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Environmental Choices and Human Perspective

by

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Editor's Note: Peter Krek is a 4th. year history and philosophy student at the University of Guelph. He graduated from The 5000 Days *distance education course in the Spring semester of 1994. This is the first of two papers in this issue by students of* The 5000 Days *course at the Arboretum, University of Guelph. Peter Krek's paper won the Ken Hammond prize for the best essay submitted in 1994. The other, which follows, is a paper by a 1993 student of the course, Hendrick (Gus) van Haarten. It is our intention to publish more student papers in future issues.*

In the introduction to Stephen Hawking's A Brief History Of Time[1], by Carl Sagan, the following statement is made:

> *.....we go about our daily lives understanding almost nothing of the world. We give little thought to the machinery that generates the sunlight that makes life possible, to the gravity that glues us on an Earth that would otherwise send us spinning off into space, or to the atoms of which we are made and on who's stability we fundamentally depend.*

> ***Today I went out walking in the amber wind, there is a hole in the sky where the sun pours in, I remember the days when I was not afraid of the sunshine. From* The Grateful Dead's *Built to Last*, 1992**
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> ***Chemicals once thought to be benign are attacking the earth's ozone shield. Unless governments, industry, and the public act now, life on earth faces an unprecedented threat from the sun.* Consumer Reports, May 1989**

It is precisely this lack of understanding that has led us to the world we find ourselves in today. The world we live in is riddled with pollution which is not only changing the structure of the environment, but also directly affecting our lives. Industrial activity and consumer products have resulted in the discharging of chemicals which are responsible for eroding our atmosphere, and, more specifically, our ozone layer. As a result of this deterioration, the atmosphere does not have the ability to absorb the powerful and pernicious rays emitted by the sun; thus, the Earth has been subjected to them.

This essay is about life and our lives: how they were, how they are and how they may be in the future. It is a study intended to demonstrate how we humans arrived

[1] Hawking, Stephen. *A Brief History Of Time*. New York: Bantam Books, 1988

here today from where we were yesterday, and how we will get to tomorrow from where we are today. It is an essay about our past and our future, about our successes and our failures, about our rewards and our consequences, about our embraces and our fears, and finally, about our limitations as well as our potential. In order to accomplish all of this, I have broken down this essay into its respective categories in the form of questions.

What is ozone and what role does it play?

Ozone is a chemically active gas made up of two tightly bonded oxygen molecules which receive a third, loosely bonded, as a result of contact with an electric current[2]. In the stratosphere – 10 to 25 miles above the Earth – ozone is created slowly as a result of either high energy radiation entering the atmosphere or lightning, or both, which provide the electric spark allowing the third oxygen molecule to bond with the existing double-bonded oxygen molecule already in existence[3]. This layer encompasses the Earth and proves to shield it from 99% of the damaging ultraviolet rays emitted by the sun. Without this protection, life as we know it could not survive[4].

What have we done to the ozone layer?

By 1973, millions of tons of Chlorofluorocarbons (CFCs) were being produced globally[5]. Chemist Sherwood Rowland experimented to try to determine what impact the production and emission of CFCs in such enormous quantities was making on the environment and what were the implications for the future. The investigation proved to reveal a horrifying discovery, which was that the same quality which made CFCs so useful – and, consequently, so used – also made them enormously destructive. Their versatility was due in part to their stability, which unfortunately is what allowed them to remain intact long enough to reach the stratosphere. Once they reached the stratosphere – where the ozone layer exists and filters out ultraviolet light – the CFCs finally came into contact with ultraviolet radiation, which was intense enough to break the CFC's stability, and thus, return it to its original components: chlorine, fluorine and carbon[6]. The problem which resulted was that it only took one chlorine molecule to destroy 100,000 ozone molecules before the chlorine molecule became inert, and, since globally, 100 million tons of CFCs were being produced, the ozone quickly began to suffer depletion[7]. To intensify matters, every 1% decrease in ozone means a 2% increase in the amount of ultraviolet light entering the atmosphere[8]. This depletion was thought likely to increase as the global CFC production was doubling every five to seven years as a result of its utility[9].

