

COLLECTED ESSAYS, Part 3
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January 2, 2016

Collected Essays Volume 3
by John Scales Avery

Published in 2016 by
Irene Publishing, Sparsnäs, Sweden
irene.publishing@gmail.com
www.irenepublishing.com
Cover design: Jørgen Johansen
Layout: John Avery
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ISBN 978-1-326-48436-1 90000



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Introduction

This book contains a collection of articles, most of which were first published in *Countercurrents*, Professor Johan Galtung's *Transcend Media Service Weekly Digest*, and in *Human Wrongs Watch* during the second half of 2014 and in 2015. A few of the essays were published in *Cadmus* or *Eru-dito*, journals of the World Academy of Art and Science. I am extremely grateful to the editors of these journals for their help and encouragement.

I hope that readers will enjoy this book and will forgive whatever they find unpleasant and offensive in it. I have tried my best to tell the truth, even at the risk of unpleasantness, because I think that our present global situation is so precarious that we need to analyse the crisis in every possible way, and to urgently search for rational solutions.

FEDERALISM AND GLOBAL GOVERNANCE

Introduction

It is becoming increasingly clear that the concept of the absolutely sovereign nation-state is a dangerous anachronism in a world of thermonuclear weapons, instantaneous communication, and economic interdependence. Probably our best hope for the future lies in developing the United Nations into a World Federation. The strengthened United Nations should have a legislature with the power to make laws that are binding on individuals, and the ability to arrest and try individual political leaders for violations of these laws. The world federation should also have the power of taxation, and the military and legal powers necessary to guarantee the human rights of ethnic minorities within nations.

Making the United Nations into a World Federation

A federation of states is, by definition, a limited union where the federal government has the power to make laws that are binding on individuals, but where the laws are confined to interstate matters, and where all powers not expressly delegated to the federal government are retained by the individual states. In other words, in a federation each of the member states runs its own internal affairs according to its own laws and customs; but in certain agreed-on matters, where the interests of the states overlap, authority is specifically delegated to the federal government.

Since the federal structure seems well suited to a world government with limited and carefully-defined powers that

would preserve as much local autonomy as possible, it is worthwhile to look at the histories of a few of the federations. There is much that we can learn from their experiences.

The Success of Federations

Historically, the federal form of government has proved to be extremely robust and successful. Many of today's nations are federations of smaller, partially autonomous, member states. Among these nations are Argentina, Australia, Austria, Belgium, Brazil, Canada, Germany, India, Mexico, Russia, Spain, South Africa and the United States.

The Swiss Federation is an interesting example, because it's regions speak three different languages: German, French and Italian. In 1291, citizens of Uri, Schwyz and Unterwalden, standing on the top of a small mountain called Rütli, swore allegiance to the first Swiss federation with the words "we will be a one and only nation of brothers". During the 14th century, Luzern, Zürich, Glarus, Zug and Bern also joined. Later additions during the 15th and 16th centuries included Fribourg, Solothurn, Basel, Schaffhausen and Appenzell. In 1648 Switzerland declared itself to be an independent nation, and in 1812, the Swiss Federation declared its neutrality. In 1815, the French-speaking regions Valais, Neuchatel and Genève were added, giving Switzerland its final boundaries.

In some ways, Switzerland is a very advanced democracy, and many issues are decided by the people of the cantons in direct referendums. On the other hand, Switzerland was very late in granting votes to women (1971), and it was only in 1990 that a Swiss federal court forced Appenzell Innerrhoden to comply with this ruling. Switzerland was also very late in joining the United Nations (10 September, 2002).

The Federal Constitution of United States of America is one of the most important and influential constitutions in history. It later formed a model for many other governments, especially in South America. The example of the United States is especially interesting because the original union of states formed by the Articles of Confederation in 1777 proved to be too weak, and it had to be replaced eleven years later by a federal constitution.

During the revolutionary war against England the 13 former colonies sent representatives to a Continental Congress, and on May 10, 1776, the Congress authorized each of the colonies to form its own local provincial government. On July 4, 1776 it published a formal Declaration of Independence. The following year, the Congress adopted the Articles of Confederation defining a government of the new United States of America. The revolutionary war continued until 1783, when the Treaty of Paris was signed by the combatants, ending the war and giving independence to the United States. However, the Articles of Confederation soon proved to be too weak. The main problem with the Articles was that laws of the Union acted on its member states rather than on individual citizens.

In 1787, a Constitutional Convention was held in Philadelphia with the aim of drafting a new and stronger constitution. In the same year, Alexander Hamilton began to publish the Federalist Papers, a penetrating analysis of the problems of creating a workable government uniting a number of semi-independent states. The key idea of the Federalist Papers is that the coercion of states is neither just nor feasible, and that a government uniting several states must function by acting on individuals. This central idea was incorporated into the Federal Constitution of the United States, which was adopted in 1788. Another important feature of the new Con-



Figure 1: *Alexander Hamilton, author of the “Federalist Papers”. He pointed out that the coercion of states is neither just nor feasible, and that a government uniting several states must function by acting on individuals. Public Domain, Wikimedia Commons*

stitution was that legislative power was divided between the Senate, where the states had equal representation regardless of their size, and the House of Representatives, where representation was proportional to the populations of the states. The functions of the executive, the legislature and the judiciary were separated in the Constitution, and in 1789 a Bill of Rights was added.

George Mason, one of the architects of the federal constitution of the United States, believed that “such a government was necessary as could directly operate on individuals, and would punish those only whose guilt required it”, while

James Madison (another drafter of the U.S. federal constitution) remarked that the more he reflected on the use of force, the more he doubted “the practicability, the justice and the efficacy of it when applied to people collectively, and not individually”. Finally, Alexander Hamilton, in his *Federalist Papers*, discussed the Articles of Confederation with the following words: “To coerce the states is one of the maddest projects that was ever devised... Can any reasonable man be well disposed towards a government which makes war and carnage the only means of supporting itself - a government that can exist only by the sword? Every such war must involve the innocent with the guilty. The single consideration should be enough to dispose every peaceable citizen against such a government... What is the cure for this great evil? Nothing, but to enable the... laws to operate on individuals, in the same manner as those of states do.”

Because the states were initially distrustful of each other and jealous of their independence, the powers originally granted to the US federal government were minimal. However, as it evolved, the Federal Government of the United States gradually became stronger, and bit by bit it became involved in an increasingly wide range of activities.

The formation of the federal government of Australia is interesting because it illustrates the power of ordinary citizens to influence the large-scale course of events. In the 19th century, the six colonies British that were later to be welded into the Commonwealth of Australia imposed tariffs on each other, so that citizens living near the Murray River (for example) would have to stop and pay tolls each time they crossed the river. The tolls, together with disagreements over railways linking the colonies, control of river water and other common concerns, finally became so irritating that citizens' leagues sprang up everywhere to demand federation.

By the 1890's such federation leagues could be found in cities and towns throughout the continent. In 1893, the citizens' leagues held a conference in Corowa, New South Wales, and proposed the "Corowa Plan", according to which a Constitutional Convention should be held. After this, the newly drafted constitution was to be put to a referendum in all of the colonies. This would be the first time in history that ordinary citizens would take part in the nation-building process. In January, 1895, the Carawa Plan was adopted by a meeting of Premiers in Hobart, and finally, despite the apathy and inaction of many politicians, the citizens had their way: The first Australian federal election was held March, 1901, and on May 9, 1901, the Federal Parliament of Australia opened. Australia was early in granting votes for women (1903). Its voting system has evolved gradually. Today there is a system of compulsory voting by citizens for both the Australian House of Representatives and the Australian Senate.

The successes and problems of the European Union provide invaluable experience as we consider the measures that will be needed to make the United Nations into a federation. On the whole, the EU has been an enormous success, demonstrating beyond question that it is possible to begin with a very limited special-purpose federation and to gradually expand it, judging at each stage whether the cautiously taken steps have been successful. The European Union has today made war between its member states virtually impossible. This goal, now achieved, was in fact the vision that inspired the leaders who initiated the European Coal and Steel Community in 1950.

The European Union is by no means without its critics or without problems, but, as we try to think of what is needed for United Nations reform, these criticisms and problems are just as valuable to us as are the successes of the EU.

Countries that have advanced legislation protecting the rights of workers or protecting the environment complain that their enlightened laws will be nullified if everything is reduced to the lowest common denominator in the EU. This complaint is a valid one, and two things can be said about it: Firstly, diversity is valuable, and therefore it may be undesirable to homogenize legislation, even if uniform rules make trade easier. Secondly, if certain rules are to be made uniform, it is the most enlightened environmental laws or labor laws that ought to be made the standard, rather than the least enlightened ones. Similar considerations would hold for a reformed and strengthened United Nations.

Another frequently heard complaint about the EU is that it takes decision-making far away from the voters, to a remote site where direct political will of the people can hardly be felt. This criticism is also very valid. Often, in practice, the EU has ignored or misunderstood one of the basic ideas of federalism: A federation is a compromise between the desirability of local self-government, balanced against the necessity of making central decisions on a few carefully selected issues.

As few issues as possible should taken to Bruxelles, but there are certain issues that are so intrinsically transnational in their implications that they must be decided centrally. This is the principle of subsidiarity, so essential for the proper operation of federations - local government whenever possible, and only a few central decisions when absolutely necessary. In applying the principle of subsidiarity to a world government of the future, one should also remember that UN reform will take us into new and uncharted territory. Therefore it is prudent to grant only a few carefully chosen powers, one at a time, to a reformed and strengthened UN, to see how these work, and then to cautiously grant other

powers, always bearing in mind that wherever possible, local decisions are the best.

Weakness of the U.N. Charter and Steps Towards a World Federation

Laws must be made binding on individuals

Among the weaknesses of the present U.N. Charter is the fact that it does not give the United Nations the power to make laws which are binding on individuals. At present, in international law, we treat nations as though they were persons: We punish entire nations by sanctions when the law is broken, 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. To be effective, the United Nations needs a legislature with the power to make laws which are binding on individuals, and the power to arrest individual political leaders for flagrant violations of international law.

The present United Nations Charter is similar to the United States Articles of Confederation, a fatally weak union that lasted only eleven years, from 1777 to 1788. Like it, the UN attempts to act by coercing states. Although the United Nations Charter has lasted almost sixty years and has been enormously valuable, its weaknesses are also apparent, like those of the Articles. One can conclude that the proper way to reform the United Nations is to make it into a full federation, with the power to make and enforce laws that are binding on individuals.

The International Criminal Court, which was established when the Rome Treaty came into force in 2002, is a step in



Figure 2: *Logo of the International Criminal Court. Although it functions imperfectly today, the ICC is an extremely important step towards effective global governance, because it enforces international laws acting on individuals rather than on states. Public Domain, Wikimedia Commons*

the right direction. The ICC's jurisdiction extends only to the crime of genocide, crimes against humanity, war crimes, and (at some time in the future) the crime of aggression. In practice, the ICC is open to the criticisms that it is often unable to enforce its rulings and that it lacks impartiality. Nevertheless, the establishment of the ICC is a milestone in humanity's efforts to replace the brutal military force of powerful governments by the rule of law. For the first time in history, individuals are being held responsible for violating international laws.

The voting system of the U.N. General Assembly must be reformed

Another weakness of the present United Nations Charter is the principle of "one nation one vote" in the General Assembly. This principle seems to establish equality between nations, but in fact it is very unfair: For example it gives a citizen of China or India less than a thousandth the voting power of a citizen of Malta or Iceland. A reform of the voting system is clearly needed. (A recent and detailed discussion of these issues has been given by Dr. Francesco Stipo, Reference 1.)

One possible plan (proposed by Bertrand Russell) would be for final votes to be cast by regional blocks, each block having one vote. The blocks might be: 1) Latin America 2) Africa 3) Europe 4) North America 5) Russia and Central Asia 6) China 7) India and Southeast Asia 8) The Middle East and 9) Japan, Korea and Oceania.

Today, Ambassadors and Permanent Representatives at the United Nations are appointed by national governments. However, in the long-term future, this system may evolve into a more democratic one, where citizens will vote directly

for their representatives, as they do in many federations, such as Australia, Germany, the United States and the European Union.

The United Nations must be given the power to impose taxes

If the UN is to become an effective World Federation, it will need a reliable source of income to make the organization less dependent on wealthy countries, which tend to give support only to those interventions of which they approve. A promising solution to this problem is the so-called "Tobin tax", named after the Nobel-laureate economist James Tobin of Yale University. Tobin proposed that international currency exchanges should be taxed at a rate between 0.1 and 0.25 percent. He believed that even this extremely low rate of taxation would have the beneficial effect of damping speculative transactions, thus stabilizing the rates of exchange between currencies. When asked what should be done with the proceeds of the tax, Tobin said, almost as an afterthought, "Let the United Nations have it."

The volume of money involved in international currency transactions is so enormous that even the tiny tax proposed by Tobin would provide the United Nations with between 100 billion and 300 billion dollars annually. By strengthening the activities of various UN agencies, the additional income would add to the prestige of the United Nations and thus make the organization more effective when it is called upon to resolve international political conflicts.

The budgets of UN agencies, such as the World Health Organization, the Food and Agricultural Organization, UNESCO and the UN Development Programme, should not just be doubled but should be multiplied by a factor of at least



Figure 3: *The Nobel-laureate economist, James Tobin. He proposed that international currency transactions be taxed at an extremely small rate, in order to stabilize exchange rates. He added, almost as an afterthought, that the proceeds should be given to the United Nations. Public Domain, Wikimedia Commons*

twenty. With increased budgets the UN agencies could sponsor research and other actions aimed at solving the world's most pressing problems - AIDS, drug-resistant infections diseases, tropical diseases, food insufficiencies, pollution, climate change, alternative energy strategies, population stabilization, peace education, as well as combating poverty, malnutrition, illiteracy, lack of safe water and so on. Scientists would be less tempted to find jobs with arms-related industries if offered the chance to work on idealistic projects. The United Nations could be given its own television channel, with unbiased news programs, cultural programs, and "State of the World" addresses by the UN Secretary General.

Besides the Tobin tax, other measures have been proposed to increase the income of the United Nations. For example, it has been proposed that income from resources of the

sea bed be given to the UN, and that the UN be given the power to tax carbon dioxide emissions. All of the proposals for giving the United Nations an adequate income have been strongly opposed by a few nations that wish to control the UN through its purse strings, especially by the United States, which has threatened to withdraw from the UN if a Tobin tax is introduced. However, it is absolutely essential for the future development of the United Nations that the organization be given the power to impose taxes. No true government can exist without this power. It is just as essential as is the power to make and enforce laws that are binding on individuals.

The United Nations must be given a standing military force

At present, when the United Nations is called upon to meet an emergency, such as preventing genocide, an *ad hoc* force must be raised, and the time required to do this often means that the emergency action is fatally delayed. The UN should immediately be given a standing force of volunteers from all nations, ready to meet emergencies. The members of this force would owe their primary loyalty to the UN, and one of its important duties would be to prevent gross violations of human rights.

In the perspective of a longer time-frame, we need to work for a world where national armies will be very much reduced in size, where the United Nations will have a monopoly on heavy armaments, and where the manufacture or possession of nuclear weapons, as well as the export of arms and ammunition from industrialized countries to the developing countries, will be prohibited. (See reference 3).

Looking towards the future, we can foresee a time when

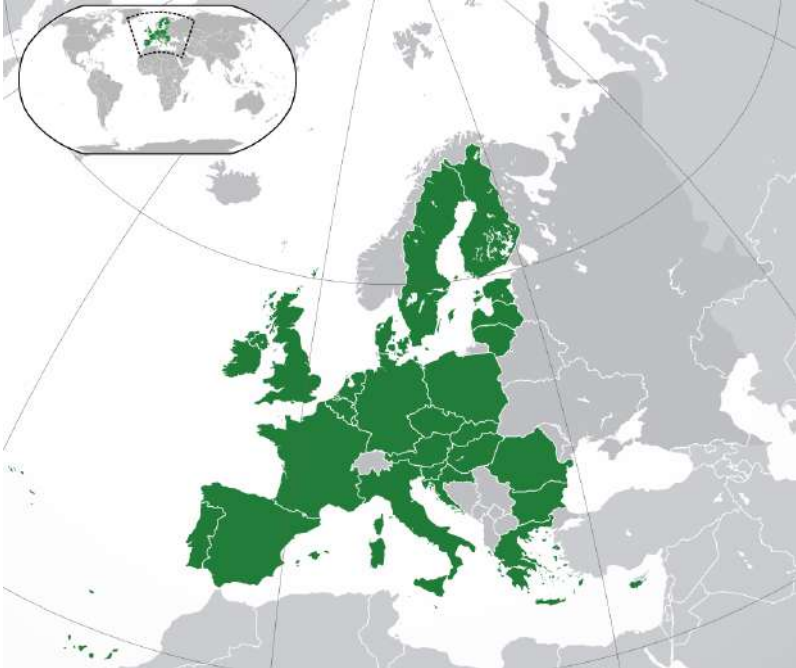


Figure 4: *A map of the European Union. Existing federations like the EU can give us insights as we work to develop the United Nations into a federation. Uploaded by Mapclean. [CC BY-SA 3.0], Wikimedia Commons*

the United Nations will have the power to make and enforce international laws which are binding on individuals. Under such circumstances, true police action will be possible, incorporating all of the needed safeguards for lives and property of the innocent.

One can hope for a future world where public opinion will support international law to such an extent that a new Hitler or Saddam Hussein or a future Milosevic will not be able to organize large-scale resistance to arrest - a world where international law will be seen by all to be just, impartial and necessary - a well-governed global community within which each person will owe his or her ultimate loyalty to humanity as a whole.

The veto power in the Security Council must be eliminated

We should remember that the UN Charter was drafted and signed before the first nuclear bomb was dropped on Hiroshima; and it also could not anticipate the extraordinary development of international trade and communication which characterizes the world today. The five permanent members of the Security Council, China, France, Russia, the United Kingdom and the United States, were the victors of World War II, and were given special privileges by the Charter as it was established in 1945, among these the power to veto UN actions on security issues. In practice, the veto power of the P5 nations has made the UN ineffective, and it has become clear that changes are needed. If the Security Council is retained in a World Federation, the veto power must be eliminated.

Subsidiarity

The need for international law must be balanced against the desirability of local self-government. Like biological diversity, the cultural diversity of humankind is a treasure to be carefully guarded. A balance or compromise between these two desirable goals can be achieved by granting only a few carefully chosen powers to a World Federation with sovereignty over all other issues retained by the member states. This leaves us with a question: Which issues should be decided centrally, and which locally?

The present United Nations Charter contains guarantees of human rights, but there is no effective mechanism for enforcing these guarantees. In fact there is a conflict between the parts of the Charter protecting human rights and the concept of absolute national sovereignty. Recent history has given us many examples of atrocities committed against ethnic minorities by leaders of nation-states, who claim that sovereignty gives them the right to run their internal affairs as they wish, free from outside interference. One feels that it ought to be the responsibility of the international community to prevent gross violations of human rights, such as genocide; and if this is in conflict with the concept of national sovereignty, then sovereignty must yield.

In the future, overpopulation and famine are likely to become increasingly difficult and painful problems in several parts of the world. Since various cultures take widely different attitudes towards birth control and family size, the problem of population stabilization seems to be one which should be decided locally. At the same time, aid for local family planning programs, as well as famine relief, might appropriately come from global agencies, such as WHO and FAO. With respect to large-scale migration, it would be un-

fair for a country which has successfully stabilized its own population, and which has eliminated poverty within its own borders, to be forced to accept a flood of migrants from regions of high fertility. Therefore the extent of immigration should be among those issues to be decided locally.

Security, and controls on the manufacture and export of armaments will require an effective authority at the global level.

The steps needed to convert the United Nations into a World Federation can be taken cautiously, one at a time. Having seen the results of a particular step, one can move on to the next. The establishment of the International Criminal Court is an important first step towards a system of international laws that acts on individuals. Another important step would be to give the UN a much larger and more reliable source of income. The establishment of a standing UN emergency military force is another step that ought to be taken in the near future.

Obstacles to a World Federation

It is easy to write down what is needed to convert the United Nations into a World Federation. But will not the necessary steps towards a future world of peace and law be blocked by the powerholders of today? Not everyone wants peace. Not everyone wants international law.¹

The United Nations was established at the end of the most destructive war the world had ever seen, and its horrors were fresh in the minds of the delegates to the 1945 San Francisco Conference. The main purpose of the Charter that they drafted was to put an end to the institution of war. It

¹The interested reader can find the “Hague Invasion Act” described on the Internet

was hoped that as a consequence, the UN would also end the colonial era, since war is needed to maintain the unequal relationships of colonialism. Neither of these things happened. War is still with us, and war is still used to maintain the intolerable economic inequalities of neocolonialism. The fact that military might is still used by powerful industrialized nations to maintain economic hegemony over less developed countries has been amply documented by Professor Michael Klare in his books on Resource Wars.

Today 2.7 billion people live on less than \$2 a day - 1.1 billion on less than \$1 per day. 18 million of our fellow humans die each year from poverty-related causes. In 2006, 1.1 billion people lacked safe drinking water, and waterborne diseases killed an estimated 1.8 million people. The developing countries are also the scene of a resurgence of other infectious diseases, such as malaria, drug-resistant tuberculosis and HIV/AIDS.²

Meanwhile, in 2011, world military budgets reached a total of 1.7 trillion dollars (i.e. 1.7 million million dollars). This amount of money is almost too large to be imagined. The fact that it is being spent means that many people are making a living from the institution of war. Wealthy and powerful lobbies from the military-industrial complex are able to influence mass media and governments. Thus the institution of war persists, although we know very well that it is a threat to civilization and that it responsible for much of the suffering that humans experience.

²It would be wrong to attribute poverty in the developing world entirely to war, and to exploitation by the industrialized countries. Rapid population growth is also a cause of poverty. Nevertheless, the enormous contrast between the rich and poor parts of the world is partly the result of unfair trade agreements imposed by means of "regime change" and "nation building", i.e. interference backed by military force.

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.

The way in which some industrialized countries maintain their control over less developed nations can be illustrated by the resource curse, i.e. the fact that resource-rich developing countries are no better off economically than those that lack resources, but are cursed with corrupt and undemocratic governments. This is because foreign corporations extracting local resources under unfair agreements exist in a symbiotic relationship with corrupt local officials.

As long as enormous gaps exist between the rich and poor nations of the world, the task turning the United Nations into an equitable and just federation will be blocked. Thus we are faced with the challenge of breaking the links between poverty and war. Civil society throughout the world must question the need for colossal military budgets, since, according to the present UN Charter, as well as the Nuremberg Principles, war is a violation of international law, except when sanctioned by the Security Council. By following this path we can free the world from the intolerable suffering caused by poverty and from the equally intolerable suffering caused by war.

Governments of large nations compared with global government

The problem of achieving internal peace over a large geographical area is not insoluble. It has already been solved.

There exist today many nations or regions within each of which there is internal peace, and some of these are so large that they are almost worlds in themselves. One thinks of China, India, Brazil, Australia, the Russian Federation, the United States, and the European Union. Many of these enormous societies contain a variety of ethnic groups, a variety of religions and a variety of languages, as well as striking contrasts between wealth and poverty. If these great land areas have been forged into peaceful and cooperative societies, cannot the same methods of government be applied globally?

Today there is a pressing need to enlarge the size of the political unit from the nation-state to the entire world. The need to do so results from the terrible dangers of modern weapons and from global economic interdependence. The progress of science has created this need, but science has also given us the means to enlarge the political unit: Our almost miraculous modern communications media, if properly used, have the power to weld all of humankind into a single supportive and cooperative society.

Bibliography

1. Francesco Stipo, *World Federalist Manifesto. Guide to Political Globalization*, (April 10, 2007), pages 1, 3, 21 and 136.
2. Francesco Stipo, *United Nations Reorganization. The Unification of the UN System*, (April 21, 2007).
3. International Commission on Peace and Food, *Uncommon Opportunities: An Agenda for Peace and Equitable Development, 2nd Edition*, pages 43-46, (2004).
4. Alexander Hamilton, James Madison and John Jay, *The Federalist Papers*, (1787-1788), Project Gutenberg.

