outside because the air was so polluted her eyes burned and turned red. In relation to her home, Peru, Claudia declared, "I can breathe in my own country". There is some air pollution in Lima, according to her, but the problem isn't nearly as great as it is here.

Karen Stub and Anne Schambye from Denmark related the problem being faced there is not as intense as it is in this country. And difficulty with air pollution is to be handled by the factors causing it. Oil from ships in the area around Denmark is becoming a problem which will soon have to be dealt with, the girls stated.

Farida Anwary said that pollution was not a problem in her country, Afghanistan. She had

no other comment about pollution here except that it needs to be dealt with promptly.

Hong Kong seems to be the notable exception to the general feeling of the foreign students. When asked about pollution there, Edith Wong replied that the problem is acute. Most of the trouble there stems from the industries and ships in and around the port. Edith's explanation was that the area is too small for the large population and extensive industries located there.

Finally, the students urged that the problem of pollution be acted upon in all haste because it will not get any better if ignored. Karen Stub said it was up to the people to take action. Because most people don't recognize the seriousness and extent of ecological pollution, each person must make others aware.



Mr. Edward Maran, St. Charles Consultant Engineer.

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