

Reflections on the Day's Discourse: Reaching for Utopia

Closing Session

Bertrand Charrier

Forty thousand years ago on Earth two species of human beings coexisted in Europe: the Neanderthals and *Homo sapiens*. The first disappeared and the second evolved into *Homo sapiens sapiens*, and heavy threats hang over it. Humankind may disappear from the planet. This possibility is not a remote scholarly hypothesis, and it would not occur because of a meteorite crashing into Earth or an exhaustion of solar energy. We are calling to mind the irreversible disruptions caused by humanity's activities on the environment, leading to its ruin. Is the disappearance of people inescapable, and is it written in the laws of evolution?

Unlike other living species, humanity is endowed with the power of reasoning and reflection. It has developed its knowledge in all areas of the mind. Since the dawn of time people have learned to master the complexity of their world. They have had to progressively expand their influence from nearby to the whole planet. They have even attempted to explore the solar system. Has the planetary machine suddenly raced out of control, directed by unknown forces, losing power over its destiny?

Easter Island: Forgotten Lessons

It would not be the first time we have lost control over our destiny. The history of human beings is filled with lost civilizations. Captain Cousteau, whom I collaborated with for more than 15 years, explored Easter Island. On this

island in the middle of the Pacific Ocean, inhabited by monumental statues, the population committed a self genocide 350 years ago. When the first Dutch explorers arrived on the island they found only a few survivors. The exploration of this mysterious island allowed us to piece together its history. Landing around 600 AD the 200 Polynesian invaders found all the necessary resources for their development. The island became prosperous and the population grew to reach an estimated 10,000 inhabitants. Clan fighting for space and resources led to the extermination of the population. The Easter Island civilization disappeared because people destroyed the essential ingredients for their survival in the island's ecosystem. Life on the island continues, flora and wildlife adapted to the ecological disruptions. New species may have appeared and others increased, but people could not adapt to the new conditions they created.

Today, 7 million Haitians live the same drama. It is happening in front of us, and we remain powerless faced with this tragedy. In 1986 with Captain Cousteau we explored Haiti, and we could only give witness to deterioration amongst the population and the quasi destruction of the environment. From the sky the succession of ravaged treeless hills resembled the rib cage of a famished child. Nothing grew on the eroded slopes. The sea did not feed the people anymore, as the remaining fish were too small to be caught in their nets.

From Easter Island and Haiti to Earth comparisons can be drawn in the exponential population growth, the depletion and waste of renewable and nonrenewable natural resources, the rise of nationalist conflicts, and the worldwide increase in poverty and insecurity. The leaders of the Easter Island people must have known that they had no chance of finding new resources because of the island's size and isolation. Despite this knowledge, they led their people to self-destruction and extermination. Human beings have yet to learn from similar catastrophes and we manage Earth as if resources were limitless and space infinite.

Are we today at the dawn of "self-genocide" for humanity? My natural optimism and faith in the ability of people to react lead me to reject such a destiny. However, scientific knowledge concerning the evolution of the main parameters governing the planetary system leads to more pessimism.

Beyond the Limits

Donella H. Meadows, Dennis L. Meadows, and Jorgen Randers work on scenarios well known in environmental circles and their work has provoked many comments. If development on our planet continues along its current course, it will collapse in less than 20 years with the worst consequences for humanity. Their latest work, *Beyond the Limits*, was published in 1992 and confirms the results they published 25 years ago in *Limits to Growth* (1974). The main criticism of their conclusions is their emphasis on people's ability to react appropriately to dramatic situations, to develop solutions and carry them through. Today, this debate is outdated. The activities of people disrupt the global ecosystem to such an extent that these irreversible disruptions will result in the most serious ecological and human catastrophes. It is still impossible to number them exactly, but do we have to wait until we know exactly how many hundreds of millions of people will die to undertake real preventive measures? Yes, is the answer given by the political and economical leaders of the planet.

To follow the political "business as usual," which is only an extrapolation of today's ten-

dencies, is to lead to the collapse of the planetary system.

