

# COLLECTED ESSAYS, VOLUME V

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# OUR CHILDREN'S FUTURE

## Loving care for our children

We give our children loving care, but it makes no sense to do so unless we do everything in our power to give them a future world in which they can survive. We also have a duty to our grandchildren, and to all future generations.

Today we are faced with the threat of an environmental megacatastrophe, of which the danger of catastrophic climate change is a part. We also face the threat of an all-destroying nuclear war.

Finally, because of population growth, the effect of climate change on agriculture, and the end of the fossil fuel era, there is a danger that by the middle of the present century a very large-scale famine could take the lives of as many as a billion people.

We owe it to our children to take urgent action to prevent these threats from becoming future realities. We must also act with dedication to save our children from other social ills that currently prevent their lives from developing in a happy and optimal way, for example child labor, child slavery, starvation, preventable disease and lack of education. These, too, are threats to our children's future.

## The climate emergency: Urgent action is needed

The annual Emissions Gap report from the U.N. Environmental Program (UNEP), released on November 26, 2019, warned that nations' commitments under the Paris climate accord from which U.S. President Donald Trump began formally withdrawing this month - are not nearly sufficient to bring about the widespread changes needed to avert climate catastrophe.

The report stated that global temperatures are on track to rise as much as 3.2°C by the end of the century, meaning only drastic and unprecedented emissions reductions can stave off the most devastating consequences of the climate crisis. What is needed, according to the report, is a complete halt in the production of fossil fuels.

Renewable energy is now cheaper than fossil fuels, so the transition to renewables could be driven by economic forces alone, if governments worldwide would stop their sponsorship of fossil fuel industries, to which they currently give enormous tax benefits and other subsidies.

Other urgently needed actions are a halt to deforestation, combined with massive reforestation, substitution of other building materials for cement, better climate coverage in the mass media, abandonment of growth-oriented economic goals, shift to more plant-based diet, and deep cuts in military activities.

## We must rid the world of nuclear weapons

A Treaty banning nuclear weapons was adopted by an overwhelming majority vote on the floor of the UN General Assembly, following the precedent set by the Arms Trade Treaty. The Treaty on the Prohibition of Nuclear Weapons was passed on 7 July, 2017. It prohibits



Figure 1: “Ensuring a livable planet for future generations means getting serious about phasing out coal, oil, and gas,” said Christiana Figueres, former executive secretary of the UNFCCC, “Countries such as Costa Rica, Spain, and New Zealand are already showing the way forward, with policies to constrain exploration and extraction and ensure a just transition away from fossil fuels. Others must now follow their lead.”



Figure 2: **One of a series of prints which the German artist Käthe Kollwitz (1867-1945) made as a protest against the atrocities of World War I.**

the development, testing, production, stockpiling, stationing, transfer, use and threat of use of nuclear weapons, as well as assistance and encouragement to the prohibited activities. For nuclear armed states joining the treaty, it provides for a time-bound framework for negotiations leading to the verified and irreversible elimination of its nuclear weapons programme.

The International Campaign to Abolish Nuclear Weapons (ICAN) campaigned vigorously for the adoption of the Treaty, and was awarded the 2017 Nobel Peace Prize for its efforts. Although bitterly opposed by nuclear weapons states, the Treaty has great normative value, and one fervently hopes that the force of public opinion will eventually force all governments to give their citizens what the vast majority long for: a nuclear-weapon-free world.

It is generally agreed that a full-scale nuclear war would have disastrous effects, not only on belligerent nations but also on neutral countries. As long as there are nations that possess nuclear weapons, there is a danger that they will be used, either deliberately or through a technical or human error, or through unconcontrollable escalation of a conflict. Only a nuclear-free world will be safe for our children and the biosphere.

## **We must address the threat of widespread famine**

As glaciers melt in the Himalayas, depriving India and China of summer water supplies; as sea levels rise, drowning the fertile rice fields of Viet Nam and Bangladesh; as drought threatens the productivity of grain-producing regions of North America; and as the end of the fossil fuel era impacts modern high-yield agriculture, there is a threat of wide-spread famine. There is a danger that the 1.5 billion people who are undernourished today will not survive an even more food-scarce future.

People threatened with famine will become refugees, desperately seeking entry into



Figure 3: Another anti-war print by Käthe Kollwitz.



Figure 4: Today, the existence of all-destroying modern weapons makes war prohibitively dangerous. If human civilization is to survive, the institution of war must be abolished. This will require effective governance at the global level. The United Nations must be strengthened and given many times the amount of money that it presently has. The UN must also be given the power to make laws that are binding on individuals.





## EDUCATION

## A transformative Response to Major Societal Challenges



countries where food shortages are less acute. Wars, such as those currently waged in the Middle East, will add to the problem.

What can we do to avoid this crisis, or at least to reduce its severity? We must urgently address the problem of climate change; and we must shift money from military expenditure to the support of birth control programs and agricultural research. We must also replace the institution of war by a system of effective global governance and enforceable international laws.

## **We must eliminate child labor and child slavery**

Worldwide 10 million children are in slavery, trafficking, debt bondage and other forms of forced labor, forced recruitment for armed conflict, prostitution, pornography and other illicit activities, according to the International Labor Organization, (ILO). 151.6 million are estimated to be in child labor (ILO). 114 million child laborers are below the age of 14 (ILO). 72 million children are in hazardous work that directly endangers their health, safety and moral development (ILO). More than 700 million women alive today were married before their 18th birthday. More than one in three (about 250 million) entered into union before age 15 (UNICEF). 300,000 children are estimated to serve as child soldiers, some even younger than 10 years old (UNICEF). 15.5 million children are in domestic work worldwide - the overwhelming majority of them are girls (ILO).

Child labor is undesirable because it prevents children from receiving an education. Furthermore, when parents regard their children as a source of labor or income, it motivates them to have very large families, and our finite earth, unlimited growth of population is a logical impossibility. Population growth increases the threat of large-scale famine as well as ecological catastrophe.

Child slavery is unacceptable, as is any form of slavery. Forced marriage, and very early marriage of girls as young as 9 in some countries are also unacceptable practices. The international community has a duty to see that existing laws against these practices are enforced.

## **We must reduce starvation and preventable disease**

According to a recent report published by the World Health Organization, in 2018 alone, 15,000 children died per day before reaching their fifth birthday. A WHO spokesman said, "It is especially unacceptable that these children and young adolescents died largely of preventable or treatable causes like infectious diseases and injuries when we have the means to prevent these deaths," the authors write in the introduction to the report. The global under-five mortality rate fell to 39 deaths per 1,000 live births in 2018, down from 76 in 2000 - a 49% decline.

"Despite advances in fighting childhood illnesses, infectious diseases remain a leading cause of death for children under the age of 5, particularly in sub-Saharan Africa and Southern Asia, says the report. Pneumonia remains the leading cause of death globally among children under the age of 5, accounting for 15% of deaths. Diarrhoea (8%) and

malaria (5%), together with pneumonia, accounted for almost a third of global under-five deaths in 2018. “Malnourished children, particularly those with severe acute malnutrition, have a higher risk of death from these common childhood illnesses. Nutrition-related factors contribute to about 45 per cent of deaths in children under 5 years of age,” warns the report. The estimates also show vast inequalities worldwide, with women and children in sub-Saharan Africa facing a higher risk of death than in all other regions. Level of maternal deaths are nearly 50 times higher for women in sub-Saharan Africa compared to high-income countries. In 2018, 1 in 13 children in sub-Saharan Africa died before their fifth birthday - this is 15 times higher than the risk a child faces in Europe, where just 1 in 196 children aged less than 5 die.

## **We must provide universal reformed education**

Illiteracy in the less developed countries exceeded that of the developed ones by a factor of ten in 1970. By 2000, this factor had increased to approximately 20. As our economies become more knowledge-based, education has become more and more important.

Besides universal education, educational reforms are urgently needed, particularly in the teaching of history. As it is taught today, history is a chronicle of power struggles and war, told from a biased national standpoint. Our own race or religion is superior; our own country is always heroic and in the right.

We urgently need to replace this indoctrination in chauvinism by a reformed view of history, where the slow development of human culture is described, giving adequate credit to all who have contributed.

The teaching of other topics, such as economics, should be reformed. Economics must be given both a social conscience and an ecological conscience. The mantra of growth must be abandoned, and the climate emergency must be addressed.

## **Childhood should be a time of joy**

Children’s play is not a waste of time. Children at play are learning skills that they will use later in their lives. Let us allow our children to play and learn, while we work to give them a secure future world. Let us give our children, not predominantly material goods, but rather the love, happiness and future that they deserve.

## **A new freely downloadable book**

I would like to announce the publication of a book, which examines the steps that we must take to give our children and their children a world in which they can survive. The book may be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/11/Our-Childrens-Future-by-John-Scales-Avery.pdf>



Figure 5: Celebrating Lucia Day in Sweden





Figure 6: **The King's College Choir in England**



Figure 7: **Children singing in Bhutan**



Figure 8: **Children singing in Africa**

# THE DEVIL'S DYNAMO

## **A military-industrial complex is a Devil's Dynamo**

A military-industrial complex involves a circular flow of money. The money flows like the electrical current in a dynamo, driving a diabolical machine. Money from immensely rich corporate oligarchs buys the votes of politicians and the propaganda of the mainstream media. Numbed by the propaganda, citizens allow the politicians to vote for obscenely bloated military budgets, which further enrich the corporate oligarchs, and the circular flow continues.

## **Colonialism was also a Devil's Dynamo**

The Devil's Dynamo of today has led to a modern version of colonialism and empire. It is therefore interesting to look at the first global era of colonialism: In the 18th and 19th centuries, the continually accelerating development of science and science-based industry began to affect the whole world. As the factories of Europe poured out cheap manufactured goods, a change took place in the patterns of world trade: Before the Industrial Revolution, trade routes to Asia had brought Asian spices, textiles and luxury goods to Europe. For example, cotton cloth and fine textiles, woven in India, were imported to England. With the invention of spinning and weaving machines, the trade was reversed. Cheap cotton cloth, manufactured in England, began to be sold in India, and the Indian textile industry withered, just as the hand-loom industry in England itself had done a century before.

As Europe became industrialized, European armaments allowed colonial expansion, until ultimately as much as 85% of the world's land surface fell under the colonial domination of the industrialized nations. Colonialism can be thought of as an early example military-industrial complexes. At this early stage of industrialism, we can already see wars conducted for the sake of resources. We can already see a circular flow of money from the profits of arms manufacturers to politicians and their newspaper supporters, and back to the arms manufacturers. We can already see the Devil's Dynamo at work. Chapter 2 reviews the history of these events.

Industrial and colonial rivalry contributed to the outbreak of the First World War, to which the Second World War can be seen as a sequel. The Second World War was terrible enough to make world leaders resolve to end the institution of war once and for all, and the United Nations was set up for this purpose. Article 2 of the UN Charter requires that All members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state." Chapters 3 and 4 discuss the events leading up to World Wars I and II, and to today's arms race. Chapter 9 discusses the growth of international law and proposals for UN Charter reform.

## **The Nuremberg Principles outlaw crimes against peace**

The Nuremberg principles, which were used in the trial of Nazi leaders after World War II, explicitly outlawed “Crimes against peace: (i) Planning, preparation, initiation or waging of war of aggression or a war in violation of international treaties, agreements or assurances; (ii) Participation in a common plan or conspiracy for the accomplishment of any of the acts mentioned under (i).”

## **Colonialism replaced by neocolonialism**

With the founding of the United Nations at the end of the Second World War, a system of international law was set up to replace the rule of military force. Law is a mechanism for equality. Under law, the weak and the powerful are in principle equal. The basic purpose of the United Nations is to make war illegal, and if war is illegal, the powerful and weak are on equal footing, much to the chagrin of the powerful. How can one can one construct or maintain an empire if war is not allowed? It is only natural that powerful nations should be opposed to international law, since it is a curb on their power. However, despite opposition, the United Nations was quite successful in ending the original era of colonialism, perhaps because of the balance of power between East and West during the Cold War. One by one, former colonies regained their independence. But it was not to last. The original era of colonialism was soon replaced by neocolonialism and by “The American Empire”.

## **Eisenhower’s Farewell Address**

The two world wars of the 20th Century involved a complete reordering of the economies of the belligerent countries, and a dangerous modern phenomenon was created - the military-industrial complex.

In his farewell address (January 17, 1961) US President Dwight David Eisenhower warned of the dangers of the war-based economy that World War II had forced his nation to build: “...We have been compelled to create an armaments industry of vast proportions”, Eisenhower said, “...Now this conjunction of an immense military establishment and a large arms industry is new in American experience. The total influence - economic, political, even spiritual - is felt in every city, every state house, every office in the federal government. ...We must not fail to comprehend its grave implications. Our toil, resources and livelihood are all involved; so is the very structure of our society. ... We must stand guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex. The potential for the disastrous rise of misplaced power exists and will persist. We must never let the weight of this combination endanger our democratic processes. We should take nothing for granted.”

This farsighted speech by Eisenhower deserves to be studied by everyone who is concerned about the future of human civilization and the biosphere. As the retiring president pointed out, the military-industrial complex is a threat both to peace and to democracy. It is not unique to the United States but exists in many countries. The world today spends



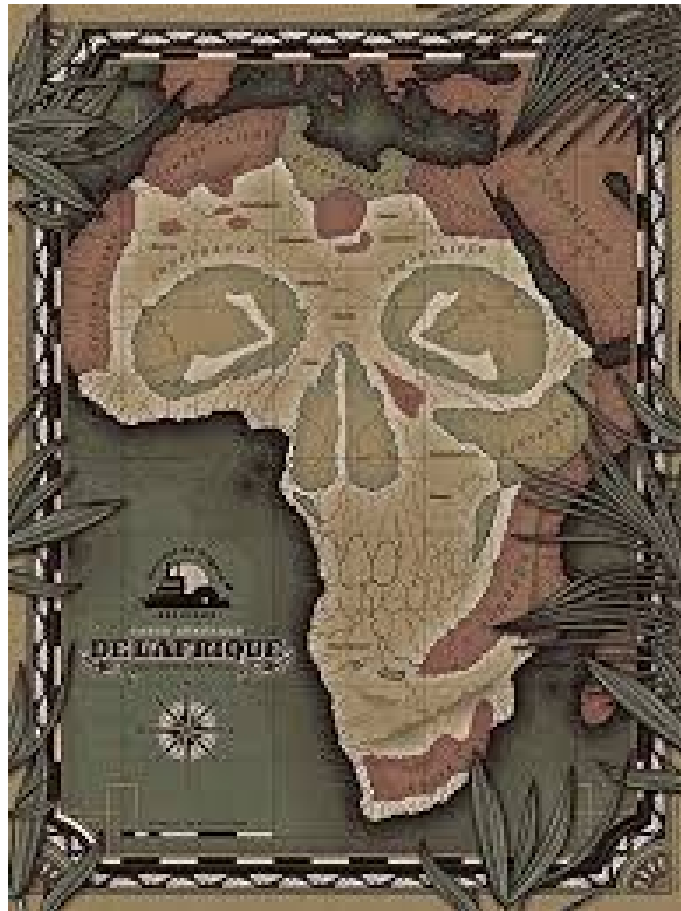


Figure 1: Half of the population of Belgian Congo died during the rule of Leopold II.

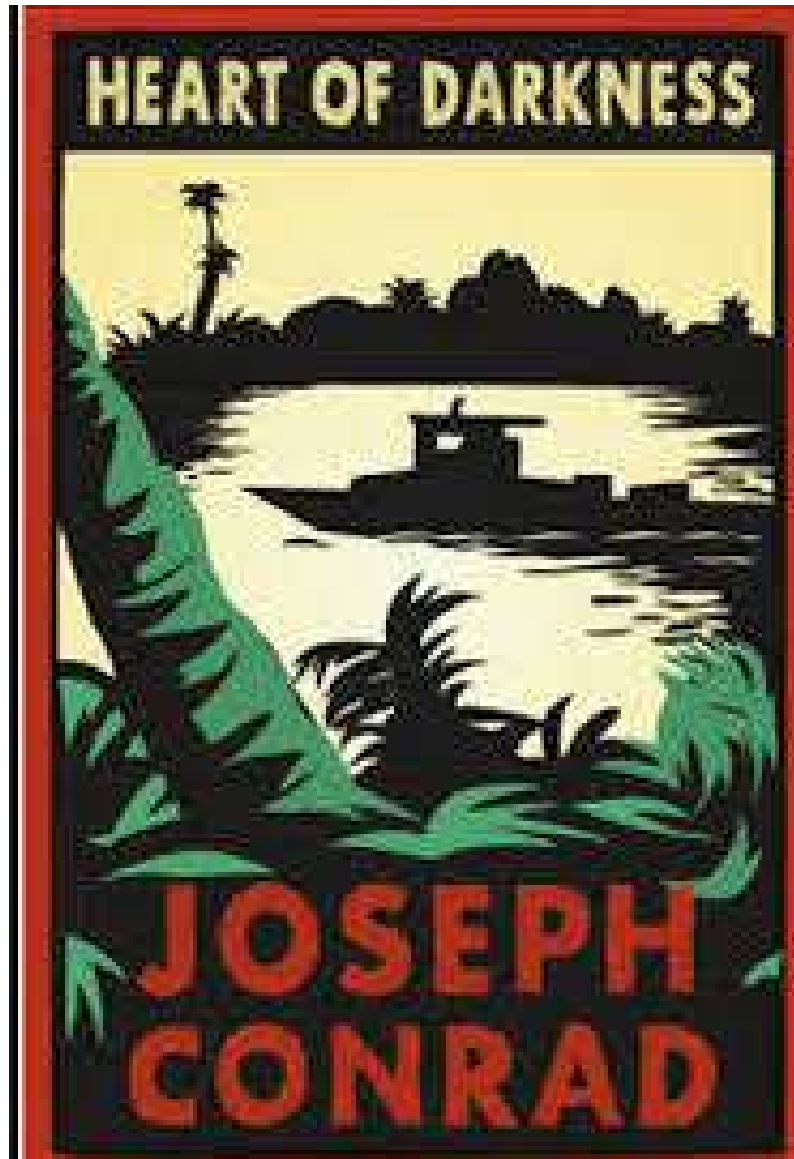


Figure 2: Joseph Conrad's famous book was written against the background of Leopold's atrocities.

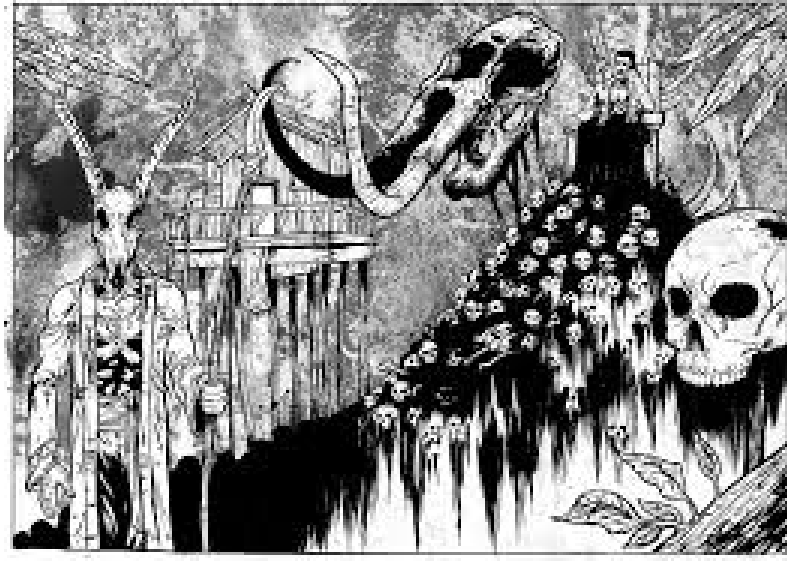


Figure 3: **Heart of Darkness:** An illustration for Joseph Conrad's book.



Figure 4: **Heart of Darkness:** A drawing used in the campaign to end Leopold's personal ownership of the Congo.



Figure 5: **Heart of Darkness:** In Leopold's Congo, human hands became a currency.



Figure 6: **World War I** casualties.



Figure 7: An arms race between the major European powers contributed to the start of World War I.



Figure 8: World War I was called “The War to End All Wars”. Today it seems more like The War that Began All Wars.



Figure 9: The naval arms race, which contributed to the start of World War I, enriched steel manufacturers and military shipbuilders.



Figure 10: Who is the leader, and who the follower?



Figure 11: The nuclear arms race casts a dark shadow over the future of human civilization and the biosphere.



Figure 12: During the Cuban Missile Crisis, the world came close to a catastrophic thermonuclear war.



Figure 13: A book by John Perkins, “Confessions of an Economic Hit-Man”, can give us an idea of the way in which our economic system operates to further enrich wealthy nations and impoverish poor ones. He wrote: “Economic hit men (EHMs) are highly paid professionals who cheat countries around the globe out of trillions of dollars. They funnel money from the World Bank, the U.S. Agency for International Development (USAID), and other foreign ‘aid’ organizations into the coffers of huge corporations and the pockets of a few wealthy families who control the planet’s natural resources.”.



roughly 1.7 trillion (i.e. 1.7 million million) US dollars each year on armaments. It is obvious that very many people make their living from war, and therefore it is correct to speak of war as a social, political and economic institution. The military-industrial complex is one of the main reasons why war persists, although everyone realizes that war is the cause of much of the suffering of humanity.

## **A military-industrial complex needs enemies**

A military-industrial complex needs enemies. Without them it would wither. Thus at the end of the Second World War, this vast power complex was faced with a crisis, but it was saved by the discovery of a new enemy: communism. The United States emerged from the two global wars as the world's dominant industrial power, taking over the position that Britain had held during the 19th century. The economies of its rivals had been destroyed by the two wars, but no fighting had taken place on American soil. Because of its unique position as the only large country whose economy was completely intact in 1945, the United States found itself suddenly thrust, almost unwillingly, into the center of the world's political stage.

The new role as "leader of the free world" was accepted by the United States with a certain amount of nervousness. America's previous attitude had been isolationism, a wish to be free from the wars and quarrels of Europe". After the Second World War, however, this was replaced by a much more active international role. Perhaps the new US interest in the rest of the world reflected the country's powerful and rapidly growing industrial economy and its need for raw materials and markets (the classical motive for empires). Publicly, however, it was the threat of Communism that was presented to American voters as the justification for interference in the internal affairs of other countries.

Today, after the end of the Cold War, it has become necessary to find another respectable motivation that can be used to justify foreign intervention, and the "Crusade Against Communism" has now been replaced by the "War on Terror".

## **Endless US wars cause immense suffering**

Despite the fact that initiating a war is a violation of the United Nations Charter and the Nuremberg Principles, the United States now maintains roughly 1000 military bases in 150 countries, According to Iraklis Tsavdaridis, Secretary of the World Peace Council, The establishment of US bases should not of course be seen simply in terms of direct military ends. They are always used to promote the economic and political goals of US capitalism. For example, US corporations and the US government have been eager for some time to build a secure corridor for US controlled oil and natural gas pipelines from the Caspian Sea in Central Asia through Afghanistan and Pakistan to the Arabian Sea. This region has more than 6 percent of the world's proven oil reserves, and almost 40 percent of its gas reserves. The war in Afghanistan and the creation of US military bases in Central Asia are viewed as a key opportunity to make such pipelines a reality."

Since World War II, the United States has interfered either militarily or covertly in the internal affairs of very many countries. These include China, 1945-49; Italy, 1947-48; Greece, 1947-49; Philippines, 1946-53; South Korea, 1945-53; Albania, 1949-53; Germany, 1950s; Iran, 1953; Guatemala, 1953-1990s; Middle East, 1956-58; Indonesia, 1957-58; British Guiana/Guyana, 1953-64; Vietnam, 1950-73; Cambodia, 1955-73; The Congo/Zaire, 1960-65; Brazil, 1961-64; Dominican Republic, 1963-66; Cuba, 1959-present; Indonesia, 1965; Chile, 1964-73; Greece, 1964-74; East Timor, 1975-present; Nicaragua, 1978-89; Grenada, 1979-84; Libya, 1981-89; Panama, 1989; Iraq, 1990-present; Afghanistan 1979-92; El Salvador, 1980-92; Haiti, 1987-94; Yugoslavia, 1999; and Afghanistan, 2001-present. Of the interventions just mentioned, the Vietnam War, the bombing of Cambodia and Laos, and the invasions of Iraq and Afghanistan were particularly terrible, resulting in many millions of dead, maimed or displaced people, most of them civilians.

## **Washington's hubris and insanity**

When the Cold War ended with the collapse of the Soviet Union, a Washington-based think tank called "Project for a New American Century" maintained that a strategic moment had arrived: The United States was now the sole superpower, and it ought to use military force to dominate and reshape the rest of the world. Many PNAC members occupied key positions in the administration of George W. Bush. These included Dick Cheney, I. Lewis Libby, Donald Rumsfeld, Paul Wulfowitz, Eliot Abrams, John Bolton and Richard Perle.

Today, the US government is taking actions that seem almost insane, risking a nuclear war with Russia and simultaneously alienating China. In the long run, such hubris cannot succeed. Overspending on war will lead to economic collapse.

## **Science and technology are double-edged**

As we start the 21st century and the new millennium, our scientific and technological civilization seems to be entering a period of crisis. Today, for the first time in history, science has given to humans the possibility of a life of comfort, free from hunger and cold, and free from the constant threat of infectious disease. At the same time, science has given us the power to destroy civilization through thermonuclear war, as well as the power to make our planet uninhabitable through pollution and overpopulation. The question of which of these alternatives we choose is a matter of life or death to ourselves and our children.

Science and technology have shown themselves to be double-edged, capable of doing great good or of producing great harm, depending on the way in which we use the enormous power over nature, which science has given to us. For this reason, ethical thought is needed now more than ever before. The wisdom of the world's religions, the traditional wisdom of humankind, can help us as we try to insure that our overwhelming material progress will be beneficial rather than disastrous.

## **Civilization's crisis**

The crisis of civilization, which we face today, has been produced by the rapidity with which science and technology have developed. Our institutions and ideas adjust too slowly to the change. The great challenge which history has given to our generation is the task of building new international political structures, which will be in harmony with modern technology. At the same time, we must develop a new global ethic, which will replace our narrow loyalties by loyalty to humanity as a whole.

In the long run, because of the enormously destructive weapons, which have been produced through the misuse of science, the survival of civilization can only be insured if we are able to abolish the institution of war.

## **A new freely-downloadable book**

A new book entitled "The Devil's Dynamo", dealing with the way in which military-industrial complexes throughout the world drive and perpetuate the institution of war, has recently been made available. The book can be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2018/03/The-Devils-Dynamo-by-John-Scales-Avery.pdf>

Other books on global problems can be found at the following address:

<http://eacpe.org/about-john-scales-avery/>

# **FASCISM, THEN AND NOW**

## **Parallels between fascism of the 1930's and neo-fascism today**

There are many extremely worrying similarities between fascism in Europe in the 1930's and the neo-fascism that we can see around us today. For example, Donald Trump, according to his first wife, kept a book of Hitler's speeches beside his bed, and studied it thoroughly. Today, he imitates Hitler's rhetoric, as is discussed in Appendix A. The white supremacist supporters of Donald Trump have revived Nazi ideology, language and symbols. Neo-fascism and neo-Nazism are not confined to the United States, but exist in many countries.

## **Why was Germany allowed to rearm during the period before World War II?**

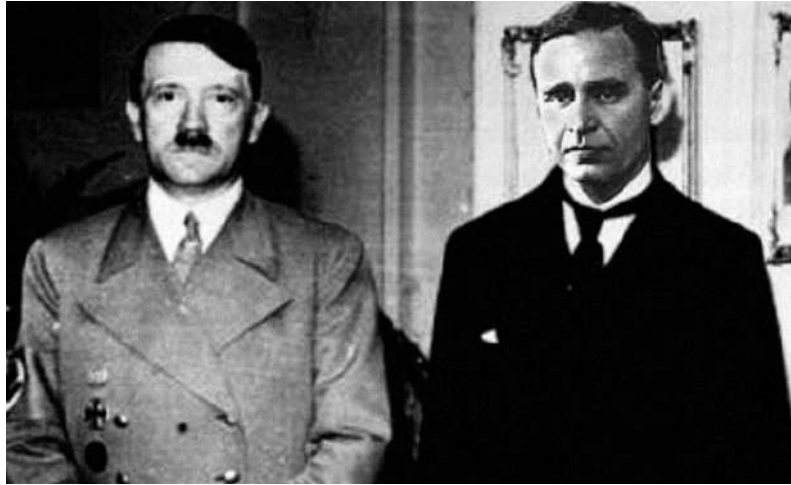
It is instructive to examine the history of Hitler's rise to power, and the question of why Germany was allowed to rearm during the period prior to the Second World War. The answer that emerges is that the elites and decision-makers in Britain regarded Hitler as a "bulwark against communism". A revolution had occurred in Russia, and they feared that it might spread elsewhere. What members of the the upper class feared most was the loss of their own privileged positions.

Are there parallels today? In the United States, members of the Republican Party are often relatively wealthy people who fear that socialism would endanger their privileged financial position. Like Hitler and Mussolini, Donald Trump uses rhetoric addressed to the mob to guarantee the privileges of the elite. In return, he is supported by wealthy patrons and corporate oligarchs. Like Hitler, Trump appeals to racism and ultra-nationalism to gain support.

## **The climate emergency**

Today human civilization and the biosphere are faced with two existential dangers. The first of these is the danger that the activities of the constantly-increasing global population will lead to uncontrollable and catastrophic climate change. The Intergovernmental Panel on Climate Change has warned that greenhouse gas emissions must be cut in half within 12 years and reduced to net zero by 2050 if we are to avoid the most disastrous effects of climate change. However, measurements at the Mount Loa Observatory in Hawaii show that atmospheric CO<sub>2</sub> concentrations are continuing to increase, unaffected by the warnings of the scientific community.

One of the major problems in mobilizing political will to take action is a contrast between two time scales: Rapid and resolute action is needed immediately, but the worst effects of rising global temperatures and sea levels lie in the long-term future. Hopefully the wildfires burning in northern Russia, which have produced a blanket of smoke the size of the European Union, will be enough to wake us up. As 16-year-old climate activist Greta Thunberg says, "Our house is on fire!".



**Figure 1: Prescott Bush, the father of George H.W. Bush and grandfather of George W. Bush, supported Hitler's rise to power with large financial contributions to the Nazi Party. The photo shows them together. Source: topinfo-post.com**

In the United States, Donald Trump maintains that climate change is a hoax. He has withdrawn the US from the Paris Agreement, sabotaged the Environmental Protection Agency, fired and insulted scientists, and enacted numerous measures supporting the fossil fuel giants. The greed of these enormous corporations weighs present profits so highly as to disregard the threatened collapse of civilization in a future burning world. Trump is their agent.

The Green New Deal concept takes its inspiration from the measures that Franklin D. Roosevelt used to bring the United States out of the Great Depression in the 1930's. In Roosevelt's New Deal, the Federal government initiated massive programs to provide the US with much-needed infrastructure, and these programs simultaneously addressed unemployment by creating jobs. Similarly, the Green New Deal would support the creation of the infrastructure needed for a complete transition to renewable energy. This large-scale project would simultaneously provide jobs.

The newly-elected congresswoman, Alexandria Ocasio-Cortez, has been one of the most active and eloquent leaders promoting the Green New Deal. She was one of the four non-white congresswomen recently demonized by Donald Trump, who tweeted, "Why don't they go back and help fix the totally broken and crime infested places from which they came?" It was another example of the racism that Trump's supporters love. In fact, three of the four, including Ocasio-Cortez, were born in the United States.

The fact that leaders of the US Republican Party have adopted a stance of climate change denial and support for the fossil fuel industries is the reason that Professor Noam Chomsky has called the party "the most dangerous organization in history".

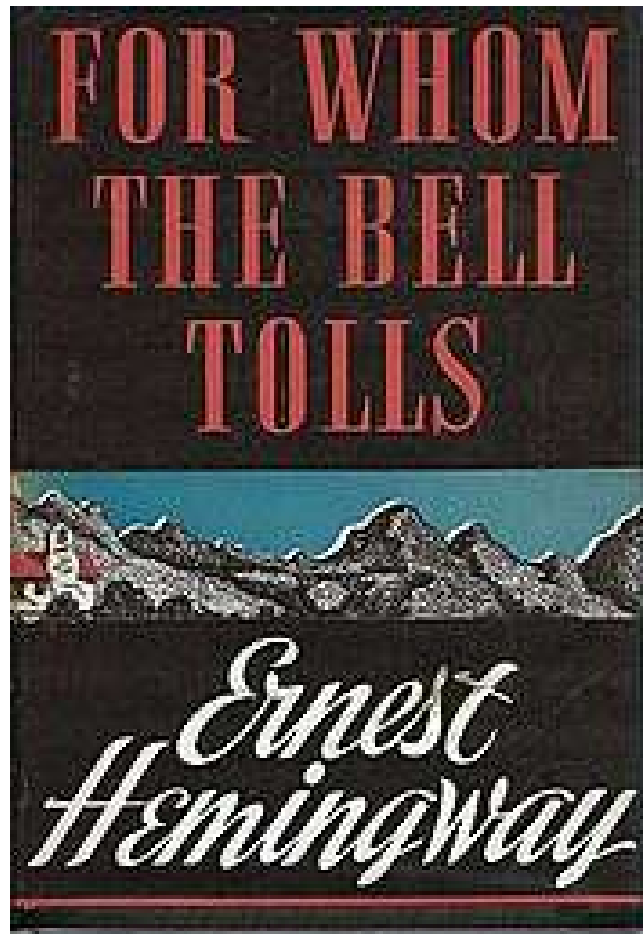


Figure 2: The cover of the first edition of Hemingway's famous book describing the Spanish Civil War. The title is taken from John Donne, who wrote: "No man is an island entire of itself; every man is a piece of the continent, a part of the main; if a clod be washed away by the sea, Europe is the less, as well as if a promontory were, as well as any manner of thy friends or of thine own were; any man's death diminishes me, because I am involved in mankind. And therefore never send to know for whom the bell tolls; it tolls for thee." By choosing this title, Hemingway tells us that Spain's change from democracy to fascist dictatorship, the outcome of the Spanish Civil War of 1936-1939, is important to and affects everyone in the world.



Figure 3: Pablo Picasso's famous painting, *Guernica*. Nazi bombers completely destroyed the culturally important Basque town, killing large numbers of civilians.



Figure 4: Mussolini defined fascism as “corporatism”. It unites the corporate state and the mob.



Figure 5: General Wesley Clark

## The threat of an all-destroying thermonuclear war

The second existential threat facing human civilization and the biosphere is the threat of a thermonuclear war. Such a war might produce wide-spread famine because of the nuclear winter effect, and it could make large regions of the world permanently uninhabitable through radioactive contamination.

Despite the Treaty on the Prohibition of Nuclear Weapons which was passed by a large majority vote at the UN General Assembly on 7 July, 2017, the nuclear weapon states have not changed their world-threatening policies. They continue to consecrate trillions of dollars to the modernization and maintenance of nuclear weapons. They continue to rely on the doctrine of nuclear deterrence, or mutually assured destruction, whose very appropriate acronym is MAD.

The concepts of nuclear deterrence and “massive retaliation” have several flaws. First of all, the obliteration of entire populations, including old people, young adults, children and babies, is genocide, and is forbidden not only by international law, but also by the ethics of all major religions. Secondly, a thermonuclear war could occur through accident, through mechanical failure or human error, or through the uncontrollable escalation of a conflict. There are very many instances when this type of disaster has been narrowly avoided. We cannot continue to be lucky forever. Thirdly, existing nuclear weapons could fall into the hands of terrorists or organized criminals.





Figure 6: There is so much wrong with Donald Trump that one hardly knows where to start. He is a bully, braggart, narcissist, racist, misogynist, habitual liar, and tax evader, in addition to being demonstrably ignorant. He has contempt for both domestic and international law, as well as for the US Constitution. In the words of Michael Moore, he is a “part-time clown and full-time sociopath”. However, it is Trump’s climate change denial, withdrawal from the Paris agreement, and sponsorship of fossil fuels that pose the greatest threats to the future of humans society and the biosphere. The general support of the Republican Party for the fossil fuel industry is the reason why Prof. Noam Chomsky has called the party “the most dangerous organization in history”.



Figure 7: Trump's racist border policies separated small children from their parents and put them into cages.





Figure 8: Proud Boys founder Gavin McInnes.



Figure 9: A member of Proud Boys.



Figure 10: Donald Trump's first wife has testified the Trump kept a copy of Hitler's speeches beside his bedside, and studied them carefully. This seems to have influenced his style of public speaking.



Figure 11: Apparently insanity rules the United States today. The Evangelical Right believes that Trump was sent by God to be King, despite the fact that, according to Glenn Kessler, author of the Washington Post’s Fact Checker column, Trump told an average of 15 lies per day in 2018, bringing the total number of documented lies since he took office in January 2017 to 7,645. But neither Trump’s lies, nor his racism and misogyny, nor his cruel authorization of imprisonment of very young children and even babies, are his worst crimes. His most serious offense is a crime against human civilization and the biosphere: his support for coal, his climate change denial, his sabotaging of renewable energy, and his withdrawal from the Paris agreement. These actions, and support for them by Republicans, caused Noam Chomsky to call the Republican Party “the most dangerous organization in history”.

Finally, we must remember that even if the danger that a catastrophic nuclear war will occur in any given year is small, over a long period of time the danger builds up into a certainty. If the dangers for any given year are 1%, 2% or 3%, the probabilities of are survival until 2100 are respectively 43%, 18% and 8%. If the period for which we must survive is extended to the year 2200, the chances of survival in the three cases are respectively .16%, .025%, and .0039%.

Donald Trump's withdrawal from the INF Treaty, and his nuclear threats against Iran and North Korea, have increased the danger of a world-destroying nuclear war.

## **Betrayal by the mainstream media**

Humanity is being betrayed by the mainstream media (with a few notable exceptions such as The Guardian). Our predicament today has been called "a race between education and catastrophe" . How do the media fulfil this life-or-death responsibility? Do they give us insight? No, they give us pop music. Do they give us an understanding of the sweep of evolution and history? No, they give us sport. Do they give us an understanding of the ecological catastrophes that threaten our planet because of unrestricted growth of population and industries? No, they give us sit-coms and soap operas. Do they give us unbiased news? No, they give us news that has been edited to conform with the interests of powerful lobbys. Do they present us with the urgent need to leave fossil fuels in the ground? No, they do not, because this would offend the powerholders. Do they tell of the danger of passing tipping points after which human efforts to prevent catastrophic climate change will be useless? No, they give us programs about gardening and making food.

In general, the mass media behave as though their role is to prevent the peoples of the world from joining hands and working to change the world and to save it from thermonuclear war, environmental catastrophes and threatened global famine. The television viewer sits slumped in a chair, passive, isolated, disempowered and stupefied. The future of the world hangs in the balance, the fate of children and grandchildren hangs in the balance, but the television viewer feels no impulse to work actively to change the world or to save it. The Roman emperors gave their people bread and circuses to numb them into political inactivity. The modern mass media seem to be playing a similar role.

## **The importance of alternative media**

The failure of the mass media to mobilize us to action against neo-fascism, decay of democracy, and the existential threats of uncontrollable climate change and thermonuclear war, increases the importance of the alternative media. We owe a debt of gratitude to the editors of independent on-line news websites, who give us news that has not been distorted by corporate greed. We owe them not only thanks, but also financial support.

## **A new book**

I would like to announce the publication of a new book, entitled Fascism, Then and Now. It can be freely downloaded from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/08/Fascism-then-and-now-John-Scales-Avery.pdf>

Please circulate the link to your friends who might be interested.

## **Other books and articles about global problems**

Some of my other books and articles can be found on the following link:

<http://eacpe.org/about-john-scales-avery/>

I hope that you will circulate this link (as well as the link at the start of this article) to friends who might be interested.

# SAVING THE FUTURE

## Statements by Jakob von Uexküll and Greta Thunberg

Here is a recent statement by Jakob von Uexküll, founder of the World Future Council:

**“Today we are heading for unprecedented dangers and conflicts, up to and including the end of a habitable planet in the foreseeable future, depriving all future generations of their right to life and the lives of preceding generations of meaning and purpose.**

**“This apocalyptic reality is the elephant in the room. Current policies threaten temperature increases triggering permafrost melting and the release of ocean methane hydrates which would make our earth unliveable, according to research presented by the British Government Met office at the Paris Climate Conference.**

**“The myth that climate change is conspiracy to reduce freedom is spread by a powerful and greedy elite which has largely captured governments to preserve their privileges in an increasingly unequal world.”**

Similarly, 15-year-old Swedish climate activist, Greta Thunberg, described our present situation in the following words:

**“When I was about 8 years old, I first heard about something called climate change or global warming. Apparently, that was something humans had created by our way of living. I was told to turn off the lights to save energy and to recycle paper to save resources. I remember thinking that it was very strange that humans, who are an animal species among others, could be capable of changing the Earths climate. Because, if we were, and if it was really happening, we wouldn’t be talking about anything else. As soon as you turn on the TV, everything would be about that. Headlines, radio, newspapers: You would never read or hear about anything else. As if there was a world war going on, but no one ever talked about it. If burning fossil fuels was so bad that it threatened our very existence, how could we just continue like before? Why were there no restrictions? Why wasnt it made illegal?”**

## Why do we not respond to the crisis?

Today we are faced with multiple interrelated crises, for example the threat of catastrophic climate change or equally catastrophic thermonuclear war, and the threat of widespread famine. These threats to human existence and to the biosphere demand a prompt and rational response; but because of institutional and cultural inertia, we are failing to take the steps that are necessary to avoid disaster.



## **Only immediate action can save the future**

Immediate action to halt the extraction of fossil fuels and greatly reduce the emission of CO<sub>2</sub> and other greenhouse gasses is needed to save the long-term future of human civilization and the biosphere.

At the opening ceremony of United Nations-sponsored climate talks in Katowice, Poland, (COP24), Sir David Attenborough said “Right now, we are facing a man-made disaster of global scale. Our greatest in thousands of years. Climate change. If we don't take action, the collapse of our civilizations and the extinction of much of the natural world is on the horizon. The world's people have spoken. Their message is clear. Time is running out. They want you, the decision-makers, to act now.”

Antonio Guterres, UN Secretary-General, said climate change was already “a matter of life and death” for many countries. He added that the world is “nowhere near where it needs to be” on the transition to a low-carbon economy.

Swedish student Greta Thunberg, is a 15-year-old who has launched a climate protest movement in her country. She said, in a short but very clear speech after that of UN leader Antonio Guterres: “Some people say that I should be in school instead. Some people say that I should study to become a climate scientist so that I can solve the climate crisis. But the climate crisis has already been solved. We already have all the facts and solutions.”

She added: “Why should I be studying for a future that soon may be no more, when no one is doing anything to save that future? And what is the point of learning facts when the most important facts clearly mean nothing to our society?”

Thunberg continued: “Today we use 100 million barrels of oil every single day. There are no politics to change that. There are no rules to keep that oil in the ground. So we can't save the world by playing by the rules. Because the rules have to be changed.”

She concluded by saying that “since our leaders are behaving like children, we will have to take the responsibility they should have taken long ago.”

## **Further growth implies future collapse**

We have to face the fact that endless economic growth on a finite planet is a logical impossibility, and that we have reached or passed the sustainable limits to growth.

In today's world, we are pressing against the absolute limits of the earth's carrying capacity, and further growth carries with it the danger of future collapse. In the long run, neither the growth of industry nor that of population is sustainable; and we have now reached or exceeded the sustainable limits.

## **Our responsibility to future generations and the biosphere**

All of the technology needed for the replacement of fossil fuels by renewable energy is already in place. Although renewable sources supplied only 9 percent of the world's total energy requirements in 2015, they supplied 23 percent of electrical generation energy in 2016, and they are growing rapidly. Because of the remarkable properties of exponential

growth, this will mean that renewables will soon become a major supplier of the worlds energy requirements, despite bitter opposition from the fossil fuel industry.

Both wind and solar energy can now compete economically with fossil fuels, and this situation will become even more pronounced if more countries put a tax on carbon emissions, as Finland, the Netherlands, Norway, Costa Rica, the United Kingdom and Ireland already have done.

## **Hope**

Here is what Greta Thunberg says about hope:

“And yes, we do need hope. Of course, we do. But the one thing we need more than hope is action. Once we start to act, hope is everywhere. So instead of looking for hope, look for action. Then and only then, hope will come today.”

## **A new book**

I have written a 396-page book about the steps that are urgently needed in order to save the future for our children and grandchildren. The book makes use of articles and book chapters that I have previously written on our current crisis, but much new material has been added. I urge readers to download and circulate the pdf file of the book from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/02/Saving-the-Future-John-Scales-Avery.pdf>

Other freely-downloadable books and articles on global problems can be found at the following address: <http://eacpe.org/about-john-scales-avery/>



Figure 1: Space-age science and stone-age politics make an extraordinarily dangerous mixture

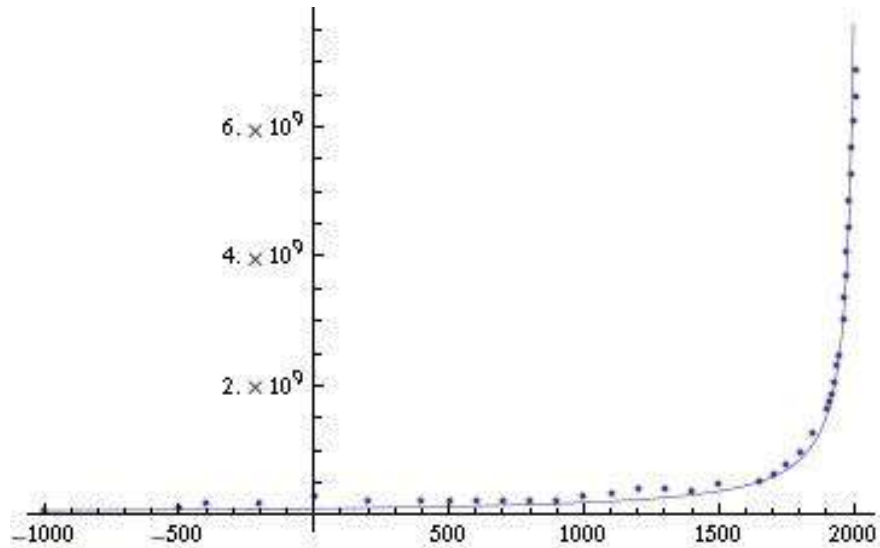


Figure 2: Starting with the Neolithic agricultural revolution and the invention of writing, human culture began to develop with explosive speed. This figure shows the estimated human population as a function of time during the last 4,000 years. The dots are population estimates in millions, while the solid curve is the hyperbola  $p = c/(2020 - y)$ , where  $p$  is the global human population,  $y$  is the year and  $c = 234000$ . The curve reflects an explosively accelerating accumulation of information. Culturally transmitted techniques of agriculture allowed a much greater density of population than was possible for hunter-gatherers. The growth of population was further accelerated by the invention of printing and by the industrial and scientific developments which followed from this invention.



Figure 3: On our shrunken globe today, there is room for one group only - the family of humankind.



Figure 4: The continued extraction and burning of fossil fuels threatens the earth with an ecological megacatastrophe.



Figure 5: Speaking at the opening ceremony of COP24, the universally loved and respected naturalist Sir David Attenborough said: “If we don’t take action, the collapse of our civilizations and the extinction of much of the natural world is on the horizon.”



Figure 6: UN Secretary-General Antonio Guterres, and 15-year-old Swedish climate activist Greta Thunberg addressing the opening ceremony of COP24.



Figure 7: Unless efforts are made to stabilize and ultimately reduce global population, there is a serious threat that climate change, population growth, and the end of the fossil fuel era could combine to produce a large-scale famine by the middle of the 21st century.



Figure 8: Today's military spending of almost two trillion US dollars per year would be more than enough to finance safe drinking water for the entire world, and to bring primary health care and family planning advice to all. If used constructively, the money now wasted (or worse than wasted) on the institution of war could also help the world to make the transition from fossil fuel use to renewable energy systems.



Chad Crowe









Figure 9: We should eat more vegetables, fruits, whole grains and nuts, while consuming much less meat and dairy products. Beef is especially damaging to the global environment. Unhealthy diets are the leading cause of ill health worldwide, with 800 million people currently hungry, 2 billion malnourished and further 2 billion people overweight or obese. The world's science academies recently concluded that the food system is broken. Industrial agriculture is also devastating the environment, as forests are razed and billions of cattle emit climate-warming methane.

# THE CLIMATE EMERGENCY:

## TWO TIME SCALES

### Why is climate change an emergency?

Quick change is needed to save the long-term future.

The central problem which the world faces in its attempts to avoid catastrophic climate change is a contrast of time scales. In order to save human civilization and the biosphere from the most catastrophic effects of climate change we need to act immediately: Fossil fuels must be left in the ground. Forests must be saved from destruction by beef or palm oil production.

These vitally necessary actions are opposed by powerful economic interests, by powerful fossil fuel corporations desperate to monetize their underground assets, and by corrupt politicians in the United States, South America and Southeast Asia, receiving money from the fossil fuel, beef or palm oil industries. However, although some disastrous effects climate change are already visible, the worst of these calamities lie in the distant future. Therefore it is difficult to mobilize the political will for quick action. We need to act immediately, because of the danger of passing tipping points beyond which climate change will become irreversible despite human efforts to control it.

### Tipping points and feedback loops

Tipping points are associated with feedback loops, such as the albedo effect and the methane hydrate feedback loop. The albedo effect is important in connection with whether the sunlight falling on polar seas is reflected or absorbed. While ice remains, most of the sunlight is reflected, but as areas of sea surface become ice-free, more sunlight is absorbed, leading to rising temperatures and further melting of sea ice, and so on, in a loop.

The methane hydrate feedback loop involves vast quantities of the powerful greenhouse gas methane, frozen in a crystalline form surrounded by water molecules. 10,000 gigatons of methane hydrates are at present locked in Arctic tundra or the continental shelves of the worlds oceans. Although oceans warm very slowly because of thermal inertia, the long-term dangers from the initiation of a methane-hydrate feedback loop are very great. There is a danger that a very large-scale anthropogenic extinction event could be initiated unless immediate steps are taken to drastically reduce the release of greenhouse gases.

### The transition to renewable energy

The transition to 100% renewable must take place in about a century because by that time fossil fuels will become too rare and expensive to burn. They will be used instead as starting points for chemical synthesis.

Although a very quick transition to renewable energy is needed, there is reason for optimism because an economic tipping point has been passed. Both solar and wind energy

are cheaper than energy from fossil fuels, especially if the enormous governmental subsidies to the fossil fuel industries are discounted. Renewable energy technology, for example the transition to electric vehicles, offers an unprecedented investment opportunity.

## **Extraction of fossil fuels must stop!**

Although the extraction of fossil fuels urgently needs to stop, coal, oil and natural gas are being produced today, almost as if the climate emergency did not exist.

We are in danger of passing tipping points, after which human efforts to prevent catastrophic climate change will become useless because of feedback loops. There is a danger that a human-produced sixth major extinction event will be initiated. It could be comparable to the Permian-Triassic extinction, during which 96% of marine species, and 76% of terrestrial vertebrates vanished forever.

## **Thermal inertia of the oceans**

The thermal inertia of the oceans contribute to the contrasting timescales mentioned above. One of the reasons why the worst effects of climate change lie in the long-term future is that the oceans warm very slowly. As the oceans slowly warm there will be sea level rise due to thermal expansion of water, and to this will be added the effects of melting ice at the poles. Rising ocean levels have already affected island nations such as the Maldives, and coral reefs are already dying.

## **Deforestation**

Deforestation is one of the main causes of climate change. In Indonesia, rainforests are deliberately burned, with the cooperation of corrupt politicians, to clear land for palm oil plantations. Rainforests of South America are also illegally burned, in this case for the sake of soy bean plantations and cattle ranches. In both cases, loss of habitat accelerates the extinction of threatened species.

## **Climate change and famine**

The effects of climate change and the end of the fossil fuel era will reduce the world's ability to feed its rapidly growing population. One can predict that these factors will combine to produce an extremely large-scale famine by the middle of the 21st century if steps are not taken to prevent it. We are already experiencing a crisis from refugees fleeing from famine, rising temperatures, drought and conflicts.

## **Business as usual is not an option**

From these facts, we must conclude that the world is facing a serious emergency. We need to recognize the emergency and act accordingly.

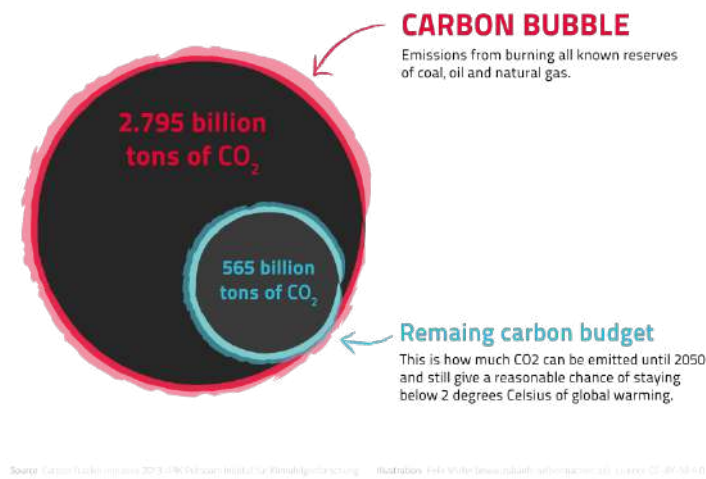


Figure 1: The Carbon Bubble according to data by the Carbon Tracker Initiative 2013. In order to avoid tipping points that will make human attempts to avoid catastrophic climate change useless, we must leave most of the known fossil fuel reserves in the ground!

Unchanged life-styles are not an option. Business as usual is not an option. Inaction is not an option. Public education is needed. Votes for environmentally friendly politicians are needed. A carbon tax is needed. Subsidies to fossil fuel giants must stop. Extraction of fossil fuels must stop. Renewable energy infrastructure must be quickly constructed. Deforestation must be replaced by reforestation. Let us cooperate and to work with dedication to save future generations and the biosphere from a long-term climate catastrophe.

## A freely-downloadable book

A book with the title "The Climate Emergency: Two Time Scales" can be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2017/11/The-Climate-Emergency-Two-Time-Scales-by-John-Scales-Avery.pdf>

Other books and articles by John Scales Avery may be freely downloaded from the following links:

<http://eacpe.org/about-john-scales-avery/>

<https://human-wrongs-watch.net/2016/03/15/peace/>

Please spread these links to friends who might be interested.

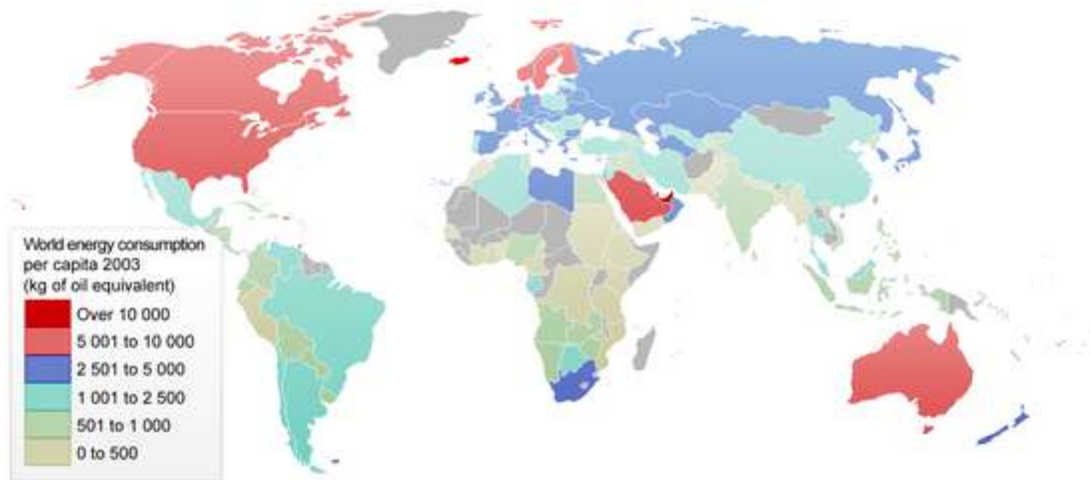


Figure 2: A map of the world showing per capita rates of energy use.

