CONTROL OF THE GREENHOUSE EFFECT

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[Assignment: Isolate an issue of critical urgency facing the American people. In a well-researched essay, construct an argument about the problem where you probe the causes as well as consider solutions.]

(1) Atmospheric scientists have long known that there are broad historical cycles of global warming and cooling; most experts believe that the earth's surface gradually began warming after the last ice age peaked 18,000 years ago. But only recently has it dawned on scientists that these climatic cycles can be affected by man. Says Stephen Schneider of the National Center of Atmospheric Research in Boulder, "Humans are altering the earth's surface and changing the atmosphere at such a rate that we have become a competitor with natural forces that maintain our climate. What is new is the potential irreversibility of the changes that are now taking place" (Lemonick and Bjerklie 59).

(2) So great is the potential damage of the greenhouse effect that the Prime Minister of Norway, Gro Harlem Brundtland, concludes of our climate conditions: "It is the second-greatest threat to world security, behind only nuclear war" (Smith, Bluestone and Yanchinski 16). What can be done to reverse this global warming trend? Control of pollutants, deforestation, and other detrimental causes along with counter-measures against what we have already done may prove that we humans have the ability to exercise positive control over our climate. What is involved in keeping our atmosphere umblemished by human mistakes?

(3) Pollution, the greatest and most obvious of contributors to the greenhouse effect, has a wide range of effects on the environment. Fossil fuels, an integral part of industry and living today, are one major culprit. It is estimated that the world belches more than 5.5 billion tons of carbon into the earth's atmosphere annually from its cars, factories and other oil, coal, and natural gas consuming devices (Smith 74). The carbon dioxide emitted into the atmosphere (measured by the weight of carbon) causes the sun's rays to be retained between it and the earth, thus creating warmer temperatures like a greenhouse. What makes matters worse is that use of fossil fuels for energy is actually increasing. By the year 2000, the world's demand for oil is anticipated to go up 8% while coal consumption will escalate nearly 40% (Smith 74).

(4) What does this mean to the United States? Hypotheses vary, but Lemonick and Bjerklie comment on what the effects could be:

> Although the region-by-region effects of rapid atmospheric warming are far from clear, scientists

> are confident of the overall trend. In the next half-century, they fear dramatically altered weather patterns, major shifts of deserts and fertile regions, intensification of tropical storms and a rise in sea level caused mainly by the expansion of sea water as it warms up. (60)

(5) Even though the damages are global and everyone will have to make the effort to reverse the various damages, it will most likely be up to the United States to take the task to hand. We are responsible for roughly one-quarter of the carbon dioxide inundation, the highest of any one country (Raloff 411). Conservation will be necessary. In the 70's the United States showed everyone that because of rising oil prices, we could conserve by making the effort to save energy where possible. The economy grew without consuming more energy. However, the strategies of today, unlike the 70's, are not focused on energy conservation. According to the ACEEE (The American Council for Energy Efficient Economy), a 2% worldwide increase in efficiency annually is all we need to keep emissions of carbon nearly level, without an economic sacrifice. The ACEEE also estimates that for every two cents put into efficiency technologies, a kilowatt-hour of electricity is saved (Smith 74).

(6) A good example of where technological efficiency could be improved is the gas mileage of cars that we drive today. We know they would get better mileage if they weren't as big and had smaller, more efficient engines. Other items such as refrigerators and light bulbs can be replaced with more efficient mechanisms, i.e., an 18-watt fluorescent bulb for a 75-watt incandescent one (Smith 74). The problem with this is getting the public to save energy when it is cheap and so easily available. It's one thing to actually see the problem when it affects us, such as gas prices, but quite another to be told to do all these energy efficient things because temperatures have risen one degree in Fahrenheit in the past 100 years. We are reluctant to depart from our set, wasteful ways.

(7) Industry acts in much the same way: if the materials are available, why not use them? Coal and oil burning factories are quite prevalent today. A mere switch to natural gas from coal or oil results in less money spent and less carbon dioxide emission when used (Smith 75). While this will lower pollution, it still will not eliminate all pollution problems. "Scrubbing," or removing carbon dioxide from smokestacks, is another option, but at the very lowest the price of electricity would double and this would also entail dumping liquid carbon dioxide 200 miles out to sea (Raloff 414). Without much encouragement such a cooperative effort to control pollution will not work, so we must look to other energy sources.

(8) Alternate energy sources are another road we can travel and we have already done so to some extent. Wind, solar and hydroelectric power all provide viable alternatives on a small scale, but on a large scale need to be less expensive. Yet this cost should matter little when we are faced with the fact that billions of dollars are needed to clean up the situation we have already created.