5. Edith Wynner, *World Federal Government in Maximum Terms: Proposals for United Nations Charter Revision*, Fedonat Press, Afton N.Y., (1954).
6. Grenville Clark and Louis B. Sohn, *World Peace Through World Law*, Harvard University Press, (1958).
7. Bertrand Russell, *Has Man A Future?*, Penguin, Hammondsworth, (1961).
8. Michael Klare, *Resource Wars: The New Landscape of Global Conflict* Owl Books, New York, (reprint edition 2002).
9. Michael Klare, *Rising Powers, Shrinking Planet: The New Geopolitics of Energy*, Henry Holt & Company, (2008).
10. Michael Klare, *The Race for What's Left: The Global Scramble for the World's Last Resources*, Metropolitan Books, (2012).
11. United Nations General Assembly, *Principles of International Law Recognized in the Charter of the Nürnberg Tribunal and in the Judgment of the Tribunal*, (1950).
12. Bengt Broms, *United Nations*, Suomalainen Tiedeakatemia, Helsinki, (1990).
13. S. Rosenne, *The Law and Practice at the International Court*, Dordrecht, (1985).
14. S. Rosenne, *The World Court - What It Is and How It Works*, Dordrecht, (1995).
15. J. D'Arcy and D. Harris, *The Procedural Aspects of International Law (Book Series), Volume 25*, Transnational Publishers, Ardsley, New York, (2001).
16. H. Cullen, *The Collective Complaints Mechanism Under the European Social Charter*, European Law Review, Human Rights Survey, p. 18-30, (2000).
17. S.D. Bailey, *The Procedure of the Security Council*, Oxford, (1988).

18. R.A. Akindale, *The Organization and Promotion of World Peace: A Study of Universal-Regional Relationships*, Univ. Toronto Press, Toronto, Ont., (1976).
19. J.S. Applegate, *The UN Peace Imperative*, Vantage Press, New York, (1992).
20. S.E. Atkins, *Arms Control, Disarmament, International Security and Peace: An Annotated Guide to Sources, 1980-1987*, Clio Press, Santa Barbara, CA, (1988).
21. N. Ball and T. Halevy, *Making Peace Work: The Role of the International Development Community*, Overseas Development Council, Washington DC, (1996).
22. F. Barnaby, Ed., *The Gaia Peace Atlas: Survival into the Third Millennium*, Doubleday, New York, (1988).
23. J.H. Barton, *The Politics of Peace: An Evaluation of Arms Control*, Stanford Univ. Press, Stanford, CA, (1981).
24. W. Bello, *Visions of a Warless World*, Friends Committee on National Education Fund, Washington DC, (1986).
25. A. Boserup and A. Mack, *Abolishing War: Cultures and Institutions; Dialogue with Peace Scholars Elise Boulding and Randall Forsberg*, Boston Research Center for the Twenty-first Century, Cambridge, MA, (1998).
26. E. Boulding et al., *Bibliography on World Conflict and Peace*, Westview Press, Boulder, CO, (1979).
27. E. Boulding et al., Eds., *Peace, Culture and Society: Transnational Research Dialogue*, Westview Press, Boulder, CO, (1991).

SAVING THREATENED SPECIES

Loss of biodiversity

All of us know that the relentless growth of human population, agriculture and industry has led to great losses in biodiversity. At present, the rate of extinction is about 1000 times the normal background rate. Great efforts have been made to focus public attention on this serious problem by such organizations as The World Wildlife Fund, and by individuals such as Sir David Attenborough, Jane Goodall, E.O. Wilson, James Lovelock and Dian Fossy. The United Nations General Assembly has declared 2011-2020 to be the UN Decade of Biodiversity. Individual species, such as the panda, the California condor and the mountain gorilla have become iconic in the struggle to save threatened species. Today dams are built in such a way as to minimize their impact on fish and waterfowl.

Less well known, however, is the fact that our enormous emissions of greenhouse gases threaten to produce a human-caused 6th geological extinction event. The concentration of CO₂ in the earth's atmosphere recently passed 400 parts per million. Commenting on this event, Dr. Charles Miller of NASA said: "Current [atmospheric] CO₂ values are more than 100 ppm higher than at any time in the last one million years (and maybe higher than at any time in the last 25 million years)... These increases in atmospheric CO₂ are causing real, significant changes in the Earth system now, not in some distant future climate, and will continue to be felt for centuries to come. We can study these impacts to better understand the way that the earth will respond to future changes, but unless serious actions are taken immediately, we risk the next threshold being a point of no return..."



Figure 5: *The famous student of animal behavior Jane Goodall has worked extremely hard to save threatened species. Uploaded by Jeekc-commonswiki. [CC BY 2.5], Wikimedia Commons*

Humans are also a threatened species

Geologists studying the fossil record have observed 5 major extinction events. These are moments in the earth's history when a very large percentage of the species then living become extinct. The largest of these was the Permian-Triassic extinction event, which took place about 252 million years ago. In this catastrophic event, up to 96% of all marine species, and 70% of terrestrial vertebrates vanished forever. It is believed that this mega-disaster was caused by the greenhouse gases from massive volcanic eruptions in Siberia. But human greenhouse gas emissions could also cause such an event, if prompt steps are not taken to limit them. We must therefore make an all-out effort to switch from fossil fuels to renewable energy.

As Thom Hartmann out in an important short video, feedback loops, such as the one involving melting of methane hydrates on ocean floors, might lead to tipping points, beyond which human efforts to control climate change would have no effect.³

It is not only the California condor and the panda that we must save: It is ourselves. Humans might become extinct as the result of out-of-control climate change; or if not extinct, so much reduced in numbers that the enormous, complex and vulnerable edifice of human civilization would not survive.

The mainstream media are failing us

Despite the severity of these threats to human civilization and the biosphere, and despite the fact that wide public discussion and prompt action are needed if we are to avert disaster, the mainstream media are completely silent. They refuse

³<http://www.youtube.com/watch?v=sRGVTK-AAvw>

to touch the subject. Discussion of the dangers is confined to the scientific community. The public is left in ignorance by the mainstream media, whose goal seems to be to reassure us that we can continue indefinitely to destroy the environment for the sake of economic growth. Short-term profits of big coal and oil companies are placed above concern for the long-term future.

The Canadian environmentalist and broadcaster David Suzuki has made an interesting video in which he introduces the idea of intergenerational crimes.

We must not commit crimes against future generations. We must not commit crimes against the other living creatures with which we share our beautiful world. We must save threatened species. We must save ourselves.

THE DEVIL'S DYNAMO

Why is the military-industrial complex sometimes called “The Devil’s Dynamo”?

The 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.

The Industrial Revolution and Colonialism

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 handloom industry in England itself had done a century before.

The rapid development of technology in the west also opened an enormous gap in military strength between the in-

dustrialized nations and the rest of the world. Taking advantage of their superior weaponry, the advanced industrial nations rapidly carved the remainder of the world into colonies, which acted as sources of raw materials and food, and as markets for manufactured goods. Throughout the American continent, the native Indian population had proved vulnerable to European diseases, such as smallpox, and large numbers of them had died. The remaining Indians were driven westward by streams of immigrants arriving from Europe.

The sometimes genocidal wars waged by industrial nations against the inhabitants of Asia, Africa and the Western Hemisphere often involved almost unimaginable cruelty. We can think, for example of the atrocities committed by the army of Leopold II in Belgian Congo, where more than ten million people were killed out of a total population of 20 million. (In Leopold's Congo human hands became a sort of currency. This was because the men in Leopold's army were ordered to cut off the hands of their victims to prove that they had not wasted bullets.) We can also think of distribution of smallpox-infected blankets to the Amerinds, or the unbelievable treachery and cruelty of Conquistadors in Central America and South South America.

Often the industrialized nations made their will felt by means of naval bombardments: In 1854, Commodore Perry forced Japan to accept foreign traders by threatening to bombard Tokyo. In 1856, British warships bombarded Canton in China to punish acts of violence against Europeans living in the city. In 1864, a force of European and American warships bombarded Choshu in Japan, causing a revolution. In 1882, Alexandria was bombarded, and in 1896, Zanzibar.

Much that was beautiful and valuable was lost, as mature traditional cultures collapsed, overcome by the power and temptations of modern industrial civilization. For the

Europeans and Americans of the late 19th century and early 20th century, progress was a religion, and imperialism was its crusade.

Between 1800 and 1875, the percentage of the earth's surface under European rule increased from 35% to 67%. In the period between 1875 and 1914, there was a new wave of colonial expansion, and the fraction of the earth's surface under the domination of colonial powers (Europe, the United States and Japan) increased to 85%, if former colonies are included.

The unequal (and unfair) contest between the industrialized countries, armed with modern weapons, and the traditional cultures with their much more primitive arms, was summarized by the English poet Hilaire Belloc in a sardonic couplet: "Whatever happens, we have got The Maxim gun, and they have not."

The Maxim gun was one of the world's first automatic machine guns. It was invented in the United States in 1884 by Hiram S. Maxim. The explorer and colonialist Henry Morton Stanley (1841-1904) was extremely enthusiastic about Maxim's machine gun, and during a visit to the inventor he tried firing it, demonstrating that it really could fire 600 rounds per minute. Stanley commented that the machine gun would be "a valuable tool in helping civilization to overcome barbarism".

During the period between 1880 and 1914, British industrial and colonial dominance began to be challenged. Industrialism had spread from Britain to Belgium, Germany and the United States, and, to a lesser extent, to France, Italy, Russia and Japan. By 1914, Germany was producing twice as much steel as Britain, and the United States was producing four times as much. . New techniques in weaponry were introduced, and a naval armaments race began among the



Figure 6: *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). Source: www.snipview.com*

major industrial powers. The English found that their old navy was obsolete, and they had to rebuild. Thus, the period of colonial expansion between 1880 and 1914 was filled with tensions, as the industrial powers raced to arm themselves in competition with each other, and raced to seize as much as possible of the rest of the world.

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.

Outlawing war

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.”

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).”

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”.

The military-industrial complex

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 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.

The “New American Century”

The 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 worlds 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, into the center of the worlds political stage.

The new role as “leader of the free world” was accepted by the United States with a certain amount of nervousness. Americas 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 countrys 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”.)

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 38 countries. Of these interventions, 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.

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 Wolfowitz, Eliot Abrams, John Bolton and Richard Perle.

The idea that the United States can and should achieve global hegemony through military force seems to motivate US policy today. The goal of controlling the world's supply of scarce resources seems to be almost forgotten. Today, the motive seems to be power for the sake of power; domination for the sake of domination. But of course, the military-industrial complex does not care so deeply about resources. All that it needs to be enriched is perpetual war.

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. Ironically the military sells itself as the protector of the security of the population, but it does no such thing. On the contrary, it threatens to kill hundreds of millions of ordinary people in a nuclear war.

THE COURT OF WORLD PUBLIC OPINION

Non-violence

In struggling against governmental injustice, both in South Africa and in India, Mahatma Gandhi firmly rejected the use of violence. He did so partly because of his experience as a lawyer. In carrying out non-violent protests against oppression, Gandhi was making a case before the jury of international public opinion. He thought that he had a better chance of succeeding if he and his followers were very clearly in the right.

Furthermore, 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.”

Thus there are two elements in Gandhi’s insistence on non-violent methods of resistance: Firstly, he and the resistance movements which he led were making a case in the court of world opinion; and secondly, the result achieved is always colored by the means that are used to achieve it. In South Africa, the fact that violence was not used to end the apartheid regime was chiefly responsible for achievement of lasting peace, and the avoidance of a blood-bath. In India, the former colony parted from the British Empire in a man-

ner that was beneficial to both. India retained what was valuable in British culture.

We can remember from Richard Attenborough's splendid film of the life of Gandhi how important good reporting was to the success of India's non-violent resistance movement. Today, when the mainstream media are so thoroughly enslaved by our oligarchic governments, we might ask whether Ghandian methods of non-violent resistance can still succeed. Nevertheless, I believe that it is still worthwhile to make a clear case in the court of world opinion.

For example, I believe that the few ineffective rockets recently fired by Hamas were damaging to the Palestinian cause. They did no real harm to Israel, but they made the case far less clear. Israel, an apartheid regime far more evil than its South African counterpart ever was, justifies its genocidal atrocities by claiming that it "has a right to self-defense"; and the clarity of the situation is lost.

I believe that even in an era such as ours, where the mainstream media are so thoroughly failing us, Gandhi's non-violence is still relevant.

CLIMATE CHANGE WILL A DISASTER WAKE US UP?

Disaster!

In a 2011 interview in *The Guardian*, Sir David Attenborough was asked: “What will it take to wake people up about climate change?”. He replied “Disaster. It’s a terrible thing to say, isn’t it? And even disaster doesn’t always do it. I mean, goodness me, there have been disasters in North America, with hurricanes, and one thing and another, and floods; and still a lot of people would deny it, and say it’s nothing to do with climate change. Well it visibly has to do with climate change!”⁴

The disasters continue: In recent weeks the drought has deepened in the southwestern part of the United States, and it has reached completely unprecedented severity.⁵ The drought will have consequences, not only for the United States, but also for people throughout the world who are dependent on exports of grain grown in that region. The pumping of water from the Ogallala Aquifer has traditionally been used to supply irrigation water to the region, but over the years, the aquifer has been seriously overdrawn, and soon it will be useless.⁶

Throughout the world, water shortages produced by a combination of climate change and falling water tables threat-

⁴<http://www.theguardian.com/environment/video/2012/oct/25/david-attenborough-climate-change-video>

⁵<http://droughtmonitor.unl.edu/>

⁶<http://www.countercurrents.org/cc170714.htm>
<http://www.informationclearinghouse.info/article39077.htm>

en the food security of large portions of the world's population. At the same time, in other regions, climate change will produce more and more disastrous floods.

But are these disasters enough to wake us up to the grave dangers of runaway climate change? Or are we so addicted to the use of fossil fuels that we cannot give them up?

Is there a difference in the attitudes of ordinary people and those of corporate-controlled governments? It is certain that the fossil fuel giants are determined to convert their coal, oil and gas holdings into cash. But ordinary citizens are more responsible, as was shown by the massive popular demonstrations at COP 15 in 2009.

UN Secretary General Ban Ki-moon has invited heads of state and governments to a 2014 Climate Summit, which will take place in New York on 23 September, 2014. Many thousands of ordinary people plan to march in New York on that day, to show their concern for the future of our planet, and to demonstrate how much they desire to give future generations of humans, animals and plants a world in which survival will be possible.

In order to prevent a tipping point, after which human efforts to prevent drastic temperature increases will become ineffective, it may be necessary for ordinary people to replace their oligarchic governments with true democracies.

BOOK REVIEW:

“HIROSHIMA, AUGUST 6, 1945

A SILENCE BROKEN”

Why the book is important

The nuclear destruction of Hiroshima was a tragedy in itself, but its larger significance is that it started a nuclear arms race which today threatens to destroy human society and much of the biosphere.

Sokka Gakkai

Sokka Gakkai is a large Nichirin Buddhist religious group. Its 12 million members are centered primarily in Japan, but Sokka Gokkai International (SGI) has groups in 192 countries. In Japanese, the words “Sokka Gakkai” mean “Value-Creating Education”. The organization was started by two Japanese educators, Tsunisaburo Makiguchi and Josei Toda, both of whom were imprisoned by their government during World War II because of their opposition to militarism. Makaguchi died as a result of his imprisonment, but Josei Toda went on to found a large and vigorous educational organization dedicated to culture, humanism, world peace and nuclear abolition.

The Toda Declaration and Daisaku Ikeda’s Proposals

In 1957, before a cheering audience of 50,000 young Sokka Gakkai members, Josei Toda declared nuclear weapons to be

an absolute evil. He said that their possession is criminal under all circumstances, and he called the young people present to work untiringly to rid the world of all nuclear weapons.

Toda was the mentor of Daisaku Ikeda, the first president SGI. Every year, President Ikeda issues a Peace Proposal, calling for international understanding and dialogue, as well as nuclear abolition, and outlining practical steps by which he believes these goals may be achieved. In his 2013 Peace Proposal, Ikeda, noted that 2015 will be the 70th anniversary of the destruction of Hiroshima, and he proposed that the NPT review conference should take place in Hiroshima, rather than in New York. He proposed that this should be followed by “an expanded global summit for a nuclear-weapon-free world”

The Hiroshima Peace Committee and the last remaining hibakushas

In Japanese the survivors of injuries from the nuclear bombing of Hiroshima and Nagasaki are called “hibakushas”. Over the years, the Sokka Gakkai Hiroshima Peace Committee has published many books containing their testimonies. The most recent of these books, “A Silence Broken”, contains the testimonies of 14 men, now all in their late 70’s or in their 80’s, who are among the last few remaining hibakushas. All 14 of these men have kept silent until now because of the prejudices against hibakusha in Japan, where they and their children are thought to be unsuitable as marriage partners because of the effects of radiation. But now, for various reasons, they have chosen to break their silence. Many have chosen to speak now because of the Fukushima disaster.

The testimonies of the hibakushas give a vivid picture



Figure 7: *In 1957, before a cheering audience of 50,000 young Sokka Gakkai members, Josei Toda declared nuclear weapons to be an absolute evil. He said that their possession is criminal under all circumstances, and he called on the young people present to work untiringly to rid the world of all nuclear weapons. Source: SGI International*

of the hell-like horrors of the nuclear attack on the civilian population of Hiroshima, both in the short term and in the long term. For example, Shigeru Nonoyama, who was 15 at the time of the attack, says: "People crawling out from crumbled houses started to flee. We decided to escape to a safe place on the hill. We saw people with melted ears stuck to their cheeks, chins glued to their shoulders, heads facing in awkward positions, arms stuck to bodies, five fingers joined together and grab nothing. Those were the people fleeing. Not merely a hundred or two, The whole town was in chaos."

"I saw the noodle shop's wife leg was caught under a fallen pole, and a fire was approaching. She was screaming, 'Help me!Help me!' There were no soldiers, no firefighters. I later heard that her husband had cut off his wife's leg with a hatchet to save her."

"Each and every scene was hell itself. I couldn't tell the difference between the men and the women. Everybody had scorched hair, burned hair, and terrible burns. I thought I saw a doll floating in a fire cistern, but it was a baby. A wife trapped under her fallen house was crying, 'Dear, please help me, help me!' Her husband had no choice but to leave her in tears."

"...I hovered between life and death for three months, from August to October. When a fly landed on a festering wound, it would bleed white maggots in a few days. My mother shooed away the flies through the night with a fan through the night. She must have been desperately determined not to lose any more sons or daughters. My dangling skin dried and turned hard, like paper. My mother picked off the dried skin. She made a cream of straw ash and cooking oil, and applied it to my burnt head, face and fingertips, turning me black..."

The testimonies of the other hibakushas are equally hor-



Figure 8: *It was like a scene from hell.* Source: SGI International.

rifying.

The postwar nuclear arms race

On August 29, 1949, the USSR exploded its first nuclear bomb. It had a yield equivalent to 21,000 tons of TNT, and had been constructed from Pu-239 produced in a nuclear reactor. Meanwhile the United Kingdom had begun to build its own nuclear weapons.

The explosion of the Soviet nuclear bomb caused feelings of panic in the United States, and President Truman authorized an all-out effort to build superbombs using thermonuclear reactions - the reactions that heat the sun and stars. On October 31, 1952, the first US thermonuclear device was exploded at Eniwetok Atoll in the Pacific Ocean. It had a yield of 10.4 megatons, that is to say it had an explo-



Figure 9: *Burned beyond recognition.* Source: SGI International.



Figure 10: *Memories of August 6.* Source: SGI International.



Figure 11: *The effects lasted a lifetime.* Source: SGI International.



Figure 12: *After the bombing.* Source: SGI International.

sive power equivalent to 10,400,000 tons of TNT. Thus the first thermonuclear bomb was five hundred times as powerful as the bombs that had devastated Hiroshima and Nagasaki. The Soviet Union and the United Kingdom were not far behind.

In 1955 the Soviets exploded their first thermonuclear device, followed in 1957 by the UK. In 1961 the USSR exploded a thermonuclear bomb with a yield of 58 megatons. A bomb of this size, two thousand times the size of the Hiroshima bomb, would destroy a city completely even if it missed it by 50 kilometers. France tested a fission bomb in 1966 and a thermonuclear bomb in 1968. In all about thirty nations contemplated building nuclear weapons, and many made active efforts to do so.

Because the concept of deterrence required an attacked nation to be able to retaliate massively even though many of its weapons might be destroyed by a preemptive strike,

the production of nuclear warheads reached insane heights, driven by the collective paranoia of the Cold War. More than 50,000 nuclear warheads were produced worldwide, a large number of them thermonuclear. The collective explosive power of these warheads was equivalent to 20,000,000,000 tons of TNT, i.e., 4 tons for every man, woman and child on the planet, or, expressed differently, a million times the explosive power of the bomb that destroyed Hiroshima. Today, the collective explosive power of all the nuclear weapons in the world is about half that much, but still enough to destroy human society.

There are very many cases on record in which the world has come very close to a catastrophic nuclear war. One such case was the Cuban Missile Crisis. Robert McNamara, who was the US Secretary of Defense at the time of the crisis, had this to say about how close the world came to a catastrophic nuclear war: "I want to say, and this is very important: at the end we lucked out. It was luck that prevented nuclear war. We came that close to nuclear war at the end. Rational individuals: Kennedy was rational; Khrushchev was rational; Castro was rational. Rational individuals came that close to total destruction of their societies. And that danger exists today."

A number of prominent political and military figures (many of whom have ample knowledge of the system of deterrence, having been part of it) have expressed concern about the danger of accidental nuclear war. Colin S. Gray, Chairman, National Institute for Public Policy, expressed this concern as follows: "The problem, indeed the enduring problem, is that we are resting our future upon a nuclear deterrence system concerning which we cannot tolerate even a single malfunction". Bruce G. Blair (Brookings Institute) has remarked that "It is obvious that the rushed nature of the

process, from warning to decision to action, risks causing a catastrophic mistake”... “This system is an accident waiting to happen.”

As the number of nuclear weapon states grows larger, there is an increasing chance that a revolution will occur in one of them, putting nuclear weapons into the hands of terrorist groups or organized criminals. Today, for example, Pakistan’s less-than-stable government might be overthrown, and Pakistan’s nuclear weapons might end in the hands of terrorists. The weapons might then be used to destroy one of the world’s large coastal cities, having been brought into the port by one of numerous container ships that dock every day, a number far too large to monitored exhaustively. Such an event might trigger a large-scale nuclear conflagration.

Recent research has shown that a large-scale nuclear war would be an ecological catastrophe of enormous proportions, producing very large-scale famine through its impact on global agriculture, and making large areas of the world permanently uninhabitable through long-lived radioactive contamination.

How do these dangers look in the long-term perspective? Suppose that each year there is a certain finite chance of a nuclear catastrophe, let us say 1 percent. Then in a century the chance of a disaster will be 100 percent, and in two centuries, 200 percent, in three centuries, 300 percent, and so on. Over many centuries, the chance that a disaster will take place will become so large as to be a certainty. Thus by looking at the long-term future, we can see that if nuclear weapons are not entirely eliminated, civilization will not survive.

We will do well to remember Josei Toda’s words: “Nuclear weapons are an absolute evil. Their possession is criminal under all circumstances”

THE MARSHALL ISLANDS SUE ALL NUCLEAR NATIONS FOR VIOLATIONS OF THE NPT'S ARTICLE VI

One can gain a small idea of the terrible ecological consequences of a nuclear war by thinking of the radioactive contamination that has made large areas near to Chernobyl and Fukushima uninhabitable, or the testing of hydrogen bombs in the Pacific, which continues to cause leukemia and birth defects in the Marshall Islands more than half a century later.

In 1954, the United States tested a hydrogen bomb at Bikini. The bomb was 1,300 times more powerful than the bombs that destroyed Hiroshima and Nagasaki. Fallout from the bomb contaminated the island of Rongelap, one of the Marshall Islands 120 kilometers from Bikini. The islanders experienced radiation illness, and many died from cancer.

Even today, half a century later, both people and animals on Rongelap and other nearby islands suffer from birth defects. The most common defects have been “jelly fish babies”, born with no bones and with transparent skin. Their brains and beating hearts can be seen. The babies usually live a day or two before they stop breathing.

A girl from Rongelap describes the situation in the following words: “I cannot have children. I have had miscarriages on seven occasions... Our culture and religion teach us that reproductive abnormalities are a sign that women have been unfaithful. For this reason, many of my friends keep quiet about the strange births that they have had. In privacy they give birth, not to children as we like to think of them, but to

things we could only describe as ‘octopuses’, ‘apples’, ‘turtles’, and other things in our experience. We do not have Marshallese words for these kinds of babies, because they were never born before the radiation came.”

The Republic of the Marshall Islands is suing the nine countries with nuclear weapons at the International Court of Justice at The Hague, arguing they have violated their legal obligation to disarm.

The Guardian reports that “In the unprecedented legal action, comprising nine separate cases brought before the ICJ on Thursday, the Republic of the Marshall Islands accuses the nuclear weapons states of a ‘flagrant denial of human justice’. It argues it is justified in taking the action because of the harm it suffered as a result of the nuclear arms race.”

“The Pacific chain of islands, including Bikini Atoll and Enewetak, was the site of 67 nuclear tests from 1946 to 1958, including the ‘Bravo shot’, a 15-megaton device equivalent to a thousand Hiroshima blasts, detonated in 1954. The Marshallese islanders say they have been suffering serious health and environmental effects ever since.”

