

# LEARNING TO LIVE IN HARMONY, by John Avery, H.C. Ørsted Institute

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## **New goals for education**

Good education ought to make students well adapted to live in their environment. In the largest sense, “environment” means not only the family setting but also the political, economic and natural environments that surround young people as they grow up today. These environments have changed almost beyond recognition during the last few centuries; in fact, they have changed enormously during the last few decades, and consequently traditional education is in great need of revision.

When Samuel Johnson visited the Birmingham factory where James Watt’s newly-invented steam engines were being manufactured during the first stages of the Industrial Revolution, the owner proudly said to him, “I sell here, Sir, what all the world desires to have - Power!” *Power, Growth, Dominance* and *Profit* have been the traditional ideals of industrial society. However, it is doubtful whether they are appropriate ideals for the present and the future. In this essay we will discuss the reasons why *Harmony* is a much better ideal and a better goal for education in the world of today.

## **From empty world to full world**

Adam Smith and other economists of the early Industrial Revolution lived in what might be called an “empty world” situation. In a world largely empty of human economic activities, they considered the limiting factors in the production of food and goods to be shortages of labor and capital. Natural resources were thought to be present in such large quantities that they were

not limiting. In the “empty world” picture of the classical economists, growth can continue as long as new capital can be accumulated, and as long as new labor can be supplied by population growth or mechanization. There is no upper limit. However, we are now encountering a “full world” situation.

In recent years the assumptions of the classical economists have become progressively more untrue. It is becoming increasingly obvious that the limiting factors in economic growth are no longer capital, human labor or ingenuity in automation. The limiting factors today are scarce cropland, scarce water, depleted reserves of fossil fuels and mineral resources, vanishing catches from overfished oceans, and limits imposed by the carrying capacity of the environment, by pollution and by climate change.

## Cropland

The possibility of opening new lands for agriculture is decreasing rapidly. A Report by the United Nations Food and Agricultural Organization (*Provisional Indicative World Plan for Agricultural Development*, FAO, Rome, 1970) makes the following statement concerning new agricultural lands:

“In Southern Asia,...in some countries in Eastern Asia, in the Near East, and North Africa...there is almost no scope for expanding the agricultural area... In the dryer regions, it will even be necessary to return to permanent pasture the land which is marginal or submarginal for cultivation. In most of Latin America and Africa south of the Sahara, there are still considerable possibilities for expanding cultivated areas; but the costs of development are high, and it will often be more economical to intensify the utilization of the areas already settled.”

In the 1950's, both the U.S.S.R and Turkey attempted to convert arid grasslands into wheat farms. In both cases, the attempts were defeated by drought and wind erosion, just as the wheat farms of Oklahoma were overcome by drought and dust in the 1930's.

If irrigation of arid lands is not performed with care, salt may be deposited, so that the land is ruined for agriculture. This type of desertification can be seen, for example, in some parts of Pakistan. Another type of desertification can be seen in the Sahel region of Africa, south of the Sahara. Rapid population growth in the Sahel has led to overgrazing, destruction of trees, and wind erosion, so that the land has become unable to support even its original population.

## **Fossil fuels; peaks of production and consumption**

Oil prices are expected to become steadily higher in the future because of diminishing reserves and increasing demand. Petroleum experts predict that the peak of production and consumption of oil (the Hubbert Peak) will occur within one or two decades. Similar figures hold for the production and consumption of a number of important minerals. The oceans cannot yield significantly greater catches of fish than they do now. In many regions, yields have dropped because of overfishing.

## **Loss of biodiversity**

Tropical forests are being destroyed at an alarming rate, with a catastrophic loss of biodiversity. The burning of fossil fuels and the destruction of tropical forests have produced an increase of carbon dioxide in the earth's atmosphere and a steadily increasing average global temperature. Tropical rain forests are thought to be the habitat of more than half of the world's species of plants, animals and insects; and their destruction is accompanied by an alarming rate of extinction of species. The Harvard biologist, E.O. Wilson, estimates that the rate of extinction resulting from deforestation in the tropics may now exceed 4,000 species per year - 10,000 times the natural background rate (*Scientific American*, September, 1989).

The enormous biological diversity of tropical rain forests has resulted from their stability. Unlike northern forests, which have been affected by glacial epochs, tropical forests have existed undisturbed for millions of years. As a result, complex and fragile ecological systems have had a chance to develop. Professor Wilson expresses this in the following words:

“Fragile superstructures of species build up when the environment remains stable enough to support their evolution during long periods of time. Biologists now know that biotas, like houses of cards, can be brought tumbling down by relatively small perturbations in the physical environment. They are not robust at all.”

The number of species which we have until now domesticated or used in medicine is very small compared with the number of potentially useful species still waiting in the world's tropical rain forests. When we destroy them, we damage our future. But we ought to regard the annual loss of thousands of species as a tragedy, not only because biological diversity is potential wealth

for human society, but also because every form of life deserves our respect and protection.