The damage to the ozone is not exclusively a result of CFC emissions, for many other chemicals are also responsible. One of these is the coolant used in air conditioners, and as 90 million cars have air conditioning, the effects were enormous. Lost coolant from air conditioners is estimated to be responsible for 16% of the depletion of the ozone layer[10]. Furthermore, it is not just consumer products which cause ozone depletion; it is also national science and technology programs, an example being the United States space program. Every time the space shuttle is launched it destroys part of the ozone layer. Estimates say, so far, that space shuttle launches are responsible for 10% of total ozone destruction[11].

The depletion was so intense that by 1984, a hole in the ozone estimated to be one third the size of Canada[12] was discovered over Antarctica: up to 67% depletion of the layer had occurred. This was so severe that initially it was thought that the satellite computers which had recorded the depletion had suffered an

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2 5000 Days Manual pp. 12-16

3 Ibid

4 "Can We Repair The Sky?", *Consumer Reports*. May 1989

5 Ibid

6 Ibid

7 Ibid

8 Gore, Al. "The Unsheltered Sky", *Forum*. July/August 1992

9 "Can We Repair The Sky?", *Consumer Reports*. May 1989

10 Ibid

11 "NASA Space Shuttle Destroys The Ozone", *UTNE Reader*. July/August 1991

12 Vincent, Isabel. "Life At The Edge Dangerous Without Sun-screen", *The Globe and Mail*. Friday May 1, 1992

equipment malfunction as ozone levels so low were unthinkable and considered impossible. As a result of this misconception, the scientists were instructed to ignore the finding as it was thought to be false. Unfortunately, the computers were correct[13].

The damage was discovered not to be exclusively restricted to Antarctica. The United States National Aeronautics and Space Administration found that the ozone layer in some regions – including some parts of Canada – may now be depleted as much as 40%.[14]. In 1987, scientists measured this global ozone reduction to be between 6 and 12%. and scientific evidence indicates that ozone is being depleted 200% faster than originally thought[15].

Further research concluded that an estimated 4 to 8% ozone reduction had occurred over the Northern Hemisphere during the last decade alone. Michael Kurylo, manager of NASA's Upper Atmosphere Research announced that "everybody should be alarmed about this. It's far worse than we thought[16].

What are the effects and consequences of ozone depletion?

As a result of the depletion of the ozone layer, several conditions have resulted which will be discussed under their respective topic headings: **health, plants and animals, weather, life style and fear of the sun**

Health

The increased absorption of ultraviolet rays into the atmosphere as a result of ozone depletion has an enormously negative effect on human health. Ozone's simple structure O_3 enables it to absorb ultraviolet radiation – "a process which is crucial to human health"[17]. With the decrease of ozone, and the increase of ultraviolet light being absorbed by the atmosphere, experts predict that 300,000 additional cases of skin cancer, 1.6 million new cases of cataracts and damage to the immune system will result[18]. Scientists estimate that the increase in ultraviolet light is directly responsible for this increased number of skin cancer and eye problems in animals and humans. In the United States, scientists estimate that over 200,000 human deaths will occur before the year 2050 as a result of decreased ozone, while the United Nations Environmental Program predicts that there could be a 26% rise in non-malignant skin cancers if the ozone levels fall by only a further 10%.[19].

In Canada, 9.6 million Canadians (45%) aged 15 and over are regularly involved in sports, most of which are played outside[20]. As a result of increased levels of radiation and incorrect sun-block protection, many of them suffer from sunburns, wrinkles and cancer. While the sunburn will fade in a few days the damage to the skin's deoxyribonucleic acid (DNA) is permanent and keeps building, year after year. As a result, the more sun you get the higher your chance of developing skin cancer.[21]. **For a list of statistics on the medical effect of the sun on Canadians, please see Appendix One.**

Perhaps the most serious effect the sun has on human health is its impact on the immune system. Immunologist Michael Kripke[22] says that:

> *We already know that the ultraviolet light can impair immunity to infectious diseases in animals. We know that there are immunological effects in humans, though we don't know yet their significance.*

The seriousness of this effect of a weakened immune system can clearly be seen in its extreme case: AIDS. Although, the significance of the effects to the immune system are not known, they are most likely to be negative, and should draw the same calibre of attention to solving the depleting ozone layer as AIDS has

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13 "Can We Repair The Sky?", *Consumer Reports*. May 1989