“The island republic is suing the five ‘established’ nuclear weapons states recognised in the 1968 nuclear non-proliferation treaty (NPT) the US, Russia (which inherited the Soviet arsenal), China, France and the UK as well as the three countries outside the NPT who have declared nuclear arsenals India, Pakistan and North Korea, and the one undeclared nuclear weapons state, Israel.”

On July 21, 2014, the United States filed a motion to dismiss the Nuclear Zero lawsuit that was filed by the Republic of the Marshall Islands (RMI) on April 24, 2014 in U.S. Federal Court. The U.S., in its move to dismiss the RMI lawsuit, does not argue that the U.S. is in compliance

with its NPT disarmament obligations. Instead, it argues in a variety of ways that its non-compliance with these obligations is, essentially, justifiable, and not subject to the court's jurisdiction.

The Nuclear Age Peace Foundation (NAPF) is a consultant to the Marshall Islands on the legal and moral issues involved in bringing this case. David Krieger, President of NAPF, upon hearing of the motion to dismiss the case by the U.S. responded, "The U.S. government is sending a terrible message to the world that is, that U.S. courts are an improper venue for resolving disputes with other countries on U.S. treaty obligations. The U.S. is, in effect, saying that whatever breaches it commits are all right if it says so. That is bad for the law, bad for relations among nations, bad for nuclear non-proliferation and disarmament - and not only bad, but extremely dangerous for U.S. citizens and all humanity."

David Krieger continued, "In 2009, President Obama shared his vision for the world, saying, 'So today, I state clearly and with conviction America's commitment to seek the peace and security of a world without nuclear weapons.' This lawsuit provides the perfect opportunity for President Obama to move his vision forward. Yet, rather than seizing that opportunity, the U.S. government is seeking dismissal without a full and fair hearing on the merits of the case."

Our only hope for the future is to replace brutal rule by military power by a just system of international law.

SCIENCE, RELIGION AND WAR

The recent murderous, and religiously motivated, attacks by ISIS on the Yazidi community in Iraq make it appropriate to ask whether religion most frequently acts as a force for peace in the world, or whether it is more often the source of conflicts.

The world's major religions have at their core the principle of universal human brotherhood, which, if practiced, would be enough to make war impossible. However, the principle of loving and forgiving one's enemies is rarely practiced.

Many wars have been fought in the name of religion. We can think, for example, of the Crusades, or the Islamic conquests in the Middle East, North Africa and Spain, or the wars between Catholics and Protestants in Europe, or the brutal treatment of the native populations of Central and South America in the name of religion. The list by no means stops there.

What about science and technology? How are they related to war? 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 ensure that our overwhelming material progress will be beneficial rather than disastrous.

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.

Is there a conflict between science and religion? This is a frequently-asked question, and many different answers have been given. My own opinion is that there are two aspects to religion: ethics and cosmology. I think that when we talk about cosmology, there is often a conflict between science and religion. But with respect to ethics, there is very little room for conflict because science has almost nothing to say about ethics.

Why do I say "almost nothing" instead of "nothing"? It is often said that ethical principles cannot be derived from science, that they must come from somewhere else. Nevertheless, 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 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.

War is based on destruction, destruction of living persons, destruction of homes, destruction of infrastructure, and destruction of the biosphere. If we are on the side of life, if

we are not traitors to life and allies of death, we must oppose the institution of war. We must oppose the military-industrial complex. We must oppose the mass media when they whip up war-fever. We must oppose politicians who vote for obscenely enormous military budgets at a time of financial crisis. We must oppose these things by working with dedication, as though our lives depended on it. In fact, they do.

But let us turn to religious ethics. Not only do they not conflict with science, but there is also a general agreement on ethical principles between the major religions of the world.

The central ethical principles of Christianity can be found in the Sermon on the Mount and in the Parable of the Good Samaritan. In the Sermon on the Mount, we are told that we must not only love our neighbors as much as we love ourselves; we must also love and forgive our enemies. This seemingly impractical advice is in fact of great practicality, since escalatory cycles of revenge and counter-revenge can only be ended by unilateral acts of kindness.

In the Parable of the Good Samaritan, we are told that our neighbor, whom we must love, is not necessarily a member of our own ethnic group. Our neighbor may live on the other side of the world and belong to an entirely different race or culture; but he or she still deserves our love and care.

It is an interesting fact that the Golden Rule, “Do unto others as you would have them do unto you”, appears in various forms in all of the world’s major religions. The Wikipedia article on the Golden Rule gives an impressive and fascinating list of the forms in which the rule appears in many cultures and religions. For example, in ancient China, both Confucius and Laozi express the Golden Rule, but they do it slightly differently: Zi Gong asked, saying, “Is there one word that may serve as a rule of practice for all one’s life?” The

Master said, “Is not reciprocity such a word?” (Confucius), and “The sage has no interest of his own, but takes the interests of the people as his own. He is kind to the kind; he is also kind to the unkind: for Virtue is kind. He is faithful to the faithful; he is also faithful to the unfaithful: for Virtue is faithful.” (Laozi)

In the Jewish tradition, we have “The stranger who resides with you shall be to you as one of your citizens; you shall love him as yourself, for you were strangers in the land of Egypt” (Leviticus) In Islam: A Bedouin came to the prophet, grabbed the stirrup of his camel and said: O the messenger of God! Teach me something to go to heaven with it. The Prophet said: “As you would have people do to you, do to them; and what you dislike to be done to you, don’t do to them. This maxim is enough for you; go and act in accordance with it!” (Kitab al-Kafi, vol. 2, p. 146)

The principle of reciprocity is an ancient one in human history, and it is thus embedded in our emotions. It is an important part of human nature. Reciprocity is the basis of non-market economies, and also the basis of social interactions between family members, friends and colleagues. In hunter-gatherer societies, it is customary to share food among all the members of the group. “Today I receive food from you, and tomorrow you will receive food from me.” Similarly, among friends in modern society, no payment is made for hospitality, but it is expected that sooner or later the hospitality will be returned.

According to Wikipedia “Reciprocity in Social Psychology refers to responding to a positive action with another positive action, rewarding kind actions. As a social construct, reciprocity means that in response to friendly actions, people are frequently much nicer and much more cooperative than predicted by the self-interest model; conversely, in re-

sponse to hostile actions they are frequently much more nasty and even brutal.” As Wikipedia points out, reciprocity can also be negative, as in the case of escalatory cycles of revenge and counter-revenge.

The Buddhist concept of karma has great value in human relations. The word “karma” means simply “action”. In Buddhism, one believes that actions return to the actor. Good actions will be returned, and bad actions will also be returned. This is obviously true in social relationships. If we behave with kindness and generosity to our neighbors, they will return our kindness. Conversely, a harmful act may lead to vicious circles of revenge and counter revenge, such as those we see today in the Middle East and elsewhere. These vicious circles can only be broken by returning good for evil.

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

In Buddhist philosophy, the concept of Karma, action and reaction, also extends to our relationship with nature. Both Hindu and Buddhist traditions emphasize the unity of all life on earth. Hindus regard killing an animal as a sin, and many try to avoid stepping on insects as they walk.

The Hindu and Buddhist picture of the relatedness of all life on earth has been confirmed by modern biological science. We now know that all living organisms have the same fundamental biochemistry, based on DNA, RNA, proteins and polysaccharides, and we know that our own human genomes are more similar to than different from the genomes of our close relations in the animal world.

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

Religion often contributes to conflicts by sharpening the boundaries between ethnic groups and by making marriage across those boundaries difficult and infrequent. However, this negative role is balanced by a positive one, whenever religion is the source of ethical principles, especially the principle of universal human brotherhood.

Many of the great ethical teachers of history lived at a time when cultural evolution was changing humans from hunter-gatherers and pastoral peoples to farmers and city dwellers. To live and cooperate in larger groups, humans needed to overwrite their instinctive behavior patterns with culturally-determined behavior involving a wider range of cooperation than previously. This period of change is marked by the lives and ideas of a number of great ethical teachers - Moses, Buddha, Lao Tse, Confucius, Socrates, Aristotle, Jesus, and Saint Paul. Mohammed lived at a slightly later period, but it was still a period of transition for the Arab peoples, a period during which their range cooperation needed to be enlarged.

The religious leaders of today's world have the opportunity to contribute importantly to the solution of the problem of war. They have the opportunity to powerfully support the concept of universal human brotherhood, to build bridges between religious groups, to make intermarriage across ethnic boundaries easier, and to soften the distinctions between communities. If they fail to do this, they will have failed humankind at a time of crisis.

INTERNATIONAL DAY FOR THE TOTAL ELIMINATION OF NUCLEAR WEAPONS

In the follow-up to the 2013 high-level meeting on nuclear disarmament, the United Nations General Assembly passed a resolution in which it declared 26 September the International Day for Total Elimination of Nuclear Weapons.⁷ The first ever event will take place a month from now on 26 September, 2014.⁸

What can you, as an individual, do? You can plan an action to commemorate the day. You can write to your Prime Minister/President and/or Foreign Minister, to ask what your government plans to do to commemorate the day. You can ask your local parliamentarian, mayor and city council the same question. You can tell www.unfoldzero.org about your activities.

The Interparliamentary Union, with 167 members, passed a resolution in March, 2014, calling on its members to support the total elimination of nuclear weapons:⁹

Why is the total elimination of nuclear weapons so urgent? Although somewhat reduced in numbers from the insane heights of the Cold War, the power of today's nuclear weapons is more than sufficient to destroy human civilization and much of the biosphere. Many of the weapons are on hair-trigger alert, meaning that those in charge of them have only

⁷<http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/1com/1com13/resolutions/L6Rev1.pdf>

⁸<http://www.unfoldzero.org/>

⁹<http://www.ipu.org/conf-e/130/Res-1.htm>
<http://www.cbsnews.com/news/whos-minding-the-nuclear-weapons/>
<https://www.youtube.com/watch?v=y6WvXxMkBWg>

minutes to decide whether a radar signal is a true or false report of an attack. Most of us alive today owe our existence to Lt. Col. Stanislav Petrov, who correctly reported such a warning as a computer error.

The system of mutual deterrence has been described as “an accident waiting to happen”. In the long run, the small yearly chance that a catastrophic accident will occur will build up into a certainty of disaster. For example, even if the yearly chance of an accident occurring were as small 1 percent (and it is certainly larger than that), over several centuries the probability accidental thermonuclear war will become a near certainty. We have been extremely lucky so far, but in the long run civilization and nuclear weapons cannot co-exist.

Just as the generals and politicians who started World War I seem not to have comprehended what a war with machine guns and long-range artillery would be like, so our leaders today seem not to have an imaginative idea of what a thermonuclear war would be like. Promising to defend their populations, they do no such thing, but instead they put us at risk of total annihilation.

Today, it is up to each individual to work with courage and dedication to put an end to nuclear insanity.

KILLING CIVILIANS

The Geneva Conventions

In Protocol I of the Geneva Conventions, Articles 51 and 54 outlaw indiscriminate attacks on civilian populations, and destruction of food, water, and other materials needed for survival. Indiscriminate attacks include directly attacking civilian (non-military) targets, but also using technology such as biological weapons, nuclear weapons and land mines, whose scope of destruction cannot be limited. A total war that does not distinguish between civilian and military targets is considered a war crime.

Targeting civilians

Throughout history, military forces have frequently committed the crime of deliberately targeting civilian populations. An early example of this was the bombardment of neutral Copenhagen by British forces, which took place, without a declaration of war, from 2-5 September, 1807. The object of the bombardment was to terrorize the citizens of the city, so that they would persuade their government to surrender the Danish-Norwegian fleet to the British. Besides exploding shells, incendiary rockets were used, and about a third of the city was destroyed. In England, news of the bombardment was greeted with mixed reactions. Canning wrote that “Nothing ever was more brilliant, more salutary or more effectual than the success [at Copenhagen]”, but Lord Erskine condemned it by saying “if hell did not exist before, Providence would create it now to punish the ministers for that damnable measure.”

Another instance of targeting of civilians was the 1937

Fascist and Nazi destruction of Guernica, made famous by Picasso's painting. A report described the event as follows: "Guernica, the most ancient town of the Basques and the centre of their cultural tradition, was completely destroyed yesterday afternoon by insurgent air raiders. The bombardment of this open town far behind the lines occupied precisely three hours and a quarter, during which a powerful fleet of aeroplanes consisting of three types [of] Junkers and Heinkel bombers, did not cease unloading on the town bombs weighing from 1,000 lbs. downwards and, it is calculated, more than 3,000 two-pounder aluminium incendiary projectiles. The fighters, meanwhile, plunged low from above the centre of the town to machine-gun those of the civilian population who had taken refuge in the fields"

The Nanking Massacre was an episode of mass murder, mass rape and looting committed by Japanese troops against civilians and unarmed prisoners of war in Nanking (Nanjing), during the Second Sino-Japanese War. The massacre occurred during a six-week period starting on December 13, 1937, the day that the city surrendered to the Japanese. The International Tribunal of the Far East estimated in 1948 that over 200,000 people were killed in this incident. Neither pregnant women, babies, young girls, nor old people were spared.

On the 25th of September, 1939, Hitler's air force began a series of intense attacks on Warsaw. Civilian areas of the city, hospitals and fleeing refugees all were targeted. On the 14th of May, 1940, Rotterdam was also devastated. The German Luftwaffe also carried out massive air attacks on targets in Britain.

Although they were not the first to start it, by the end of the war, the United States and Britain were bombing civilian populations on a far greater scale than Japan and Germany had ever done. We can think of the terrible fire bombings of

Hamburg, Kassel, Pforzheim, Mainz, Dresden and Berlin, as well as Tokyo, Kobe, Yokahama, and the nuclear destruction of Hiroshima and Nagasaki. General Curtis LeMay, under whose command many of the attacks on Japanese civilians were carried out, said later: "I suppose that if [we] had lost the war, I would have been tried as a war criminal."

Among the most savage recent attacks on civilians were those that occurred during the Vietnam War. Besides conventional high explosives, chemical weapons were used, including the notorious Agent Orange. This was a defoliant which not only lastingly damaged the ecology of Vietnam, but also had terrible effects on the health of the civilian population.

According to Wikipedia, "The government of Vietnam says that 4 million of its citizens were exposed to Agent Orange, and as many as 3 million have suffered illnesses because of it; these figures include the children of people who were exposed....Children in the areas where Agent Orange was used have been affected, and have multiple health problems, including cleft palate, mental disabilities, hernias and extra fingers and toes. In the 1970's high levels of dioxin were found in the breast milk of South-Vietnamese women, and in the blood of US military personnel who had served in Vietnam."

During the Vietnam war, the effect of conventional high-explosive bombs was also enormous. According to a study by Edward Miguel and Gerard Roland of the University of California, "The United States Air Force dropped in Indochina, from 1964 to August 15, 1973, a total of 6,162,000 tons of bombs [in Indochina]...This tonnage far exceeded that expended in World War II."

Of this enormous quantity, more than 2 million tons of bombs were dropped on the tiny country of Laos, making

it, per capita, the most heavily bombed nation in history. The bombings were part of the U.S. Secret War in Laos to support the Royal Lao Government against the Pathet Lao and to interdict traffic along the Ho Chi Minh Trail. The bombings destroyed many villages and displaced hundreds of thousands of Lao civilians during the nine-year period. Up to a third of the bombs did not explode, leaving Laos contaminated with vast quantities of unexploded ordnance.¹⁰

Genocides must also be included if we are to have a complete picture of the way in which governments attack civilian populations. These include the mass murder of Jews, Poles and Gypsies by the Nazis during World War II, Armenian Genocide, the genocides in Rwanda and Darfur, the genocidal treatment of Palestinians by Israel, and many many other cases.¹¹

Do our “Defense Departments” really defend us?

What is the point of this long and gruesome list of crimes committed by military forces against civilians? What I am trying to show, is that the very name, “Department of Defense” is a fraud. The military-industrial complex sells itself by claiming to defend civilians. It justifies vast and crippling budgets by the same claim. But it is a lie. Soldiers do not “guard us while we sleep” as Kipling believed. What the military establishments of the world give us is war, and in modern war, most of the victims are civilians. What the generals, arms manufacturers and politicians are really de-

¹⁰<http://legaciesofwar.org/about-laos/secret-war-laos/>

¹¹<http://www.presstv.com/detail/2014/07/11/370869/gaza-genocide-and-criminal-rogue-israel/>

fending is their own power, and their own profits. Civilians are just hostages. They are expendable.

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.

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. Nevertheless, our leaders stubbornly hold onto their nuclear toys, which seem to give them a sense of god-like power.

Civilians must stop being passive hostages. Civil society must make its will felt. Where democracy has decayed, it must be restored. If our leaders continue to enthusiastically support the institution of war, if they continue to cling to nuclear weapons, then let us have new leaders!

60 YEARS IN THE PEACE MOVEMENT

An apology

Holger Terp, the Editor of the Danish Peace Academy's enormous and popular website, suggested that I should write something about my involvement in the peace movement as part of this collection of articles. Since I am now 81 years old and in poor health, perhaps I can be forgiven for following his advice and writing down some things that I remember, while I still can do it.

World Federalism

In 1954, sixty years ago, I graduated from MIT and went on to do postgraduate work in theoretical physics at the University of Chicago. At that time, my political opinions were not very different from those of my parents, who were Eisenhower-supporting Republicans. I was very much against the institution of war, and in favor of world government. However, I thought that the establishment of a world authority would have to wait until most of the member states had decent governments.

At the University of Chicago, the general atmosphere was quite liberal, and I may have been influenced by it. But what really changed my mind was hearing a speech by a World Federalist named Vernon Nash. Besides convincing me that a world government ought to be a federation, he also made me see that if we waited until all the member states had governments of which we could approve, we would have waited too long. We urgently need global governance

precisely because of faults in the governments of the nations of the world.

Vernon Nash had once been in favor of abolishing the United Nations and starting again from scratch with a World Constitutional Convention. He had justified this position by saying “No one has ever got across a ditch of any size in two jumps”. However, other World Federalists had later made him see how impractical his position was, and he finally agreed that gradual reform of the UN was the best way to go forward.

After studying the writings of the World Federalists, I reached beliefs that are very close to the ones that I hold today. I recently expressed these ideas in an article in *Cadmus*, a journal of the World Academy of Art and Science. You can find the article by typing “John Scales Avery, *Cadmus*” into a search engine.

But what are the reforms that are needed? After the horrors of World War II, the United Nations was founded to eliminate the institution of war. However, the UN Charter drafted in 1945 was far too weak to achieve this goal because it was a confederation rather than a federation. This was very similar to what happened during the early history of the United States: First a confederation was tried, but it soon proved to be too weak, and it was replaced by the present US federal constitution. The debates that occurred at that time are very relevant to UN reform today.

George Mason, one of the architects of the federal constitution of the United States, believed that “such a government was necessary as could directly operate on individuals, and would punish those only whose guilt required it”, while James Madison (another drafter of the U.S. federal constitution) remarked that the more he reflected on the use of force, the more he doubted “the practicability, the justice and the

efficacy of it when applied to people collectively, and not individually”.

Finally, Alexander Hamilton, in his *Federalist Papers*, discussed the Articles of Confederation with the following words: “To coerce the states is one of the maddest projects that was ever devised... Can any reasonable man be well disposed towards a government which makes war and carnage the only means of supporting itself - a government that can exist only by the sword? Every such war must involve the innocent with the guilty. The single consideration should be enough to dispose every peaceable citizen against such a government... What is the cure for this great evil? Nothing, but to enable the... laws to operate on individuals, in the same manner as those of states do.”

In other words, the essential difference between a confederation and a federation, both of them unions of states, is that a federation has the power to make and to enforce laws that act on individuals, rather than attempting to coerce states (in Hamilton’s words, “one of the maddest projects that was ever devised.”)

Other reforms are also needed: If the UN is to become an effective World Federation, it will need a reliable source of income to make the organization less dependent on wealthy countries, which tend to give support only to those interventions of which they approve. A promising solution to this problem is the so-called “Tobin tax”, named after the Nobel-laureate economist James Tobin of Yale University. Tobin proposed that international currency exchanges should be taxed at a rate between 0.1 and 0.25 percent. He believed that even this extremely low rate of taxation would have the beneficial effect of damping speculative transactions, thus stabilizing the rates of exchange between currencies. When asked what should be done with the proceeds of the tax, To-

bin said, almost as an afterthought, “Let the United Nations have it.”

The volume of money involved in international currency transactions is so enormous that even the tiny tax proposed by Tobin would provide the United Nations with between 100 billion and 300 billion dollars annually. By strengthening the activities of various UN agencies, the additional income would add to the prestige of the United Nations and thus make the organization more effective when it is called upon to resolve international political conflicts.

The budgets of UN agencies, such as the World Health Organization, the Food and Agricultural Organization, UN-ESCO and the UN Development Programme, should not just be doubled but should be multiplied by a factor of at least twenty. With increased budgets the UN agencies could sponsor research and other actions aimed at solving the world’s most pressing problems - AIDS, drug-resistant infections diseases, tropical diseases, food insufficiencies, pollution, climate change, alternative energy strategies, population stabilization, peace education, as well as combating poverty, malnutrition, illiteracy, lack of safe water and so on. Scientists would be less tempted to find jobs with arms-related industries if offered the chance to work on idealistic projects. The United Nations could be given its own television channel, with unbiased news programs, cultural programs, and “State of the World” addresses by the UN Secretary General.

In addition, the voting system of the United Nations General Assembly needs to be reformed, and the veto power in the Security Council need to be abolished (or alternatively, the Security Council could be abolished).

So in 1954, convinced that war could only be eliminated by making the United Nations into a federation, I became



Figure 13: *The Campaign for Nuclear Disarmament (CND) organized marches from London to Aldermaston every Easter to protest against nuclear weapons. Source: CND*

an active World Federalist. In fact, during my stay at the University of Chicago, I became the Membership Chairman for the Chicago Area of the World Association of World Federalists.

The CND

After receiving an M.Sc. in theoretical physics at the University of Chicago, I studied theoretical chemistry at Imperial College of Science and Technology, a part of the University of London, where I completed a Ph.D. in 1965. I must say that London was a splendid place to live in the 1960's and early 1970's. This was the era of "swinging London", the era of the Beatles, Twiggy and Mary Quant. If you went to

King's Road in Chelsea on a Saturday you could see young people dressed in absolutely mad costumes which they had purchased at stores like *I Was Lord Kitchener's Valet*. It was also the era of Aldermaston Marches, which I joined, and I was a member of the British Society for Social Responsibility in Science.

Science, Ethics and Politics

I taught at Imperial College until 1973, when I moved to the University of Copenhagen for family reasons. Copenhagen is also a splendid place to live, and before very long I found myself involved with the peace movement in Denmark. What happened was as follows:

My young daughters Anne and Julie used to sing in the choir of an 800-year-old church in the village of Herstedøster, near to where we lived on the outskirts of Copenhagen. My wife and I sometimes attended the church services to hear them sing. As I thought more and more about it, I began to think that the Christian Church ought to work actively for peace, since Christian ethics require us to love our neighbors and even to forgive our enemies, in contrast to the nuclear doctrine of massive retaliation, which requires our governments to commit genocide.

I took these ideas to our two local priests, Elna and Stephan, hoping that they would introduce working for peace as a theme in their sermons. They told me that they could not do that, because church regulations did not allow it; but they agreed with enthusiasm to organize a series of evening seminars about Christianity and peace. These were a great success, and among the people who attended them was a young man (at that time he was young) named Nicky Brown. When he told me his name, I said "Oh, you must be the son

of Gerald Brown". It was an easy guess and it turned out to be right. His father was a very well-known physicist at the Niels Bohr Institute, whose books I had recently been using. Brown is not such a common name in Copenhagen.

Nicky, who is a religious person, suggested that we should organize a "Danish Christian Peace Movement". We were soon a small organization which used to have regular meetings. The next step in the strange sequence of events was that the International College in Helsingør invited our Danish Christian Peace Movement to be a co-organizer of a two-week summer school on non-violence, together with Jørgen Milwertz of the World Health Organization.

The summer school, which was called "Towards a Non-Violent Society", was a great success, and during the course of it I came to know Jørgen Milwertz quite well. He called to my attention an essay contest sponsored by the Nuclear Age Peace Foundation. A prize was offered for the best essay on how to give science and engineering students a sense of social responsibility. I wrote an essay saying that all universities and engineering schools ought to offer a course on the history of science and its social impact. As one came to the modern era, topics such as nuclear weapons, gene splicing, sustainability and climate change would make it natural to discuss the impact of science and technology in the context of ethics.

My essay did not win the Nuclear Age Peace Foundation's contest, but Jørgen Milwertz liked it so much that he translated it into Danish and sent it to *Politiken*, one of Denmark's major newspapers. It was accepted and published, and the students at the University of Copenhagen read it. A delegation of students came to me and said: "If you really believe what you wrote, you have to make such a course."