Every year, more than 100,000 square kilometers of rain forest are cleared and burned, an area which corresponds to that of Switzerland and the Netherlands combined. Almost half of the world's tropical forests have already been destroyed. Ironically, the land thus cleared often becomes unsuitable for agriculture within a few years.

Tropical soils may seem to be fertile when covered with luxuriant vegetation, but they are usually very poor in nutrients because of leeching by heavy rains. The nutrients which remain are contained in the vegetation itself; and when the forest cover is cut and burned, they are rapidly leached away.

Often the remaining soil is rich in aluminum oxide and iron oxide. When such soils are exposed to oxygen and sun-baking, a rocklike substance called laterite is formed. The temples of Angkor Wat in Cambodia are built of laterite; and it is thought that the Khmer civilization, which built these temples a thousand years ago, disappeared because of laterization of the soil.

## **The mathematical properties of exponential growth**

Our economists, whose education is based on the assumptions of Adam Smith and other economic thinkers of the early Industrial Revolution, still continue to regard *Growth* as the Holy Grail. A 5 percent rate of growth is considered to be the mark of a healthy economy. This blind faith in growth can only be maintained by ignoring not only the rapid approach of the global economy to limits imposed by the carrying capacity of the earth's environment, but also by ignoring the mathematical properties of exponential growth. Economists apparently refuse to look more than a decade or so into the future. What they would see, if they looked a little farther, is that a 5 percent rate of growth implies that whatever is growing will double in 14 years, grow by a factor of 132 in a century, by a factor of 17,292 in two centuries, by a factor of 2,273,996 in three centuries, and so on. Thus, in the long run, economic growth cannot possibly be sustainable; nor can population growth be sustainable, as can be seen from the mathematics of any type of exponential growth.

The goals of education, especially the education of economists, need to be changed in such a way as to include a realistic picture of today's world. All students, especially economists, must learn the fact that in the long run neither population growth nor economic growth is sustainable. A new kind of

economics should be taught - not “empty world” economics but “full world” economics; not the economics of growth but the economics of equilibrium and stability. More detailed discussions of these issues can be found on this website in *Malthus’ Essay on the Principle of Population* and in *Towards a Sustainable Global Society*.

## **The social impact of science**

Let us consider some other ways in which the world is changing, all of which imply a need for new goals in education. Science and technology have developed extremely rapidly in recent decades, and they will undoubtedly continue to do so in the future. The result has been that humans now have an unprecedented and constantly increasing power over nature, which can be used for both good and evil. Science has given us the possibility of a life free from hunger and free from the constant threat of death through infectious disease. At the same time, however, our constantly accelerating technology has given us the possibility of destroying civilization in a thermonuclear war.

Since it is almost impossible to prevent science from making new discoveries that can be used both constructively and disastrously, one of the new goals of education must be to give voters the knowledge needed to choose wisely the among ways in which our enormous new powers over nature can be used. This implies that some familiarity with science is needed even for students who specialize in the humanities. A study of the history and social impact of science ought to be part of the education of both scientists and humanists. This should include discussions of global problems and ethical dilemmas related to scientific and technological progress. Scientists also need some background in the humanities in order to see their work as part of a larger picture.

## **Global ethics**

Traditional education has always tried to produce patriotism in its students. This may once have been a reasonable goal, but today a broader view than narrow nationalism is needed. Global interdependence and communication have increased to such an extent that the absolutely sovereign nation-state has become a dangerous anachronism. If the disaster of a third world war is to be avoided, structures of government and law must be built up at an

international level. One of the new goals for education should be to prepare students for this great task. Today's students need a global ethic - a loyalty to humanity as a whole, rather than a narrowly nationalistic loyalty.

History has traditionally been taught in such a way that one's own nation is seen as being heroic and always in the right. History textbooks also emphasize power, dominance and military conflicts. A reformed teaching of history might instead be a chronicle of the gradual cultural advances of humankind as a whole, giving adequate recognition to the contributions of all nations and peoples, and giving weight to constructive achievements rather than to power struggles and conflicts.

### **Harmony in human relations; The problem of war**

When he heard of the nuclear destruction of Hiroshima and Nagasaki, Albert Einstein said, "Everything has changed except our way of thinking." Expressing the same thought, but in more detail, the Nobel laureate biochemist Albert Szent-Györgyi once wrote:

"The story of man consists of two parts, divided by the appearance of modern science at the turn of the century. In the first period, man lived in the world in which his species was born and to which his senses were adapted. In the second, man stepped into a new, cosmic world to which he was a complete stranger.... The forces at man's disposal were no longer terrestrial forces, of human dimension, but were cosmic forces, the forces which shaped the universe. The few hundred Fahrenheit degrees of our flimsy terrestrial fires were exchanged for the ten million degrees of the atomic reactions which heat the sun."