Until 2000 there is an increase in life expectancy, agricultural production, and industrial wealth. After 2010 the situation deteriorates. Pollution is increasing by 4.5 percent a year in 2010 and by 12 percent a year in 2040, this affects agricultural land fertility. Between 1990 and 2020 nonrenewable resources are seriously decreasing, thus a larger part of industrial capital is directed toward agriculture and supplying raw materials. Industry lacks investment and cannot maintain its performance, agricultural production decreases rapidly beginning in 2020, and pollution increases greatly. The crisis is major, worldwide, and all areas are affected. The death rate is considerable, the birth rate drops drastically, population decreases as early as 2030; after a maximum level of 8.5 billion, it drops under its 1990 level. The world crisis leads to the collapse of all areas considered.

Stabilizing the Population

Population birth and death rates need to be stabilized as soon as possible. An average of two children per woman will allow a strict generation renewal. If the fertility level of 2.06 is reached in 2025, the world population will be more than 10 billion by 2025, and 11 billion by 2100. This hypothesis, the most reasonable according to demographers, does not avoid the predicted chaos.

Eradicating World Hunger

The main priority is to adequately feed people. About 1 billion people receive less calories than they need today. Between 500 million and 1 billion people are chronically famished. Malnutrition affects the future development of individuals; new generations are physically and intellectually weakened and can no longer face the ecological and social upheavals set by the planet's economic development. An average of 13 million people die of hunger every year, the majority are children. Hunger is one of the worst curses that we have not been able to combat and eradicate.

By decreasing losses along the chain from production to distribution, food production

would be enough to properly feed 5.7 billion people. Today, the eradication of hunger is not about how much food is produced, but rather how efficient are all the steps involved. World grain production has slightly decreased since 1980. The yearly amount of grain produced per capita varies between 310 kilograms and 340 kilograms, and everything has to be done to avoid going below 310 kilograms per capita.

In 1992 world grain production reached 1,745 million tons. With a population of 10 billion people in the middle of the next century, the world grain production should exceed 3,100 million tons, that is 77 percent more than today.

Protecting Agricultural Land

The massive increase in food production can only come from land area increase, yield increase, and decrease of losses. Contributions from aquaculture and synthetic food will stay marginal.

In 1992, 1,500 million hectares of the world was cultivated. The area used for grain production was about 700 million hectares, similar to 20 years ago. The area used for grain production per capita has been decreasing since 1950; in 1992 it was 0.13 hectares per capita. Although new land is farmed, benefits are reduced by losses from erosion, urbanization, desertification, salification, overgrazing, and farming malpractice. Soil preservation has become a priority. The World Resources Institute estimates that the agricultural land potential is 4,000 million hectares. This implies that all available areas are used, and deforestation is under control. This number is therefore theoretical. We may be able to count on 2,000 million hectares, a 30 percent increase in agricultural land. This goal of 500 million hectares of land durably won over forests and deserts will be difficult to reach. This goal would allow us to reserve 950 million hectares for grain production.

To Increase Agricultural Productivity in Developing Countries

Because of the difficulty of gaining new farm land, increasing the yield is the complementary

solution to satisfy the food needs of an ever-increasing population. Agricultural productivity has seen considerable worldwide improvement since the decade of the 1960s, with the green revolution. Since the middle of 1980 one has noticed a stabilization of the best yields in countries with high productivity.

Even though an agricultural productivity limit seems to exist, there is much room to maneuver with a world yield of 25 quintal per hectare. To be able to feed the 10 billion people in the middle of the next century, world yield will have to regularly increase to reach 32 quintal per hectare, if the goal of 30 percent agricultural land increase is reached. If we can only maintain today's agricultural areas, world yield should reach 46 quintal per hectare!

Taking on the Grain Production Challenges

The grain production challenges that must be met in order to feed the world population are summarized in table 1. We can discuss the precision of the numbers, but the proportions are there. Some, like Lester Brown (Brown and others 1993), believe these challenges are so great that they are impossible to meet.