This was the origin of the course on "Science and Society"

(“Videnskab og Samfund”), which I gave from 1987 until my retirement in 2003, in addition to my scientific teaching. At first the course was called “Science, Ethics and Politics”, and there were serious difficulties in getting it accepted. The Study Board thought that science, ethics and politics were three entirely separate things, and that they ought not to have anything to do with each other. Finally they agreed to allow the course to be given, provided that neither I nor the students should get any credit for it.

Nevertheless, despite all these difficulties, the course was a great success. I wrote a book, which we used as a text. It was published in three editions and many reprintings by the Ørsted Institute Press, and was later excellently translated into Danish by Ole Rughede and Aase Lundsteen. The book was also used as a text for similar courses in England, Switzerland and Sweden.

Professor Ove Nathan, who was the Rektor (President) of the University of Copenhagen at the time, was aware of my course and the difficulties that I had encountered. He sent me many small notes telling me not to be discouraged but to keep on regardless of the opposition. One day in 1988 I received a telephone call from Ove Nathan. He told me that Pugwash Conferences on Science and World Affairs had asked him to be their Contact Person for Denmark. He was so busy with his duties as Rektor that he could not accept, and he asked me whether I would be willing to take on the duty in place of him. I was very happy to do so, and between that time and today I have worked hard for Pugwash. More about that later.

Several other similar courses were later started. For example, at the Niels Bohr Institute, Center Leader Claus Emmeche began to teach a course on the philosophy of science. Finally, in 2001, all of us who were involved in such



Figure 14: *Margrethe Vestager, who was Minister of Education in 2001. Source: Den Store Danske*

courses wrote to the Danish Minister of Education, Margrethe Vestager, saying that we believed that all science and engineering students ought to take a course which would emphasize the need for ethics in relation to their work.

Margrethe Vestager called together the heads of all the institutions of higher education in Denmark and proposed to them that such a course should be created. The leaders of these institutions agreed. The only problem was that there was a lack of people who were qualified to teach the proposed course. However, Claus Emmeche heroically started a series of seminars designed to prepare the needed teachers. In 2004, everything was ready, and from that year onward, all science and engineering students in Denmark have been required to take a course which emphasizes ethics in relation to their work.

The Roman Catholic Peace Movement

1985 was the 100th anniversary of the birth of Niels Bohr. It occurred to me that this might be a good occasion to make a radio program about nuclear weapons. The Danish state radio had the policy that listeners could submit audio tapes, and if these were good enough, they would be broadcast. Accordingly I took some recording equipment to the meeting of Nobel Laureates and students at Lindau Germany.

The meetings at Lindau were hosted by Count Lennart Bernadotte and his wife and they were very pleasant and beautiful occasions. I interviewed a group of winners of the physics Nobel Prize, and tried to get them to discuss why so many nuclear weapons were needed. At that time there were roughly 50,000 nuclear weapons in the world, with an explosive power equal to about a million Hiroshima bombs.

The quality of my recording was not good enough to be broadcast, but a transcription of the recording was published by the Danish newspaper *Information*. My daughter Helen also translated the transcription into French, and we spread it as widely as possible.

A Catholic Cardinal had attended the Lindau meeting had noticed my efforts, and as a result I was invited later to a high-level meeting of the Roman Catholic Peace Movement, organized by Cardinal König of Austria. The meeting took place at Schönbrunn Palace near to Vienna. I soon realized that the main purpose of the meeting was to obtain better conditions for Catholic churches inside the Soviet block by implementing the Helsinki Agreements. But many excellent suggestions were also made for reducing tensions between East and West through trade and cultural exchanges.

The meeting at Schönbrunn Palace was also addressed by the physicist Carl Friedrich von Weizsäcker, the elder brother



Figure 15: *Cardinal König of Austria (1905-2004). He and many others in the Roman Catholic Church have worked actively for peace. Cardinal König was the international head of the Catholic peace movement Pax Christi. Source: Andreas Gutenbrunner, Archdiocese of Vienna, Wikimedia Commons*

of the President of Germany. In his speech, von Weizäcker discussed the global population explosion, and suggested that the Catholic Church ought to modify its position on birth control. Surprisingly, the high-ranking churchmen present, including Archbishop Silivstrini, all applauded.

At one point during the meeting, I was introduced to Cardinal König. He held up his ring for me to kiss, but not being a Catholic, I did not know that this was what I was supposed to do. Cardinal König quickly understood what the problem was, and he reduced my embarrassment by smiling in a friendly way.

Camilla Plum's huge event at Louisiana

One of my closest friends in Denmark was Keld Helmer-Petersen, a famous pioneer of photography as a modern art-form. He and his wife Birthe (also famous as a television writer and director) had a summer house near to the one which my family and I rented near to the sea, about 50 kilometers north of Copenhagen. My family and I greatly admired Keld and Birthe, and enjoyed conversations with them.

In 1982, Keld and I produced a pamphlet entitled "The World as it Is, and the World as it Could Be" both in English and in Danish. (See "Collected Essays, Volume 1".) This pamphlet attracted the attention of some very wealthy and idealistic friends of Keld and Birthe, Hagen and Tata Hasselbalch, and Camilla and Lisa Plum. I was introduced to them, and we discussed what needed to be done to promote peace.

A little later, Camilla contacted me and asked me to help with a huge 2-day peace event which she and her mother Lisa were organizing at the Louisiana Museum of Modern

Art, north of Copenhagen. Camilla asked me to help to organize an event where leaders of many religions would meet to find the common ethical principles which united their diverse faiths. Camilla and her mother were willing to spend great amounts of money on the project, so we were able to bring together patriarchs and archbishops from the Russian Orthodox, Greek Orthodox and Catholic churches, as well as representatives of the Protestant, Jewish and Muslim faiths. The Japanese Society of Prayer for World Peace was also represented.

Our representative from the Muslim faith was not completely typical. He was the Imam of a mosque belonging to the Amadiyyh Muslims. The Amadiyyh Muslims are a relatively new branch of Islam. They believe in education and equality for women, and many other reforms of Islamic tradition. For this reason, they have been persecuted since the foundation of their movement in 1889.

The Danish Amadiyyh Imam was impressed with our event at Louisiana, and he decided to repeat it every year at his mosque in Hidovre (a suburb of Copenhagen). It became a tradition, and I was always invited as a representative of the peace movement, which is a sort of religion.

After this had gone on for several years, I received an invitation to meet Caliph Mirza Tahir Ahmed, the leader of the 10-million-strong worldwide Amadiyyh movement. He was scheduled to visit Copenhagen, and a large press conference had been arranged for him. My role in the conference was to ask him questions related to peace. I sat next to him on the podium, and I could see that he was extremely tired because of his heavy schedule. His eyes were red from lack of sleep. Nevertheless, he answered all the questions with great wisdom.

At one point, a reporter asked the Caliph how a young

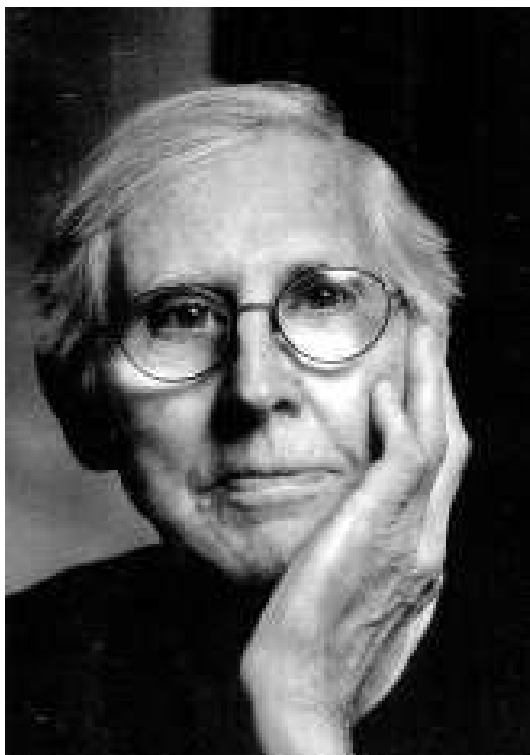


Figure 16: *My close friend Keld Helmer-Petersen (1920-2013) was a famous pioneer of modern photography as an art-form. Besides his visual genius, he also had extraordinarily wide-ranging interests and human understanding. Source: poltiken.dk*



Figure 17: *Camilla Plum. She and her family gave the bulk of their large fortune to work for peace. Camilla, who believes that it is immoral to live on inherited money, now makes a living as a television personality with a show about cooking and growing organic food. We see her here in one of the greenhouses where she grows food without the use of pesticides or chemical fertilizers. Source: nordichouse.is*

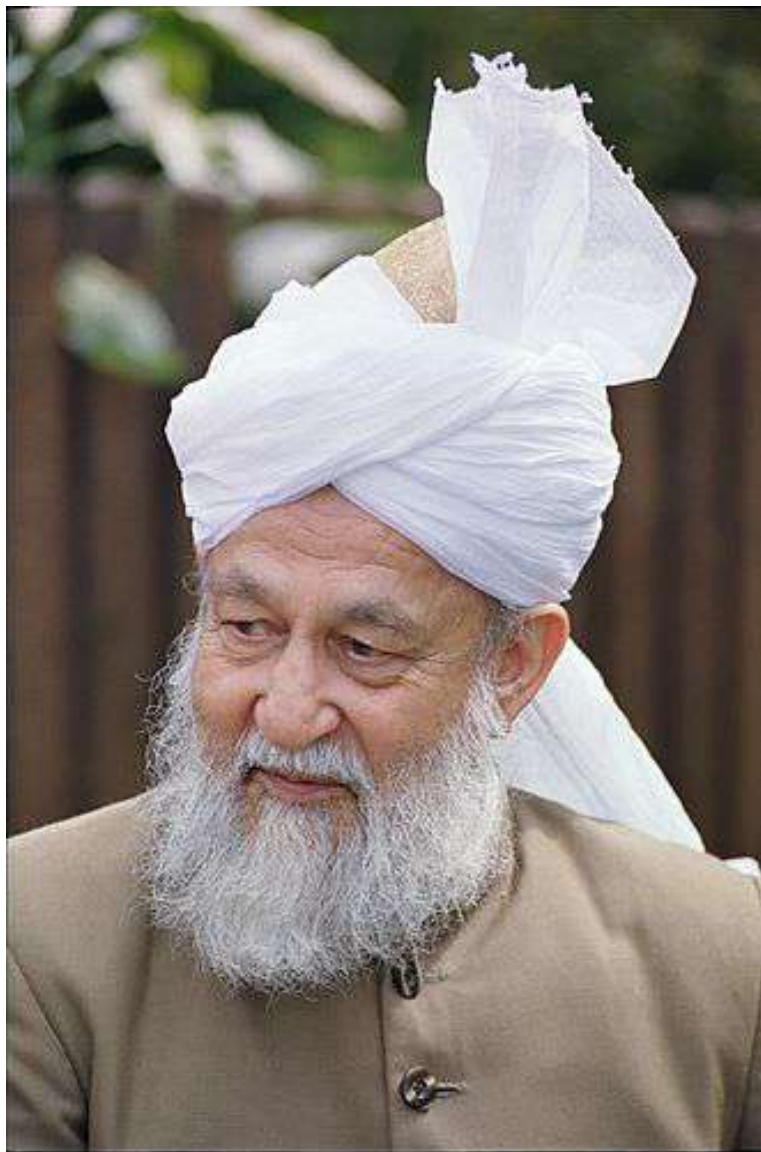


Figure 18: *Caliph Mirza Tahir Ahmed. I was much impressed by his wisdom. Source: Wikipedia*

Amadiyyh Muslim living in the west should behave. Should he or she follow old traditions or adjust to western society. The Caliph answered that such a young person should follow what was best in both the eastern and western traditions. He said that in many respects western ideas might be the best. However, he said that in other respects, he thought that western society had lost its way. For example, he thought that western classical music was excellent, since listening to it gave people peace. However, he thought that modern popular music, and modern culture in general, aimed not at peace but at excitement. Excitement, the Caliph said, is a far less worthy aim than calm and peace. I have always remembered his words.

In 1988, shortly before the fall of the Berlin Wall, there was a large peace meeting at the Bella Center near to Copenhagen. About 5,000 people from peace groups of both western Europe and the Soviet Block participated in this meeting. Few of us who attended the meeting had previously been aware of the strength of the peace movement in the Soviet Block.

Hagen Hasselbalch, whom I had met at Keld and Birthe's summer house, urged me to try to arrange for the conference to be filmed, and to send the film to Ted Turner. Hagen knew Ted Turner personally, and he thought that the film would be broadcast on CNN. I was unable to arrange for the filming, but luckily when I attended the conference I met a young man called Slavomir Horsky, who was filming the conference for Czech television. Slavomir agreed to send me his tapes, and he did so. They turned out to be in a format that was incompatible with that used by western television. After much effort, I was able to arrange for the tapes to be converted to the right format and sent to CNN. I am not sure whether they were ever broadcast, but certainly in Denmark

there was a total news blackout about the conference. Despite the size and importance of the conference, no television program or newspaper mentioned it. I realized for the first time the extent to which our mass media are the slaves of the military-industrial complex, which of course had an interest in keeping the Cold War going as long as possible.

Part-time work for the World Health Organization

An unexpected chance to do something for peace came when I was contacted by the World Health Organization and given the job of completing a large annotated bibliography that they had started to make on “Health Effects of War and the Threat of War”. During his period as Director General of WHO, Halfdan Mahler pointed to war as the world’s major health problem, and in consequence he commissioned the bibliography. The European Office of WHO had made a start, but they were bogged down in political problems, and hence asked me for help.

When the bibliography was completed, WHO gave me another job: They asked me to participate in planning meetings for setting the goals of WHO for the European Region. In particular, my job was to try to predict the way that science and technology would develop during the coming decades. This was exciting and fascinating work, and my association with WHO lasted a number of years.

When I was working to complete the bibliography for WHO, I was helped at the Royal library in Copenhagen by Dr. Jens Junghans, who at that time was a Research Librarian at the Royal Library. I met him again very many years later in 1995 at one of the sessions of the World Social Summit in Copenhagen.

The talk which Jens Junghans gave at the World Social Summit was entitled “The Long-Term Future of Industrial Civilization”. The point which he made very forcefully in this talk was that in the long run, the exhaustion of resources, especially fossil fuels, would put an end to industrial civilization as we know it today.

I realized immediately that he was right, and I asked him whether he intended to write a book about his ideas. He said that he did not intend to write a book, but only newspaper articles in Danish. I then asked Jens Junghans whether he would mind if I tried to write a book in English developing the theme about which he had spoken. He said that he would not mind, and that he would help me by lending me books from his large private library.

This was the origin of my book, “Energy, Resources and the Long-Term Future”, published by World Scientific in 2007. Jens Junghans and I have continued to be close friends, and we often cooperate on projects related to the environment. He predicts that unless policy changes are made, human thoughtlessness is going to lead to an environmental mega-disaster.

Pugwash Conferences on Science and World Affairs

But back to the Pugwash Conferences on Science and World Affairs. Let me give a brief history of how the organization and its series of conferences started: In March, 1954, the US tested a 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 fallout from the test killed one crew member and made the others very 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.

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. After consultations with Albert Einstein and others, he drafted a document warning of the grave dangers presented by fission-fusion-fission bombs. 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

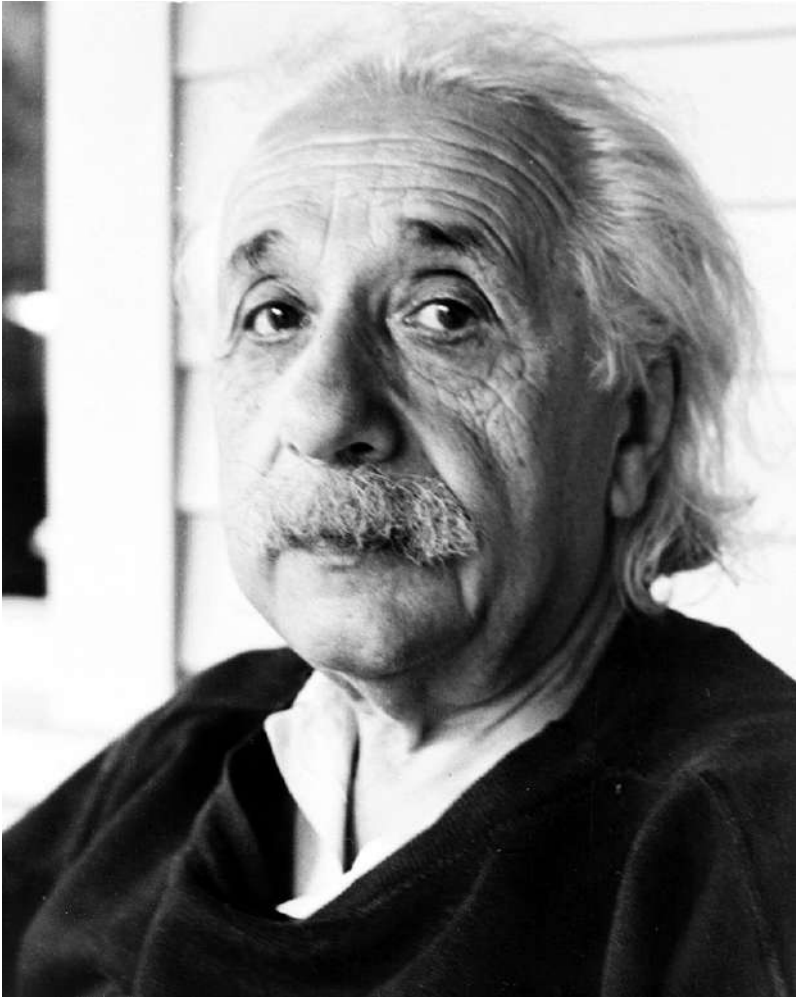


Figure 19: *Signing the Russell-Einstein declaration was the last act of Einstein's life. Public Domain, Wikimedia Commons*



Figure 20: *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. Source: CND*

you can do so, the way lies open to a new Paradise; if you cannot, there lies before you the risk of universal death.”

In 1945, with the horrors of World War II fresh in everyone’s minds, the United Nations had been established with the purpose of eliminating war. A decade later, the Russell-Einstein Manifesto reminded the world that war *must* be abolished as an institution because of the constantly increasing and potentially catastrophic power of modern weapons.

The Russell-Einstein Manifesto called for a meeting of scientists from both sides of the Cold War to try to minimize the danger of a thermonuclear conflict. The first meeting took place at the summer home of the Canadian philanthropist Cyrus Eaton at the small village of Pugwash, Nova Scotia.

From this small beginning, a series of conferences developed, in which scientists, especially physicists, attempted to work for peace, and tried to address urgent problems related to science. These conferences were called Pugwash Conferences on Science and World Affairs, taking their name from the small village in Nova Scotia where the first meeting was held. From the start, the main aim of the meetings was to reduce the danger that civilization would be destroyed in a thermonuclear war.

It can be seen from what has been said that the Pugwash Conferences began during one of the tensest periods of the Cold War, when communication between the Communist and Anti-communist blocks was difficult. During this period, the meetings served the important purpose of providing a forum for informal diplomacy. The participants met, not as representatives of their countries, but as individuals, and the discussions were confidential.

This method of operation proved to be effective, and the initial negotiations for a number of important arms con-

trol treaties were aided by Pugwash Conferences. These include the START treaties, the treaties prohibiting chemical and biological weapons, the Nuclear Nonproliferation Treaty (NPT), and the Comprehensive Test Ban Treaty (CTBT).

Former Soviet President Gorbachev has said that discussions with Pugwash scientists helped him to conclude that the policy of nuclear confrontation was too dangerous to be continued.

Over the years, the number of participants attending the annual Pugwash Conference has grown, and the scope of the problems treated has broadened. Besides scientists, the participants now include diplomats, politicians, economists, social scientists and military experts. Normally the number attending the yearly conference is about 150.

Besides plenary sessions, the conferences have smaller working groups dealing with specific problems. There is always a working group aimed at reducing nuclear dangers, and also groups on controlling or eliminating chemical and biological weapons. In addition, there may now be groups on subjects such as climate change, poverty, United Nations reform, and so on.

Invitations to the conferences are issued by the Secretary General to participants nominated by the national groups. The host nation usually pays for the local expenses, but participants finance their own travel.

In addition to the large annual meeting, the Pugwash organization also arranges about ten specialized workshops per year, with 30-40 participants each.

Although attendance at the conferences and workshops is by invitation, everyone is very welcome to join one of the national Pugwash groups. The international organization's website is at www.pugwash.org.

In 1995, the Nobel Peace Prize was awarded jointly to



Figure 21: *This photo shows Sir Joseph Rotblat in his London office shortly after he had been informed about the award of the Nobel Peace Prize. The bundles of manuscripts in the background are there because he edited the proceedings of each large yearly Pugwash Conference. The resulting books were then distributed to governments and to decision-makers. Source: Pugwash Conferences*

Prof. Joseph Rotblat and to Pugwash Conferences on Science and World Affairs as an organization, "...for their efforts to diminish the part played by nuclear arms in international politics and in the longer run to eliminate such arms." The award was made 50 years after the tragic destruction of Hiroshima and Nagasaki.

In his acceptance speech, Sir Joseph Rotblat (as he soon became) emphasized the same point that has been made by 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 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 nuclear war.

"The quest for a war-free world", Sir Joseph concluded, "has a basic purpose: survival. But if, in the process, we can learn to achieve it by love rather than by fear, by kindness rather than compulsion; if in the process we can learn to combine the essential with the enjoyable, the expedient with the benevolent, the practical with the beautiful, this will be an extra incentive to embark on this great task. Above all, remember your humanity"

I vividly remember the ceremony in Oslo when the 1995 Nobel Peace Prize was awarded jointly to Sir Joseph and to Pugwash Conferences. About 100 people from the Pugwash organization were invited, and I was included because I was the chairman of the Danish National Pugwash Group. My chair at the ceremony was only a few meters away from the Norwegian royal family.

After the ceremony and before the dinner, local peace groups had organized a torchlight parade. It was already

dark, because we were so far to the north, and snow was falling. About 3,000 people carrying torches marched through the city and assembled under Sir Joseph's hotel window, cheering and shouting "Rotblat! Rotblat! Rotblat!". Finally he appeared at the hotel window, waved to the crowd and tried to say a few words. This would have been the moment for a memorable speech, but the acoustics were so terrible that we could not hear a word that he said. I later tried (without success) to persuade the BBC to make a program about nuclear weapons and about Sir Joseph's life, ending with the falling snow and the torch lit scene.

I attended almost all of the yearly Pugwash Conferences from 1989 onwards, until I became too ill to travel. Some of them are especially vivid in my memory. The 1991 conference took place in Beijing, and I served as Rapporteur for the working group on Eliminating Poverty and Achieving Sustainability. The task of being Rapporteur involves sleepless nights, but it is also very instructive because one has to learn to write rapidly. My report in Beijing was a big hit, partly because I emphasized the important role of women in achieving sustainability.

The following year, the big conference was held in Berlin. It was especially interesting because Prof. Hans-Peter Durr, the Director of the Max Planck Institute for Physics, argued strongly that for a process to be truly sustainable, it has to be cyclic. There cannot be sources, because in the long run they will be exhausted, nor sinks, because in the long run they will be filled. I was again chosen to be Rapporteur for the working group on Sustainability.

The night before the end of the conference I had just finished the final version of my report, which emphasized the need for stabilizing global population. It was 2.00 AM, and I had just turned off my light and was about to go to



Figure 22: *Prof. Hans-Peter Durr, (1929-2014), Director of the Max Planck Institute for Physics. He argued strongly that for a process to be truly sustainable, it has to be cyclic. There cannot be sources, because in the long run they will be exhausted, nor sinks, because in the long run they will be filled. Source: Leifiman at the German language Wikipedia.*

sleep. There was a knock on the door, and when I opened it I was faced with a delegation that had come to persuade me to change the part about population stabilization. At about 3.00 AM we finally reached a compromise, and they left me to sleep in peace for a few hours.

I attended many other Pugwash conferences in various parts of the world, all of them interesting. I was almost always chosen to be Rapporteur for whatever working group I was a part. As mentioned, this involved sleepless nights. The Rapporteur had to prepare draft report overnight, which was presented at the last session of the working group. The report was criticized by the members of the group. Then a final draft had to be prepared overnight, and read to the final plenary session of the conference. It was exhausting work, but besides giving me practice in rapid writing, it also gave me experience in speaking to a large and important audience.

In 1995, after Pugwash Conferences had shared the Nobel Peace Prize with Sir Joseph Rotblat, our organization was given considerable publicity in Denmark. For the moment, at least, everyone knew who we were. I felt that I ought to make use of this situation to apply for money to organize a Pugwash workshop. The topic that I thought would be interesting for the workshop was "The Role of Women in Achieving a Sustainable Society".

I went to see Elisabeth Møller Jensen, the leader of the Danish feminist movement, who was related by marriage to my wife. I did not expect that much would happen during my first visit with Elisabeth, but such was her enormous decisiveness and efficiency as an administrator that by the time I left her office everything was completely arranged for the workshop. She had even made reservations at a center for Nordic cooperation in a fashionable suburb of Copenhagen.