"This is but a beginning, with endless possibilities in both directions - a building of a human life of undreamt-of wealth and dignity, or a sudden end in utmost misery. Man lives in a new cosmic world for which he was not made. His survival depends on how well and how fast he can adapt himself to it, rebuilding all his ideas, all his social and political institutions."

"...Modern science has abolished time and distance as factors separating nations. On our shrunken globe today, there is room for one group only - the family of man."

New ways of thinking are urgently required to deal with the threat of nuclear weapons. The need for new ways of thinking implies a need for new modes of education. Two enormous tasks for the future will face the students

passing through our educational systems. The first task is to stabilize global population. The second great task for the future will be to eliminate the institution of war and to replace it by humane governance and an equitable system of laws at the global level.

During the last century, the rapid development of science has made war progressively more horrible and potentially catastrophic. In the First World War it became clear that the romantic ideal of war no longer existed. Ideals of heroism, patriotism and gallantry filled the minds of the millions of young men who went to war in 1914, but instead of the romantic adventures they expected, they experienced the horrors of trench warfare, gangrene, barbed wire, artillery bombardments, machine-gun slaughter, and poison gas. Sixty-five million soldiers were mobilized in the First World War. When it was over, 37.5 million of these were casualties - either killed, wounded or missing. For some countries, the percentage of casualties among the mobilized soldiers was astonishingly high: Austria-Hungary mobilized 7.8 million soldiers, and of these, 7.0 million were casualties, i.e., 90%! For Germany, Russia, France and Romania, the percentages were respectively 65%, 76%, 76%, and 71%.

In the Second World War, the number of soldiers killed was roughly the same as in World War I, but the numbers of civilian deaths was much larger. In the USSR alone, about 20 million people are thought to have been killed, directly or indirectly, by World War II, and of these only 7.5 million were battle deaths. Many of the USSR's civilian deaths were caused by starvation, disease or exposure. Civilian populations also suffered greatly in the devastating bombings of cities such as London, Coventry, Rotterdam, Warsaw, Dresden, Cologne, Berlin, Tokyo, Hiroshima and Nagasaki.

If we look several decades into the future, it becomes clear that the survival of civilization requires that nuclear weapons (and ultimately the institution of war itself) must be abolished. Here are some facts that indicate how pressing the danger really is:

- **Despite the end of the Cold War, and despite reductions following the SALT treaties, there are still 30,000 nuclear weapons in the world.** 95% of these weapons are in the United States and Russia, but China, Great Britain, France, Pakistan, India, North Korea and Israel have sufficient numbers to do enormous damage. Israel is thought to have between 100 and 200 nuclear weapons, including thermonuclear bombs and neutron bombs.

- **44 countries have access to the fissile materials and technology needed to make nuclear weapons.** As the number of countries possessing these weapons increases, there is an increasing danger that they will be used in conflicts, or that, through collapse of an unstable state, the weapons will fall into the hands of subnational groups.
- **More than 4,500 warheads remain on hair-trigger alert.** If the “fire on warning” status of these warheads is not reduced, then, over a long period of time, the danger that a catastrophic accident will occur will increase so much as to become almost a certainty. According to the US government, there were 32 accidents, false alarms and malfunctions involving US nuclear weapons prior to 1980. Several of these brought us to the brink of accidental nuclear war. In the USSR, an especially dangerous accident occurred on 26 September, 1983. A newly-installed Soviet surveillance system reported that the United States had launched a missile attack against the Soviet Union. Had it not been for the insistence of Colonel Stanislov Petrov that this should be reported as a false alarm, thousands of warheads would have been launched against the US in retaliation. The megatonnage involved in the resulting thermonuclear exchange between the two countries would have been 30 to 60 times the amount needed to produce nuclear winter. This incident is considered by many analysts to be the closest the world has come to a full-scale nuclear disaster, but there is a great threat that such an accident will actually occur in the future.
- **There are more than 3,000,000 kilograms of highly enriched uranium (HEU) and plutonium in the world.** Almost half of this fissile material is in Russia, in poorly-guarded installations. A subnational organization in possession of a critical mass of HEU would be capable of constructing a crude gun-type nuclear weapon. In such a device, two grapefruit-sized subcritical pieces of HEU are placed at opposite ends of a cannon, and are driven together by conventional explosives. Such a device, brought into a city by means of a truck or boat and exploded, could destroy the city center and cause several hundred thousand deaths. The sequence of events initiated by such a nuclear terrorist attack could be catastrophic.
- **The Nuclear Non-Proliferation Treaty (NPT) is in danger.**

The NPT has been in force as international law since 1970 and it has now been signed by 187 nations. In this treaty, the five original nuclear weapon states (the US, USSR, France, China and England) agreed to take effective steps towards complete nuclear disarmament (Article IV). In return, the non-nuclear-weapon states agreed not to obtain these weapons. Israel, India and Pakistan have refused to sign the NPT, and North Korea has withdrawn its signature. The NPT is reviewed every 5 years and it was reviewed again in May, 2005. However, the disagreement between the nuclear weapon states and those lacking these weapons was so great that they could not even agree on an agenda for the 2005 NPT Review Conference. The nuclear weapon states refused even to discuss the 13 Practical Steps towards nuclear disarmament which were agreed on at the NPT Review Conference in 2000.