14 Gore, Al. "The Unsheltered Sky", *Forum*. July/August 1992

15 Ibid

16 Lemonick, Michael. "The Ozone Vanishes", *Time*. 17 February, 1992.

17 "Play It Safe In The Sun", Published by The Canadian Dermatology Association

18 Gore, Al. "The Unsheltered Sky", *Forum*. July/August 1992

19 Vincent, Isabel. "Life At The Edge Dangerous Without Sun-screen", *The Globe and Mail*. Friday May 1, 1992

20 "Play It Safe In The Sun", Published by The Canadian Dermatology Association

21 Ibid

22 Lemonick, Michael. "The Ozone Vanishes", *Time*. 17 February, 1992.

received, in the fight to find its cure. Furthermore, the effect on the immune system of animals is also enormously concerning, as the weakening of their immune systems may affect their population, which, in turn, may affect humans, in terms of food supply

Interestingly, Bedrich Magas, a Chilean professor, compares the problem of a depleting ozone layer to the problem of AIDS in that both problems were handled similarly; that is, "at first everybody laughed and made jokes about ozone holes. Then they started to worry."[23] He believes that Chili is on the verge of an environmental disaster, recording that in 1991, on peak days, the levels of the ultraviolet rays jumped more than 1000%[24].

Plants and animals

The increase of ultraviolet rays into the atmosphere is also negatively affecting the entire food chain. Ultraviolet rays are affecting the oceans in that they are penetrating them much deeper than originally thought, consequently causing serious reductions in the productivity of much ocean life, such as krill and plankton: organisms that form the base of the food chain[25]. Ultraviolet rays also affect negatively the ability of plants to perform photosynthesis; that is, their ability to convert carbon dioxide to oxygen. This decrease in productivity and the increase in carbon dioxide lead to global warming, an entire problem of its own, which will not be discussed here. The mention of it is only to demonstrate the interconnection between our general lack of respect for the environment and the problems it presents us[26]. Richard Schultz, a Chilean business man, believes that excessive ultraviolet radiation is killing his plants and his business, and scientists agree with him and claim that ultraviolet radiation interferes with photosynthesis in plants. Schultz says that he can no longer grow all his plants outside and has to increasingly depend on indoor systems of growing. Schultz says that "if we do not do something about this soon, we will all be ruined."[27].

In particular, ultraviolet rays act negatively on peas, beans, squash, cabbage and soya beans in terms of reduced nutrient content and slower growth, as well as impairing photosynthesis[28]. This fact also demonstrates the connection between our treatment of the environment and the problems we face, for as it becomes more difficult to produce food, the problem of feeding the world becomes compounded.

Weather

Although I did not find much information concerning the depleting ozone layer's effect on the weather, I did find the following, which I felt was important to mention. Chemist Sherwood Rowland – the same man who did the research on CFC's effect on the environment in the early 1970's – says that "if you change the amount of ozone or even just change its distribution, you can change the temperature structure of the stratosphere. You are playing there with the whole scheme of how the weather is created."[29] Now considering that Rowland's research and warnings were not initially heeded – and we know how much trouble we ended up in as a result – it is important to realize that ozone depletion affects so many aspects of life and that it is in our best interest to attempt to remedy it.

Changes in life style

The depletion of the ozone layer, with its collective negative effects has led humans to alter their life styles. First, our life styles and activities have begun to be determined by an expanded weather forecast which now includes ozone reports. As of March 12, 1992, weekly ozone reports are incorporated in the regular weather forecasts. During the summer months, reports are given daily in order that people can decide whether or not to take precautions and protect themselves from the sun. The report will provide the ozone levels for the period – day or week – and then tell how they compare to the long term average between 1960 and 1980[30]. Also, our activities are beginning to be affected by conditions in which it is 'safe' to be outside.

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[23] Vincent, Isabel. "Life At The Edge Dangerous Without Sun-screen", *The Globe and Mail*. Friday May 1, 1992

[24] Ibid

[25] Gore, Al. "The Unsheltered Sky", *Forum*. July/August 1992

[26] Ibid

[27] Vincent, Isabel. "Life At The Edge Dangerous Without Sun-screen". *The Globe and Mail*. Friday May 1, 1992

[28] "Can We Repair The Sky?", *Consumer Reports*. May 1989

[29] Lemonick, Michael. "The Ozone Vanishes", *Time*. 17 February, 1992

[30] York, Geoffrey, "First Weekly Ozone Warning Issued", *The Globe and Mail*. March 12, 1992