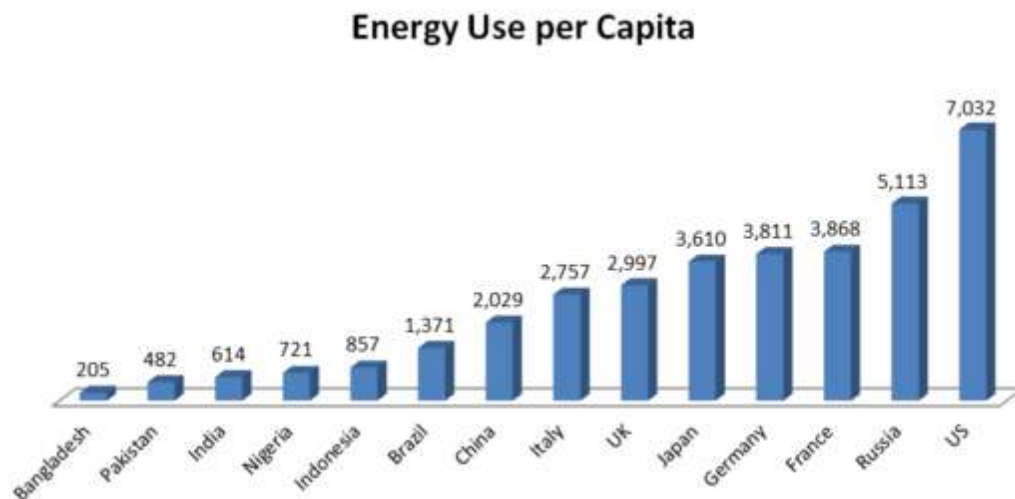


Figure 3: Energy use per capita by country (World Bank data)



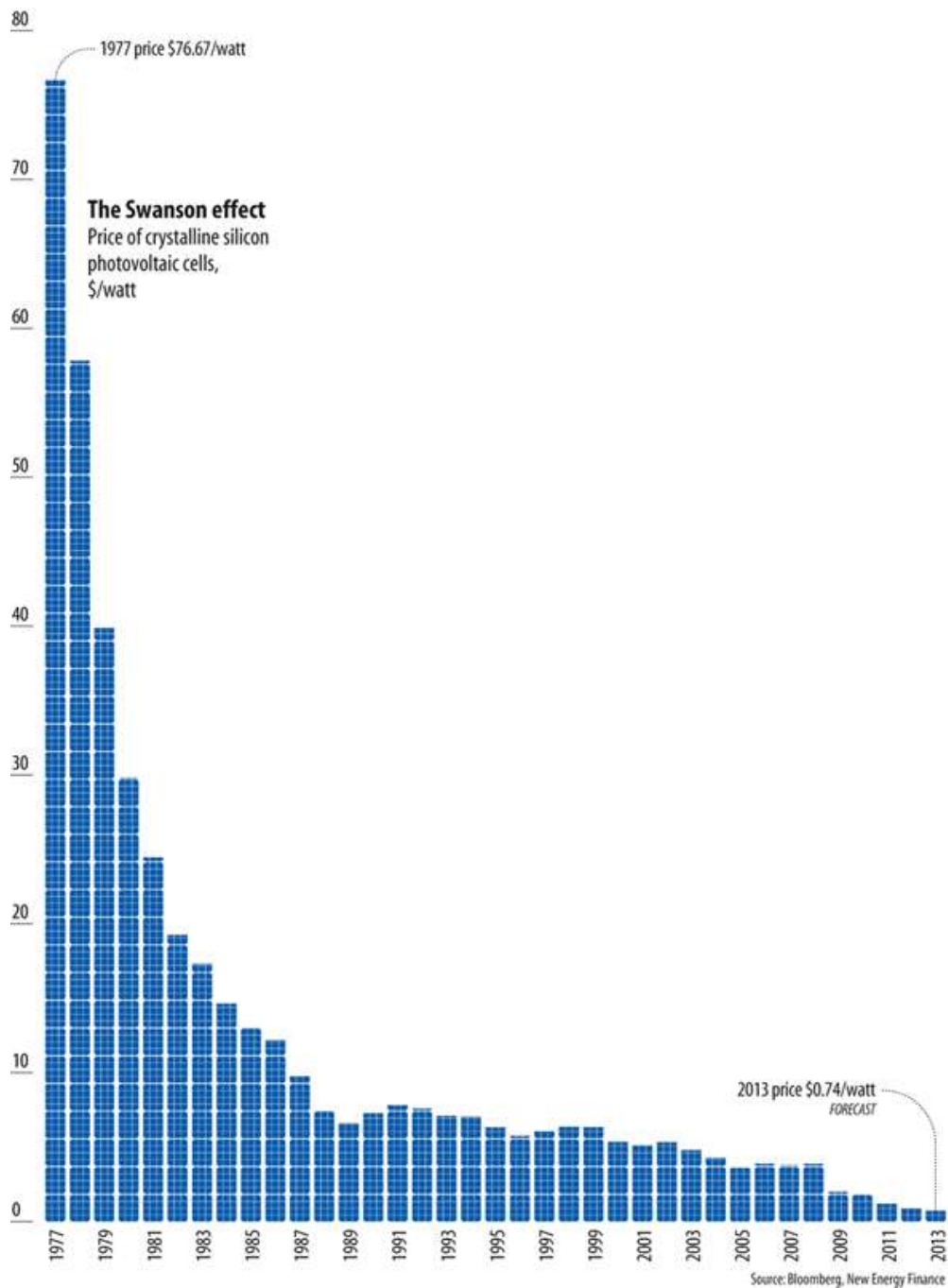


Figure 4: The cost of photovoltaic cell panels is falling rapidly



Figure 5: Air pollution from the burning of coal has become a serious problem in China. This problem has helped to shift Chinese public opinion away from the burning of coal and towards renewables. China has now become a major manufacturer of photovoltaic cells.



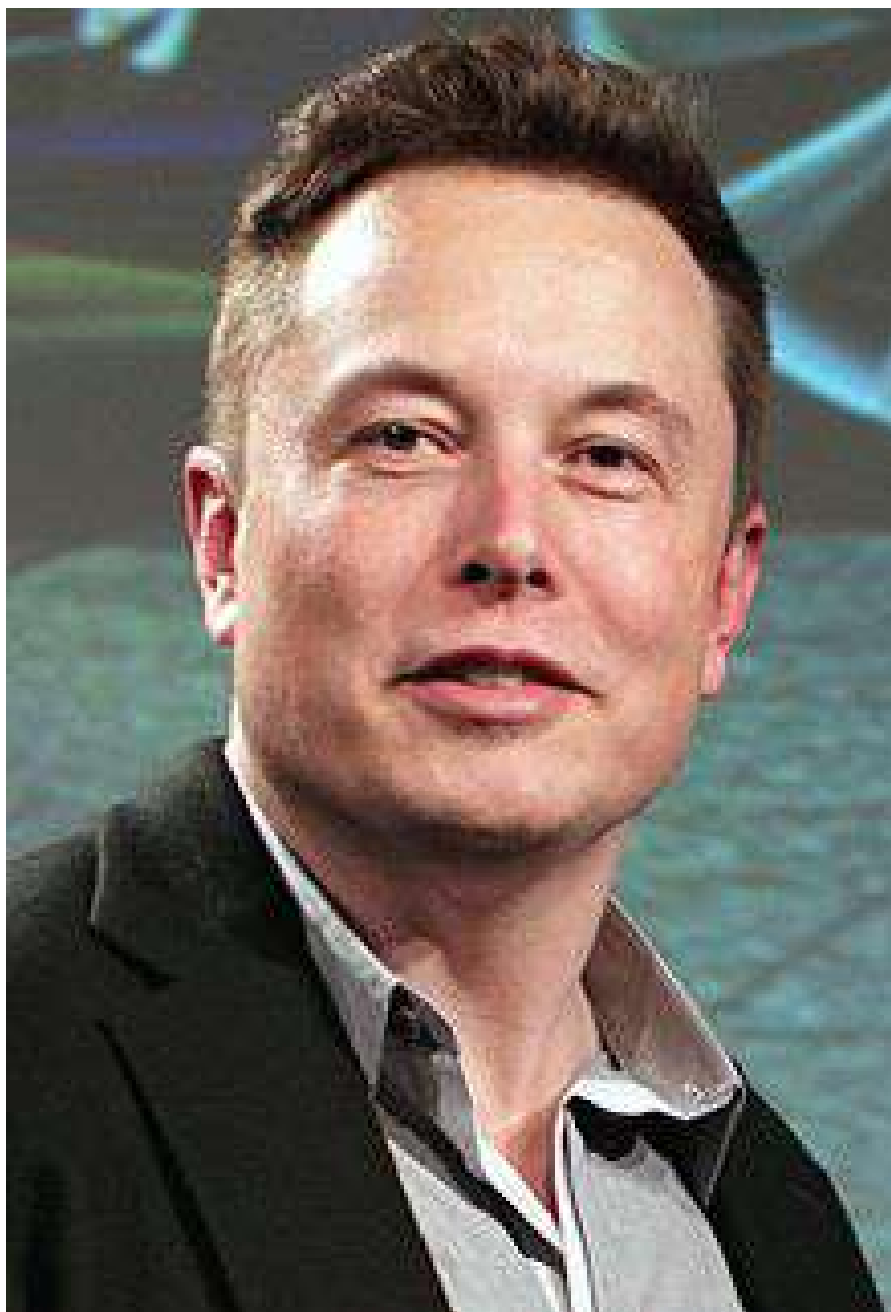


Figure 6: **Elon Musk in 2015** (Wikipedia)



Figure 7: Tesla's Gigafactory 1 in Nevada produces improved lithium ion batteries. Energy for the factory is supplied by solar panels on the roof.



Figure 8: Gigafactory 2. SolarCity's factory in Buffalo New York produces high-efficiency solar modules. Elon Musk estimates that only 100 gigafactories would be enough to achieve a worldwide transition to 100% renewable energy.



Figure 9: Protesters at the 2017 G20 meeting in Hamburg Germany.

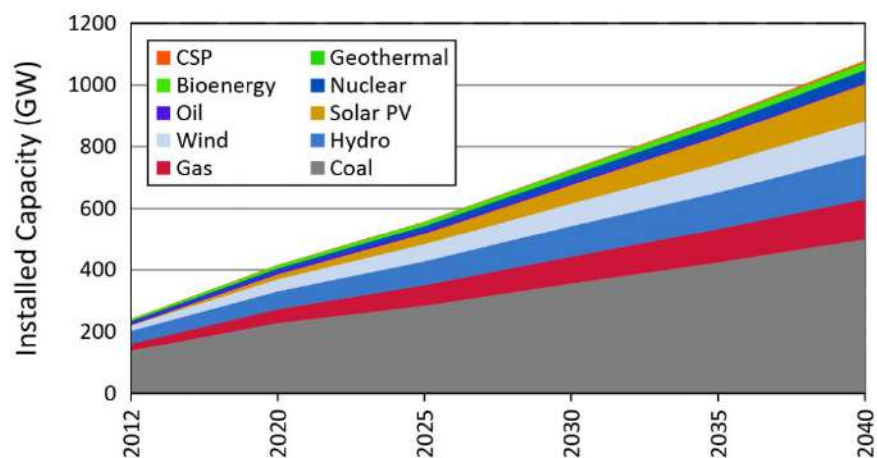


Figure 10: India's installed and future energy mix, as visualized by the World Coal Association. A recent MIT article pointed out that "Such growth would easily swamp efforts elsewhere in the world to curtail carbon emissions, dooming any chance to head off the dire effects of global climate change".



Figure 11: Oil production on the shelf in the Russian Arctic.



Figure 12: Get rich quick at the Canadian oil sands.





Figure 13: A view of oil refineries from the Galveston Channel in Texas (Photo: Roy Luck/flick/CC)

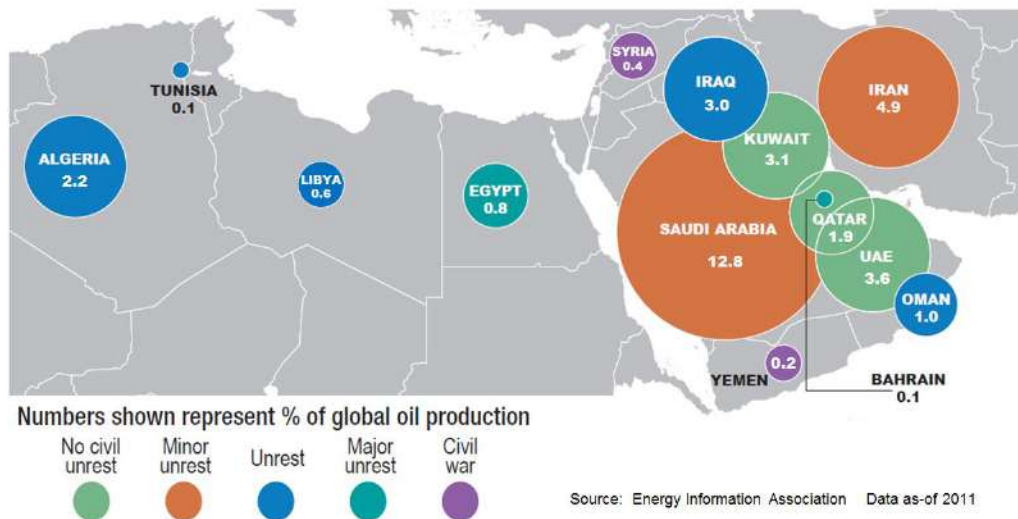


Figure 14: A map showing the major oil-producing countries of the Middle East and North Africa. The percent of global oil production is indicated. Many of the countries shown have some degree of civil unrest or civil war.



Figure 15: Burning of coal in China has contributed to rapid industrial growth, but besides being a major factor in the threat of catastrophic climate change, it has produced hundreds of thousands of deaths each year through air pollution (an estimated 366,000 in 2013).



Figure 16: Protests against the Keystone XL and Dakota Access pipelines which, if completed, would carry oil from the Canadian oil sands to refineries in Texas.

# **MONEY, MEDIA AND THE CLIMATE CRISIS**

## **Immediate action is needed to save the future**

The Intergovernmental Panel on Climate Change, in their October 2018 report, used strong enough language to wake up at least part of the public: the children whose future is at stake. Here is an excerpt from a speech which 16-year-old Swedish climate activist Greta Thunberg made at the Davos Economic Forum in January, 2019:

“Our house is on fire. I am here to say our house is on fire. According to the IPCC we are less than 12 years away from not being able to undo our mistakes. In that time, unprecedented changes in all aspects of society need to have taken place, including a reduction of our CO2 emissions by at least 50%...

“Here in Davos - just like everywhere else everyone is talking about money. It seems that money and growth are our main concerns.

“And since the climate crisis has never once been treated as a crisis, people are simply not aware of the full consequences on our everyday life. People are not aware that there is such a thing as a carbon budget, and how incredibly small that remaining carbon budget is. That needs to change today...”

## **Money drives the mania of growth**

Undoubtedly even the most growth-crazed economists realize that endless growth on a finite planet is a logical impossibility. But with self-imposed short-sightedness they refuse to look more than a decade or two into the future, and concentrate all their attention on short-term profits. All this has been changed by the climate crisis, since saving the long-term future for our children and grandchildren is now the most urgent of our tasks. The long-term future of human civilization and the biosphere must now be given our highest priority.

## **Our entire economic system must be reformed**

Old ideas and old economic indicators can no longer serve us. Seen from an ecological perspective, the gross national product of a country does not indicate how well the economy is doing, but almost the reverse. GNP has become a measure of how fast an economy is destroying the environment.

## **Lifestyle change but not unhappiness**

The urgent actions needed to avoid catastrophic climate change imply lifestyle changes, but we will not necessarily become less happy. Do we really enjoy sitting in traffic jams? We can still be happy when the use of private automobiles (except when absolutely necessary) is replaced by bicycles and public transport. We can still be happy without air travel for

recreational purposes. We can still be happy with the smaller families which will be needed to stabilize and ultimately reduce global population.

## **Climate and social justice addressed simultaneously**

The highly successful social and economic systems of the Scandinavian countries, together with their excellent renewable energy policies, demonstrate that the climate emergency can be addressed while simultaneously reducing economic inequality and providing needed services such as free medical care, social security, and free higher education.

## **We can afford the Green New Deal**

The Green New Deal concept, which is currently advocated in the United States and many other countries, aims at simultaneously addressing the climate emergency and socio-economic issues. It advocates massive governmental action to create renewable energy infrastructure, simultaneously addressing unemployment through new green jobs. Critics say “We can’t afford it.” They are wrong. What we cannot afford is inaction, since the entire future of human civilization and the biosphere is at stake.

We can easily finance the Green New Deal by making deep cuts in military spending, which currently costs the world \$1.8 trillion per year, and by raising taxes on super-rich individuals and corporations. Most voters are in favor of greater economic equality, and a safe long-term future for their grandchildren. We owe it to future generations to act now!

## **A new book on the climate crisis**

I have just completed a new book entitled “Money, Media and the Climate Crisis”, which discusses the climate emergency from the standpoint of economics. It makes some use of my previous publications on the climate emergency, but consists mainly of new material. I urge readers to download the book from the following link, and to circulate the link to their friends who might be interested:

<http://www.fredsakademiet.dk/library/Money.pdf>

If printed copies are desired, they can be obtained from:

<https://www.lulu.com/>

Other books and articles on global problems can be downloaded from:

<http://eacpe.org/about-john-scales-avery/>





Figure 1: Do we really enjoy sitting in traffic jams? The lifestyle changes which are now so urgently needed to address the climate emergency will not necessarily make us less happy. The Green New Deal aims at social justice as well as well as quick climate action. There is much evidence showing that greater economic equality in societies leads to greater happiness.



Figure 2: Demonstrators in London. The UK has now declared a climate emergency,

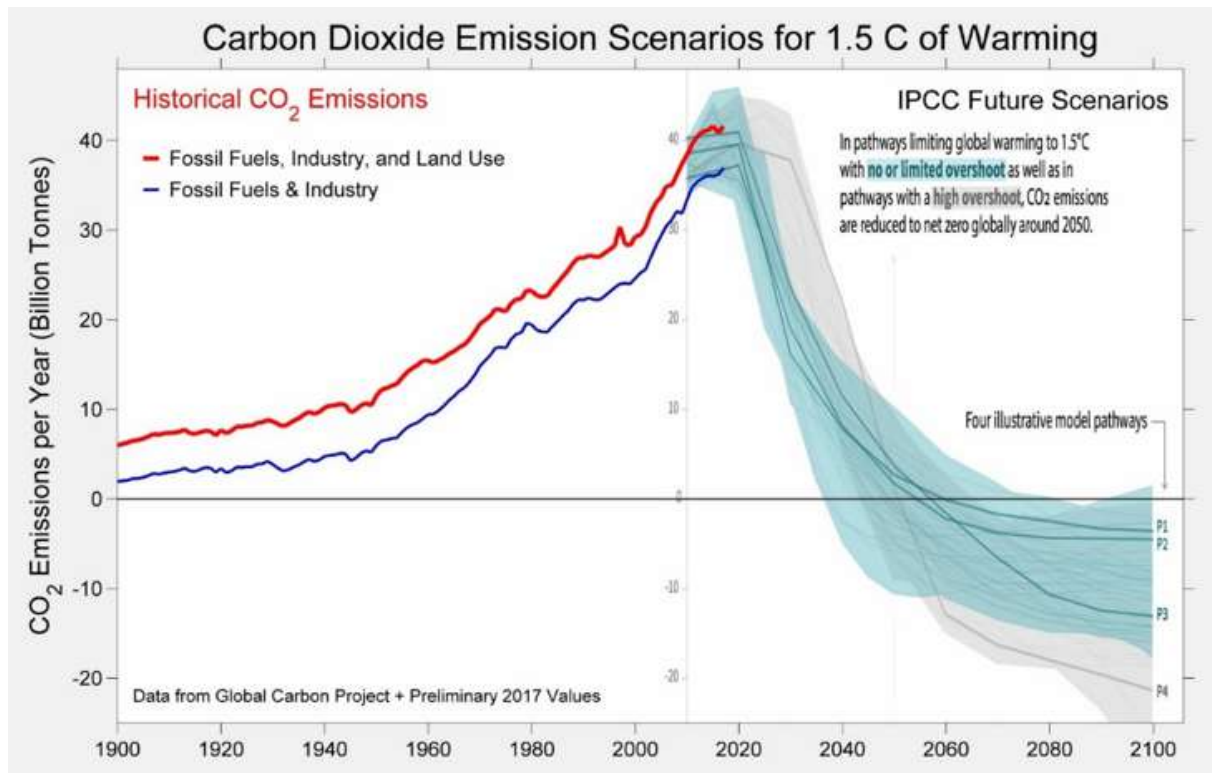
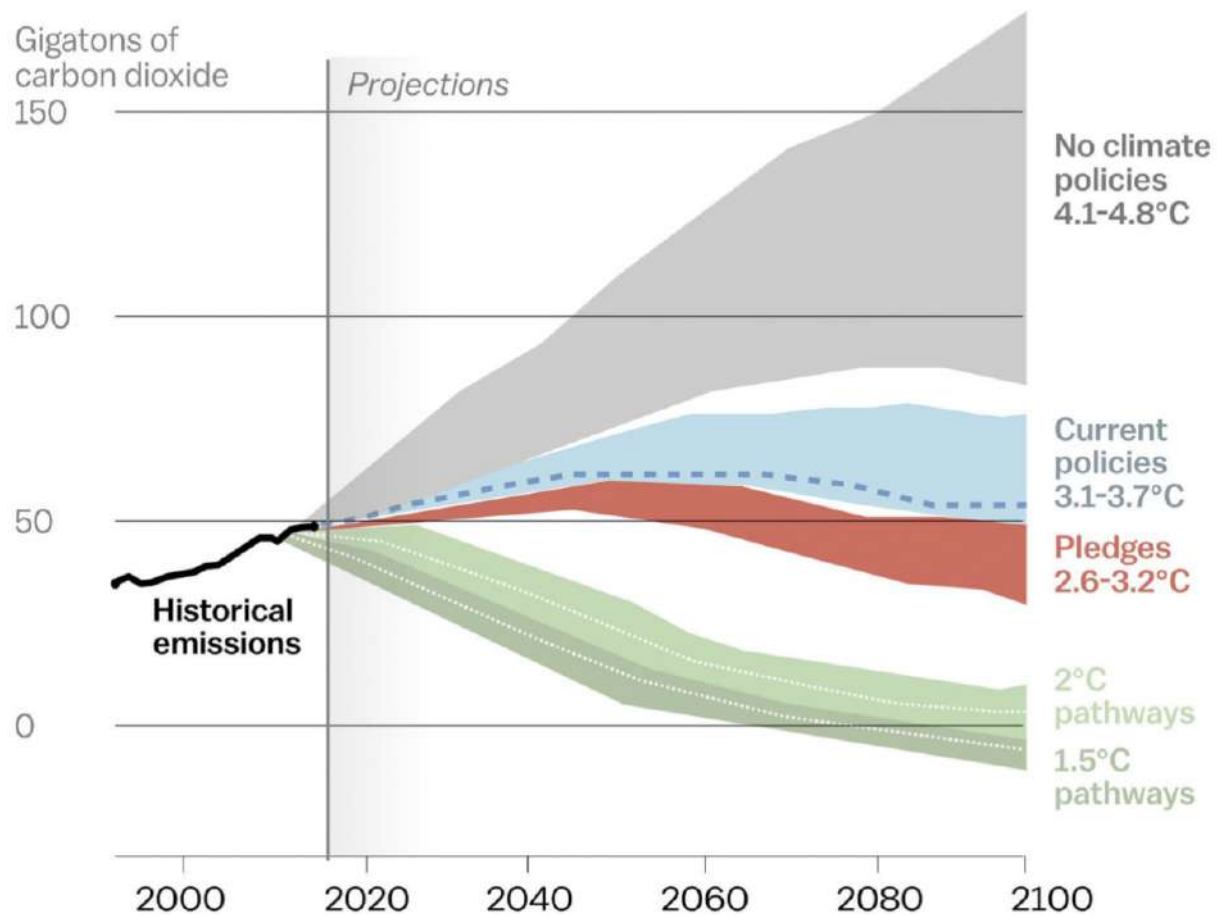


Figure 3: Our carbon budget. If global warming is to be limited to 1.5°C, CO<sub>2</sub> emissions must fall extremely rapidly. This means radical and fundamental changes for economies and lifestyles.

# Effect of current pledges and policies

*Global greenhouse gas emissions*



Source: Climate Action Tracker

**Vox**

Figure 4: Predicted gigatons of carbon emitted during the present century under various policies. Under current policies, temperatures at the end of the century are predicted to be 3.1-3.7°C higher than normal, which would be disastrous. This implies that quick action must be taken to change current policies.







Figure 5: Greta Thunberg at the Davos Economic Forum in Switzerland, January 2019. Most of the billionaires and heads of state attending the Davos Forum arrived by private jet. Greta arrived by train.



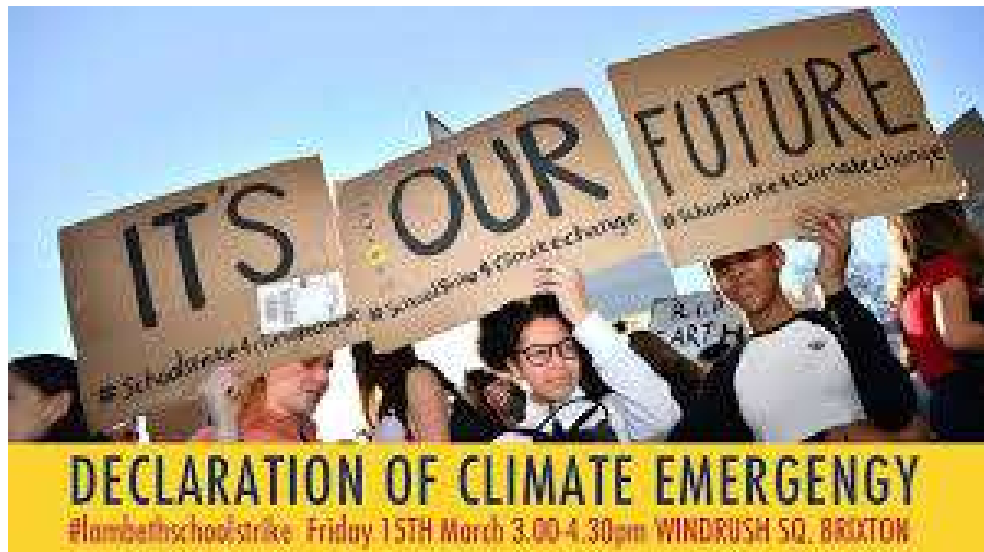


Figure 6: Eve White and her children join climate protesters in Tasmania. According to an article in The Guardian, parents and grandparents around the world are mobilizing in support of the youth climate movement that has swept the globe.



Figure 7: Greta Thunberg addressing a meeting of the European Parliament in April, 2019. She complained that Brexit was treated as an emergency by the European Union, but climate change, which is a far greater emergency has been almost neglected. The 16-year-old, who is due to meet the Pope on Wednesday, said, “We face an end to civilization as we know it unless permanent changes take place in our society...European elections are coming soon and many like me who are affected most by this crisis, are not allowed to vote. That is why millions of children are taking to the street to draw attention to the climate crisis... It is not too late to act but it will take far-reaching vision and fierce determination... My plea is: Please wake up and do the seemingly impossible.”





Figure 8: Wind, solar, and biomass are three emerging renewable sources of energy. Wind turbines in a rapeseed field in Sandesneben, Germany.

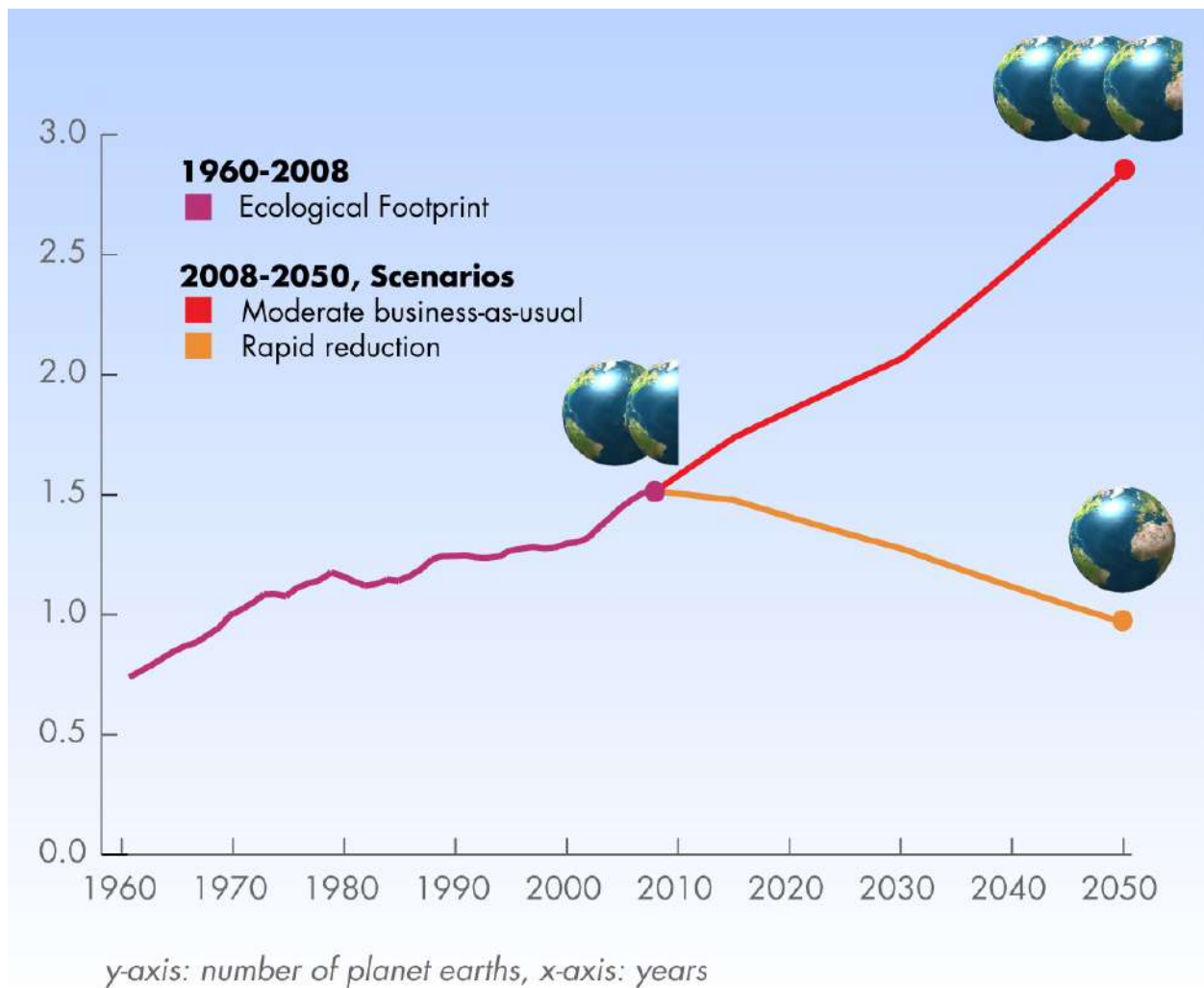


Figure 9: Our present trajectory is completely unsustainable. If we follow it, then by 2050 it would take almost three earths to regenerate our demands on resources. Source: footprintnetwork.org



Figure 10: **Whitechuck Glacier in the North Cascades National Park in 1973.**  
Source: [www.nichols.ewdu](http://www.nichols.ewdu)



Figure 11: **The same glacier in 2006.** Source: [www.nichols.edu](http://www.nichols.edu)

SANCTIONS IMMISERATE SANCTIONS STARVE  
SANCTIONS IMPOVERISH SANCTIONS TORTURE  
**SANCTIONS KILL**  
SANCTIONS ARE AN ACT OF WAR SANCTIONS MUST BE STOPPED

Figure 12: Aurelio Peccei (1908-1984), main founder of the Club of Rome. Concerning our present economic system, he wrote: “The only way we have devised to meet the surging waves of our rampant militarism and consumerism is to draw increasingly on the natural environment and to exploit, indiscriminately, the most accessible mineral and fuel deposits and all living resources we can lay our hands on. Such actions irreversibly impoverish our unique, irreplaceable, world, whose bounty and generosity are not infinite. Even if all the other adverse situations we find ourselves in today were to be alleviated, in itself, our high-handed treatment of Nature can bring about our doom.”



Figure 13: **The Fossil Fuel Financial Report Card, 2019.** Banks have given fossil fuel giants \$1.9 trillion since Paris.







# NUCLEAR WEAPONS: AN ABSOLUTE EVIL

A pdf file of this book can be freely downloaded from the following link:

<http://eacpe.org/app/wp-content/uploads/2017/11/Nuclear-Weapons-An-Absolute-Evil-by-John-Scales-Avery.pdf>

I urge you to download this file and to send the link or file to friends who might be interested.

All of my books and articles on the serious global problems that we face today can be found on the following link:

<http://eacpe.org/about-john-scales-avery/>

Please spread both links to any of your friends who might be interested. Also, if you have a website, please publish it there.

## **An excerpt from an appendix on the 2017 Nobel Peace Prize:**

The International Campaign to Abolish Nuclear Weapons, abbreviated ICAN, is a coalition of 468 NGO's in 101 countries. The purpose of ICAN is to change the focus in the disarmament debate to "the the humanitarian threat posed by nuclear weapons, drawing attention to their unique destructive capacity, their catastrophic health and environmental consequences, their indiscriminate targeting, the debilitating impact of a detonation on medical infrastructure and relief measures, and the long-lasting effects of radiation on the surrounding area."

On July 7, 2017, the Treaty on the Prohibition of Nuclear Weapons was adopted by an overwhelming majority, 122 to 1, by the United Nations General Assembly. The adoption of the treaty, a milestone in humanity's efforts to rid itself of nuclear insanity, was to a large extent due to the efforts of ICAN's participating organizations.

On December 10, 2017 ICAN's efforts were recognized by the award of the Nobel Peace Prize. Part of the motivation for the award was the fact that the threat of a thermonuclear global catastrophe is higher today than it has been at any time since the Cuban Missile Crisis. Because of the belligerent attitudes and mental instability of Donald Trump and Kim Jong Un, the end of human civilization and much of the biosphere is, in the words of ICAN's Executive Director Beatrice Fihn, "only a tantrum away".

Here are some excerpts from the Introduction to my book on nuclear weapons:

## **The threat of nuclear war is very high today**

This book is a collection of articles and book chapters that I have written advocating the abolition of nuclear weapons. Some new material has also been added, for example a discussion of the Treaty on the Prohibition of Nuclear Weapons, which has recently been adopted by an overwhelming majority vote at the United Nations General Assembly.

Today, because of the possibility that U.S. President Donald Trump will initiate a nuclear war against Iran or North Korea, or even Russia, the issue of nuclear weapons is at the center of the global stage. I strongly believe that the time has come for all countries to



take a united stance on this issue. Most of the world's nations live in nuclear weapon free zones. This does not give them any real protection, since the catastrophic environmental effects of nuclear war would be global, not sparing any nation. However, by supporting the Nuclear Weapons Convention and by becoming members of NWFZ's, nations can state that they consider nuclear weapons to be morally unacceptable, a view that must soon become worldwide if human civilization is to survive.

We must take a stand, and state clearly that nuclear weapons are an absolute evil; that their possession does not increase anyone's security; that their continued existence is a threat to the life of every person on the planet; and that these genocidal and potentially omniscidal weapons have no place in a civilized society.

## **Nuclear warfare as genocide**

On December 9, 1948, the United Nations General Assembly adopted a convention prohibiting genocide. It seems appropriate to discuss nuclear warfare against the background of this important standard of international law.

Cannot nuclear warfare be seen as an example of genocide? It is capable of killing entire populations, including babies, young children, adults in their prime and old people, without any regard for guilt or innocence. The retention of nuclear weapons, with the intent to use them under some circumstances, must be seen as the intent to commit genocide. Is it not morally degrading to see our leaders announce their intention to commit the "crime of crimes" in our names?

## **The continuity of life is sacrosanct**

In 1985, International Physicians for the Prevention of Nuclear War received the Nobel Peace Prize. IPPNW had been founded in 1980 by six physicians, three from the Soviet Union and three from the United States. Today, the organization has wide membership among the world's physicians. Professor Bernard Lowen of the Harvard School of Public Health, one of the founders of IPPNW, said in a recent speech:

"...No public health hazard ever faced by humankind equals the threat of nuclear war, which could make this planet uninhabitable... Modern medicine has nothing to offer, not even a token benefit, in the event of nuclear war...

"We are but transient passengers on this planet Earth. It does not belong to us. We are not free to doom generations yet unborn. We are not at liberty to erase humanity's past or dim its future. Social systems do not endure for eternity. Only life can lay claim to uninterrupted continuity. This continuity is sacred."

## **Nuclear weapons are criminal! Every war is a crime!**

War was always madness, always immoral, always the cause of unspeakable suffering, economic waste and widespread destruction, and always a source of poverty, hate, barbarism and endless cycles of revenge and counter-revenge. It has always been a crime for soldiers

to kill people, just as it is a crime for murderers in civil society to kill people. No flag has ever been wide enough to cover up atrocities.

But today, the development of all-destroying modern weapons has put war completely beyond the bounds of sanity and elementary humanity. Today, war is not only insane, but also a violation of international law. Both the United Nations Charter and the Nuremberg Principles make it a crime to launch an aggressive war. According to the Nuremberg Principles, every soldier is responsible for the crimes that he or she commits, even while acting under the orders of a superior officer.

Nuclear weapons are not only insane, immoral and potentially omnicidal, but also criminal under international law. In response to questions put to it by WHO and the UN General Assembly, the International Court of Justice ruled in 1996 that “the threat and use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and particularly the principles and rules of humanitarian law.” The only possible exception to this general rule might be “an extreme circumstance of self- defense, in which the very survival of a state would be at stake”. But the Court refused to say that even in this extreme circumstance the threat or use of nuclear weapons would be legal. It left the exceptional case undecided. In addition, the Court added unanimously that “there exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control.”

Can we not rid ourselves of both nuclear weapons and the institution of war itself? We must act quickly and resolutely before everything that we love in our beautiful world is reduced to radioactive ashes.

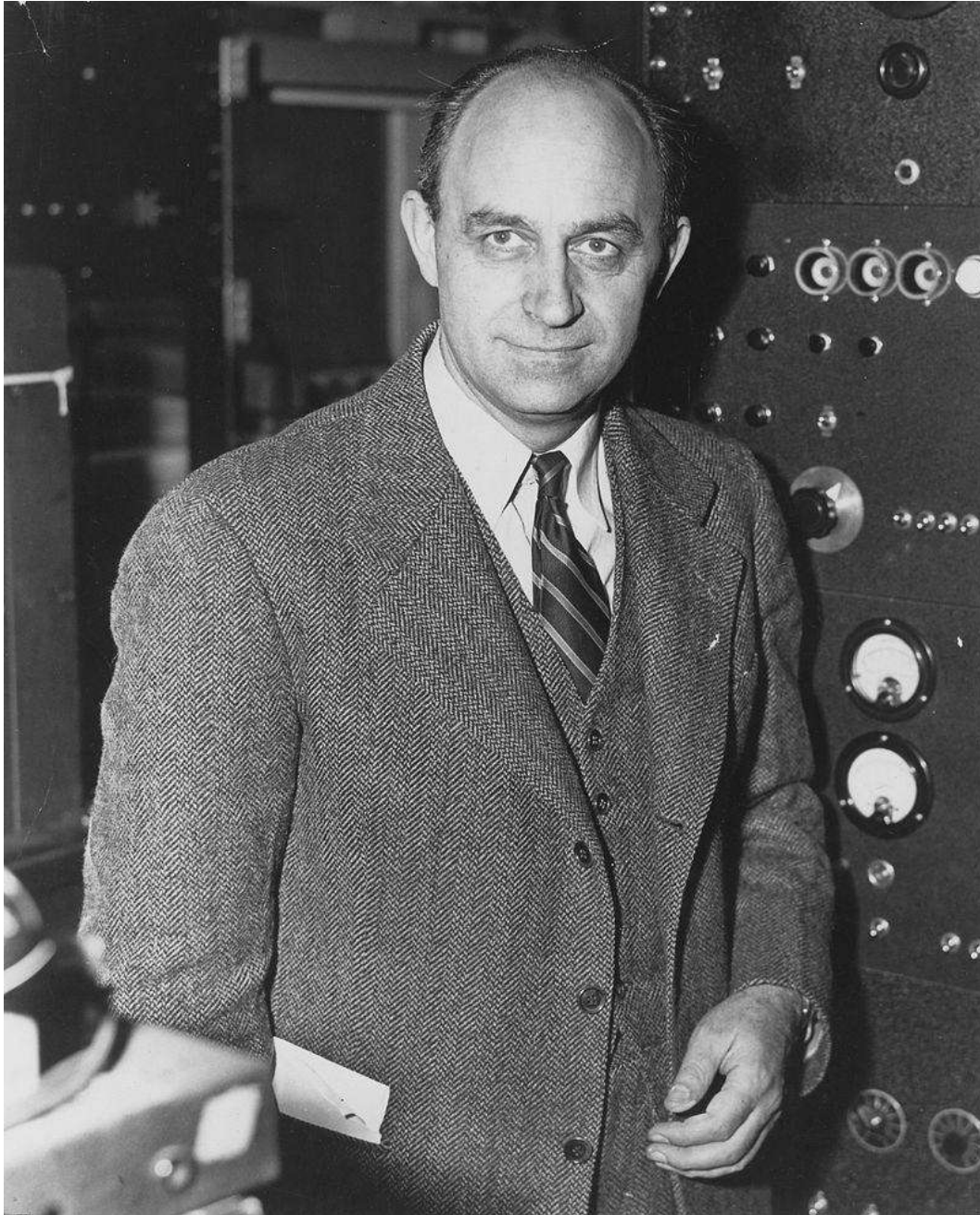


Figure 1: Enrico Fermi (1901–1954). In 1934, he and his team of young Italian physicists split uranium atoms without realizing it.

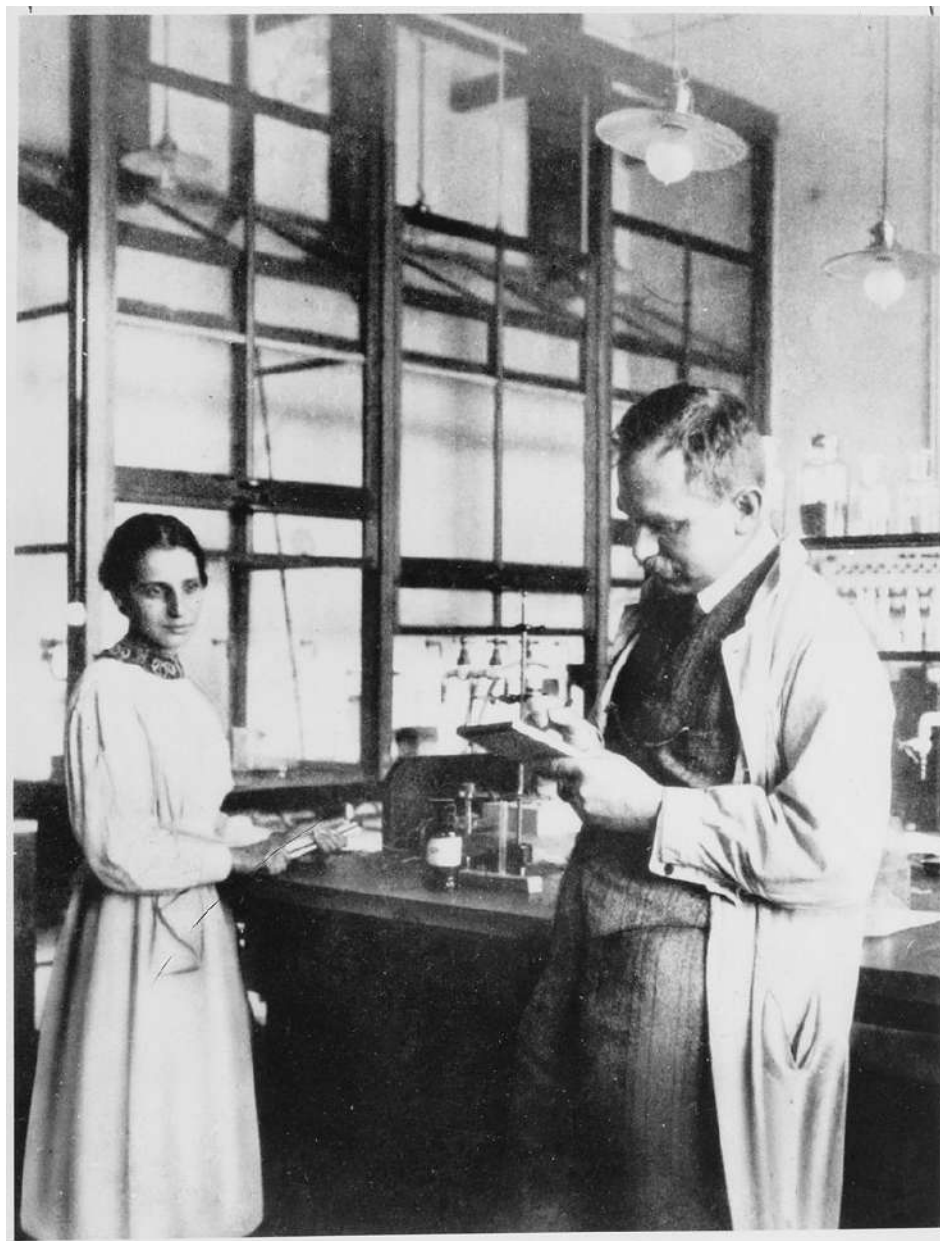


Figure 2: Otto Hahn and Lise Meitner. Hahn was a German radiochemist, and Meitner his assistant. Their experiments showed that Fermi and his group had actually split the atom using neutrons.



Figure 3: Albert Einstein and Leo Szilard with the fateful letter to Roosevelt. In part, the letter read as follows: “Some recent work of E. Fermi and L. Szilard, which has been communicated to me in manuscript, leads me to expect that the element uranium may be turned into an important source of energy in the immediate future. Certain aspects of the situation seem to call for watchfulness and, if necessary, quick action on the part of the Administration. I believe, therefore, that it is my duty to bring to your attention the following.. It is conceivable that extremely powerful bombs of a new type may be constructed. A single bomb of this type, carried by boat and exploded in a port, might very well destroy the whole port, together with some of the surrounding territory..” Einstein later bitterly regretted signing the letter.

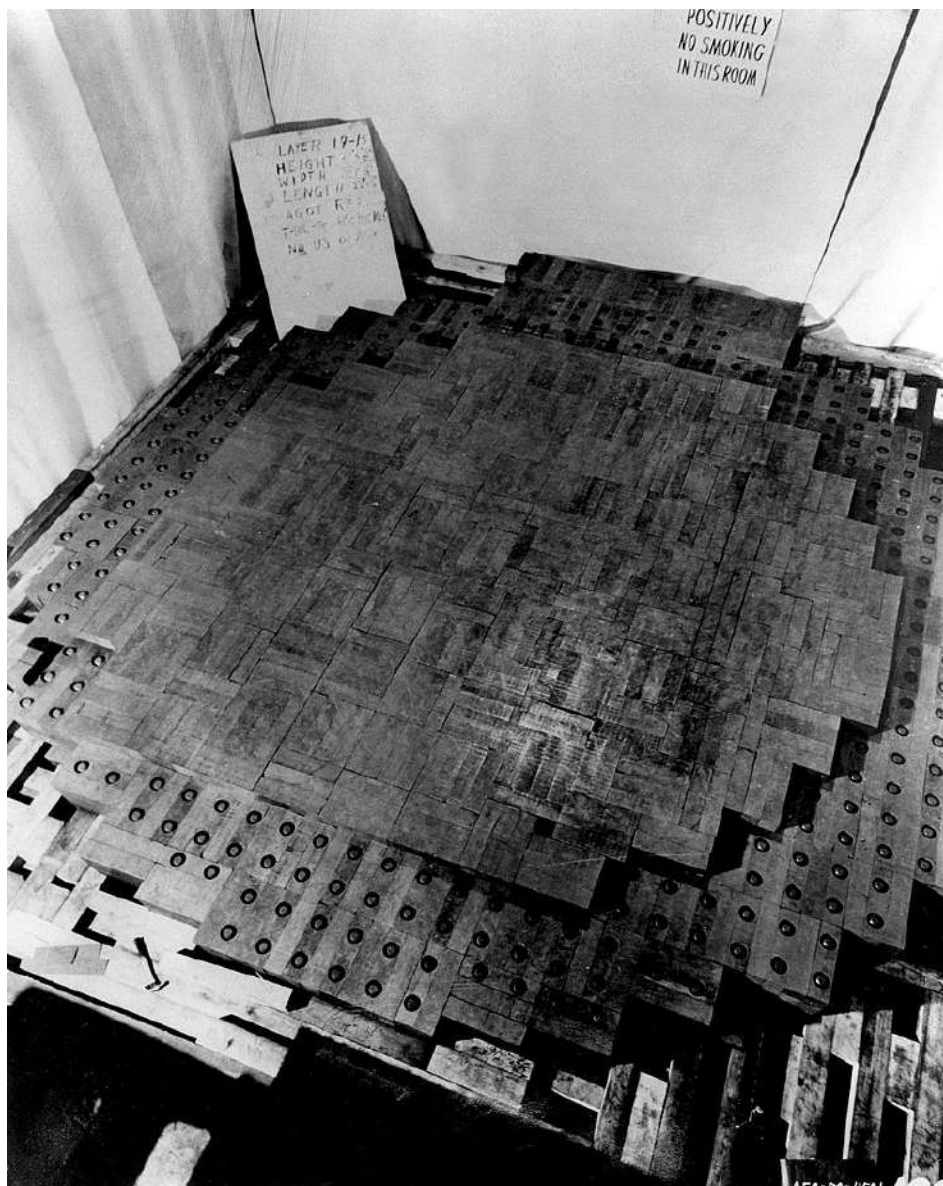


Figure 4: This is the only photograph made during the construction of the first nuclear reactor.



Figure 5: Oppenheimer with General Leslie Groves, military head of the Manhattan Project. Public domain, Wikimedia Commons





Figure 6: It was like a scene from hell. Source: SGI International.



Figure 7: Memories of August 6. Source: SGI International.





Figure 8: The effects lasted a lifetime. Source: SGI International.



Figure 9: After the bombing. Source: SGI International.



Figure 10: **Burned beyond recognition.** Source: SGI International.



Figure 11: The United States exploded a hydrogen bomb near the island of Enewetak in the South Pacific in 1952. The explosive force of the bomb was 500 times greater than the bombs that destroyed Hiroshima and Nagasaki. The Soviet Union tested its first hydrogen bomb in 1953. In March, 1954, the US tested another hydrogen bomb at the Bikini Atoll in the Pacific Ocean. It was 1000 times more powerful than the Hiroshima bomb. The Japanese fishing boat, Lucky Dragon, was 130 kilometers from the Bikini explosion, but radioactive fallout from the test killed one crew member and made all the others seriously ill. In England, Prof. Joseph Rotblat, a Polish scientist who had resigned from the Manhattan Project for moral reasons when it became clear that Germany would not develop nuclear weapons, was asked to appear on a BBC program to discuss the Bikini test. He was asked to discuss the technical aspects of H-bombs, while the Archbishop of Canterbury and the philosopher Lord Bertrand Russell were asked to discuss the moral aspects. Rotblat had become convinced that the Bikini bomb must have involved a third stage, where fast neutrons from the hydrogen thermonuclear reaction produced fission in a casing of ordinary uranium. Such a bomb would produce enormous amounts of highly dangerous radioactive fallout, and Rotblat became extremely worried about the possibly fatal effect on all living things if large numbers of such bombs were ever used in a war. He confided his worries to Bertrand Russell, whom he had met on the BBC program.



Figure 12: After discussing the Bikini test and its radioactive fallout with Joseph Rotblat, Lord Russell became concerned for the future of the human gene pool if large numbers of such bombs should ever be used in a war. To warn humanity of the danger, he wrote what came to be known as the Russell-Einstein Manifesto. On July 9, 1955, with Rotblat in the chair, Russell read the Manifesto to a packed press conference. The document contains the words: “Here then is the problem that we present to you, stark and dreadful and inescapable: Shall we put an end to the human race, or shall mankind renounce war?... There lies before us, if we choose, continual progress in happiness, knowledge and wisdom. Shall we, instead, choose death because we cannot forget our quarrels? We appeal as human beings to human beings: Remember your humanity, and forget the rest. If you can do so, the way lies open to a new Paradise; if you cannot, there lies before you the risk of universal death.” Lord Russell devoted much of the remainder of his life to working for the abolition of nuclear weapons. Here he is seen in 1962 in Trafalgar Square, London, addressing a meeting of the Campaign for Nuclear Disarmament.

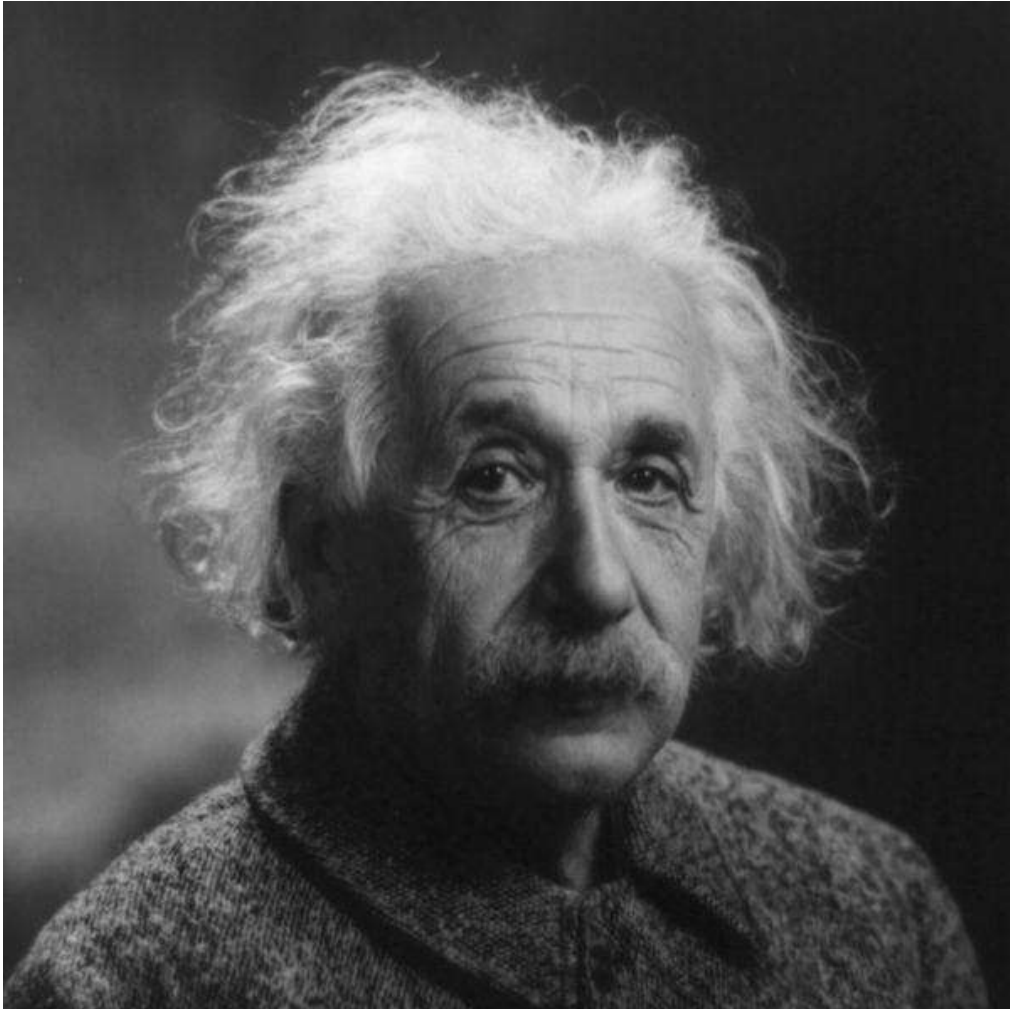


Figure 13: Albert Einstein wrote: “The unleashed power of the atom has changed everything save our modes of thinking, and we thus drift toward unparalleled catastrophes.” He also said, “I don’t know what will be used in the next world war, but the 4th will be fought with stones.”



Figure 14: Joseph Rotblat devoted the remainder of his life to working for peace and for the abolition of nuclear weapons. He became the president and guiding spirit of the Pugwash Conferences on Science and World Affairs, an organization of scientists and other scholars devoted to these goals. In his 1995 Nobel Peace Prize acceptance speech, Sir Joseph Rotblat (as he soon became) emphasized the same point that had been made in the Russell-Einstein Manifesto - that war itself must be eliminated in order to free civilization from the danger of nuclear destruction. The reason for this is that the knowledge of how to make nuclear weapons can never be forgotten. Even if they were eliminated, these weapons could be rebuilt during a major war. Thus the final abolition of nuclear weapons is linked to a change of heart in world politics and to the abolition of the institution of war.

# THE PASSIONS OF MANKIND

## Human emotions: An evolutionary paradox?

Today, our emotions seem to be driving us towards disaster. At first this seems to be a paradox. Our emotions have been produced by evolution, and Darwinian natural selection is supposed to produce traits that lead to survival, rather than to destruction. Examining the question more closely, we can notice that in our species, evolution is divided into two parts, genetic evolution, which proceeds very slowly, and cultural evolution, which moves with lightning-like speed, and is constantly accelerating.

On the time-scale of genetic evolution, it only took a moment for our ancestors to move from making cave-paintings to speculating on the existence of atoms in ancient Greece. In another moment, we had unleashed the terrible power of the atom. During this time our emotions did not change. We face the global problems created by today's science and technology, and by the exponential growth of population and industry, with our poor cave-man's brains and our anachronistic stone-age emotions.

## Condorcet, Godwin and Malthus

The Enlightenment in Europe was a period of tremendous optimism. Summarizing the ideas of human progress that were current at the time, the Marquis de Condorcet (1743-1794) wrote an enormously optimistic book entitled "Esquisse d'un Tableau Historique des Progres de l'Esprit Humain", or in English, "Sketch for an Historical Picture of the Progress of the Human Mind".

In England, William Godwin (1756-1836) wrote an equally optimistic book, "Political Justice", in which he maintained that progress would soon produce a world with mechanized agriculture and material plenty in which humans would only need to work very few hours each day to gain their daily bread, the rest of their time being devoted to culture and mental improvement. The savage system of laws of Godwin's time, in which stealing a handkerchief was punishable by hanging, would not be needed in the future, because in the midst of plenty, no one would be motivated to steal.

## A debate between father and son

Thomas Robert Malthus (1755-1834) was introduced to these books by his father, Daniel Malthus, an intellectual English country gentleman and an enthusiastic supporter of the ideas of Condorcet and Godwin. Listening to his father, the thoughts of Thomas Robert Malthus turned to the rapid population growth which, as a clergyman, he had noticed in the records of births and deaths in his congregation. He told his father that all the benefits of progress would be eaten up by growing populations. Impressed by these arguments, Daniel Malthus urged his son to write them out and to publish them. The result was T.R. Malthus' famous book on population, which he continued to revise and republish until the end of his life. Malthus' refutation of Godwin's utopia is particularly interesting.



## **The laws of nature and the passions of mankind**

Malthus discussed William Godwin's egalitarian utopia, which, he said, would be extremely attractive if only it could be achieved: "The system of equality which Mr. Godwin proposes, Malthus wrote, is, on the first view of it, the most beautiful and engaging which has yet appeared. A melioration of society to be produced merely by reason and conviction gives more promise of permanence than any change effected and maintained by force. The unlimited exercise of private judgement is a doctrine grand and captivating, and has a vast superiority over those systems where every individual is in a manner the slave of the public."

"But alas!" Malthus continued, "That moment can never arrive.... The great error under which Mr. Godwin labours throughout his whole work is the attributing of almost all the vices and misery that prevail in civil society to human institutions. Political regulations and the established administration of property are, with him, the fruitful sources of all evil, the hotbeds of all the crimes that degrade mankind. Were this really a true state of the case, it would not seem a completely hopeless task to remove evil completely from the world; and reason seems to be the proper and adequate instrument for effecting so great a purpose."

"But the truth is, that though human institutions appear to be, and indeed often are, the obvious and obtrusive causes of much misery in society, they are, in reality, light and superficial in comparison with those deeper-seated causes of evil which result from the laws of nature and the passions of mankind."

The passions of mankind drive humans to reproduce, while the laws of nature set limits to the carrying capacity of the environment. Godwin's utopia, if established, would be very favorable to the growth of population; and very soon the shortage of food would lead to its downfall, because of the overpowering force of population growth.

## **A new freely downloadable book**

I would like to announce the publication of a book which discusses human emotions from an evolutionary perspective. The book consists mainly of book chapters and articles that I have previously published, although some new material has been added. It can be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/10/The-Passions-of-Mankind-by-John-Scales-Avery.pdf>

In "The Passions of Mankind", I have tried to discuss the impact of anachronistic human emotions on today's world.