These facts indicate that the world must construct a system of global law to replace the institution of war as a means of resolving conflicts. The facts also indicate that we do not have an unlimited time in which to make these reforms. A more detailed discussion of problems related to war and nuclear weapons can be found on this website in in *Space-Age Science and Stone-Age Politics*.

## **The interrelatedness of global problems; War as a cause of poverty**

It is important to notice all of the major problems facing the world today are closely interlinked. For example, the problem of eliminating global inequality and poverty is linked in several ways with the problem of eliminating war.

In the first place, war is one of the greatest sources of poverty. For example, much of the enormous third world debt is due to arms purchases, which make no constructive contribution to development. Indeed, the pervasiveness of small arms in parts of Africa makes armed conflict there so endemic that development is all but impossible. Wars also destroy infrastructure and damage ecology on a large scale. One can think, for example of the destruction of power plants and water purification plants in Iraq during the first Gulf war or the use of defoliants during the Viet Nam War. The defoliants destroyed forests and made large areas of land unsuitable for agriculture.

Victims of land mines, poison gas, bombings or small arms can be crippled for life and can become economic burdens for their societies. Soldiers are taken away from useful occupations during wars, and if killed or severely wounded, they can no longer help their families. The treatment of war casualties imposes a great burden on medical facilities. Psychological damage is inflicted soldiers (especially child soldiers), making them unfit for useful roles in society. Industries making munitions are diverted from useful activities. Thus, in a variety of ways, war is one of the most important sources of poverty.

### **Poverty as a hindrance to global law and governance**

A second link between poverty and the problem of war has to do with the contrasts between rich and poor nations as a hindrance to the development of international law and governance. If we survey the nations of the world, we can find many within which good government has been achieved, together with some measure of internal peace and happiness. Some very large countries can claim to function as coherent (although not ideal) social units, with almost complete freedom from internal wars. One can think, for example, of Brazil, India, China, the United States and Russia. Each of these countries is so large and has such an inhomogeneous population that the problem of achieving internal peace within them is not qualitatively different from the problem of achieving peace throughout the entire world. The same methods that each of these enormous countries uses within itself could be used globally - for example education for social cohesion, and systems of laws that act on individuals. However, plans for strong government at a global level are blocked by enormous contrasts between rich and poor nations. Rich nations fear that with a strong world government, they would lose the advantages that they now have.

The European Union has already encountered the problem of economic inequality as a barrier to efforts to strengthen and enlarge the federation. The richer nations of the EU fear that they will have to pay high taxes to support economic progress in the poorer parts of the Union. Nevertheless, the EU is attempting to solve these problems, motivated by the conviction that whatever its defects, some degree of political union is needed to rule out the possibility that the horrors of World Wars I and II will ever be repeated. The EU is extremely interesting since it gives us a model of what needs to be

done globally. Of course the global contrasts between rich and poor nations are far greater than those found within the EU, but these global North-South contrasts also can be and must be eliminated.

The legacy of the Industrial Revolution and colonialism can be seen in the division of today's world into a set of rich industrialized countries (typified by the G8) and a group of developing countries with far smaller per capita GDP's. The problem of achieving equal economic conditions throughout the world must be solved by the generation of students now going through our school system, and their education must prepare them for this task. A stable future world cannot be a world of inequality.

## **Pandemics, poverty and war**

Another problem facing the world today is the resurgence of infectious disease. Examples of this are pandemics of HIV/AIDS, malaria, and drug-resistant tuberculosis. The seriousness of these pandemics can be gauged by the following statistics:

- In 2004, there were approximately 39.4 million people living with HIV, 4.9 million new HIV infections, and 3.1 million deaths due to AIDS. It is estimated that in five populous countries, Nigeria, Ethiopia, Russia, India and China, the number of people infected with HIV/AIDS will grow from 14-23 million currently to 50-75 million by 2010. 95% of those living with HIV/AIDS do not know that they are infected with the disease.
- Approximately 2 billion people (one third of the world's population!) are infected with TB, often in a latent form. 90% of the burden of TB falls on the developing countries; on India alone, 30%. Roughly 2 million people die from TB each year. It is the number one killer of women of childbearing age.
- Every year there are 300 million cases of malaria, and it causes about one million deaths. There are roughly 10 new cases of malaria every second, 90% of which are in Africa. A quarter of all childhood deaths in Africa are due to malaria.