Knowing the obstacles that lie ahead allows us to anticipate them—the challenges are great. Industrial countries need to preserve active agricultural systems, but must not finance surpluses at great cost, which are capable of modifying the rules of international markets. Such market distortions penalize production in the developing countries. Food aid received by some developing countries discourages local farmers, who move to urban centers. Assistance, which is vital today, becomes the enemy of the future. The North and South must together imagine some mechanism to achieve food security for all the people on the planet; for the 10–11 billion inhabitants of tomorrow. Therefore, a worldwide agency of cooperation for food security and development must be created. Furthermore, agricultural production must be spread out to reduce the impacts of natural, climatic, and genetic hazards. One can see the outline of new responsibilities for the United Nations Security Council.

Table I. Grain production challenges during the next century

	1992	2000	2025	2050	2100
Population (millions)	5,420	6,120	8,400	9,920	11,100
Total area cultivated					
hectares per capita	0.28	0.25	0.21	0.21	0.20
billions of hectares	1,500	1,530	1,760	2,080	2,200
Area cultivated for grain					
hectares per capita	0.13	0.12	0.10	0.10	0.09
Grain production					
kilograms per capita	318	320	320	320	320
billions of tons	1,720	1,960	2,650	3,170	3,550
tons per hectare	2.5	2.6	3.3	3.4	3.7
hectares per capita	0.13	0.12	0.10	0.10	0.09

Rights and Duties

The purpose of the Easter Island example and this numeric display is to show that population growth and natural resource consumption growth in a finite world is not sustainable, but destructive and indeed exterminating. The limitations on population and growth in consumption of natural resources are either voluntary or imposed by the environment, wars, and instability. For the first time in the history of humanity we are able to construct elaborate scenarios about the evolution of the planet which become real forecasts based on scientific data and analysis.

Since the Easter Island misfortune humanity has experienced many political, social, economic, and scientific revolutions. Humankind has become a species isolated from the others, having invented a set of values which are meaningless in nature: justice, equality, fraternity, solidarity, and liberty. Throughout the centuries people wrote solemn declarations adopted by individual countries, or collectively, in multilateral assemblies. By these, people's inalienable rights are protected—respect of dignity, and human and citizen rights, including the right to live a decent life on a healthy uncontaminated Earth. These rights give people a special place in nature. But these rights imply some duties which are only being partially fulfilled. In particular, the duty of people to respect nature. A new balance between people and nature has yet to be invented. The knowledge of the planet's physical limits gives new responsibilities to humanity, leading to deep social, economical, scientific, technical, and political adaptations.

Reforming the Economic System

Of course, we imagine solutions to modify loaded tendencies leading to self-genocide, and we hope to find solutions for the most deprived to avoid serious misfortunes. Our ant-like work to promote durable and sustainable development in converted circles make us forget that the most important decisions are not taken in our milieu.

Nature teaches us that the more varied and numerous the species are within an ecosystem, the more able the ecosystem is to face changes. A parallel between people and nature leads us to think that keeping and even reinforcing cultural diversity is a priority—like preserving biological diversity. The most fragile, least-adapted natural species disappear daily in a changing environment. Insects have the best chances to survive ecological disruptions, because their short lives allow numerous generations in a short time, with mutations resulting in individuals adapted to the new conditions. People do not follow this pattern: our generation time is 20 years, as opposed to merely hours or even minutes for insects. Predictable environmental changes will be very quick on the human scale. They will not leave enough time for biological or social adaptation. Therefore, everything has to be done to slow down great ecological disruptions.

The free trade economic rules cannot be suddenly applied to those around the planet who have not experienced the scientific and technical revolution. This major cultural revolution in Western civilization is the continuation of a long cultural evolutionary process. To miss all these steps means, for billion of people on the planet, a fast fading of their cultures and a chronic mal-

adjustment to a new social and economic environment. Training the future leaders of developing countries in Western universities is not enough to fill the gap between peoples, and above all, it does not increase people's ability to adapt to living conditions imposed by Western civilization. For example, when the Western countries imposed their hygiene standards on developing countries, this prompted deep unbalance in their demographic evolution. Our moral and philanthropic reasons were perfectly valid and justified; however, the people and their social and economical systems were not ready to welcome the hundreds of millions of newcomers. It is totally up to the industrial countries to take on this legacy and take all the necessary measures to lighten the demographic weight.