The Canadian Dermatology Association provides[31] six steps that can be followed so that people can protect themselves during outdoor sports and recreation. They are the following:

- *avoid sun from 11 am to 4 pm so that you are only exposed to 1/2 the intensity of ultraviolet rays;*
- *wear protective clothing; pants and long sleeved shirts and.....a hat with a 7.5 cm brim;*
- *use SPF 15 or higher on all exposed body parts;*
- *don't be fooled by clouds -- 80% of the suns rays can penetrate through light clouds, haze and fog;*
- *avoid reflected light, snow, sand and cement;*
- *when observing sports events or lounging, do so in the shade. If unavailable, bring your own; that is, an umbrella.*

In addition to such *restrictions*, some school teachers in countries such as Chile hold students in class between 10 a.m. and 3 p.m. to avoid the period when the ultraviolet rays are most intense[32], while schools in countries such as New Zealand, urge their children to wear hats and eat their lunch in the shade[33].

Sun-phobia

The phenomenon which I will discuss next is the one which initially drew my attention to this subject. It is what Naomi Wolf refers to as *sun-phobia*[34]. The following sentences are all taken from the introductory paragraph of an article[35] out of *Time*. They are:

- *The world knows that danger is shining through the sky.*
- *No longer is the threat just to our future; the threat is here and now.*
- *This unprecedented assault on the planet's life-support system could have horrendous long term effects on human health, animal life, the plants that support the food chain and just about every other strand that makes up the delicate web of nature.*

The location and intensity of all three sentences reflect the **fear**, danger and threat that the sun now poses to our existence. This was not an isolated instance of a source which reflected **sun-phobia**.

United States Vice President Al Gore, asks the question: *what will it do to our children's outlook on life if we have to teach them to be afraid to look up?*'[36]

The Chilean professor, Magas, says "there is a general perception that the sun is not the same, and you really cannot be too careful"[37]. Finally, the Grateful Dead sing, *today I went out walking in the amber wind, there is a hole in the sky where the sun pours in, I remember the days when I was not afraid of the sunshine*[38].

The truth, and perhaps the tragedy of *sun-phobia*, as well as what Magas is saying, is that the sun has not changed. It is exactly the same sun it has been for over a million years. What has changed is the environment, and this change is completely a result of our lack of respect towards it. Although there are those who claim not to be concerned with the effects of the sun, they are most likely those who have not experienced, or are unaware of its pernicious potential. Essentially, the phenomenon of *sun-phobia* is self-generated, and that is the most tragic thing about it. What used to be a symbol of life, health and strength is quickly becoming a symbol of quite the opposite: death, sickness and weakness[39].

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31 "Play It Safe In The Sun", Published by The Canadian Dermatology Association

32 Vincent, Isabel. "Life At The Edge Dangerous Without Sun-screen", *The Globe and Mail*. Friday May 1, 1992

33 Lemonick, Michael. "The Ozone Vanishes", *Time*. 17 February, 1992.

34 Although Naomi Wolfe does not actually discuss sun-phobia in the same context as I do, the term was taken from her best-seller *The Beauty Myth*

35 Lemonick, Michael. "The Ozone Vanishes", *Time*. 17 February, 1992.

36 Ibid

37 Vincent, Isabel. "Life At The Edge Dangerous Without Sun-screen", The Globe and Mail. Friday May 1, 1992

38 The Grateful Dead. *Built To Last*. 1992

39 Death, in terms of the sun's potential, health in terms of cancer and other diseases, and weakness in terms of the restrictions on our activity.

What have we done about the destruction of the ozone layer?

In response to the ozone crisis, the international community arrived at three international agreements in order to reduce and eventually eliminate the production and use of CFCs in order to protect the ozone layer, which has been deteriorating since the early 1970s. The three conferences are: the Vienna convention in 1985 – which was considered weak at best, the Montreal Protocol in 1987 – which cut the production of CFCs by 50%, and the amendment to the Montreal Protocol in 1990 that not only phased out CFCs and other chemicals but also helped fund developing countries to do the same[40]. The results of these three conferences are considered the most successful environmental diplomacy to date; however, even with its enormously successful task completed, it seems that although it was the right measure to take, it may have been too late to really head off serious ozone depletion[41].