## **Other books and articles about global problems are on these links**

<http://eacpe.org/about-john-scales-avery/>

<https://wsimag.com/authors/716-john-scales-avery>

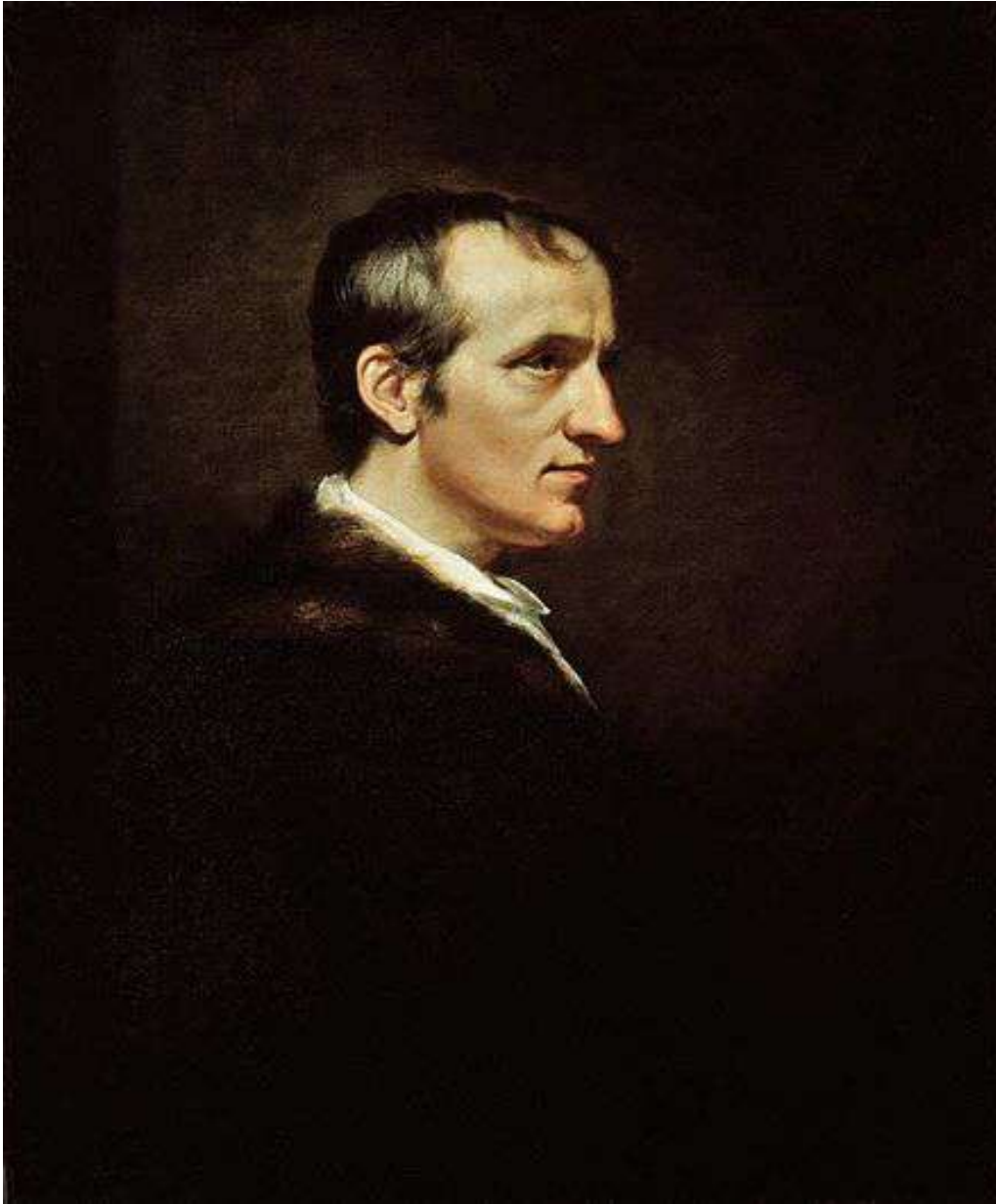


Figure 1: William Godwin (1756-1836) in a painting by James Northcote. He achieved great fame through his book *Political Justice*, a utopian vision of the future.



Figure 2: Thomas Robert Malthus (1755-1834). His refutation of Godwin's utopian ideas is extremely interesting. Malthus wrote that the evils produced by our institutions are light compared with those produced by "the laws of nature and the passions of mankind". Our inherited emotional nature conflicts with today's social and political needs because of the slowness of genetic evolution compared with the rapidity of cultural change. For example, human nature contains an element of tribalism, which is easily exploited by militarists who profit from our endless wars.

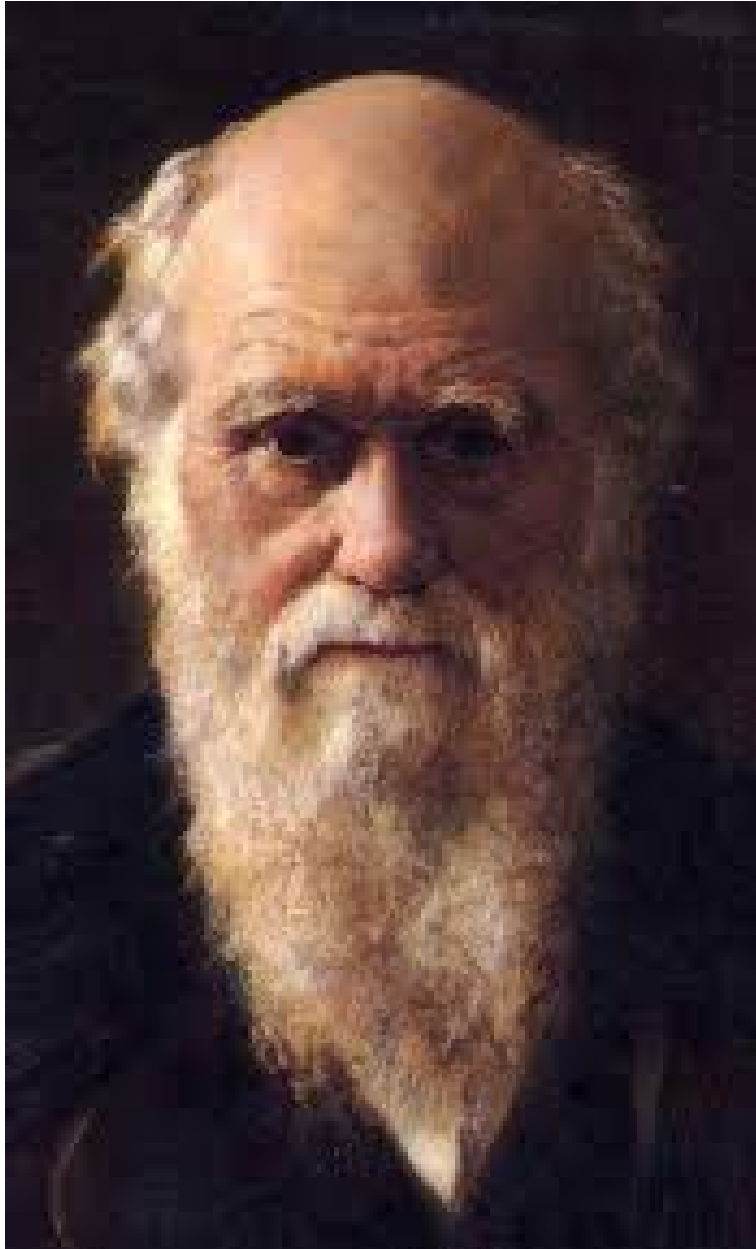


Figure 3: Because of Charles Darwin's book "The Expression of Emotions in Man and Animals", he is considered to be the founder of the field of Ethology, the study of inherited behavior patterns.



Figure 4: Nikolaas Tinbergen (1907-1988) on the left, with Konrad Lorenz (1903-1989). Together with Karl von Frisch (1886-1982) they shared the 1973 Nobel Prize in Physiology and Medicine for their pioneering work in Ethology.



Figure 5: Konrad Lorenz with geese who consider him to be their mother, since he was the first living thing that they saw upon hatching. Lorenz discovered this instinct when he was only a young boy.



Figure 6: Sir Ronald Aylmer Fischer (1890-1962). Together with J.B.S Haldane he pioneered the theory of population genetics. Recent contributions to this theory have been made by W.D. Hamilton and E.O. Wilson. According to the group selection model, a tribe whose members showed altruism towards each other would be more likely to survive than a tribe whose members cooperated less effectively. Since several tribes might be in competition for the same territory, intertribal aggression might, under some circumstances, increase the chances for survival of one's own tribe. Thus, on the basis of the group selection model, one would expect humans to be kind and cooperative towards members of their own group, but at the same time to sometimes exhibit terrible aggression towards members of other groups, especially in conflicts over territory. One would also expect intergroup conflicts to be most severe in cases where the boundaries between groups are sharpest - where marriage is forbidden across the boundaries.



Figure 7: A tattooed face can help to establish tribal identity. Surveying the human scene, one can find endless examples of signs that mark the bearer as a member of a particular group - signs that can be thought of as “tribal markings”: tattoos; piercing; bones through the nose or ears; elongated necks or ears; filed teeth; Chinese binding of feet; circumcision, both male and female; unique hair styles; decorations of the tongue, nose, or naval; peculiarities of dress, fashions, veils, chadors, and headdresses; caste markings in India; use or nonuse of perfumes; codes of honor and value systems; traditions of hospitality and manners; peculiarities of diet (certain foods forbidden, others preferred); giving traditional names to children; knowledge of dances and songs; knowledge of recipes; knowledge of common stories, literature, myths, poetry or common history; festivals, ceremonies, and rituals; burial customs, treatment of the dead and ancestor worship; methods of building and decorating homes; games and sports peculiar to a culture; relationship to animals, knowledge of horses and ability to ride; nonrational systems of belief. Even a baseball hat worn backwards or the professed ability to enjoy atonal music can mark a person as a member of a special “tribe”.





Figure 8: An example of the dueling scars that Prussian army officers once used to distinguish their caste from outsiders.

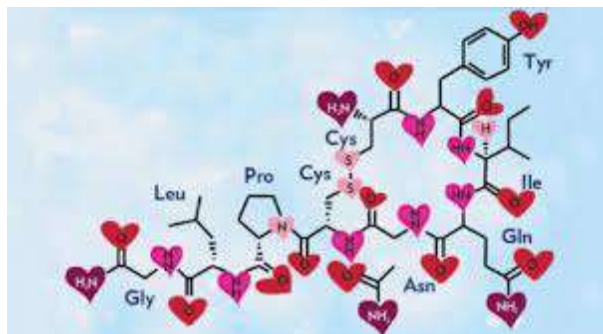


Figure 9: An artist's impression of the structure of oxytocin. Oxytocin plays a role in social bonding and sexual reproduction in both sexes. During childbirth, Oxytocin is released into the bloodstream of women in response to stretching of the cervix and uterus during labour, and also in response to breastfeeding. The hormone then facilitates the bonding between mother and child. Oxytocin is also present in men and its concentration in their bloodstream increases in response to romantic attachments and social bonding. A very similar hormone, with similar functions, is also present in other mammals besides humans.



Figure 10: Mother love: One of the most beautiful emotions.



Figure 11: **Mother love.**



Figure 12: **Mother love**



Figure 13: Mother love:



Figure 14: Mother love



Figure 15: Males fighting for dominance and mating rights

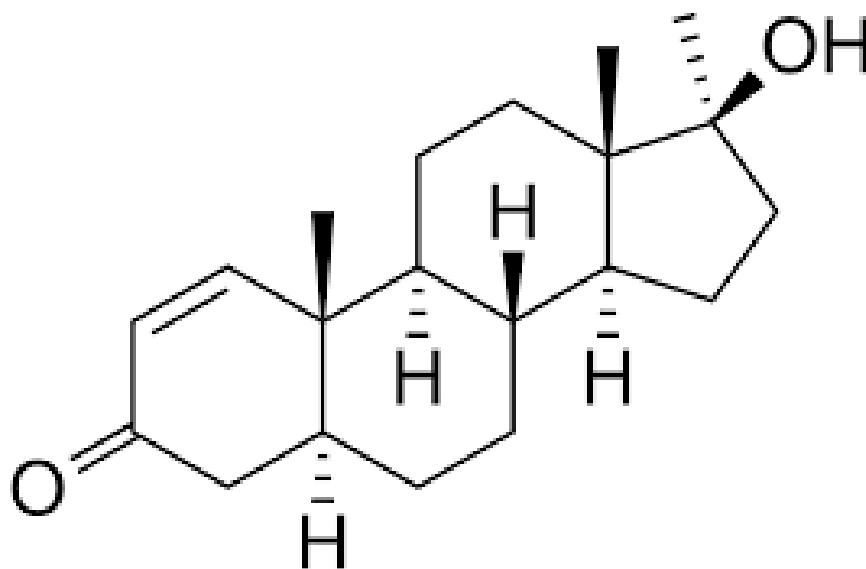


Figure 16: Testosterone is a hormone present in large quantities in males and much smaller amounts in females. It is involved in rank-determining fights and mating.



Figure 17: An expensive automobile can be thought of as a mating display used by human males to impress females.

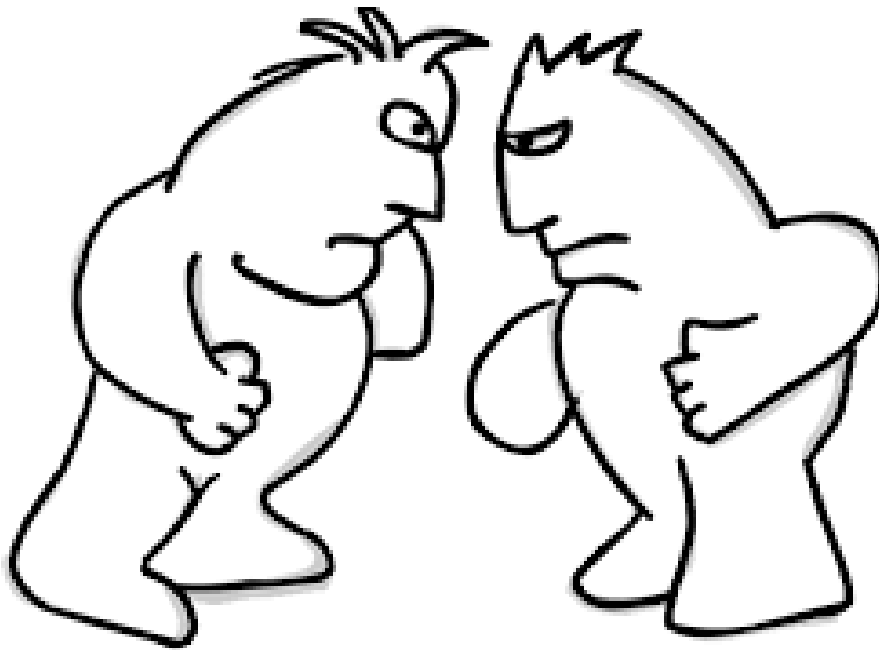


Figure 18: Males fighting for dominance and mating rights.

# POPULATION AND THE ENVIRONMENT

## Limits to the earth's carrying capacity

One hopes that human wisdom and ethics will continue to grow, but unlimited growth of population and industry on a finite earth is a logical impossibility.

Today we are pressing against the absolute limits of the earth's carrying capacity. There are many indications that the explosively increasing global population of humans, and the growth of pollution-producing and resource-using industries are threatening our earth with an environmental disaster. Among the serious threats that we face are catastrophic anthropogenic climate change, extinction of species, and a severe global famine, perhaps involving billions of people rather than millions. Such a famine may occur by the middle of the present century when the end of the fossil fuel era, combined with the effects of climate change reduce our ability to support a growing population.

## A new book

I would like to announce the publication of a book addressing these problems, entitled Population and the Environment. The book may be freely downloaded and circulated from the following links:

<http://eacpe.org/app/wp-content/uploads/2018/07/Population-And-The-Environment-by-John-Scales-Avery.pdf>

[www.fredsakademiet.dk/library/popbook.pdf](http://www.fredsakademiet.dk/library/popbook.pdf)

The book discusses some of the measures that will help us to stabilize global population and to achieve a sustainable global society. Most of the material is new, but I have made use of book chapters and articles that I have previously written on these issues.

## Stabilizing Global Population

Experts agree that the following steps are needed if we are to avoid a catastrophic global famine and a population crash:

Higher education and higher status for women throughout the world: Women need higher education to qualify for jobs outside their homes. They need higher status within their families so they will not be forced into the role of baby-producing machines.

Primary health care for all: Children should be vaccinated against preventable diseases. Materials and information for family planning should be provided for all women who desire smaller families. Advice should be given on improving sanitation.

The provision of clean water supplies near to homes is needed in order to reduce the incidence of water-borne diseases. In some countries today, family members, including children, spend large amounts of time carrying water home from distant sources.

State provision of care for the elderly is a population-stabilization measure because in many countries, parents produce many children so that the children will provide for them in their old age.



In many countries child labour is common, and in some there is child slavery. Parents who regard their children as a source of income are motivated to produce large families. Enforceable laws against child labour and slavery contribute to population stabilization.

General economic progress has been observed to contribute to population stabilization. However in some countries there is a danger of population growing so rapidly that it prevents the economic progress that would otherwise have stabilized population. This situation is known as the demographic trap.

Forced marriage should be forbidden, and very early marriage discouraged

## **The battle for birth control**

Thomas Robert Malthus' "Essay on The Principle of Population", the first edition of which was published in 1798, was one of the the first systematic studies of the problem of population in relation to resources. Earlier discussions of the problem had been published by Botero in Italy, Robert Wallace in England, and Benjamin Franklin in America. However Malthus' "Essay" was the first to stress the fact that, in general, powerful checks operate continuously to keep human populations from increasing beyond their available food supply. In a later edition, published in 1803, he buttressed this assertion with carefully collected demographic and sociological data from many societies at various periods of their histories.

Malthus considered birth control to be a form of vice, and as "preventive checks" to excessive population growth he instead recommended celibacy, late marriage and "moral restraint" within marriage. Had he been writing today, Malthus would undoubtedly have agreed that birth control is the most humane method of avoiding the grim "positive checks" that prevent populations from exceeding their supply of food - famine, disease and war.

The battle for birth control was not easily won. Part of the opposition to contraceptive methods came from industrialists who were happy to have an excess supply of workers to whom they could pay starvation wages. Chapter 3 of my book discusses the battle for birth control in various countries.

## **Women in public life**

We mentioned that one of the most important steps in population stabilization is for women to have higher education, higher status, and jobs outside the home. These reforms, like birth control, have been vigorously opposed by the ruling classes of most countries. Chapter 4 outlines the struggle for womens rights. while Chapters 5 and 6 discuss the history of womens struggle for representation in science, politics, literature, music and the visual arts.

## **Achieving a sustainable and peaceful global society**

The remaining chapters of the book discuss threats to the environment and the steps that will be needed to achieve a stable and peaceful global society. Here are some of the reforms



Figure 1: **Thomas Robert Malthus (1766-1834).**



Figure 2: Captain James Cook, FRS (1728-1779). According to Cook, the native New Zealanders practiced both ceaseless war and cannibalism; and population pressure provided a motive for both practices. Malthus based his description of hunter-gatherer societies on the writings of explorers such as Cook and Vancouver.



Figure 3: Tiny Tim, from Charles Dickens' *A Christmas Carol*. When he is informed that Tiny Tim will die unless he receives medical treatment, Scrooge remarks, "Then he had better die and reduce the surplus population!". Many of the events in Dickens' books can be viewed as protests against the ideas of Malthus.



Figure 4: **The Irish Potato Famine.**

that will be needed:

- We must achieve a steady-state economic system.
- We must restore democracy in our own countries whenever it has been replaced by oligarchy.
- We must decrease economic inequality both between nations and within nations.
- We must break the power of corporate greed. Economics must be given both a social conscience and an ecological conscience.
- We must leave fossil fuels in the ground.
- We must stabilize and ultimately reduce the global population to a level that can be supported by sustainable agriculture after the end of the fossil fuel era.
- We must stop using material goods for social competition. This will be necessary in order to reduce per-capita consumption.
- We must eliminate the institution of war. Thermonuclear weapons have made war prohibitively dangerous.
- We must build a new global ethical system based on the concept of a universal human family.

## **Thank you or circulating the links**

As mentioned above, my book on population may be freely downloaded and circulated. I would be extremely grateful to readers who circulate the links to everyone who might be interested. Many of my other books and articles can be found on the following websites:

<http://eacpe.org/about-john-scales-avery/>  
<https://human-wrongs-watch.net/2016/03/15/peace/>



Figure 5: The Irish Potato Famine.

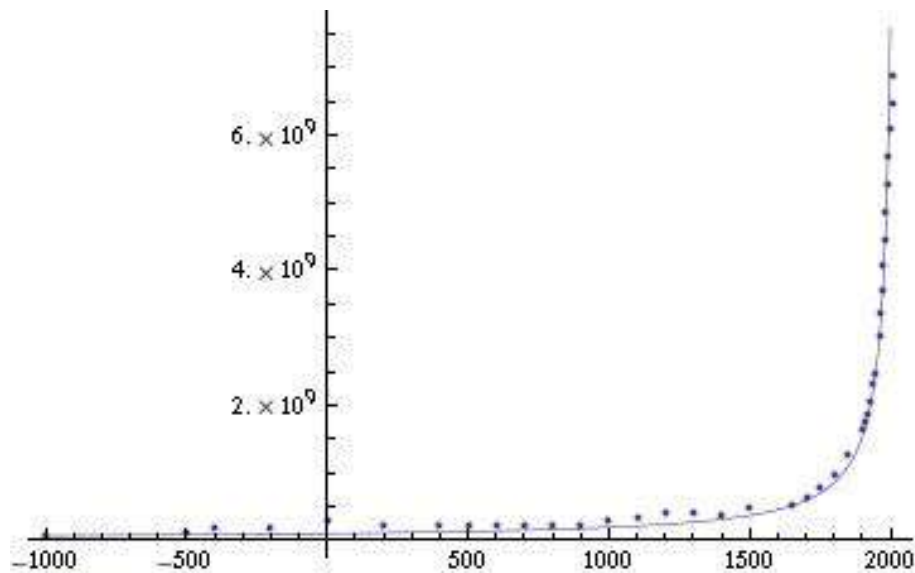


Figure 6: The simple mathematical curve that fits best to human population data over the last 3,000 years is not an exponential increase, but rather a hyperbola of the form  $P=C/(2025-t)$ . Here  $P$  represents population,  $C=190,000,000,000$  and  $t$  is the year. The curve goes to infinity at  $t=2025$  (only a few years away), which is of course impossible. Global population has already started to fall away from the hyperbolic trajectory. Will it level off, or will it crash disastrously? Because of the enormous amount of human suffering that would be involved in a population crash, the question has great importance.





Figure 7: The Utilitarian philosopher and political economist James Mill (1773-1836) was an early advocate of birth control. In his *Elements of Political Economy*, he wrote: “The result to be aimed at is to secure to the great body of the people all the happiness which is capable of being derived from the matrimonial union, (while) preventing the evils which the too rapid increase of their numbers would entail. The progress of legislation, the improvement of the education of the people, and the decay of superstition will, in time, it may be hoped, accomplish the difficult task of reconciling these important objects.”



Figure 8: Annie Besant (1847-1933). She and the Liberal politician Charles Bradlaugh sent a polite letter to the magistrates announcing when and where they intended to sell Knowlton's book on birth control methods, and asking to be arrested. The result was a famous trial, at which the arguments of Malthus were quoted both by the judge and by the defense. The result of trial was inconclusive, however: Annie Besant and Charles Bradlaugh were acquitted, but Knowlton's book was held to be obscene.



Figure 9: Margaret Sanger (1879-1966) is considered to be the founder of the modern birth control movement. Defying threats of arrest, she founded the first birth control clinic in America as well as an organization that developed into the Planned Parenthood Federation of America. In 1925 Sanger organized the Sixth International Neo-Malthusian Birth Control Conference. From 1952 to 1959, she served as President of the International Planned Parenthood Federation.



Figure 10: Emmeline Pankhurst (1858-1928). In 1999, Time Magazine named Emmeline Pankhurst as one of the 100 most important people of the 20th century, noting that “she shaped an idea of women for our time; she shook society into a new pattern from which there could be no going back”.



Figure 11: Annie Kenney and Emmeline Pankhurst's daughter, Christobel. When World War I broke out, both Emmeline and Christobel Pankhurst halted their protests and supported conscription and the war effort. By contrast, Sylvia opposed the war. When the war was over, the Representation of the People Act of 1918 extended the right to vote to men over 21, and to women property owners over 30. The discrepancy between men and women was intended to ensure that women did not become a majority.



# **WE NEED AN ECOLOGICAL REVOLUTION**

## **Our present crisis of civilization is unique**

Does history repeat itself? Is it cyclic, or is it unidirectional? Certainly many aspects of history are repetitive the rise and fall of empires, cycles of war and peace, cycles of construction and destruction. But on the other hand, if we look at the long-term history of human progress, we can see that it is clearly unidirectional. An explosion of knowledge has created the modern world. Never before has the world had a population of 7 billion people, to which a billion are added every decade. Never before have we had the power to destroy human civilization and the biosphere with catastrophic anthropogenic climate change or thermonuclear weapons. Our situation today is unique. We cannot rely on old habits, old traditions or old institutions. To save the long-term future for our children and grandchildren, and for all the other creatures with which we share the gift of life, we must overcome the inertia of our institutions and our culture.

## **Harmony between human society and nature must be restored**

Among the many global leaders who have pointed to the need for fundamental change are Pope Francis and former U.S. Vice President Al Gore.

In June, 2015, Pope Francis addressed the climate crisis in an encyclical entitled “*Laudato Si*”, in which he said “Climate change is a global problem with grave implications: environmental, social, economic, political and for the distribution of goods. It represents one of the principle challenges facing humanity in our day.” In his Apostolic Exhortation “*Evangelii Gaudium*”, Pope Francis wrote: “Just as the commandment ‘Thou shalt not kill’ sets a clear limit in order to safeguard the value of human life, today we also have to say thou shalt not to an economy of exclusion and inequality.”

For very many years, Al Gore has struggled to call public attention to the existential dangers of catastrophic climate change. These efforts were recognized with a Nobel Peace Prize, which Al Gore shared with the Intergovernmental Panel on Climate Change (IPCC). The October 2018 report of the IPCC shocked the world. The report finds that limiting global warming to 1.5 degrees C would require rapid and far-reaching transitions in land, energy, industry, buildings, transport and cities. Global net human-caused emissions of carbon-dioxide would need to fall by about 45 percent from 2010 levels by 2030, reaching net zero around 2050. Another conclusion of the report was that humanity has only 12 years in which to act if tipping points are to be avoided, beyond which uncontrollable feedback loops would be set in motion.

This situation caused 16-year-old Swedish climate activist Greta Thunberg, addressing the 2019 Davos Economic Forum in Switzerland, to say “Our house is on fire. I am here to say that our house is on fire. According to the IPCC, we are less than 12 years away from not being able to undo our mistakes. In that time, unprecedented changes in all aspects of society need to have taken place, including reductions of our CO<sub>2</sub> emissions by at least 50 percent.”



## **Fundamental changes are needed**

Fundamental changes are needed in order to give our economic system both an ecological conscience and a social conscience. In many countries, economics and politics are linked, because excessive inequality in wealth has meant that corporate oligarchs control our political systems. To restore democracy, we must decrease economic inequality. Furthermore, reformed economic systems must prioritize ecological goals, especially the replacement of fossil fuels by renewable energy, reforestation, and the drastic reduction of greenhouse gas emissions.

Since rapid and fundamental changes are urgently needed to save the future, it is perhaps not an exaggeration to speak of the need for an ecological revolution, but it must be a nonviolent revolution.

Strong reasons for avoiding violence in situations of conflict have been given by Mahatma Gandhi. To the insidious argument that “the end justifies the means”, Gandhi answered firmly: “They say that ‘means are after all means’. I would say that ‘means are after all everything’. As the means, so the end. Indeed, the Creator has given us limited power over means, none over end... The means may be likened to a seed, and the end to a tree; and there is the same inviolable connection between the means and the end as there is between the seed and the tree. Means and end are interconvertable terms in my philosophy of life.”

Trained as a lawyer, Gandhi fought his battles in the court of public opinion. In this court, violent methods fatally weaken one’s case, besides being futile if one is opposing overwhelming military strength. Today, our case for the need to make rapid and fundamental changes must be fought in the court of public opinion. This is made difficult by the fact that the mass media are firmly under the control of powerholding oligarchs. However, the Internet is still relatively uncensored, and this gives us the opportunity to create our own media.

We give our children loving care; but it makes no sense to do so unless we also do all that is within our power to give them a future in which they can survive.

None of us asked to be born at a time of crisis, But we have been born at such a time, and history has given us an enormous responsibility. If we do not work with courage and dedication to save our beautiful world for future generations, all of the treasures that past generations have given to us will be lost. You and I, all of us together, can save the future if we work hard enough. Let us join hands and save the earth for our children and grandchildren.

## **A new book**

I would like to announce the publication of a new book entitled “We Need An Ecological Revolution”. The book can be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/03/We-need-an-ecological-revolution-John-Scales-Avery.pdf>

I have included short sketches of the lives of many famous non-violent revolutionaries;

and I hope that these lives of the saints can give us inspiration. Of course, the choice of whom to include was rather arbitrary, and very many others deserve recognition; but I hope that the few can stand for the many, and I hope that they can inspire us to put our duty to future generations ahead of present profit or pleasure.

One of the chapters discusses the ideals of the Enlightenment. Those ideals are still valid today.

## **Other books and articles on serious global problems**

Other books and articles on serious global problems are available on: <http://eacpe.org/about-john-scales-avery/>



Figure 1: Carl Wolmar Jakob, Baron von Uexküll (born 1944) co-founded the World Future Council and the Other Economic Summit, as well as contributing the money needed to fund the Right Livelihood Award. Concerning the future, he says: “Today we are heading for unprecedented dangers and conflicts, up to and including the end of a habitable planet”.



Figure 2: Swedish climate activist Greta Thunberg was 15 years old at the time of the COP24 climate conference in Poland. After the UN Secretary General had spoken to the opening session, Greta made a short but very clear and powerful speech, making a plea for strong climate action on behalf of civil society, and especially on behalf of the world's children. At the age of 8, Greta had asked herself "If burning fossil fuels was so bad that it threatened our very existence, how could we just continue like before? Why were there no restrictions? Why wasn't it made illegal?"



Figure 3: **Former US Vice President Al Gore (born in 1948).** Because of his outstanding work to make the public aware of the danger of catastrophic climate change, he shared the 2007 Nobel Peace Prize with the IPCC.



Figure 4: The Academy Award winning actor and environmental activist **Leonardo DiCaprio** (born in 1974) has produced several documentaries on climate change, most notably “Before the Flood”.

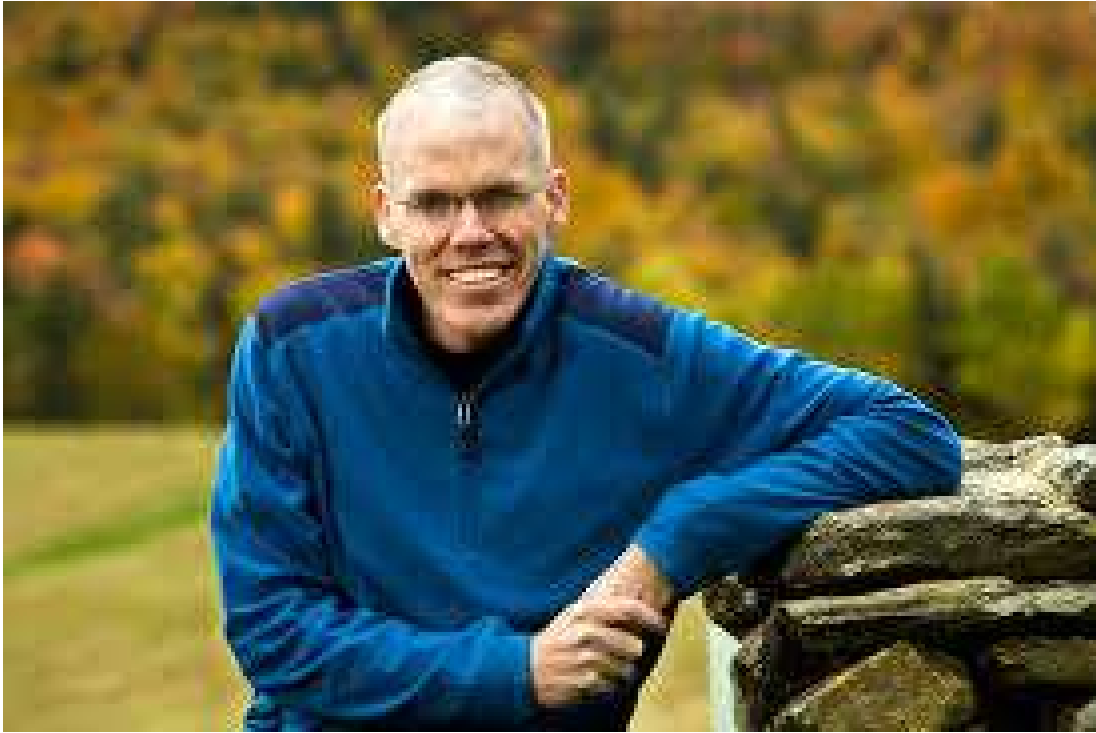


Figure 5: The American author, journalist and environmental activist Bill McKibben (born in 1960) is the founder and leader of 350.org, an important organization that campaigns world-wide for the immediate reduction of CO<sub>2</sub> emissions. Wikipedia writes of him: “In 2009, he led 350.org’s organization of 5,200 simultaneous demonstrations in 181 countries. In 2010, McKibben and 350.org conceived the 10/10/10 Global Work Party, which convened more than 7,000 events in 188 countries.” After graduating from Harvard in 1982, McKibben worked for five years as a writer for the New Yorker Magazine, after which he produced numerous books on the dangers of climate change. 350.org takes its name from James Hansen’s statement that “If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO<sub>2</sub> will need to be reduced from its current 385 ppm to at most 350 ppm, but likely less than that.” (Today the atmospheric CO<sub>2</sub> concentration has exceeded 400 ppm!). In 2014, Bill McKibben and 350.org shared the Right Livelihood Award, which is often called the *Alternative Nobel Prize*.





Figure 6: Born in 1928, Institute Professor Emeritus Noam Chomsky of MIT and the University of Arizona is considered to be one of the greatest public intellectuals in the world. As a linguist and cognitive scientist, he revolutionized our ideas of the inherited universal grammar of humans. He is also a philosopher and historian, and has written more than 100 important books, many of which criticize the the mass media and US government policies. Professor Chomsky has stated that because of its climate change denial, the US Republican Party is the most dangerous organization in history, since its actions may lead to catastrophic climate change and perhaps the extinction of the human species.



Figure 7: 28-year-old Alexandria Ocasio-Cortez (born in 1989) won a stunning victory in the Democratic Party primary election of June 26, 2018. Although outspent by a factor of 18 to 1 by her opponent (Democratic Caucus Chair, Joseph Crowley), she won the primary by 57% to 42%. Her campaign contributions came from small individual donors, while his came in large blocks, from corporations. Ocasio-Cortez calls for the United States to transition by 2035 to an electrical grid running on 100% renewable-energy production and end the use of fossil fuels. She calls healthcare “a human right”, and says: “Almost every other developed nation in the world has universal healthcare. It’s time the United States catch up to the rest of the world in ensuring all people have real healthcare coverage that doesn’t break the bank”. The Guardian called her victory “one of the biggest upsets in recent American political history”, and Senator Bernie Sanders commented “She took on the entire local Democratic establishment in her district and won a very strong victory. She demonstrated once again what progressive grassroots politics can do”. The lesson that the US Democratic Party must learn from this is that in order to overthrow Donald Trump’s openly racist Republican Party in the 2018 midterm elections, they must free themselves from the domination of corporate oligarchs, and instead stand for honest government and progressive values.



Figure 8: Members of the Sunrise movement in the office of House Majority Leader Nancy Pelosi, protesting against her lack of support for the Green New Deal.

# **FIGHTING FOR AMERICA'S SOUL**

## **Democratic institutions are in danger**

Today there is a deep split in public opinion in the United States. Democratic institutions are in danger from racism and neo-fascism. Progressives are fighting to save the values and institutions on which their country was founded. They are fighting to save America's soul.

## **Racism, discrimination and xenophobia**

Progressives today would like to eliminate all forms of discrimination, whether based on race, religion, ethnicity, or gender. They are opposed by white nationalist groups, especially in rural areas and among white industrial workers and evangelicals, who fear that their own groups will soon be outnumbered by those who differ from them in ethnicity, race or religion.

Donald Trump has appealed to these fears using rhetoric similar to that of Hitler. According to the testimony of his first wife, he kept a book Hitler's speeches beside his bedside and studied it diligently. Hitler's rise to power in Germany probably would not have occurred had it not been for the terrible economic stress produced by the terms of the Versailles Treaty. Working-class white Americans are similarly stressed, and they have chosen a similar leader.

## **Excessive economic inequality**

The United States today is characterized by excessive economic inequality. As Senator Bernie Sanders said, "There is no justice, and I want you to hear this clearly, when the top one-tenth of 1 percent - not 1 percent, the top one-tenth of 1 percent - today in America owns almost as much wealth as the bottom 90 percent."

Such exaggerated inequality is bad in itself, but it also leads to governmental corruption. Since Citizens United, corporations have been able to make enormous donations to the campaigns of politicians, essentially buying their support. Studies have shown that at present, the wishes of voters matter little in comparison to the wishes of the corporate sponsors of politicians. Because of this, the United States is not a democracy but an oligarchy. Progressives are fighting to change this. They are fighting to save "government of the people, by the people and for the people". They are fighting for America's soul.

## **The military-industrial complex**

In his famous farewell address, Dwight D. Eisenhower warned about the power of the military-industrial complex. He said "In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the Military-industrial complex. The potential for the disastrous rise of misplaced power exists and will persist."

In another speech, Eisenhower said, Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed. This world in arms is not spending money alone. It is spending the sweat of its laborers, the genius of its scientists, the hopes of its children.

Today the United States has bases in almost every country of the world, and spends almost a trillion dollars every year on armaments, or more than a trillion, depending on what is included. Aggressive foreign wars, and regime change coups have produced untold suffering, as well as a refugee crisis.

Progressives are fighting to change this. They are fighting for a more peaceful America. They are fighting for America's soul.

## **Secrecy and democracy are incomparable**

John Adams wrote: "The jaws of power are always open to devour, and her arm is always stretched out, if possible, to destroy the freedom of thinking, speaking, and writing."

According to the Nuremberg Principles, the citizens of a country have a responsibility for the crimes that their governments commit. But to prevent these crimes, the people need to have some knowledge of what is going on. Indeed, democracy cannot function at all without this knowledge.

What are we to think when governments make every effort to keep their actions secret from their own citizens? We can only conclude that although they may call themselves democracies, such governments are in fact oligarchies or dictatorships.

We do not know what will happen to Julian Assange. If he dies in the hands of his captors he will not be history's first martyr to the truth. The ageing Galileo was threatened with torture and forced to recant his heresy, that the Earth moves around the Sun. Galileo spent the remainder of his days in house arrest.

Giordano Bruno was less lucky. He was burned at the stake for maintaining that the universe is larger than it was then believed to be. If Julian Assange becomes a martyr to the truth like Galileo or Bruno, his name will be honored in the future, and the shame of his captors will be remembered too.

Edward Snowden's revelations showed us the extent of government spying, and the extent of the deep state. Progressives are fighting to make the American government more truthful and open. They are fighting for America's soul.

## **A new freely downloadable book**

I would like to announce the publication of a book entitled FIGHTING FOR AMERICA'S SOUL It describes the efforts of US progressives to save the values and institutions on which their country was founded. The book may be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/11/Fighting-for-Americas-Soul-by-John-Scales-Avery.pdf>

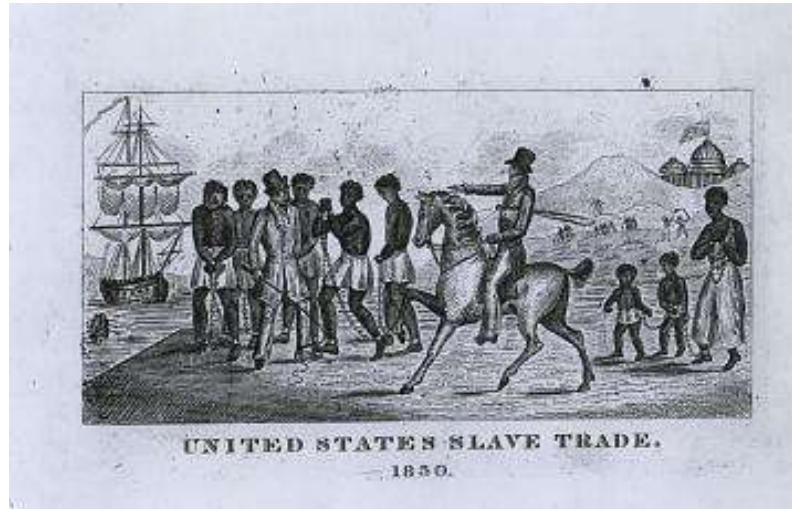


Figure 1: An estimated 600,000 enslaved African Americans were bought and sold in the United States in the decades before the Civil War. More than half of those sales separated parents and children.

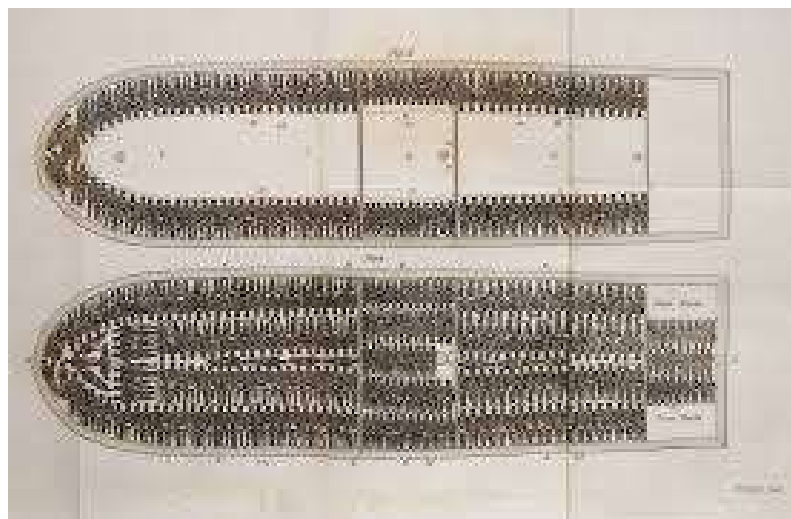


Figure 2: Diagram of a slave ship. A considerable proportion of the slaves being transported in this way, died during the voyage, and their bodies were thrown overboard.



Figure 3: Martin Luther King Jr. speaking in Washington. “I have a dream that one day this nation will rise up and live out the true meaning of its creed: ‘We hold these truths to be self-evident: that all men are created equal.’ I have a dream that one day on the red hills of Georgia the sons of former slaves and the sons of former slave owners will be able to sit down together at the table of brotherhood... I have a dream that my four little children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character... This is our hope. This is the faith that I go back to the South with. With this faith we will be able to hew out of the mountain of despair a stone of hope. With this faith we will be able to transform the jangling discords of our nation into a beautiful symphony of brotherhood. With this faith we will be able to work together, to pray together, to struggle together, to go to jail together, to stand up for freedom together, knowing that we will be free one day.”

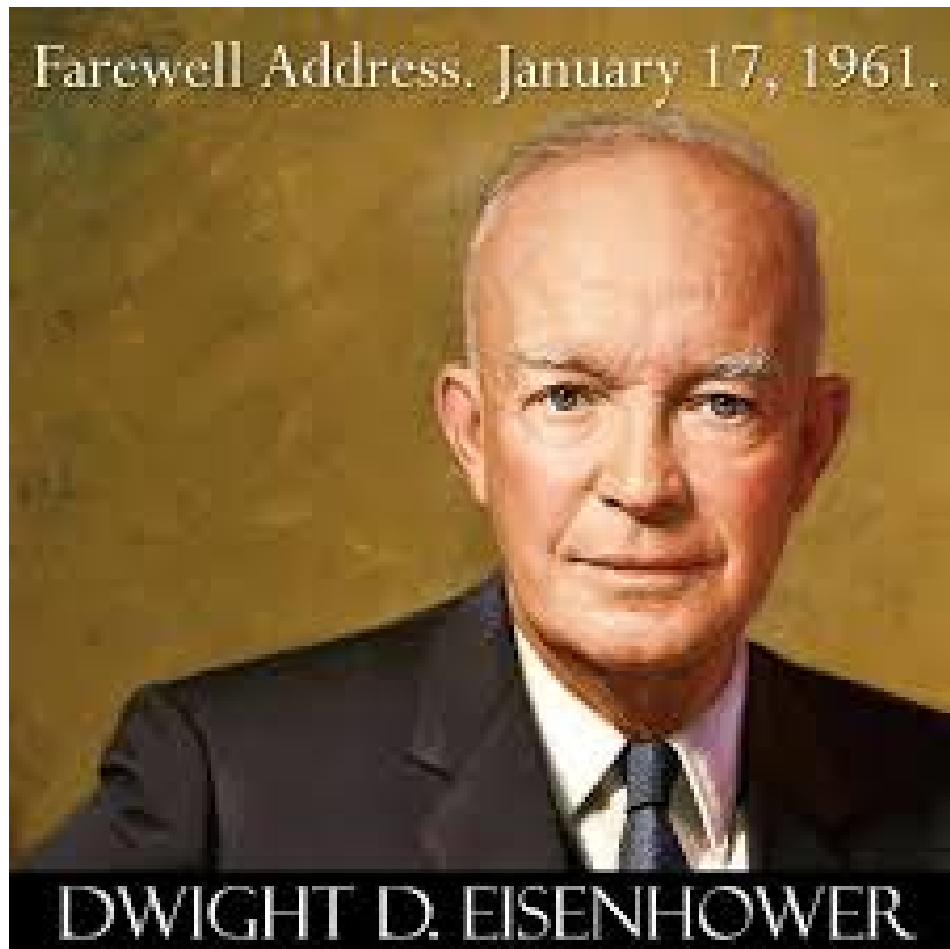


Figure 4: “In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the Military-industrial complex. The potential for the disastrous rise of misplaced power exists and will persist.”



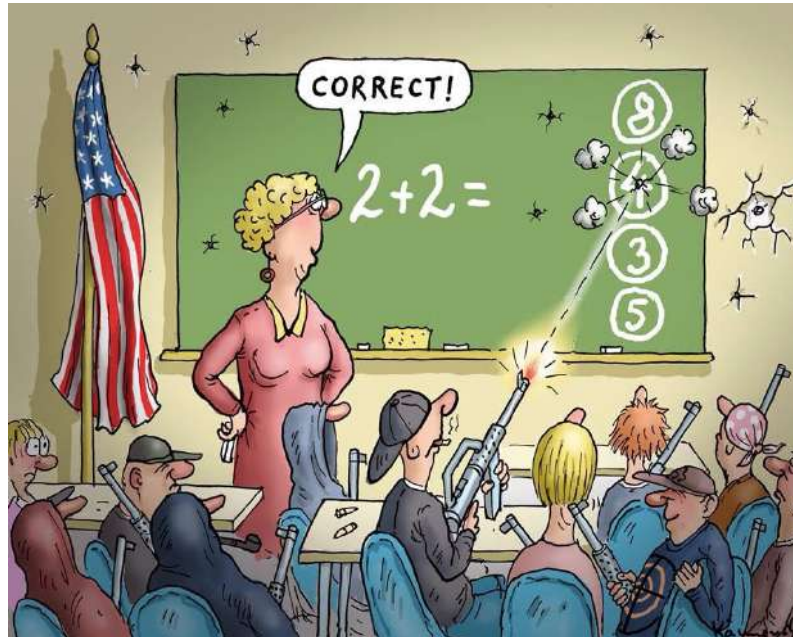


Figure 5: **A culture of violence:** In the United States the National Rifle Association has proposed guns in schools as the answer to the epidemic of school shootings.

**Other books and articles about global problems are on these links**

I hope that you will circulate the links in this article to friends and contacts who might be interested.

<http://eacpe.org/about-john-scales-avery/>

<https://wsimag.com/authors/716-john-scales-avery>

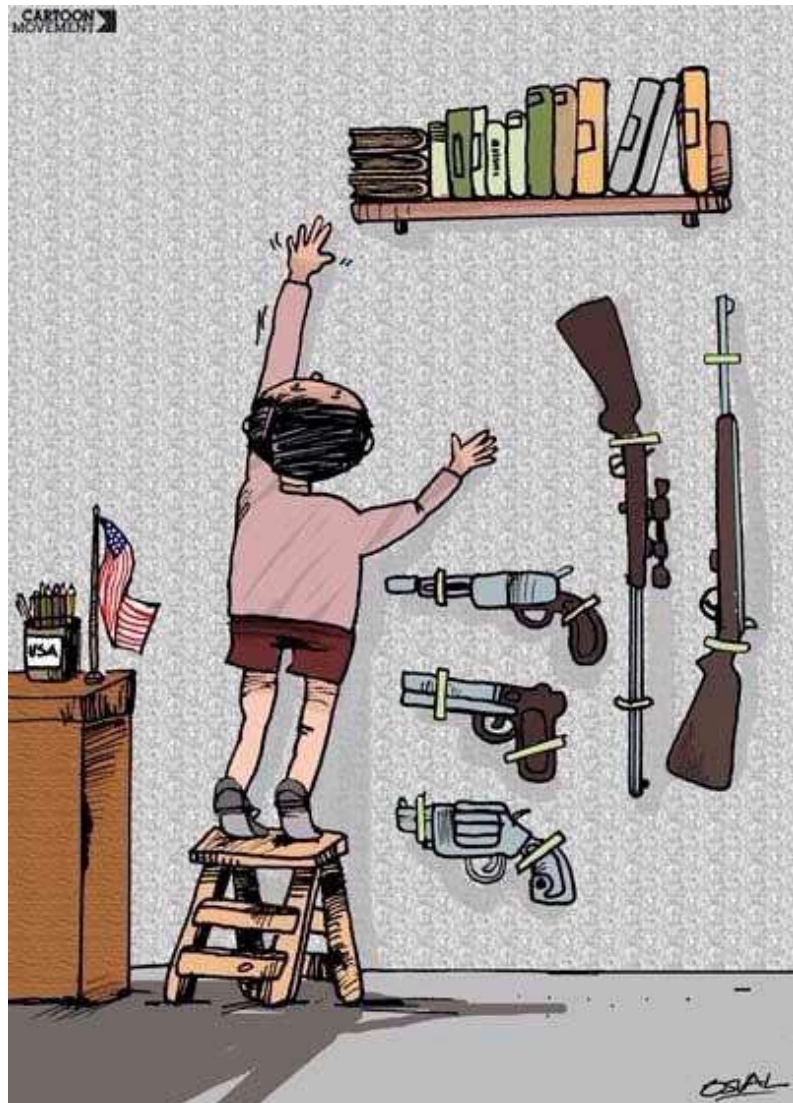


Figure 6: A culture of violence. Guns in schools?



Figure 7: When Senator Bernie Sanders began his campaign for the Democratic presidential nomination, few people believed that he could succeed. But as his campaign gained momentum, enormous crowds were attracted to his reformist speeches, and small individual donors supported his expenses. Although the crowds at Sanders' speeches were at least four times the size of those attending the rallies of other candidates, they were not reported in the mass media. Sanders' campaign was also sabotaged by the corporate-controlled Democratic National Committee. His huge popularity remains undimmed today, despite his loss in the 2016 primary. He advocates a social system for the United States similar to these which have made the Scandinavian countries leaders in both human development and human happiness indices.



Figure 8: Against expectations, Donald Trump who, in the words of Michael Moore, is a “wretched, ignorant, dangerous part-time clown and full-time sociopath”, was elected in 2016. What happened? Disillusioned by the way in which the immensely popular Senator Bernie Sanders was sabotaged by the media and by the Democratic National Committee, and despising Hillary Clinton for her involvement in US wars and Wall Street banks, many progressive voters stayed away from the polls. In their absence, Trump won narrowly. He lost the popular vote, but won the electoral vote. Today, the White House is a morass of dissension, erratic decisions and lies.



Figure 9: Disillusioned progressive voters who stayed at home were responsible for Trump's victory.



Figure 10: The stain will be indelible. Kavanaugh is both a multiple perjurer under oath before congress and a multiple attempted rapist. His tenure on the US supreme court will always be tainted by the highly partisan and morally bankrupt process that forced through his US senate confirmation on October 7, 2018. The photo shows angry crowds protesting the confirmation. One fervently hopes that public action will restore democracy to the United States.

# **TERRORISM: A FALSE THREAT**

## **Are we being driven like cattle?**

Is the threat of terrorism real? Or is it like the barking of a dog driving a herd of cattle? The threat of catastrophic climate change is very real indeed. The threat to future global food security is real too. Already 11 million children die every year from malnutrition and poverty-related causes. The threat to human civilization and the biosphere posed by a possible Third World War is real. The threat of exhaustion of non-renewable resources and economic collapse is real. The dangers associated with our unstable fractional reserve banking system are also real. Beside these all too real threats to our future, the threat of terrorism is vanishingly small.

Millions starve. Millions die yearly from preventable diseases. Millions die as a consequence of wars. Compared with these numbers, the total count of terrorist victims is vanishingly small. It is even invisible compared with the number of people killed yearly in automobile accidents.

## **The official story of 9/11 is untrue**

There is strong evidence, available to everyone who is willing to look at it on the Internet, which shows that the official version of 9/11 is untrue, and that the US government made the disaster worse than it otherwise would have been in order to justify not only an unending “War on Terror”, but also the abridgement of civil liberties within the United States. But very few people wish to challenge the official version of the attack on the World Trade Center. Those who accept the official version are, by definition, respectable citizens, while those who challenge it are “leftists” and “probably terrorist sympathizers”. As George W. Bush said, “You are either for us, or you are against us”.

## **Wars in Iraq and Afghanistan**

Bush’s response to the 9/11 attacks seems to have been to inquire from his advisors whether he was now free to invade Iraq. According to former counterterrorism chief, Richard Clarke, Bush was obsessed with Iraq as his principal target after 9/11.

The British Prime Minister, Tony Blair, was a guest at a private White House dinner nine days after the terrorist attacks on New York and Washington. Sir Christopher Meyer, former UK Ambassador to Washington, was also present at the dinner. According to Meyer, Blair said to Bush that they must not get distracted from their main goal - dealing with the Taliban and al-Qaeda in Afghanistan, and Bush replied: “I agree with you Tony. We must deal with this first. But when we have dealt with Afghanistan, we must come back to Iraq.” Faced with the prospect of wars in both Iraq and Afghanistan, Blair did not protest, according to Meyer.

During the summer of 2002, Bush and Blair discussed Iraq by telephone. A senior official from Vice-President Dick Cheney’s office who read the transcript of the call is



quoted by the magazine Vanity Fair as saying: “The way it read was that come what may, Saddam was going to go; they said that they were going forward, they were going to take out the regime, and they were doing the right thing. Blair did not need any convincing. There was no ‘Come on, Tony, we’ve got to get you on board’. I remember reading it and then thinking, ‘OK, now I know what we’re going to be doing for the next year.’”

On June 1, 2002, Bush announced a new US policy which not only totally violated all precedents in American foreign policy but also undermined the United Nations Charter and international law. Speaking at the graduation ceremony of the US Military Academy at West Point he asserted that the United States had the right to initiate a preemptive war against any country that might in the future become a danger to the United States. “If we wait for threats to fully materialize”, he said, “we will have waited too long.” He indicated that 60 countries might fall into this category, roughly a third of the nations of the world.

The assertion that the United States, or any other country, has the right to initiate preemptive wars specifically violates Chapter 1, Articles 2.3 and 2.4, of the United Nations Charter. These require that “All members shall settle their disputes by peaceful means in such a manner that international peace, security and justice are not endangered”, and that “All members shall refrain in their international relations from the threat or use of force against the territorial integrity of any state, or in any other manner inconsistent with the purposes of the United Nations.” The UN Charter allows a nation that is actually under attack to defend itself, but only until the Security Council has had time to act.

## **Murder and torture in the name of fighting terrorism**

With the end of the Cold War, a new justification for the colossal US military budget had to be found. The answer was the “War on Terror”. No matter that terrorism is a crime committed by individuals rather than by nations, and that police action rather than war is the appropriate answer. Whole nations were accused of “sponsoring terror”, and invaded. Furthermore, individual terrorist suspects were extrajudicially murdered, for example through drone strikes. Large-scale torture programs were also initiated and justified by the excuse that any method can be used when “fighting terror”.

Of course, the effect of innocent people killed in drone strikes, and the effect of torture programs, was not to reduce the number of terrorists, but to produce more of them and to strengthen their fanaticism. But that was fine with the government, since the real aim of the “War on Terror” was not to end terrorism, but to justify obscenely bloated military budgets.

## **Progressives can save America**

This article has been unsparing in its criticism of America’s “War on Terror”. But America is full of good people. Although an enormous river of money from the military-industrial complex (and other corporate oligarchies) controls many corrupt politicians, progressives



Figure 1: Molten steel pouring from the burning World Trade Center. An ordinary fire is not hot enough to melt steel.

are fighting back. We must unite behind progressives and combat militarism, not only in the United States but also throughout the world.

### **A new freely downloadable book**

I would like to announce the publication of a book, which examines the consequences of the “War on Terror” in more detail. The book may be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/12/Terrorism-a-False-Threat-by-John-Scales-Avery.pdf>

### **Other books and articles about global problems are on these links:**

<http://eacpe.org/about-john-scales-avery/>

<https://wsimag.com/authors/716-john-scales-avery>





Figure 2: Molten steel in the ruins of the World Trade Center.



Figure 3: Photo of the World Trade Center shortly before its collapse. Thermite, used for cutting steel in the demolition of buildings, produces white smoke when it burns

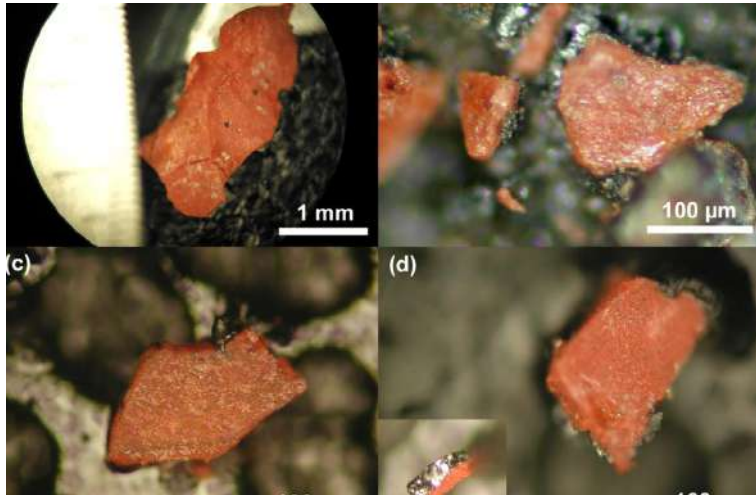


Figure 4: The type of thermite that seems to have been used for the destruction of WTC 1 and WTC 2 was military-grade nano-thermite, which cannot be purchased by private persons.