Clearly these pandemics are linked to poverty, both as causes of poverty and as its effects. They are also linked to the problem of war. Today, the

world spends roughly a trillion (million million) US dollars each year on armaments. This amount of money is almost too large to imagine, and if we instead used it constructively, almost all of the problems facing the world today could be solved. In particular, a tiny fraction of the money wasted (or worse than wasted) on armaments could drastically reduce the number of deaths from malnutrition and preventable disease.

The World Health Organization lacks funds to carry through an anti-malarial program on as large a scale as would be desirable, but the entire program could be financed for less than our military establishments spend in a single day. Five hours of world arms spending is equivalent to the total cost of the 20-year WHO campaign that resulted in the eradication of smallpox. For every 100,000 people in the world, there are 556 soldiers, but only 85 doctors. Every soldier costs an average of \$20,000 per year, while the average spent on education is only \$380 per school-aged child. With a diversion of funds consumed by three weeks of military spending, the world could create a sanitary water supply for all its people, thus eliminating the cause of almost half of all human illness.

A new drug-resistant form of tuberculosis has recently become widespread in Asia and in the former Soviet Union. In order to combat this new and highly dangerous form of tuberculosis and to prevent its spread, WHO needs \$500 million, an amount equivalent to 4 hours of world arms spending.

Today's world is one in which roughly ten million children die every year from starvation or from diseases related to poverty. Besides this enormous waste of young lives through malnutrition and preventable disease, there is a huge waste of opportunities through inadequate education. The rate of illiteracy in the 25 least developed countries is 80%, and the total number of illiterates in the world is estimated to be 800 million. Meanwhile every 60 seconds the world spends \$2 million on armaments.

## **Population growth as a cause of poverty**

It is vital for the wellbeing of future generations that global population should be stabilized and perhaps even somewhat reduced. Here again there are links to the problem of war. T.R. Malthus, one of the pioneers of demography, pointed out that at almost all times, populations are held in check by strong forces. These may be preventive checks, such as late marriage or birth control; but if the preventive checks fail, the grim "Malthusian forces" come into play

- famine, disease and war. One hopes that in the future it may be possible to reduce the human suffering caused by the terrible Malthusian forces - war, famine, and disease. But if these positive checks to exponential population growth are removed, they must be replaced by preventive checks.

One of the goals of the World Health Organization has been the ideal aim of providing primary health to all people throughout the world. The former Director General of WHO, Halfdan Mahler, realized that his organization had a responsibility for providing social health as well as health in the purely biological sense. Therefore Dr. Mahler believed that primary health care should include the provision of the materials and information needed for family planning. He expressed the relationship between health, development and family planning in the following words:

“Country after country has seen painfully achieved increases in total output, food production, health and educational facilities and employment opportunities reduced or nullified by excessive population growth. Most underdeveloped countries therefore seek to limit their population growth.”

“The lesson of recent years is that virtually wherever health-care facilities have been made available, women have demanded information and the necessary materials for spacing their children and limiting their families.”

Thus the universal provision of primary health care could help greatly to stabilize the global population. Adequate money for this purpose would be easily available if it were not wasted on armaments. Education, especially education of girls, is also strongly linked to population stabilization, and the money needed for education is only a tiny fraction of the trillion dollars spent each year on war. See also *Malthus Essay on the Principle of Population* on this website.

## **War, education and the mass media**

Advocates of education for peace can obtain important guidance and encouragement from UNESCO - the United Nations Educational, Scientific and Cultural Organization. The Constitution of UNESCO, was written immediately after the end of the Second World War, during which education had been misused (especially in Hitler's Germany) to indoctrinate students in such a way that they became uncritical and fanatical supporters of military dictatorships. The founders of the United Nations were anxious to correct this misuse, and to make education instead one of the foundations

of a peaceful world. One can see this hope in the following paragraph from UNESCO's Constitution:

“The purpose of the Organization is to contribute to peace and security by promoting collaboration among nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations.” In other words, UNESCO was given the task of promoting education for peace, and of promoting peace through international cooperation in education.

During the time when he was Secretary-General of UNESCO, Federico Mayor Zaragoza of Spain introduced the concept of a *Culture of Peace*. He felt, as many did, that civilization was entering a period of crisis. Federico Mayor believed this crisis to be as much spiritual as it was economic and political. It was necessary, he felt, to counteract our present power-worshiping culture of violence with a Culture of Peace, a set of ethical and aesthetic values, habits and customs, attitudes towards others, forms of behavior and ways of life. Mayor and UNESCO implemented this idea by designating the year 2000 as the International Year of the Culture of Peace.

In addition, Federico Mayor and UNESCO initiated a Campaign for the Children of the World, and this eventually developed into the International Decade for a Culture of Peace and Non-Violence for the Children of the World (2001-2010). In support of this work, the UN General Assembly drafted a Program of Action on a Culture of Peace (53rd Session, 2000). The Program of Action obliges its signatories to “ensure that children, from an early age, benefit from education on the values, attitudes, modes of behavior and ways of life to enable them to resolve any dispute peacefully and in a spirit of respect for human dignity and of tolerance and non-discrimination”, and to “encourage the revision of educational curricula, including textbooks...”