Not all legislation has aided the protection of the ozone. Canada's federal and provincial governments were accused of catering to industry – or allowing industry to dictate to government their schedule – when they allowed industry a longer grace period for the use of hydrochlorofluorocarbons (HCFCs) as well as extending the dead line for phasing out older ozone destroying substances such as CFCs and Halon. This extension means that non-recoverable uses of HCFCs will be permitted until 2010, while their import and production will be permitted until 2030. Government cites international scientific evaluation that HCFCs are about 95% less destructive long term to ozone[42].

There was even a time when, as a representative of Dupont states, *in the absence of regulations, there was nothing to drive the search for alternatives (for CFCs and other destructive chemicals) because there was no market demand for it*[43].

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[40] Parson, Edward A. "Stratosphere Ozone and CFCs", *Environment*. May 1992

[41] Ibid

[42] Wilson, Deborah. "Ottawa Attacked Over Ozone Policy", *The Globe and Mail*. Thursday March 26, 1992

[43] "Can We Repair The Sky?", *Consumer Reports*. May 1989

Sun-screen or smoke screen?

One thing that has emerged, become strong and flourished under the dangerous ultraviolet rays which now flood the Earth is the sun-screen industry. Sun-screen was first developed in the 1920s but did not become widely in use until the 1960s[44]. Originally, the product was developed to protect against ultraviolet B rays (UVB), then in the late 1980s, with the ultraviolet A rays (UVA) being identified as harmful, a broad spectrum sun-screen hit the market in 1989. The products advertise what is known as *sun protection factor* (SPF), which is how many times longer one can stay in the sun without burning[45]. For example, if one's skin burns naturally after 10 minutes, then an SPF factor of, lets say 8 – if used properly – will allow the person to stay out 80 minutes without burning.

This would seem to have been a godsend, except that sun-screen may not even protect people from melanoma skin cancer, and may actually be an indicator of a higher possibility that the user may develop melanoma[46]. This may be so for two reasons: the first, it allows the sunbather to stay out longer without burning, thus absorbing massive amounts of the carcinogenic UVA rays, and the second, people who use sun-screen may do so because they burn more easily

, thus, are more susceptible to cancer naturally. In fact, sun-screen usage may act as a marker for people genetically susceptible to cancer. Light hair, blue eyes and fair skin are an indication of high susceptibility of skin cancer[47]. This indicates the unfortunate position that we hold which is one that searches and is satisfied with *band-aid* solutions rather than fixing the problem; the more damaging elements there are out there, the more protection we develop instead of fixing the problem. An attitude like that can only lead to a world saturated with problems, and, of course, one which fuels the 280-million-dollar-a-year and growing sun-screen industry[48]. This attitude may be one of the

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[44] Fugh-Berman, Adriane. "Sun-screen Or Smoke Screen", *Ms.*.July/August 1994

[45] Fugh-Berman, Adriane. "Sun-screen Or Smoke Screen", *Ms.*. July/August 1994

[46] Ibid

[47] Ibid

[48] Ibid

largest stumbling blocks to 'curing' our planet and remedying its problems.

What are the new attitudes?

There are, however, new attitudes developing about tanning as a result of its increased danger to human health. The first is that sun tanning is no longer considered chic, rather, it is considered downright dangerous[49]. This change in attitude is particularly important for young people as research indicates that 80% of skin damage occurs by age 18, and therefore, one can reduce the chances of developing skin cancer by avoiding burning for the first 18 years of life[50]. The perception used to be that a tan was a sign of health, but in fact it is quite the opposite, it is a sign that one is not healthy, for if you have a tan, it indicates that your skin has already been damaged. Furthermore, it used to be thought that a tan would protect you from burning; however, this also is false as a sun tan only provides an SPF of about 4 for Caucasian and light skinned people, while providing an SPF of about 8 for black and dark skinned people[51].

As a result of the health risks that both tanning and burning provide, a new idea of beauty has begun to emerge. While a dark brown or bronze colouring was once considered beautiful for Caucasians, its health risk makes it an unattractive option. Instead, because of the safety that it offers, there has been a return to the Victorian image of beauty: a white and pale skin tone and appearance.

What are the responses of popular culture?