Sadly, the Pugwash Council did not allow me to organize



Figure 23: *Elisabeth Møller Jensen, leader of the Danish feminist movement. Source: Kvindfo.*

a workshop on the topic that I had chosen. Instead they insisted that the workshop should be on “The United Nations Framework Convention on Climate Change”. I was forced to go along, and we were still able to use the reservations made by Elisabeth. I was also able to obtain financial support for the workshop.

At that time, I did not realize the full importance of climate change, but I must admit that one of the lectures at the workshop was alarming and thought-provoking. It was by Prof. John P. Holdren. During his lecture, he showed us images illustrating the degree of global warming that was predicted for the 21st century in various parts of the world. Then, in answer to a question, he also showed us similar images for the 22nd century. John’s last images were absolutely shocking, predicting three or four times as much warming as during the 21st century! But more about that later.



Figure 24: *Prof. John P. Holdren. He was chairman of the Executive Committee of Pugwash Conferences and is currently one of President Obama's chief scientific advisors. Public domain, Wikimedia Commons*

Some Activities of the Danish Pugwash Group

In the beginning, our Danish Pugwash Group was very small. Three of us, Tom Børsen Hansen, Jens-Christian Navarro Poulsen, and I, used to have lunch together once a week at the Ørsted Institute where all of us worked. Tom Børsen was my former student M.Sc. student, and he later helped me to teach the Science and Society course. Jens-Christian was the head of laboratory work at the Chemistry Department.

At that time, before his marriage and small children, Tom had enough free time to be very active, and he organized a Student Pugwash group that met regularly to discuss global problems. Later on, he had to give that up because of the duties of fatherhood.

When we were discussing possible activities at our weekly

lunchtime meetings, Jens-Christian had the bright idea that we should invite Dr. Tadatoshi Akiba, the Mayor of Hiroshima, to visit Copenhagen. Dr. Akiba was the President of Mayors for Peace, an organization that was working very effectively for the abolition of nuclear weapons. Copenhagen was not a member of Mayors for Peace, and Jens-Christian thought that it ought to be.

Jens-Christian's idea turned out to be a wonderful one. By arranging for Dr. Akiba to visit several other countries in Scandinavia, we were able to get the Mayors for Peace organization to support his travel expenses. We were also able to persuade the Lord Mayor of Copenhagen, Ritt Bjerregaard, to join Mayors for Peace, despite a Danish law that forbids mayors from expressing themselves on foreign policy issues.

In connection with Dr. Akiba's visit, we also arranged a day of peace education at Copenhagen's Open Gymnasium. About 15 people from various branches of Denmark's peace movement arrived at the gymnasium at 7.00 a.m., and between 8.00 and 10.00 they talked to 15 groups of about 25-50 students about topics related to peace. At 10.30, all 500 students assembled in a large hall, where Dr. Akiba gave an address on abolition of nuclear weapons. A chorus from the gymnasium sang, and finally there was a panel discussion. The students were extremely enthusiastic about the whole program.

The success of our 2007 effort made us want to do something similar in 2008, and perhaps to broaden the scope. Therefore we wrote to the Danish Minister of Education, Bertel Haarder, and proposed that October 24, United Nations Day, should be a theme day in all Danish schools and gymnasiums - a day devoted to the discussion of global problems and their solutions. We received a very kind reply. The Minister said that he thought our idea was a good one, but

that he did not have the power to dictate the curricula to schools. We needed to contact the individual schools, gymnasiums and municipalities.

In the autumn of 2009 we arranged a United Nations Day program on October 24 at Sankt Ann Gymnasium with the cooperation of Nørre Gymnasium. We offered prizes to drama students at the two gymnasiums for the best peace-related dramatic sketch, a condition being that the sketches should be performed and judged before a large audience. Our judges were the actress Mia Lyhne, Johan Olsen, the lead singer of “Magtens Korridorer” and the dramatist Steen Haakon Hansen. The students’ sketches and the judges speeches about the meaning of peace were very strong and moving. Everyone was very enthusiastic about the day. The judges have said that they would be willing to work with us again on peace-related cultural events.

In 2010, with the help of the Hermod Lannung Foundation, we offered student peace prizes to the students in 9 Danish gymnasiums. In 2011, the Hermod Lannung Foundation has given us sufficient funds to offer United Nations Day Student Peace Prizes at 11 Danish gymnasiums. We hope that the 2011 projects will be as exciting as they have been in previous years. We also hope that we will be able to continue and perhaps expand the project in the future.

One of the greatest benefits of Dr. Akiba’s visit was that it brought us into contact with a Japanese-Danish Buddhist group called SGI Denmark. (For a description of SGI, see the book review on page 45 of this volume). Getting to know and cooperate with SGI Denmark and its leaders, Jan Møller and Mark Kamio, as well as many others in the organization, has been a great joy to me personally, and it has greatly helped the work for peace of our Danish Pugwash Group. Like the Quakers, and a few other religious groups, SGI is dedicated

to working courageously and actively for peace, international understanding, and the total abolition of nuclear weapons.

We soon found that it was convenient to have our Pugwash meetings at SGI Denmark's beautiful Nordic Cultural Center, enjoying the wonderful hospitality of Jan and Mark and the others. I also began the practice of traveling to Askov College in Jutland twice a year to lecture about nuclear dangers to visiting students from the Sokka University, Tokyo. Also, for three years in a row, I had the privilege of being invited to give a half-hour speech on Hiroshima Day (August 6) at SGI Denmark's annual summer course. It was an enormous pleasure to speak to the 400 or so enthusiastic SGI members assembled for the course.

Kjeld Aakjær, who advised the Baltic NGO Forum, came quite regularly to our Danish Pugwash meetings. He called our attention to the Hermod Lannung Foundation. Kjeld forcefully told us that in order to make a political impact, we had to hold large meetings at the Danish Parliament, and he told us that the Lannung Foundation supported such projects.

This was good advice indeed. We followed it, and with the help of the Lannung Foundation, we organized many large conferences and smaller meetings at the Danish Parliament. Over many years, the Hermod Lannung Foundation has also supported a project where we offer students at Danish gymnasiums Student Peace Prizes for projects related to the United Nations, to world peace, and to the solution of global problems. The projects are presented on United Nations Day (October 24) before a large audience of other students.

In the spring of 2013, we organized a renewable energy symposium at the University of Copenhagen's Alexander Hall. The symposium took place on the 9th of March, 2013, almost exactly two years after the Fukushima disaster. It



Figure 25: *Hans Blix addressing a conference on “Strengthening the Nuclear Nonproliferation Treaty and the International Atomic Energy Agency”, which we organized at the Danish Parliament. To his right are Jens-Christian, myself, MP Holger K. Nielsen, Hans K. Kristensen, and Ambassador Ali Soltineah.*



Figure 26: *The audience listening to Hans Blix. Source: Danish Pugwash Group*

aimed at increasing cooperation between Denmark and Japan in the field of renewable energy. This aim included both academic and research cooperation, and also cooperation between companies. The program for the symposium is given below:

Program

15.00-15.05: Welcome

15.05-15.20: His Excellency Mr. Toshio Sano, Ambassador of Japan

15.20-15.40: Prof. Bent Sørensen, Director, Energy, Environment and Climate Research Group, Roskilde University

15.40-16.00: Prof. Peter Hauge Madsen, Head of Department, Department of Wind Energy, Technical University of Denmark

16.00-16.30: Coffee break

16.30-16.50: Prof. Søren Linderøth, Head of Department, DTU Energy Conversion, Technical University of Denmark

16.50-17.30: General Discussion

The Danish Peace Academy

I must also mention my involvement in the Danish Peace Academy, an organization that was founded by Holger Terp. Holger completed his education as a librarian in 1992. In

1996, he participated in a course on “Internet and Presentation Technique” at the Academy of Fine Arts in Copenhagen. However, in 1999 he suffered a stroke, which made him blind in one eye and almost blind in the other. The stroke also affected Holger’s speech, so that it was difficult to understand him when he talked. Instead of giving up, as many people would have done, Holger resolved to devote the remainder his life to the cause of world peace. Despite his severe handicap, he has achieved almost incredible results.

Holger’s greatest achievement has been to found the Danish Peace Academy and to single-handedly create its enormous website. The website contains more than 90,000 files related to peace, in Danish, English and German, and it is currently visited by approximately 4,000 different people each day. Many of the visitors are from schools and universities in various parts of the world, who use the information on the website as a part of their studies.

In creating his website, Holger has used both his training as a librarian and the knowledge that he gained from the 1996 course at Copenhagen’s Academy of Fine Arts. As a result, many parts of the website have great visual beauty because of the liberal use of images. For example, one can enjoy Holger’s “Greenham Common Songbook”, which is an account of the successful efforts of the woman’s peace movement in England to prevent common land at Greenham from being used as a base for nuclear weapons. The songbook is a piece of history, illustrated not only by the songs, which the visitor to the website can hear performed by such artists as Peggy Seeger, but also by countless beautiful posters and photos from the era. Other special features of the website are numerous books, articles, poetry and song collections, a peace-related encyclopedia, and a timeline showing the history of the peace movement, from the middle ages up to the

present. The website also has outlines for peace-education courses, and a bibliography of books related to peace.

Holger himself is the author or editor of numerous books, and he has translated Gandhi's autobiography into Danish. The example of Gandhi's life has always been a guide for Holger, and perhaps Holger's life can be a guide for our own efforts, as we strive to work for peace. If he could achieve so much with such a severe handicap, then the rest of us ought to be able to do something too.

Some final remarks

Many thoughtful people realize that the 21st century is a time of crisis for civilization. Dr. Jens Junghans, whose opinions I greatly respect, points to an ecological megacatastrophe that will result if humans do not stop their destruction of our fragile global environment. I agree with him completely, but would add that nuclear war is also a threat, both to human civilization and to the biosphere.

Although none of us asked to be born at a time of crisis, history has given us great responsibilities. Unless we work with courage and dedication to save our beautiful world for future generations, all the treasures that past generations have given us will be lost.

What are the great tasks that history has given to us? Where true democracy has decayed into oligarchy, democracy must be restored. Global population must be stabilized, and in the long run, reduced. Nuclear weapons must be completely abolished. The institution of war must be abolished by turning the United Nations into a federation. Our consumption of fossil fuels must quickly end, through changes in lifestyle, and through an all-out effort to rapidly develop renewable energy.



Figure 27: *Thom Hartmann broadcasting. He contacted me because of my articles about dangers from the methane hydrate feedback loop. I realized that his video on the subject is enormously important, and I have been promoting it ever since. The video can be found by typing Thom Hartmann Last Hours into a search engine. [CC SA 3.0], Wikimedia Commons.*

Soldiers in war are asked to give their lives for their countries. We, who are opposed to war, must be equally willing to devote our lives to a cause - the cause of saving civilization - the cause of saving the the biosphere - the cause of saving the future.

CLIMATE CHANGE

MEANS LIFESTYLE CHANGE

Scientists are unanimous in warning us that unless we very rapidly reduce CO₂ emissions, we risk passing a tipping point beyond which we will be powerless to prevent uncontrollable global warming. We risk a human-produced extinction event comparable to the Permian-Triassic thermal maximum, during which 96 percent of marine species and 70 percent of terrestrial vertebrates became extinct.¹²

The excellent videos of Thom Hartmann and his co-workers tell us very clearly a fact of which the scientific community is very conscious, but which the mass media refuse to discuss. The fact is this:

Arctic seas are warming very rapidly, and they will soon be free of ice in the summers. The warming of Arctic seas and tundra threatens to release vast quantities of methane into the atmosphere by melting methane hydrates. This in turn threatens to warm the remainder of the world so much that methane hydrates in all offshore deposits will be destabilized. If this happens, the result will be a major extinction event, which will threaten not only human civilization, but also much of the biosphere.¹³

The worrying thing about the threat of an out-of-control methane hydrate feedback loop is that the quantity of methane hydrates is so vast. There are roughly 10,000 gigatons.

¹²<https://www.youtube.com/watch?v=k4LL1B3JfnY>
<https://www.youtube.com/watch?v=vZO2WQ-qK5c>

¹³<https://www.youtube.com/watch?v=m6pFDu7ILV4>
<https://www.youtube.com/watch?v=a9PshoYtoxo>
<https://www.youtube.com/watch?v=c3XpF1MvC8s>

of these ice-like crystals on ocean floors, an amount of carbon greater than all of the world's deposits of fossil fuels. Methane hydrates or clathrates are stable at ordinary temperatures, but if oceans warm, they will melt, releasing the potent greenhouse gas methane.

It is not so surprising that our mass media do not give us a correct picture of these grave dangers to the future of our earth. The mainstream media are owned by oligarchic financial interests, including large coal and oil companies, which are desperately anxious cash in on their huge holdings of fossil fuels.

Despite silence and misinformation in the mass media, the general public is becoming, to some extent, aware of the grave dangers posed by out-of-control climate change. However, this does not seem to affect people's behavior. Professor Michael Klare discussed this strange split between awareness and behavior in a recent article:¹⁴

“Considering all the talk about global warming, peak oil, carbon divestment, and renewable energy”, Prof. Klare writes, “you’d think that oil consumption in the United States would be on a downward path. By now, we should certainly be witnessing real progress toward a post-petroleum economy. As it happens, the opposite is occurring. U.S. oil consumption is on an upward trajectory, climbing by 400,000 barrels per day in 2013 alone, and, if current trends persist, it should rise again both this year and next.”

“In other words, oil is back. Big time. Signs of its resurgence abound. Despite what you may think, Americans, on average, are driving more miles every day, not fewer, filling ever more fuel tanks with ever more gasoline, and evidently feeling ever less bad about it. The stigma of buying new gas-guzzling SUVs, for instance, seems to have vanished; ac-

¹⁴<http://www.countercurrents.org/klare040914.htm>

according to CNN Money, nearly one out of three vehicles sold today is an SUV. As a result of all this, Americas demand for oil grew more than Chinas in 2013, the first time thats happened since 1999.”

There is a second reason why the mainstream media conspire to reassure their readers and viewers that it is fine to continue their usual lifestyles: This second reason is the fear of precipitating an economic recession. Such a recession is due to occur soon in the United States because of US over-spending on war, using money borrowed from China, and because the petrodollar is threatened by BRICS agreements. However, the short-term profit motive ensures that the slave-like media continue to make us believe that all is well, and that economic growth can continue forever.

Undeniably, an economic recession will be extremely painful, but sooner or later it will certainly occur. On a finite planet, endlessly continued economic growth is a logical impossibility. Furthermore, it is exactly that growth which threatens to produce a 6th mass extinction event.

If we wish to save the long-term future of our beautiful earth for future generations of humans, and for the animals and plants with which we share the earth today, we must not only urgently develop all forms of renewable energy, but also we must quickly change our lifestyles. Renewables, such as wind power and solar cells are producing a rapidly increasing fraction of our energy needs, but this fraction is still very small, only 19 percent in 2014.

What then must we do? We must develop a new economic system which will aim at long-run sustainability. Within such a system, the problem of unemployment can be addressed by shifting jobs to the task of building renewable energy infrastructure. Secondly, we must recognize that our usual lifestyles cannot be continued. We must limit our con-

sumption to necessities; and we must travel only when absolutely necessary. If we do not make these changes, we will have lost the struggle for the future.

THE AGONY OF IRAQ

There is a close relationship between petroleum and war. James A. Paul, Executive Director of the Global Policy Forum, has described this relationship very clearly in the following words:

“Modern warfare particularly depends on oil, because virtually all weapons systems rely on oil-based fuel - tanks, trucks, armored vehicles, self-propelled artillery pieces, airplanes, and naval ships. For this reason, the governments and general staffs of powerful nations seek to ensure a steady supply of oil during wartime, to fuel oil-hungry military forces in far-flung operational theaters.”

“Just as governments like the US and UK need oil companies to secure fuel for their global war-making capacity, so the oil companies need their governments to secure control over global oilfields and transportation routes. It is no accident, then, that the worlds largest oil companies are located in the worlds most powerful countries.”

“Almost all of the worlds oil-producing countries have suffered abusive, corrupt and undemocratic governments and an absence of durable development. Indonesia, Saudi Arabia, Libya, Iraq, Iran, Angola, Colombia, Venezuela, Kuwait, Mexico, Algeria - these and many other oil producers have a sad record, which includes dictatorships installed from abroad, bloody coups engineered by foreign intelligence services, militarization of government and intolerant right-wing nationalism.”

Iraq, in particular, has been the scene of a number of wars motivated by the Wests thirst for oil. During World War I, 1914-1918, the British captured the area (then known as Mesopotamia) from the Ottoman Empire after four years of bloody fighting. Although Lord Curzon (a member of the

British War Cabinet who became Foreign Minister immediately after the war) denied that the British conquest of Mesopotamia was motivated by oil, there is ample evidence that British policy was indeed motivated by a desire for control of the regions petroleum. For example, Curzons Cabnet colleague Sir Maurice Hankey stated in a private letter that oil was “a first-class war aim”. Furthermore, British forces continued to fight after the signing of the Murdos Armistice.

In this way, they seized Mosul, the capital of a major oil-producing region, thus frustrating the plans of the French, who had been promised the area earlier in the secret Sykes-Picot Agreement. Lord Curzon was well aware of the military importance of oil, and following the end of the First World War he remarked: “The Allied cause has floated to victory on a wave of oil”.

The Sykes-Picot Agreement essentially took away from the Arabs the autonomy that they had been promised if they fought on the side of the Allies against the Turks. Today this secret double-cross continues to be a great source of bitterness.¹⁵

During the period between 1918 and 1930, fierce Iraqi resistance to the occupation was crushed by the British, who used poison gas, airplanes, incendiary bombs, and mobile armored cars, together with forces drawn from the Indian Army. Winston Churchill, who was Colonial Secretary at the time, regarded the conflict in Iraq as an important test of modern military-colonial methods.

An article in The Guardian explains that Churchill was particularly keen on chemical weapons, suggesting that they be used 'against recalcitrant Arabs as an experiment I am

¹⁵<https://www.khanacademy.org/humanities/history/euro-hist/middle-east-20th-century/v/sykes-picot-agreement-and-the-balfour-declaration>

strongly in favour of using poison gas against uncivilized tribes...'¹⁶

In 1932, Britain granted nominal independence to Iraq, but kept large military forces in the country and maintained control of it through indirect methods. In 1941, however, it seemed likely that Germany might try to capture the Iraqi oilfields, and therefore the British again seized direct political power in Iraq by means of military force. It was not only Germany that Britain feared, but also US attempts to gain access to Iraqi oil.

The British fear of US interest in Iraqi oil was soon confirmed by events. In 1963 the US secretly backed a military coup in Iraq that brought Saddam Husseins Baath Party to power. In 1979 the western-backed Shah of Iran was overthrown, and the United States regarded the fundamentalist Shiite regime that replaced him as a threat to supplies of oil from Saudi Arabia.

Washington saw Saddams Iraq as a bulwark against the militant Shiite extremism of Iran that was 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 Husseins 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 Husseins government to obtain chemical weapons. A chemical plant, called Falluja 2, was built by Britain in 1985, and this plant was used to produce mustard gas and nerve gas.

¹⁶<http://www.theguardian.com/world/2003/apr/19/iraq.arts>

Also, according to the Riegel Report to the US Senate, May 25, (1994), the Reagan Administration turned a blind eye to the export of chemical weapon precursors to Iraq, as well as anthrax and plague cultures that could be used as the basis for biological weapons. According to the Riegel Report, “records available from the supplier for the period 1985 until the present show that during this time, pathogenic (meaning disease producing) and toxigenic (meaning poisonous), and other biological research materials were exported to Iraq pursuant to application and licensing by the US Department of Commerce.”

In 1984, Donald Rumsfeld, Reagan's newly appointed Middle East Envoy, visited Saddam Hussein to assure him of America's continuing friendship, despite Iraqi use of poison gas. When (in 1988) Hussein went so far as to use poison gas against civilian citizens of his own country in the Kurdish village of Halabja, the United States worked to prevent international condemnation of the act. Indeed US support for Saddam was so unconditional that he obtained the false impression that he had a free hand to do whatever he liked in the region.

On July 25, 1990, US Ambassador April Glaspie met with Saddam Hussein to discuss oil prices and how to improve US-Iraq relations. According to the transcript of the meeting, Ms Glaspie assured Saddam that the US had no opinion on the Arab-Arab conflicts, like your border disagreement with Kuwait. She then left on vacation. Mistaking this conversation for a green light, Saddam invaded Kuwait eight days later.

By invading Kuwait, Hussein severely worried western oil companies and governments, since Saudi Arabia might be next in line. As George Bush senior said in 1990, at the time of the Gulf War, “Our jobs, our way of life, our own freedom

and the freedom of friendly countries around the world would all suffer if control of the worlds great oil reserves fell into the hands of Saddam Hussein.”

On August 6, 1990, the UN Security Council imposed comprehensive economic sanctions against Iraq with the aim of forcing Iraq to withdraw from Kuwait. Meanwhile, US Secretary of State James A. Baker III used arm-twisting methods in the Security Council to line up votes for UN military action against Iraq. In Bakers own words, he undertook the process of “cajoling, extracting, threatening and occasionally buying votes”.

On November 29, 1990, the Council passed Resolution 678, authorizing the use of all necessary means (by implication also military means) to force Iraq to withdraw from Kuwait. There was nothing at all wrong with this, since the Security Council had been set up by the UN Charter to prevent states from invading their neighbors. However, one can ask whether the response to Saddam Husseins invasion of Kuwait would have been so wholehearted if oil had not been involved.

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 Shiites and Kurds were encouraged by the Allies to rebel against Saddam Husseins 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.¹⁷

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 crueler than these. They are suffering slowly, helplessly, without simple remedial medication, without simple sedation to relieve pain, without mercy.”

In discussing Iraq, we mentioned oil as a motivation for

¹⁷<https://www.transcend.org/tms/2014/09/usauk-committed-genocide-against-iraq-people/>
<http://www.informationclearinghouse.info/article37511.htm>

western interest. Similar considerations hold also for Afghanistan. US-controlled oil companies have long had plans for an oil pipeline from Turkmenistan, passing through Afghanistan to the Arabian Sea, as well as plans for a natural gas pipeline from Turkmenistan through Afghanistan to Pakistan.

The September 11 terrorist attacks resulted in a spontaneous worldwide outpouring of sympathy for the United States, and within the US, patriotic support of President George W. Bush at a time of national crisis. Bush's response to the 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 were 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 law⁶. 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.

Bush's principle of preemptive war was promptly condemned by the Catholic Church. Senior Vatican officials pointed to the Catholic teaching that “preventive” war is unjustifiable, and Archbishop Renato Martino, prefect of the Vatican Council for Justice and Peace, stated firmly that “unilateralism is not acceptable”.

However, in the United States, the shocking content of Bush's West Point address was not fully debated. The speech was delivered only a few months after the 9/11 terrorist

attacks, and the US supported whatever exceptional measures its President thought might be necessary for the sake of national security. American citizens, worried by the phenomenon of terrorism, did not fully appreciate that the principle of preemptive war could justify almost any aggression, and that in the long run, if practiced by all countries, it would undermine the security of the United States as well as that of the entire world.

During the spring of 2003, our television and newspapers presented us with the spectacle of an attack by two technologically superior powers on a much less industrialized nation, a nation with an ancient and beautiful culture. The ensuing war was one-sided. Missiles guided by laser beams and signals from space satellites were more than a match for less sophisticated weapons. Speeches were made to justify the attack. It was said to be needed because of weapons of mass destruction (some countries are allowed to have them, others not). It was said to be necessary to get rid of a cruel dictator (whom the attacking powers had previously supported and armed). But the suspicion remained that the attack was resource-motivated. It was about oil, or at least largely about oil. The war on Iraq was also designed to destroy a feared enemy of Israel.

The Nobel Peace Prize winner, Mairead Corrigan Maguire estimates that US and UK actions between 1990 and 2012 killed 3.3 million people, including 750,000 children.

Against the historical background discussed in this article, we can appreciate the enormous hypocrisy of Obama's claim that the current bombing of Iraq is "humanitarian".

THE UNITED NATIONS

CLIMATE SUMMIT

On Tuesday, the 23rd of September, 2014, Leonardo de Caprio made a really excellent speech to the United Nations Climate Summit in New York. Despite the extremely high quality and genuine conviction of his speech, de Caprio failed to mention the terrible long-term threat which the world faces from the methane-hydrate feedback loop, which threatens to produce a human-induced 6th geological extinction event comparable to the Permian-Triassic thermal maximum.¹⁸ Leonardo de Caprio's failure to mention it in his otherwise excellent UN speech is surprising, since he and his family were closely involved with the production of the video.