Figure 5: Building 7 was not hit by any aircraft, and yet it collapsed many hours later, during the afternoon, in a manner that looked exactly like a controlled demolition.



Figure 6: Reports of observers who heard explosions are corroborated by MSNBC video footage of reporter Ashleigh Banfield several blocks north of WTC 7. In the video, she hears a loud sound, turns her attention to WTC 7, and says, “Oh my god.... This is it.” About seven seconds after she hears the loud sound, WTC 7 collapses. As David Chandler observes in the video Sound Evidence for Explosions: There were two blasts, followed by seven more regularly spaced all in two and a half seconds. Craig Bartmer’s testimony may come to mind: “The whole time you’re hearing ‘thump, thump, thump, thump, thump.’ ”....



Figure 7: This picture shows materials of WTC 1, including multi-ton beams, being explosively ejected several hundred feet in all directions. Physics teacher David Chandler states that “[U]nder the canopy of falling debris, do you see the rapid sequence of explosive ejections of material? Some of the jets have been clocked at over 100 mph.... They’re continuous and widespread. They move progressively down the faces of the building, keeping pace with the falling debris.... The building is being progressively destroyed from the top down by waves of explosions creating a huge debris field.”

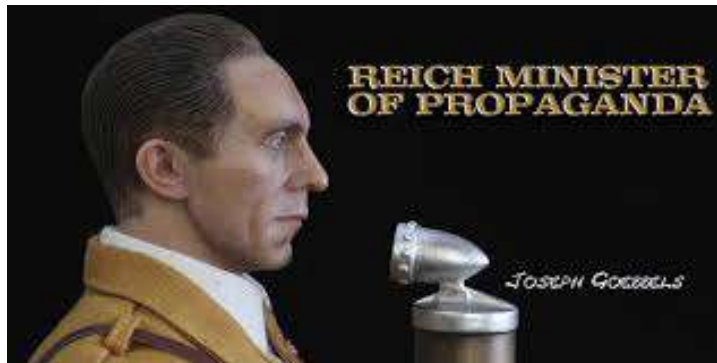


Figure 8: Goebbels said: “Propaganda works best when those who are being manipulated are confident that they are acting on their own free will”.

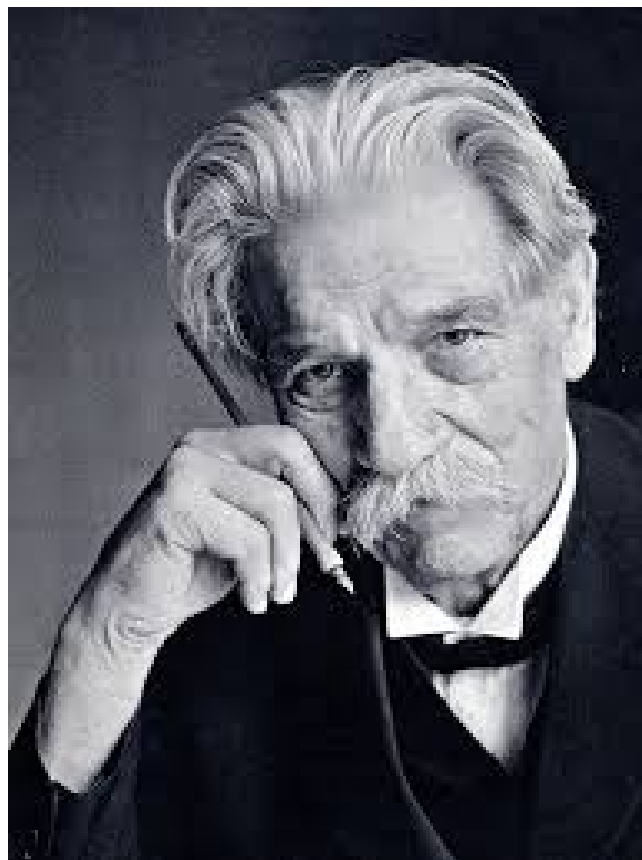


Figure 9: The peoples of the industrialized nations urgently need to acquire a non-anthropocentric element in their ethics, similar to the reverence for all life found in the Hindu and Buddhist traditions, as well as in the teachings of St. Francis of Assisi and Albert Schweitzer.

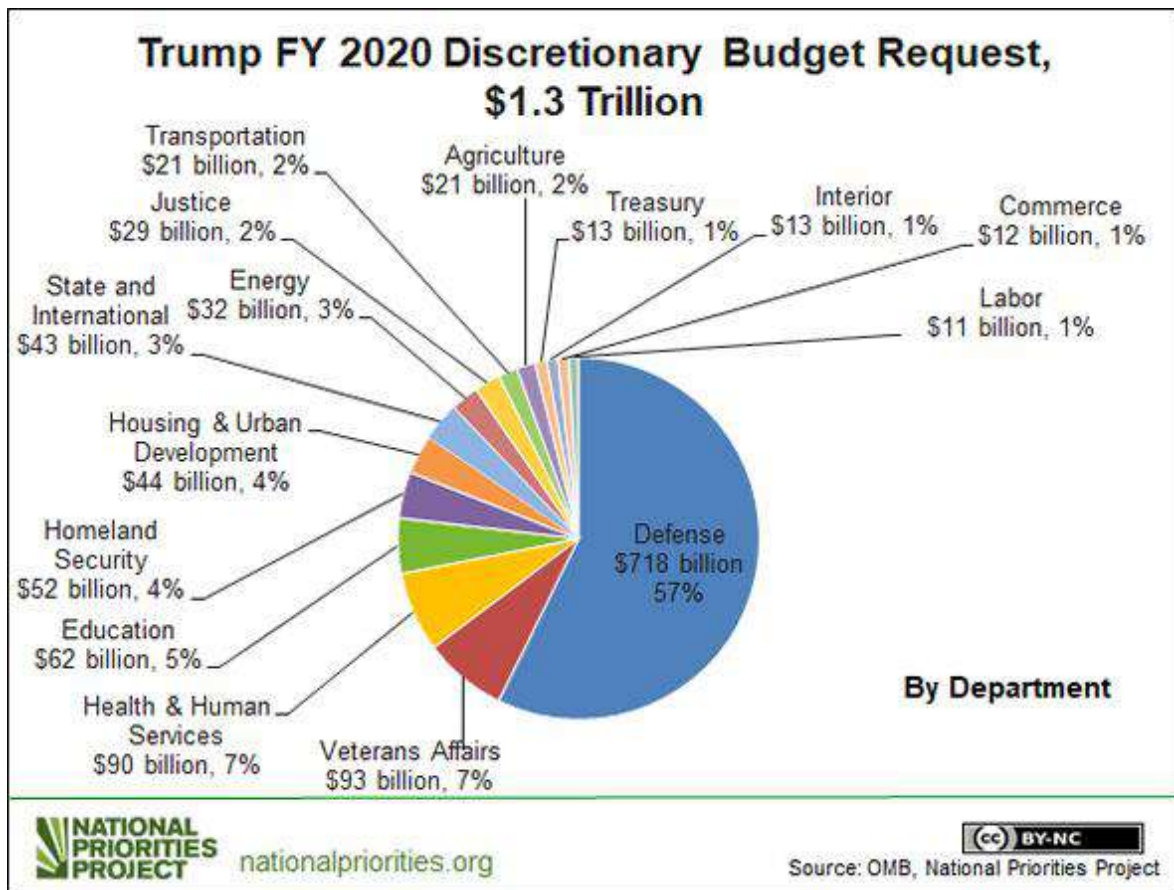


Figure 10: Veteran's Affairs should be viewed as part of the "Defense" budget. Thus the total for military purposes is \$0.811 trillion, or 64% of the total budget. The Trump administration plans to slash all social services because "the money for them is not available".





**Map 2:**

### **US Military and CIA Interventions since World War II**

■ targeted countries    ★ US bombings    — US government assassination plots

Source: William Blum, *Killing Hope: U.S. Military and CIA Intervention Since World War II*, 2004  
and *Rogue State*, 2005. (<http://www.killinghope.org/>)

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Figure 11: During the period from 1945 to the present the US interfered, militarily or covertly, in the internal affairs of a large number of nations: China, 1945-49; Italy, 1947-48; Greece, 1947-49; Philippines, 1946-53; South Korea, 1945-53; Albania, 1949-53; Germany, 1950s; Iran, 1953; Guatemala, 1953-1990s; Middle East, 1956-58; Indonesia, 1957-58; British Guiana/Guyana, 1953-64; Vietnam, 1950-73; Cambodia, 1955-73; The Congo/Zaire, 1960-65; Brazil, 1961-64; Dominican Republic, 1963-66; Cuba, 1959-present; Indonesia, 1965; Chile, 1964-73; Greece, 1964-74; East Timor, 1975-present; Nicaragua, 1978-89; Grenada, 1979-84; Libya, 1981-89; Panama, 1989; Iraq, 1990-present; Afghanistan 1979-92; El Salvador, 1980-92; Haiti, 1987-94; Yugoslavia, 1999; and Afghanistan, 2001-present. Most of these interventions were explained to the American people as being necessary to combat communism (or more recently, terrorism), but an underlying motive was undoubtedly the desire to put in place governments and laws that would be favorable to the economic interests of the US and its allies.



Figure 12: Families of disappeared people, near the mass graves where 26 political prisoners have been buried by the Chilean military. After the 1973 military coup organized by Augusto Pinochet, the military formed a special taskforce known as Caravan of Death. It swept the north of Chile, picking up political prisoners to interrogate and torture, executing most of them and burying them in remote locations.





Figure 13: The sales of George Orwell's 1984 soared after Snowden's revelations.





Figure 14: The data of major Internet corporations was stolen without their knowledge or consent.



Figure 15: These huge buildings in Fort Meade, Maryland, are the main headquarters of NSA.



# SANCTIONS AS COLLECTIVE PUNISHMENT

## **We treat nations as though they were individuals**

Under the Fourth Geneva Convention, collective punishment is war crime. Article 33 states that “No protected person may be punished for an offense that he or she did not personally commit.”

At present, we treat nations as though they were persons: We punish entire nations by sanctions, even when only the leaders are guilty, even though the burdens of the sanctions fall most heavily on the poorest and least guilty of the citizens, and even though sanctions often have the effect of uniting the citizens of a country behind the guilty leaders. Should we not regard sanctions as collective punishment? If we do so, then sanctions are a war crime, under the Fourth Geneva Convention.

There is much that can be criticized in the way that the Gulf War of 1990-1991 was carried out. Besides military targets, the US and its allies bombed electrical generation facilities with the aim of creating postwar leverage over Iraq. The electrical generating plants would have to be rebuilt with the help of foreign technical assistance, and this help could be traded for postwar compliance. In the meantime, hospitals and water-purification plants were without electricity. Also, during the Gulf War, a large number of projectiles made of depleted uranium were fired by allied planes and tanks. The result was a sharp increase in cancer in Iraq. Finally, both Shi'ites and Kurds were encouraged by the Allies to rebel against Saddam Hussein's government, but were later abandoned by the allies and slaughtered by Saddam.

The most terrible misuse of power, however, was the US and UK insistence the sanctions against Iraq should remain in place after the end of the Gulf War. These two countries used their veto power in the Security Council to prevent the removal of the sanctions. Their motive seems to have been the hope that the economic and psychological impact would provoke the Iraqi people to revolt against Saddam. However that brutal dictator remained firmly in place, supported by universal fear of his police and by massive propaganda. The effect of the sanctions was to produce more than half a million deaths of children under five years of age, as is documented by UNICEF data. The total number of deaths that the sanctions produced among Iraqi civilians probably exceeded a million, if older children and adults are included.

Ramsey Clark, who studied the effects of the sanctions in Iraq from 1991 onwards, wrote to the Security Council that most of the deaths “are from the effects of malnutrition including marasmas and kwashiorkor, wasting or emaciation which has reached twelve per cent of all children, stunted growth which affects twenty-eight per cent, diarrhea, dehydration from bad water or food, which is ordinarily easily controlled and cured, common communicable diseases preventable by vaccinations, and epidemics from deteriorating sanitary conditions. There are no deaths crueller than these. They are suffering slowly, helplessly, without simple remedial medication, without simple sedation to relieve pain, without mercy.”

The sanctions that the Trump Administration has currently imposed on Iran are also

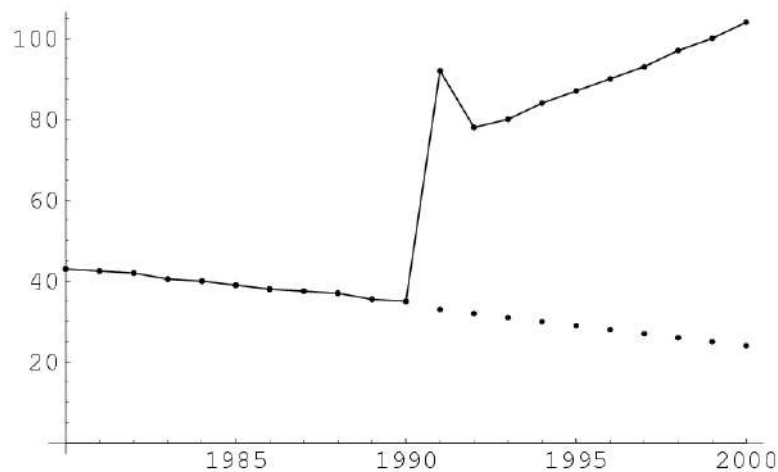


Figure 1: Deaths of children under five years of age in Iraq, measured in thousands. This graph is based on a study by UNICEF, and it shows the effect of sanctions on child mortality. From UNICEF's figures it can be seen that the sanctions imposed on Iraq caused the deaths of more than half a million children.

**SANCTIONS IMMISERATE SANCTIONS STARVE**  
**SANCTIONS IMPOVERISH SANCTIONS TORTURE**  
**SANCTIONS KILL**  
**SANCTIONS ARE AN ACT OF WAR SANCTIONS MUST BE STOPPED**





an example of collective punishment. They are damaging the health of ordinary Iranian citizens, who can in no way be blamed for the policies of their government. According to Wikipedia: “Pharmaceuticals and medical equipment do not fall under the international sanctions, but the country is facing shortages of drugs for the treatment of 30 illnesses, including cancer, heart and breathing problems, thalassemia and multiple sclerosis, because Iran is not allowed to use International payment systems.... In addition, there are 40,000 hemophiliacs who can’t get anti-clotting medicines... An estimated 23,000 Iranians with HIV/Aids have had their access to the drugs they need to keep alive severely restricted.”

In addition to the fact that sanctions are a form of collective punishment, and thus a war crime under the Fourth Geneva Convention, we should also remember that Iran is completely within its rights under international law and under the NPT.

## Israel, Iran and the NPT

The NPT was designed to prevent the spread of nuclear weapons beyond the five nations that already had them; to provide assurance that “peaceful” nuclear activities of non-nuclear-weapon states would not be used to produce such weapons; to promote peaceful use of nuclear energy to the greatest extent consistent with non-proliferation of nuclear weapons; and finally, to ensure that definite steps towards complete nuclear disarmament would be taken by all states, as well steps towards comprehensive control of conventional armaments (Article VI).

The non-nuclear-weapon states insisted that Article VI be included in the treaty as a price for giving up their own ambitions. The full text of Article VI is as follows:

“Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict international control.”

Several nuclear weapon states, notably the United States, are grossly violating Article VI.

The NPT has now been signed by 187 countries and has been in force as international law since 1970. However, Israel, India, Pakistan, and Cuba have refused to sign, and North Korea, after signing the treaty, withdrew from it in 1993.

According to Wikipedia, Israel’s first Prime Minister, David Ben-Gurion was “nearly obsessed with obtaining nuclear weapons”, and under his administration, work on obtaining

these weapons for Israel was started in 1949 under his administration.

The Wikipedia article states that “In 1949 Israeli scientists were invited to the Saclay Nuclear Research Centre, this cooperation leading to a joint effort including sharing of knowledge between French and Israeli scientists especially those with knowledge from the Manhattan Project... Progress in nuclear science and technology in France and Israel remained closely linked throughout the early fifties....There were several Israeli observers at the French nuclear tests and the Israelis had unrestricted access to French nuclear test explosion data.

The article continues: “When Egyptian President Gamal Abdel Nasser nationalized the Suez Canal, France proposed Israel attack Egypt and invade the Sinai as a pretext for France and Britain to invade Egypt posing as ‘peacekeepers’ with the true intent of seizing the Suez Canal. In exchange, France would provide the nuclear reactor as the basis for the Israeli nuclear weapons program. Shimon Perez, sensing the opportunity on the nuclear reactor, accepted.”

According to Wikipedia, “Top secret British documents obtained by BBC Newsnight show that Britain made hundreds of secret shipments of restricted materials to Israel in the 1950s and 1960s. These included specialist chemicals for reprocessing and samples of fissile material, uranium-235, in 1959, and plutonium in 1966, as well as highly enriched lithium-6, which is used to boost fission bombs and fuel hydrogen bombs. The investigation also showed that Britain shipped 20 tons of heavy water directly to Israel in 1959 and 1960 to start up the Dimona reactor.”

Here we see both France and Britain as gross violators of the NPT, since the NPT forbids nations possessing nuclear weapons helping other nations to obtain them. The United States government knew what was happening, but prevented the knowledge from becoming public.

Israel completed its first nuclear weapons in the early 1960’s. The country is now thought to have 100 to 300 of them, including hydrogen bombs and neutron bombs. Israel’s government maintains a policy of “nuclear opacity”, meaning that while visibly possessing nuclear weapons, it denies having them.

## **Recent sanctions against Iran**

In a November 6, 2018 article in the Internet journal *Countercurrents*, Medea Benjamin wrote: “Iranian government officials want to know how the Trump administration can get away with punishing Iran and other countries for complying with the internationally recognized nuclear deal signed in 2015. ‘The US is, in effect, threatening states who seek to abide by Resolution 2231 with punitive measures,’ said President Rouhani. ‘This constitutes a mockery of international decisions and the blackmailing of responsible parties who seek to uphold them.’...”

“This is the second round of sanctions since Trump pulled out of the Iran nuclear deal, a deal that was signed in 2015 not only by the US and Iran, but also by Germany, England, France, Russia and China - and approved unanimously by the UN Security Council. It’s also a deal that has been working. Iran has been complying with the most intrusive

inspections regime ever devised, as the International Atomic Energy Agency has confirmed 13 times.

“Trump, always ready to bulldoze international agreements, unilaterally withdrew from the deal and imposed a first round of sanctions in August and the second round now. These sanctions are designed to stop not just US companies from trading with Iran, but all companies - anywhere in the world. According to Treasury Secretary Steve Mnuchin, ‘Any financial institution, company, or individual who evades our sanctions risks losing access to the U.S. financial system and the ability to do business with the United States or U.S. companies.’ In effect, the Trump administration, practicing imperial hubris on steroids, is determined to punish countries abiding by an internationally approved agreement.”

The sanctions are already taking a tragic toll on the innocent people of Iran, undermining both their health and their economic security. Surely this must be seen as an example of collective punishment.



# ATTACKS ON IRAN, PAST AND PRESENT

## The assassination of General Qasem Soleimani

On Friday, 3 January, 2020, progressives in the United States and all peace-loving people throughout the world were horrified to learn that Donald Trump had added to his long list of crimes and imbecilities by ordering the assassination of General Qasem Soleimani, who is a hero in his own country, Iran. The murder, which was carried out by means of a drone strike on Friday, immediately and drastically increased the probability of a new large-scale war in the Middle East and elsewhere. Against this background, I would like to review the history of oil-motivated attacks on Iran.

## The desire to control Iran's oil

Iran has an ancient and beautiful civilization, which dates back to 5,000 BC, when the city of Susa was founded. Some of the earliest writing that we know of, dating from from approximately 3,000 BC, was used by the Elamite civilization near to Susa. Today's Iranians are highly intelligent and cultured, and famous for their hospitality, generosity and kindness to strangers. Over the centuries, Iranians have made many contributions to science, art and literature, and for hundreds of years they have not attacked any of their neighbors. Nevertheless, for the last 90 years, they have been the victims of foreign attacks and interventions, most of which have been closely related to Iran's oil and gas resources. The first of these took place in the period 1921-1925, when a British-sponsored coup overthrew the Qajar dynasty and replaced it by Reza Shah.

Reza Shah (1878-1944) started his career as Reza Khan, an army officer. Because of his high intelligence he quickly rose to become commander of the Tabriz Brigade of the Persian Cossacks. In 1921, General Edmond Ironside, who commanded a British force of 6,000 men fighting against the Bolsheviks in northern Persia, masterminded a coup (financed by Britain) in which Reza Khan lead 15,000 Cossacks towards the capital. He overthrew the government, and became minister of war. The British government backed this coup because it believed that a strong leader was needed in Iran to resist the Bolsheviks. In 1923, Reza Khan overthrew the Qajar Dynasty, and in 1925 he was crowned as Reza Shah, adopting the name Pahlavi.

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Reza Shah believed that he had a mission to modernize Iran, in much the same way that Kamil Ata Turk had modernized Turkey. During his 16 years of rule in Iran, many roads were built, the Trans-Iranian Railway was constructed, many Iranians were sent to study in the West, the University of Tehran was opened, and the first steps towards industrialization were taken. However, Reza Shah's methods were sometimes very harsh.

In 1941, while Germany invaded Russia, Iran remained neutral, perhaps leaning a little towards the side of Germany. However, Reza Shah was sufficiently critical of Hitler to offer safety in Iran to refugees from the Nazis. Fearing that the Germans would gain control of the Abadan oil fields, and wishing to use the Trans-Iranian Railway to bring supplies to Russia, Britain invaded Iran from the south on August 25, 1941. Simultaneously, a Russian force invaded the country from the north. Reza Shah appealed to Roosevelt for help, citing Iran's neutrality, but to no avail. On September 17, 1941, he was forced into exile, and replaced by his son, Crown Prince Mohammed Reza Pahlavi. Both Britain and Russia promised to withdraw from Iran as soon as the war was over. During the remainder of World War II, although the new Shah was nominally the ruler of Iran, the country was governed by the allied occupation forces.

Reza Shah, had a strong sense of mission, and felt that it was his duty to modernize Iran. He passed on this sense of mission to his son, the young Shah Mohammed Reza Pahlavi. The painful problem of poverty was everywhere apparent, and both Reza Shah and his son saw modernization of Iran as the only way to end poverty.

In 1951, Mohammad Mosaddegh became Prime Minister of Iran through democratic elections. He was from a highly-placed family and could trace his ancestry back to the shahs of the Qajar dynasty. Among the many reforms made by Mosaddegh was the nationalization of the Anglo-Iranian Oil Company's possessions in Iran. Because of this, the AIOC (which later became British Petroleum), persuaded the British government to sponsor a secret coup that would overthrow Mosaddegh. The British asked US President Eisenhower and the CIA to join M16 in carrying out the coup claiming that Mosaddegh represented a communist threat (a ludicrous argument, considering Mosaddegh's aristocratic background). Eisenhower agreed to help Britain in carrying out the coup, and it took place in 1953. The Shah thus obtained complete power over Iran.

The goal of modernizing Iran and ending poverty was adopted as an almost-sacred mission by the young Shah, Mohammed Reza Pahlavi, and it was the motive behind his White Revolution in 1963, when much of the land belonging to the feudal landowners and the crown was distributed to landless villagers. However, the White Revolution angered both the traditional landowning class and the clergy, and it created fierce opposition. In dealing with this opposition, the Shah's methods were very harsh, just as his fathers had been. Because of alienation produced by his harsh methods, and because of the growing power of his opponents, Shah Mohammed Reza Pahlavi was overthrown in the Iranian Revolution of 1979. The revolution of 1979 was to some extent caused by the British-American coup of 1953.

One can also say that the westernization, at which both Shah Reza and his son aimed, produced an anti-western reaction among the conservative elements of Iranian society. Iran was "falling between two stools", on the one hand western culture and on the other hand

the country's traditional culture. It seemed to be halfway between, belonging to neither. Finally in 1979 the Islamic clergy triumphed and Iran chose tradition. Meanwhile, in 1963, the US had secretly backed a military coup in Iraq that brought Saddam Hussein's Ba'ath Party to power. In 1979, when the western-backed Shah of Iran was overthrown, the United States regarded the fundamentalist Shiite regime that replaced him as a threat to supplies of oil from Saudi Arabia. Washington saw Saddam's Iraq as a bulwark against the Shiite government of Iran that was thought to be threatening oil supplies from pro-American states such as Kuwait and Saudi Arabia.

In 1980, encouraged to do so by the fact that Iran had lost its US backing, Saddam Hussein's government attacked Iran. This was the start of an extremely bloody and destructive war that lasted for eight years, inflicting almost a million casualties on the two nations. Iraq used both mustard gas and the nerve gases Tabun and Sarin against Iran, in violation of the Geneva Protocol. Both the United States and Britain helped Saddam Hussein's government to obtain chemical weapons.

The present attacks on Iran by Israel and the United States, both actual and threatened, have some similarity to the war against Iraq, which was launched by the United States in 2003. In 2003, the attack was nominally motivated by the threat that nuclear weapons would be developed, but the real motive had more to do with a desire to control and exploit the petroleum resources of Iraq, and with Israel's extreme nervousness at having a powerful and somewhat hostile neighbor. Similarly, hegemony over the huge oil and gas reserves of Iran can be seen as one of the main reasons why the United States is presently demonizing Iran, and this is combined with Israel's almost paranoid fear of a large and powerful Iran. Looking back on the "successful" 1953 coup against Mosaddegh, Israel and the United States perhaps feel that sanctions, threats, murders and other pressures can cause a regime change that will bring a more compliant government to power in Iran - a government that will accept US hegemony. But aggressive rhetoric, threats and provocations can escalate into full-scale war.

I do not wish to say that Iran's present government is without serious faults. However, any use of violence against Iran would be both insane and criminal. Why insane? Because the present economy of the US and the world cannot support another large-scale conflict; because the Middle East is already a deeply troubled region; and because it is impossible to predict the extent of a war which, if once started, might develop into World War III, given the fact that Iran is closely allied with both Russia and China. Why criminal? Because such violence would violate both the UN Charter and the Nuremberg Principles. There is no hope at all for the future unless we work for a peaceful world, governed by international law, rather than a fearful world, where brutal power holds sway.

## **An attack on Iran could escalate**

We recently passed the 100th anniversary World War I, and we should remember that this colossal disaster escalated uncontrollably from what was intended to be a minor conflict. There is a danger that an attack on Iran would escalate into a large-scale war in the Middle East, entirely destabilizing a region that is already deep in problems.

The unstable government of Pakistan might be overthrown, and the revolutionary Pakistani government might enter the war on the side of Iran, thus introducing nuclear weapons into the conflict. Russia and China, firm allies of Iran, might also be drawn into a general war in the Middle East.

In the dangerous situation that could potentially result from an attack on Iran, there is a risk that nuclear weapons would be used, either intentionally, or by accident or miscalculation. Recent research has shown that besides making large areas of the world uninhabitable through long-lasting radioactive contamination, a nuclear war would damage global agriculture to such an extent that a global famine of previously unknown proportions would result.

Thus, nuclear war is the ultimate ecological catastrophe. It could destroy human civilization and much of the biosphere. To risk such a war would be an unforgivable offense against the lives and future of all the peoples of the world, US citizens included.

Recent research has shown that thick clouds of smoke from firestorms in burning cities would rise to the stratosphere, where they would spread globally and remain for a decade, blocking the hydrological cycle, and destroying the ozone layer. A decade of greatly lowered temperatures would also follow. Global agriculture would be destroyed. Human, plant and animal populations would perish.

We must also consider the very long-lasting effects of radioactive contamination. One can gain a small idea of what it would be like by thinking of the radioactive contamination that has made large areas near to Chernobyl and Fukushima permanently uninhabitable, or the testing of hydrogen bombs in the Pacific in the 1950's, which continues to cause leukemia and birth defects in the Marshall Islands more than half a century later. In the event of a thermonuclear war, the contamination would be enormously greater.

We have to remember that the total explosive power of the nuclear weapons in the world today is 500,000 times as great as the power of the bombs that destroyed Hiroshima and Nagasaki. What is threatened today is the complete breakdown of human civilization and the destruction of much of the biosphere.

The common human culture that we all share is a treasure to be carefully protected and handed down to our children and grandchildren. The beautiful earth, with its enormous richness of plant and animal life, is also a treasure, almost beyond our power to measure or express. What enormous arrogance and blasphemy it is for our leaders to think of risking these in a thermonuclear war!



Figure 1: Donald Tromp added to his long list of crimes and imbecilities by ordering the assassination of General Qasem Soleimani, who is a hero in his own country, Iran.



Figure 2: Reza Shah (1878-1944) obtained power in a British-organized coup in 1923. He believed that he had a mission to eliminate poverty in Iran by modernizing the country. The goal was good, but his methods were often extremely harsh.



Figure 3: Mohammad Mosaddegh (1882-1967) was the democratically elected Prime Minister of Iran, In 1953, he was overthrown by a coup orchestrated by the United States' Central Intelligence Agency and the United Kingdom's MI6.

# KICKING THE HABIT

## **Our addiction to fossil fuels can kill us**

The Industrial Revolution marked the start of a massive human use of fossil fuels. The stored energy from several hundred million years of plant growth began to be used at roughly a million times the rate at which it had been formed. The effect on human society was like that of a narcotic. There was a euphoric (and totally unsustainable) surge of growth of both population and industrial production. Meanwhile, the carbon released by the burning of fossil fuels began to duplicate the conditions that lead to the 5 geologically-observed mass extinction events during each of which more than half of all living species disappeared forever.

We all know that drug addicts can die from their addiction. The world's scientists are unanimous in telling us that unless we take immediate action to kick the habit, our addiction to fossil fuels will kill human society and much of the biosphere.

## **Immediate action is needed to save the future**

The central problem which the world faces in its attempts to avoid catastrophic climate change is a contrast of time scales. In order to save human civilization and the biosphere from the most disastrous effects of climate change, we need to act immediately. But it is difficult to mobilize public opinion behind urgently needed action because the most severe effects of global warming belong to the long-term future. Immediate action is needed because without it, feedback loops, such as the albedo effect, the drying out and burning of tropical rain-forests, or the methane-hydrate feedback loop, will take over, making human efforts futile.

## **Greta Thunberg told to “study economics”**

At the 2020 Davos Forum, teenage Swedish climate activist Greta Thunberg urged business leaders to divest from the catastrophic activities of the fossil fuel industries. She was rebuked by the US Secretary of the Treasury, Steven Mnuchin, who said, “After she goes and studies economics in college, she can come back and explain that to us”. Thunberg's response to tweet a UN graph showing that the world's remaining carbon budget will be used up by 2027 unless emissions are curbed. “You don't need a college education to understand the graph”, she said.

The exchange is interesting because it shows the stark contrast between the demands of our current economic system, and what has to be done to save human civilization. Economics has been called the science of growth, but growth is killing us. The size of the human footprint has become too large for our environment to support.

Our entire economic system is currently based on the use of fossil fuels, but our addiction to coal, oil and gas will surely kill us unless we can kick the habit in time. Mnuchin is saying, “You will damage the economy”. Thunberg is saying, “Perhaps so, but we have



to stop emissions immediately to save the long-term future of human society and the biosphere”. We can gain hope from the fact that, if massive government subsidies to fossil fuels were removed, renewables would already be cheaper than fossil fuels, and the urgently-needed transition to renewables would be driven by economic forces alone.

## **Trump was tried for the wrong crimes**

The impeachment trial of Donald Trump has now come to an end, with no witness allowed, and Republican senators voting along strict party lines to acquit the obviously guilty president. Many people, myself included, feel that Trump was tried for minor crimes, whereas he ought to have been tried for his major ones.

There is so much wrong with Donald Trump that one hardly knows where to start. He is a bully, braggart, narcissist, racist, misogynist, habitual liar and tax evader, in addition to being demonstrably ignorant. He has contempt for both domestic and international law, as well as the US Constitution. In the words of Michael Moore, he is a “part-time clown and full-time sociopath”. However, it is Trump’s climate change denial, withdrawal from the Paris Agreement, and sponsorship of the fossil fuel industry that pose the greatest threats to human society and the biosphere. The general support of the Republican Party for the fossil fuel industry is the reason why Prof. Noam Chomsky called the party “the most dangerous organization in history”.

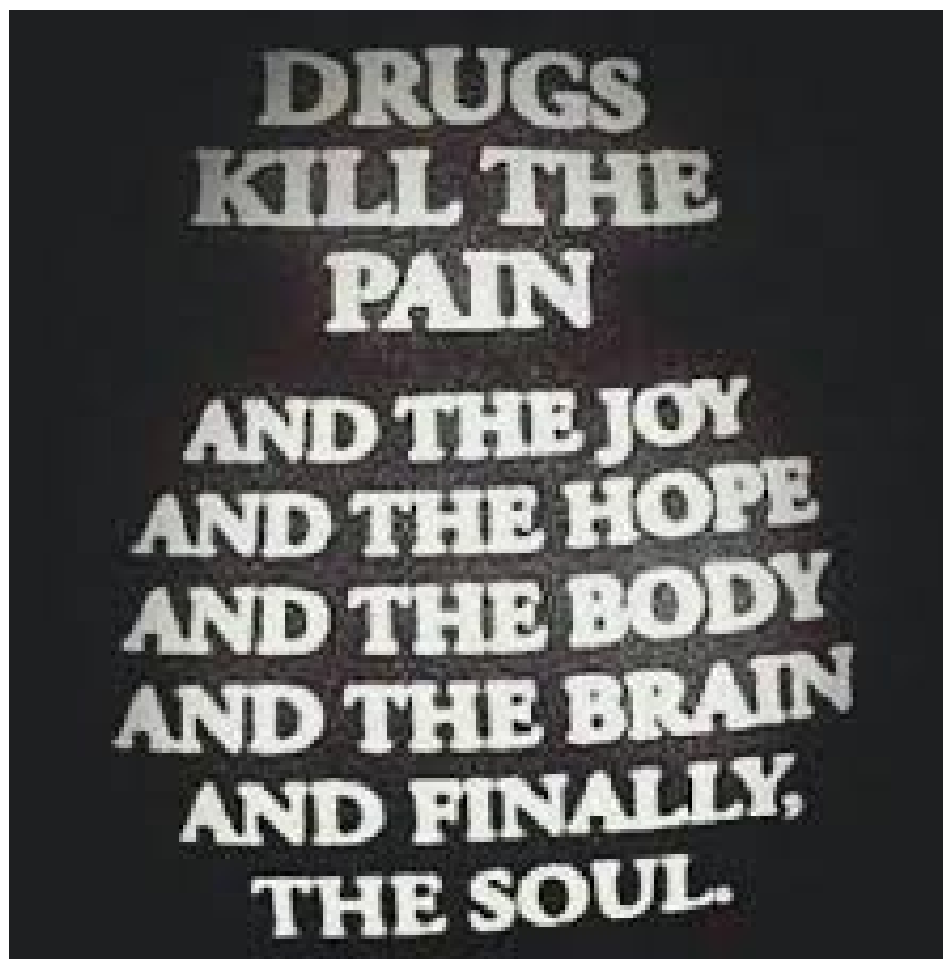
## **Destroying the world for profit**

Does it make sense to destroy the world for the sake of profit or personal advantage? This is exactly what our governments and business leaders are doing today. This is what very many ordinary people are doing. But does it make sense?

Does it make sense to saw off the branch on which you are sitting? Does it make sense to jockey for a place at the Captain’s table on board an iceberg-struck Titanic? Whoever contributes to the destruction of the world has to live in the world that they have destroyed.

Perhaps a short-term advantage can be gained; perhaps a small private Utopia can be created by acts that harm the general future; but all individual fates will sink like stones in a deep sea, if society as a whole sinks. Individual fates will be lost in the general fate. There will be no protection for anyone, if the world as a whole goes to pieces. We must hope that the world’s leaders will wake up and begin to think about the long-term future. After all, like the rest of us, they love their children and grandchildren.





# INSTITUTIONAL AND CULTURAL INERTIA

## Why do we not respond to the crisis?

Today we are faced with multiple interrelated crises, for example the threat of catastrophic climate change or equally catastrophic thermonuclear war, and the threat of widespread famine. These threats to human existence and to the biosphere demand a prompt and rational response; but because of institutional and cultural inertia, we are failing to take the steps that are necessary to avoid disaster.

## Only immediate climate action can save the future.

Immediate action to halt the extraction of fossil fuels and greatly reduce the emission of CO<sub>2</sub> and other greenhouse gasses is needed to save the long-term future of human civilization and the biosphere.

At the opening ceremony of United Nations-sponsored climate talks in Katowice, Poland, Sir David Attenborough said “Right now, we are facing a man-made disaster of global scale. Our greatest threat in thousands of years. Climate change. If we don’t take action, the collapse of our civilizations and the extinction of much of the natural world is on the horizon. The world’s people have spoken. Their message is clear. Time is running out. They want you, the decision-makers, to act now.”

Antonio Guterres, UN Secretary-General, said climate change was already “a matter of life and death” for many countries. He added that the world is “nowhere near where it needs to be on the transition to a low-carbon economy”.

Swedish student Greta Thunberg, is a 15-year-old who has launched a climate protest movement in her country. She said to the UN leader Antonio Guterres at the UN conference in Katowice: “Some people say that I should be in school instead. Some people say that I should study to become a climate scientist so that I can ‘solve the climate crisis’. But the climate crisis has already been solved. We already have all the facts and solutions.”

She added: “Why should I be studying for a future that soon may be no more, when no one is doing anything to save that future? And what is the point of learning facts when the most important facts clearly means nothing to our society?”

Thunberg continued: “Today we use 100 million barrels of oil every single day. There are no politics to change that. There are no rules to keep that oil in the ground. So we cant save the world by playing by the rules. Because the rules have to be changed.”

She concluded by saying that “since our leaders are behaving like children, we will have to take the responsibility they should have taken long ago.”

## Institutional inertia

Our collective failure to respond adequately to the current crisis is very largely due to institutional inertia. Our financial system is deeply embedded and resistant to change.

Our entire industrial infrastructure is based on fossil fuels; but if the future is to be saved, the use of fossil fuels must stop.

International relations are still based on the concept of absolutely sovereign nation states, even though this concept has become a dangerous anachronism in an era of instantaneous global communication and economic interdependence. Within nations, systems of law and education change very slowly, although present dangers demand rapid revolutions in outlook and lifestyle.

The failure of the recent climate conferences to produce strong final documents can be attributed to the fact that the nations attending the conferences felt themselves to be in competition with each other, when in fact they ought to have cooperated in response to a common danger. The heavy hand of the fossil fuel industry also made itself felt at the conferences.

Until the development of coal-driven steam engines in the 19th century, humans lived more or less in harmony with their environment. Then, fossil fuels, representing many millions of years of stored sunlight, were extracted and burned in two centuries, driving a frenzy of growth of population and industry that has lasted until the present. But today, the party is over. Coal, oil and gas are nearly exhausted, and what remains of them must be left in the ground to avoid existential threats to humans and the biosphere.

Big coal and oil corporations base the value of their stocks on ownership of the remaining resources that are still buried, and they can be counted on to use every trick, fair or unfair, turn those resources into money.

In general corporations represent a strong force resisting change. By law, the directors of corporations are obliged to put the profits of stockholders above every other consideration. No room whatever is left for an ecological or social conscience. Increasingly, corporations have taken control of our mass media and our political system. They intervene in such a way as to make themselves richer, and thus to increase their control of the system.

## **Polite conversation and cultural inertia**

Each day, the conventions of polite conversation contribute to our sense that everything is as it always was. Politeness requires that we do not talk about issues that might be contrary to another persons beliefs. Thus polite conversation is dominated by trivia, entertainment, sports, the weather, gossip, food, and so on, Worries about the the distant future , the danger of nuclear war, the danger of uncontrollable climate change, or the danger of widespread famine seldom appear in conversations at the dinner table, over coffee or at the pub. In conversations between polite people, the situation is exactly the same as in the mass media. We obtain the false impression that all is well with the world. But in fact, all is not well. We have to act promptly and adequately to save the future.

## **Shooting Santa Claus**

No one wants to shoot Santa Claus. That goes without saying! Who would want to harm that jolly old man, with his reindeer and sleigh, and his workshop at the North Pole? Who

would want to prevent him from bringing happiness to everyone? Who would want to stop him from making the childrens eyes light up like stars? Surely no one!

But the sad truth today is that we have to get rid of Santa somehow, before he kills us, and before he kills most of the plants and animals with which we share our world. Perhaps shooting is too harsh. Perhaps we should just forget Santa and all that he stands for, with his red suit, invented by the advertising department of Coca Cola.

This is what Santa stands for: The customer is always right. Your wish is our command. You have a right to whatever you desire. If you feel like taking a vacation on the other side of the world, dont hesitate, just do it. If you feel like buying a SUV, just do it. Self-fulfillment is your birthright. Spending makes the economy grow, and growth is good. Isn't that right?

But sadly that isn't right. We have to face the fact that endless economic growth on a finite planet is a logical impossibility, and that we have reached or passed the sustainable limits to growth.

In today's world, we are pressing against the absolute limits of the earth's carrying capacity, and further growth carries with it the danger of future collapse. In the long run, neither the growth of industry not that of population is sustainable; and we have now reached or exceeded the sustainable limits.

The size of the human economy is, of course, the product of two factors: the total number of humans, and the consumption per capita. Let us first consider the problem of reducing the per-capita consumption in the industrialized countries. The whole structure of western society seems designed to push its citizens in the opposite direction, towards ever-increasing levels of consumption. The mass media hold before us continually the ideal of a personal utopia, filled with material goods.

Every young man in a modern industrial society feels that he is a failure unless he fights his way to the "top"; and in recent years, women too have been drawn into the competition. Of course, not everyone can reach the top; there would not be room for everyone; but society urges us all to try, and we feel a sense of failure if we do not reach the goal. Thus, modern life has become a competition of all against all for power and possessions.

When possessions are used for the purpose of social competition, demand has no natural upper limit; it is then limited only by the size of the human ego, which, as we know, is boundless. This would be all to the good if unlimited industrial growth were desirable; but today, when further industrial growth implies future collapse, western society urgently needs to find new values to replace our worship of power, our restless chase after excitement, and our admiration of excessive consumption.

If you turn on your television set, the vast majority of the programs that you will be offered give no hint at all of the true state of the world or of the dangers which we will face in the future. Part of the reason for this willful blindness is that no one wants to damage consumer confidence. No one wants to bring on a recession. No one wants to shoot Santa Claus.

But sooner or later a severe recession will come, despite our unwillingness to recognize this fact. Perhaps we should prepare for it by reordering the worlds economy and

infrastructure to achieve long-term sustainability, i.e. steady-state economics, population stabilization, and renewable energy.

## **Our responsibility to future generations and to the biosphere**

All of the technology needed for the replacement of fossil fuels by renewable energy is already in place. Although renewable sources currently supply only 19 percent of the worlds energy requirements, they are growing rapidly. For example, wind energy is growing at the rate of 30 percent per year. Because of the remarkable properties of exponential growth, this will mean that wind will soon become a major supplier of the worlds energy requirements, despite bitter opposition from the fossil fuel industry.

Both wind and solar energy have can now compete economically with fossil fuels, and this situation will become even more pronounced if more countries put a tax on carbon emissions, as Finland, the Netherlands, Norway, Costa Rica, the United Kingdom and Ireland already have done.

Much research and thought have also been devoted to the concept of a steady-state economy. The only thing that is lacking is political will. It is up to the people of the world to make their collective will felt.

History has given to our generation an enormous responsibility towards future generations. We must achieve a new kind of economy, a steady-state economy. We must stabilize global population. We must replace fossil fuels by renewable energy. We must abolish nuclear weapons. We must end the institution of war. We must reclaim democracy in our own countries when it has been lost. We must replace nationalism by a just system of international law. We must prevent degradation of the earths environment. We must act with dedication and fearlessness to save the future of the earth for human civilization and for the plants and animals with which we share the gift of life.



Figure 1: No one wants to shoot Santa Claus. That goes without saying! Who would want to harm that jolly old man, with his reindeer and sleigh, and his workshop at the North Pole? Who would want to prevent him from bringing happiness to everyone? Who would want to stop him from making the childrens eyes light up like stars? Surely no one!





Figure 2: Greta: “Many people say that Sweden is just a small country, and it doesn’t matter what we do. But I’ve learned that you are never too small to make a difference. And if a few children can get headlines all over the world just by not going to school, then imagine what we could all do together if we really wanted to.”



Figure 3: Greta: “You only talk about moving forward with the same bad ideas that got us into this mess, even when the only sensible thing to do is pull the emergency brake. You are not mature enough to tell it like it is. Even that burden you leave to us children.”



Figure 4: A bulldozer moves coal that will be burned to generate electricity at the American Electric Power Co. Inc. coal-fired John E. Amos Power Plant in Winfield, West Virginia, U.S. Photographer: Luke Sharrett.



Figure 5: A fireman fighting a wildfire in California.

## Global fossil fuel & industry emissions 2014

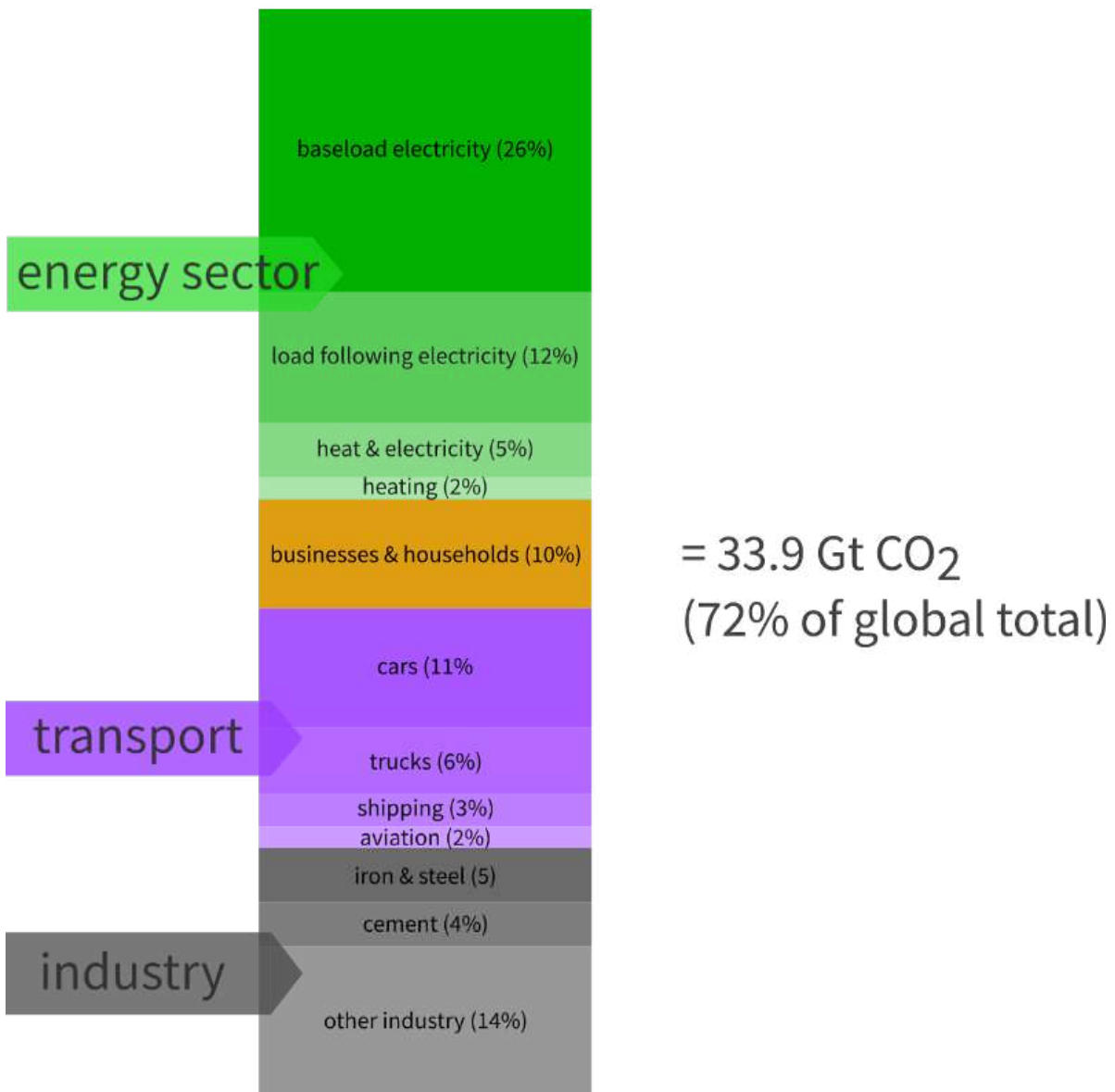


Figure 6: Sectors contributing to CO<sub>2</sub> emissions.

# OUR LIFESTYLES MUST CHANGE

## **Our house is on fire!**

“Our house is on fire!”, said teenage climate activist Greta Thunberg at Davos last January, “According to the IPCC we are less than 12 years away from not being able to undo our mistakes. In that time, unprecedented changes in all aspects of society need to have taken place, including a reduction of our CO<sub>2</sub> emissions by at least 50%.” She is right. Our world is on fire. The Amazon is burning. Alaska is burning. The forests of Siberia are burning, producing a plume of smoke as large as Europe.

## **Climate change means lifestyle change**

“This changes everything!”, wrote award-winning author Naomi Klein. But on the whole, little seems to be changing. There are too many vested interests - too much money to be made by inaction, and denial - too much institutional and cultural inertia. Our whole economic system is built on the extraction and use of fossil fuels, and they continue to be extracted. Oil tankers continue to sail. Russian gas continues to heat Ukraine and Europe. Advertisers continue to urge us to buy more than we really need. including the latest fashions.

Meanwhile the world burns, sea levels rise and we face a worsening refugee crisis, driven, in part, by climate change. The problem we face in mobilizing political will to make the necessary changes in society is the slowness of effects such as sea level rise. The worst consequences of catastrophic climate change lie in the long-term future. But as the IPCC has told us, immediate action is needed to prevent feedback loops from taking control and making human efforts useless.

## **Will lifestyle change trigger a recession?**

But what if we stop buying more than we need? What if we stop driving cars, and ride bicycles instead? What if we stop traveling by air to distant countries for vacations? What if we stop eating beef? What if we wear our clothes until they wear out, instead of buying the latest fashions? Will this not produce a recession?

There are signs that a recession is on the way in any case. The increase in debt, both individual and governmental, cannot be sustained. Furthermore, perpetual growth on a finite planet is a logical impossibility. Only a steady-state economic system is sustainable in the long run.

## **The Green New Deal**

Even before taking her place in the US House of Representatives, with its newly-won Democratic majority, Alexandria Ocasio-Cortez became the leader of a campaign for a Green New Deal. This program takes its inspiration from the massive Federal government

program by which Franklin Delano Roosevelt ended the depression of the 1930's. FDR's New Deal built dams, planted forests, and in general to create much needed infrastructure, while at the same time addressing the problem of unemployment by providing jobs.

Wikipedia describes FDR's New Deal as follows: **The New Deal was a series of programs, public work projects, financial reforms and regulations enacted by President Franklin D. Roosevelt in the United States between 1933 and 1936. It responded to needs for relief, reform and recovery from the Great Depression. Major federal programs included the Civilian Conservation Corps (CCC), the Civil Works Administration (CWA), the Farm Security Administration (FSA), the National Industrial Recovery Act of 1933 (NIRA) and the Social Security Administration (SSA). They provided support for farmers, the unemployed, youth and the elderly. The New Deal included new constraints and safeguards on the banking industry and efforts to re-inflate the economy after prices had fallen sharply. New Deal programs included both laws passed by Congress as well as presidential executive orders during the first term of the presidency of Franklin D. Roosevelt. The programs focused on what historians refer to as the "3 Rs": relief for the unemployed and poor, recovery of the economy back to normal levels and reform of the financial system to prevent a repeat depression.**

Alexandria Ocasio-Cortez believes that the climate emergency that the world now faces is a much more severe emergency than the great depression. Indeed, if quick action is not taken immediately, the long-term effects of catastrophic climate change pose existential threats to human civilization and the biosphere. Therefore she advocates a massive governmental program to create renewable energy infrastructure. Such a program, like FDR's New Deal, would simultaneously solve the problem of unemployment. Money for the program could be taken from the Pentagon's obscenely bloated budget. Ocasio-Cortez has also proposed a 70% income tax for the ultra-wealthy.

According to a January 24 2019 article by Robert R. Raymond, "When polled, 92 percent of registered Democratic voters say they support the Green New Deal. But perhaps more importantly, a full 81 percent of all registered voters support it - a number that includes both Republicans and Democrats."

## Youth leads the way

Over 1.4 million young students across all continents took to the streets on Friday March 15th for the first ever global climate strike. Messages in more than 40 languages were loud and clear: world leaders must act now to address the climate crisis and save our future. The school strike was the largest climate action in history.

Greta Thunberg, the teenage Swedish climate activist whose lone protest outside the Swedish Parliament inspired the worldwide youth protests, says "And yes, we do need hope. Of course, we do. But the one thing we need more than hope is action. Once we start to act, hope is everywhere. So instead of looking for hope, look for action. Then and only then, hope will come today."



## **Our responsibility to future generations and to the biosphere**

All of the technology needed for the replacement of fossil fuels by renewable energy is already in place. Although renewable sources currently supply only 19 percent of the world's energy requirements, they are growing rapidly. For example, wind energy is growing at the rate of 30 percent per year. Because of the remarkable properties of exponential growth, this will mean that wind will soon become a major supplier of the world's energy requirements, despite bitter opposition from the fossil fuel industry.<sup>1</sup>

Both wind and solar energy can now compete economically with fossil fuels, and this situation will become even more pronounced if more countries put a tax on carbon emissions, as Finland, the Netherlands, Norway, Costa Rica, the United Kingdom and Ireland already have done. A Global Green New Deal is both necessary and possible.

Much research and thought have also been devoted to the concept of a steady-state economy. The only thing that is lacking is political will. It is up to the people of the world to make their collective will felt.<sup>2</sup>

History has given to our generation an enormous responsibility towards future generations. We must achieve a new kind of economy, a steady-state economy. We must stabilize global population. We must replace fossil fuels by renewable energy. We must abolish nuclear weapons. We must end the institution of war. We must reclaim democracy in our own countries when it has been lost. We must replace nationalism by a just system of international law. We must prevent degradation of the earth's environment. We must act with dedication and fearlessness to save the future of the earth for human civilization and for the plants and animals with which we share the gift of life.

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<sup>1</sup><http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>

<sup>2</sup><http://steadystate.org/category/herman-daly/>





# FEEDBACK LOOPS

## Why climate is an emergency

The central problem which the world faces in its attempts to avoid catastrophic climate change is a contrast of time scales. In order to save human civilization and the biosphere from the most catastrophic effects of climate change we need to act immediately, Fossil fuels must be left in the ground. Forests must be saved from destruction by beef or palm oil production.

These vitally necessary actions are opposed by powerful economic interests, by powerful fossil fuel corporations desperate to monetize their underground “assets”, and by corrupt politicians receiving money the beef or palm oil industries.

However, although some disastrous effects climate change are already visible, the worst of these calamities lie in the distant future. Therefore it is difficult to mobilize the political will for quick action. We need to act immediately, because of the danger of passing tipping points beyond which climate change will become irreversible despite human efforts to control it.

Tipping points are associated with feedback loops, such as the albedo effect and the methane hydrate feedback loop. The albedo effect is important in connection with whether the sunlight falling on polar seas is reflected or absorbed. While ice remains, most of the sunlight is reflected, but as areas of sea surface become ice-free, more sunlight is absorbed, leading to rising temperatures and further melting of sea ice, and so on, in a loop.

The methane hydrate feedback loop involves vast quantities of the powerful greenhouse gas methane, frozen in a crystalline form surrounded by water molecules. 10,000 gigatons of methane hydrates are at present locked in Arctic tundra or the continental shelves of the world’s oceans. Although oceans warm very slowly because of thermal inertia, the long-term dangers from the initiation of a methane-hydrate feedback loop are very great. There is a danger that a very large-scale anthropogenic extinction event could be initiated unless immediate steps are taken to drastically reduce the release of greenhouse gases.

## The world is on fire!

“The world is on fire!” says Swedish climate activist Greta Thunberg. She is right. California is burning. The Amazon is burning. Indonesia is burning. Alaska is burning. Siberia is burning. These fires have been produced partly by the degree of climate warming that has already occurred, and partly by human greed for profits, for example from beef production or palm oil

New research has shown that rising sea levels could wipe out many major cities by 2050.

Speaking at the opening ceremony of the UN climate conference COP24, the universally loved and respected naturalist, Sir David Attenborough, said: “If we don’t take action, the collapse of our civilizations and the extinction of much of the natural world is on the horizon.” Sir David’s two-part program, “Climate Change: The Facts” is currently being



broadcast by BBC Earth. Hopefully, this important documentary film, like Leonardo DiCaprio's excellent film "Before the Flood", can do much to mobilize public opinion behind the immediate action that is needed to save the long-term future of human civilization and the biosphere.

Recently more than 7 million young people in 150 countries took part in strikes aimed at focusing public opinion on the need for rapid climate action. The Extinction Rebellion movement, which started in the UK, has now spread to many countries, and is also doing important work. In the United States, popular political figures such as Bernie Sanders and Alexandria Ocasio-Cortez are doing much to mobilize public opinion behind the Green New Deal and much to counteract Donald Trump's climate change denial.

## **The remarkable properties of exponential growth**

Positive feedback loops occur when the presence of something leads to the generation of more of the same thing. For example in the presence of an unlimited food supply, the growth of a population will lead to more individuals reaching reproductive age, and hence an accelerated growth of the population. This type of relationship leads to the mathematical relationship known as exponential growth.

Exponential growth of any quantity with time has some remarkable characteristics, which we ought to try to understand better, since this understanding will help us to predict the future. The knowledge will also show us the tasks which history has given to our generation. We must perform these tasks with urgency in order to create a future in which our descendants will be able to survive.