An interesting study of attitude change is the one which has occurred in popular culture over the years. For instance, in the early 1970's when Sherwood Rowland was just beginning his research on the effects of CFCs on the environment, not many were concerned with depleting ozone, cancer or sun burns, as the danger was not really acknowledged or known. This can be observed in the following lyric, which is in the song *A Horse With No Name*, released in 1971 by Dewey Bunnel. In this, he states that "after two days in the desert sun, my skin began to turn red."[52] This would certainly not be the case in 1994, and in fact, if the song was remade today, it might sing something like this, "after 10 minutes in the desert sun, my skin began to turn red". The idea of being under the desert sun of today for two days is horrifying. The lyrics from the Grateful Dead's new album released in 1991 are certainly more appropriate to the attitude of the 1990's:

> *Today I went out walking in the amber wind. There is a hole in the sky where the sun pours in. I remember the days when I was not afraid of the sunshine*[53].

Even I, only being 22-years-old, can remember spending my two-month summers at the cottage on the dock and swimming, not only without sun-screen but without being concerned about cancer and not burning. I too remember the days when I was not afraid of the sunshine. For popular culture's record of what our attitudes used to be and what they ought to be, I offer the following revelation from the Indigo Girls recently released compact disk, *Swamp Ophelia*:

> *So long ago when we were taught, that for whatever kind of puzzle you got, you just stick the right formula in, a solution for every fool...what makes me think I could start clean slated? The hardest to learn was the least complicated*[54].

This passage reflects that the solution to our environmental problems are not going to be run-of-the-mill, generic solutions; rather, they will require an intense re-evaluation of ourselves, our attitudes and our goals. Finally, the lyric of *Tunnel of Love* by Bruce Springsteen will hold true only if we surrender to our weaknesses and to our divided attitudes concerning our environment; that is, that we will have to *learn to live with what we cannot rise above*[55].

What may the future hold?

Although a discussion of the past history and consequences are enormously important, it is not a complete, satisfying or productive exercise if we do not use the information for anything besides professing doom. An equally, or possibly more important

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49 "The Sun And Your Skin", Published by The Canadian Dermatology Association.

50 Ibid

51 "The Sun, Your Baby and You", Published by Health And Welfare Canada and The Canadian Dermatology Association

52 Music America. *Greatest Hits*. 1971

53 The Grateful Dead. *Built To Last*. 1992

54 The Indigo Girls. *Swamp Ophelia*. 1994

55 Bruce Springsteen. *Tunnel of Love*. 1989

component is projecting to the future to see what it may hold: particularly, what kind of world we will have built for tomorrow with our actions of today.

United States Vice President Al Gore in his best seller, *Earth in Balance*, questions: *what does it means to redefine one's relationship to the sky? What will it do to our children's outlook on life if we have to teach them to be afraid to look up?*[56] Whatever the answers are to these questions, one thing is known: our perception of and relationship to the environment and the sun have changed and will continue to change. Unfortunately, this change is not necessarily a result of altruistic good judgment on behalf of humanity reflecting an appreciation and respect for the environment, but rather a requirement issued by our instinct for self-preservation, for if we continue to abuse our Planet, our doom is sealed.

Humanity has the ability to endure numerous consequences – some of which have been mentioned earlier – which are a result of our actions towards the environment. This is a tremendous burden for us to carry and it is only getting heavier. As a result of our attitude which holds that problems can be fixed with band-aid solutions instead of correcting the problem, we face in the future the consequences of our band-aid solutions. The consequences are two-fold: one, that we have not solved the problem as claimed, and two, we are entering into the equation a whole other set of irresponsible actions, whose consequences are not yet known.

I next will discuss a scenario which may develop in the future based on the present situation. *Consumer Reports* stated, in its May 1989 issue, that:

> *Chemicals once thought to be benign are attacking the earth's ozone shield. Unless governments, industry, and the public act now, life on earth faces an unprecedented threat from the sun*[57].