Delegates at the United Nations Climate Summit were shown images of the inspiring and heartfelt People's Climate March, which took place on Sunday, September 21st. The organizers of the march had expected 100,000 participants. In fact, more than 400,000 people came, and the march was unique in its artistic brilliance and its ethnic diversity. It was one of 2,600 events in 170 nations. The slogan of the march in New York was "To change everything, we need everyone", and in fact everyone came!¹⁹ The United Nations Climate Summit was certainly a success. Much was achieved And yet, much was missing from the results²⁰

¹⁸<https://www.youtube.com/watch?v=sRGVTK-AAvw>
<http://eruditio.worldacademy.org/author/john-scales-avery>

¹⁹<https://www.youtube.com/watch?v=h5YaqcPEUNc>

²⁰<http://mashable.com/2014/09/24/united-nations-climate-summit-takeaways/>
<http://mashable.com/2014/09/23/un-climate-summit-country-promises-map/>
[tp://www.breitbart.com/Big-Peace/2014/09/23/](http://www.breitbart.com/Big-Peace/2014/09/23/)

However, China and India are now the world's two largest emitters of CO₂, and they did not make firm commitments to abandon the burning of coal. In fact, these two countries will suffer greatly from climate change, perhaps already in the near future. The present floods in Kashmir are a warning of what is to come. Summer temperatures in India may soon become so high that people without air conditioning will be unable to survive. In both China and India, summer water supplies will be threatened by the melting of Himalayan glaciers.

Throughout the world, people of all countries need to act with urgency to switch to an economy that aims at sustainability rather than endless consumption and growth, an economy based on renewable energy rather than fossil fuels, an economy devoted to life rather than to profits.

INTERRELATED THREATS TO HUMANS AND THE BIOSPHERE

Relatively short-term dangers from climate change

David Wasdell, Director of the Apollo Gaia Project, has pointed out that curves based on observations indicate that possibly as soon as 2015, the Arctic will be free of sea ice in September, which is the month when ice is at a minimum. Arctic seas will of course refreeze during the winters, but the ice is observed to be thinner and more vulnerable to storms, and before one or two decades have passed, sea ice will vanish entirely from the Arctic.²¹

With the vanishing of Arctic sea ice, several dangerous feedback loops will come into play. Ice reflects sunlight, but dark water absorbs it, accelerating the warming of the region. Warmer waters will progressively release more water vapor into the atmosphere, where it acts like a greenhouse gas. Melting Arctic tundra will release large quantities of the potent greenhouse gas methane. Furthermore, the warming of the bottoms of shallow Arctic seas will destabilize the very large amounts of methane hydrate crystals found there, releasing much more methane and CO₂ into the atmosphere, and further accelerating the rise in temperatures. The Arctic is already roughly 3 degrees Celsius above the 1981-2010 average.

²¹<https://www.youtube.com/watch?v=AjZaFjXfLec>
<https://www.youtube.com/watch?v=NUBZi3t4ZTo>

In 2012, the World Bank issued a carefully-researched report which concluded that the world as a whole is presently on track for warming of 4 degrees C by the end of the 21st century, and if determined action is not taken to prevent it, the warming will not stop there.²²

With higher temperatures, melting of the Greenland ice cap will accelerate. The time that will be needed for the complete melting of the Greenland icecap is uncertain. It is predicted to take place within 1,000 years, but non-linear effects may cause it to take place much sooner. It is observed that lakes forming on the surface of the ice sheet during the summers drain down to the bottom of the sheet, where they lubricate the flow of the ice towards the sea. Complete melting of the Greenland ice cap would raise global ocean levels by about 7 meters, and the loss of Antarctic sea ice would add approximately 7 meters to the total. Coastal cities throughout the world are at risk.

The rising sea levels, combined with the increased intensity of hurricanes and typhoons, have already had devastating results. One can think of the effects of hurricanes Katrina, Irene and Sandy in North America, and Typhoon Haiyan in the Philippines. As ocean levels continue to rise, and as sea surface temperatures continue to increase, the damage caused by hurricanes will become much greater.

Rising ocean levels threaten to flood many low-lying regions of the world, such as the Netherlands, oceanic islands, parts of Vietnam, Bangladesh and Southern Florida, producing climate refugees and reducing global agricultural output.

Glaciers throughout the world are melting rapidly because of climate change. The continuation of this trend would threaten the summer water supplies of China, India

²²<http://www.worldbank.org/en/news/feature/2012/11/18/Climate-change-report-warns-dramatically-warmer-world-this-century>

and some parts of North and South America. This would also damage global agriculture at a time when population is increasing. Droughts and floods produced by climate change also threaten the world's agricultural output. We have recently seen severe floods in Jammu and Kashmir, as well as unprecedented droughts in the South Western regions of the United States and in East Africa.²³

Thus, through several mechanisms, climate change threatens the world's food supply. We must also recognize that a large fraction of global agricultural output depends heavily on high-yield modern agriculture (the "Green Revolution"), which in turn depends on the availability of fossil fuels, for producing chemical fertilizers, for driving farm machinery, and for transportation of food. Not only is the use of fossil fuels one of the main causes of climate change, but also one can predict that both oil and natural gas will soon become very expensive.

We can see that by the middle of the present century, just as the global population reaches the unprecedented level of approximately 9 billion, the world's food supply will be dealt a severe blow by the effects of climate change coupled with the collapse of modern high-yield agriculture. There is a danger that an extremely wide-spread global famine will then occur, which may produce billions of deaths, rather than millions.

Almost all scientists agree that the threats posed by climate change are very severe indeed, and yet the majority of governments fail to take the firm steps that will be needed to avoid its worst effects. To make matters worse, powerful lobbyists from fossil fuel industries have mounted massive advertising campaigns to convince the public that climate change

²³<http://www.nrdc.org/globalwarming/watersustainability/files/WaterRisk.pdf>

is not real, that it is “a liberal hoax”. Thus we can see that dangers due to climate change are linked with dangers from the rise of economic inequality and corporate power, and to the decay of democratic government. Part of the blame must also fall on our servile and dishonest mainstream media.

Economic inequality, the decay of democracy, and the danger of nuclear war

A recently released study by Oxfam concluded that almost half of the world’s wealth is now owned by just 1 percent of the population. The report states that “Left unchecked, political institutions are undermined and governments overwhelmingly serve the interests of economic elites, to the detriment of ordinary people”.²⁴

Extreme inequality, such as we have today, can also contribute to economic collapse. The poor do not have enough money, and the very rich are too few in number to buy back the output of a society. This is a formula for economic recession. To avoid the inevitable downturn caused by excessive inequality, our oligarchic governments resort to what might be called “Military Keynesianism”. To prevent the crash of stock markets and banks, our corporate-controlled governments pour almost unimaginable amounts of money into perpetual wars. Enemies have to be found: communists, terrorists, the Islamic world, Russia, Iran, China, and so on. The corporate press keeps the public perpetually in fear of these “enemies”.

Although many countries have undemocratic and oligarchic governments, the decay of democracy is especially worry-

²⁴<http://www.oxfam.org/en/research/working-few>
<http://www.commondreams.org/views/2014/10/30/inequality-not-inevitable-its-time-even-it>

ing in the United States. When Barak Obama was elected President, there was hope throughout the world that the gangster-like domestic and foreign policies of the Bush administration would change. On the basis of his campaign promises and his speeches in Prague and Cairo, Obama was even (prematurely) awarded a Nobel Peace Prize. But nothing changed. In fact, under Obama, perpetual wars and aggressive interventions in the internal affairs of other countries have become more flagrant and reckless than they were under Bush. At home, violations of the constitution and civil rights, as well as prosecution of whistle-blowers and militarization of the police have become the norm.

Why did Obama change overnight into a new and worse version of George W. Bush? Why do both Democrats and Republications in the US Congress slavishly vote for the interests of the super-rich oligarchy, the military-industrial complex, the fossil fuel industry and Israel? Why do European politicians support the imperial goals of the United States? Are they being blackmailed through personal secrets revealed by all-encompassing NSA spying? Are they being bribed, or threatened, or both? We do not know. All we know is that the will of the people no longer counts for anything. In Frank Zappa's words "Government is the Entertainment division of the military-industrial complex". The corporate billionaire oligarchs are saying to us: Vote for whomever you like; we own them all". Of course voting for good candidates remains extremely important, but we cannot stop there. After voting we must remain politically active and dedicated to ensure that elected politicians are not bought by lobbies.

Under the present system, Washington insiders have begun to believe their own propaganda. Influenced by ingrown group-think, they exhibit symptoms of recklessness border-

ing on insanity. We can see this almost-insane recklessness most clearly in the recent attempt of the United States government to revive the Cold War by supporting a neo-Nazi coup against the elected government of Ukraine. The aim seems to be to provoke a conflict with Russia. Conflicts are, after all, needed to justify obscenely bloated military budgets. But a conflict between Russia and the United States could easily escalate into a nuclear war.

The centenary of the tragic outbreak of World War I reminds us of the dangers of escalation. We can also remember that none of the people responsible for the outbreak of that world-destroying conflict had any imaginative idea of what it would be like. They thought that it would be over in a few months. They visualized romantic and heroic cavalry charges. But the machine gun, long-range artillery and poison gas had changed the character of war. Similarly, it seems that none of the Washington hawks who today risk provoking a thermonuclear war with Russia have any imaginative idea of what such a war would be like.

Recent research shows that a large-scale nuclear war would be an ecological catastrophe, damaging global agriculture to such an extent that it could initiate a very large-scale famine involving billions of deaths, and severely damaging the biosphere. Furthermore, long-lasting radioactive contamination would make large areas of the world permanently uninhabitable.²⁵

Limits to growth

Although never-ending exponentially-increasing economic growth on a finite planet is a logical impossibility, today's politicians and economists are almost universally committed

²⁵<http://www.nucleardarkness.org/>

to such growth. Their defiance of logic is achieved by refusing to look more than one or two decades into the future. We can gain some understanding of this self-imposed myopia by examining today's fractional-reserve banking system.

Fractional reserve banking is the practice whereby private banks keep only a small fraction of the money entrusted to them, and lend out the remaining amount. Under this system, profits from any expansion of the money supply go to the 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 currency.

When the economy contracts instead of expanding, the result is still worse. The depositors then ask the banks for their money, which it is their right to do; but the banks do not have the cash. It has been lent out. Unless the government and the taxpayers are able and willing to save the banks, they collapse. This explains why politicians and economists fear a stationary or contracting economy, and why they are so dedicated to limitless growth, despite the fact that it is a logical and mathematical impossibility.

Of course, it is necessary to distinguish between industrial growth and growth of knowledge and culture, which can and should continue to grow. Qualitative improvements in human society are possible and desirable, but resource-using and pollution-producing industrial growth has reached or exceeded its sustainable limits.

Because of the unrestricted growth of both industry and population, the earth is headed towards an ecological megacatastrophe. According to Wikipedia, "Global deforestation sharply accelerated around 1852. It has been estimated that about half of the earth's mature tropical forests... have now been destroyed. Some scientists have predicted that unless significant measures (such as seeking out and protecting old-

growth forests that have not been disturbed) are taken on a worldwide basis, by 2030 there will be only 10 percent remaining, with another 10 percent in a degraded condition. 80 percent will have been lost, and with them hundreds of thousands of irreplaceable species.”²⁶

The world’s ability to feed its growing population is threatened by loss of fertile cropland through erosion, salination, desertification, loss of topsoil, urbanization and failure of water supplies. In China, India and in the southwestern part of the United States, water tables are being overdrawn and are falling at an alarming rate. For example, the Ogallala aquifer in the US southwest is has a yearly overdraft of 160 percent.

If irrigation of arid lands is not performed with care, salt may be deposited so that the land is ruined for agriculture. Another type of desertification can be seen in the Sahel region of Africa, south of the Sahara. Rapid population growth has led to overgrazing, destruction of trees and wind erosion, so that the land has become unable to support even its original population. Often tropical rain forests are felled or burned for the sake of new agricultural land. However, the nutrients in the newly-cleared land are often quickly washed away by rains, so that the land becomes unsuitable for farming and has to be abandoned. Loss of fertile land also occurs when it is paved over by urban development.²⁷

The long-term perspective

The interrelated threats to humans and the biosphere which

²⁶<http://en.wikipedia.org/wiki/Deforestation>

²⁷<http://www.worldwildlife.org/threats/soil-erosion-and-degradation>
<http://en.wikipedia.org/wiki/Desertification>

we have been discussing become still more clear and severe if we consider the long-term perspective. For example, we mentioned climate change feedback loops resulting from the destabilization of methane hydrate crystals on Arctic sea floors. In the long term, there is a danger that melting of these crystals will occur at the bottom of oceans throughout the world. Geologists tell us that there have been five major extinction events in the past, in each of which more than half of all living organisms were lost. Many scientists believe that global warming by 10-15 degrees C due to the release of methane from ocean floors was the cause of these mass extinctions, and that unless prompt measures are taken to prevent it, there will be a danger of a human-initiated 6th mass extinction. The worrying thing about methane hydrate crystals at the bottoms of oceans is the enormous quantity of carbon which they contain, perhaps as much as 10,000 gigatons. One can put this enormous quantity into perspective by comparing it with the total amount of carbon emitted by human activities since the start of the Industrial Revolution: 337 gigatons.²⁸

The danger of nuclear war also becomes clearer when we look at far ahead. Suppose that each year there is a certain finite chance of a nuclear catastrophe, let us say 1 percent. Then in a century the chance of a disaster will be 100 percent, and in two centuries, 200 percent, in three centuries, 300 percent, and so on. Over many centuries, the chance that a disaster will take place will become so large as to be a certainty. Thus by looking at the long-term future, we can see that if nuclear weapons are not entirely eliminated, civilization will not survive.

Finally, the limits to growth become very clear if we look far into the future. One can argue about the exact future

²⁸<https://www.youtube.com/watch?v=sRGVTK-AAvw>

date at which particular non-renewable resources will become so expensive that they cannot be used economically, but one cannot argue that such a time will never come. Furthermore, exponential growth of any kind, whether it is growth of population or growth of pollution-producing and resource-using industry, cannot be continued indefinitely on a finite planet. For example, if the rate of increase is a modest 2 percent per year, then over 500 years, whatever is growing at that rate will have increased by a factor of 22,000. No one can maintain that the earth can support 22,000 times its present human population or 22,000 times its present industry.

What then can we do?

On the 23rd of September, 2014, the United Nations Climate Summit took place in New York. Delegates and heads of state from around the world were shown images of the inspiring and heartfelt People's Climate March, which took place on Sunday, September 21st. The organizers of the march had expected 100,000 participants. In fact, more than 400,000 came, and the march was unique in its artistic brilliance and ethnic diversity. On the same day 2,600 similar events took place in 170 nations throughout the world, with the participation of 600,000 people. The slogan of the march in New York was "To change everything, we need everyone", and in fact, everyone came!²⁹

On that momentous September Sunday in 2014, the people of the world spoke with one voice on the urgent need to prevent the worst effects of climate change. They shouted

²⁹<https://www.youtube.com/watch?v=h5YaqcPEUNc>
<http://steadystate.org/category/herman-daly/>
<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>

loudly, “We do not want climate change! We want system change!” In her new book, “This Changes Everything”, author and activist Naomi Klein argues that the urgent need for action to avoid the worst consequences of climate change can unite people in the cause of other urgently needed changes, such as re-establishing democracy.

Pulitzer Prize-winning author Chris Hedges believes that widespread demonstrations will be necessary if democratic government is to be re-established. Of course such demonstrations cannot be violent, since they would have no chance at all against today’s militarized, tank-driving police. But both Mahatma Gandhi and Martin Luther King have shown how effective non-violent campaigns can be as a tool for system change.

All of the technology needed for the replacement of fossil fuels by renewable energy is already in place. Much research and thought have 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.

We live in a time of crisis. We did not ask to be born at such a time, but 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 the institution of war. 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.

BIRGITTA JONSDOTTIR, DEMOCRACY, AND FREEDOM OF INFORMATION

The Icelandic parliamentarian, Birgitta Jonsdottir, has taken an important step towards solving one of the central problems that the world is facing today. The problem is this: How can we regain democratic government when the mainstream media are completely controlled the corporate oligarchy?

If anyone doubts that democratic government has been lost and needs to be regained, let them think of the recent US election, in which a large percentage of the voters stayed home because they were disillusioned with the political process. They knew that whomever they elected, their voices would not be heard.

The voters did not like to be told that they had power, which in fact they did not have. Both major political parties follow the dictates of the corporate oligarchs, rather than the will of the people. No doubt the Democrats in the US Congress are slightly better than the Republicans, but both parties have essentially been bought by big money from lobbies representing the military-industrial complex, the fossil fuel companies, and Israel.

Contrary to the wishes of the people, social services continue to be cut in favor of obscenely bloated military budgets, perpetual foreign wars, and environment-destroying subsidization of the fossil fuel industry. Despite the will of the people, the US government exposes our beautiful earth to

the deadly risks of all-destroying thermonuclear war and out-of-control global warming.

The United States is by no means the only country with an oligarchic non-democratic government. Globally, countries with truly democratic and sane governments are the exception rather than the rule. Therefore the problem is a global one, and let us repeat it: How can we regain democratic government when the mainstream media are completely controlled the corporate oligarchy?

Let us return to Birgitta Jonsdottir. Who is she? Birgitta is a popular and successful young Icelandic poet, writer, artist, publisher and anti-war activist, who had no inkling until quite recently that she was destined to become a politician. Then in 2008, Iceland underwent a financial crisis. It became clear that the crisis was due to corrupt links of politicians with Iceland's financial sector. In 2009, Birgitta ran for the Icelandic Parliament (Althingi, the oldest parliament in the world) as part of the reform movement.

Believing that lack of free information was the main cause of the corruption behind Iceland's 2008 crisis, Birgitta Jonsdottir persuaded her colleagues in the Althingi to pass unanimously a law calling for complete freedom of information in Iceland. She also worked closely with Julian Assange to produce the video *Collateral Murder*.³⁰

Under Birgitta Jonsdottir's leadership, Icelandic parliamentarians plan to pass laws which will make make Iceland a safe haven for journalistic freedom. In so doing, they will help to re-establish democratic government throughout the world, a vital step if nuclear and climatic disasters are to be averted.

³⁰<https://en.immi.is/media/documentaries-on-immi/>
<http://birgitta.is>
<http://en.immi.is>

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 because of institutional and cultural inertia, we are failing to take the steps that are necessary to avoid disaster.

Institutional inertia

Our collective failure to respond adequately to the current crisis is very largely due to institutional inertia. For example, international relations are still based 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. 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.

The failure of the recent COP20 climate conference in Lima to produce a strong final document can be attributed to the fact that the nations attending the conference 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 conference.

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 person's beliefs. Thus polite conversation is dominated by trivia, entertainment, sports, the weather, gossip, food, and so on. Worries about 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 children's 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, don't 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 nor 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 world's economy and infrastructure to achieve long-term sustainability, i.e. steady-state economics, population stabilization, and renewable energy.

Religious conservatism

All known human societies have religions; and this is true not only of societies that exist today, but also of all past societies of which we have any record. Therefore it seems reasonable to suppose that the tendency to be religious is an intrinsic part of human nature. It seems to be coded into our genes. If evolutionary forces have produced the human tendency to be religious, then it must have some survival value. My own belief is that religion helps us because it is a mechanism for the preservation and transmission of human cultures.

All living organisms on earth hand on information from one generation to the next in the form of messages coded into their DNA and RNA. Humans are unique in having also evolved extremely efficient non-genetic methods for transmitting information from one generation to the next through our highly developed languages.

Cultural evolution is responsible for the success of our species. We dominate the earth because of cultural evolution. Thus, if religion is a mechanism for the preservation and transmission of particular cultures, it must have con-

ferred a great advantage to those societies that possessed religion, and a tendency to be religious would have been favored by the Darwinian forces of natural selection. This perhaps explains why it is now a universal part of human nature.

Throughout history, until recent times, the conservative role of religions in transmitting and preserving our cultural heritage has been a great advantage. However, the dangers that we are experiencing today demand quick changes in our patterns of thought and in our lifestyles; and here the conservatism of religion may be a disadvantage. For example, at a time when the exploding global population contributes to the severity of most of the dangers that we face, religious opposition to birth control has become inappropriate.

Furthermore, human history is drenched with blood from wars have been fought in the name of religion. We can think, for example, of the Crusades, or the Islamic conquests in the Middle East, North Africa and Spain, or the wars between Catholics and Protestants in Europe, or the brutal treatment of the indigenous populations of Africa, and the Americas in the name of religion. The list by no means stops there. This is because religion is so closely associated with ethnicity and nationalism.

The religious leaders of today have the opportunity to contribute importantly to the solution of the problem of war. They have the opportunity to powerfully support the concept of universal human brotherhood, to build bridges between religious groups by making intermarriage across ethnic boundaries easier, and to soften the distinctions between communities. If they fail to do this, they will have failed humankind in a time of crisis.

Although religion may be a part of the problems that we face today, it can potentially be part of the solution. Because

of the all-destroying modern weapons developed through the misuse of science, we urgently need religious ethics, i.e. the traditional wisdom of humankind. Not only do the fundamental ethical principles of the world's great religions agree with each others, but they also do not conflict in any way with science. If practiced, these principles would make war impossible, thus eliminating one of the greatest dangers that we face today, the cause of much of the suffering that humans experience.

The central ethical principles of Christianity can be found in the Sermon on the Mount and in the Parable of the Good Samaritan. In the Sermon on the Mount, we are told that we must not only love our neighbors as much as we love ourselves; we must also love and forgive our enemies. This seemingly impractical advice is in fact of great practicality, since escalatory cycles of revenge and counter-revenge can only be ended by unilateral acts of kindness. In the Parable of the Good Samaritan, we are told that our neighbor, whom we must love, is not necessarily a member of our own ethnic group. Our neighbor may live on the other side of the world and belong to an entirely different race or culture; but he or she still deserves our love and care.

Contrast this with the idea of "massive retaliation" which is part of the doctrine of nuclear deterrence! In nuclear retaliation, the victims would include people of every kind: women, men, old people, and infants, completely irrespective to any degree of guilt that they might have. As the result of such an attack, many millions of people in neutral countries would also die. This type of killing has to be classified as genocide.

When a suspected criminal is tried for a wrongdoing, great efforts are made to clarify the question of guilt or innocence. Punishment only follows if guilt can be established

beyond any reasonable doubt. Contrast this with the totally indiscriminate mass slaughter that results from a nuclear attack!

Thus both the doctrine of nuclear deterrence, and the very existence of nuclear weapons, are completely contrary to the central ethical principles of Christianity; and not only to the principles of Christianity, but to those of every other major religion.

It is an interesting fact that the Golden Rule, “Do unto others as you would have them do unto you”, appears in various forms in all of the world’s major religions. Wikipedia’s article on the Golden Rule gives a fascinating list of the forms in which the rule appears in many cultures and religions.

The Buddhist concept of karma has great value in human relations. The word karma means simply action. In Buddhism, one believes that actions will return to the actor. Good actions will be returned, and bad actions will also be returned. This is obviously true in social relationships. If we behave with kindness to our neighbors, they will return our kindness. Conversely, a harmful act may lead to vicious circles of revenge and counter-revenge. These vicious circles can only be broken by returning good for evil. However, the concept of karma has a broader and more abstract validity, beyond the direct returns of actions to the actor:

When we perform a good action, we increase the total amount of good karma in the world. If all people similarly behave well, the world as a whole will become more pleasant and more safe. Human nature seems to have a built-in recognition of this fact, and we are rewarded by inner happiness when we perform good and kind actions. In his wonderful book, *Ancient Wisdom, Modern World*, the Dalai Lama says that good actions lead to happiness and bad actions to unhappiness, even if our neighbors do not return these actions.

Inner peace, he tells us, can only be achieved through good actions.

In Buddhist philosophy, the concept of karma, action and reaction, also extends to our relationship with nature. Both Hindu and Buddhist traditions emphasize the unity of all life on earth. Most Hindus regard killing an animal as a sin, and many try to avoid accidentally stepping on insects as they walk. The Hindu and Buddhist picture of the relatedness of all life on earth has been confirmed by modern biological science. We now know that all living organisms have the same fundamental biochemistry, and we know that our own genomes are more similar to than different from the genomes of our close relations in the animal world.

The peoples of the industrialized nations urgently need to acquire a non-anthropocentric element in their ethics, similar to 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. We need to value other species for their own sakes, and not because we expect to use them for our own economic goals. (The simple life-style that we associate with St. Francis can also teach us much. St. Francis and St. Claire and many others who have followed in their footsteps lived lives of voluntary poverty and service, close to the ideals of Jesus himself, who said "Lay not up treasures on earth..." .)

Today a few societies follow a way of life similar to that of our hunter-gatherer ancestors. Anthropologists are able to obtain a vivid picture of the past by studying these societies. Usually the religious ethics of the hunter-gatherers emphasize the importance of harmony with nature. As the expansion of industry threatens to produce an ecological megacatastrophe, we can learn much from societies that live in balance with the natural world.