If any quantity, for example population, industrial production or indebtedness, is growing at the rate of 3% per year, it will double in 23.1 years; if it is growing at the rate of 4% per year, the doubling time is 17.3 years. For a 5% growth rate, the doubling time is 13.9 years, if the growth rate is 7% (the rate of economic growth that China's leaders hope to maintain), the doubling time is only 9.9 years. If you want to find out the doubling time for any exponentially growing quantity, just divide 69.3 years by the growth rate in percent.

Looking at the long-term future, we can calculate that any quantity increasing at the modest rate of 3% per year will grow by a factor of 20.1 in a century. This implies that in four centuries, whatever is growing at 3% will have increased by a factor of 163,000. These facts make it completely clear that long-continued economic growth on a finite planet is a logical absurdity. Yet economists and governments have an almost religious belief in perpetual economic growth. They can only maintain this belief by refusing to look more than a short distance into the future.

Exponential decay of any quantity follows similar but inverse rules. For example, if the chance of a thermonuclear war will be initiated by accident or miscalculation or malice is 3% in any given year, the chance that the human race will survive for more than four centuries under these conditions is only 1 in 163,000, i.e. 0.000625 percent. Clearly, in the long run, if we do not completely rid ourselves of nuclear weapons, our species will have no hope of survival.

Besides nuclear war, the other great threat to the survival of the human species and the biosphere is catastrophic climate change. The transition to 100% renewable energy must take place within about a century because fossil fuels will become too rare and expensive to burn. But scientists warn that if the transition does not happen much faster than that, there is a danger that we may reach a tipping point beyond which feedback loops, such as the albedo effect and the methane hydrate feedback loop, could take over and produce an out-of-control and fatal increase in global temperature.

In 2012, the World Bank issued a report warning that without quick action to curb CO<sub>2</sub> emissions, global warming is likely to reach 4 degrees C during the 21st century. This is dangerously close to the temperature which initiated the Permian-Triassic extinction event: 6 degrees C above normal. During the Permian-Triassic extinction event, which occurred 252 million years ago. In this event, 96 percent of all marine species were wiped out, as well as 70 percent of all terrestrial vertebrates.

Is a quick transition to 100% renewable energy technically possible? The technology is available, remarkable characteristics of exponential growth can give us hope that it can indeed be done, provided that we make the necessary effort. Governments currently give enormous subsidies to fossil fuel industries. These must be stopped, or better yet, shifted to subsidize renewable energy. If this is done, economic forces alone will drive the shift to renewable energy. The remarkable properties of exponential growth can give us hope that the transition will take place rapidly enough to save the future of our planet from the worst effects of climate change.<sup>1</sup>

## Feedback loops and ethics

All of the major religions of the world contain some version of the Golden Rule, “Do unto others as you would have them do unto you”. In Christianity, there is a striking passage from the Sermon on the Mount: “Ye have heard that it hath been said, Thou shalt love thy neighbor, and hate thine enemy. But I say unto you, Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you, and persecute you.”

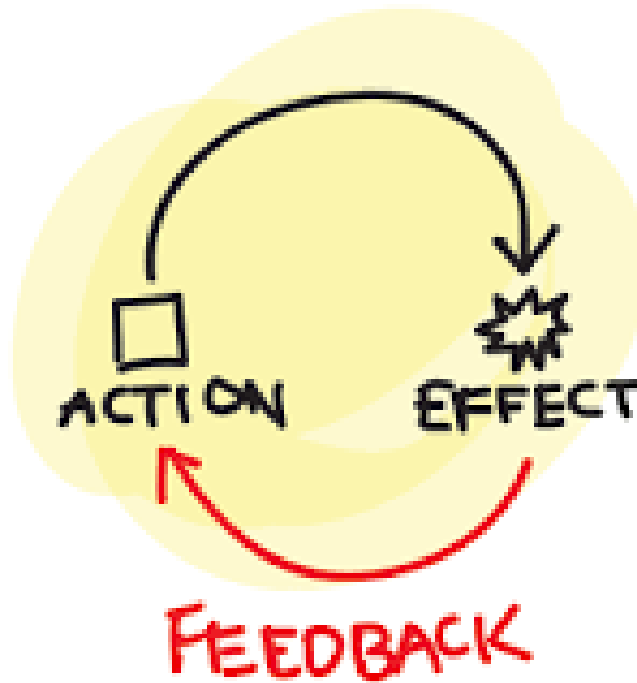
This seemingly impractical advice, that we should love our enemies and do good to them, is in fact extremely practical. It prevents the feedback loops of revenge and counter-revenge that we see so often in today’s conflicts. In fact, if nations that claim to be Christian really followed this commandment, their participation in war would be impossible. Conflicts can be prevented by unilateral acts of kindness.

## Feedback loops and the information explosion

In 1965, the computer scientist Gordon E. Moore predicted that the number of components per integrated circuit would increase exponentially for the next ten years. In 1975, he

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<sup>1</sup><https://www.theguardian.com/environment/2019/oct/21/renewable-energy-to-expand-by-50-in-next-five-years-report>



revised his growth rate to correspond to a doubling time of every two years. Astonishingly, Moore's Law, as this relationship has come to be called, has proved to be valid for much longer than he or anyone else believed would be possible.

Moore's Law is an example of the fact that the growth of knowledge feeds on itself. The number of scientific papers published each year is also increasing exponentially. This would be all to the good, if our social and political institutions matched our technology, but because of institutional and cultural inertia, the exponentially accelerating rate of technical innovation is threatening to shake human society to pieces. We need new global institutions of governance<sup>2</sup> and new global ethics to match our new technology.<sup>3</sup>

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<sup>2</sup><http://eacpe.org/app/wp-content/uploads/2018/11/A-World-Federation-by-John-Scales-Avery.pdf>

<sup>3</sup><http://eacpe.org/app/wp-content/uploads/2019/10/The-Passions-of-Mankind-by-John-Scales-Avery.pdf>



Figure 1: Gordon E. Moore (born 1929), a founder of Intel and the author of Moore's Law. In 1965 he predicted that the number of components in integrated circuits would double every year for the next 10 years". In 1975 he predicted the this doubling would continue, but revised the doubling rate to every two years. Astonishingly, Moore's Law has held much longer than he, or anyone else, anticipated.

# CRITICISM OF ISRAEL IS NOT ANTISEMITISM

## Outstanding contributions of Jewish culture

Let us begin by recognizing the brilliant contributions that Jewish intellectuals have given to the world. Of the three great monotheistic Abrahamic religions, Judaism, Christianity and Islam, Judaism was the first. Thus the religious traditions of much of the world have their roots in Jewish culture.

We should also acknowledge the remarkable intellectual achievements of thinkers such as Albert Einstein, Sigmund Freud, Niels Bohr, Hanna Adler, Emmy Noether, Noam Chomsky, and many many more. Interested readers can look at a more complete list on the following link:

<https://www.juliantrubin.com/schooldirectory/jewishscientists.html>

## Jews have suffered terrible persecutions

One must also think of the terrible suffering that the Jewish people have endured, for example, exiles into Babylon and Egypt, persecutions under the Roman Emperor Hadrian, pogroms during the Middle Ages in Europe, and more recently in Russia, and finally the unspeakable genocide inflicted in the Jewish people of Europe by Nazi Germany.

## These facts should not make Israel immune to criticism

Criticism of the state of Israel is by no means the same as antisemitism. We can acknowledge the great contributions of Jewish culture and brilliant Jewish individuals, and at the same time criticize the state of Israel. There is much to criticize. The international community was unanimous in condemning apartheid in South Africa, but the state of Israel has pursued a policy of apartheid as cruel as that of South Africa - or perhaps even worse. Furthermore, Israel has repeatedly launched aggressive military attacks and wars against its neighbors, Lebanon and Syria, and is threatening to attack Iran.

## Sabotaging Jeremy Corbyn

Neither British Labour Party Leader Jeremy Corbyn nor his party are anti-Semitic. But Corbyn is not afraid to criticize the government of Israel. For this reason, Britain's Chief Rabbi, Ephraim Mirvis, has taken the unprecedented step of interfering in an election by attacking Corbyn as an antisemite.<sup>1</sup>

Not only is this demonstrably untrue, but also the two things are not the same. Criticizing Israel is not the same as antisemitism.

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<sup>1</sup><https://countercurrents.org/2019/11/britains-chief-rabbi-is-helping-to-stoke-antisemitism>

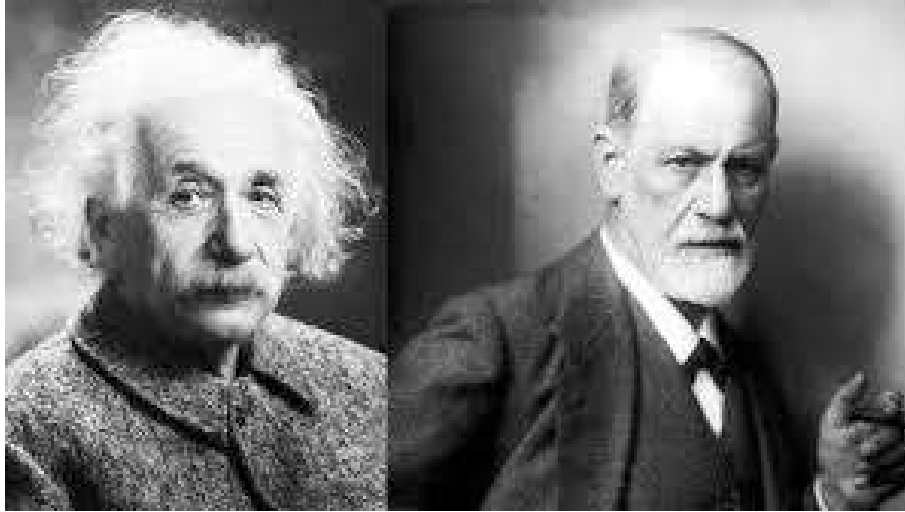


Figure 1: “Why War?”, an exchange of letters between Albert Einstein and Sigmund Freud, is an example of the enormous cultural contributions to civilization made by Jewish intellectuals.



Figure 2: Nazi genocides: A pile of corpses in the Buchenwald extermination camp. The Jewish people have suffered terrible persecutions; but this does not mean that the state of Israel should remain forever free from criticism, no matter what it does.



Figure 3: Jeremy Corbyn is not an antisemite, but he has criticized the state of Israel. The two things are not the same! The real reason why he has been so savagely attacked is that his socialism threatens the privileges of England's ruling elite.



Figure 1: Dr. David Krieger, born in 1942, is the founder and longtime president of the Nuclear Age Peace Foundation.

## INTERVIEW WITH DR. DAVID KRIEGER

### David Krieger's background

David Krieger, Ph.D. is founder and president of the Nuclear Age Peace Foundation. Amongst several of his wide-spanning leadership endeavors in global peacebuilding, he is a founder and a member of the Global Council of Abolition 2000, councilor on the World Future Council, and is the chair of the Executive Committee of the International Network of Engineers and Scientists for Global Responsibility. He has a BA in Psychology and holds MA and Ph.D. degrees in Political Science from the University of Hawaii as well as a J.D. from the Santa Barbara College of Law; he served for 20 years as a judge pro tem for the Santa Barbara Municipal and Superior Courts. Dr. Krieger is the author of many books and studies of peace in the Nuclear Age. He has written or edited more than 20 books and hundreds of articles and book chapters. He is a recipient of several awards and honors, including the OMNI Center for Peace, Justice and Ecology Peace Writing Award for Poetry (2010). He has a new collection of poems entitled *Wake Up*. For more visit the Nuclear Age Peace Foundation website: [www.wagingpeace.org](http://www.wagingpeace.org).

### The interview

**John Avery:** I have long admired your dedicated and heroic life-long work for the complete abolition of nuclear weapons. You did me the great honour of making me an Advisor to the Nuclear Age Peace Foundation (NAPF). You are both the Founder and the President of the NAPF. Could you tell us a little about your family, and your early life and



education? What are the steps that led you to become one of the world's most famous advocates of the complete abolition of nuclear weapons?

**David Krieger:** John, you have honored us by being an advisor to the Nuclear Age Peace Foundation. You are one of the most knowledgeable people I know on the dangers of nuclear and other technologies to the future of life on our planet, and you have written brilliantly about these threats.

Regarding my family, early life and education, I was born three years before the cities of Hiroshima and Nagasaki were destroyed by nuclear weapons. My father was a pediatrician, and my mother a housewife and hospital volunteer. Both were very peace oriented, and both rejected militarism unreservedly. I would describe my early years as largely uneventful. I attended Occidental College, where I received a good liberal arts education. After graduating from Occidental, I visited Japan, and was awakened by seeing the devastation suffered by Hiroshima and Nagasaki. I realized that in the US, we viewed these bombings from above the mushroom cloud as technological achievements, while in Japan the bombings were viewed from beneath the mushroom cloud as tragic events of indiscriminate mass annihilation.

After returning from Japan, I went to graduate school at the University of Hawaii and earned a Ph.D. in political science. I was also drafted into the military, but was able to join the reserves as an alternate way of fulfilling my military obligation. Unfortunately, I was later called to active duty. In the military, I refused orders for Vietnam and filed for conscientious objector status. I believed that the Vietnam War was an illegal and immoral war, and I was unwilling as a matter of conscience to serve there. I took my case to federal court and eventually was honorably discharged from the military. My experiences in Japan and in the U.S. Army helped shape my views toward peace and nuclear weapons. I came to believe that peace was an imperative of the Nuclear Age and that nuclear weapons must be abolished.

**John Avery:** Humanity and the biosphere are threatened by the danger of an all-destroying thermonuclear war. It could occur through a technical or human failure, or through uncontrollable escalation of a war fought with conventional weapons. Can you say something about this great danger?

**David Krieger:** There are many ways in which a nuclear war could start. I like to talk about the five "Ms." These are: malice, madness, mistake, miscalculation and manipulation. Of these five, only malice is subject to possibly being prevented by nuclear deterrence and of this there is no certainty. But nuclear deterrence (threat of nuclear retaliation) will not be at all effective against madness, mistake, miscalculation or manipulation (hacking). As you suggest, any war in the nuclear age could escalate into a nuclear war. I believe that a nuclear war, no matter how it would start, poses the greatest danger confronting humankind, and can only be prevented by the total abolition of nuclear weapons, achieved through negotiations that are phased, verifiable, irreversible and transparent.

**John Avery:** Can you describe the effects of a nuclear war on the ozone layer, on global temperatures, and on agriculture? Could nuclear war produce a large-scale famine?

**David Krieger:** My understanding is that a nuclear war would largely destroy the ozone layer allowing extreme levels of ultraviolet radiation to reach the earth's surface. Additionally, a nuclear war would dramatically lower temperatures, possibly throwing the planet into a new Ice Age. The effects of a nuclear war on agriculture would be very marked. Atmospheric scientists tell us that even a small nuclear war between India and Pakistan in which each side used 50 nuclear weapons on the other side's cities would put enough soot into the stratosphere to block warming sunlight, shorten growing seasons, and cause mass starvation leading to some two billion human deaths. A major nuclear war would produce even more severe effects, including the possibility of destroying most complex life on the planet.

**John Avery:** What about the effects of radiation from fallout? Can you describe the effects of the Bikini tests on the people of the Marshall Islands and other nearby islands?

**Davis Krieger:** Radiation fallout is one of the unique dangers of nuclear weapons. Between 1946 and 1958, the U.S. conducted 67 of its nuclear tests in the Marshall Islands, with the equivalent power of detonating 1.6 Hiroshima bombs daily for a twelve year period. Of these tests, 23 were conducted in the Bikini Atoll in the Marshall Islands. Some of these tests contaminated islands and fishing vessels hundreds of miles away from the test sites. Some islands are still too contaminated for the residents to return. The U.S. shamefully treated the people of the Marshall Islands who suffered the effects of radioactive fallout like guinea pigs, studying them to learn more about the effects of radiation on human health.

**John Avery:** The Nuclear Age Peace Foundation cooperated with the Marshall Islands in suing all of the nations which signed the Nuclear Nonproliferation Treaty and which currently possess nuclear weapons for violating Article VI of the NPT. Can you describe what has happened? The Marshall Islands' Premier, Tony deBrum, received the Right Livelihood Award for his part in the lawsuit. Can you tell us something about this?

**David Krieger:** The Nuclear Age Peace Foundation consulted with the Marshall Islands on their heroic lawsuits against the nine nuclear-armed countries (U.S., Russia, UK, France, China, Israel, India, Pakistan, and North Korea). The lawsuits in the International Court of Justice (ICJ) in The Hague were against the first five of these countries for their failure to fulfill their disarmament obligations under Article VI of the Non-Proliferation Treaty (NPT) for negotiations to end the nuclear arms race and achieve nuclear disarmament. The other four nuclear-armed countries, those not parties to the NPT, were sued for the same failures to negotiate, but under customary international law. The U.S. was sued additionally in U.S. federal court.

Of the nine countries, only the UK, India and Pakistan accepted the compulsory ju-

isdiction of the ICJ. In these three cases the Court ruled that there was not a sufficient controversy between the parties and dismissed the cases without getting to the substance of the lawsuits. The votes of the 16 judges on the ICJ were very close; in the case of the UK the judges split 8 to 8 and the case was decided by the casting vote of the president of the Court, who was French. The case in U.S. federal court was also dismissed before getting to the merits of the case. The Marshall Islands was the only country in the world willing to challenge the nine nuclear-armed states in these lawsuits, and did so under the courageous leadership of Tony de Brum, who received many awards for his leadership on this issue. It was an honor for us to work with him on these lawsuits. Sadly, Tony passed away in 2017.

**John Avery:** On July 7, 2017, the Treaty on the Prohibition of Nuclear Weapons (TPNW) was passed by an overwhelming majority by the United Nations General Assembly. This was a great victory in the struggle to rid the world of the danger of nuclear annihilation. Can you tell us something about the current status of the Treaty?

**David Krieger:** The Treaty is still in the process of attaining signatures and ratifications. It will enter into force 90 days after the 50th country deposits its ratification or accession to it. At present, 69 countries have signed and 19 have ratified or acceded to the treaty, but these numbers change frequently. ICAN and its partner organizations continue to lobby states to join the treaty.

**John Avery:** ICAN received a Nobel Peace Prize for its efforts leading to the establishment of the TPNW. The Nuclear Age Peace Foundation is one of the 468 organizations that make up ICAN, and therefore, in a sense, you have already received a Nobel Peace Prize. I have several times nominated you, personally, and the NAPF as an organization for the Nobel Peace Prize. Can you review for us the activities that might qualify you for the award?

**David Krieger:** John, you have kindly nominated me and NAPF several times for the Nobel Peace Prize, for which I deeply thank you. I would say that my greatest accomplishment has been to found and lead the Nuclear Age Peace Foundation and to have worked steadily and unwaveringly for peace and the total abolition of nuclear weapons. I don't know if this would qualify me for a Nobel Peace Prize, but it has been good and decent work that I am proud of. I also feel that our work at the Foundation, though international, focuses largely on the United States, and that is a particularly difficult country in which to make progress. But I would say this. It has been gratifying to work for such meaningful goals for all humanity and, in doing such work, I have come across many, many dedicated people who deserve to receive the Nobel Peace Prize, including you. There are many talented and committed people in the peace and nuclear abolition movements, and I bow to them all. It is the work that is most important, not prizes, even the Nobel, although the recognition that comes with the Nobel can help with making further progress. I think this has been the case with ICAN, which we joined at the beginning and have worked closely with over the years. So, we are happy to share in this award.

**John Avery:** Military-industrial complexes throughout the world need dangerous confrontations to justify their enormous budgets. Can you say something about the dangers of the resulting brinkmanship?

**David Krieger:** Yes, the military-industrial complexes throughout the world are extremely dangerous. It is not only their brinkmanship which is a problem, but the enormous funding they receive that takes away from social programs for health care, education, housing, and protecting the environment. The amount of funds going to the military-industrial complex in many countries, and particularly in the U.S., is obscene.

I have recently been reading a great book, titled *Strength through Peace*, written by Judith Eve Lipton and David P. Barash. It is a book about Costa Rica, a country that gave up its military in 1948 and has lived mostly in peace in a dangerous part of the world since then. The book's subtitle is *How Demilitarization Led to Peace and Happiness in Costa Rica, & What the Rest of the World can Learn from a Tiny Tropical Nation*. It is a wonderful book that shows there are better ways of pursuing peace than through military strength. It turns the old Roman dictum on its head. The Romans said, If you want peace, prepare for war. The Costa Rican example says, If you want peace, prepare for peace. It is a much more sensible and decent path to peace.

**John Avery:** Has Donald Trump's administration contributed to the danger of nuclear war?

**David Krieger:** I think that Donald Trump himself has contributed to the danger of nuclear war. He is narcissistic, mercurial, and generally uncompromising, which is a terrible combination of traits for someone in charge of the world's most powerful nuclear arsenal. He is also surrounded by Yes men, who generally seem to tell him what he wants to hear. Further, Trump has pulled the U.S. out of the agreement with Iran, and has announced his intention to withdraw from the Intermediate-Range Nuclear Forces Treaty with Russia. Trump's control of the U.S. nuclear arsenal may be the most dangerous threat of nuclear war since the beginning of the Nuclear Age.

**John Avery:** Could you say something about the current wildfires in California? Is catastrophic climate change a danger comparable to the danger of a nuclear catastrophe?

**David Krieger:** The wildfires in California have been horrendous, the worst in California history. These terrible fires are yet another manifestation of global warming, just as are the increased intensity of hurricanes, typhoons and other weather-related events. I believe that catastrophic climate change is a danger comparable to the danger of nuclear catastrophe. A nuclear catastrophe could happen at any time. With climate change we are approaching a point from which there will be no return to normalcy and our sacred earth will become uninhabitable by humans.

## THE IMPORTANCE OF ALTERNATIVE MEDIA

### The superficiality of today's television

Social critic Neil Postman contrasted the futures predicted in *Nineteen Eighty-Four* and *Brave New World* in the foreword of his 1985 book *Amusing Ourselves to Death*. He wrote:

“What Orwell feared were those who would ban books. What Huxley feared was that there would be no reason to ban a book, for there would be no one who wanted to read one. Orwell feared those who would deprive us of information. Huxley feared those who would give us so much that we would be reduced to passivity and egotism. Orwell feared that the truth would be concealed from us. Huxley feared the truth would be drowned in a sea of irrelevance.”

Niel Postman's book, *Amusing Ourselves To Death; or Public Discourse in an Age of Show Business* (1985), had its origins at the Frankfurt Book Fair, where Postman was invited to join a panel discussing George Orwell's *Nineteen Eighty-Four*. Postman said that our present situation was better predicted by Huxley's *Brave New World*. Today, he maintained it is not fear that bars us from truth. Instead, truth is drowned in distractions and the pursuit of pleasure, by the public's addiction to amusement.

Postman sees television as the modern equivalent of Huxley's pleasure-inducing drug, soma, and he maintains that that television, as a medium, is intrinsically superficial and unable to discuss serious issues. Looking at television as it is today, one must agree with him.

### The wealth and power of the establishment

The media are a battleground where reformers struggle for attention, but are defeated with great regularity by the wealth and power of the establishment. This is a tragedy because today there is an urgent need to make public opinion aware of the serious problems facing civilization, and the steps that are needed to solve these problems. The mass media could potentially be a great force for public education, but in general their role is not only unhelpful - it is often negative. War and conflict are blatantly advertised by television and newspapers.

### Newspapers and war

There is a true story about the powerful newspaper owner William Randolph Hearst that illustrates the relationship between the mass media and the institution of war: When an explosion sank the American warship USS Maine in the harbor of Havana, Hearst anticipated (and desired) that the incident would lead to war between the United States and Spain. He therefore sent his best illustrator, Fredrick Remington, to Havana to produce drawings of the scene. After a few days in Havana, Remington cabled to Hearst, “All's quiet here. There will be no war.” Hearst cabled back, “You supply the pictures. I'll supply the war.” Hearst was true to his words. His newspapers inflamed American public

opinion to such an extent that the Spanish-American War became inevitable. During the course of the war, Hearst sold many newspapers, and Remington many drawings. From this story one might almost conclude that newspapers thrive on war, while war thrives on newspapers.

Before the advent of widely-read newspapers, European wars tended to be fought by mercenary soldiers, recruited from the lowest ranks of society, and motivated by financial considerations. The emotions of the population were not aroused by such limited and decorous wars. However, the French Revolution and the power of newspapers changed this situation, and war became a total phenomenon that involved emotions. The media were able to mobilize on a huge scale the communal defense mechanism that Konrad Lorenz called militant enthusiasm - self-sacrifice for the defense of the tribe. It did not escape the notice of politicians that control of the media is the key to political power in the modern world. For example, Hitler was extremely conscious of the force of propaganda, and it became one of his favorite instruments for exerting power.

With the advent of radio and television, the influence of the mass media became still greater. Today, state-controlled or money-controlled newspapers, radio and television are widely used by the power elite to manipulate public opinion. This is true in most countries of the world, even in those that pride themselves on allowing freedom of speech. For example, during the US-led invasion of Iraq in 2003, the official version of events was broadcast by CNN, and criticism of the invasion was almost absent from their transmissions.

## **The mass media and our present crisis**

Today we are faced with the task of creating a new global ethic in which loyalty to family, religion and nation will be supplemented by a higher loyalty to humanity as a whole. In case of conflicts, loyalty to humanity as a whole must take precedence. In addition, our present culture of violence must be replaced by a culture of peace. To achieve these essential goals, we urgently need the cooperation of the mass media.

The predicament of humanity today has been called “a race between education and catastrophe”: Human emotions have not changed much during the last 40,000 years. Human nature still contains an element of tribalism to which nationalistic politicians successfully appeal. The completely sovereign nation-state is still the basis of our global political system. The danger in this situation is due to the fact that modern science has given the human race incredibly destructive weapons. Because of these weapons, the tribal tendencies in human nature and the politically fragmented structure of our world have both become dangerous anachronisms.

We have to learn to think in a new way. Will we learn this in time to prevent disaster? When we consider the almost miraculous power of our modern electronic media, we can be optimistic. Cannot our marvelous global communication network be used to change anachronistic ways of thought and anachronistic social and political institutions in time, so that the system will not self-destruct as science and technology revolutionize our world? If they were properly used, our instantaneous global communications could give us hope.

The success of our species is built on cultural evolution, the central element of which is

cooperation. Thus human nature has two sides, tribal emotions are present, but they are balanced by the human genius for cooperation. The case of Scandinavia - once war-torn, now cooperative shows that education is able to bring out either the kind and cooperative side of human nature, or the xenophobic and violent side. Which of these shall it be? It is up to our educational systems to decide, and the mass media are an extremely important part of education. Hence the great responsibility that is now in the hands of the media.

How do the mass media fulfill this life-or-death responsibility? Do they give us insight? No, they give us pop music. Do they give us an understanding of the sweep of evolution and history? No, they give us sport. Do they give us an understanding of need for strengthening the United Nations, and the ways that it could be strengthened? No, they give us sit-coms and soap operas. Do they give us unbiased news? No, they give us news that has been edited to conform with the interests of the military-industrial complex and other powerful lobbys. Do they present us with the need for a just system of international law that acts on individuals? On the whole, the subject is neglected. Do they tell of the essentially genocidal nature of nuclear weapons, and the urgent need for their complete abolition? No, they give us programs about gardening and making food.

A consumer who subscribes to the package of broadcasts sold by a cable company can often search through all 100 or so channels without finding a single program that offers insight into the various problems that are facing the world today. What the viewer finds instead is a mixture of pro-establishment propaganda and entertainment. Meanwhile the neglected global problems are becoming progressively more severe. In general, the mass media behave as though their role is to prevent the peoples of the world from joining hands and working to change the world and to save it from thermonuclear and environmental catastrophes. The television viewer sits slumped in a chair, passive, isolated, disempowered and stupefied. The future of the world hangs in the balance, the fate of children and grandchildren hang in the balance, but the television viewer feels no impulse to work actively to change the world or to save it. The Roman emperors gave their people bread and circuses to numb them into political inactivity. The modern mass media seem to be playing a similar role.

## **Our duty to future generations**

The future of human civilization is endangered both by the threat of thermonuclear war and by the threat of catastrophic climate change. It is not only humans that are threatened, but also the other organisms with which we share the gift of life. We must also consider the threat of a global famine of extremely large proportions, when the end of the fossil fuel era, combined with the effects of climate change, reduce our ability to support a growing global population.

We live at a critical moment of history. Our duty to future generations is clear: We must achieve a steady-state economic system. We must restore democracy in our own countries when it has been replaced by oligarchy. We must decrease economic inequality both between nations and within nations. We must break the power of corporate greed. We must leave fossil fuels in the ground. We must stabilize and ultimately reduce the global

population. We must eliminate the institution of war; and we must develop new ethics to match our advanced technology, ethics in which narrow selfishness, short-sightedness and nationalism will be replaced by loyalty to humanity as a whole, combined with respect for nature.

Inaction is not an option. We have to act with courage and dedication, even if the odds are against success, because the stakes are so high.

The mass media could mobilize us to action, but they have failed in their duty.

Our educational systems could also wake us up and make us act, but they too has failed us. The battle to save the earth from human greed and folly has to be fought in the alternative media.

The alternative media, and all who work with them deserve both our gratitude and our financial support. They alone, can correct the distorted and incomplete picture of the world that we obtain from the mass media. They alone can show us the path to a future in which our children, grandchildren, and all future generations can survive.

A book discussing the importance of alternative media can be freely downloaded and circulated from this address:

<http://eacpe.org/app/wp-content/uploads/2018/10/Searching-for-truth-by-John-Scales-Avery.pdf>

More freely downloadable books and articles on other global problems can be found on the following link:

<http://eacpe.org/about-john-scales-avery/>



# **CLIMATE CRISIS AND THE 2020 US ELECTIONS**

## **Trump and his party must be defeated**

There are so many things wrong with Donald Trump that one hardly knows where to begin. He is a racist, habitual liar, tax evader, cruel cager of infants, misogynist, narcissist, bully, violator of numerous laws, both national and international, a friend of rich oligarchs and enemy of the poor, to mention only a few of his faults. He has made the United States resemble Germany, Italy or Spain in the 1930s, when fascism was on the rise.

However, most importantly for the future of human civilization and the biosphere, Trump has denied the reality of the climate emergency, encouraged the use of coal as well as exploration for new oil, sabotaged the Environmental Protection Agency, and withdrawn the United States from the Paris Agreement. Because of the climate issue alone, it is vital for the future of humanity that he and his party should be defeated in the 2020 elections.

## **The importance of immediate climate action**

The central problem which the world faces in its attempts to avoid catastrophic climate change is a contrast of time scales. In order to save human civilization and the biosphere from the most disastrous effects of climate change we need to act immediately, But it is difficult to mobilize public opinion behind urgently needed action because the most severe disasters due to global warming belong to the long-term future.

The Intergovernmental Panel on Climate Change, in their October 2018 report, stated that global CO<sub>2</sub> emissions must be reduced by 50% in just 12 years if the worst effects of climate change are to be avoided.

## **What happened in the disastrous 2016 election?**

One is reminded of the words of Yeats: Things fall apart. The centre cannot hold. The best lack all conviction, while the worst are filled with passionate intensity. And what rough beast, its time come round at last, slouches towards Bethlehem to be born?

When Senator Bernie Sanders began his campaign for the Democratic presidential nomination, few people believed that he could succeed. But as his campaign gained momentum, enormous crowds were attracted to his reformist speeches, and small individual donors supported his expenses. Although the crowds at Sanders speeches were at least four times the size of those attending the rallies of other candidates, they were not reported in the mass media. Sanders' campaign was also sabotaged by the corporate- controlled Democratic National Committee. His huge popularity remains undimmed today, despite his loss in the 2016 primary. He advocates a social system for the United States similar to these which have made the Scandinavian countries leaders in both human development and human happiness indices.

Against expectations, Donald Trump who, in the words of Michael Moore, is a “wretched, ignorant, dangerous part-time clown and full-time sociopath”, was elected in 2016. What

happened? Disillusioned by the way in which the immensely popular Senator Bernie Sanders was sabotaged by the media and by the Democratic National Committee, and despising Hillary Clinton for her involvement in US wars and Wall Street banks, many progressive voters, especially young ones, stayed away from the polls. In their absence, Trump won narrowly. He lost the popular vote, but won the electoral vote. Today, the White House is a morass of dissension, erratic decisions and lies.

Part of the blame for what happened must fall on the cynicism and greed of the mass media, for example the CBS executive who gave Trump's outrageous statements enormous amounts of free air time, and who said: "Donald Trump is bad for the country, but he's good for CBS".

## **The Democrats must not repeat the mistakes that they made in 2016!**

The Democrats can win in 2020 if they learn from the mistakes that their leaders made in 2016. They must not repeat these mistakes, but currently they seem to be doing so. Joe Biden is a candidate who is closely analogous to Hillary Clinton. He is tainted by associations with Wall Street, the fossil fuel industry, and he has blood from US wars on his hands. By supporting Biden, rather than progressive candidates such as Warren or Sanders, the center-seeking Democratic National Committee is making the same mistake that they made in 2016. They risk the same outcome: Offended and disillusioned progressive voters may stay home from the polls.

To win in 2020, the Democratic Party must be clearly progressive. They must support progressive presidential candidates; and they must strongly support rapid climate action and the Green New Deal.

# BENEFITS OF EQUALITY

“If Trump is a symptom, what is the disease?” One often encounters this interesting question in alternative media articles . I think that at least part of the answer is “Excessive economic inequality”.

## Hobson’s explanation of imperialism

The English economist and Fabian, John Atkinson Hobson (1858-1940), offered a famous explanation of the colonial era in his book “Imperialism: A Study” (1902). According to Hobson, the basic problem that led to colonial expansion was an excessively unequal distribution of incomes in the industrialized countries. The result of this unequal distribution was that neither the rich nor the poor could buy back the total output of their society. The incomes of the poor were insufficient, and rich were too few in number. The rich had finite needs, and tended to reinvest their money. As Hobson pointed out, reinvestment in new factories only made the situation worse by increasing output.

Hobson had been sent as a reporter by the Manchester Guardian to cover the Second Boer War. His experiences had convinced him that colonial wars have an economic motive. Such wars are fought, he believed, to facilitate investment of the excess money of the rich in African or Asian plantations and mines, and to make possible the overseas sale of excess manufactured goods. Hobson believed imperialism to be immoral, since it entails suffering both among colonial peoples and among the poor of the industrial nations. The cure that he recommended was a more equal distribution of incomes in the manufacturing countries.

Interestingly, TED Talks (ideas worth spreading) was recently under fire from many progressive groups for censoring a short talk by the adventure capitalist, Nick Hanauer, entitled “Income Inequality”. In this talk, Hanauer said exactly the same thing as John Hobson, but he applies the ideas, not to colonialism, but to current unemployment in the United States. Hanauer said that the rich are unable to consume the products of society because they are too few in number. To make an economy work, demand must be increased, and for this to happen, the distribution of incomes must become much more equal than it is today in the United States.

TED has now posted Hanauer’s talk, and the interested reader can find another wonderful TED talk dealing with the same issues from the standpoint of health and social problems. In a splendid lecture entitled “How economic inequality harms societies”, Richard Wilkinson demonstrates that there is almost no correlation between gross national product and a number of indicators of the quality of life, such as physical health, mental health, drug abuse, education, imprisonment, obesity, social mobility, trust, violence, teenage pregnancies and child well-being. On the other hand he offers comprehensive statistical evidence that these indicators are strongly correlated with the degree of inequality within countries, the outcomes being uniformly much better in nations where income is more equally distributed.

## **Extreme inequality today**

Here are two quotations from a report by the Global Inequality organization:<sup>1</sup>

“Inequality has been on the rise across the globe for several decades. Some countries have reduced the numbers of people living in extreme poverty. But economic gaps have continued to grow as the very richest amass unprecedented levels of wealth. Among industrial nations, the United States is by far the most top-heavy, with much greater shares of national wealth and income going to the richest 1 percent than any other country.”

“The world’s 10 richest billionaires, according to Forbes, own \$745 billion in combined wealth, a sum greater than the total goods and services most nations produce on an annual basis. The globe is home to 2,208 billionaires, according to the 2018 Forbes ranking.”

## **Corporate oligarchs control governments and the mainstream media**

Today, the world faces two existential threats, the threat of an all-destroying thermonuclear war, and the threat of uncontrollable catastrophic climate change. In the United States, and several other countries, immensely rich corporate oligarchies use money to control both the mass media and politics, and the result is that no action is taken to save the future of the earth for our children and grandchildren.

It is not surprising that the fossil fuel industry supports, on a vast scale, politicians and mass media that deny the reality of climate change. The amounts of money at stake are vast. If catastrophic climate change is to be avoided, coal, oil and natural gas assets worth trillions of dollars must be left in the ground. Giant fossil fuel corporations are desperately attempting to turn these “assets” into cash.

Our military-industrial complexes maintain the threat of thermonuclear war, as well as spending vast amounts of government money that could alternatively be used for social programs or renewable energy infrastructure. A military-industrial complex involves a circular flow of money. The money flows like the electrical current in a dynamo, driving a diabolical machine. Money from immensely rich corporate oligarchs buys the votes of politicians and the propaganda of the mainstream media. Numbed by the propaganda, citizens allow the politicians to vote for obscenely bloated military budgets, which further enrich the corporate oligarchs, and the circular flow continues.

Excessive economic inequality is at the root of the decay of democracy and the drift towards neofacism in a number of countries. It is not a coincidence that the United States and Brazil, two of the countries where inequality is the greatest, now have governments characterized by racism, militarism, cruelty, misogyny, decay of democracy and climate change denial.

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<sup>1</sup><https://inequality.org/facts/global-inequality/>

## **Economic equality and climate action in Scandinavia**

Senator Bernie Sanders, a popular reformist candidate for the US Presidency in 2020, has said that he is a socialist. When asked to explain in detail what he meant by that, Sanders said that he believed that the US would benefit from having a social and economic system similar to those of Scandinavia.

The Green New Deal can simultaneously address the climate crisis and the problem of excessive economic inequality. In this context, it is interesting to look at the social and economic systems of the Scandinavian countries, Norway, Sweden, Finland, Denmark and Iceland. In these countries the contrast between the rich and poor has been very much reduced. It is almost true to say that poverty has been eliminated in these countries. At the same time, the Scandinavians have strong policies to address the climate emergency. Thus Scandinavian successes are a counter-argument to those who say that the Green New Deal cannot be put into practice.

## **Renewable energy in Denmark**

Here are some excerpts from a recent report by the Danish Ministry of Energy, Utilities and Climate:

“Denmark’s success in transforming into a sustainable, green society is widely recognized. Denmark is at the forefront of numerous international initiatives and collaborative endeavors. In 2017, for the second consecutive year in a row, Denmark won the World Energy Council award for the worlds best energy system.”

“In 2017, Denmark achieved a world record of 43.4% power produced solely by wind turbines. Denmark can cover the largest share of its electricity production with green power from wind turbines. Denmark is also a European leader in the export of energy technology, as exports of energy equipment account for a larger share of total exports than in any other EU country.”

“The government has set ambitious goals that few other countries can match: At least 50% of Denmarks energy needs must be covered by renewable energy by 2030. Coal must be completely phased out of the power supply by 2030. Moratorium on all exploration and drilling activities for oil, gas and shale gas on land and inland waters of Denmark. Denmark must be a low-emission society independent of fossil fuels in 2050.”

## **Eliminating excessive economic inequality increases happiness**

For many years, the Scandinavian countries have ranked as the best places to live, according to the World Happiness Report. Perhaps these countries can serve as models, if we wish the future of human society to be a happy one. A step towards both happiness and sustainability must be the elimination of excessive economic inequality.

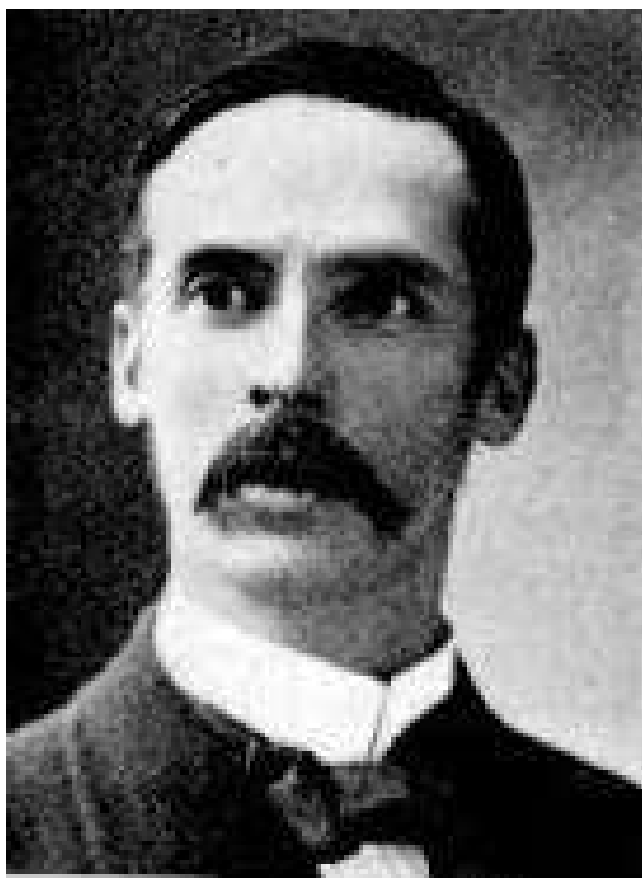


Figure 1: John Atkinson Hobson (1858-1940) was a British economist and journalist. He was sent to South Africa to cover the Second Boer War, and from his observations, concluded that colonial wars are due to industrialized nations' need for new markets to buy their manufactured goods, and new sources of raw materials. He believed that this need was due to excessive economic inequality in the industrialized countries. The rich were too few in number to buy all the products of their factories, and the poor lacking the money to do so,

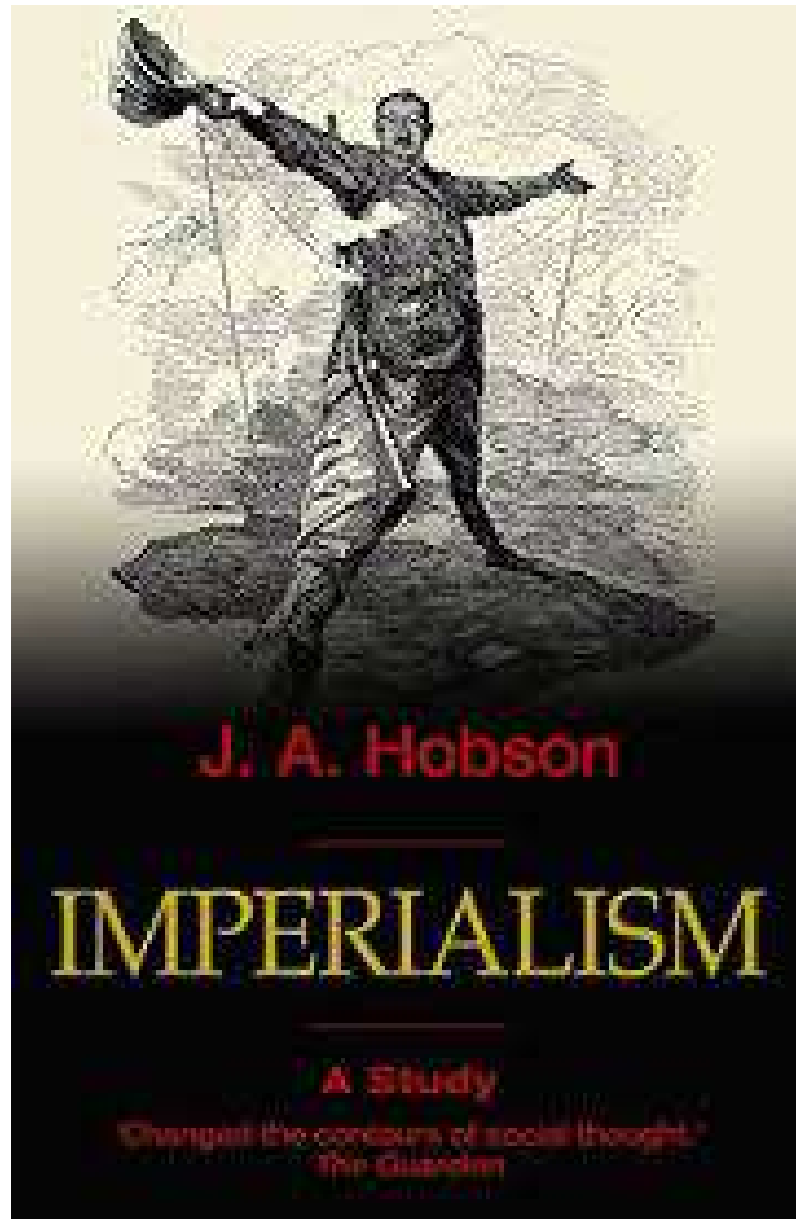


Figure 2: Hobson's famous book, *Imperialism, a Study*, was published in 1902. Today we can apply Hobson's ideas to problems produced by excessive economic inequality in many parts of the world.

# **FLOODS IN IRAN AND CLIMATE CHANGE**

## **62 million people affected by extreme weather in 2018**

According to a recent United Nations report, extreme weather events displaced 2 million people during 2018. While no single event can be unambiguously attributed to anthropogenic climate change, scientists believe the the increasing frequency of extreme weather events is definitely linked to global warming.

The report states that during 2018, extreme weather events impacted roughly 62 million people, of whom 2 million were displaced from their homes. In the words of the WMO report, “The physical signs and socio-economic impacts of climate change are accelerating, as record greenhouse gas concentrations drive global temperatures towards increasingly dangerous levels.”

UN Secretary General Antonio Guterres, speaking at the launching of the WMO report, used the occasion to remind global leaders of the urgency of the climate emergency. Guterres has convened a climate summit meeting scheduled for September 23, 2019, and referring to the meeting, he said: “Don’t come with a speech, come with a plan. This is what science says is needed. It is what young people around the globe are rightfully demanding.” Two weeks previously, on March 15, one and a half million students from more than 130 countries had skipped school to participate in the largest climate demonstration in history, demanding action to save the future from the threat of catastrophic climate change.

## **The tragic floods in Iran**

The recent tragic flood disasters in Iran are an example of the socio-economic impact of extreme weather events. Besides causing numerous deaths, the floods also inflicted economic damage amounting to hundreds of millions of dollars.

## **Books discussing the climate emergency**

Here are links to some freely-downloadable books that discuss the climate emergency:

<http://eacpe.org/app/wp-content/uploads/2019/03/We-need-an-ecological-revolution-John-Scales-Avery.pdf>

<http://eacpe.org/app/wp-content/uploads/2019/02/Saving-the-Future-John-Scales-Avery.pdf>

<http://eacpe.org/app/wp-content/uploads/2017/11/The-Climate-Emergency-Two-Time-Scales-by-John-Scales-Avery.pdf>

<http://eacpe.org/about-john-scales-avery/>







# **GANDHI'S MESSAGE FOR TODAY'S WORLD**

## **We must become more modest and more peaceful**

2019 is the 150th anniversary of Mahatma Gandhi's birth. Therefore it might be appropriate to look at his life, and his message for today's world.

If humans are ever to achieve a stable global society in the future, they will have to become much more modest in their economic behavior and much more peaceful in their politics. For both modesty and peace, Gandhi is a useful source of ideas. The problems with which he struggled during his lifetime are extremely relevant to us in the 21st Century, when both nuclear and ecological catastrophes threaten the world.

## **Avoiding escalation of conflicts**

Today we read almost every day of killings that are part of escalating cycles of revenge and counter-revenge, for example in the Middle East. Gandhi's experiences both in South Africa and in India convinced him that such cycles could only be ended by unilateral acts of kindness and understanding from one of the parties in a conflict. He said, "An eye for an eye makes the whole world blind".

## **Gandhi studies law in England**

Mohandas Karamchand Gandhi was born in 1869 in Porbandar, India. His family belonged to the Hindu caste of shopkeepers. (In Gujarati "Gandhi" means "grocer".) However, the family had risen in status, and Gandhi's father, grandfather, and uncle had all served as dewans (i.e. prime ministers) of small principalities in western India.

In 1888, Gandhi sailed for England, where he spent three years studying law at the Inner Temple in London. Before he left India, his mother had made him take a solemn oath not to touch women, wine, or meat. He thus came into contact with the English vegetarians, who included Sir Edward Arnold (translator of the Bhagavad Gita), the Theosophists Madame Blavatsky and Annie Besant, and the Fabians. Contact with this idealistic group of social critics and experimenters helped to cure Gandhi of his painful shyness, and it also developed his taste for social reform and experimentation.

## **South Africa**

Gandhi's exceptionally sweet and honest character won him many friends in England, and he encountered no racial prejudice at all. However, when he traveled to Pretoria in South Africa a few years later, he experienced racism in its worst form. Although he was meticulously well dressed in an English frock coat, and in possession of a first-class ticket, Gandhi was given the choice between traveling third class or being thrown off the train. (He chose the second alternative.) Later in the journey he was beaten by a coach driver

because he insisted on his right to sit as a passenger rather than taking a humiliating position on the footboard of the coach.

The legal case which had brought Gandhi to South Africa was a dispute between a wealthy Indian merchant, Dada Abdullah Seth, and his relative, Seth Tyeb (who had refused to pay a debt of 40,000 pounds, in those days a huge sum). Gandhi succeeded in reconciling these two relatives, and he persuaded them to settle their differences out of court. Later he wrote about this experience:

“Both were happy with this result, and both rose in public estimation. My joy was boundless. I had learnt the true practice of law. I had learnt to find out the better side of human nature and to enter men’s hearts. I realized that the true function of a lawyer was to unite parties riven asunder. The lesson was so indelibly burnt into me that a large part of my time during my twenty years of practice as a lawyer was occupied in bringing about compromises of hundreds of cases. I lost nothing thereby - not even money, certainly not my soul.”

Gandhi was about to return to India after the settlement of the case, but at a farewell party given by Abdullah Seth, he learned of a bill before the legislature which would deprive Indians in South Africa of their right to vote. He decided to stay and fight against the bill.

Gandhi spent the next twenty years in South Africa, becoming the leader of a struggle for the civil rights of the Indian community. In this struggle he tried “...to find the better side of human nature and to enter men’s hearts.”

Gandhi’s stay in England had given him a glimpse of English liberalism and English faith in just laws. He felt confident that if the general public in England could be made aware of gross injustices in any part of the British Empire, reform would follow. He therefore organized non-violent protests in which the protesters sacrificed themselves so as to show as vividly as possible the injustice of an existing law. For example, when the government ruled that Hindu, Muslim and Parsi marriages had no legal standing, Gandhi and his followers voluntarily went to prison for ignoring the ruling.

Gandhi used two words to describe this form of protest: “satyagraha” (the force of truth) and ahimsa (non-violence). Of these he later wrote: I have nothing new to teach the world. Truth and non-violence are as old as the hills. All that I have done is to try experiments in both on as vast a scale as I could. In so doing, I sometimes erred and learnt by my errors. Life and its problems have thus become to me so many experiments in the practice of truth and non-violence.

In his autobiography, Gandhi says: “Three moderns have left a deep impression on my life and captivated me: Raychandbhai (the Indian philosopher and poet) by his living contact; Tolstoy by his book ‘The Kingdom of God is Within You’; and Ruskin by his book ‘Unto This Last’.”

Ruskin’s book, “Unto This Last”, which Gandhi read in 1904, is a criticism of modern industrial society. Ruskin believed that friendships and warm interpersonal relationships are a form of wealth that economists have failed to consider. He felt that warm human contacts are most easily achieved in small agricultural communities, and that therefore the modern tendency towards centralization and industrialization may be a step backward in terms of human happiness. While still in South Africa, Gandhi founded two religious

Utopian communities based on the ideas of Tolstoy and Ruskin. Phoenix Farm (1904) and Tolstoy Farm (1910). At this time he also took an oath of chastity (“bramacharya”), partly because his wife was unwell and he wished to protect her from further pregnancies, and partly in order to devote himself more completely to the struggle for civil rights.

## **The struggle for Indian independence**

Because of his growing fame as the leader of the Indian civil rights movement in South Africa, Gandhi was persuaded to return to India in 1914 and to take up the cause of Indian home rule. In order to re-acquaint himself with conditions in India, he traveled tirelessly, now always going third class as a matter of principle.

During the next few years, Gandhi worked to reshape the Congress Party into an organization which represented not only India’s Anglicized upper middle class but also the millions of uneducated villagers who were suffering under an almost intolerable burden of poverty and disease. In order to identify himself with the poorest of India’s people, Gandhi began to wear only a white loincloth made of rough homespun cotton. He traveled to the remotest villages, recruiting new members for the Congress Party, preaching non-violence and firmness in the truth, and becoming known for his voluntary poverty and humility. The villagers who flocked to see him began to call him “Mahatma” (Great Soul).

Disturbed by the spectacle of unemployment and poverty in the villages, Gandhi urged the people of India to stop buying imported goods, especially cloth, and to make their own. He advocated the re-introduction of the spinning wheel into village life, and he often spent some hours spinning himself. The spinning wheel became a symbol of the Indian independence movement, and was later incorporated into the Indian flag.

The movement for boycotting British goods was called the “Swadeshi movement”. The word Swadeshi derives from two Sanskrit roots: Swa, meaning self, and Desh, meaning country. Gandhi described Swadeshi as “a call to the consumer to be aware of the violence he is causing by supporting those industries that result in poverty, harm to the workers and to humans or other creatures.”

Gandhi tried to reconstruct the crafts and self-reliance of village life that he felt had been destroyed by the colonial system. “I would say that if the village perishes India will perish too”, he wrote, India will be no more India. Her own mission in the world will get lost. The revival of the village is only possible when it is no more exploited. Industrialization on a mass scale will necessarily lead to passive or active exploitation of the villagers as problems of competition and marketing come in. Therefore we have to concentrate on the village being self-contained, manufacturing mainly for use. Provided this character of the village industry is maintained, there would be no objection to villagers using even the modern machines that they can make and can afford to use. Only they should not be used as a means of exploitation by others.

“You cannot build nonviolence on a factory civilization, but it can be built on self-contained villages... Rural economy as I have conceived it, eschews exploitation altogether, and exploitation is the essence of violence... We have to make a choice between India of the villages that are as ancient as herself and India of the cities which are a creation of

foreign domination...”

“Machinery has its place; it has come to stay. But it must not be allowed to displace necessary human labour. An improved plow is a good thing. But if by some chances, one man could plow up, by some mechanical invention of his, the whole of the land of India, and control all the agricultural produce, and if the millions had no other occupation, they would starve, and being idle, they would become dunces, as many have already become. There is hourly danger of many being reduced to that unenviable state.”

In these passages we see Gandhi not merely as a pioneer of nonviolence; we see him also as an economist. Faced with misery and unemployment produced by machines, Gandhi tells us that social goals must take precedence over blind market mechanisms. If machines are causing unemployment, we can, if we wish, use labor-intensive methods instead. With Gandhi, the free market is not sacred - we can do as we wish, and maximize human happiness, rather than maximizing production and profits.

Gandhi also organized many demonstrations whose purpose was to show the British public that although the British raj gave India many benefits, the toll exacted was too high, not only in terms of money, but also in terms of India’s self-respect and self-sufficiency. All of Gandhi’s demonstrations were designed to underline this fact. For example, in 1930 Gandhi organized a civil-disobedience campaign against the salt laws. The salt laws gave the Imperial government a monopoly and prevented Indians from making their own salt by evaporating sea water. The majority of Indians were poor farmers who worked long hours in extreme heat, and salt was as much a necessity to them as bread. The tax on salt was essentially a tax on the sweat of the farmers.

Before launching his campaign, Gandhi sent a polite letter to the Viceroy, Lord Irwin, explaining his reasons for believing that the salt laws were unjust, and announcing his intention of disregarding them unless they were repealed.

Then, on March 12 1930, Gandhi and many of his followers, accompanied by several press correspondents, started on a march to the sea to carry out their intention of turning themselves into criminals by making salt. Every day, Gandhi led the procession about 12 miles, stopping at villages in the evenings to hold prayer meetings. Many of the villagers joined the march, while others cast flower petals in Gandhi’s path or sprinkled water on his path to settle the dust.

On April 5 the marchers arrived at the sea, where they spent the night in prayer on the beach. In the morning they began to make salt by wading into the sea, filling pans with water, and letting it evaporate in the sun. Not much salt was made in this way, but Gandhi’s action had a strong symbolic power.

A wave of non-violent civil disobedience demonstrations swept over India, so extensive and widespread that the Imperial government, in danger of losing control of the country, decided to arrest as many of the demonstrators as possible. By midsummer, Gandhi and a hundred thousand of his followers were in prison, but nevertheless the civil disobedience demonstrations continued.

In January, 1931, Gandhi was released from prison and invited to the Viceroy’s palace to talk with Lord Irwin. They reached a compromise agreement: Gandhi was to call off the demonstrations and would attend a Round Table Conference in London to discuss Indian

home rule, while Lord Irwin agreed to release the prisoners and would change the salt laws so that Indians living near to the coast could make their own salt.

The salt march was typical of Gandhi's non-violent methods. Throughout the demonstrations he tried to maintain a friendly attitude towards his opponents, avoiding escalation of the conflict. Thus at the end of the demonstrations, the atmosphere was one in which a fair compromise solution could be reached. Whenever he was in prison, Gandhi regarded his jailers as his hosts. Once, when he was imprisoned in South Africa, he used the time to make a pair of sandals, which he sent to General Smuts, the leader of the South African government. Thus Gandhi put into practice the Christian principle, "Love your enemies; do good to them that hate you."

## **Mahatma Gandhi's message for us today**

Gandhi believed that human nature is essentially good, and that it is our task to find and encourage whatever is good in the character of others.

During the period when he practiced as a lawyer, Gandhi's aim was to unite parties riven asunder, and this was also his aim as a politician. In order for reconciliation to be possible in politics, it is necessary to avoid escalation of conflicts. Therefore Gandhi used non-violent methods, relying only on the force of truth. "It is my firm conviction," he wrote, "that nothing can be built on violence."

To the insidious argument that "the end justifies the means," Gandhi answered firmly: "They say 'means are after all means'. I would say 'means are after all everything'. As the means, so the end. Indeed the Creator has given us control (and that very limited) over means, none over end. ... The means may be likened to a seed, and the end to a tree; and there is the same inviolable connection between the means and the end as there is between the seed and the tree. Means and end are convertible terms in my philosophy of life." In other words, a dirty method produces a dirty result; killing produces more killing; hate leads to more hate. But there are positive feedback loops as well as negative ones. A kind act produces a kind response; a generous gesture is returned; hospitality results in reflected hospitality. Hindus and Buddhists call this principle "the law of karma".

Gandhi believed that the use of violent means must inevitably contaminate the end achieved. Because Gandhi's methods were based on love, understanding, forgiveness and reconciliation, the non-violent revolution which he led left very little enmity in its wake. When India finally achieved its independence from England, the two countries parted company without excessive bitterness. India retained many of the good ideas which the English had brought - for example the tradition of parliamentary democracy - and the two countries continued to have close cultural and economic ties.