(9) Nuclear power is another optional energy source. Lester B. Lave, Professor of Economics at Carnegie-Mellon University, says there is no alternative but nuclear energy if we are to cut back on fossil fuels (qtd. in Smith 75). Yet to do so, especially with Three Mile island and Chernobyl still fresh in our memories, safety standards and design will have to be much improved, not to mention creating a feasible depository for radioactive waste, before any major action is taken. What can be done, then? Having realized that money must be spent on conservation of our environment, people have finally begun to act of their own accord.

(10) Last October, a small fossil-fuel burning power plant set a precedent by undertaking a program to plant enough trees in Guatemala to offset the amount of carbon dioxide it will spew into the air. The trees take in the carbon dioxide, emit oxygen, and store the carbon in their tissues (Raloff 411). The example this little factory sets is valuable to everyone who cares about what happens to our earth. This program makes us mindful of another cause of atmospheric heating, deforestation.

(11) Deforestation of huge wooded tracts, in Brazil and Indonesia for instance, is responsible for adding annually 0.4-1.6 billion tons of carbon dioxide to the atmosphere (Smith 75). The problem here lies in the fact that these countries usually need to use these resources to survive. Between starving and leaving trees alone, the trees will lose every time. The situation must be taken care of by those with money such as the company planting trees in Guatemala.

(12) Planting enough trees to offset the carbon dioxide deluge is an idea that has come under serious consideration only recently. The solution is controversial because of the sheer volume of trees it would take to absorb the emitted carbon. Gregg Marland of Oak Ridge National Laboratory says that an area roughly the size of Australia would have to be planted. This is about 7 million square kilometers (Booth 19). On the other hand, Norman Myers of the World Wildlife Fund believes that to stablilize the global warming we would merely need enough trees to soak up 3 billion tons of carbon, or a forest the size of Zaire (Booth 20).

(13) But even reforestation is not a simple solution because another problem sets in. As the trees get old

and die they will give off carbon in the process of decay, making them only a temporary solution. Myers suggests sticking decaying trees underground or underwater (Booth 20), but this doesn't get rid of the problem and just makes a time-bomb ready to go off at an unexpected time. Nonetheless, planting trees has other effects that are beneficial and could buy us time until we can discover better ways of dealing with what we have done to our environment.

(14) Other factors involved with the greenhouse effect include ozone depletion, methane production, and chlorofluorocarbon (CFC) production. Ozone depletion, due to natural and man-made causes still not fully understood, amplifies the greenhouse effect by letting in more harmful ultraviolet rays of the sun. The extra rays heat the atmosphere up even more. Our problem with ozone depletion is not whether we can control it, but how and to what degree we should combat it, for the atmosphere has a very delicate balance and our lack of complete knowledge could be our downfall.

(15) CFC's, normally thought of as contributors to ozone depletion, not only affect the atmosphere in this way, but also act much like carbon dioxide molecules in reflecting rays back into the atmosphere. Freon is an example of this. CFC's have been outlawed in the U.S., but abandoned refrigerators whose coolants have CFC contents are still contributing to the destruction, and legal use in other countries also perpetuates their destructive effect (Lemonick 67). Complete elimination of CFC's is the only answer to the problem.

(16) Methane acts in much the same ways as the CFC's, destroying ozone and reflecting rays. It is estimated that termites are the cause of up to 50% of the methane in the atmosphere. Methane may be created as quickly as 5 liters in an hour from one termite hill (Lemonick 67). Destruction of termite mounds is not necessary yet because methane is not as abundant as the other gasses that contribute to the greenhouse effect, nor is it as dangerous, but it is still one of the many variables that must be taken into account when considering the most effective way of controlling the greenhouse effect.

(17) In conclusion, I would say that our world needs to be looked at in a new way--as something we can destroy--and not as a playground that is unaffected by our actions. Michael MacCracken of the Lawrence Livermore National Laboratory puts it aptly:

> It's like a Rube Goldberg machine in the sense of the number of things that interact in order to tip the world into fire or ice. (qtd. in Lemonick 61)

Our only real answer is to strive for temperance and quick efficiency.

> Boosting energy efficiency and shifting the alternative energy sources will buy the greatest degree of climate insurance for the dollar. (qtd. in "Tree Planting")

Controlling the pollution created by fossil fuels, replanting trees while controlling deforestation, and recognizing the effects of other contributors to the greenhouse effect will help us achieve a world where we can have a positive influence on our environment. George Woodwell, director of the Woods Hole Research Center, believes that the greenhouse effect can be remedied with cooperation. And this is at least one bright hope in the clouds of our future (qtd. in Smith 74).

Works Cited

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