We can see from this discussion that religious conservatism cuts both ways. In some respects, it damages our response to the current crisis, for example when it supports war or opposes birth control. On the other hand, the ethical principles of the world's great religions can help to save us.

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% of the world's energy requirements, they are growing rapidly. For example, wind energy is growing at the rate of 30% 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.

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.³¹

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.³²

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

³¹<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>

³²<http://steadystate.org/category/herman-daly/>

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 countries where 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.

POLITENESS IN MULTI-ETHNIC SOCIETIES

The attack on Charlie Hebdo, in which 12 people were killed, claimed massive media attention worldwide. Everyone agreed that freedom of speech and democracy had been brutally attacked, and many people proclaimed “Je suis Charlie!”, in solidarity with the murdered members of the magazine’s staff.

In Denmark, it was proposed that the offending cartoons of the prophet Mohammad should be reprinted in major newspapers. However, in the United States, there was no such proposal, and in fact, US television viewers were not even allowed to see the drawings that had provoked the attack. How is this difference between Denmark and the US to be explained?

Denmark is a country with a predominantly homogeneous population, which only recently has become more diverse through the influx of refugees from troubled parts of the world. Thus, I believe, Denmark has not yet had time to learn that politeness is essential for preventing conflicts in a multi-ethnic society. On the other hand, the United States has lived with the problem for much longer.

During most of its history, the US has had substantial Spanish-speaking and Italian-speaking minorities, as well as great religious diversity. During the 1960’s the civil rights movement fought against racial prejudice and gradually achieved most of its goals. Thus, over a very long period of time, the United States learned to avoid racial and religious insults in its media, and this hard-earned wisdom has allowed the very markedly multi-ethnic US society to function with a minimum of racial and religious conflicts.

Is this a lesson that the world as a whole needs to learn? I strongly believe that it is. Globally, we are in great need of a new ethic, which regards all humans as brothers and sisters, regardless of race, religion or nationality. Human solidarity will become increasingly important in the future, as stress from climate change and the vanishing of nonrenewable resources becomes more pronounced.

To get through the difficult time ahead of us, we will need to face the dangers and challenges of the future arm in arm, respecting each other's differing beliefs, and emphasizing our common humanity rather than our differences.

SOME CONTRIBUTIONS OF ISLAMIC CULTURE

At a time when the corporate-controlled media of Europe and the United States are doing their utmost to fill us with poisonous Islamophobia, it is perhaps a useful antidote to remember the great role that Islamic civilization played in preserving, enlarging and transmitting to us the knowledge and culture of the ancient world.

After the burning of the great library at Alexandria and the destruction of Hellenistic civilization, most of the books of the classical Greek and Hellenistic philosophers were lost. However, a few of these books survived and were translated from Greek, first into Syriac, then into Arabic and finally from Arabic into Latin. By this roundabout route, fragments from the wreck of the classical Greek and Hellenistic civilizations drifted back into the consciousness of the West.

The Roman empire was ended in the 5th century A.D. by attacks of barbaric Germanic tribes from northern Europe. However, by that time, the Roman empire had split into two halves. The eastern half, with its capital at Byzantium (Constantinople), survived until 1453, when the last emperor was killed vainly defending the walls of his city against the Turks.

The Byzantine empire included many Syriac-speaking subjects; and in fact, beginning in the 3rd century A.D., Syriac replaced Greek as the major language of western Asia. In the 5th century A.D., there was a split in the Christian church of Byzantium; and the Nestorian church, separated from the official Byzantine church. The Nestorians were bitterly persecuted by the Byzantines, and therefore they migrated, first to Mesopotamia, and later to south-west Persia. (Some Nestorians migrated as far as China.)

During the early part of the middle ages, the Nestorian capital at Gondisapur was a great center of intellectual activity. The works of Plato, Aristotle, Hippocrates, Euclid, Archimedes, Ptolemy, Hero and Galen were translated into Syriac by Nestorian scholars, who had brought these books with them from Byzantium.

Among the most distinguished of the Nestorian translators were the members of a family called Bukht-Yishu (meaning Jesus hath delivered), which produced seven generations of outstanding scholars. Members of this family were fluent not only in Greek and Syriac, but also in Arabic and Persian.

In the 7th century A.D., the Islamic religion suddenly emerged as a conquering and proselytizing force. Inspired by the teachings of Mohammad (570 A.D. - 632 A.D.), the Arabs and their converts rapidly conquered western Asia, northern Africa, and Spain. During the initial stages of the conquest, the Islamic religion inspired a fanaticism in its followers which was often hostile to learning. However, this initial fanaticism quickly changed to an appreciation of the ancient cultures of the conquered territories; and during the middle ages, the Islamic world reached a very high level of culture and civilization.

Thus, while the century from 750 to 850 was primarily a period of translation from Greek to Syriac, the century from 850 to 950 was a period of translation from Syriac to Arabic. It was during this latter century that Yuhanna Ibn Masawiah (a member of the Bukht-Yishu family, and medical advisor to Caliph Harun al-Rashid) produced many important translations into Arabic.

The skill of the physicians of the Bukht-Yishu family convinced the Caliphs of the value of Greek learning; and in this way the family played an extremely important role in the preservation of the western cultural heritage. Caliph al-

Mamun, the son of Harun al-Rashid, established at Baghdad a library and a school for translation, and soon Baghdad replaced Gondisapur as a center of learning.

The English word "chemistry" is derived from the Arabic words "al-chimia", which mean "the changing". The earliest alchemical writer in Arabic was Jabir (760-815), a friend of Harun al-Rashid. Much of his writing deals with the occult, but mixed with this is a certain amount of real chemical knowledge. For example, in his Book of Properties, Jabir gives a recipe for making what we now call lead hydroxycarbonate (white lead), which is used in painting and pottery glazes:

Another important alchemical writer was Rhazes (c. 860 - c. 950). He was born in the ancient city of Ray, near Teheran, and his name means "the man from Ray". Rhazes studied medicine in Baghdad, and he became chief physician at the hospital there. He wrote the first accurate descriptions of smallpox and measles, and his medical writings include methods for setting broken bones with casts made from plaster of Paris. Rhazes was the first person to classify substances into vegetable, animal and mineral. The word "alkali", which appears in his writings, means "the calcined" in Arabic. It is the source of our word "alkali", as well as of the symbol K for potassium.

The greatest physician of the middle ages, Avicenna, (Abu-Ali al Hussain Ibn Abdullah Ibn Sina, 980-1037), was also a Persian, like Rhazes. More than a hundred books are attributed to him. They were translated into Latin in the 12th century, and they were among the most important medical books used in Europe until the time of Harvey. Avicenna also wrote on alchemy, and he is important for having denied the possibility of transmutation of elements.

In mathematics, one of the most outstanding Arabic writ-

ers was al-Khwarizmi (c. 780 - c. 850). The title of his book, *Ilm al-jabr wad muqabalah*, is the source of the English word “algebra”. In Arabic *al-jabr* means “the equating”. Al-Khwarizmi's name has also become an English word, “algorithm”, the old word for arithmetic. Al-Khwarizmi drew from both Greek and Hindu sources, and through his writings the decimal system and the use of zero were transmitted to the West.

One of the outstanding Arabic physicists was al-Hazen (965-1038). He did excellent work in optics, and in this field he went far beyond anything done by the Greeks. Al-Hazen studied the reflection of light by the atmosphere, an effect which makes the stars appear displaced from their true positions when they are near the horizon; and he calculated the height of the atmospheric layer above the earth to be about ten miles. He also studied the rainbow, the halo, and the reflection of light from spherical and parabolic mirrors. In his book, *On the Burning Sphere*, he shows a deep understanding of the properties of convex lenses. Al-Hazen also used a dark room with a pin-hole opening to study the image of the sun during an eclipse. This is the first mention of the camera obscura, and it is perhaps correct to attribute the invention of the camera obscura to al-Hazen.

Another Islamic philosopher who had great influence on western thought was Averroes, who lived in Spain from 1126 to 1198. His writings took the form of thoughtful commentaries on the works of Aristotle. He shocked both his Muslim and his Christian readers by maintaining that the world was not created at a definite instant, but that it instead evolved over a long period of time, and is still evolving.

In the 12th century, parts of Spain, including the city of Toledo, were reconquered by the Christians. Toledo had been an Islamic cultural center, and many Muslim scholars,

together with their manuscripts, remained in the city when it passed into the hands of the Christians. Thus Toledo became a center for the exchange of ideas between east and west; and it was in this city that many of the books of the classical Greek and Hellenistic philosophers were translated from Arabic into Latin.

It is interesting and inspiring to visit Toledo. A tourist there can see ample evidence of a period of tolerance and enlightenment, when members of the three Abrahamic religions, Christianity, Judaism and Islam , lived side by side in harmony and mutual respect, exchanging important ideas which were to destined to become the foundations of our modern civilization. One can also see a cathedral, a mosque and a synagogue, in each of which craftsmen from all three faiths worked cooperatively to produce a beautiful monument to human solidarity.

QUICK ACTION IS NEEDED TO SAVE THE LONG-TERM FUTURE

Several long-term threats face human civilization and the biosphere. But the window of opportunity for averting catastrophe is not long. If we do not act promptly, it will be too late.

It is a characteristic of human nature to be more concerned about dangers that affect us today or in the very near future than about what will happen hundreds or thousands of years from now. In particular, economists and politicians tend to be extremely short-sighted.

Most economists deliberately limit their time-horizon to a few decades. Their reason for doing so is their cult-like quasi-religious devotion to the mantra of growth. This is closely connected with the fact that our fractional-reserve banking system is stable only as long as the economy is growing. But never-ending, resource-using, pollution-producing industrial growth on a finite planet is a logical impossibility. To be truly sustainable in the long term, a process must be cyclic. It cannot have sources, because in the long run they will be exhausted; nor can it have sinks, because in the long run, they will be overfilled.

To avoid the logical contradictions inherent in the concept of never-ending growth, economists say, "We are practical people. We are only concerned with the next few decades. Prediction of the long-term future is too speculative." Politicians do not dare to challenge the economists or the associated corporate and banking oligarchy. Furthermore, their main concern may be the next election, so their time-horizon is often even shorter than that of the economists.

But what are the long-term dangers that require rapid action? The first of these is the danger of catastrophic climate change. Scientists are unanimous in warning us that unless we very rapidly reduce CO₂ emissions, we risk passing a tipping point beyond which we will be powerless to prevent uncontrollable global warming. We risk a human-produced extinction event comparable to the Permian-Triassic thermal maximum, during which 96 percent of marine species and 70 percent of terrestrial vertebrates became extinct.³³

The excellent videos of Thom Hartmann and his co-workers tell us very clearly a fact of which the scientific community is very conscious, but which the mass media refuse to discuss. The fact is this: Arctic seas are warming very rapidly, and they will soon be free of ice in the summers. The warming of Arctic seas and tundra threatens to release vast quantities of methane into the atmosphere by melting methane hydrates. This in turn threatens to warm the remainder of the world so much that methane hydrates in all offshore deposits will be destabilized. If this happens, the result will be a major extinction event, which will threaten not only human civilization, but also much of the biosphere.³⁴

The worrying thing about the threat of an out-of-control methane hydrate feedback loop is that the quantity of methane hydrates is so vast. There are roughly 10,000 gigatons. of these ice-like crystals on ocean floors, an amount of carbon greater than all of the world's deposits of fossil fuels. To put this huge quantity into perspective, we can remember that the total amount of carbon that humans have released into

³³<https://www.youtube.com/watch?v=k4LL1B3JfnY>
<https://www.youtube.com/watch?v=vZO2WQ-qK5c>

³⁴<https://www.youtube.com/watch?v=m6pFDu7ILV4>
<https://www.youtube.com/watch?v=a9PshoYtoxo>
<https://www.youtube.com/watch?v=c3XpF1MvC8s>

the atmosphere since the start of the Industrial Revolution is only 337 gigatons. Methane hydrates or clathrates are stable at ordinary temperatures, but if oceans warm, they will melt, releasing the potent greenhouse gas methane.

In 2012, the World Bank issued a report warning that without quick action to curb CO₂ 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.³⁵

Although climate change is already starting to do appreciable damage in the form of hurricanes, floods and droughts, its worst effects will come in hundreds or thousands of years, if action is not taken within a few decades. The complete melting of the Greenland icecap would raise ocean levels by 7 meters, and the melting of the Western Antarctic Ice Sheet would add a further 7 meters, drowning coastal cities and important agricultural land throughout the world; but these events would take several centuries to happen.

The Permian Mass Extinction, which is thought to have been caused by the worldwide destabilization of methane hydrate crystals on ocean floors, occurred roughly 80,000 years after the massive volcanic eruptions in Siberia that initiated it. So these are long-term threats. But actions to prevent climatic disaster must be taken quickly.

Before irreversible climatic feed-back loops take over, making human action useless, we must replace fossil fuels completely by renewable energy. This is by no means a hopeless task. The technology needed is already in place, and many forms of renewable energy are able to compete in price with

³⁵<http://www.worldbank.org/en/news/feature/2012/11/18/Climate-change-report-warns-dramatically-warmer-world-this-century>

energy from fossil fuels. Renewables now supply 19 percent of our total global energy consumption, and wind energy, for example, is growing at the rate of 30 percent per year. Because of the remarkable properties of exponential growth, it is entirely possible for us to replace fossil fuels by renewables quickly enough to prevent catastrophic climate change. The main obstacle to be overcome is the greed of the fossil fuel industries. They will use any method, fair or foul, to cash in on the vast deposits of fossil fuels which they own.³⁶

Although the contrast between potentially catastrophic dangers and the quick actions needed to prevent them is most striking when we are discussing climate change, we can obtain valuable insights into other dangers by thinking of the long-term future: Linked to climate change, exhaustion of non-renewable resources, environmental degradation and population growth, is the long-term threat of a very widespread global famine.

As climate change becomes more pronounced, heat and aridity will reduce the productivity of many regions of the world that presently supply much of our grain, while in other regions, floods will damage food production. As glaciers in the Himalayas and the Andes melt, China, India, Viet Nam and parts of South America will be deprived of their summer water supplies. As sea levels rise, valuable rice-producing lands will be drowned. As the prices of oil and gas become prohibitively high, modern petroleum-dependent agriculture will be dealt a severe blow. As populations continue to increase, the risk of severe famine will grow.

Rapid actions are needed to prevent a catastrophic future famine: The steps towards preventing drastic climate change, discussed above, must be taken with a sense of ur-

³⁶<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>

gency. Furthermore, urgent efforts must be made to prevent loss of topsoil, salanation and desertification of agricultural land. Finally, global population must be stabilized, and later reduced.

The danger of nuclear war also becomes clearer when we look at far ahead. Suppose that each year there is a certain finite chance of a nuclear catastrophe, let us say 2 percent. Then in a century the chance of survival will be 13.5 percent, and in two centuries, 1.8 percent, in three centuries, 0.25 percent, in 4 centuries, there would only be a 0.034 percent chance of survival and so on. Over many centuries, the chance of survival would shrink almost to zero.

Thus by looking at the long-term future, we can clearly see that if nuclear weapons are not entirely eliminated, civilization will not survive. Rapid actions are also needed to prevent a nuclear catastrophe. Threats of wars that could potentially escalate into nuclear conflicts are present today, both in the Middle East and in the war that has been created by the US-sponsored coup in Ukraine. The leaders of the European Union are starting to realize the danger and come to their senses, but civil society throughout the world must make its will felt.

All of us have a duty to act quickly, with dedication and urgency. We must save the long-term future of our beautiful planet, not only for ourselves, and our children and grandchildren, but also for all future generations of humans, and for the dazzling diversity of plants and animals with which we share the gift of life.

REMEMBER YOUR HUMANITY

This year, 2015, marks the 60th anniversary of the Russell-Einstein Manifesto, which contains the following words: “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? 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.”

The background for the Russell-Einstein Manifesto is as follows: In March, 1954, the United States had tested a hydrogen bomb at the Bikini Atoll in the Pacific Ocean. It was 1,000 times more powerful than the Hiroshima bomb. The Japanese fishing boat, the Lucky Dragon, was 130 kilometers from the Bikini explosion, but the radioactive fallout from the test killed one crew member, and made all the others seriously ill.

In England, Professor 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, in which fast neutrons from the hydrogen thermonuclear reaction produced fission in an outer casing of ordinary uranium. Such a bomb would produce enormous amounts of highly dangerous fallout, and Rotblat became extremely worried about the possibly fatal effects 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.

After discussing the Bikini test and its radioactive fallout with Joseph Rotblat, Lord Russell became concerned for the future of the human gene pool. After consulting a number of leading physicists, including Albert Einstein, he wrote what came to be known as the Russell-Einstein Manifesto.

Russell was convinced that in order for the Manifesto to have maximum impact, Einstein's signature would be absolutely necessary; but as Russell was flying from Italy to France, the pilot announced to the passengers that Einstein had just died. Russell was crushed by the news, but when he arrived at his hotel in Paris, he found waiting for him a letter from Einstein and his signature on the document. Signing the Manifesto had been the last act of Einstein's life. Others who signed were Max Born, Percy W. Bridgman, Leopold Infeld, Frederic Joliot-Curie, Hermann J. Muller, Linus Pauling, Cecil F. Powell, Joseph Rotblat, Hideki Yukawa and Bertrand Russell. All of them, except Infeld and Rotblat, were Nobel Laureates.

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? ." Lord Russell devoted much of the remainder of his life to working for the abolition of nuclear weapons.³⁷

In 1957, with the Russell-Einstein Manifesto as a background, a group of scientists from both sides of the Cold

³⁷<http://www.umich.edu/pugwash/Manifesto.html>

War met in the small village of Pugwash, Nova Scotia. The meeting was held at the summer residence of the Canadian-American financier and philanthropist Cyrus Eaton, who had given money for the conference. The aim of the assembled scientists was to reduce the danger of a catastrophic nuclear war.

From this small beginning, a series of conferences developed, in which scientists, especially physicists, attempted to work for peace, and tried to address urgent problems related to science. These conferences were called Pugwash Conferences on Science and World Affairs, taking their name from the small village in Nova Scotia where the first meeting was held. From the start, the main aim of the meetings was to reduce the danger that civilization would be destroyed in a thermonuclear war.

It can be seen from what has been said that the Pugwash Conferences began during one of the tensest periods of the Cold War, when communication between the Communist and Anti-communist blocks was difficult. During this period, the meetings served the important purpose of providing a forum for informal diplomacy. The participants met, not as representatives of their countries, but as individuals, and the discussions were confidential.

This method of operation proved to be effective, and the initial negotiations for a number of important arms control treaties were aided by Pugwash Conferences. These include the START treaties, the treaties prohibiting chemical and biological weapons, the Nuclear Nonproliferation Treaty (NPT), and the Comprehensive Test Ban Treaty (CTBT). Former Soviet President Gorbachev has said that discussions with Pugwash scientists helped him to conclude that the policy of nuclear confrontation was too dangerous to be continued.

Over the years, the number of participants attending the annual Pugwash Conference has grown, and the scope of the problems treated has broadened. Besides scientists, the participants now include diplomats, politicians, economists, social scientists and military experts. Normally the number attending the yearly conference is about 150.

Besides plenary sessions, the conferences have smaller working groups dealing with specific problems. There is always a working group aimed at reducing nuclear dangers, and also groups on controlling or eliminating chemical and biological weapons. In addition, there may now be groups on subjects such as climate change, poverty, United Nations reform, and so on.

Invitations to the conferences are issued by the Secretary General to participants nominated by the national groups. The host nation usually pays for the local expenses, but participants finance their own travel. Besides the large annual meeting, the Pugwash organization also arranges about ten specialized workshops per year, with 30-40 participants each. Although attendance at the conferences and workshops is by invitation, everyone is very welcome to join one of the national Pugwash groups. The international organization's website is at www.pugwash.org.

In 1995, the Nobel Peace Prize was awarded jointly to Prof. Joseph Rotblat and to Pugwash Conferences on Science and World Affairs as an organization, “...for their efforts to diminish the part played by nuclear arms in international politics and in the longer run to eliminate such arms.” The award was made 50 years after the tragic destruction of Hiroshima and Nagasaki.

In his acceptance speech, Sir Joseph Rotblat (as he soon became) emphasized the same point that has been made by the Russell-Einstein Manifesto, that war itself must be elim-

inated in order to free civilization from the danger of nuclear destruction. The reason for this is that 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 war.

“The quest for a war-free world”, Sir Joseph concluded, “has a basic purpose: survival. But if, in the process, we can learn to achieve it by love rather than by fear, by kindness rather than compulsion; if in the process we can learn to combine the essential with the enjoyable, the expedient with the benevolent, the practical with the beautiful, this will be an extra incentive to embark on this great task. Above all, remember your humanity”

I vividly remember the ceremony in Oslo when the 1995 Nobel Peace Prize was awarded jointly to Sir Joseph and to Pugwash Conferences. About 100 people from the Pugwash organization were invited, and I was included because I was the chairman of the Danish National Pugwash Group. After the ceremony and before the dinner, local peace groups had organized a torchlight parade. It was already dark, because we were so far to the north, and snow was falling. About 3,000 people carrying torches marched through the city and assembled under Sir Joseph’s hotel window, cheering and shouting “Rotblat! Rotblat! Rotblat!”. Finally he appeared at the hotel widow, waved to the crowd and tried to say a few words. This would have been the moment for a memorable speech, but the acoustics were so terrible that we could not hear a word that he said. I later tried (without success) to persuade the BBC to make a program about nuclear weapons and about Sir Joseph’s life, ending with the falling snow and the torch-lit scene.

The dangers are very great today

Although the Cold War has ended, the danger of a nuclear catastrophe is greater today than ever before. There are 16,300 nuclear weapons in the world today, of which 15,300 are in the hands of Russia and the United States. Several thousand of these weapons are on hair-trigger alert, meaning that whoever is in charge of them has only a few minutes to decide whether the signal indicating an attack is real, or an error. The most important single step in reducing the danger of a disaster would be to take all weapons off hair-trigger alert.

Bruce G. Blair, Brookings Institute, has remarked that "It is obvious that the rushed nature of the process, from warning to decision to action, risks causing a catastrophic mistake... This system is an accident waiting to happen." Fred Ikle of the Rand Corporation has written, "But nobody can predict that the fatal accident or unauthorized act will never happen. Given the huge and far-flung missile forces, ready to be launched from land and sea on on both sides, the scope for disaster by accident is immense... In a matter of seconds, through technical accident or human failure, mutual deterrence might thus collapse."

Although their number has been cut in half from its Cold War maximum, the total explosive power of todays weapons is equivalent to roughly half a million Hiroshima bombs. To multiply the tragedy of Hiroshima and Nagasaki by a factor of half a million changes the danger qualitatively. What is threatened today is the complete breakdown of human society.

There is no defense against nuclear terrorism. We must remember the remark of U.N. Secretary General Kofi Annan after the 9/11/2001 attacks on the World Trade Center. He

said, “This time it was not a nuclear explosion”. The meaning of his remark is clear: If the world does not take strong steps to eliminate fissionable materials and nuclear weapons, it will only be a matter of time before they will be used in terrorist attacks on major cities. Neither terrorists nor organized criminals can be deterred by the threat of nuclear retaliation, since they have no territory against which such retaliation could be directed. They blend invisibly into the general population.

Nor can a “missile defense system” prevent terrorists from using nuclear weapons, since the weapons can be brought into a port in any one of the hundreds of thousands of containers that enter on ships each year, a number far too large to be checked exhaustively.

As the number of nuclear weapon states grows larger, there is an increasing chance that a revolution will occur in one of them, putting nuclear weapons into the hands of terrorist groups or organized criminals. Today, for example, Pakistans less-than-stable government might be overthrown, and Pakistans nuclear weapons might end in the hands of terrorists. The weapons might then be used to destroy one of the worlds large coastal cities, having been brought into the port by one of numerous container ships that dock every day. Such an event might trigger a large-scale nuclear conflagration.

Today, the world is facing a grave danger from the reckless behavior of the government of the United States, which recently arranged a coup that overthrew the elected government of Ukraine. Although Victoria Nuland’s December 13 2013 speech talks much about democracy, the people who carried out the coup in Kiev can hardly be said to be democracy’s best representatives. Many belong to the Svoboda Party, which had its roots in the Social-National Party of

Ukraine (SNPU). The name was an intentional reference to the Nazi Party in Germany.³⁸

It seems to be the intention of the US to establish NATO bases in Ukraine, no doubt armed with nuclear weapons. In trying to imagine how the Russians feel about this, we might think of the US reaction when a fleet of ships sailed to Cuba in 1962, bringing Soviet nuclear weapons. In the confrontation that followed, the world was brought very close indeed to an all-destroying nuclear war. Does not Russia feel similarly threatened by the thought of hostile nuclear weapons on its very doorstep? Can we not learn from the past, and avoid the extremely high risks associated with the similar confrontation in Ukraine today?

