I. Our home, Earth

In the Solar System, quite far out from the center or hub of our Milky Way galaxy, there is only (to the best of commonly held knowledge) one habitable planet. Our two closest neighbors, Venus and Mars, are, respectively, too hot and too cold. They are believed to be devoid of water and elements necessary for life such as oxygen and carbon, to name just two. At the time of writing this article, the planet Mars is being explored for the first time. And though there are remote and exciting possibilities that water once existed on this now barren planet, if this is indeed so, it was very long ago.

So, here we are in a most rare situation: on a living, breathing planet which we call Earth, and which is believed to actually be self-healing. And we, by far the most dominant species on the planet, seem to be doing our best to trash it. We are greedily using up the planet's natural resources without seeming to care for the need to replace them. We poison the very air which we require to breathe with a never-ending list of deadly toxins, poisons, and hydrocarbons from our voracious consumption of petroleum products. Honestly, this sounds unerringly like the plot of a science fiction movie. Perhaps it already is.

Vocabulary

1. Earth
2. Solar System
3. Milky Way
4. hydrocarbon
5. voracious

Discussion Questions

1. Do you think there is life on other planets?
2. If it were possible, would you like to visit another planet, such as Mars, or the Moon?
3. What are some of the ways in which humans and their activities are damaging the Earth?
4. Do you agree that human society is greedy in the way that it is using the Earth's resources?
5. Are you worried for the future of the environment of planet Earth?

II. The poisoning of planet Earth - Water

It is common knowledge that the Earth is made up of 70% water, and that approximately 97% of that percentage is saltwater from the oceans. Of the remaining 3%, 2% is accounted for by the ice that makes up the planet's northern-most habitable areas along with the North Pole and Antarctica. This means that approximately only 1% of the water that makes up Earth is usable, fresh water. That is a staggering percentage considering the need and daily usage of humans let alone the remainder of the living organisms on the planet.

Research is being conducted in how to turn saltwater into usable water. This involves removing the salt and other chemicals from the saltwater. Research in this field is being done all over the world. This process can now be done; but it is complicated and difficult. Moreover, this process uses a lot of energy – it takes a lot of energy to remove the salt and other chemicals from seawater, and so it is also currently very expensive, and so not currently an economical option. We will have to wait to see if this process can become cheap enough to solve the problem of water shortage on Earth. Until then, water shortages and droughts will continue to occur in certain parts of the world.

Vocabulary

1. habitable
2. North Pole
3. Antarctica
4. research
5. drought

Discussion Questions

1. Why is there such a worry about water? The Earth is 70% water!
2. According to the article, why can't humans yet turn saltwater into usable water?
3. Think of 3-5 things we use water for every day.
4. Where is Antarctica? Would you like to travel there?
5. Do you like to visit areas with large bodies of water such as the sea or lakes? If you do, what do you like to do there?

III. The poisoning of planet Earth – Hydrocarbons

Hydrocarbons are common today in many different forms. Household agents, such as furniture cleaners and solvents are very toxic, even in small amounts sometimes if ingested or inhaled. But the larger danger is through petroleum products such as gasoline – as in what we use to fuel our motor vehicles or automobiles. These toxins are no great threat when talking about low amounts of emissions from a few automobiles; but it seems everyone in modern society must have at least two cars in the driveway and another polluter of some type stored in their garage. It is the cumulative effect of all those vehicles that is creating a serious environmental threat to planet Earth.

However, there have been and continue to be positive changes. From the early 1970s through the 1980s and 1990s, there have been changes to the vehicles and emissions standards and, perhaps most importantly, to the testing. Today we have computerized emission checks which are done regularly, certainly in most states in the US. The engines have become more carefully and closely regulated in regards to the emissions they exhume, making them more environmentally friendly. From the air intake to the exhaust, there have been changes throughout the system to lower emissions and to adhere to set standards. Hopefully these and future changes will help to reverse the trend and help save the environment and our health.

Vocabulary

1. household furniture cleaner
2. emission
3. health risk/danger
4. standards
5. adhere

Discussion Questions

1. Identify the primary sources of hydrocarbon emissions.
2. Explain the potential health problems associated with these emissions.
3. Describe some of the changes that have been made in order to reduce these emissions.
4. Do you have any other ideas for how to control emissions?
5. Are there different types of car engines in use and or planned for the future?

IV. Changes to automobiles

What is clear is that we must change how we design, produce, use, and test our automobiles for toxic emissions. But beyond reducing emissions, what else can we do for cars? It us wholly unlikely that Americans in particular will suddenly be convinced to sell off their "extra vehicles" to help save the environment. But what other options are there for cars? Are there other alternative types of vehicles? The answer is yes. The most widely known and available is the diesel engine. While primarily used in large commercial trucks, there are many diesel vehicles in use in Europe, and it is gaining popularity in Asia as well.

More modern options such as biofuel are catching on; but it is difficult to find refilling stations, while gasoline, the common alternative, is of course readily available and convenient. The next and currently most promising alternative is the electric-powered automobile. While it has taken many years to catch on, there are now companies which produce only electric models of their automobiles – and the recharging stations are starting to show up all over Europe, in Asia and even finally in some places in the USA. The newest and most exciting prospect on the road although in very low production numbers, is the hydrogen-powered car. Though so far almost exclusively available only in Japan, this new fuel type is starting to gain popularity around the world due to its unique technology. Who knows what else might be just around the corner?

Vocabulary

1. biofuel
2. convenience
3. diesel
4. electric
5. hydrogen

Discussion Questions

1. What different types of cars are available today?
2. What different types of engines or power sources are being used?
3. If you had to design a new automobile for a modern family, what features would you give it? What power source would you use? (You can use ideas from today's technology and/or ideas from science fiction or other sources).
4. Why is it hard to get new technology to catch on?
5. What does the future hold? Will there be flying cars in the future like in science fiction?

V. The environment, the future

So, what lies ahead for our species, for our planet? What might happen if no changes are made, if we just continue with the status quo? While it is clear that our planet is self-healing, there is a limit to its ability to self-heal. From our dwindling fresh water supply to ever-increasing overpopulation, it is not hard to see the possibility of devastating climate changes in our near future. As mentioned in the previous article, automobile emissions continue to increase and worsen pollution. There is likely a "point of no return" where the planet cannot heal itself anymore. The status quo cannot continue forever. So what can we do before it's too late?

As one greater community we must band together, put aside all petty grievances, and focus our considerable scientific and engineering might upon these problems. If the combined intellect of humankind is directed and focused on a singular goal synergistically, it should be more than enough to change our world – and save it. In addition, groups of scientists and engineers should consider focusing on making solar and wind power more accessible and more efficient. And people? We should all think of ways to help the environment and avoid damaging it. Does the family really need an additional automobile? Maybe you can take a stroll to the store instead of making that five minute drive? With today's inner city traffic problems, it's probably quicker anyway!

Vocabulary

1. status quo
2. point of no return
3. focus
4. petty grievances
5. synergy / synergistically

Discussion Questions

1. From the articles you have read in this section and from other sources if you wish, give 3-5 environmental problems that planet Earth currently faces.
2. Is it too late to fix these environmental problems? If not, what can be done?
3. What 3-5 things do you think we should focus on fixing first?
4. What is synergy and how does it work?
5. Should we continue to explore outer space, or just solely focus on Earth? Should we explore other planets, or should we first further explore the oceans and jungles here on Earth? Where can we learn more to help save our planet?