Gandhi's insight can be applied to the argument that the nuclear bombings that destroyed Hiroshima and Nagasaki helped to end World War II and were therefore justified. In fact, these terrible events lead to a nuclear arms race that still casts an extremely dark shadow over the future of human civilization. Here, as in every other case, the end did not justify the means. The end achieved was contaminated by the means used to achieve it.

Today, as in Gandhi's lifetime, we need a revolution. We need to end the institution



Figure 1: **Gandhi and his wife Kasturbhai in 1902.**

of war. We need to restore democracy in our own countries when it has been replaced by oligarchy. We need to act promptly to prevent catastrophic climate change, thermonuclear war and a large-scale global famine. But this revolution must be a non-violent one, like Gandhi's revolutions in South Africa and India.

### **We must stop using material possessions for social competition**

Mahatma Gandhi was assassinated by a Hindu extremist on January 30, 1948. After his death, someone collected and photographed all his worldly goods. These consisted of a pair of glasses, a pocket watch, a pair of sandals and a white homespun loincloth. That was all. Here, as in the Swadeshi movement, we see Gandhi as a pioneer of economics. He deliberately reduced his possessions to an absolute minimum in order to demonstrate that there is no connection between personal merit and material goods. Mahatma Gandhi told us that we must stop using material goods as a means of social competition. We must start to judge people not by what they have, but by what they are.





Figure 2: Gandhi's spinning wheel was incorporated into the flag of the Congress Party and later into the national flag of an independent India.

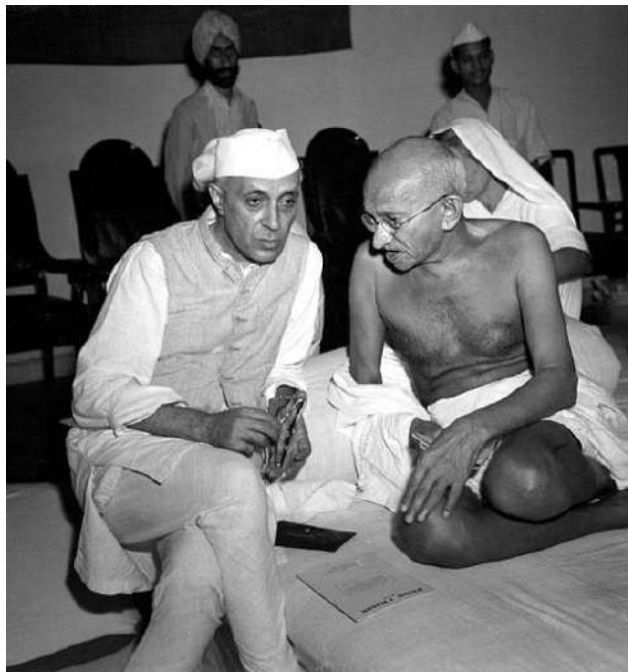


Figure 3: After India gained its independence, it was Nehru's vision of an urbanized and industrialized India that was carried through, rather than Gandhi's vision of "India of villages".



## GREED IS DRIVING US TOWARDS DISASTER

### Greed is the most deadly of sins

Greed, in particular the greed of corporations and billionaire oligarchs, is driving human civilization and the biosphere towards disaster.

The greed of giant fossil fuel corporations is driving us towards a tipping point after which human efforts to control climate change will be futile because feedback loops will have taken over. The greed of the military industrial complex is driving us towards a Third World War that might develop into a catastrophic thermonuclear war. The greed of our financial institutions is also driving us towards economic collapse.

Until the start of the Industrial Revolution in the 18th and 19th centuries, human society maintained a more or less sustainable relationship with nature. However, with the beginning of the industrial era, traditional ways of life, containing elements of both social and environmental ethics, were replaced by the money-centered, growth-oriented life of today, from which these vital elements are missing.

According to the followers of Adam Smith (1723-1790), self-interest (even greed) is a sufficient guide to human economic actions. The passage of time has shown that Smith was right in many respects. The free market, which he advocated, has turned out to be the optimum prescription for economic growth. However, history has also shown that there is something horribly wrong or incomplete about the idea that self-interest alone, uninfluenced by ethical and ecological considerations, and totally free from governmental intervention, can be the main motivating force of a happy and just society. There has also

proved to be something terribly wrong with the concept of unlimited economic growth.

The Stern Review Discussion Paper of 2006 stated that “Melting of permafrost in the Arctic could lead to the release of huge quantities of methane. Dieback of the Amazon forest could mean that the region starts to emit rather than to absorb greenhouse gases. These feedbacks could lead to warming that is at least twice as fast as current high-emission projections, leading to temperatures higher than seen in the last 50 million years.”

The greed of giant fossil fuel corporations has recently led them to conduct large-scale advertising campaigns to convince the public that anthropogenic climate change is not real. These corporations own vast oil, coal and gas reserves that must be kept in the ground if we are to avoid catastrophic global warming. It does not seem to bother the fossil fuel giants that if the earth is made uninhabitable, future generations of both humans and animals will perish.

When the United Nations was established in 1945, the purpose of the organization was to abolish the institution of war. This goal was built into many of the articles of the UN Charter. Accordingly, throughout the world, many War Departments were renamed and became Departments of Defense. But the very name is a lie. In an age of nuclear threats and counter-threats, populations are by no means protected. Ordinary citizens are just hostages in a game for power and money. It is all about greed.

Why is war continually threatened? Why is Russia threatened? Why is war with Iran threatened? Why fan the flames of conflict with China? Is it to “protect” civilians? Absolutely not! In a thermonuclear war, hundreds of millions of civilians would die horribly everywhere in the world, also in neutral countries. What is really being protected are the profits of arms manufacturers. As long as there are tensions; as long as there is a threat of war, military budgets are safe; and the profits of arms makers are safe. The people in several “democracies”, for example the United States, do not rule at the moment. Greed rules.

Greed and lack of ethics are built into the structure of corporations. By law, the Chief Executive Officer of a corporation must be entirely motivated by the collective greed of the stockholders. He must maximize profits. Nothing must count except the bottom line. If the CEO abandons this single-minded chase after corporate profits for ethical reasons, or for the sake of humanity or the biosphere or the future, he (or she) must, by law, be fired and replaced.

## **COP25 was sabotaged by greed**

At the COP25 in Madrid, delegations from the United States, Australia, Brazil and Saudi Arabia worked actively to prevent meaningful progress, and they prevented it. In the words of Alden Meyer, director of strategy for the Union of Concerned Scientists, “I’ve been attending these climate negotiations since they first started in 1991, but never have I seen the almost total disconnect we’ve seen here at COP25 in Madrid between what the science requires and the people of the world demand, and what the climate negotiations are delivering in terms of meaningful action”.

## **The world is on fire!**

“Our house is on fire!”, says Greta Thunberg, and she is right. The year 2019 saw a rise in wildfires across the globe. Bush fires in Australia are threatening Sydney and have caused the Australian government to declare a state of emergency. But Australia’s politicians continue the policies that have made their nation a climate change criminal, exporting vast quantities of coal and beef. The Deputy Prime Minister Michael McCormack said, of the fire victims: “They don’t need the ravings of some pure enlightened and woke capital city greenies at this time when they are trying to save their homes.” In other words, let’s not talk about climate change.

In the Arctic, wildfires raged, producing plumes of smoke the size of the European continent. In the Amazon, fires were deliberately set by greedy mining interests and beef farmers, illegally, but condoned by the government of Jair Bolsonaro, the “Trump of the Tropics”. In Indonesia, plumes of smoke from burning forests darkened the skys over many nearby countries. Again, the deliberately set fires were illegal, but they were condoned by corrupt politicians, receiving money from the hugely profitable palm oil business.

## **Extraction of fossil fuels must stop**

A United Nations report released Wednesday , 20 November, 2019, warned that worldwide projections for fossil fuel production over the next decade indicate that the international community is on track to fail to rein in planet-heating emissions and prevent climate catastrophe.

<http://productiongap.org/wp-content/uploads/2019/11/Production-Gap-Report-2019.pdf>

“The Production Gap” is an 80 page report produced by a collaboration between the UN Environmental Programme and a number of academic institutions. It examines the discrepancy between countries’ planned fossil fuel production and global production levels consistent with limiting warming to 1.5 degrees C or 2 degrees C, and concludes that the necessary policy changes are currently not being made.

The famous economist, Lord Nicholas Stern, has stated that “This important report shows that governments’ projected and planned levels of coal, oil, and gas production are dangerously out of step with the goals of the Paris agreement on climate change. It illustrates the many ways in which governments subsidize and otherwise support the expansion of such production. Instead, governments should implement policies that ensure existing production peaks soon and then falls very rapidly.”

In an article published in Common Dreams on Wednesday, November 20, 2019, Hoda Baraka, the Chief Communications Officer for 350.org wrote:

“The disconnect between Paris temperature goals and countries’ plans and policies for coal, oil, and gas production is massive, worrying and unacceptable...”

“The ‘production gap’ is a term used to refer to the difference between a countries’ planned levels of fossil fuel production, and what is needed to achieve international climate goals. This is the first time a UN report has looked directly and specifically at fossil fuel production as a key driver of climate breakdown. It shows that countries are planning to

produce fossil fuels far in excess of the levels needed to fulfil their climate pledges under the Paris Agreement, which themselves are far from adequate. This over investment in coal, oil, and gas supply locks in fossil fuel infrastructure that will make emissions reductions harder to achieve.

“The science is clear, to stay below 1.5 degrees we must stop the expansion of the fossil fuel industry immediately. That means that not a single new mine can be dug, not another pipeline built, not one more emitting powerplant fired up. And we have to get to work transitioning to sustainable renewable energy powered energy systems.

“Across the globe resistance to fossil fuels is rising, the climate strikes have shown the world that we are prepared to take action. Going forward our job is to keep up a steady drumbeat of actions, strikes and protests that gets louder and louder throughout 2020. Governments need to follow through, to act at the source of the flames that are engulfing our planet and phase out coal, oil, and gas production.

## **New global ethics to match our technology**

Today, human greed and folly are destroying the global environment. As if this were not enough, there is a great threat to civilization and the biosphere from an all-destroying thermonuclear war. Both of these severe existential threats are due to faults our inherited emotional nature.

From the standpoint of evolutionary theory, this is a paradox. As a species, we are well on the road to committing collective suicide, driven by the flaws in human nature. But isn't natural selection supposed to produce traits that lead to survival? Today, our emotions are not leading us towards survival, but instead driving us towards extinction. What is the reason for this paradox?

Our emotions have an extremely long evolutionary history. Both lust and rage are emotions that we share with many animals. However, with the rapid advance of human cultural evolution, our ancestors began to live together in progressively larger groups, and in these new societies, our inherited emotional nature was often inappropriate. What once was a survival trait became a sin which needed to be suppressed by morality and law.

Today we live in a world that is entirely different from the one into which our species was born. We face the problems of the 21st century: exploding populations, vanishing resources, and the twin threats of catastrophic climate change and thermonuclear war. We face these severe problems with our poor cave-man's brain, with an emotional nature that has not changed much since our ancestors lived in small tribes, competing for territory on the grasslands of Africa.

After the invention of agriculture, roughly 10,000 years ago, humans began to live in progressively larger groups, which were sometimes multi-ethnic. In order to make towns, cities and finally nations function without excessive injustice and violence, both ethical and legal systems were needed. Today, in an era of global economic interdependence, instantaneous worldwide communication and all-destroying thermonuclear weapons, we urgently need new global ethical principles and a just and enforceable system of international laws.

The very long childhood of humans allows learned behavior to overwrite instinctive behavior. A newborn antelope is able to stand on its feet and follow the herd almost immediately after birth. By contrast, a newborn human is totally helpless. With cultural evolution, the period of dependence has become progressively longer. Today, advanced education often requires humans to remain dependent on parental or state support until they are in their middle 20's!

Humans are capable of tribalistic inter-group atrocities such as genocides and wars, but they also have a genius for cooperation. Cultural evolution implies inter-group exchange of ideas and techniques. It is a cooperative enterprise in which all humans participate. It is cultural evolution that has given our special dominance. But cultural evolution depends on overwriting destructive tribalism with the principles of law, ethics and politeness. The success of human cultural evolution demonstrates that this is possible. Ethics can overwrite tribalism!

The whole is greater than the sum of its parts. Human society is a superorganism, far greater than any individual in history or in the present. The human superorganism has a supermind, a collective consciousness far greater than the consciousness of individuals. Each individual contributes a stone to the cairn of civilization, but our astonishing understanding of the universe is a collective achievement.

Science derives its great power from the concentration of enormous resources on a tiny fragment of reality. It would make no sense to proceed in this way if knowledge were not permanent and if information were not shared globally. But scientists of all nations pool their knowledge at international conferences and through international publications. Scientists stand on each other's shoulders. Their shared knowledge is far greater than the fragments that each contributes.

Other aspects of culture are also cooperative and global. For example, Japanese woodblock printers influenced the French Impressionists. The nonviolent tradition of Shelly, Thoreau, Tolstoy, Gandhi, Martin Luther King and Nelson Mandela is international. Culture is cooperative. It is not competitive. Global cultural cooperation can lead us to a sustainable and peaceful society. Our almost miraculous modern communications media, if properly used, can give us a stable, prosperous and cooperative future society.





# INDIA'S FUTURE

## Dangers facing the world today

Today, at the start of the 21st century, human civilization and the biosphere face two existential threats: the danger of uncontrollable catastrophic climate change, and the danger of an all-destroying thermonuclear war. We must also be aware that population growth, climate change, and the end of the fossil fuel era may lead to a very large scale famine, possibly involving billions rather than millions of people. The consequences of these threatened disasters will be felt by all nations, if they occur, and all must cooperate if they are to be avoided.

## What are India's special responsibilities?

India is one of the nuclear weapon states that oppose the Treaty on the Prohibition of Nuclear Weapons, which was passed by the United Nations General Assembly on 7 July, 2017. Furthermore, India and Pakistan continue to contribute to the danger of nuclear war through continual aggressive threats and rhetoric. The two countries blame and threaten each other, but a nuclear war between them, if it should come, would affect all the nations of the world. All nuclear weapon states, including India and Pakistan, are in violation of Article VI of the Nuclear Nonproliferation Treaty, which requires them to set up a definite schedule for getting rid of their nuclear weapons.

Regarding the climate crisis, India has a special responsibility as the world's 4th largest emitter of CO<sub>2</sub>, after China, the United States and the European Union. An MIT article on India's plans for expanding the use of coal states that "such growth would swamp efforts elsewhere in the world to curtail carbon emissions, dooming any chance to head off the dire effects of global climate change."

## The threat of famine

India is especially vulnerable to the threat of famine, produced by a combination of population growth, climate change, and the end of the fossil fuel era. Glaciers in the Himalayas are melting rapidly, threatening India's summer water supplies. Water tables are also falling, and are threatened by salination. Climate change may also disturb the regularity of India's monsoons. Furthermore, the high-yield crops introduced by the Green Revolution require heavy energy inputs, which may be unavailable in the post-fossil-fuel era. Thus, government-supported birth control programs might be advisable.



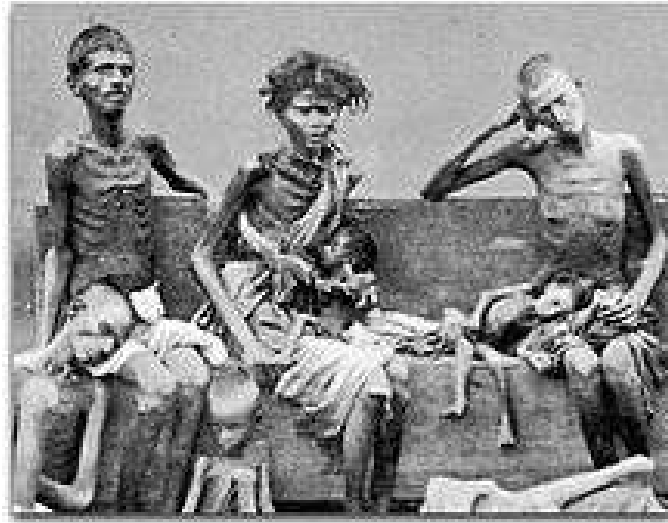


Figure 1: Victims of the Great Famine of 1876-78 in India, pictured in 1877. The Great Famine was caused by British colonial policy. Grain was exported from India during the famine. However, today, India is vulnerable to a famine produced by climate change, population growth, and the end of the fossil fuel era.



Figure 2: Another photograph from the Great Famine of 1876-78.

# KASHMIR: WHAT WOULD GANDHI SAY?

## The threat of a nuclear war over Kashmir

What would Mahatma Gandhi say about the threat of war between India and Pakistan, which has brought the two nations and the world to the brink of a nuclear catastrophe? Throughout the struggle for Indian independence, Gandhi was faced with the serious problem of avoiding conflict between religious groups once independence had been achieved. He made every effort to bridge the rift between the Hindu and Muslim communities.

## Harmony between religious groups

Gandhi believed that at their core, all religions are based on the concepts of truth, love, compassion, nonviolence and the Golden Rule. When asked whether he was a Hindu, Gandhi answered, Yes I am. I am also a Christian, a Muslim, a Buddhist and a Jew. When praying at his ashram, Gandhi made a point of including prayers from many religions. One of the most serious problems that he had to face in his efforts to free India from British rule was disunity and distrust, even hate, between the Hindu and Muslim communities. Each community felt that with the British gone, they might face violence and repression from the other. Gandhi made every effort to bridge the differences and to create unity and harmony.

When independence of India from Britain was accompanied by terrible violence between Hindus and Muslims, Gandhi fasted almost until death in a plea for reconciliation between the two religious communities.

## Avoiding escalation of conflicts

Today we read almost every day of killings that are part of escalating cycles of revenge and counter-revenge. Gandhi's experiences both in South Africa and in India convinced him that such cycles could only be ended by unilateral acts of kindness and understanding from one of the parties in a conflict. He said, An eye for an eye makes the whole world blind.

To the insidious argument that the end justifies the means, Gandhi answered firmly: "They say that 'means are after all means. I would say that means are after all everything. As the means, so the end. Indeed, the Creator has given us limited power over means, none over end... The means may be likened to a seed, and the end to a tree; and there is the same inviolable connection between the means and the end as there is between the seed and the tree. Means and end are convertible terms in my philosophy of life."

Gandhi's advocacy of non-violence is closely connected to his attitude towards ends and means. He believed that violent methods for achieving a desired social result would inevitably result in an escalation of violence. The end achieved would always be contaminated by the methods used. He was influenced by Leo Tolstoy with whom he exchanged many letters, and he in turn influenced Martin Luther King and Nelson Mandela.

## **Who profits from war, and who loses?**

Do our Defense Departments really defend us? Absolutely not! Their very name is a lie. Military-industrial complexes sell themselves by claiming to defend civilians. They justify vast and crippling budgets by this claim, but it is a fraud. Their only goal is money and power. Civilians play the role of hostages.

Nations possessing nuclear weapons threaten each other with Mutually Assured Destruction, which has the very appropriate acronym MAD. What does this mean? Does it mean that civilians are being protected? Not at all. Instead they are threatened with complete destruction. Civilians here play the role of hostages in the power games of their leaders.

## **Nuclear weapons are criminal! Every war is a crime!**

War was always madness, always immoral, always the cause of unspeakable suffering, economic waste and widespread destruction, and always a source of poverty, hate, barbarism and endless cycles of revenge and counter-revenge. It has always been a crime for soldiers to kill people, just as it is a crime for murderers in civil society to kill people. No flag has ever been wide enough to cover up atrocities.

But today, the development of all-destroying modern weapons has put war completely beyond the bounds of sanity and elementary humanity. The danger of a catastrophic nuclear war casts a dark shadow over the future of our species. It also casts a very black shadow over the future of the global environment. The environmental consequences of a massive exchange of nuclear weapons have been treated in a number of studies by meteorologists and other experts from both East and West. They predict that a use of nuclear weapons would result in fire storms with very high winds and high temperatures, which would burn a large proportion of the wild land fuels in the affected nations. The resulting smoke and dust would block out sunlight for a period of many months, with a disastrous effect on agriculture. Scientists believe that the nuclear weapons possessed by India and Pakistan would be sufficient to cause a nuclear famine.

## **The future of Kashmir**

Here is a link to a recent interview by Democracy Now in which Professor Zia Mian of Princeton University was asked about the future of Kashmir:

<https://truthout.org/video/as-india-and-pakistan-issue-veiled-nuclear-threats-new-ceasefire-urged/>

In response to questions, Professor Mian said: The real issue that we need to talk about is the fact that this level of violence between India and Pakistan has continued for a very, very long time and that its not so much the military-on-military violence, but the fact that large numbers of civilians along the Line of Control, that divide Indian Kashmir and Pakistani Kashmir, are caught in this endless barrage of artillery and firing across there, which claims civilian casualties on a regular basis, and also the fact that no one seems



Figure 1: **Today, Kashmir suffers from the conflict between India and Pakistan. Modi's revocation of Kashmir's special status has made the situation much worse.**



Figure 2: **Blessed by nature with extraordinary beauty, Kashmir deserves to be free from conflict.**

interested in thinking about what the future of this conflict and these people trapped in Kashmir between these two states determined to resolve their issues by force I mean, whats the future going to be like for these people?

My own suggested solution would be for Kashmir to become an independent state, under the protection of the United Nations, and for the military forces of both Pakistan and India to withdraw completely from Kashmir. This beautiful region, blessed by nature, deserves to be free from the terrible suffering and destruction caused by militarism.

# MADMEN AND ECONOMISTS

**“Anyone who believes in indefinite growth in anything physical, on a physically finite planet, is either mad or an economist.”**

**Kenneth E. Boulding (1910-1993)**

## **Why are economists addicted to growth?**

Economists (with a few notable exceptions) have long behaved as though growth were synonymous with economic health. If the gross national product of a country increases steadily by 4 percent per year, most economists express approval and say that the economy is healthy. If the economy could be made to grow still faster (they maintain), it would be still more healthy. If the growth rate should fall, economic illness would be diagnosed. However, it is obvious that on a finite Earth, neither population growth nor economic growth can continue indefinitely.

But why do economists cling almost religiously to the idea of growth? In general, growth brings profits to speculators. For example, purchase of land on the outskirts of a growing city will be rewarded as the land increases in value; and when the economy grows, stocks rise in value.

Today, as economic growth falters, the defects and injustices of our banking system have come sharply into focus, and light has also been thrown onto the much-too-cozy relationship between banking and government. The collapse of banks during the subprime mortgage crisis of 2008 and their subsequent bailout by means of the taxpayer's money can give us an insight into both phenomena - the faults of our banking system and its infiltration into the halls of government. The same can be said of the present national debt crisis in the Euro zone and elsewhere.

One feature of banking that cries out for reform is “fractional reserve banking”, i.e. the practice whereby private banks keep only a tiny fraction of the money entrusted to them by their depositors, and lend out all the remaining amount. By doing so, the banks are in effect coining their own money and putting it into circulation, a prerogative that ought to be reserved for governments. Under the system of fractional reserve banking, profits from any expansion of the money supply go to private banks rather than being used by the government to provide social services. This is basically fraudulent and unjust; the banks are in effect issuing their own counterfeit money.

When the economy contracts instead of expanding, the effect of fractional reserve banking is still worse. In that case the depositors ask the banks for their money, which it is their right to do. But the banks do not have the money - they have lent it out, and thus they fail. However, the bankers have insured themselves against this eventuality by buying the votes of government officials. Thus the banks are bailed out and the taxpayers are left with the bill, as in the recent example in which the US Federal Reserve secretly gave 7.7 trillion of the taxpayers' dollars to bail out various banks.

## Information-driven population growth

Today we are able to estimate the population of the world at various periods in history, and we can also make estimates of global population in prehistoric times. Looking at the data, we can see that the global population of humans has not followed an exponential curve as a function of time, but has instead followed a hyperbolic trajectory.

At the time of Christ, the population of the world is believed to have been approximately 220 million. By 1500, the earth contained 450 million people, and by 1750, the global population exceeded 700 million. As the industrial and scientific revolution has accelerated, global population has responded by increasing at a break-neck speed: In 1930, the population of the world reached two billion; in 1958 three billion; in 1974 four billion; in 1988 five billion, and in 1999, six billion. Today, we have reached 7.6 billion, and roughly a billion people are being added to the world's population every twelve years.

As the physicist Murry Gell-Mann has pointed out, a simple mathematical curve which closely approximates the global population of humans over a period of several thousand years is a hyperbola of the form  $P = 190,000,000,000/(2025-t)$ . Here  $P$  represents the global population of humans and  $t$  is the year.

How are we to explain the fact that the population curve is not an exponential? We can turn to Malthus for an answer: According to his model, population does not increase exponentially, except under special circumstances, when the food supply is so ample that the increase of population is entirely unchecked.

Malthus gives us a model of culturally-driven population growth. He tells us that population increase tends to press against the limits of the food supply, and since these limits are culturally determined, population density is also culturally-determined. Hunter-gatherer societies need large tracts of land for their support; and in such societies, the population density is necessarily low. Pastoral methods of food production can support populations of a higher density. Finally, extremely high densities of population can be supported by modern agriculture. Thus, Gell-Mann's hyperbolic curve, should be seen as describing the rapidly-accelerating growth of human culture, this being understood to include methods of food production.

If we look at the curve,  $P=C/(2025-t)$ , it is obvious that human culture has reached a period of crisis. The curve predicts that the world's population will rise to infinity in the year 2025, which of course is impossible. Somehow the actual trajectory of global population as a function of time must deviate from the hyperbolic curve, and in fact, the trajectory has already begun to fall away from the hyperbola.

Because of the great amount of human suffering which may be involved, and the potentially catastrophic damage to the earth's environment, the question of how the actual trajectory of human population will come to deviate from the hyperbola is a matter of enormous importance. Will population overshoot the sustainable limit, and crash? Or will it gradually approach a maximum? In the case of the second alternative, will the checks which slow population growth be later marriage and family planning? Or will the grim Malthusian forces - famine, disease and war - act to hold the number of humans within the carrying capacity of their environment?

We can anticipate that as the earth's human population approaches 10 billion, severe famines will occur in many developing countries. The beginnings of this tragedy can already be seen. It is estimated that roughly 30,000 children now die every day from starvation, or from a combination of disease and malnutrition.

## **Beyond the fossil fuel era**

An analysis of the global ratio of population to cropland shows that we have probably already exceeded the sustainable limit of population through our dependence on petroleum: Between 1950 and 1982, the use of cheap synthetic fertilizers increased by a factor of 8. Much of our present agricultural output depends on their use, but their production is expensive in terms of energy. Furthermore, petroleum-derived synthetic fibers have reduced the amount of cropland needed for growing natural fibers, and petroleum-driven tractors have replaced draft animals which required cropland for pasturage.

Also, petroleum fuels have replaced fuelwood and other fuels derived for biomass. The reverse transition, from fossil fuels back to renewable energy sources, will require a considerable diversion of land from food production to energy production. For example, 1.1 hectares are needed to grow

the sugarcane required for each alcohol-driven Brazilian automobile. This figure may be compared with the steadily falling average area of cropland available to each person in the world: .24 hectares in 1950, .16 hectares in 1982.

Thus there is a danger that just as global population reaches the unprecedented level of 10 billion or more, the agricultural base for supporting it may suddenly collapse. Ecological catastrophe, possibly compounded by war and other disorders, could produce famine and death on a scale unprecedented in history - a disaster of unimaginable proportions, involving billions rather than millions of people.

## **What would Malthus say today?**

What would Malthus tell us if he were alive today? Certainly he would say that we have reached a period of human history where it is vital to stabilize the world's population if catastrophic environmental degradation and famine are to be avoided. He would applaud efforts to reduce suffering by eliminating poverty, widespread disease, and war; but he would point out that, since it is necessary to stop the rapid increase of human numbers, it follows that whenever the positive checks to population growth are removed, it is absolutely necessary to replace them by preventive checks. Malthus' point of view became more broad in the successive editions of his Essay; and if he were alive today, he would probably agree that family planning is the most humane of the preventive checks.

## **Eliminating poverty and war**

In most of the societies which Malthus described, a clear causal link can be seen, not only between population pressure and poverty, but also between population pressure and war.

As one reads his Essay, it becomes clear why both these terrible sources of human anguish saturate so much of history, and why efforts to eradicate them have so often met with failure: The only possible way to eliminate poverty and war is to reduce the pressure of population by preventive checks, since the increased food supply produced by occasional cultural advances can give only very temporary relief.

Today, the links between population pressure, poverty, and war are even more pronounced than they were in the past, because the growth of human population has brought us to the absolute limits imposed by ecological constraints. since the increased food supply produced by occasional cultural advances can give only very temporary relief. Furthermore, the development of nuclear weapons has made war prohibitively dangerous.

### **How many people can the earth support in comfort?**

The resources of the earth and the techniques of modern science can support a global population of moderate size in comfort and security; but the optimum size is undoubtedly smaller than the world's present population. Given a sufficiently small global population, renewable sources of energy can be found to replace disappearing fossil fuels. Technology may also be able to find renewable substitutes for many disappearing mineral resources for a global population of a moderate size. What technology cannot do, however, is to give a global population of 10 billion people the standard of living which the industrialized countries enjoy today.





Figure 1: Kenneth Ewart Boulding (1910-1993) was an English-born American economist, educator, peace activist, and interdisciplinary philosopher. He said, “Anyone who believes in indefinite growth in anything physical, on a physically finite planet, is either mad or an economist”. Boulding’s life proves that not all economists are mad. Other notable exceptions include Nicholas Georgescu-Roegen, Herman Daly and Aurelio Pecci.

# MAINSTREAM UNDER-REPORTING OF THE CLIMATE CRISIS

## A speech by Bill Moyers

At an April 30 conference entitled *Covering Climate Now*, co-sponsored by *The Nation* and *Colombia Journalism Review*, Bill Moyers made a speech which included the following remarks:

“I have been asked to bring this gathering to a close by summing up how we can do better at covering the possible ‘collapse of our civilization and extinction of much of the natural world’, to quote the noted environmentalist David Attenborough, speaking at the recent *Unites Nations climate summit* in Poland...

“Many of us have recognized that our coverage of global warming has fallen short. There’s been some excellent reporting by independent journalists and by enterprising reporters and photographers from legacy newspapers and other news outlets. But the Go-liaths of the US news media, those with the biggest amplifiers – the corporate broadcast networks - have been shamelessly AWOL. Despite their extraordinary profits. The combined coverage of the three major networks and Fox fell from just 260 minutes in 2017 to a mere 142 minutes in 2018, a drop of 45 percent, reported by the watchdog group *Media Matters*.”

## The Golden Rule: “Whoever has the gold makes the rules”

Network administrators have noticed that programs about climate change often have low viewer ratings. Since they see delivering high viewer ratings to their advertisers as their primary duty, these executives seldom allow programs dealing with the dangers of catastrophic climate change. The duty to save the earth from environmental catastrophe is neglected for the sake on money. As Al Gore said, “Instead of having a well-informed electorate, we have a well-amused audience”.

## World-wide student strikes under-reported

On Friday, March 15, 2019, over 1.4 million students on all continents took to the streets for the first ever global climate strike. Messages in more than 40 languages were loud and clear: World leaders must act now to address the climate crisis and save our future. The school strike was the largest climate action in history. Nevertheless, it went almost unmentioned in the media.

On Friday, May 24, massive student strikes advocating rapid climate action again took place, this time in an expected 1,351 separate locations all over the world. Again the historic and highly important event was under-reported by mainstream media. In fact, on the CNN and BBC World News broadcasts that I watched on Friday evening, the worldwide student strikes for climate action were not reported at all.



**Figure 1: Speaking at a UN Climate Summit in Katowice, Poland, Sir David Attenborough warned that climate change could lead to the collapse of civilization if action isn't taken.**

### **Some outstanding exceptions**

There are exceptions to the general rule that the mass media downplay or completely ignore the climate emergency. The Guardian is a newspaper with absolutely superb coverage of all issues related to climate change. No praise can be high enough for the courageous environmental editorial policy of this famous old British newspaper. Here is a link to The Guardian's report of the May 24 school strikes for climate action:

<https://www.theguardian.com/environment/live/2019/may/24/school-climate-strikes-expected-to-be-largest-yet-live-coverage-greta-thunberg>

One can also mention that the National Geographic Television Channel has several times shown Leonardo DiCaprio's important film, "Before the Flood".

# **LARGEST CLIMATE ACTION IN HISTORY NEGLECTED BY THE MEDIA**

## **Worldwide school strike, 15 March, 2019**

Over 1.5 million young students across all continents took to the streets on Friday March 15th for the first ever global climate strike. Messages in more than 40 languages were loud and clear: world leaders must act now to address the climate crisis and save our future. The school strike was the largest climate action in history. Nevertheless it went almost unmentioned in the media,

Here are some of the statements by the students explaining why they took part in the strikes:

“In India, no one talks about climate change. You don’t see it on the news or in the papers or hear about it from government. We want global leaders to declare a climate emergency. If we don’t act today, then we will have no tomorrow.” - Vidit Baya, 17, Udaipur, India.

“We face heartbreaking loss due to increasingly extreme weather events. We urge the Taiwanese government to implement mitigation measures and face up to the vulnerability of indigenous people, halt construction projects in the indigenous traditional realm, and recognize the legal status of Plains Indigenous People, in order to implement environmental protection as a bottom-up approach” - Kaisanan Ahuan, Puli City, Taiwan.

“We have reached a point in history when we have the technical capacities to solve poverty, malnutrition, inequality and of course global warming. The deciding factors for whether we take advantage of our potential will be our activism, our international unity and our ability to develop the art of making the impossible possible. Whether we succeed or not depends on our political will” - Eyal Weintraub, 18, and Bruno Rodriguez, 18, Argentina.

“I want to be certain that our government is committed to investing in a just transition to a more sustainable country, that we will lower carbon emissions and curb climate change. I am joining this strike to demand that decisions are more future-focused and that policy will reflect our environmental rights as written in our constitution” - Dona Van Eeden, 21, Cape Town, South Africa.

“The damage done by multinationals is enormous: the lack of transparency, dubious contracts, the weakening of the soil, the destruction of flora and fauna, the lack of respect for mining codes, the contamination of groundwater. In Mali, the state exercises insufficient control over the practices of the multinationals, and it is us, the citizens, who suffer the consequences. The climate alarm has sounded, and the time has come for us all to realize that there is still time to act locally, in our homes, our villages, our cities” - Mone Fousseny, 22, Mali.

“The governments failed to respond properly to the dramatic challenge of our climate crisis. Our generation, the least responsible for the acts of the polluters, will be the ones to

see the most devastating impacts of climate change. World leaders are losing the window to act, but we are not going to stand still watching their inertia.” Greta Thunberg, Sweden

## **Greta Thunberg has been nominated for the Nobel Peace Prize**

16-year-old Swedish climate activist Greta Thunberg, who started a worldwide children’s climate movement last summer with her lone school strike in front of the Swedish Parliament, is now a leader of the global movement for climate change. Her eloquent and crystal-clear speeches at COP24 in Poland in 2018, at the Davos Economic Forum in Switzerland in 2019, and at the recent European Union’s climate meeting in Belgium, have produced real change. For example, influenced by Greta’s speech, European Commission President Jean-Claude Juncker stated that “In the next financial period, 2021-2027, every fourth euro spent in the EU budget will go towards climate mitigation actions”. The EU budget is usually 1 percent of its economic output, or 1 trillion euros across seven years.

The three Norwegian parliamentarians who nominated Greta Thunberg for the Nobel Peace Prize cited the connection between climate change, the refugee crisis and threatened wars. Like the global school strikes of March 15, Greta’s nomination receives little mention, not only in mainstream media, but also in alternative media.

## **Attention has been distracted by the atrocious murders in New Zealand**

The almost simultaneous neofascist and racist murders in New Zealand have distracted media attention from the children’s global school strike for climate action. But while combatting racism and neofascism is important, it is much less important than the urgent need for rapid action on the issue of climate change, without which the entire future of human civilization and the biosphere will be lost. We give our children loving care, but it makes no sense to do so and not do everything within our power to give them a future in which they can survive. The media have a duty to help in mobilizing public opinion for the great task that history has given to us the task of saving the future.

Some discussion of these issues can be found in my new book, entitled Saving the Future, which may be downloaded from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/02/Saving-the-Future-John-Scales-Avery.pdf>









# SECRECY VERSUS DEMOCRACY

## The jaws of power

“The jaws of power are always open to devour, and her arm is always stretched out, if possible, to destroy the freedom of thinking, speaking, and writing.” John Adams, (1735-1826)

According to the Nuremberg Principles, the citizens of a country have a responsibility for the crimes that their governments commit. But to prevent these crimes, the people need to have some knowledge of what is going on. Indeed, democracy cannot function at all without this knowledge,

What are we to think when governments make every effort to keep their actions secret from their own citizens? We can only conclude that although they may call themselves democracies, such governments are in fact oligarchies or dictatorships.

At the end of World War I, it was realized that secret treaties had been responsible for its outbreak, and an effort was made to ensure that diplomacy would be more open in the future. Needless to say, these efforts did not succeed, and diplomacy has remained a realm of secrecy.

Many governments have agencies for performing undercover operations (usually very dirty ones). We can think, for example of the KGB, the CIA, M5, or Mossad. How can countries that have such agencies claim to be democracies, when the voters have no knowledge of or influence over the acts that are committed by the secret agencies of their governments?

Nuclear weapons were developed in secret. It is doubtful whether the people of the United States would have approved of the development of such antihuman weapons, or their use against an already-defeated Japan, if they had known that these things were going to happen. The true motive for the nuclear bombings was also kept secret. In the words of General Groves, speaking confidentially to colleagues at Los Alamos, the real motive was to control the Soviet Union.

The true circumstances surrounding the start of the Vietnam war would never have been known if Daniel Ellsberg had not leaked the Pentagon Papers. Ellsberg thought that once the American public realized that their country's entry into the war was based on a lie, the war would end. It did not end immediately, but undoubtedly Ellsberg's action contributed to the end of the war.

## Julian Assange, a martyr to the truth

We do not know what will happen to Julian Assange. If his captors send him to the US, and if he is executed there for the crime of publishing leaked documents (a crime that he shares with the New York Times), he will not be the first martyr to the truth. The ageing Galileo was threatened with torture and forced to recant his heresy - that the earth moves around the sun. Galileo spent the remainder of his days in house arrest. Giordano Bruno was less lucky. He was burned at the stake for maintaining that the universe is larger than





**Figure 1: A martyr to the truth. Julian Assange is in very poor health, and may die in the hands of his captors.**

it was then believed to be. If Julian Assange becomes a martyr to the truth like Galileo or Bruno, his name will be honored in the future, and the shame of his captors will be remembered too.

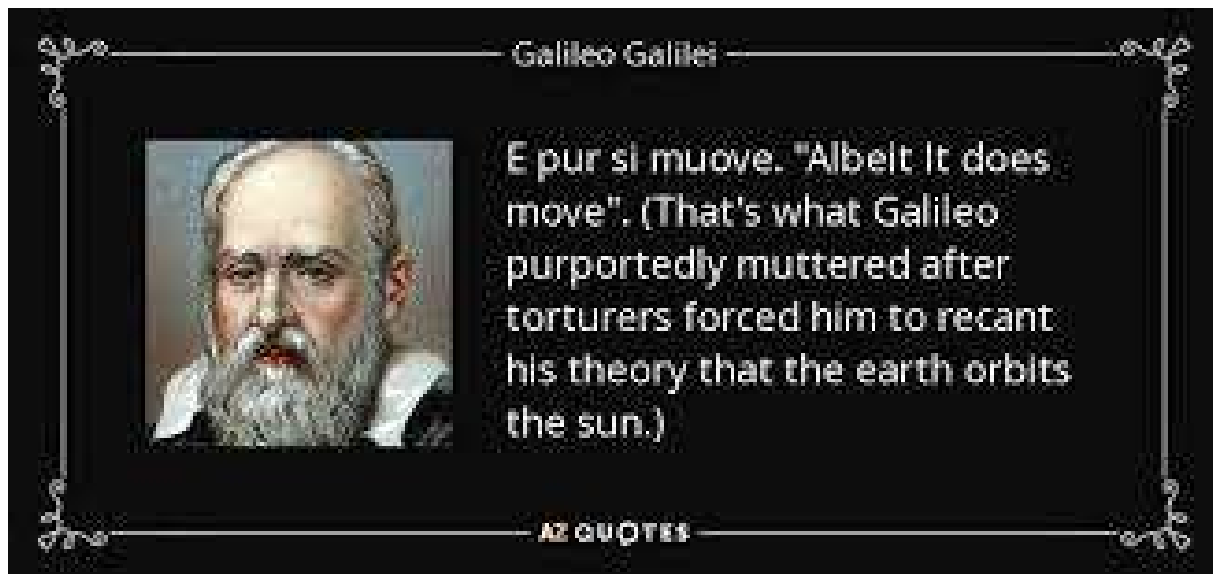


Figure 2: According to tradition, as he rose from his knees after the recantation, Galileo muttered “Eppur si muove!”, (“Still it moves!”) It is unlikely that he muttered anything of the kind, since it would have been fatally dangerous to do so, and since at that moment, Galileo was a broken man. Nevertheless, the retort which posterity has imagined him to make remains unanswerable. As Galileo said, before his spirit was broken by the Inquisition, “...It is not in the power of any creature to make (these ideas) true or false or otherwise than of their own nature and in fact they are.”

# WE CAN UNILATERALLY STOP BEING NASTY

In general, nations should not act unilaterally in foreign affairs. They should instead support international law and the United Nations. But there is one thing that we can and should do on our own: We can unilaterally stop being nasty!

Interestingly, this principle is at the core of Christian ethics, although our supposedly Christian governments rarely follow it. Here are some words from the Sermon on the Mount:

“Ye have heard it hath been said, Thou shalt love thy neighbor and hate thine enemy.

“But I say unto you, Love your enemies, bless them that curse you, do good to them that curse you, and pray for them that despitefully use you and persecute you.”

Christians are required to love their enemies, and to do good to those who have wronged them. This seemingly impractical advice is in fact extremely practical. Cycles of revenge and counter-revenge can only be stopped by unilateral acts of kindness.

Contrast the duty to love and do good to one's enemies with the doctrine of massive retaliation, which is built into the concept of nuclear deterrence. In a nuclear war, the hundreds of millions, or even billions, of victims in every country of the world, also neutral countries, would include people of every kind: women, men, old people, children and babies, completely irrespective of any degree of guilt that they might have. This type of killing has to be classified as genocide.

If Christians were true to their beliefs, not only nuclear war, but every kind of war would be forbidden for them.

The Second World War was the direct consequence of Clemenceau's insistence on revenge. The impossible-to-pay reparations imposed on Germany by the Treaty of Versailles lead to hyper-inflation, financial chaos, and desperation in Germany, and without these conditions, Hitler's Nazi Party would never have gained a foothold. By contrast, the unilateral act of kindness implicit in the Marshall Plan has produced the peaceful Germany of today.

Humanitarian disasters provide us with many opportunities for unilateral acts of kindness. For example, an extremely severe drought is currently threatening the children of North Korea with starvation. We have the opportunity to help by providing food. Has anyone thought of treating North Korea with kindness? It might be a useful experiment to try.

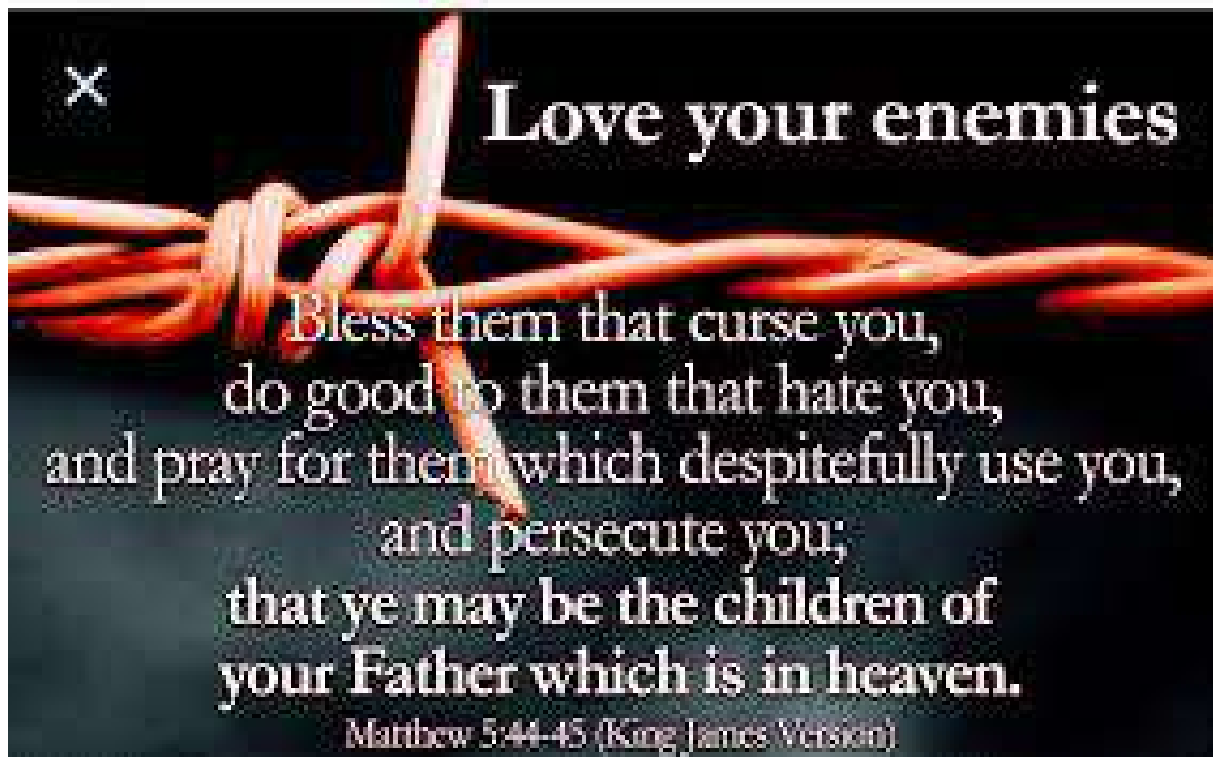


Figure 1: Contrast our duty to love our enemies with the doctrine of massive nuclear retaliation. If Christians obeyed this commandment, not only nuclear war, but war in general would be impossible for them. The seemingly impractical advice, that we should love our enemies, is in fact extremely practical and useful, since it prevents escalatory cycles of revenge and counter-revenge. Conflicts can be ended through unilateral acts of kindness.

# **THE KIDNAPING OF MENG WANZHOU**

## **The UN Security Council alone has the power to impose sanctions**

According to the Charter of the United Nations, only the UN Security Council has a mandate by the international community to apply sanctions (Article 41) that must be complied with by all UN member states (Article 2,2). Therefore sanctions on Iran, unilaterally imposed by the United States government, are illegal. They are a violation of the United Nations Charter.

With amazing hubris and arrogance, the US government has imposed sanctions on various countries, including Iran. In the case of Iran, these sanctions have caused the suffering of millions of innocent people, who are unable to buy medicines for serious illnesses, and whose financial security is threatened by the economic damage produced by US sanctions. Although other nations realize that the US sanctions are a violation of international law, they nevertheless comply because they fear US financial reprisals.

## **Who is Meng Wanzhou?**

Meng Wanzhou is the Chief Financial Officer of Huawei, the world's largest telecom equipment manufacturer. She is also the daughter of Huawei's founder. While flying from Hong Kong to Mexico, Ms. Meng was changing planes at the Vancouver International Airport when she was suddenly detained by the Canadian government on an August US warrant. She faces extradition to a New York City courtroom, where she could receive up to thirty years in federal prison for having allegedly conspired in 2010 to violate America's unilateral (and illegal) trade sanctions against Iran.

## **The US is drifting towards fascism**

The kidnaping of Ms. Meng is yet another example of the almost insane hubris and arrogance of the present government of the United States. Insane is not too strong a word, since many psychiatrists consider Donald Trump to be mentally unstable. Furthermore, Trump's racism and his advocacy of violence are worryingly similar to the fascists of the 1930's, such as Hitler and Mussolini. It is clear from Trump's actions that the present government of the United States no longer belongs to the American people. It belongs instead to corporate oligarchs, to Wall Street, and to the Israel Lobby. Trump's advocacy of fossil fuels is an existential threat to the future of human civilization and the biosphere. Will he be re-elected in 2020? Worryingly we can remember that Hitler was legally elected, but retained his power through illegal means.

## **Leader of the Free World?**

Just as the United States once declared its independence from Britain, so Europe and the remainder of the world ought to declare independence from the United States. Clearly,



**Figure 1: The kidnaping of Ms. Meng is yet another example of the almost insane hubris and arrogance of the present government of the United States..**

insane arrogance, hubris, contempt for international law, racism and many of the aspects of fascism, do not deserve to be blindly followed. Whatever moral authority the United States may once have had has evaporated in a seemingly endless series of aggressive foreign wars and drone killings.

# THE SOCIAL RESPONSIBILITY OF SCIENTISTS

## The special responsibility of scientists and engineers

As we start the 21st century, our scientific and technological civilization seems to be entering a period of crisis. Today, for the first time in history, science has given to humans the possibility of a life of comfort, free from hunger and cold, and free from the constant threat of infectious disease. At the same time, science has given us the power to destroy civilization through thermonuclear war, as well as the power to make our planet uninhabitable through pollution, overpopulation and climate change. The question of which of these alternatives we choose is a matter of life or death to ourselves and our children. Scientists and engineers have a special responsibility for ensuring that their work is used in a way that bebefits human civilization and the biosphere, rather than harmfully.

Genetically we are almost identical with our Neolithic ancestors; but their world has been replaced by a world of quantum theory, relativity, supercomputers, antibiotics, genetic engineering and space telescopes - unfortunately also a world of nuclear weapons and nerve-gas. Because of the slowness of genetic evolution in comparison to the rapid and constantly-accelerating rate of cultural change, our bodies and emotions are not adapted to our new way of life. They still reflect the way of life of our hunter-gatherer ancestors.

In addition to the contrast between the slow pace of genetic evolution when compared with the rapid and constantly accelerating rate of cultural evolution, we can also notice a contrast between rapidly- and slowly-moving aspects of cultural change: Social institutions and structures seem to change slowly when compared with the lightning-like pace of scientific and technological innovation. Thus, tensions and instability characterize our information-driven contemporary society, not only because the human nature we have inherited from our ancient ancestors is not appropriate to our present way of life, but also because science and technology change so much more rapidly than institutions, laws, and attitudes.

Space-age science and stone-age politics make an extraordinarily dangerous mixture. It seems probable that in the future, the rapidity of scientific and technological change will produce ethical dilemmas and social tensions even more acute than those we experience today. It is likely that the fate of our species (and the fate of the biosphere) will be made precarious by the astonishing speed of scientific and technological change unless this progress is matched by the achievement of far greater ethical and political maturity than we have yet attained.

Science and technology have shown themselves to be double-edged, capable of doing great good or of producing great harm, depending on the way in which we use the enormous power over nature, which science has given to us. For this reason, ethical thought is needed now more than ever before. The wisdom of the world's religions, the traditional wisdom of humankind, can help us as we try to insure that our overwhelming material progress will



Figure 1: **Enormous concentration of attention on a small fragment of reality blinds the researcher to the larger whole. Looking through a microscope, he sees what is on the slide in great detail, but he sees nothing else.**

be beneficial.

The crisis of civilization, which we face today, has been produced by the rapidity with which science and technology have developed. Our institutions and ideas adjust too slowly to the change. The great challenge which history has given to our generation is the task of building new international political structures, which will be in harmony with modern technology. At the same time, we must develop a new global ethic, which will replace our narrow loyalties by loyalty to humanity as a whole.

Ethical considerations have traditionally been excluded from scientific discussions. This tradition perhaps has its roots in the desire of the scientific community to avoid the bitter religious controversies which divided Europe following the Reformation. Whatever the historical reason may be, it has certainly become customary to speak of scientific problems in a dehumanized language, as though science had nothing to do with ethics or politics.

The great power of science is derived from an enormous concentration of attention and resources on the understanding of a tiny fragment of nature; but this concentration is at the same time a distortion of values. To be effective, a scientist must believe, at least temporarily, that the problem on which he or she is working is more important than anything else in the world, which is of course untrue. Thus a scientist, while seeing a fragment of reality better than anyone else, becomes blind to the larger whole. For example, when one looks into a microscope, one sees the tiny scene on the slide in tremendous detail, but that is all one sees. The remainder of the universe is blotted out by this concentration of attention.

The system of rewards and punishments in the training of scientists produces researchers who are highly competent when it comes to finding solutions to technical problems, but whose training has by no means encouraged them to think about the ethical or political consequences of their work. Scientists may, in fact, be tempted to escape from the intractable



moral and political difficulties of the world by immersing themselves in their work. Enrico Fermi, (whose research as much as that of any other person made nuclear weapons possible), spoke of science as “soma” - the escapist drug of Aldous Huxley’s *Brave New World*. Fermi perhaps used his scientific preoccupations as an escape from the worrying political problems of the 30’s and 40’s.

The education of a scientist often produces a person with a strong feeling of loyalty to a particular research discipline, but perhaps without sufficient concern for the way in which progress in that discipline is related to the general welfare of humankind. To remedy this lack, it would be very desirable if the education of scientists could include some discussion of ethics, as well as a review of the history of modern science and its impact on society.

The explosive growth of science-driven technology during the last two centuries has changed the world completely; and our social and political institutions have adjusted much too slowly to the change. The great problem of our times is to keep society from being shaken to pieces by the headlong progress of science, the problem of harmonizing our social and political institutions with technological change. Because of the great importance of this problem, it is perhaps legitimate to ask whether anyone today can be considered to be educated without having studied the impact of science on society. Should we not include this topic in the education of both scientists and non-scientists?

Science has given us great power over the forces of nature. If wisely used, this power will contribute greatly to human happiness; if wrongly used, it will result in misery. In the words of the Spanish writer, Ortega y Gasset, “We live at a time when man, lord of all things, is not lord of himself”; or as Arthur Koestler has remarked, “We can control the movements of a spaceship orbiting about a distant planet, but we cannot control the situation in Northern Ireland.”

To remedy this situation, educational reforms are needed. Science and engineering students ought to have some knowledge of the history and social impact of science. They could be given a course on the history of scientific ideas; but in connection with modern historical developments, such as the industrial revolution, the global population explosion, the development of nuclear weapons, genetic engineering, and information technology, some discussion of social impact could be introduced. One might hope to build up in science and engineering students an understanding of the way in which their work is related to the general welfare of humankind. These elements are needed in science education if rapid technological development is to be beneficial rather than disastrous.

## **The threats and costs of war**

In the long run, because of the enormously destructive weapons, which have been produced through the misuse of science, the survival of civilization can only be insured if we are able to abolish the institution of war.

Modern warfare has become prohibitively dangerous and destructive because of the enormously powerful weapons that scientists and engineers have developed. The institution of war could not continue without their cooperation. Thus, scientists and engineers

throughout the world have a special responsibility.

Wars are driven by the collective paranoia of voters, who are willing to allow colossal sums to be spent by ‘ ‘Defense Departments’. But are civilians really defended? Absolutely not!

We can see this most clearly if we think of nuclear war. Nations threaten each other with “Mutually Assured Destruction”, which has the very appropriate acronym MAD. What does this mean? Does it mean that civilians are being protected? Not at all. Instead they are threatened with complete destruction. Civilians here play the role of hostages in the power games of their leaders. Those leaders’ goal is not protection of ordinary people, but rather protection of the gargantuan profits of the military-industrial complex. As the Indian writer Arundhati Roy put it, “Once weapons were manufactured to fight wars. Now wars are manufactured to sell weapons.”

If a thermonuclear war occurs, it will be the end of human civilization and much of the biosphere. This will definitely happen in the future unless the world rids itself of nuclear weapons, since, in the long run, the finite chance of accidental nuclear war happening due to a technical or human failure during a given year will gradually build up into a certainty of disaster. Scientists and engineers must not sell their knowledge and talents to this march towards the precipice.

## **The direct and indirect costs of war**

The costs of war, both direct and indirect, are so enormous that they are almost beyond comprehension. We face a direct threat because a thermonuclear war may destroy human civilization and much of the biosphere, and an indirect threat because the institution of war interferes seriously with the use of tax money for constructive and peaceful purposes.

Today, despite the end of the Cold War, the world spends roughly 1.7 trillion (i.e. 1.7 million million) US dollars each year on armaments. This colossal flood of money could have been used instead for education, famine relief, development of infrastructure, or on urgently needed public health measures.

The World Health Organization lacks funds to carry through an antimalarial 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 1.2 hours of world arms spending.



Figure 2: **Children born with birth defects due to the US use of Agent Orange during the Vietnam War. Source: stopwarcoalition.org**

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 \$6.5 million on armaments.

It is plain that if the almost unbelievable sums now wasted on the institution of war were used constructively, most of the pressing problems of humanity could be solved, but today the world spends more than 20 times as much on war as it does on development.

## **Medical and psychological consequences; loss of life**

While in earlier epochs it may have been possible to confine the effects of war mainly to combatants, in the 20th century the victims of war were increasingly civilians, and especially children. For example, according to Quincy Wright's statistics, the First and Second World Wars cost the lives of 26 million soldiers, but the toll in civilian lives was much larger: 64 million.

Since the Second World War, despite the best efforts of the UN, there have been over 150 armed conflicts; and, if civil wars are included, there are on any given day an average of 12 wars somewhere in the world. In the conflicts in Indo-China, the proportion of civilian victims was between 80% and 90%, while in the Lebanese civil war some sources state that the proportion of civilian casualties was as high as 97%.

Civilian casualties often occur through malnutrition and through diseases that would be preventable in normal circumstances. Because of the social disruption caused by war, normal supplies of food, safe water and medicine are interrupted, so that populations become vulnerable to famine and epidemics.<sup>1</sup>

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<sup>1</sup><http://www.cadmusjournal.org/article/volume-2/issue-2-part-3/lessons-world-war-i>  
<http://www.truth-out.org/opinion/item/27201-the-leading-terrorist-state>



Figure 3: A little girl cries as medics attend to her injuries at al-Shifa hospital in Gaza in 2014, during the conflict. Photo: UNICEF/Eyad El Baba

## Effects of war on children

According to UNICEF figures, 90% of the casualties of recent wars have been civilians, and 50% children. The organization estimates that in recent years, violent conflicts have driven 20 million children from their homes. They have become refugees or internally displaced persons within their own countries.

During the last decade 2 million children have been killed and 6 million seriously injured or permanently disabled as the result of armed conflicts, while 1 million children have been orphaned or separated from their families. Of the ten countries with the highest rates of death of children under five years of age, seven are affected by armed conflicts. UNICEF estimates that 300,000 child soldiers are currently forced to fight in 30 armed conflicts throughout the world. Many of these have been forcibly recruited or abducted.