The economic system imposed on the world, based on the market economy, was envisaged without reference to the planet's spatial limits or the quantitative limits of natural resources. According to David Ricardo, John Keynes, and Milton Friedman, some of the most famous market economy theorists, the space to conquer or the natural resources to use were limitless and therefore were not considered. Scientific results show different. Earth is a finite system receiving energy from the sun—which is the only infinite source of energy—both facts ignored by economists. The economic models of the future will have to integrate time and space. Economists must take the long term into account, as well as the fact there is no more land to discover.

During the Earth Summit in Rio de Janeiro in 1992 experts mentioned a yearly US\$125 billion official development assistance (ODA) to eradicate poverty. Five years later ODA has not risen above half of this. The United Nations Special General Assembly on Sustainable Development met in June 1997 and could only make note of it. We have to require immediate agreement from governments to bring ODA to 0.7 percent of industrial countries' gross national product.

Achieving Utopia

People are in control of their destiny. It is always possible to change bad decisions with dialogue and respect, even at an international level. An example of this is the protection of Antarctica.

This continent is managed by signatory countries of the Antarctica Treaty of 1958. As the years went by improvements were made regarding flora and wildlife protection.

In June 1988, after several years of negotiations, the state delegates met in Wellington and adopted a convention on mineral resources exploitation in Antarctica. The hypothetical mineral resources such as oil, natural gas, and coal became legally accessible. The agreement's measures to protect the environment were judged insufficient by environmental organizations. There was no possible guarantee that mining development and oil drilling would be harmless to the environment on a continent with such climatic extremes. Immediately after the Wellington Convention, Captain Cousteau launched an international campaign of public awareness. Over 2 million people in France, and 5 million worldwide, signed a petition asking for the banning of mining development in Antarctica. Deputies and senators throughout the world asked questions of their governments. The decision was made to abandon the Wellington Convention and, after a three-year negotiation, a protocol was adopted to protect the environment in Antarctica. Politicians, diplomats, scientists, and environmentalists won a tremendous victory. The white continent, officially declared "Land of Peace, Land of Science," was truly protected for the next 50 years, leaving options open to future generations. The protection of Antarctica was judged more important than the discovery of a new Eldorado.

The final decision to protect Antarctica for 50 years from all mining development was brought about by political power. The shift was brought about by public opinion, using unconventional means to state the case. Citizens had been informed by a visionary man, Captain Cousteau. More such voices need to be heard throughout the world.

Conclusion

The activities of humanity threaten the general balance of the planetary ecosystem. One has to accept this scientific evidence: the planet's carrying capacity is limited. The economic devel-

opment model, which has been followed by industrial countries for the past two centuries does not take into account the exhaustion of natural resources or the limits of the ecosystem to absorb waste. Those with political power must become aware of the true dimension of the threats to the planet. It is up to all of us to prepare the debate on the future of the planet and to create the conditions for a sustainable future for everyone on the planet. We have now to go beyond the notion of sustainable development, which put the public to sleep and reassured the economic and political leaders. We have to go beyond the 1992 Earth Summit, but keep alive the spirit of Rio.

A new mission awaits the United Nations Security Council, with greater responsibilities than in the past. A quick-acting collective security system should be accompanied by a drastic reduction in military spending, thus providing new opportunities for political leaders. It is not yet too late to choose "sustainable mankind development," which must be, according to N.N. Moissev, a true Strategy for Humankind. Mikhail

Gorbachev, President of Green Cross, International speaks of a "philosophy for survival, as a philosophy of disruption." The hundred million people empathetic to environmental and humanitarian actions are citizens who reject the political "business as usual." They demand a different, world-scale economic policy. They want priority to be given to a sustainable future for humanity.

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