One of our responses to this threat is the development and use of sun-screens. We think of them as a solution to the increased amount of ultraviolet radiation entering our atmosphere, and are told to apply them liberally and with high frequency. We assume them to be safe, but will we find out in the next 10 years that sun-block also thought to be benign is actually harmful to humans? It has been stated earlier that sun-screen may cause a higher change of melanoma as a result of its ability to allow you to stay in the sun longer, thus absorbing enormous amounts of ultraviolet rays. What will we discover next: that the actual chemicals thought to be protecting us actually are harming us on top of not being as effective as once thought? Many chemicals – such as CFCs – were, as *Consumer Reports* said "thought to be benign"[58], so why is it not a possibility that our chemical lotions are not potentially damaging? Besides, what kind of solution is this? We have allowed the sun to poison our skin through our poisoning of our atmosphere, and we are attempting to avoid that poisoning by protecting ourselves with what could be a potential poison. Should we not be able to learn from out mistakes? Why is there no concern about putting chemical lotion on our skin? Have we missed the entire point about what is happening to our environment? Does this reaction tell us that our society has more interest in band-aiding than fixing. If the environment is not getting better, it probably is getting worse, for to consider that all our activity is not changing the environment's state – positively or negatively – would be an unusual reality and a rare achievement.

Because of the fact that chemicals such as CFCs released into the atmosphere will require time before they complete their destruction of the ozone, it is hard to determine exactly how much ozone damage there will end up being as a result of decades of our neglect[59]. But one thing is known: consecutively, for the past few years the **danger time** – that is, times when the suns ultraviolet rays are strongest – has been expanding. I remember when there were no warnings for danger times and when it was first suggested that you should stay out of the sun between 11:00 a.m. and 2:00 p.m. This time period quickly extended, as did the importance of avoiding the sun from 11:00 a.m. to 3:00 p.m., then from 11:00 a.m. to 4:00 p.m. Now some say it is in your best interest to avoid the sun from 10:00 a.m. to 4:00 p.m. to be *safe*. As the damage to the ozone layer increases, and the ultraviolet rays intensify, it may be necessary to avoid the sun for most or all of the day. After all, today, in

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[56] Lemonick, Michael. "The Ozone Vanishes", *Time*. 17 February, 1992.

[57] "Can We Repair The Sky?". *Consumer Reports*. May 1989

[58] Ibid

[59] Lemonick, Michael. "The Ozone Vanishes", *Time*. 17 February, 1992.

order to be safe, one should avoid the sun for six hours, and since sun conscious people usually avoid it for longer, it is not a huge jump to add four more to that number which would increase the danger period from, lets say 9:00 a.m. to 7:00 p.m.

This increase in the danger period, the increase in the ultraviolet rays and concerns over the effectiveness and effects of sun-screen, may result in a life-style which requires that the sun be completely avoided. This may be a world where all activities occur inside during the day, while the night will be the only safe time to be outdoors. People may start to become nocturnal in order to avoid the sun, resulting in a complete reversal of daily – that is, in the sense of 24 hour – activities. Those activities which require execution during the day may lead to a system of operations that can be performed while completely avoiding the sun. An example could be the development of a type of glass that filters out all poisonous rays which could be used for windows. This could then be used in cars and then if a system of canopies and coverings was developed people could got to work during the day never having to be exposed to the sun.

Unfortunately, there are many costs of this kind of life-style. Some are as follows: the more cars that are required – which of course would require some way of cooling their air without polluting the environment – the more demand on fuels and the more pollution would be generated. Similarly, the more night activity there is, the larger the energy intensive infrastructure that will be required to provide artificial lighting and security. If the threat from the sun increases, abstinence from the sun may be the only protection.

There may be some positive implications of the necessity to protect ourselves from the sun. One may be the promotion of intercultural marriages in order that off-spring may be of mixed blood with a higher tolerance of the sun. This would occur if one parent of a child was fair skinned – thus having a higher susceptibility to skin damage – and one parent was dark skinned, thus having a higher tolerance to skin damage. The offspring of such parents would then have a higher tolerance than a child that was born of two fair skinned people. In fact, this may be a necessity, and may even be the one thing that will finally unite humanity and the age-old struggle between black and white. Although, this may result and would definitely be a benefit, the benefit does not balance the cost as such unity of humanity can be achieved if we desire it instead of requiring it as indicated in the premise mentioned above.

Unlike the population issue – as discussed in essay one – who's effects are hard to appreciate living the high-life style and standard of a Western developed nation, the effects which the sun has on humans and their activity affect and will continue to affect all humans regardless of when or under what standard of living they live. If we do not act appropriately – that is, to remedy the atmospheric damage while learning to appreciate and respect the environment – we will be condemning ourselves to suffer the consequences. This issue does not require abstract educational awareness, as it only takes one burn to remind us solidly of how sensitive, fragile and subject humanity is to the sun. The tragic reality is that, as resourceful creatures, the question is not whether we can find a means by which to endure the world we have built, but rather, what kind of life style will it be and what will the quality of life be? The suggestion of what the future may hold mentioned above is not all that radical or extreme, and one day soon may even be in effect. The unfortunate part of an alternative like the one mentioned above, is that humanity, consequently, will become severed from its natural environment, which we have never been separated from in our existence.