Just as this program was starting, the September 11 terrorist attacks gave an enormous impetus to the culture of violence, and almost silenced the voices speaking for a Culture of Peace. Since that event, the mass media (which are an important part of our educational system) have more than ever supported a culture of violence and war.

Scientific progress has given us almost miraculously powerful means of electronic communication. If properly used, they could help enormously in the task of building a global ethic and global consciousness, but too often

they are misused to support narrow nationalism and the culture of war and violence. If a peaceful and stable future world is to be built, it must be through reform of education and reform of the mass media.

Why doesn't the United Nations have its own global television and radio network? Such a network could produce an unbiased version of the news. It could broadcast documentary programs on global problems. It could produce programs showing viewers the music, art and literature of other cultures than their own. It could broadcast programs on the history of ideas, in which the contributions of many societies were adequately recognized. At New Year, when people are in the mood to think of the past and the future, the Secretary General of the United Nations could broadcast a "State of the World" message, summarizing the events of the past year and looking forward to the new year, with its problems, and with his recommendations for their solution. A United Nations television and radio network would at least give viewers and listeners a choice between programs supporting militarism, and programs supporting a global culture of peace. At present they have little choice. A more detailed discussion of these issues can be found on this website in Chapter 9 of *Space-Age Science and Stone-Age Politics*.

## **Learning the concept of harmony from pre-industrial cultures**

The era of colonialism has left the industrialized countries with a rather arrogant attitude towards other cultures. Although formal political colonialism has almost entirely vanished, many of the assumptions of the colonial era persist and are strongly supported by the mainstream mass media. It is assumed by many people in the industrialized North that if the developing countries would only learn mass production, modern farming techniques and a modern lifestyle, all would be well. However, a sustainable global future may require a transfer of knowledge, techniques and attitudes in precisely the opposite direction - from pre-industrial societies to highly industrialized ones. The reason for this is that the older societies have cultures that allow them to live in harmony with nature, and this is exactly what the highly industrial North must learn to do.

Industrialism and the rapid development of science and technology have given some parts of the world a 200-year period of unbroken expansion and

growth, but today this growth is headed for a collision with a wall-like barrier - limits set by the carrying capacity of the global environment and by the exhaustion of non-renewable resources. Encountering these limits is a new experience for the the industrialized countries. By contrast, pre-industrial societies have always experienced limits. The industrialized world must soon replace the economics of growth with equilibrium economics. Pre-industrial societies have already learned to live in equilibrium - in harmony with nature.

Like biodiversity, cultural diversity is an extremely valuable resource, and for similar reasons. A large genetic pool gives living organisms the flexibility needed to adapt to changes in the environment. Similarly, cultural diversity can give humans the flexibility needed to cope with change. In the changed world of today (changed by the invention of thermonuclear weapons and by the extraordinary growth of global population and commerce) we urgently need to learn to live in harmony, in harmony with ourselves, in harmony with nature, and in harmony with other members of our species. We can do this if we draw on the full human heritage of cultural diversity. We can draw not only on the knowledge and wisdom of presently existing societies, but also on the experiences and ideas of societies of the past.

- **The Pythagorean concept of harmony:** In the ancient world, the concept of harmony was developed to a high level by the Pythagoreans. The Pythagoreans used the idea of harmony to understand medicine, music, mathematics and ethics. A description of Pythagorean ideals can be found on this website in Chapter 2 of *Science and Society*.
- **The concept of harmony in Chinese civilization:** Chinese civilization is very ancient, and it has made many extremely important contributions to the cultural heritage of the world - for example, the invention of paper, ink, printing and the magnetic compass. Agriculture began in China as early as 6,000 B.C. The art of working in bronze was developed in China during the Shang dynasty (1,500 B.C. - 1,100 B.C.) and it reached a high pitch of excellence in the Chou dynasty (1,100 B.C. - 250 B.C.).

In the Chou period, many of the cultural characteristics which we recognize as particularly Chinese were developed. During this period, the Chinese evolved a code of behavior based on politeness and ethics. Much of this code of behavior is derived from the teachings of K'ung

Fu-tzu (Confucius), a philosopher and government official who lived between 551 B.C. and 479 B.C.. The “Golden Rule” was known to K’ung Fu-tzu, but was formulated in a negative way: “Do not do to others anything that you would not like them do to you”.

The rational teachings of K’ung Fu-tzu were complemented by the more mystical and intuitive doctrines of Lao-tzu and his followers. Lao-tzu lived at about the same time as K’ung Fu-tzu, and he founded the Taoist religion. The Taoists believed that unity with nature could be achieved by passively blending oneself with the forces of nature.