Even when they are not killed or wounded by conflicts, children often experience painful psychological traumas: the violent death of parents or close relatives, separation from their families, seeing family members tortured, displacement from home, disruption of ordinary life, exposure to shelling and other forms of combat, starvation and anxiety about the future.<sup>2</sup>

## Refugees

Human Rights Watch estimates that in 2001 there were 15 million refugees in the world, forced from their countries by war, civil and political conflict, or by gross violations of human rights. In addition, there were an estimated 22 million internally displaced persons, violently forced from their homes but still within the borders of their countries.

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<sup>2</sup><http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2080482/>



Figure 4: Asylum-seekers in a holding centre on Greece's Samos Island.

In 2001, 78% of all refugees came from ten areas: Afghanistan, Angola, Burma, Burundi, Congo-Kinshasa, Eritria, Iraq, the Palestinian territories, Somalia and Sudan. A quarter of all refugees are Palestinians, who make up the world's oldest and largest refugee population. 45% of the world's refugees have found sanctuaries in Asia, 30% in Africa, 19% in Europe and 5% in North America.

Refugees who have crossed an international border are in principle protected by Article 14 of the Universal Declaration of Human Rights, which affirms their right "to seek and to enjoy in other countries asylum from persecution". In 1950 the Office of the High Commissioner for Refugees was created to implement Article 14, and in 1951 the Convention Relating to the Status of Refugees was adopted by the UN. By 2002 this legally binding treaty had been signed by 140 nations. However the industrialized countries have recently adopted a very hostile and restrictive attitude towards refugees, subjecting them to arbitrary arrests, denial of social and economic rights, and even forcible return to countries in which they face persecution.

The status of internally displaced persons is even worse than that of refugees who have crossed international borders. In many cases the international community simply ignores their suffering, reluctant to interfere in the internal affairs of sovereign states. In fact, the United Nations Charter is self-contradictory in this respect, since on the one hand it calls for non-interference in the internal affairs of sovereign states, but on the other hand, people everywhere are guaranteed freedom from persecution by the Charter's Universal Declaration of Human Rights.<sup>3</sup>

## Damage to infrastructure

Most insurance policies have clauses written in fine print exempting companies from payment of damage caused by war. The reason for this is simple. The damage caused by war

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<sup>3</sup><https://www.hrw.org/topic/refugees>

is so enormous that insurance companies could never come near to paying for it without going bankrupt.

We mentioned above that the world spends 1.7 trillion dollars each year on preparations for war. A similarly colossal amount is needed to repair the damage to infrastructure caused by war. Sometimes this damage is unintended, but sometimes it is intentional.

During World War II, one of the main aims of air attacks by both sides was to destroy the industrial infrastructure of the opponent. This made some sense in a war expected to last several years, because the aim was to prevent the enemy from producing more munitions. However, during the Gulf War of 1990, the infrastructure of Iraq was attacked, even though the war was expected to be short. Electrical generating plants and water purification facilities were deliberately destroyed with the apparent aim of obtaining leverage over Iraq after the war.

In general, because war has such a catastrophic effect on infrastructure, it can be thought of as the opposite of development. War is the greatest generator of poverty.<sup>4</sup>

## Ecological damage

Warfare during the 20th century has not only caused the loss of 175 million lives (primarily civilians) - it has also caused the greatest ecological catastrophes in human history. The damage takes place even in times of peace. Studies by Joni Seager, a geographer at the University of Vermont, conclude that “a military presence anywhere in the world is the single most reliable predictor of ecological damage”.

Modern warfare destroys environments to such a degree that it has been described as an “environmental holocaust.” For example, herbicides use in the Vietnam War killed an estimated 6.2 billion board-feet of hardwood trees in the forests north and west of Saigon, according to the American Association for the Advancement of Science. Herbicides such as Agent Orange also made enormous areas of previously fertile land unsuitable for agriculture for many years to come. In Vietnam and elsewhere in the world, valuable agricultural land has also been lost because land mines or the remains of cluster bombs make it too dangerous for farming.

During the Gulf War of 1990, the oil spills amounted to 150 million barrels, 650 times the amount released into the environment by the notorious Exxon Valdez disaster. During the Gulf War an enormous number of shells made of depleted uranium were fired. When the dust produced by exploded shells is inhaled it often produces cancer, and it will remain in the environment of Iraq for decades.

Radioactive fallout from nuclear tests pollutes the global environment and causes many thousands of cases of cancer, as well as birth abnormalities. Most nuclear tests have been carried out on lands belonging to indigenous peoples. Agent Orange also produced cancer,

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<sup>4</sup><https://www.wsws.org/en/articles/2002/11/iraq-n04.html>  
<http://www.globalresearch.ca/crimes-against-humanity-the-destruction-of-iraqs-electricity-infrastructure-the-social-economic-and-environmental-impacts/5355665>  
<http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/00157630-EN-ERP-48.PDF>



Figure 5: **Image source: Greenpeace**

birth abnormalities and other serious forms of illness both in the Vietnamese population and among the foreign soldiers fighting in Vietnam<sup>5</sup>

## **The threat of nuclear war**

As bad as conventional arms and conventional weapons may be, it is the possibility of a catastrophic nuclear war that poses the greatest threat to humanity. There are today roughly 16,000 nuclear warheads in the world. The total explosive power of the warheads that exist or that could be made on short notice is approximately equal to 500,000 Hiroshima bombs.

To multiply the tragedy of Hiroshima by a factor of half a million makes an enormous difference, not only quantitatively, but also qualitatively. Those who have studied the question believe that a nuclear catastrophe today would inflict irreversible damage on our civilization, genetic pool and environment.

Thermonuclear weapons consist of an inner core where the fission of uranium-235 or plutonium takes place. The fission reaction in the core is able to start a fusion reaction in the next layer, which contains isotopes of hydrogen. It is possible to add a casing of ordinary uranium outside the hydrogen layer, and under the extreme conditions produced by the fusion reaction, this ordinary uranium can undergo fission. In this way, a fission-fusion-fission bomb of almost limitless power can be produced.

For a victim of severe radiation exposure, the symptoms during the first week are nausea, vomiting, fever, apathy, delirium, diarrhoea, oropharyngeal lesions and leukopenia. Death occurs during the first or second week.

We can perhaps be helped to imagine what a nuclear catastrophe means in human

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<sup>5</sup><http://www.dailymail.co.uk/news/article-2401378/Agent-Orange-Vietnamese-children-suffering-effects-herbicide-sprayed-US-Army-40-years-ago.html>





**Figure 6: The 15 megaton explosion detonated by the United States at Bikini Atoll in 1954 produced lasting biological damage to humans and animals living on the distant Marshall Islands. Today, half a century later, the islanders still experience radiation sickness in the form of leukemia and birth defects. Source: [www.theguardian.com](http://www.theguardian.com)**

terms by reading the words of a young university professor, who was 2,500 meters from the hypocenter at the time of the bombing of Hiroshima: “Everything I saw made a deep impression: a park nearby covered with dead bodies... very badly injured people evacuated in my direction... Perhaps most impressive were girls, very young girls, not only with their clothes torn off, but their skin peeled off as well. ... My immediate thought was that this was like the hell I had always read about. ... I had never seen anything which resembled it before, but I thought that should there be a hell, this was it.”

One argument that has been used in favor of nuclear weapons is that no sane political leader would employ them. However, the concept of deterrence ignores the possibility of war by accident or miscalculation, a danger that has been increased by nuclear proliferation and by the use of computers with very quick reaction times to control weapons systems.

Recent nuclear power plant accidents remind us that accidents frequently happen through human and technical failure, even for systems which are considered to be very “safe.” We must also remember the time scale of the problem. To assure the future of humanity, nuclear catastrophe must be avoided year after year and decade after decade. In the long run, the safety of civilization cannot be achieved except by the abolition of nuclear weapons, and ultimately the abolition of the institution of war.

In 1985, International Physicians for the Prevention of Nuclear War received the Nobel Peace Prize. IPPNW had been founded in 1980 by six physicians, three from the Soviet Union and three from the United States. Today, the organization has wide membership among the world’s physicians. Professor Bernard Lowen of the Harvard School of Public Health, one of the founders of IPPNW, said in a recent speech:

“...No public health hazard ever faced by humankind equals the threat of nuclear war. Never before has man possessed the destructive resources to make this planet uninhabit-



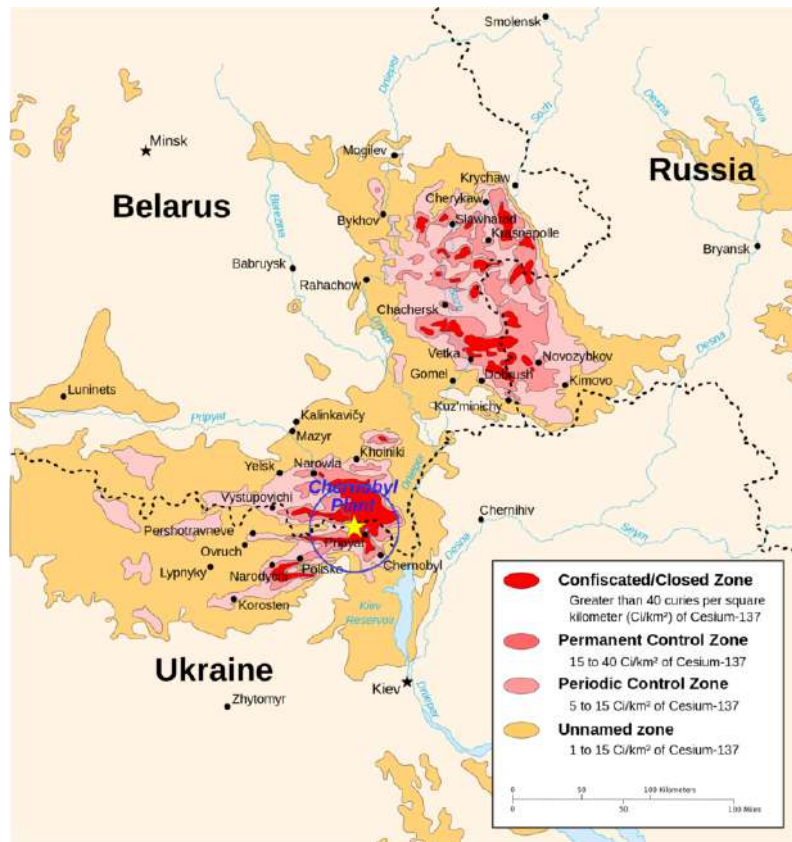


Figure 7: A nuclear war would be an ecological disaster, making large portions of the world permanently uninhabitable because of long-lasting radioactivity. Chernobyl radiation map 1996 30km zone by CIA Factbook. Licensed under CC BY-SA 2.5 via Wikimedia Commons.



Figure 8: Sculpture depicting Saint George slaying the dragon. The dragon is created from fragments of Soviet SS-20 and United States Pershing nuclear missiles. UN Photo/Milton Grant

able... Modern medicine has nothing to offer, not even a token benefit, in the event of nuclear war..."

"We are but transient passengers on this planet Earth. It does not belong to us. We are not free to doom generations yet unborn. We are not at liberty to erase humanity's past or dim its future. Social systems do not endure for eternity. Only life can lay claim to uninterrupted continuity. This continuity is sacred."

The danger of a catastrophic nuclear war casts a dark shadow over the future of our species. It also casts a very black shadow over the future of the global environment. The environmental consequences of a massive exchange of nuclear weapons have been treated in a number of studies by meteorologists and other experts from both East and West. They predict that a large-scale use of nuclear weapons would result in fire storms with very high winds and high temperatures, which would burn a large proportion of the wild land fuels in the affected nations. The resulting smoke and dust would block out sunlight for a period of many months, at first only in the northern hemisphere but later also in the southern hemisphere.

Temperatures in many places would fall far below freezing, and much of the earth's plant life would be killed. Animals and humans would then die of starvation. The nuclear winter effect was first discovered as a result of the Mariner 9 spacecraft exploration of Mars in 1971. The spacecraft arrived in the middle of an enormous dust-storm on Mars, and measured a large temperature drop at the surface of the planet, accompanied by a heating of the upper atmosphere. These measurements allowed scientists to check their theoretical models for predicting the effect of dust and other pollutants distributed in planetary atmospheres.

Using experience gained from the studies of Mars, R.P. Turco, O.B. Toon, T. Ackerman, J.B. Pollack and C. Sagan made a computer study of the climatic effects of the smoke and dust that would result from a large-scale nuclear war. This early research project is sometimes called the TTAPS Study, after the initials of the authors.

In April 1983, a special meeting was held in Cambridge, Massachusetts, where the results of the TTAPS Study and other independent studies of the nuclear winter effect were discussed by more than 100 experts. Their conclusions were presented at a forum in Washington, D.C., the following December, under the chairmanship of U.S. Senators Kennedy and Hatfield. The numerous independent studies of the nuclear winter effect all agreed of the following main predictions:

High-yield nuclear weapons exploded near the earth's surface would put large amounts of dust into the upper atmosphere. Nuclear weapons exploded over cities, forests, oilfields and refineries would produce fire storms of the type experienced in Dresden and Hamburg after incendiary bombings during the Second World War. The combination of high-altitude dust and lower altitude soot would prevent sunlight from reaching the earth's surface, and the degree of obscuration would be extremely high for a wide range of scenarios.

A baseline scenario used by the TTAPS study assumes a 5,000-megaton nuclear exchange, but the threshold for triggering the nuclear winter effect is believed to be much lower than that. After such an exchange, the screening effect of pollutants in the atmosphere might be so great that, in the northern and middle latitudes, the sunlight reaching

the earth would be only 1% of ordinary sunlight on a clear day, and this effect would persist for many months. As a result, the upper layers in the atmosphere might rise in temperature by as much as 100 °C, while the surface temperatures would fall, perhaps by as much as 50 °C.

The temperature inversion produced in this way would lead to superstability, a condition in which the normal mixing of atmospheric layers is suppressed. The hydrological cycle (which normally takes moist air from the oceans to a higher and cooler level, where the moisture condenses as rain) would be strongly suppressed. Severe droughts would thus take place over continental land masses. The normal cleansing action of rain would be absent in the atmosphere, an effect which would prolong the nuclear winter.

In the northern hemisphere, forests would die because of lack of sunlight, extreme cold, and drought. Although the temperature drop in the southern hemisphere would be less severe, it might still be sufficient to kill a large portion of the tropical forests, which normally help to renew the earth's oxygen.

The oxygen content of the atmosphere would then fall dangerously, while the concentration of carbon dioxide and oxides of nitrogen produced by firestorms would remain high. The oxides of nitrogen would ultimately diffuse to the upper atmosphere, where they would destroy the ozone layer.

Thus, even when the sunlight returned after an absence of many months, it would be sunlight containing a large proportion of the ultraviolet frequencies which are normally absorbed by the ozone in the stratosphere, and therefore a type of light dangerous to life. Finally, after being so severely disturbed, there is no guarantee that the global climate would return to its normal equilibrium.

Even a nuclear war below the threshold of nuclear winter might have climatic effects very damaging to human life. Professor Paul Ehrlich, of Stanford University, has expressed this in the following words:

"...A smaller war, which set off fewer fires and put less dust into the atmosphere, could easily depress temperatures enough to essentially cancel grain production in the northern hemisphere. That in itself would be the greatest catastrophe ever delivered upon Homo Sapiens, just that one thing, not worrying about prompt effects. Thus even below the threshold, one cannot think of survival of a nuclear war as just being able to stand up after the bomb has gone off."<sup>6</sup>

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<sup>6</sup><http://www.voanews.com/content/pope-francis-calls-for-nuclear-weapons-ban/2909357.html>  
<http://www.cadmusjournal.org/article/issue-4/flaws-concept-nuclear-deterrence>  
<http://www.countercurrents.org/avery300713.htm>  
<https://www.wagingpeace.org/author/john-avery/>  
<http://www.commondreams.org/news/2015/08/06/70-years-after-bombing-hiroshima-calls-abolish-nuclear-weapons>  
<http://www.informationclearinghouse.info/article42488.htm>  
<http://www.informationclearinghouse.info/article42492.htm>  
<http://www.commondreams.org/views/2015/08/06/hiroshima-and-nagasaki-remembering-power>  
<http://human-wrongs-watch.net/2015/07/22/israel-iran-and-the-nuclear-non-proliferation-treaty/>  
<http://human-wrongs-watch.net/2015/06/25/militarisms-hostages/>  
<http://human-wrongs-watch.net/2015/05/24/the-path-to-zero-dialogues-on-nuclear-dangers-by-richard->

## **Nuclear weapons are criminal! Every war is a crime!**

War was always madness, always immoral, always the cause of unspeakable suffering, economic waste and widespread destruction, and always a source of poverty, hate, barbarism and endless cycles of revenge and counter-revenge. It has always been a crime for soldiers to kill people, just as it is a crime for murderers in civil society to kill people. No flag has ever been wide enough to cover up atrocities.

But today, the development of all-destroying modern weapons has put war completely beyond the bounds of sanity and elementary humanity.

Today, war is not only insane, but also a violation of international law. Both the United Nations Charter and the Nuremberg Principles make it a crime to launch an aggressive war. According to the Nuremberg Principles, every soldier is responsible for the crimes that he or she commits, even while acting under the orders of a superior officer.

Nuclear weapons are not only insane, immoral and potentially omnicidal, but also criminal under international law. In response to questions put to it by WHO and the UN General Assembly, the International Court of Justice ruled in 1996 that “the threat and use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and particularly the principles and rules of humanitarian law.” The only possible exception to this general rule might be “an extreme circumstance of self-defense, in which the very survival of a state would be at stake”. But the Court refused to say that even in this extreme circumstance the threat or use of nuclear weapons would be legal. It left the exceptional case undecided. In addition, the Court added unanimously that “there exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control.”

Can we not rid ourselves of both nuclear weapons and the institution of war itself? We must act quickly and resolutely before everything that we love in our beautiful world is reduced to radioactive ashes.

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falk-and-david-krieger/

<http://human-wrongs-watch.net/2015/03/30/europe-must-not-be-forced-into-a-nuclear-war-with-russia/>

<http://www.truth-out.org/opinion/item/32073-the-us-should-eliminate-its-nuclear-arsenal-not-modernize-it>

<http://www.cadmusjournal.org/article/issue-4/flaws-concept-nuclear-deterrence>

<http://www.cadmusjournal.org/article/issue-6/arms-trade-treaty-opens-new-possibilities-u>

<http://eruditio.worldacademy.org/issue-6/article/remember-your-humanity>

<http://www.informationclearinghouse.info/article42568.htm>

<https://firstlook.org/theintercept/2014/09/23/nobel-peace-prize-fact-day-syria-7th-country-bombed-obama/>

<http://www.informationclearinghouse.info/article42577.htm>

<http://www.informationclearinghouse.info/article42580.htm>

<http://human-wrongs-watch.net/2015/08/06/us-unleashing-of-atomic-weapons-against-civilian-populations-was-a-criminal-act-of-the-first-order/>

<http://human-wrongs-watch.net/2015/08/06/hiroshima-and-nagasaki-remembering-the-power-of-peace/>

<http://human-wrongs-watch.net/2015/08/04/atomic-bombing-hear-the-story-setsuko-thurlow/>

<http://human-wrongs-watch.net/2015/08/04/atomic-bombing-hear-the-story-yasuaki-yamashita/>

<http://human-wrongs-watch.net/2015/08/03/why-nuclear-weapons/>

## Suggestions for further reading

1. A. Robock, L. Oman, G. L. Stenchikov, O. B. Toon, C. Bardeen, and R. Turco, *Climatic consequences of regional nuclear conflicts*, Atmospheric Chemistry and Physics, Vol. 7, p. 2003-2012, (2007).
2. M. Mills, O. Toon, R. Turco, D. Kinnison, R. Garcia, *Massive global ozone loss predicted following regional nuclear conflict*, Proceedings of the National Academy of Sciences (USA), vol. 105(14), pp. 5307-12, Apr 8, (2008).
3. O. Toon, A. Robock, and R. Turco, *The Environmental Consequences of Nuclear War*, Physics Today, vol. 61, No. 12, p. 37-42, (2008).
4. R. Turco, O. Toon, T. Ackermann, J. Pollack, and C. Sagan, *Nuclear Winter: Global consequences of multiple nuclear explosions*, Science, Vol. 222, No. 4630, pp. 1283-1292, December (1983).
5. A. Robock, L. Oman, G. Stenchikov, *Nuclear winter revisited with a modern climate model and current nuclear arsenals: Still catastrophic consequences*, Journal of Geophysical Research - Atmospheres, Vol. 112, No. D13, p. 4 of 14, (2007).
6. I. Helfand, *An Assessment of the Extent of Projected Global Famine Resulting From Limited, Regional Nuclear War*, International Physicians for the Prevention of Nuclear War, Physicians for Social Responsibility, Leeds, MA, (2007).
7. George P. Schultz, William J. Perry, Henry A. Kissinger and Sam Nunn, *A World Free of Nuclear Weapons*, The Wall Street Journal, January 4, 2007, page A15 and January 15, (2008), page A15.
8. Mikhail Gorbachev, *The Nuclear Threat*, The Wall Street Journal, January 30, (2007), page A15.
9. Massimo D'Alema, Gianfranco Fini, Giorgio La Malfa, Arturo Parisi and Francesco Calogero, *For a World Free of Nuclear Weapons*, Corriere Della Sera, July 24, (2008).
10. Hoover Institution, *Reykjavik Revisited; Steps Towards a World Free of Nuclear Weapons*, October, (2007).
11. Douglas Hurd, Malcolm Rifkind, David Owen and George Robertson, *Start Worrying and Learn to Ditch the Bomb*, The Times, June 30, (2008).
12. Des Brown, Secretary of State for Defense, UK, *Laying the Foundations for Multilateral Disarmament*, Geneva Conference on Disarmament, February 5, (2008).
13. Government of Norway, International Conference on *Achieving the Vision of a World Free of Nuclear Weapons*, Oslo, Norway, February 26-27, (2008).
14. Jonas Gahr Støre, Foreign Minister, Norway, *Statement at the Conference on Disarmament*, Geneva, March 4, (2008).
15. Anne-Grete Strøm-Erichsen, Defense Minister, Norway, *Emerging Opportunities for Nuclear Disarmament*, Pugwash Conference, Canada, July 11, (2008).
16. Kevin Rudd, Prime Minister, Australia, *International Commission on Nuclear Non-Proliferation and Disarmament*, Media Release, July 9, (2008).
17. Helmut Schmidt, Richard von Weizsäcker, Egon Bahr and Hans-Dietrich Genscher, *Towards a Nuclear-Free World: a German View*, International Herald Tribune, January 9, (2009).

18. Hans M. Kristensen and Elliot Negin, *Support Growing for Removal of U.S. Nuclear Weapons from Europe*, Common Dreams Newscenter, first posted May 6, (2005).
19. David Krieger, *President-elect Obama and a World Free of Nuclear Weapons*, Nuclear Age Peace Foundation Website, (2008).
20. J.L. Henderson, *Hiroshima*, Longmans (1974).
21. A. Osada, *Children of the A-Bomb, The Testament of Boys and Girls of Hiroshima*, Putnam, New York (1963).
22. M. Hachiya, M.D., *Hiroshima Diary*, The University of North Carolina Press, Chapel Hill, N.C. (1955).
23. M. Yass, *Hiroshima*, G.P. Putnam's Sons, New York (1972).
24. R. Jungk, *Children of the Ashes*, Harcourt, Brace and World (1961).
25. B. Hirschfield, *A Cloud Over Hiroshima*, Baily Brothers and Swinfin Ltd. (1974).
26. J. Hersey, *Hiroshima*, Penguin Books Ltd. (1975).
27. R. Rhodes, *Dark Sun: The Making of the Hydrogen Bomb*, Simon and Schuster, New York, (1995)
28. R. Rhodes, *The Making of the Atomic Bomb*, Simon and Schuster, New York, (1988).
29. D.V. Babst et al., *Accidental Nuclear War: The Growing Peril*, Peace Research Institute, Dundas, Ontario, (1984).
30. S. Britten, *The Invisible Event: An Assessment of the Risk of Accidental or Unauthorized Detonation of Nuclear Weapons and of War by Miscalculation*, Menard Press, London, (1983).
31. M. Dando and P. Rogers, *The Death of Deterrence*, CND Publications, London, (1984).
32. N.F. Dixon, *On the Psychology of Military Incompetence*, Futura, London, (1976).
33. D. Frei and C. Catrina, *Risks of Unintentional Nuclear War*, United Nations, Geneva, (1982).
34. H. L'Etang, *Fit to Lead?*, Heinemann Medical, London, (1980).
35. SPANW, *Nuclear War by Mistake - Inevitable or Preventable?*, Swedish Physicians Against Nuclear War, Lulea, (1985).
36. J. Goldblat, *Nuclear Non-proliferation: The Why and the Wherefore*, (SIPRI Publications), Taylor and Francis, (1985).
37. J. Schear, ed., *Nuclear Weapons Proliferation and Nuclear Risk*, Gower, London, (1984).
38. D.P. Barash and J.E. Lipton, *Stop Nuclear War! A Handbook*, Grove Press, New York, (1982).
39. C.F. Barnaby and G.P. Thomas, eds., *The Nuclear Arms Race: Control or Catastrophe*, Francis Pinter, London, (1982).
40. L.R. Beres, *Apocalypse: Nuclear Catastrophe in World Politics*, Chicago University press, Chicago, IL, (1980).
41. F. Blackaby et al., eds., *No-first-use*, Taylor and Francis, London, (1984).
42. NS, ed., *New Statesman Papers on Destruction and Disarmament* (NS Report No. 3), New Statesman, London, (1981).

43. H. Caldicot, *Missile Envy: The Arms Race and Nuclear War*, William Morrow, New York, (1984).
44. R. Ehrlich, *Waging the Peace: The Technology and Politics of Nuclear Weapons*, State University of New York Press, Albany, NY, (1985).
45. W. Epstein, *The Prevention of Nuclear War: A United Nations Perspective*, Gunn and Hain, Cambridge, MA, (1984).
46. W. Epstein and T. Toyoda, eds., *A New Design for Nuclear Disarmament*, Spokesman, Nottingham, (1975).
47. G.F. Kennan, *The Nuclear Delusion*, Pantheon, New York, (1983).
48. R.J. Lifton and R. Falk, *Indefensible Weapons: The Political and Psychological Case Against Nuclearism*, Basic Books, New York, (1982).
49. J.R. Macy, *Despair and Personal Power in the Nuclear Age*, New Society Publishers, Philadelphia, PA, (1983).
50. A.S. Miller et al., eds., *Nuclear Weapons and Law*, Greenwood Press, Westport, CT, (1984).
51. MIT Coalition on Disarmament, eds., *The Nuclear Almanac: Confronting the Atom in War and Peace*, Addison-Wesley, Reading, MA, (1984).
52. UN, *Nuclear Weapons: Report of the Secretary-General of the United Nations*, United Nations, New York, (1980).
53. IC, *Proceedings of the Conference on Understanding Nuclear War*, Imperial College, London, (1980).
54. B. Russell, *Common Sense and Nuclear Warfare*, Allen and Unwin, London, (1959).
55. F. Barnaby, *The Nuclear Age*, Almqvist and Wiksell, Stockholm, (1974).
56. D. Albright, F. Berkhout and W. Walker, *Plutonium and Highly Enriched Uranium 1996: World Inventories, Capabilities and Policies*, Oxford University Press, Oxford, (1997).
57. G.T. Allison et al., *Avoiding Nuclear Anarchy: Containing the Threat of Loose Russian Nuclear Weapons and Fissile Material*, MIT Press, Cambridge MA, (1996).
58. B. Bailin, *The Making of the Indian Atomic Bomb: Science, Secrecy, and the Post-colonial State*, Zed Books, London, (1998).
59. P. Bidawi and A. Vanaik, *South Asia on a Short Fuse: Nuclear Politics and the Future of Global Disarmament*, Oxford University Press, Oxford, (2001).
60. F.A. Boyle, *The Criminality of Nuclear Deterrence: Could the U.S. War on Terrorism Go Nuclear?*, Clarity Press, Atlanta GA, (2002).
61. G. Burns, *The Atomic Papers: A Citizen's Guide to Selected Books and Articles on the Bomb, the Arms Race, Nuclear Power, the Peace Movement, and Related Issues*, Scarecrow Press, Metuchen NJ, (1984).
62. L. Butler, *A Voice of Reason*, The Bulletin of Atomic Scientists, **54**, 58-61, (1998).
63. R. Butler, *Fatal Choice: Nuclear Weapons and the Illusion of Missile Defense*, Westview Press, Boulder CO, (2001).
64. R.P. Carlisle (Ed.), *Encyclopedia of the Atomic Age*, Facts on File, New York, (2001).
65. G.A. Cheney, *Nuclear Proliferation: The Problems and Possibilities*, Franklin Watts, New York, (1999).

66. A. Cohen, *Israel and the Bomb*, Colombia University Press, New York, (1998).
67. S.J. Diehl and J.C. Moltz, *Nuclear Weapons and Nonproliferation: A Reference Handbook*, ABC-Clio Information Services, Santa Barbara CA, (2002).
68. H.A. Feiveson (Ed.), *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-Alerting of Nuclear Weapons*, Brookings Institution Press, Washington D.C., (1999).
69. R. Hilsman, *From Nuclear Military Strategy to a World Without War: A History and a Proposal*, Praeger Publishers, Westport, (1999).
70. International Physicians for the Prevention of Nuclear War and The Institute for Energy and Environmental Research *Plutonium: Deadly Gold of the Nuclear Age*, International Physicians Press, Cambridge MA, (1992).
71. R.W. Jones and M.G. McDonough, *Tracking Nuclear Proliferation: A Guide in Maps and Charts, 1998*, The Carnegie Endowment for International Peace, Washington D.C., (1998).
72. R.J. Lifton and R. Falk, *Indefensible Weapons: The Political and Psychological Case Against Nuclearism*, Basic Books, New York, (1982).
73. R.E. Powaski, *March to Armageddon: The United States and the Nuclear Arms Race, 1939 to the Present*, Oxford University Press, (1987).
74. J. Rotblat, J. Steinberger and B. Udgaonkar (Eds.), *A Nuclear-Weapon-Free World: Desirable? Feasible?*, Westview Press, (1993).
75. The United Methodist Council of Bishops, *In Defense of Creation: The Nuclear Crisis and a Just Peace*, Graded Press, Nashville, (1986).
76. U.S. Congress Office of Technology Assessment (Ed.), *Dismantling the Bomb and Managing the Nuclear Materials*, U.S. Government Printing Office, Washington D.C., (1993).
77. S.R. Weart, *Nuclear Fear: A History of Images*, Harvard University Press, (1988).
78. P. Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age*, University of North Carolina Press, (1985).
79. C. Perrow, *Normal Accidents: Living With High-Risk Technologies*, Basic Books, (1984).
80. P. Rogers, *The Risk of Nuclear Terrorism in Britain*, Oxford Research Group, Oxford, (2006).
81. MIT, *The Future of Nuclear Power: An Interdisciplinary MIT Study*, <http://web.mit.edu/nuclearpow> (2003).
82. Z. Mian and A. Glaser, *Life in a Nuclear Powered Crowd*, INES Newsletter No. 52, 9-13, April, (2006).
83. K. Bergeron, *Nuclear Weapons: The Death of No Dual-use*, Bulletin of the Atomic Scientists, 15-17, January, (2004).
84. E. Chivian, and others (eds.), *Last Aid: The Medical Dimensions of Nuclear War*, W.H. Freeman, San Fransisco, (1982).
85. Medical Association's Board of Science and Education, *The Medical Effects of Nuclear War*, Wiley, (1983).



86. Kevin Rudd, Prime Minister, Australia, "International Commission on Nuclear Non-Proliferation and Disarmament", Media Release, July 9, 2008.
87. Global Zero, [www.globalzero.org/paris-conference](http://www.globalzero.org/paris-conference)
88. Helmut Schmidt, Richard von Weizsäcker, Egon Bahr and Hans-Dietrich Genscher, "Towards a Nuclear-Free World: a German View", International Herald Tribune, January 9, 2009.
89. Hans M. Kristensen and Elliot Negin, "Support Growing for Removal of U.S. Nuclear Weapons from Europe", Common Dreams Newscenter, first posted May 6, 2005.
90. David Krieger, "President-elect Obama and a World Free of Nuclear Weapons", Nuclear Age Peace Foundation Website, 2008.
91. J.L. Henderson, *Hiroshima*, Longmans (1974).
92. A. Osada, *Children of the A-Bomb, The Testament of Boys and Girls of Hiroshima*, Putnam, New York (1963).
93. M. Hachiya, M.D., *Hiroshima Diary*, The University of North Carolina Press, Chapel Hill, N.C. (1955).
94. M. Yass, *Hiroshima*, G.P. Putnam's Sons, New York (1972).
95. R. Jungk, *Children of the Ashes*, Harcourt, Brace and World (1961).
96. B. Hirschfield, *A Cloud Over Hiroshima*, Baily Brothers and Swinfin Ltd. (1974).
97. J. Hersey, *Hiroshima*, Penguin Books Ltd. (1975).
98. R. Rhodes, *Dark Sun: The Making of the Hydrogen Bomb*, Simon and Schuster, New York, (1995)
99. R. Rhodes, *The Making of the Atomic Bomb*, Simon and Schuster, New York, (1988).
100. D.V. Babst et al., *Accidental Nuclear War: The Growing Peril*, Peace Research Institute, Dundas, Ontario, (1984).
101. S. Britten, *The Invisible Event: An Assessment of the Risk of Accidental or Unauthorized Detonation of Nuclear Weapons and of War by Miscalculation*, Menard Press, London, (1983).
102. M. Dando and P. Rogers, *The Death of Deterrence*, CND Publications, London, (1984).
103. N.F. Dixon, *On the Psychology of Military Incompetence*, Futura, London, (1976).
104. D. Frei and C. Catrina, *Risks of Unintentional Nuclear War*, United Nations, Geneva, (1982).
105. H. L'Etang, *Fit to Lead?*, Heinemann Medical, London, (1980).
106. SPANW, *Nuclear War by Mistake - Inevitable or Preventable?*, Swedish Physicians Against Nuclear War, Lulea, (1985).
107. J. Goldblat, *Nuclear Non-proliferation: The Why and the Wherefore*, (SIPRI Publications), Taylor and Francis, (1985).
108. IAEA, *International Safeguards and the Non-proliferation of Nuclear Weapons*, International Atomic Energy Agency, Vienna, (1985).
109. J. Schear, ed., *Nuclear Weapons Proliferation and Nuclear Risk*, Gower, London, (1984).
110. D.P. Barash and J.E. Lipton, *Stop Nuclear War! A Handbook*, Grove Press, New York, (1982).

111. C.F. Barnaby and G.P. Thomas, eds., *The Nuclear Arms Race: Control or Catastrophe*, Francis Pinter, London, (1982).
112. L.R. Beres, *Apocalypse: Nuclear Catastrophe in World Politics*, Chicago University press, Chicago, IL, (1980).
113. F. Blackaby et al., eds., *No-first-use*, Taylor and Francis, London, (1984).
114. NS, ed., *New Statesman Papers on Destruction and Disarmament* (NS Report No. 3), New Statesman, London, (1981).
115. H. Caldicot, *Missile Envy: The Arms Race and Nuclear War*, William Morrow, New York, (1984).
116. R. Ehrlich, *Waging the Peace: The Technology and Politics of Nuclear Weapons*, State University of New York Press, Albany, NY, (1985).
117. W. Epstein, *The Prevention of Nuclear War: A United Nations Perspective*, Gunn and Hain, Cambridge, MA, (1984).
118. W. Epstein and T. Toyoda, eds., *A New Design for Nuclear Disarmament*, Spokesman, Nottingham, (1975).
119. G.F. Kennan, *The Nuclear Delusion*, Pantheon, New York, (1983).
120. R.J. Lifton and R. Falk, *Indefensible Weapons: The Political and Psychological Case Against Nuclearism*, Basic Books, New York, (1982).
121. J.R. Macy, *Despair and Personal Power in the Nuclear Age*, New Society Publishers, Philadelphia, PA, (1983).
122. A.S. Miller et al., eds., *Nuclear Weapons and Law*, Greenwood Press, Westport, CT, (1984).
123. MIT Coalition on Disarmament, eds., *The Nuclear Almanac: Confronting the Atom in War and Peace*, Addison-Wesley, Reading, MA, (1984).
124. UN, *Nuclear Weapons: Report of the Secretary-General of the United Nations*, United Nations, New York, (1980).
125. IC, *Proceedings of the Conference on Understanding Nuclear War*, Imperial College, London, (1980).
126. B. Russell, *Common Sense and Nuclear Warfare*, Allen and Unwin, London, (1959).
127. F. Barnaby, *The Nuclear Age*, Almqvist and Wiksell, Stockholm, (1974).
128. D. Albright, F. Berkhout and W. Walker, *Plutonium and Highly Enriched Uranium 1996: World Inventories, Capabilities and Policies*, Oxford University Press, Oxford, (1997).
129. G.T. Allison et al., *Avoiding Nuclear Anarchy: Containing the Threat of Loose Russian Nuclear Weapons and Fissile Material*, MIT Press, Cambridge MA, (1996).
130. B. Bailin, *The Making of the Indian Atomic Bomb: Science, Secrecy, and the Post-colonial State*, Zed Books, London, (1998).
131. G.K. Bertsch and S.R. Grillot, (Eds.), *Arms on the Market: Reducing the Risks of Proliferation in the Former Soviet Union*, Routledge, New York, (1998).
132. P. Bidawi and A. Vanaik, *South Asia on a Short Fuse: Nuclear Politics and the Future of Global Disarmament*, Oxford University Press, Oxford, (2001).
133. F.A. Boyle, *The Criminality of Nuclear Deterrence: Could the U.S. War on Terrorism Go Nuclear?*, Clarity Press, Atlanta GA, (2002).

134. G. Burns, *The Atomic Papers: A Citizen's Guide to Selected Books and Articles on the Bomb, the Arms Race, Nuclear Power, the Peace Movement, and Related Issues*, Scarecrow Press, Metuchen NJ, (1984).
135. L. Butler, *A Voice of Reason*, The Bulletin of Atomic Scientists, **54**, 58-61, (1998).
136. R. Butler, *Fatal Choice: Nuclear Weapons and the Illusion of Missile Defense*, Westview Press, Boulder CO, (2001).
137. R.P. Carlisle (Ed.), *Encyclopedia of the Atomic Age*, Facts on File, New York, (2001).
138. G.A. Cheney, *Nuclear Proliferation: The Problems and Possibilities*, Franklin Watts, New York, (1999).
139. A. Cohen, *Israel and the Bomb*, Colombia University Press, New York, (1998).
140. S.J. Diehl and J.C. Moltz, *Nuclear Weapons and Nonproliferation: A Reference Handbook*, ABC-Clio Information Services, Santa Barbara CA, (2002).
141. H.A. Feiveson (Ed.), *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-alerting of Nuclear Weapons*, Brookings Institution Press, Washington D.C., (1999).
142. R. Hilsman, *From Nuclear Military Strategy to a World Without War: A History and a Proposal*, Praeger Publishers, Westport, (1999).
143. International Physicians for the Prevention of Nuclear War and The Institute for Energy and Environmental Research *Plutonium: Deadly Gold of the Nuclear Age*, International Physicians Press, Cambridge MA, (1992).
144. R.W. Jones and M.G. McDonough, *Tracking Nuclear Proliferation: A Guide in Maps and Charts, 1998*, The Carnegie Endowment for International Peace, Washington D.C., (1998).
145. R.J. Lifton and R. Falk, *Indefensible Weapons: The Political and Psychological Case Against Nuclearism*, Basic Books, New York, (1982).
146. J. Rotblat, J. Steinberger and B. Udgaonkar (Eds.), *A Nuclear-Weapon-Free World: Desirable? Feasible?*, Westview Press, (1993).
147. The United Methodist Council of Bishops, *In Defense of Creation: The Nuclear Crisis and a Just Peace*, Graded Press, Nashville, (1986).
148. U.S. Congress Office of Technology Assessment (Ed.), *Dismantling the Bomb and Managing the Nuclear Materials*, U.S. Government Printing Office, Washington D.C., (1993).
149. S.R. Weart, *Nuclear Fear: A History of Images*, Harvard University Press, (1988).
150. P. Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age*, University of North Carolina Press, (1985).
151. A. Makhijani and S. Saleska, *The Nuclear Power Deception: Nuclear Mythology From Electricity 'Too Cheap to Meter' to 'Inherently Safe' Reactors*, Apex Press, (1999).
152. C. Perrow, *Normal Accidents: Living With High-Risk Technologies*, Basic Books, (1984).
153. P. Rogers, *The Risk of Nuclear Terrorism in Britain*, Oxford Research Group, Oxford, (2006).
154. MIT, *The Future of Nuclear Power: An Interdisciplinary MIT Study*, <http://web.mit.edu/nuclearpow> (2003).

155. Z. Mian and A. Glaser, *Life in a Nuclear Powered Crowd*, INES Newsletter No. 52, 9-13, April, (2006).
156. E. Chivian, and others (eds.), *Last Aid: The Medical Dimensions of Nuclear War*, W.H. Freeman, San Fransisco, (1982).

## Some organizations working for peace and international law

- Pugwash Conferences on Science and World Affairs, <https://pugwash.org/>
- International Network of Engineers and Scientists for Global Responsibility (INES), <http://www.ippnw.org/>
- The Nuclear Age Peace Foundation, <https://www.wagingpeace.org/>
- The International Peace Bureau (IPB), <http://www.ipb.org/>
- UNESCO Campaign for a Culture of Peace, <http://en.unesco.org/events/national-campaign-promotion-culture-peace-among-youth-cameroon>
- Global Zero, <https://www.globalzero.org/>
- Abolition 2000, <http://www.abolition2000.org/en/>
- Nuclear Abolition Forum, <http://www.abolitionforum.org/>
- International Campaign to Abolish Nuclear Weapons (ICAN), <http://www.icanw.org/>
- Campaign for Nuclear Disarmament (CND), <http://www.cnduk.org/>
- World Association of World Federalists, <http://www.wfuna.org/partner/world-federalist-movement-institute-for-global-policy-wfm-igp>
- Stocckholm International Peace Research Institute (SIPRI), <https://www.sipri.org/>
- Peace Research Institute, Oslo, <https://www.prio.org/>
- Hiroshima Peace Memorial Museum, <http://hpmmuseum.jp/?lang=eng>
- United Nations Integrated Peacebuilding Office, <https://uniogbis.unmissions.org/en>
- The Committee for a Sane Nuclear Policy, <https://sites.google.com/a/nyu.edu/nuclearnyc/antinuclear-movement-1950s-1960s/sane>
- Middle Powers Initiative, <http://www.middlepowers.org/>
- Bertrand Russell Peace Foundation, <http://www.russfound.org/>
- Gandhi International Institute of Peace, <http://www.gandhianpeace.com/>
- Danish Peace Academy, <http://www.fredsakademiet.dk/faquk.htm>

## INTERVIEW WITH EDITOR BINU MATHEW

Binu Mathew lives and works in India, and he is the brilliant and courageous Editor of the Internet news website “Countercurrents”. In April, 2017, he came to my home in Denmark to interview me. Here is a transcript of the interview:

### The interview

**Binu Mathew:** I have a fascination to know how life evolved on this earth, and what's its future. Your wonderful book, “Information Theory and Evolution” answers almost all these questions. What prompted you to write the book?

**John Avery:** During the summers of 1960 and 1961, while I was still a postgraduate student in theoretical physics at the University of Chicago, I had the privilege of spending two summers working in the laboratory of the great Hungarian-American physiologist and biochemist, Albert Szent-Györgyi. He was famous for isolating vitamin C and for discovering the molecular mechanism of muscle contraction. But more importantly, he founded a new field of study: Bioenergetics.

Szent-Györgyi wondered how the chemical energy from food is harnessed to do mechanical work or to drive our metabolisms. He reasoned that there must be structures in living organisms which are analogous to the structures of engines. If you pour gasoline onto the street and set fire to it, no useful work results, only heat, but if you burn it inside an engine, the chemical energy of the gasoline can be converted into useful mechanical work. Following this line of thought, Szent-Györgyi looked for energy-transducing structures in the tissues of living organisms.

Among the structures that caught Szent-Györgyi's attention were mitochondria, which power the metabolism of all animals, and he also studied the microscopic photosynthetic unit (thylakoids) in plants. After some years of work, he became convinced that quantum theory was needed in order to gain a complete understanding of how these microscopic engines work. Therefore he spent a year at the Institute for Advanced Study in Princeton, where he learned quite a lot of quantum theory.

Although he knew enough quantum theory to understand what physicists were talking about, he nevertheless thought that for the research which he wanted to undertake, he needed to collaborate with people whose whole education was in that field, and he brought some theoretical physicists (including me) to his laboratory. During the time that I was there, we worked to obtain a quantum theoretical understanding of the mechanism of the primary process in photosynthesis, where the energy of a photon is stabilized and trapped, ready to drive the synthesis of sugars.

In 1969, after I had obtained a Ph.D. in theoretical chemistry from Imperial College, University of London, and was teaching there, Plenum Press invited me to start a new journal and to become its first Managing Editor: It was called “The Journal of Bioenergetics and Biomembranes”. (I think that Szent-Györgyi must have recommended me

for this task). I served as editor until 1980. During that time, I am proud to say, our authors included Peter Mitchell and Jens C. Skou, whose papers were being refused by other journals at the time, but who each later won a Nobel Prize.

In 1973, for family reasons, I moved permanently to the University of Copenhagen. One of the courses I helped to teach there was on “Statistical Mechanics from the Standpoint of Information Theory”. What a title! My Copenhagen colleague, Dr. Knud Andersen, who had initiated this course, was really ahead of his time! I learned a great deal from helping him to teach the course.

Also, for many years, I taught physical chemistry to biologists. In this field, the concept of Gibbs free energy is very central. In a chemical reaction, the entropy (i.e. disorder) of the universe must always increase, as is required by the second law of thermodynamics. Entropy is a measure of disorder, and the universe always moves towards a state of greater disorder. To say this is the same as saying that the universe always moves from less probable configurations to states of greater and greater probability. We can create local order, but only by exporting disorder to the universe as a whole. In chemical thermodynamics, the requirement that Gibbs free energy must always decrease in a spontaneous chemical reaction is equivalent to saying that the entropy of the universe must always increase, but it allows us to take into account the fact that chemical reactions usually occur at constant temperature and pressure.

In addition to teaching courses in chemistry and physics, I also taught a course on “Science and Society”. This was a history of science and its enormous social impact. An enlarged and updated version of the book that I wrote for this course has recently been published by World Scientific. One of the features of my Science and Society course was that we had many exciting guest lecturers. Among these were Dr. Claus Emmeche and Dr. Luis Emilio Bruni, both of whom were experts in the new field of Biosemiotics, which regards information as the central feature of living organisms. Listening to their wonderful lectures, I found a criticism forming in my mind: They did not distinguish between cybernetic information and thermodynamic information. In other words, they did not distinguish between the information contained in messages, and the information content of Gibbs free energy. I decided that I would try to write a book which would make this distinction clear, but the project was left “on the back burner”, and I took no steps towards starting it.

However, a few years later, when I was visiting the Harvard laboratory of the famous chemical physicist Professor Dudley R. Herschbach, he took me to lunch with his post-graduate student, Anita Goel. She was in a special Harvard-MIT program where she was simultaneously obtaining both her Ph.D. in chemical physics and her M.D.

After lunch, I spent the afternoon talking with Anita, and I told her about the information theory book that I was vaguely planning to write. Listening to her reaction, I realized that this was an extremely hot topic. Anita told me that there were many other people working hard on these questions, although they perhaps did not have exactly my angle of approach. I decided to start writing immediately.

Anita was very good at asking questions, and during the whole afternoon she asked me more and more about how my planned book would be organized. How would I explain

this, and how that? Which topics should come first and which afterwards? Her excellent questions forced me to find answers. At the end of the afternoon, I returned to my lodgings and wrote down in detail my whole conversation with Anita.

By a coincidence, when I returned to Copenhagen, I found on my desk a letter from the World Scientific Publishing Company asking whether I had any writing plans in which they might be interested. I immediately formalized the outline that I had written at Harvard, and sent it to them; but I did not think that they could find a reviewer who had a background both in information theory and in biology.

To my amazement, World Scientific found a Swedish professor with a background in both fields. He wrote an extremely long review of my book proposal, many times the usual length, criticizing some aspects of my proposed outline, suggesting improvements, and finally recommending publication.

Biosemiotics experts like Claus and Luis, but in fact they liked what I had written. Recently World Scientific asked me to produce a new edition, incorporating the latest research. Today, if one includes topics like artificial life and computer technology inspired by mechanisms of the brain, the field is developing with great speed. MIT, where I graduated with a B.Sc. in 1954, now has a Department of Cognitive Science, in which half the researchers are looking more and more deeply at how the brain works, while the other half are producing hardware and software that mimic the functions of the brain, including learning and intuition.

**Binu Mathew:** I also have a fascination for the second law of thermodynamics, and how it affects every aspect of our life. Youve wonderfully connected the evolution of life and the second law of thermodynamics. Can you explain briefly for CC readers how both these phenomena are connected?

**John Avery:** The second law of thermodynamics states that the entropy (disorder) of the universe constantly increases. This follows from the fact that disorder is more statistically probable than order. For example, if we put a completed jigsaw puzzle into the bottom of a box, and shake the box, a disordered jumble of pieces results. The reverse process is virtually impossible. We could never, or almost never, put disordered pieces of a puzzle into a box, shake it, and then to find the completed puzzle in the bottom.

Since disorder (entropy) always increases, how is it possible that the world we see around us so highly ordered? How is life possible? How is the Taj Mahal possible? How is the internet possible?

The answer is that the earth is not a closed system. A flood of information-containing free energy reaches the earth's biosphere in the form of sunlight. Passing through the metabolic pathways of living organisms, this information keeps the organisms far away from thermodynamic equilibrium, which is death. As the thermodynamic information flows through the biosphere, much of it is degraded to heat, but part is converted into cybernetic information and preserved in the intricate structures which are characteristic of life. The principle of natural selection ensures that when this happens, the configurations of matter in living organisms constantly increase in complexity, refinement and statistical

improbability. This is the process which we call evolution, or in the case of human society, progress.

In his 1944 book, “What is Life”, Erwin Schrödinger (one of the main founders of quantum theory) showed that, even at that early date, he was already aware of how life and entropy are related. He wrote: “What is that precious something contained in our food which keeps us from death? That is easily answered. Every process, event, happening, call it what you will; in a word, everything that is going on in Nature means an increase of the entropy of the part of the world where it is going on. Thus a living organism continually increases its entropy, or if you will, produces positive entropy., which is death. It can only keep aloof from it, i.e. alive, by continually drawing from its environment negative entropy”

“Entropy, taken with a negative sign, is itself a measure of order. Thus the device by which an organism maintains itself at a fairly high level of orderliness (= a fairly low level of entropy) really consists in sucking orderliness from its environment.”

**Binu Mathew:** The information revolution has made life easier for many of us humans, even helping us to be born. But it has also destroyed our ecosystems, putting our own life, and the life of our fellow species, into peril. Can we use the information revolution to our advantage to save the planet?

**John Avery:** Cultural evolution depends on the non-genetic storage and transmission, diffusion and utilization of information. The development of human speech, the invention of writing, the development of paper and printing, and finally in modern times, mass media, computers and the Internet: all these have been crucial steps in society’s explosive accumulation of information and knowledge. Human cultural evolution proceeds at a constantly accelerating speed; so great in fact that it threatens to shake society to pieces.

Within rapidly-moving cultural evolution, we can observe that technical change now moves with such astonishing rapidity that neither social institutions, nor political structures, nor education, nor public opinion can keep pace. The lightning-like pace of technical progress has made many of our ideas and institutions obsolete. For example, the absolutely sovereign nation-state and the institution of war have both become dangerous anachronisms in an era of instantaneous communication, global interdependence and all-destroying weapons.

In many respects, human cultural evolution can be regarded as an enormous success. However, at the start of the 21st century, most thoughtful observers agree that civilization is entering a period of crisis. As all curves move exponentially upward, population, production, consumption, rates of scientific discovery, and so on, one can observe signs of increasing environmental stress, while the continued existence and spread of nuclear weapons threaten civilization with destruction. Thus, while the explosive growth of knowledge has brought many benefits, the problem of achieving a stable, peaceful and sustainable world remains serious, challenging and unsolved.

The achievements of modern society are achievements of cooperation. We can fly, but no one builds an airplane alone. We can cure diseases, but only through the cooperative efforts



of researchers, doctors and medicinal firms. We can photograph and understand distant galaxies, but the ability to do so is built on the efforts of many cooperating individuals.

Looking at human nature, both from the standpoint of evolution and from that of everyday experience, we see the two faces of Janus: one face shines radiantly; the other is dark and menacing. Two souls occupy the human breast, one warm and friendly, the other, murderous. Humans have developed a genius for cooperation, the basis for culture and civilization; but they are also capable of genocide; they were capable of massacres during the Crusades, capable of genocidal wars against the Amerinds, capable of the Holocaust, of Hiroshima, of the killing-fields of Cambodia, of Rwanda, and of Darfur.

This being so, there are strong reasons to enlist the help of education and religion to make the bright side of human nature win over the dark side. Today, the mass media are an important component of education, and thus the mass media have a great responsibility for encouraging the cooperative and constructive side of human nature rather than the dark and destructive side. Our almost miraculous means of communication, if properly used, offer us the possibility of welding humanity into a single cooperative society.

**Binu Mathiew:** Like every activity on earth, economic activity also is a dissipative form of energy flow. Why is so much income disparity taking place? According to a recent Oxfam report, eight people own as much wealth as the poorest half of humanity. How do you explain it? Do you think that the second law of thermodynamics should be made an essential part of our educational system, especially in economics?

**John Avery:** With your permission, I will try to answer your last question first. I absolutely agree with you that the concept of entropy and the second law of thermodynamics ought to be made an essential part of our educational system, especially in economics. Although classical economic theory leaves it out entirely, a few pioneers of economic thought have realized that entropy and dissipation need to play an a central role in any correct theory.

One of the first people to call attention to the relationship between entropy and economics was the English radiochemist Frederick Soddy (1877-1956). Soddy won the Nobel Prize for Chemistry in 1926 for his work with Ernest Rutherford, demonstrating the transmutation of elements in radioactive decay processes. His concern for social problems then led him to a critical study of the assumptions of classical economics. Soddy believed that there is a close connection between free energy and wealth, but only a very tenuous connection between wealth and money.

He was working on these problems during the period after World War I, when England left the gold standard, and he advocated an index system to replace it. In this system, the Bank of England would print more money and lend it to private banks whenever the cost of standard items indicated that too little money was in circulation, or conversely destroy printed money if the index showed the money supply to be too large.

Soddy was extremely critical of the system of “fractional reserve banking” whereby private banks keep only a small fraction of the money that is entrusted to them by their depositors and lend out the remaining amount. He pointed out that, in this system, the

money supply is controlled by the private banks rather than by the government, and that profits made from any expansion of the money supply go to private corporations instead of being used to provide social services. When the economy is expanding, this system is unjust but not disastrous. However, when the economy contracts, depositors ask for their money; but it is not there, having been lent out; and the banks crash. Fractional reserve banking exists today, not only in England but also in many other countries. Soddy's criticisms of this practice casts light on the subprime mortgage crisis of 2008 and the debt crisis of 2011.

As Soddy pointed out, real wealth is subject to the second law of thermodynamics. As entropy increases, real wealth decays. He contrasted this with the behavior of debt at compound interest, which increases exponentially without any limit, and he remarked: "You cannot permanently pit an absurd human convention, such as the spontaneous increment of debt [compound interest] against the natural law of the spontaneous decrement of wealth [entropy]".

Thus, in Soddy's view, it is a fiction to maintain that being owed a large amount of money is a form of real wealth. Frederick Soddy's book, "Wealth, virtual wealth and debt: The solution of the economic paradox", published in 1926 by Allen and Unwin, was received by the professional economists of the time as the quixotic work of an outsider. Today, however, Soddy's common-sense economic analysis is increasingly valued for the light that it throws on the instability of our fractional reserve banking system as economic growth falters.

The incorporation of the idea of entropy into economic thought also owes much to the mathematician and economist Nicholas Georgescu-Roegen (1906- 1994), the son of a Romanian army officer. Georgescu-Roegen's talents were soon recognized by the Romanian school system, and he was given an outstanding education in Mathematics, which later contributed to his success and originality as an economist.

In Georgescu-Roegen's words, "The idea that the economic process is not a mechanical analogue, but an entropic, unidirectional transformation began to turn over in my mind long ago, as I witnessed the oil wells of the Ploesti field of both World Wars' fame becoming dry one by one, and as I grew aware of the Romanian peasants' struggle against the deterioration of their farming soil by continuous use and by rains as well. However it was the new representation of a process that enabled me to crystallize my thoughts in describing the economic process as the entropic transformation of valuable natural resources (low entropy) into valueless waste (high entropy)."

After making many technical contributions to economic theory, Georgescu-Roegen returned to this insight in his important 1971 book, *The Entropy Law and the Economic Process* (Harvard University Press, Cambridge, 1971), where he outlines his concept of bioeconomics.

Nicholas Georgescu-Roegen's influence continues to be felt today, not only through his own books and papers but also through those of his student, the distinguished economist Herman E. Daly, who for many years has been advocating a steady-state economy. As Daly points out in his books and papers, it is becoming increasingly apparent that unlimited economic growth on a finite planet is a logical impossibility. However, it is important to distinguish between knowledge, wisdom and culture, which can and should continue to



Figure 1: **The Roumanian-American mathematician, statistician and economist Nicholas Georgescu-Roegen (1906-1994) introduced the concept of entropy into economics.**

grow, and growth in the sense of an increase in the volume of material goods produced, which is reaching its limits.

Daly describes our current situation as follows: “The most important change in recent times has been the growth of one subsystem of the Earth, namely the economy, relative to the total system, the ecosphere. This huge shift from an “empty” to a “full” world is truly ‘something new under the sun’... The closer the economy approaches the scale of the whole Earth, the more it will have to conform to the physical behavior mode of the Earth... The remaining natural world is no longer able to provide the sources and sinks for the metabolic throughput necessary to sustain the existing oversized economy - much less a growing one. Economists have focused too much on the economy’s circulatory system and have neglected to study its digestive tract.”