What will my role be in the future?

Having thought extensively of where this problem started, where we are today and what tomorrow may be like as well as how we will get there. I have also considered what my role may be in the future we are building today. The first role I concern myself with is also the purpose of this essay: educating and informing myself. Only after education – not necessarily formal, as in the case of this essay – can one start to work for a better world, and that is where I see my role. By understanding both the problem and the consequences I can begin to inform those who are interested but unwilling to teach themselves. By acting responsibly, I am setting an example and positive role model for others who look for leadership. Actions such as avoiding the danger times through the use of umbrella and selectively scheduled activities will set an example for others to follow. Also, by not only refusing to participate in the destruction of the ozone layer and avoiding the products and manufacturers that do, I am assuming- responsibility for my actions while showing signs of appreciation and respect to the world

I live in. Many pessimists may choose to assume the position that 'one person cannot change the world'; however, I do not agree. I believe in the idea that the world can be changed by one person, that all change occurs by believing that if everyone assumed the responsibility of their own life style, that the world would change very quickly. A study of history would indicate that the world has been changed – both positively and negatively – by one person. If all the great people in history, from prophets to politicians all assumed the belief that they could not make a difference, and thus put no effort into making the world a better place, where would our world be today in terms of moral and ethical understanding? For instance, where would we be today if Sherwood Rowland felt he could not change the world and never researched what the effects CFCs had on our environment? Would we have any ozone left at all? Perhaps this pessimistic and cynical attitude is the basis of our environmental problem. Perhaps it is a lack of belief in ourselves, a lack of knowledge about what we are, about how we fit into our world and our universe that is the cause of all our lack of appreciation and respect for our environment which has caused its carnage.

I believe in preventive medicine, a holistic and intuitive understanding of ourselves and our environment and the personal stage development which requires that we develop and understand ourselves first, our community second, and our cosmos third. If we do not develop according to our stage development, we become individuals with a skewed understanding of how to live healthily.

If we do not quickly begin to appreciate and respect the environment, we will have to suffer the consequences of living in fear of it.

Conclusion

Many issues have been dealt with in this essay, too numerous to all be summarized here in the conclusion. The one I feel is the most important is that all the environmental problems are essentially a reflection of humanity and of which state we are collectively in. The solution then, requires that our role and understanding of ourselves as a species and as individuals be re-evaluated and redefined; our present conceptions are clearly failing us. In order to do this we must unite towards a common goal for the future of the planet and consequently our own future. Abraham Lincoln said during the American Revolution that "a house divided, cannot stand", and that the only future for America was in uniting in strength. The same follows for the environment; its only future, and our only future, is in a united effort. It must be united in terms of humanity as a unit, humanity and the planet, as well as a united approach in the search for the solution to clean up the mess we have made.

The ozone layer can be thought of as a 'blanket' covering the Earth, which can be affected by all, and which requires caretaking by a united world[60]. If we continue to punch holes in this blanket, to tear it and to abuse it, we will be opening Pandora's box and essentially be responsible for our own subjugation, we will be a slave to our own whip.

It does not have to be that way though. I do not embrace a pessimistic attitude, one which negates all responsibility, for I believe we can rise above our past mistakes and weaknesses. The environmental crisis which the planet faces today can be thought of as, in Macbeth's own words, "a knell, that summons thee to heaven, or to hell".

Appendix One

The following are statistics on how a deficit ozone layer will affect Canadians:-

- this year 50,000 Canadians will get skin cancer -- almost all skin cancers are avoidable and curable if treated in time.
- children born today have one-in-seven risk of developing cancer during their life time.
- this year 3,000 Canadians will get melanoma skin cancer, the most serious form of disease and 500 will die from it.
- sunburns are more serious for children as they have more surface area (skin) compared to body mass.[61]

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[60] Gore, Al. "The Unsheltered Sky", *Forum*. July/August 1992

[61] "Play It Safe In The Sun", Published by The Canadian Dermatology Association