On the whole, politicians and scholars followed the practical teachings of K’ung Fu-tzu, while poets and artists became Taoists. The intuitive sensitivity to nature inspired by Taoist beliefs allowed these artists and poets to achieve literature and art of unusual vividness and force with great economy of means. The Taoist religion has much in common with Buddhism, and its existence in China paved the way for the spread of Buddhism from India to China and Japan.

Taoist and Confucian teachings each emphasized a particular aspect of harmony. Taoism emphasized harmony with nature, while Confucianism taught harmonious relationships between humans. Thus in China, harmony became an ideal advocated by both traditions. The Chinese respect for harmony as an ideal can be seen, for example, in the beautiful Temple of Divine Harmony in Beijing.

- **India:** Evidence of a very early river-valley civilization in India has been found at a site called Mohenjo-Daro. However, in about 2,500 B.C., this early civilization was destroyed by some great disaster, perhaps a series of floods; and for the next thousand years, little is known about the history of India. During this dark period between 2,500 B.C. and 1,500 B.C., India was invaded by the Indo-Aryans, who spoke Sanskrit, a language related to Greek. The Indo-Aryans partly drove out and partly enslaved the native Dravidians. However, there was much intermarriage between the groups, and to prevent further intermarriage, the Indo-Aryans introduced a caste system sanctioned by religion.

According to Hindu religious belief, the soul of a person who has died is reborn in another body. If, throughout his life, the person has faithfully performed the duties of his caste, then his or her soul may be reborn

into a higher caste. Finally, after existing as a Brahman, the soul may be so purified that it can be released from the cycle of death and rebirth.

In the 6th century B.C., Gautama Buddha founded a new religion in India. Gautama Buddha was convinced that all the troubles of humankind spring from an excessive attachment to earthly things. He felt that the only escape from sorrow is through the renunciation of earthly desires. He also urged his disciples to follow a high ethical code, the Eightfold Way. Among the sayings of Buddha are the following:

“Hatred does not cease by hatred at any time; hatred ceases by love.”

“Let a man overcome anger by love; let him overcome evil by good.”

“All men tremble at punishment. All men love life. Remember that you are like them, and do not cause slaughter.”

Both Hindu and Buddhist traditions emphasize the unity of all life on earth. Hindus regard killing an animal as a sin, and many try to avoid accidentally stepping on insects as they walk. (The Hindu and Buddhist picture of the relatedness of all life on earth has been confirmed by modern biological science. We now know that all living organisms have the same fundamental biochemistry, based on DNA, RNA, proteins and polysaccharides, and we know that our own human genomes are more similar to than different from the genomes of our close relations in the animal world.)

The peoples of the industrialized nations urgently need to acquire a non-anthropocentric element in their ethics, similar to reverence for all life found in the Hindu and Buddhist traditions, as well as in the teachings of Saint Francis of Assisi and Albert Schweitzer. We need to learn to value other species for their own sakes, and not because we expect to use them for our own economic goals.

The Buddhist concept of karma has great value in human relations. The word “karma” means simply “action”. In Buddhism, one believes that actions return to the actor. Good actions will be returned, and bad actions will also be returned. This is obviously true in social relationships. If we behave with kindness and generosity to our neighbors, they will return our kindness. Conversely, a harmful act may lead to a vicious circle of revenge and counter-revenge which can only be broken

by returning good for evil. However the concept of karma has a broader and more abstract validity beyond the direct return of actions to the actor.

When we perform a good action, we increase the total amount of good karma in the world. If all people similarly behave well, the the world as a whole will become more pleasant and more safe. Human nature seems to have a built-in recognition of this fact, and we are rewarded by inner happiness when we perform good and kind actions. In his wonderful book, “Ancient Wisdom, Modern World”, the Dalai Lama says that good actions lead to happiness and bad actions to unhappiness even if our neighbors do not return these actions. Inner peace, he tells us, is incompatible with bad karma and can be achieved only through good karma, i.e. good actions.

There is a great deal of similarity between the Buddhist concept of karma and some of the ethical principles of Christianity, particularly principles that appear in the Sermon on the Mount. Also Buddha’s saying “Hatred does not cease by hatred at any time; hatred ceases by love” echoes the Christian principle of returning good for evil. Both are aimed at stopping vicious circles of revenge and counter-revenge, such as those that can now be observed in the Middle East.

More details about the Chinese and Indian civilizations can be found in Chapter 4 of *Science and Society*

- **Bhutan** Before the doors of Bhutan were cautiously opened to visitors in 1974, the country remained aloof from the modern world. One of the most striking characteristics of the ancient Bhutanese culture was that most of the actions of its citizens were done from a sense of duty and tradition, rather than for economic reasons. The citizens of Bhutan derived great happiness from these actions. For example, caring for the elderly was to them not only a duty but also a great source of pleasure. It is doubtful whether modernization will increase the happiness of the Bhutanese.
- **Harmony with nature in the Native American culture:** The attitude towards nature of the Sioux can be seen from the following quotations from *Land of the Spotted Eagle* by the Lakota (Western Sioux) chief, Standing Bear (ca. 1834 - 1908):

“The Lakota was a true lover of Nature. He loved the earth and all things of the earth... From Waken Tanka (the Great Spirit) there came a great unifying life force that flowered in and through all things – the flowers of the plains, blowing winds, rocks, trees, birds, animals – and was the same force that had been breathed into the first man. Thus all things were kindred and were brought together by the same Great Mystery.”