Let me now turn to your question about enormous economic inequality. This exists today both within nations and between nations. Part of the explanation for this intolerable economic inequality can be found in the remarkable properties of exponential growth. If any quantity, for example indebtedness, is growing at the rate of 3% per year, it will double in 23.1 years; if it is growing at the rate of 4% per year, the doubling time is 17.3 years. For a 5% growth rate, the doubling time is 13.9 years, if the growth rate is 7%, the doubling time is only 9.9 years. It follows that if a debt remains unpaid for a few years, most of the repayments will go for interest, rather than for reducing the amount of the debt.

In the case of the debts of third world countries to private banks in the industrialized

parts of the world and to the IMF, many of the debts were incurred in the 1970's for purposes which were of no benefit to local populations, for example purchase of military hardware. Today the debts remain, although the amount paid over the years by the developing countries is very many times the amount originally borrowed. Third world debt can be regarded as a means by which the industrialized nations extract raw materials from developing countries without any repayment whatever. In fact, besides extracting raw materials, they extract money. The injustice of this arrangement was emphasized recently by Pope Francis in his wonderful encyclical "Laudato Si' "

Another part of the explanation lies in "resource wars", conducted by militarily powerful countries to put in place or maintain unfair trade relationships with resource-rich nations in the third world. Finally, our present economic system favors concentration of wealth. "The rich get richer, and the poor get poorer", or "To him who hath, it shall be given, but from him who hath not, even that which he hath shall be taken away". At present, powerful oligarchs use their wealth to control governments. Democracy decays, tax loopholes are found for the rich, and inequality increases. This situation, and the impossibility of perpetual growth on a finite planet, point to the need for a new economic system, a system where cooperation plays a greater role; a system with both a social conscience and an ecological conscience.

**Binu Mathiew:** The nuclear bomb is the greatest concentration of man-made energy on earth. Why is it that peace is the only software capable of diffusing this dangerous concentration of energy?

**John Avery:** Let me begin to try to answer your question by quoting Albert Szent-Györgyi: I have always found these words very enlightening and inspiring: "The story of man consists of two parts, divided by the appearance of modern science...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".

I would also like to quote from the Russell-Einstein Manifesto of 1955, the founding document of Pugwash Conferences on Science and World Affairs. The Manifesto ends with the words, "Here, then, is the problem which we present to you, stark and dreadful and inescapable. Shall we put an end to the human race, or shall mankind renounce war?..."



Figure 2: Albert Szent-Györgyi called attention to the way in which science and technology have completely changed our world. He concluded that “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.”.



Figure 3: **Sir Joseph Rotblat in his London office.**

There lies before us, if we choose, continual progress in happiness, knowledge and wisdom. Shall we instead choose death because we cannot forget our quarrels? .. We appeal as human beings to human beings: Remember your humanity and forget the rest. If you can do so, there lies before you a new Paradise; if you cannot, there lies before you the threat of universal death.”

The human tendency towards tribalism evolved when our remote ancestors lived in small, genetically homogeneous tribes, competing for territory on the grasslands of Africa. Because marriage within a tribe was much more common than marriage outside it, genes were shared within the tribe. The tribe as a whole either survived or perished. The tribe, rather than the individual was the unit upon which the Darwinian forces of natural selection acted.

Although it was a survival trait 100,000 years ago, tribalism threatens our human civilization of today with thermonuclear annihilation. As Konrad Lorenz put it, “An impartial visitor from another planet, looking at man as he is today, in his hand the atom bomb, the product of his intelligence, in his heart the aggression drive, inherited from his anthropoid ancestors, which the same intelligence cannot control, such a visitor would not give mankind much chance of survival.”

Today, at the start of the 21st century, we live in nation-states to which we feel emotions of loyalty very similar to the tribal emotions of our ancestors. The enlargement of the fundamental political and social unit has been made necessary and possible by improved transportation and communication, and by changes in the techniques of warfare.

The tragedy of our present situation is that the same forces that made the nation-state replace the tribe as the fundamental political and social unit have continued to operate with constantly increasing intensity. For this reason, the totally sovereign nation-state has become a dangerous anachronism.

Although the world now functions as a single unit because of modern technology, its political structure is based on fragments, on absolutely sovereign nation-states. They are large compared to tribes, but too small for present-day technology, since they do not include all of mankind.

The elimination of war, and the elimination of the threat of nuclear annihilation, will require effective governance at the global level. In 1995 the Nobel Peace Prize was awarded jointly to Pugwash Conferences on Science and World Affairs and to its leader, Sir Joseph Rotblat. In his acceptance speech, Sir Joseph said, "We have to extend our loyalty to the whole of the human race... A war-free world will be seen by many as Utopian. It is not Utopian. There already exist in the world large regions, for example the European Union, within which war is inconceivable. What is needed is to extend these."

**Binu Mathew:** How can information theory play a role in peace politics?

**John Avery:** Biosemiotics regards information as being the central feature of living organisms- Societies can be regarded as super-organism. One might think of extending Biosemiotics to the study of the way in which information is the central feature of the development and function of societies. Such a field of study might be called Sociosemiotics. Information theory is certainly essential to an understanding of history and to an understanding of the crisis of civilization that has been produced by the information explosion.

**Binu Mathew:** Do you see any connection between the rise of populist and even fascist leaders around the world and information theory and thermodynamics?

**John Avery:** When the earth's human population is plotted as a function of time over a period of 10,000 years, the simple mathematical function that best fits the data is not an exponentially increasing curve but a hyperbola,  $P=C/(2025-t)$ , where  $P$  is the population,  $C$  is a constant, and  $t$  is the time, measured in years. If population continued to follow this curve, it would become infinite in the year 2025, which, of course, is impossible. In fact, global population has already begun to fall below the curve. Why is the empirical curve a hyperbola rather than an exponential? We can understand this if we see the growth of population as being driven by the information explosion. According to Malthus, population always presses against its food supply. As human knowledge and control of nature increased, the food supply also increased, leading to an increase in population. But today, we are facing a crisis. Our global food supply may be hit severely by the end of the fossil fuel era, and by climate change. These factors have already produced a flood of refugees fleeing environmental catastrophes in Africa. Added to this is are millions of refugees from wars in the Middle East.

The result of the refugee crisis has been a loss of human solidarity, and the rise of

fascism. In this difficult situation, we need to regain our human solidarity. We need to fight against fascism, and to regain democratic government. We need to end the wars, which are producing many millions of refugees. We need to avoid catastrophic climate change.

**Binu Mathew:** “Post-truth” was the word of the year of 2016. Why such a word now? Was there a “pre-truth” or “truth” era? Or is there ever truth?

**John Avery:** Let me again quote Albert Szent-Györgyi. One of his remarks that I remember from the time that I worked in his laboratory was this: “The human mind was not designed by evolutionary forces for finding truth. It was designed for finding advantage”.

Napoleon Bonaparte, quoting Fontanelle, said “History is a set of agreed-upon lies”.

Members of tribelike groups throughout history have marked their identity by adhering to irrational systems of belief. Like the ritual scarification which is sometimes used by primitive tribes as a mark of identity, irrational systems of belief also mark the boundaries of groups. We parade these beliefs to demonstrate that we belong a special group and that we are proud of it. The more irrational the belief is, the better it serves this purpose. When people tell each other that they believe the same nonsense, a bond is forged between them. The worse the nonsense, the stronger the bond.

Sometimes motives of advantage are mixed in. As Szent-Györgyi observed, evolution designed the human mind, not for finding truth, but for finding advantage. Within the Orwellian framework of many modern nations, it is extremely disadvantageous to hold the wrong opinions. The wiretappers know what you are thinking. But truth has the great virtue that it allows us to accurately predict the future. If we ignore truth because it is unfashionable, or painful, or heretical, the future will catch us unprepared.

**Binu Mathew:** What do you think of fake news, and the discussions going on the mechanisms to control it?

**John Avery:** Throughout history, art was commissioned by rulers to communicate, and exaggerate their power, glory, absolute rightness, etc. to the population. Modern power-holders are also aware of the importance of propaganda. Thus the media are a battleground, where reformers struggle for attention, but are defeated with great regularity by the wealth and power of the establishment. This is a tragedy, because today, there is an urgent need to make public opinion aware of the serious threats that are facing civilization, and the steps that are needed to solve these problems. The mass media could potentially be a great force for public education, but in general, their role is not only unhelpful: it is often negative. Today we are faced with the task of creating a new global ethic in which loyalty to family, religion and nation will be supplemented by a higher loyalty to humanity as a whole. In addition, our present culture of violence must be replaced by a culture of peace. To achieve these essential goals, we urgently need the cooperation of the mass media.

How do the media fulfil this life-or-death responsibility? Do they give us insight? No, they give us pop music. Do they give us an understanding of the sweep of evolution and history? No, they give us sport. Do they give us an understanding of need for strengthening



the United Nations, and the ways that it could be strengthened? No, they give us sit-coms and soap operas. Do they give us unbiased news? No, they give us news that has been edited to conform with the interests of the military-industrial complex and other powerful lobbys. Do they present us with the need for a just system of international law that acts on individuals? On the whole, the subject is neglected. Do they tell of the essentially genocidal nature of nuclear weapons, and the need for their complete abolition? No, they give us programs about gardening and making food.

In general, the mass media behave as though their role is to prevent the peoples of the world from joining hands and working to save the world from thermonuclear and environmental catastrophes. The television viewer sits slumped in a chair, passive, isolated, disempowered and stupefied. The future of the world hangs in the balance, the fate of children and grandchildren hang in the balance, but the television viewer feels no impulse to work actively to change the world or to save it. The Roman emperors gave their people bread and circuses to numb them into political inactivity. The modern mass media seem to be playing a similar role.

Because the mass media have failed us completely, the work of independent editors like yourself has become enormously important for the future of humanity and the biosphere.

**Binu Mathew:** Do you think that humanity can tackle climate change? Do you have any suggestions?

**John Avery:** Solar power and wind energy are already much cheaper than fossil fuels if the enormous subsidies given to fossil fuel corporations are discounted. The main thing that the world needs to do is to abolish these subsidies, or, better yet, shift them to the support of renewable energy infrastructure. If this is done, then economic forces alone will produce the rapid transition to renewable energy which we so urgently need to save the planet.

Oil Change International, an organization devoted to exposing the true costs of fossil fuels, states that “Internationally governments provide at least \$775 billion to \$1 trillion annually in subsidies, not including other costs of fossil fuels related to climate change, environmental impacts, military conflicts and spending, and health impacts.”

Hope that catastrophic climate change can be avoided comes from the exponentially growing world-wide use of renewable energy, and from the fact prominent public figures, such as Pope Francis, Leonardo DiCaprio, Elon Musk, Bill McKibben, Naomi Klein and Al Gore, are making the public increasingly aware of the long-term dangers. This awareness is needed to counter the climate change denial propaganda sponsored by politicians subservient to the fossil fuel industry.

Short-term disasters due to climate change may also be sufficiently severe to wake us up. We can already see severe effects of global warming in Africa, in parts of India and in island nations threatened by rising sea levels.

**Binu Mathew:** What do you think of the attitude of people like James Lovelock, who say “enjoy life while you can”?

**John Avery:** I believe that this is a betrayal of our responsibility to our children and grandchildren and to all future generations of humans. It is also a betrayal of all the other species with which we share our beautiful planet.

We give our children loving care, but it makes no sense to do so and at the same time to neglect to do all that is within our power to ensure that they and their descendants will inherit an earth in which they can survive.

Inaction is not an option. We have to act with courage and dedication, even if the odds are against success, because the stakes are so high.

The mass media could mobilize us to action, but they have failed in their duty. Our educational system could also wake us up and make us act, but it too has failed us. The battle to save the earth from human greed and folly has to be fought in the alternative media.

We need a new economic system, a new society, a new social contract, a new way of life. Here are the great tasks that history has given to our generation: We must achieve a steady-state economic system. We must restore democracy. We must decrease economic inequality. We must break the power of corporate greed. We must leave fossil fuels in the ground. We must stabilize and ultimately reduce the global population. We must eliminate the institution of war. And finally, we must develop a more mature ethical system to match our new technology.

**Binu Mathew:** What do you think of a world 50 years from now?

**John Avery:** The future looks extremely dark because of human folly, especially the long-term future. The greatest threats are catastrophic climate change and thermonuclear war, but a large-scale global famine also has to be considered. Nevertheless, I hope for the best, and I think that it is our collective duty to work for the best. The problems that we face today are severe, but they all have rational solutions.

It is often said that ethical principles cannot be derived from science, and that they must come from somewhere else. However, when nature is viewed through the eyes of modern science, we obtain some insights which seem almost ethical in character. Biology at the molecular level has shown us the complexity and beauty of even the most humble living organisms, and the interrelatedness of all life on earth. Looking through the eyes of contemporary biochemistry, we can see that even the single cell of an amoeba is a structure of miraculous complexity and precision, worthy of our respect and wonder.

Knowledge of the second law of thermodynamics, the statistical law favoring disorder over order, reminds us that life is always balanced like a tight-rope walker over an abyss of chaos and destruction. Living organisms distill their order and complexity from the flood of thermodynamic information which reaches the earth from the sun. In this way, they create local order; but life remains a fugitive from the second law of thermodynamics. Disorder, chaos, and destruction remain statistically favored over order, construction, and complexity.

It is easier to burn down a house than to build one, easier to kill a human than to raise and educate one, easier to force a species into extinction than to replace it once it is gone,

easier to burn the Great Library of Alexandria than to accumulate the knowledge that once filled it, and easier to destroy a civilization in a thermonuclear war than to rebuild it from the radioactive ashes.

Knowing this, we can use the second law of thermodynamics to form an almost ethical insight: To be on the side of order, construction, and complexity, is to be on the side of life. To be on the side of destruction, disorder, chaos and war is to be against life, a traitor to life, an ally of death. Knowing the precariousness of life, knowing the statistical laws that favor disorder and chaos, we should resolve to be loyal to the principle of long-continued construction upon which life depends.

# CULTURAL HISTORY

## Reformed teaching of history

Human nature has two sides: It has a dark side, to which nationalism and militarism appeal; but our species also has a genius for cooperation, which we can see in the growth of culture. Our modern civilization has been built up by means of a worldwide exchange of ideas and inventions. It is built on the achievements of many ancient cultures. China, Japan, India, Mesopotamia, Egypt, Greece, the Islamic world, Christian Europe, and the Jewish intellectual traditions all have contributed. Potatoes, corn, squash, vanilla, chocolate, chilli peppers, and quinine are gifts from the American Indians.

We need to reform our educational systems, particularly the teaching of history. As it is taught today, history is a chronicle of power struggles and war, told from a biased national standpoint. We are taught that our own country is always heroic and in the right. We urgently need to replace this indoctrination in chauvinism by a reformed view of history, where the slow development of human culture is described, giving credit to all who have contributed. When we teach history, it should not be about power struggles. It should be about how human culture was gradually built up over thousands of years by the patient work of millions of hands and minds. Our common global culture, the music, science, literature and art that all of us share, should be presented as a precious heritage - far too precious to be risked in a thermonuclear war.

## Culture, education, solidarity and sustainability

Cultural and educational activities have a small ecological footprint, and therefore are more sustainable than pollution-producing, fossil-fuel-using jobs in industry. Furthermore, since culture and knowledge are shared among all nations, work in culture and education leads societies naturally towards internationalism and peace.

Economies based on a high level of consumption of material goods are unsustainable and will have to be abandoned by a future world that renounces the use of fossil fuels in order to avoid catastrophic climate change, a world where non-renewable resources such as metals will become increasingly rare and expensive. How then can full employment be maintained?

The creation of renewable energy infrastructure will provide work for a large number of people; but in addition, sustainable economies of the future will need to shift many workers from jobs in industry to jobs in the service sector. Within the service sector, jobs in culture and education are particularly valuable because they will help to avoid the disastrous wars that are currently producing enormous human suffering and millions of refugees, wars that threaten to escalate into an all-destroying global thermonuclear war.

Nor is a truly sustainable economic system utopian or impossible. To achieve it, we should begin by shifting jobs to the creation of renewable energy infrastructure, and to the fields of culture and education. By so doing we will support human solidarity and avoid the twin disasters of catastrophic war and climate change.

## **A series of books on cultural history**

I have started a series of books on the cultural history of humanity, from earliest times to the present. The series is not yet complete, but those books that are finished at present (February 2020) are listed below

## **LIVES IN ENGINEERING**

### **A new freely downloadable book**

I would like to announce the publication of a book, which reviews the development of engineering, from ancient times to the present. The book may be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2020/01/Lives-in-Engineering-by-John-Scales-Avery.pdf>

### **Human mastery over nature**

Science and engineering have combined to give humans mastery over nature. This book traces that historical development, looking mainly at the contributions of engineering. It is a success story, but human society has now reached a critical point where our mastery of nature may destroy not only nature but also ourselves.

We can take pride in human mastery over nature, but at the same time we must remember that excessive pride was called “hubris” by the ancient Greeks, and in their dramas, it was always punished by the gods. We are not outside nature. We are part of the natural world, and our survival depends on whether we respect nature, and care for it.

Chapter 11 of this book discusses Ecological Engineering, in other words, the engineering that we need to produce urgently needed renewable energy infrastructure. Without very rapid action, uncontrollable feedback loops may take over, so that human attempts to avoid catastrophic climate change will prove to be useless. We need to act very rapidly. At the same time we can be encouraged by the fact that renewables are now cheaper than fossil fuels. If governments would eliminate their direct and indirect subsidies to fossil fuel giants, the urgently needed transition to renewable energy would be driven by economic forces.

### **Society as a superorganism**

In Chapter 12 we discuss human society, viewed as a superorganism, with the global economy as its digestive system. A completely isolated human being would find it as difficult to survive for a long period of time as would an isolated ant or bee or termite. Therefore it seems correct to regard human society as a superorganism. In the case of humans, the analog of the social insects’ nest is the enormous and complex material structure of civilization. It is, in fact, what we call the human economy. It consists of functioning factories,

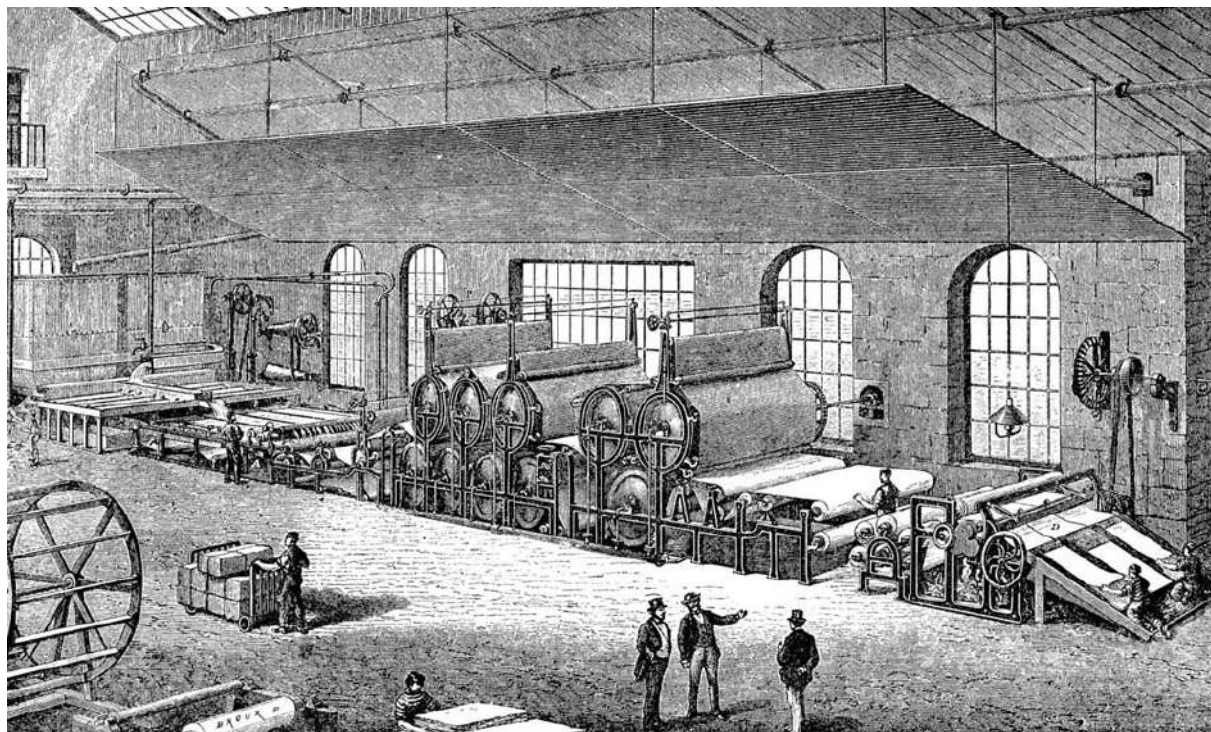


Figure 1: **LIVES IN ENGINEERING.**

farms, homes, transportation links, water supplies, electrical networks, computer networks and much more.

Almost all of the activities of modern humans take place through the medium of these external “exosomatic” parts of our social superorganism. The terms “exosomatic” and “endosomatic” were coined by the American scientist Alfred Lotka (1880-1949). A lobster’s claw is endosomatic; it is part of the lobster’s body. The hammer used by a human is exosomatic, like a detachable claw. Lotka spoke of “exosomatic evolution”, including in this term not only cultural evolution but also the building up of the material structures of civilization.

The economy associated with the human superorganism eats resources and free energy. It uses these inputs to produce local order, and finally excretes them as heat and waste. The process is closely analogous to food passing through the alimentary canal of an individual organism. The free energy and resources that are the inputs of our economy drive it just as food drives the processes of our body, but in both cases, waste products are finally excreted in a degraded form.

Almost all of the free energy that drives the human economy came originally from the sun’s radiation, the exceptions being geothermal energy which originates in the decay of radioactive substances inside the earth, and tidal energy, which has its origin in the slowing of the motions of the earth-moon system. However, since the start of the Industrial Revolution, our economy has been using the solar energy stored in of fossil fuels. These

fossil fuels were formed over a period of several hundred million years. We are using them during a few hundred years, i.e., at a rate approximately a million times the rate at which they were formed.

The present rate of consumption of fossil fuels is more than 14 terawatts and, if used at the present rate, fossil fuels would last less than a century. However, because of the very serious threats posed by climate change, human society must very rapidly stop the consumption of coal, oil and natural gas if the worst consequences of global warming are to be avoided.

### **We need a new economic system**

Economists are not used to thinking of the long-term future. We can see this in their attitude to economic growth, a concept which mainstream economists support with almost-religious fervor. But the unlimited growth of anything physical on a physically finite planet is a logical impossibility. To avoid this logic, mainstream economists, with self-imposed shortsightedness, willfully limit their view of the future to a few decades. However, the climate crisis is a long-term multi- generational issue. Young people throughout the world are rightly protesting that their long-term future is being blighted by today's greed.

A few far-sighted economists outside the mainstream, for example Herman Daly, have made extensive studies of Steady-State Economics. Logic tells us that this must become the economics of the future, replacing the growth-worshipping and greed-sanctioning economics of today.

## **LIVES IN ASTRONOMY**

### **A new freely downloadable book**

I would like to announce the publication of a book, which reviews the lives and thoughts of some of the women and men who have contributed importantly to the development of astronomy, from ancient times to the present. The book may be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2020/01/Lives-in-Astronomy-by-John-Scales-Avery.pdf>

### **Our enormous universe**

From prehistoric times until the present, every culture has tried to explain the origin of the universe, the Sun, Moon and stars, and the Earth, with its humans, plants and animals. In the earliest of these creation myths, imaginative poetical images predominate. The myths of creation were handed down orally, and to hold the attention of listeners, the stories had to be dramatic and entertaining.

Gradually, over many thousands of years, astronomy developed, and the Earth began to lose its privileged position as the center of the universe. During the Hellenistic Era, (323 B.C.-31 B.C.), Aristarchus of Samos developed a sun-centered cosmology, which was



Figure 2: **LIVES IN ASTRONOMY.**

forgotten during the Middle Ages, but rediscovered and further developed during the Renaissance by Copernicus, Tycho Brahe, Galileo and Kepler. The work of Isaac Newton brought order and universal natural laws into our picture of the solar system.

Finally, in modern times, the discoveries of Einstein, Hubble, Penzias and Wilson have given us a picture of an almost indescribably vast universe, in which our solar system appears only as an insignificant speck.

Today we are “lost in the stars”. Our planet no longer seems to be the center of the universe, about which everything else revolves. Nevertheless, the Earth is our home, and it is enormously important not only to all humans, but also to the plants and animals with which we share the gift of life. The Earth may be just a small blue speck, drifting onwards in the dark immensity of space, but it is our home, and we must work with courage and dedication to care for it. We must give our children a future world in which they can survive.



## LIVES IN CHEMISTRY

### A freely-downloadable book

I would like to announce the publication of a new book with the title “Lives in Chemistry”. The book traces the development of chemistry from earliest times to the present, through the lives of some of the women and men who have contributed importantly to the development of the subject. The book may be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/11/Lives-in-Chemistry-by-John-Scales-Avery.pdf>

### The Chemical Revolution

Robert Boyle was the first important figure in what has been called the Chemical Revolution. This revolution is described in Chapters 5-11 of the present book, while later developments are discussed in Chapters 12-16.

- Robert Boyle (1627-1691)
- Joseph Black (1728-1799)
- Henry Cavendish (1731-1810)
- Joseph Priestley (1733-1804)
- Antoine Lavoisier (1743-1794)
- John Dalton (1766-1844)
- Amedeo Avogadro (1776-1856)
- Joseph Gay-Lussac (1778-1850)
- Humphry Davy (1778-1829)
- Jöns Jacob Berzelius (1779-1848)
- Michael Faraday (1791-1867)
- Dmitri Mendeleev (1834-1907)
- Josiah Willard Gibbs (1839-1903)
- Ludwig Boltzmann (1844-1906)
- Max Planck (1858-1947)
- Svante Arrhenius (1859-1927)
- Albert Einstein (1879-1955)
- Niels Bohr (1885-1962)
- Erwin Schrödinger (1887-1961)
- Wolfgang Pauli (1900-1958)

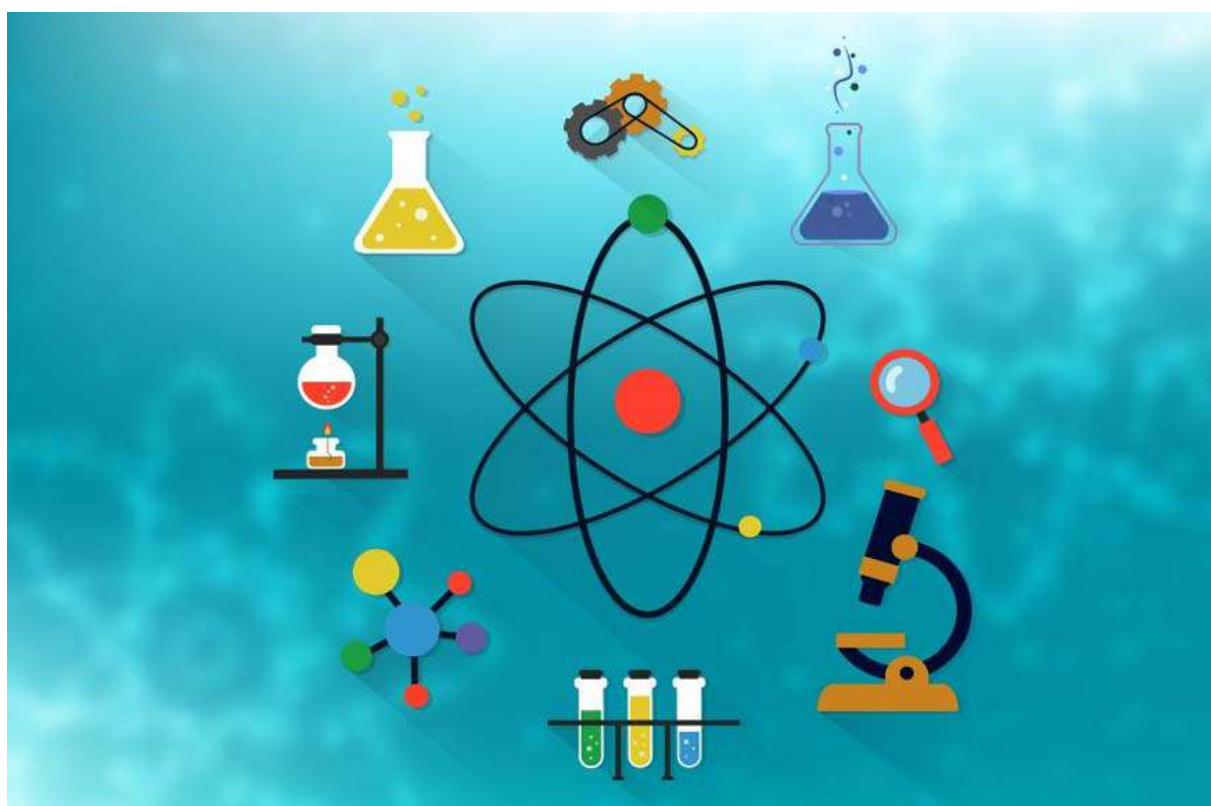


Figure 3: **LIVES IN CHEMISTRY.**

## More recent developments

- Wilhelm Conrad Röntgen (1845-1923)
- Sir William Henry Bragg (1862-1942)
- Gilbert N. Lewis (1875-1946)
- Sir William Lawrence Bragg (1880-1971)
- Erich Hückel (1896-1980)
- Robert S. Mulliken (1896-1986)
- Douglas Hartree (1897-1958)
- Vladimir A. Fock (1898-1974)
- Linus Pauling (1901-1994)
- John Desmond Bernal (1901-1971)
- Dorothy Crowfoot Hodgkin (1910-1994)
- Charles Coulson (1910-1974)
- Francis Crick (1916-2004)
- Maurice Wilkins (1916-2004)
- Per-Olov Löwdin (1916-2000)
- Sir John Kendrew (1917-1997)
- Clemens C.J. Roothaan (1918-2019)
- Alberte Pullman (1920-2011)
- Sir Geoffrey Wilkinson (1921-1996)
- James Dewey Watson (born in 1928)
- Rosalind Franklin (1929-1958)
- Dudley Robert. Herschbach (born in 1932)
- Jean-Marie Lehn (born in 1939)

## LIVES IN MEDICINE

### A new freely downloadable book

I would like to announce the publication of a book, which reviews the history of medicine through the lives and thoughts of some of the women and men who have contributed importantly to the field.. The book covers developments from ancient times to the present, and modern topics, such as biosemiotics, cloning and theories of the origin of life are included. The book can be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/09/Lives-in-Medicine-John-Scales-Avery.pdf>

### Table of contents of “Lives in Medicine”

1. HYPOCRATES AND GALEN
2. THE BUKHT-YISHU FAMILY
3. AVICENNA



Figure 4: **LIVES IN MEDICINE.**

4. LEONARDO'S ANATOMICAL STUDIES
5. EPIDEMICS OF PLAGUE AND CHOLERA
6. JENNER
7. PASTEUR
8. EHRLICH, MECHNIKOV AND JERNE
9. FLEMMING, FLOREY AND CHAIN
10. SZENT-GYÖRGYI
11. CRICK AND WATSON
12. THE ORIGIN OF LIFE
13. HODGKIN, HUXLEY AND ECCLES
14. PATHFINDING
15. SOME MODERN DEVELOPMENTS

## **LIVES IN ECOLOGY**

### **A new freely downloadable book**

I would like to announce the publication of a book, which reviews the lives and thoughts of some of the women and men who have addressed the crucial problems of ecology and sustainability that we are currently facing. I have tried to let them speak to us in their own words. The book may be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/09/Lives-in-Ecology-by-John-Scales-Avery.pdf>

### **We face an ecological crisis**

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.

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,



Figure 5: **LIVES IN ECOLOGY.**

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 a sustainable way, in harmony with nature. This is exactly what the highly industrial North must learn to do.

### **We need their voices today!**

How can we avoid the ecological megacatastrophe that is currently threatening both human society and the biosphere? How can we achieve a stable and sustainable global society? Voices from those who have thought deeply about the problems can help us. We need their voices today!

### **Table of contents of “Lives in Ecology”**

1. INDIGENOUS PEOPLES
2. SAINT FRANCIS

3. HENRY DAVID THOREAY
4. JOHN MUIR
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6. RACHEL CARSON
7. JANE GOODALL
8. HUMAN ECOLOGY
9. WANGARI MAATHAI
10. POPE FRANCIS I
11. JAMES HANSEN, BILL MCKIBBEN AND AOC
12. NAOMI KLEIN
13. HELENA NORBERG-HODGE AND MAUDE BARLOW
14. SIR DAVID ATTENBOROUGH
15. AL GORE
16. GRETA THUNBERG

## **LIVES IN PHYSICS**

### **A new freely-downloadable book**

I would like to announce the publication of a new book, which discusses the development of physics from earliest times until the present. The book may be freely downloaded and circulated from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/07/Lives-in-Physics-by-John-Scales-Avery.pdf>

### **Science has developed with constantly-accelerating speed**

40,000 years ago, our hunter-gatherer ancestors were making paintings of the animals that they hunted on the walls of the caves in which they lived. Only a blink of an eye later on the vast time-scale of evolutionary history, they were speculating about the existence of atoms. After another brief tick of the evolutionary clock, humans had invented the atomic bomb.

## Genetic evolution contrasted with cultural evolution

Humans, like all animals and plants, transmit genetic information to future generations by means of the DNA and RNA macromolecules. The slow process of genetic evolution takes place through the genetic lottery, in which characteristics from one parent or the other are transmitted to the next generation in a random way. Also, random mutations of the parents DNA or RNA sometimes occur. Natural selection ensures that when these random variations are favorable, they survive, while if they are unfavorable they are discarded. Most mutations result in very early spontaneous abortions of which the mother is not even conscious.

Genetic evolution is a very slow process. Genetically we are almost identical with our hunter-gatherer ancestors of 40,000 years ago; but cultural evolution has changed our way of life beyond recognition.

Although other animals have languages, the amazing linguistic abilities of humans exceed these by many orders of magnitude. The acquisition of humans' unique linguistic abilities seems to have occurred about 100,000-200,000 years ago. I have discussed a possible genetic mechanism for this abrupt change in another book, *Languages and Classification*, (2917)<sup>1</sup>.

The highly developed languages of our species initiated our lightning-like cultural evolution, which has completely outpaced genetic evolution, and allowed humans to grow from a few million hunter-gatherers to a population of more than seven billion, to which a billion are being added every decade. Today we are so numerous that humans threaten to destroy the global environment by the sheer weight of numbers.

## Acceleration of cultural evolution

Human cultural evolution began to accelerate with the invention and spread of agriculture. It began to move faster still with the invention of writing, followed by paper, ink, printing, and printing with movable type. In our own time, with transistors, microelectronics, the Internet, cell phones, Skype, and Wikipedia, cultural evolution has exploded into a constantly-morphing world-changing force.

## Institutional and cultural inertia

If we look more closely at cultural evolution, we can see that it is divided into two main parts, with different rates of change. Science and technology are changing with breathtaking and constantly accelerating speed, while laws, economic practices, education, religion, ethics and political structures change more slowly. The contrast between these two rates of change has severely stressed and endangered modern human society.

For example, we still preserve the concept of the absolutely sovereign nation-state, but instantaneous global communications and economic interdependence, and all-destroying modern weapons have made this concept a dangerous anachronism. As another example,

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<sup>1</sup><http://eacpe.org/about-john-scales-avery/>



we can think of our fossil-fuel-based economic system which has been made anachronistic by the urgent need to halt CO<sub>2</sub> emissions before feedback loops take over and make human efforts to avoid catastrophic climate change futile. As a third example, we can think of social practices, such as child marriage in Africa, which lead to very high birth rates and the threat of future famine. We urgently need new ethical, educational, legal, social and political systems which will be appropriate to our new science and technology.

### **Tribalism and the institution of war**

Compared with cultural evolution of all kinds, genetic evolution is extremely slow. Genetically and emotionally, we are almost identical to our hunter-gatherer ancestors, who lived in small tribes, competing with other tribes for territory on the grasslands of Africa. Thus it is not surprising that inherited human nature contains an element of what might be called “tribalism” - the tendency to be kind and loyal to members of one’s own group, and sometimes murderously hostile towards outsiders that are perceived as threats. The willingness of humans to sacrifice their own lives in defense of their group is explained by population genetics, which regards the group rather than the individual as the unit upon which the Darwinian forces of natural selection act.

Because human emotions contain this tendency towards tribalism, the military-industrial complexes of our modern world, and their paid political servants, find it easy to persuade citizens that they are threatened by this or that outside nation, and that obscenely large military budgets are justified.

Today the world spends 1.7 trillion dollars each year on armaments, an almost unimaginably large amount of money. It is the huge river of money that drives and perpetuates the institution of war. But today, the threat of a thermonuclear war is one of the two existential threats to human civilization and the biosphere, the other being the threat of catastrophic climate change.

### **Physicists have known sin**

J. Robert Oppenheimer, the leader of the Los Alamos project that constructed the first nuclear bomb, said, “In some sort of crude sense which no vulgarity, no humor, no overstatement can quite extinguish, the physicists have known sin; and this is a knowledge which they cannot lose.” He also said, “If atomic bombs are to be added as new weapons to the arsenals of a warring world, or to the arsenals of the nations preparing for war, then the time will come when mankind will curse the names of Los Alamos and Hiroshima. The people of this world must unite or they will perish.”.

### **Science and democracy**

It matters a great deal whether the results of science and technology are used constructively or whether they are used in way that harm human society or the environment. In a democracy, decisions decisions of this kind ought to be made by all of the voters. It is

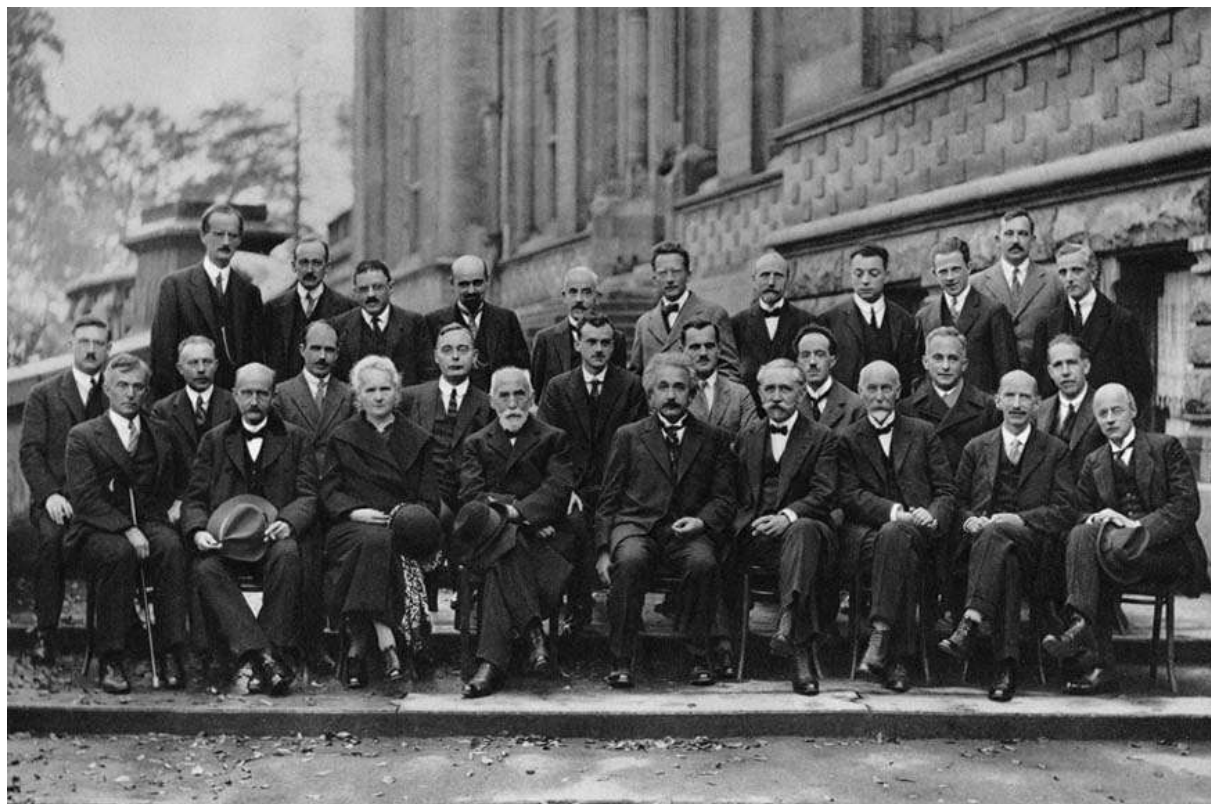


Figure 6: **LIVES IN PHYSICS.**

therefore important that a qualitative understanding of science should be part of everyone's education.

I hope that this book will contribute to the goal of making the history of physics and its social impact available to a wide audience. I have tried to tell the story through the lives of a few of the people who have contributed importantly to the development of physics, not in an exhaustive way, but rather letting the lives of few researchers stand for many others who could equally well have been chosen. I hope that you will enjoy the book.

#### **Table of contents of “Lives in Physics”**

1. THE ATOMISTS
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3. GALILEO
4. NEWTON
5. GALVANI AND VOLTA
6. FARADAY AND MAXWELL

7. EINSTEIN
8. THOMSON
9. RUTHERFORD
10. BOHR
11. QUANTUM THEORY
12. FERMI
13. BARDEEN

## **LIVES IN ECONOMICS**

### **Their lives can help us today**

would like to announce the publication of a book describing the lives of some of the people who have contributed importantly to economic thought. Their lives can help us today, as the world faces a crisis that has both economic dimensions. The book can be freely downloaded from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/06/Lives-in-economics-by-John-Scales-Avery.pdf>

### **The climate crisis**

Appendix A outlines the present climate emergency, made vivid by the October 2018 report of the Intergovernmental Panel on Climate Change. In the words of 16-year-old Swedish climate activist Greta Thunberg, According to the IPCC, we are less than 12 years away from not being able to undo our mistakes. In that time, unprecedented changes in all aspects of society need to have taken place, including a reduction of our CO<sub>2</sub> emissions by at least 50

Although the worst consequences of out-of-control catastrophic climate change lie in the long-term future, the steps needed to avoid disaster must be taken immediately. Otherwise feedback loops such as the albedo effect or the methane hydrate feedback loop will take hold in earnest, making human mitigation efforts useless.

There is a contrast between two time scales; a contrast between the need for immediate action and the long time-delay until the worst effects of inaction are felt. This contrast is our central problem in dealing with the climate emergency. If all coastal cities were already under water, if monsoons were already failing, if fresh water were already unavailable, if heatwaves were already killing millions of people and destroying agriculture, it would be easier to mobilize the political will needed for abrupt change.



Figure 7: **LIVES IN ECONOMICS.**

### **Economists and the long-term future**

Economists are not used to thinking of the long-term future. We can see this in their attitude to economic growth, a concept which mainstream economists support with almost-religious fervor. But the unlimited growth of anything physical on a physically finite planet is a logical impossibility. To avoid this logic, mainstream economists, with self-imposed shortsightedness, willfully limit their view of the future to a few decades. However, the climate crisis is a long-term multi-generational issue. Young climate activists across the globe, rightfully protest the fact that the climate inaction of adults is depriving them of their future. We give our children loving care, but it makes no sense to do so unless we give them a future in which they can survive.

With a little thought, we can see that all future generations need to be considered. No one should want the human race to become extinct in a few thousand years. Nor should we wish the natural world to be destroyed. We have a responsibility to all future generations and to all the plants and animals with which we share the gift of life.

## **Transition to a sustainable future**

The Green New Deal concept that is currently being advocated, both in the United States and in other countries, offers a way of addressing both the climate crisis and the economic shocks that may result from abandoning our fossil-fuel-dependent economy. John Maynard Keynes advised Franklin D. Roosevelt on methods for ending the Great Depression of the 1930's. The Green New Deal seeks to do something very similar in our present situation, to address unemployment through government-supported jobs creating much-needed renewable energy infrastructure. Although renewables are now cheaper than fossil fuels, so that a transition might be driven by market forces alone, the changes must happen rapidly, and governments must play an important role in the transition to a sustainable future. Government subsidies must be shifted from fossil fuels to renewables.

## **A crisis of civilization**

History has given to our generation the task of saving the future. As Greta Thunberg said in her 2019 speech at the Davos Economic Forum, "We are at a time in history where everyone with any insight of the climate crisis that threatens our civilization - and the entire biosphere - must speak out in clear language, no matter how uncomfortable and unprofitable that may be. We must change almost everything in our current societies. The bigger your carbon footprint, the bigger your moral duty. The bigger your platform, the bigger your responsibility."

## **Table of contents of "Lives in Ecology"**

1. THE MEDICIS
2. ADAM SMITH
3. THOMAS ROBERT MALTHUS
4. THE UTOPIAN SOCIALISTS
5. THE REFORM MOVEMENT IN ENGLAND
6. THOREAU, VEBLEN AND GANDHI
7. JOHN MAYNARD KAYNES
8. ADDICTION TO GROWTH
9. WE CAN AFFORD THE GREEN NEW DEAL
10. COOPERATION AND RECIPROCITY
11. THE URGENT NEED FOR RENEWABLE ENERGY

## **LIVES IN THE PEACE MOVEMENT**

### **A new book**

I would like to announce the publication of a book describing the lives of some of the people who have contributed importantly to the peace movement. The book can be freely downloaded from the following link:

<http://eacpe.org/app/wp-content/uploads/2019/06/Lives-in-the-peace-movement-by-John-Scales-Avery.pdf>

I hope that the lives of these women and men can inspire us as we work together to abolish the institution of war. Today, war has been made prohibitively dangerous by the destructiveness of modern weapons, and the abolition of war is an essential condition for the survival of human civilization. But we can hope for a better future. It is not an impossible goal to think of enlarging the already-large groups of the modern world to include all of humanity. On our small but beautiful earth, made small by technology, made beautiful by nature, there is room for one group only: the all-inclusive family of humankind.

### **Human greed and folly**

Today, human greed and folly are destroying the global environment. As if this were not enough, there is a great threat to human civilization and the biosphere from an all-destroying thermonuclear war. Both of these severe existential threats are due to faults in our inherited emotional nature.

From the standpoint of evolutionary theory, this is a paradox. As a species, we are well on the way to committing collective suicide, driven by the flaws in human nature. But isn't natural selection supposed to produce traits that lead to survival? Today, our emotions are not leading us towards survival, but instead driving us towards extinction. What is the reason for this paradox?

Can biological science throw any light on the problem of why our supposedly rational species seems intent on choosing war, pain and death instead of peace, happiness and life? To answer this question, we need to turn to the science of ethology - the study of inherited emotional tendencies and behavior patterns in animals and humans.

### **Ethology**

In "The Origin of Species", Charles Darwin devoted a chapter to the evolution of instincts, and he later published a separate book on "The Expression of Emotions in Man and Animals". Because of these pioneering studies, Darwin is considered to be the founder of ethology.

The study of inherited behavior patterns in animals (and humans) was continued in the 20th century by such researchers as Karl von Frisch (1886-1982), Nikolaas Tinbergen (1907-1988), and Konrad Lorenz (1903-1989), three scientists who shared a Nobel Prize in Medicine and Physiology in 1973.

The third of the 1973 prizewinners, Konrad Lorenz, is controversial, but at the same time very interesting in the context of studies of the causes of war and discussions of how war may be avoided. As a young boy, he was very fond of animals, and his tolerant parents allowed him to build up a large menagerie in their house in Altenberg, Austria. Even as a child, he became an expert on waterfowl behavior, and he discovered the phenomenon of imprinting. He was given a one day old duckling, and found, to his intense joy, that it transferred its following response to his person. As Lorenz discovered, young waterfowl have a short period immediately after being hatched, when they identify as their “mother” whomever they see first. In later life, Lorenz continued his studies of imprinting, and there exists a touching photograph of him, with his white beard, standing waist deep in a pond, surrounded by an adoring group of goslings who believe him to be their mother. Lorenz also studied bonding behavior in waterfowl.

## **On Aggression**

It is, however, for his controversial book “On Aggression” that Konrad Lorenz is best known. In this book, Lorenz makes a distinction between intergroup aggression and intragroup aggression. Among animals, he points out, rank-determining fights are seldom fatal. Thus, for example, the fights that determine leadership within a wolf pack end when the loser makes a gesture of submission. By contrast, fights between groups of animals are often fights to the death, examples being wars between ant colonies, or of bees against intruders, or the defense of a rat pack against strange rats.

Many animals, humans included, seem willing to kill or be killed in defense of the communities to which they belong. Lorenz calls this behavioral tendency a communal defense response. He points out that the “holy shiver” - the tingling of the spine that humans experience when performing a heroic act in defense of their communities - is related to the prehuman reflex for raising the hair on the back of an animal as it confronts an enemy - a reflex that makes the animal seem larger than it really is.

In his book “On Aggression”, Konrad Lorenz gives the following description of the emotions of a hero preparing to risk his life for the sake of the group:

“In reality, militant enthusiasm is a specialized form of communal aggression, clearly distinct from and yet functionally related to the more primitive forms of individual aggression. Every man of normally strong emotions knows, from his own experience, the subjective phenomena that go hand in hand with the response of militant enthusiasm. A shiver runs down the back and, as more exact observation shows, along the outside of both arms. One soars elated, above all the ties of everyday life, one is ready to abandon all for the call of what, in the moment of this specific emotion, seems to be a sacred duty. All obstacles in its path become unimportant; the instinctive inhibitions against hurting or killing one’s fellows lose, unfortunately, much of their power. Rational considerations, criticisms, and all reasonable arguments against the behavior dictated by militant enthusiasm are silenced by an amazing reversal of all values, making them appear not only untenable, but base and dishonorable.

“Men may enjoy the feeling of absolute righteousness even while they commit atrocities.

Conceptual thought and moral responsibility are at their lowest ebb. As the Ukrainian proverb says: ‘When the banner is unfurled, all reason is in the trumpet’.

Lorenz goes on to say, “An impartial visitor from another planet, looking at man as he is today - in his hand the atom bomb, the product of his intelligence - in his heart the aggression drive, inherited from his anthropoid ancestors, which the same intelligence cannot control - such a visitor would not give mankind much chance of survival.”

### **The mystery of self-sacrifice in war**

In an essay entitled *The Urge to Self-Destruction*, Arthur Koestler wrote: “Even a cursory glance at history should convince one that individual crimes, committed for selfish motives, play a quite insignificant role in the human tragedy compared with the numbers massacred in unselfish love of one’s tribe, nation, dynasty, church or ideology...Wars are not fought for personal gain, but out of loyalty and devotion to king, country or cause...”

“We have seen on the screen the radiant love of the Führer on the faces of the Hitler Youth... They are transfixed with love, like monks in ecstasy on religious paintings. The sound of the nation’s anthem, the sight of its proud flag, makes you feel part of a wonderfully loving community. The fanatic is prepared to lay down his life for the object of his worship, as the lover is prepared to die for his idol. He is, alas, also prepared to kill anybody who represents a supposed threat to the idol.” The emotion described here by Koestler is the same as the communal defense mechanism (“militant enthusiasm”) described in biological terms by Lorenz.

Generations of schoolboys have learned the Latin motto: “*Dulce et decorum est pro patria mori*” - it is both sweet and noble to die for one’s country. Even in today’s world, death in battle in defense of country and religion is still praised by nationalists. However, because of the development of weapons of mass destruction, both nationalism and narrow patriotism have become dangerous anachronisms.

In thinking of violence and war, we must be extremely careful not to confuse the behavioral patterns that lead to wife-beating or bar-room brawls with those that lead to episodes like the trench warfare of the First World War, or to the nuclear bombing of Hiroshima and Nagasaki. The first type of aggression is similar to the rank-determining fights of animals, while the second is more akin to the team-spirit exhibited by a football side. Heroic behavior in defense of one’s community has been praised throughout the ages, but the tendency to such behavior has now become a threat to the survival of civilization, since tribalism makes war possible, and war with thermonuclear weapons threatens civilization with catastrophe.

Warfare involves not only a high degree of aggression, but also an extremely high degree of altruism. Soldiers kill, but they also sacrifice their own lives. Thus patriotism and duty are as essential to war as the willingness to kill. As Arthur Koestler points out, “Wars are not fought for personal gain, but out of loyalty and devotion to king, country or cause...”

Tribalism involves passionate attachment to one’s own group, self-sacrifice for the sake of the group, willingness both to die and to kill if necessary to defend the group from its enemies, and belief that in case of a conflict, one’s own group is always in the right.



## **Population genetics**

If we examine altruism and aggression in humans, we notice that members of our species exhibit great altruism towards their own children. Kindness towards close relatives is also characteristic of human behavior, and the closer the biological relationship is between two humans, the greater is the altruism they tend to show towards each other. This profile of altruism is easy to explain on the basis of Darwinian natural selection since two closely related individuals share many genes and, if they cooperate, the genes will be more effectively propagated.

To explain from an evolutionary point of view the communal defense mechanism discussed by Lorenz - the willingness of humans to kill and be killed in defense of their communities - we have only to imagine that our ancestors lived in small tribes and that marriage was likely to take place within a tribe rather than across tribal boundaries. Under these circumstances, each tribe would tend to consist of genetically similar individuals. The tribe itself, rather than the individual, would be the unit on which the evolutionary forces of natural selection would act. The idea of group selection in evolution was proposed in the 1930's by J.B.S. Haldane and R.A. Fisher, and more recently it has been discussed by W.D. Hamilton and E.O. Wilson.

According to the group selection model, a tribe whose members showed altruism towards each other would be more likely to survive than a tribe whose members cooperated less effectively. Since several tribes might be in competition for the same territory, intertribal aggression might, under some circumstances, increase the chances for survival of one's own tribe. Thus, on the basis of the group selection model, one would expect humans to be kind and cooperative towards members of their own group, but at the same time to sometimes exhibit aggression towards members of other groups, especially in conflicts over territory. One would also expect intergroup conflicts to be most severe in cases where the boundaries between groups are sharpest - where marriage is forbidden across the boundaries.

## **Military-industrial complexes**

Today the world spends more than 1.8 trillion US dollars per year on armaments. This enormous river of money, almost too large to be imagined, drives and perpetuates the institution of war. Money from immensely rich corporate oligarchs buys the votes of politicians and the propaganda of the mainstream media. Numbed by the propaganda, citizens allow the politicians to vote for obscenely bloated military budgets, which further enrich the corporate oligarchs, and the circular flow continues. The fact that inherited human nature contains an element of tribalism makes it easy for the propaganda of the powerholders to label other nations or ethnic groups as "enemies". Without enemies, industrial-military complexes would wither.

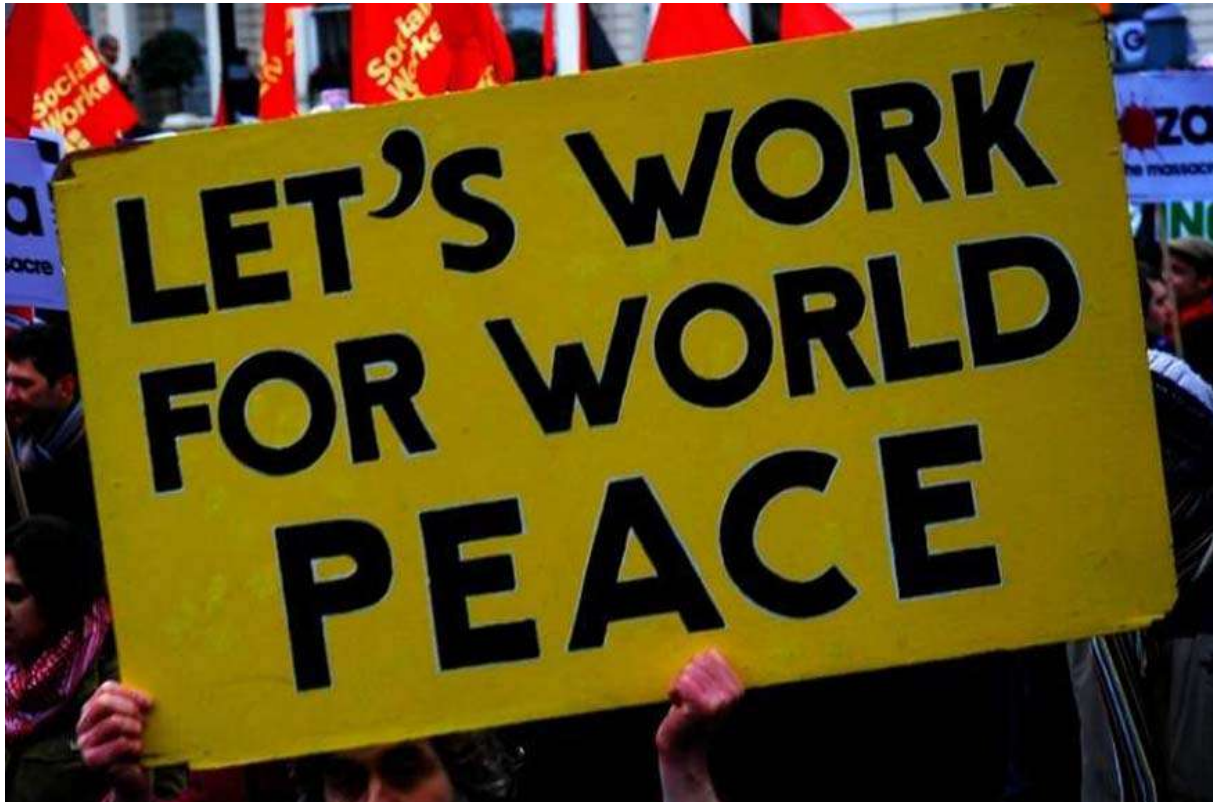


Figure 8: **LIVES IN THE PEACE MOVEMENT.**

## **Hope for the future**

Luckily, tribalism can be overwritten by ethics. Indeed, ethical education became a part of human cultural evolution in order to overwrite tribalism, when the agricultural revolution changed humans from tribal hunter-gatherers to farmers living in larger and more heterogeneous settled communities.

The social and political groups of the modern world are larger still, and are often multiracial and multiethnic. There are a number of large countries that are remarkable for their diversity, for example India, China, Brazil, and the United States. Nevertheless it has been possible to establish social cohesion and group identity within each of these enormous nations.

It is not an impossible goal to think of enlarging the already-large groups of the modern world to include all of humanity. Doing so is the great task that history has given to our generation.

## **Table of contents of “Lives in the Peace Movement”**

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2. THE BIRTH OF ETHICS

3. TOLSTOY, GANDHI AND KING
4. THREE POETS
5. BERTHA VON SUTTNER AND HELEN KELLER
6. RUSSELL, EINSTEIN AND ROTBLAT
7. MUSIC FOR PEACE
8. MAIREAD CORRIGAN MAGUIRE
9. GLOBAL ZERO
10. DAISAKU IKEDA AND SGI
11. DAVID KRIEGER AND RICHARD FALK
12. ICAN'S NOBEL LECTURE
13. PEACE EDUCATION