“Kinship with all creatures of the earth, sky, and water was a real and active principle. For the animal and bird world there existed a brotherly feeling that kept the Lakota safe among them. And so close did some of the Lakota come to their feathered and furred friends that in true brotherhood they spoke a common tongue.”

“The animal had rights – the right of man’s protection, the right to live, the right to multiply, the right to freedom, and the right to man’s indebtedness – and in recognition of these rights the Lakota never enslaved the animal, and spared all life that was not needed for food and clothing.”

“This concept of life was humanizing and gave to the Lakota an abiding love. It filled his being with the joy and mystery of things; it gave him reverence for all life; it made a place for all things in the scheme of existence with equal importance to all. The Lakota could despise no creature, for all were one blood, made by the same hand, and filled with the essence of the Great Mystery.”

A similar attitude towards nature can be found in traditional Inuit cultures.

- **St. Francis of Assisi (1181-1226) and Mahatma Gandhi (1869-1948):** There are similarities between the doctrines of these two great ethical teachers. Both came from wealthy families, but during the course of their lives they acquired strong sympathy with the poor and rejected excessive attachment to worldly goods. Both dressed in the simplest possible rough homespun clothes. (Gandhi said, “Live simply that others may simply live.”) Both taught peace between humans and kindness to all life. St. Francis is said to have preached sermons to the birds; Gandhi personally took care of sick animals in his ashram.

- **Respect for nature in African cultures:** In some parts of Africa, a man who plans to cut down a tree offers a prayer of apology, telling the tree why necessity has forced him to harm it. This pre-industrial attitude is something from which the industrialized North could learn. In industrial societies, land “belongs” to some one, and the owner has the “right” to ruin the land or to kill the communities of creatures living on it if this happens to give some economic advantage, in much the same way that a Roman slaveowner was thought to have the “right” to kill his slaves. Pre-industrial societies have a much less rapacious and much more custodial attitude towards the land and towards its non-human inhabitants.
- **Preservation of the land for future generations:** Many traditional agricultural societies have an ethical code that requires them to preserve the fertility of the land for future generations. This recognition of a duty towards the distant future is in strong contrast to the shortsightedness of modern economists. For example, John Maynard Keynes has been quoted as saying “In the long run, we will all be dead”, meaning that we need not look that far ahead. By contrast, members of traditional agricultural societies recognize that their duties extend far into the distant future, since their descendants will still be alive.

The pre-industrial societies and ethical teachers mentioned above have much to tell us about how to achieve harmony with ourselves, harmony with nature, and harmony with other members of our own species. Of course it is necessary to learn from the best aspects of each culture and not the worst. Also we must remember that the population of the world is now so large that a complete return to a pre-industrial way of life would not be possible. However, some of the values and attitudes of pre-industrial cultures can help us to an awareness of what it will take to achieve a truly sustainable global society.

The advertising-driven orgies of consumerism that characterize modern market economies cannot be extended into the distant future because of limitations that will be imposed by exhaustion of non-renewable resources and by the limited carrying capacity of the global environment. Therefore we need to stop using material goods as a measure of merit. Gandhi deliberately reduced his possessions to a minimum in order to demonstrate that merit and

goods are not synonymous. St. Francis did the same. We can learn from them, and from the values of pre-industrial societies, to stop worshipping the false ideals, *Power*, *Dominance*, *Growth*, and *Profit*. Instead we must learn to live in *Harmony*.

## **Education for a harmonious future**

Our educational system must reflect the kind of world that we want for the future - and what kind of world do we want? We want a world where war is abolished as an institution, and where the enormous resources now wasted on war are used constructively. We want a world where a stable population of moderate size lives in comfort and security, free from fear of hunger or unemployment. We want a world where peoples of all countries have equal access to resources, and an equal quality of life. We want a world with a new economic system, not designed to produce unlimited growth, but aiming instead at meeting the real needs of the human community in equilibrium with the global environment. We want a world of changed values, where extravagance and waste are regarded as morally wrong; where kindness, wisdom and beauty are admired; and where the survival of other species than our own is regarded as an end in itself, not just a means to our own ends.

In our reverence for the intricate beauty and majesty of nature, and our respect for the dignity and rights of other humans, we can feel united with the great religious and philosophical traditions of mankind, and with the traditional wisdom of our ancestors.

Pictures sent back by the astronauts show the earth as it really is - a small, fragile, beautiful planet, drifting on through the dark immensity of space - our home, where we must learn to live in harmony with nature and with each other.

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