Since we have recently marked the 100th anniversary of the outbreak of the First World War, it is appropriate to view the crisis in Ukraine against the background of that catastrophic event, which still casts a dark shadow over the future of human civilization. We must learn the bitter lessons which World War I has to teach us, in order to avoid a repetition of the disaster.

We can remember that the First World War started as a small operation by the Austrian government to punish the Serbian nationalists; but it escalated uncontrollably into a global disaster. Today, there are many parallel situations, where uncontrollable escalation might produce a world-destroying conflagration.

In general, aggressive interventions, in Iran, Syria, Ukraine, the Korean Peninsula and elsewhere, all present dangers for uncontrollable escalation into large and disastrous conflicts, which might potentially threaten the survival of

³⁸<http://www.informationclearinghouse.info/article37599.htm>
<http://www.thedailybeast.com/articles/2014/02/06/state-dept-official-caught-on-tape-fuck-the-eu.html>

human civilization.

Another lesson from the history of World War I comes from the fact that none of the people who started it had the slightest idea of what it would be like. Science and technology had changed the character of war. The politicians and military figures of the time ought to have known this, but they didn't. They ought to have known it from the million casualties produced by the use of the breach-loading rifle in the American Civil War. They ought to have known it from the deadly effectiveness of the Maxim machine gun against the native populations of Africa, but the effects of the machine gun in a European war caught them by surprise.

Few politicians or military figures today have any imaginative understanding of what a war with thermonuclear weapons would be like. Recent studies have shown that in a nuclear war, the smoke from firestorms in burning cities would rise to the stratosphere where it would remain for a decade, spreading throughout the world, blocking sunlight, blocking the hydrological cycle and destroying the ozone layer.

The effect on global agriculture would be devastating, and the billion people who are chronically undernourished today would be at risk. Furthermore, the tragedies of Chernobyl and Fukushima remind us that a nuclear war would make large areas of the world permanently uninhabitable because of radioactive contamination. A full-scale thermonuclear war would be the ultimate ecological catastrophe. It would destroy human civilization and much of the biosphere.

One can gain a small idea of the terrible ecological consequences of a nuclear war not only by thinking of the radioactive contamination that has made large areas near to Chernobyl and Fukushima uninhabitable, but also from the testing of hydrogen bombs in the Pacific, which continues

to cause leukemia and birth defects in the Marshall Islands more than half a century later.

As we discussed above, the United States tested a hydrogen bomb at Bikini in 1954. Fallout from the bomb contaminated the island of Rongelap, one of the Marshall Islands 120 kilometers from Bikini. The islanders experienced radiation illness, and many died from cancer. Even today, half a century later, both people and animals on Rongelap and other nearby islands suffer from birth defects. The most common defects have been “jelly fish babies”, born with no bones and with transparent skin. Their brains and beating hearts can be seen. The babies usually live a day or two before they stop breathing.

A girl from Rongelap describes the situation in the following words: “I cannot have children. I have had miscarriages on seven occasions... Our culture and religion teach us that reproductive abnormalities are a sign that women have been unfaithful. For this reason, many of my friends keep quiet about the strange births that they have had. In privacy they give birth, not to children as we like to think of them, but to things we could only describe as ‘octopuses’, ‘apples’, ‘turtles’ and other things in our experience. We do not have Marshallese words for these kinds of babies, because they were never born before the radiation came.”

The Republic of the Marshall Islands is suing the nine countries with nuclear weapons at the International Court of Justice at The Hague, arguing they have violated their legal obligation to disarm. The Guardian reports that “In the unprecedented legal action, comprising nine separate cases brought before the ICJ on Thursday, the Republic of the Marshall Islands accuses the nuclear weapons states of a ‘flagrant denial of human justice’. It argues it is justified in taking the action because of the harm it suffered.”

“The Pacific chain of islands, including Bikini Atoll and Enewetak, was the site of 67 nuclear tests from 1946 to 1958, including the ‘Bravo shot’, a 15-megaton device equivalent to a thousand Hiroshima blasts, detonated in 1954. The Marshallese islanders say they have been suffering serious health and environmental effects ever since.”

“The island republic is suing the five ‘established’ nuclear weapons states recognized in the 1968 nuclear non-proliferation treaty (NPT), the US, Russia (which inherited the Soviet arsenal), China, France and the UK, as well as the three countries outside the NPT who have declared nuclear arsenals India, Pakistan and North Korea, and the one undeclared nuclear weapons state, Israel.” The Republic of the Marshall Islands is not seeking monetary compensation, but instead it seeks to make the nuclear weapon states comply with their legal obligations under Article VI of the Nuclear Nonproliferation Treaty and the 1996 ruling of the International Court of Justice.

On July 21, 2014, the United States filed a motion to dismiss the Nuclear Zero lawsuit that was filed by the Republic of the Marshall Islands (RMI) on April 24, 2014 in U.S. Federal Court. The U.S., in its move to dismiss the RMI lawsuit, does not argue that the U.S. is in compliance with its NPT disarmament obligations. Instead, it argues in a variety of ways that its non-compliance with these obligations is, essentially, justifiable, and not subject to the court’s jurisdiction.³⁹

The Nuclear Age Peace Foundation (NAPF) is a consultant to the Marshall Islands on the legal and moral issues involved in bringing this case. David Krieger, President of

³⁹<http://www.truth-out.org/opinion/item/28997-bush-appointed-judge-dismisses-nuclear-zero-lawsuit-marshall-islands-to-appeal>

NAPF, upon hearing of the motion to dismiss the case by the U.S. responded, "The U.S. government is sending a terrible message to the world, that is, that U.S. courts are an improper venue for resolving disputes with other countries on U.S. treaty obligations. The U.S. is, in effect, saying that whatever breaches it commits are all right if it says so. That is bad for the law, bad for relations among nations, bad for nuclear non-proliferation and disarmament, and not only bad, but extremely dangerous for U.S. citizens and all humanity."

The RMI will appeal the U.S. attempt to reject its suit in the U.S. Federal Court, and it will continue to sue the 9 nuclear nations in the International Court of Justice. Whether or not the suits succeed in making the nuclear nations comply with international law, attention will be called to the fact the 9 countries are outlaws. In vote after vote in the United Nations General Assembly, the peoples of the world have shown how deeply they long to be free from the menace of nuclear weapons. Ultimately, the tiny group of power-hungry politicians must yield to the will of the citizens whom they are at present holding as hostages.

It is a life-or-death question. We can see this most clearly when we look at far ahead. Suppose that each year there is a certain finite chance of a nuclear catastrophe, let us say 2%. Then in a century the chance of survival will be 13.5%, and in two centuries, 1.8%, in three centuries, 0.25%, in 4 centuries, there would only be a 0.034% chance of survival and so on. Over many centuries, the chance of survival would shrink almost to zero. Thus by looking at the long-term future, we can clearly see that if nuclear weapons are not entirely eliminated, civilization will not survive.

Civil society must make its will felt. A thermonuclear war today would be not only genocidal but also omnicidal.

It would kill people of all ages, babies, children, young people, mothers, fathers and grandparents, without any regard whatever for guilt or innocence. Such a war would be the ultimate ecological catastrophe, destroying not only human civilization but also much of the biosphere. Each of us has a duty to work with dedication to prevent it.

GANDHI AS AN ECONOMIST

Mahatma Gandhi is most famous as the father of his nation's independence, and as an ethical philosopher, but it is also worthwhile to remember his contributions to economics. This is especially important today, as it becomes more and more clear that our present economic system is completely unsustainable. Today it is obvious that "shopping as a way of life" and "grow or die" economics are destroying our planet.

In a recent interview, Naomi Klein said "The economic system that we have created has also created global warming. I didn't make this up. The system is broken, economic inequality is too great and lack of restraint on the part of energy companies is disastrous."⁴⁰ It is worthwhile to look at Gandhi's ideas on these issues.⁴¹

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

⁴⁰<https://www.transcend.org/tms/2015/03/naomi-klein-the-economic-system-we-have-created-global-warming/>

⁴¹<http://www.peacemagazine.org/archive/v14n2p28.htm>
<http://www.gandhianeconomics.com/>

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.

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 reacquaint 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 Indias 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 Indias 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 reintroduction 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, and 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.

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 pair of sandals, two pieces of rough homespun cloth, which he wore, a bowl for eating and a watch. 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.

Like Veblen, 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.

SECRECY AND DEMOCRACY ARE INCOMPATIBLE

It is obvious, almost by definition, that excessive governmental secrecy and true democracy are incompatible. If the people of a country have no idea what their government is doing, they cannot possibly have the influence on decisions that the word democracy implies.

Dark government

Governmental secrecy is not something new. Secret diplomacy contributed to the outbreak of World War I, and the secret Sykes-Picot agreement later contributed to the bitterness of conflicts in the Middle East. However, in recent years, governmental secrecy has grown enormously.

The revelations of Edward Snowden and others have shown that the number of people involved in secret operations of the United States government is now as large as the entire population of Norway: roughly 5 million. The influence of this dark side of government has become so great that no president is able to resist it.

In a recent article, John Chuckman remarked that “The CIA is now so firmly entrenched and so immensely well financed (much of it off the books, including everything from secret budget items to the peddling of drugs and weapons) that it is all but impossible for a president to oppose it the way Kennedy did. Obama, who has proved himself to be a fairly weak character from the start, certainly has given the CIA anything it wants. The dirty business of ISIS in Syria and Iraq is one project. The coup in Ukraine is another. The pushing of NATO’s face right against Russia’s borders is another. Several attempted coups in Venezuela are still

more. And the creation of a drone air force for extra-judicial killings in half a dozen countries is yet another. They don't resemble projects we would expect from a smiley-faced intelligent man who sometimes wore sandals and refused to wear a flag pin on his lapel during his first election campaign."⁴²

Of course the United States government is by no means alone in practicing excessive secrecy: Scott Horton recently wrote an article entitled *How to Rein in a Secretive Shadow Government Is Our National Security Crisis*. He dedicated the article to the Soviet dissident Andrei Sakharov because, as he said, "Sakharov recognized that the Soviet Union rested on a colossal false premise: it was not so much socialism (though Sakharov was certainly a critic of socialism) as it was the obsession with secrecy, which obstructed the search for truth, avoided the exposure of mistakes, and led to the rise of powerful bureaucratic elites who were at once incompetent and prone to violence."⁴³

Censorship of the news

Many modern governments have become very expert in manipulating public opinion through mass media. They only allow the public to hear a version of the "news" that has been handed down by powerholders. Of course, people can turn to the alternative media that are available on the Internet. But on the whole, the vision of the world presented on television screens and in major newspapers is the "truth" that is accepted by the majority of the public, and it is this picture of events that influences political decisions. Censor-

⁴²<http://www.informationclearinghouse.info/article41222.htm>

⁴³<http://truth-out.org/progressivepicks/item/29636-scott-horton-how-to-rein-in-a-secretive-shadow-government-is-our-national-security-crisis>

ship of the news by the power elite is a form of secrecy, since it withholds information that is needed for a democracy to function properly.

Coups, torture and illegal killing

During the period from 1945 to the present, the US interfered, militarily or covertly, in the internal affairs of at least 38 nations. 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.

For the sake of balance, we should remember that during the Cold War period, the Soviet Union and China also intervened in the internal affairs of many countries. These Cold War interventions were also unjustifiable. Nothing can justify military or covert interference by superpowers in the internal affairs of smaller countries, since people have a right to live under governments of their own choosing even if those governments are not optimal.

Many people in Latin America and elsewhere have been tortured: The long history of CIA torture was recently investigated, but only small portions of the 6000-page report are available to the public. The rest remains secret.⁴⁴ Extrajudicial killing of civilians by means of drones is also shrouded by secrecy, and it too is a gross violation of democratic principles.⁴⁵

⁴⁴<https://www.transcend.org/tms/2015/03/the-cia-in-latin-america-from-coups-to-torture-and-preemptive-killings/>

⁴⁵<http://www.globalresearch.ca/lawless-drone-killings/5355535>

Secret trade deals

The Trans-Pacific Partnership is one of the trade deals that is being negotiated in secret. Not even the US congress is allowed to know the details of the document. However, enough information has been leaked to make it clear that if the agreement is passed, foreign corporations would be allowed to “sue” the US government for loss of profits because of (for example) environmental regulations. The “trial” would be outside the legal system, before a tribunal of lawyers representing the corporations.⁴⁶

A similar secret trade deal with Europe, the Trans-Atlantic Trade and Investment Partnership (TTIP), is also being “fast-tracked”. One can hardly imagine greater violations of democratic principles.

Secret land purchases in Africa

According to a report released by the Oakland Institute, in 2009 alone, hedge funds bought or leased nearly 60 million hectares of land in Africa, an area the size of France.⁴⁷

As populations increase, and as water becomes scarce, China, and other countries, such as Saudi Arabia are also buying enormous tracts of agricultural land, not only in Africa, but also in other countries.⁴⁸ These land purchases are very often kept secret from the local populations by corrupt governments.

⁴⁶<http://www.citizen.org/Page.aspx?pid=5411>
<https://www.transcend.org/tms/2015/03/world-at-a-crossroads-stop-the-fast-track-to-a-future-of-global-corporate-rule/>

⁴⁷<http://www.bbc.com/news/world-africa-13688683>

⁴⁸<http://www.latimes.com/world/asia/la-fg-china-foreign-farmland-20140329-story.html>

Secrecy, democracy and nuclear weapons

Nuclear weapons were developed in secret. The decision to use them on the civilian populations of Hiroshima and Nagasaki in an already-defeated Japan was made in secret. Since 1945, secrecy has surrounded all aspects of nuclear weapons, and for this reason it is clear that they are essentially undemocratic.

Nuclear disarmament has been one of the core aspirations of the international community since the first use of nuclear weapons in 1945. A nuclear war, even a limited one, would have global humanitarian and environmental consequences, and thus it is a responsibility of all governments, including those of non-nuclear countries, to protect their citizens and engage in processes leading to a world without nuclear weapons.

Now a new process has been established by the United Nations General Assembly, an Open Ended Working Group (OEWG) to Take Forward Multilateral Nuclear Disarmament Negotiations. The OEWG convened at the UN offices in Geneva on May 14, 2013. Among the topics discussed was a Model Nuclear Weapons Convention.

The Model Nuclear Weapons Convention prohibits development, testing, production, stockpiling, transfer, use and threat of use of nuclear weapons. States possessing nuclear weapons will be required to destroy their arsenals according to a series of phases. The Convention also prohibits the production of weapons usable fissile material and requires delivery vehicles to be destroyed or converted to make them non-nuclear capable.

Verification will include declarations and reports from States, routine inspections, challenge inspections, on-site sensors, satellite photography, radionuclide sampling and other

remote sensors, information sharing with other organizations, and citizen reporting. Persons reporting suspected violations of the convention will be provided protection through the Convention including the right of asylum.

Thus we can see that the protection of whistleblowers is an integral feature of the Model Nuclear Weapons Convention now being discussed. As Sir Joseph Rotblat (1908-2005, Nobel Laureate 1995) frequently emphasized in his speeches, societal verification must be an integral part of the process of “going to zero” (i.e, the total elimination of nuclear weapons). This is because nuclear weapons are small enough to be easily hidden. How will we know whether a nation has destroyed all of its nuclear arsenal? We have to depend on information from insiders, whose loyalty to the whole of humanity prompts them to become whistleblowers. And for this to be possible, they need to be protected.

In general, if the world is ever to be free from the threat of complete destruction by modern weapons, we will need a new global ethic, an ethic as advanced as our technology. Of course we can continue to be loyal to our families, our localities and our countries. But this must be supplemented by a higher loyalty: a loyalty to humanity as a whole.

Freedom from fear

In order to justify secrecy, enormous dark branches of government and mass illegal spying, governments say: “We are protecting you from terrorism”. But terrorism is not a real threat, since our chances of dying from a terrorist attack are vanishingly small compared to (for example) preventable disease or an automobile accident. If we are ever to reclaim our democracy, we must free ourselves from fear.

EUROPE MUST NOT BE PUSHED INTO A NUCLEAR WAR WITH RUSSIA

A thermonuclear war today would be not only genocidal but also omnicidal. It would kill people of all ages, babies, children, young people, mothers, fathers and grandparents, without any regard whatever for guilt or innocence. Such a war would be the ultimate ecological catastrophe, destroying not only human civilization but also much of the biosphere. Each of us has a duty to work with dedication to prevent it. Europe must not be the close ally (or vassal) of the world's greatest purveyor of violence and war.

Our leaders do not seem interested in protecting us

In an important recent lecture, Institute Professor Noam Chomsky of MIT has pointed out that our leaders act to preserve their own power, and the power of the state. They seem to have little interest in protecting the general population from destruction.⁴⁹

Civilians are just hostages. They are expendable. We can see this most clearly if we think of nuclear war. Governments threaten each other with “Mutually Assured Destruction”, which has the very appropriate acronym MAD. What does

⁴⁹<http://www.informationclearinghouse.info/article41340.htm>
<http://www.informationclearinghouse.info/article37599.htm>
<http://www.thedailybeast.com/articles/2014/02/06/state-dept-official-caught-on-tape-fuck-the-eu.html>

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.

Washington's hubris

A symptom of the megalomania and hubris of both Napoleon and Hitler was that they undertook to invade Russia's vast territory. In both cases, what followed was the defeat and downfall of the invaders. Today, Washington's dark government seems to be similarly seized with megalomania and hubris. Not only do the neo-conservatives contemplate dominance over Russia and the Middle East but also over China. As in the case of Napoleon and Hitler, the outcome must inevitably be a catastrophe.

Must Europe be involved? Must we be the accomplices in such a crime against international law and the Nuremberg principles? Must we be dragged into a war with Russia, very probably a nuclear war? Must European cities become targets for thermonuclear weapons? Are the people of Europe aware of this danger? Our mainstream media certainly do not make us sufficiently aware of it. Why are our leaders slaves to Washington's madmen? Have they been bribed? Have they been blackmailed through secrets revealed by the massive spying of the NSA?

Russia's actions have been defensive, not offensive

It is an historical fact that the United States arranged a coup that overthrew the elected government of Ukraine. There is much evidence that the coup was planned long in ad-

vance. On December 13, 2013, US Assistant Secretary of State for Europe, Victoria Nuland said: “Since the declaration of Ukrainian independence in 1991, the United States has supported the Ukrainians in the development of democratic institutions and skills in promoting civil society and a good form of government... We have invested more than 5 billion dollars to help Ukraine to achieve these and other goals.” Nuland’s famous “Fuck the EU” telephone call, made well in advance of the coup, gives further evidence that the coup was planned long in advance, and engineered in detail.

Although Victoria Nuland’s December 13 2013 speech talks much about democracy, the people who carried out the coup in Kiev can hardly be said to be democracy’s best representatives. Many belong to the Svoboda Party, which had its roots in the Social-National Party of Ukraine (SNPU). The name was an intentional reference to the Nazi Party in Germany. According to *Der Spiegel*’s article about SNPU, “anti-Semitism is part of the extremist party’s platform”, which rejects certain minority and human rights. The article states that in 2013, a Svoboda youth leader distributed Nazi propaganda written by Joseph Goebbels. According to the journalist Michael Goldfarb, Svoboda’s platform calls for a Ukraine that is “one race, one nation, one Fatherland”.

Since the time of the coup, Russia’s actions have been essentially defensive, rather than offensive. There is every hope that a catastrophic Third World War can be avoided if European civil society makes its will felt, and if European leaders come to their senses. Just as the United States once declared its independence from England, Europe must now declare its independence from the United States.

MILLAY'S "EPITAPH FOR THE RACE OF MAN"

The beautiful red-haired American poet, Edna St. Vincent Millay (1892-1950), is known for her lyric poetry, but she also wrote some of the finest sonnets in the English language, combining classic form with modern imagery. Many of these sonnets are based on the emotions that she experienced in her love affairs. However, my own favorite is a serious sequence of eighteen sonnets, "Epitaph for the Race of Man", published in 1934, just as the catastrophe of World War II was about to engulf our planet.

The basic premise of Millay's "Epitaph" is that we know from the evolutionary history of life on earth, that no species survives forever. She speculates on what will be the final cause of the extinction of the human race, and concludes that Man will die by his own hand, since none the innumerable disasters that nature has thrown at us over the millennia has persuaded humankind "to lay aside the lever and the spade, and be as dust among the dusts that blow". Here are a few of the sonnets from the sequence:

"Oh Earth, unhappy planet, born to die,
Might I your scribe and your confessor be,
What wonders must you not relate to me
Of Man, who, when his destiny was high
Strode like the sun into the middle sky
And shone an hour, and who so bright as he,
And like the sun went down into the sea,
Leaving no spark to be remembered by.
But no; you have not learned in all these years
To tell the leopard and the newt apart;
Man, with his singular laughter, his droll tears,

His engines and his conscience and his art,
 Made but a simple sound upon your ears:
 The patient beating of an animal heart.”

“Alas for Man, so stealthily betrayed,
 Bearing the bad cell in him from the start,
 Pumping and feeding on his healthy heart
 That wild disorder never to be stayed
 When once established, destined to invade
 With angry hordes the true and proper part,
 ’Til Reason joggles in the headsman’s cart.
 And Mania spits from every balustrade.
 Would he had searched his closet for his bane,
 Where lurked the trusted ancient of his soul,
 Obsequious Greed, and seen that visage plain;
 Would he had whittled treason from his side
 In his stout youth and bled his body whole,
 Then had he died a king, or never died.”

“Here lies, and none to mourn him but the sea,
 That falls incessant on the empty shore,
 Most various Man, cut down to spring no more;
 Before his prime, even in his infancy
 Cut down, and all the clamour that was he,
 Silenced; and all the riveted pride he wore,
 A rusted iron column whose tall core
 The rains have tunneled like an aspen tree.
 Man, doughty Man, what power has brought you low,
 That heaven itself in arms could not persuade
 To lay aside the lever and the spade
 And be as dust among the dusts that blow?
 Whence, whence the broadside? Whose the heavy blade?...
 Strive not to speak, poor scattered mouth; I know.”



Figure 28: *A photograph of Edna St. Vincent Millay. Public domain, Wikimedia Commons*

It seems to me that although Millay's words were extremely appropriate as a warning to humankind in 1934, they are even more heavy with meaning today, when we are threatened with the disaster of thermonuclear war as well as catastrophic climate change, both self-inflicted. The cancer-like root of the problem is obsequious Greed. Please read the whole sonnet sequence yourself. Millay speaks eloquently to us over the years.

**“THE PATH TO ZERO:
DIALOGUES
ON NUCLEAR DANGERS”
BY RICHARD FALK
AND DAVID KRIEGER**

This book ought to be required reading for college students everywhere in the world, and also for decision-makers. It shakes us out of our complacency and makes us realize that widespread, immediate and dedicated public action is urgently needed if we are to save human civilization and the biosphere from a thermonuclear catastrophe. The book is published by Paradigm Publishers, 2845 Wilderness Place, Boulder, CO 80301, USA. (www.paradigmpublishers.com) On the back cover there are endorsements, with which I entirely agree, by Nobel Peace Laureate Archbishop Desmond Tutu and by David Ellsberg. Archbishop Tutu writes:

“We are greatly privileged, like flies on the wall, to join this conversation between two remarkable stalwarts. Richard Falk and David Krieger, in the campaign for a nuclear-free world. It is unconscionable that so many of us seem to accept the prospect of our ‘mutually assured destruction’, the immoral massacre of millions of civilians, and to view with equanimity such a gross violation of international law. Falk and Krieger discuss persuasively and cogently the folly of reliance on nuclear weapons that can cause apocalyptic devastation. If we want to survive in a habitable world, then we have no choice: we must heed, and do so urgently, these lovers of mankind.”

“In ‘The Path to Zero’, Falk and Krieger engage in a stunningly eloquent dialogue on a range of nuclear dangers, and our common responsibility to put an end to them. This is urgent reading for citizens, scientists, policy-makers and political leaders, actually for anyone who cares about the future of civilization and life on earth”, Daniel Ellsberg, Whistle-blower. Other enthusiastic endorsements come from Jonathan Schell, Commander Robert Green and Maude Barlow.

The book has ten chapters: 1 The Nuclear Age; 2 Nuclear Deterrence; 3 Nuclear Proliferation; 4 Nuclear Arms Control and Nuclear Disarmament; 5 Nuclear Weapons and Militarism; 6 Nuclear Weapons and Nuclear Energy; 7 Nuclear Weapons and International Law; 8 Nuclear Weapons, Culture and Morality; 9 Nuclear Weapons and Democracy; 10 The Path to Zero.

The two authors

Richard Falk is Albert G. Milbank Professor of International Law and Practice Emeritus at Princeton, where he was a member of the faculty for 40 years. Since 2002 he has been a research professor at the University of California-Santa Barbara. He has been Special Rapporteur on Occupied Palestine for the UN Human Rights Council since 2008, and served on a panel of experts appointed by the President of the UN General Assembly, 2008-2009. He is the author or editor of numerous books, including “Legality and Legitimacy in Global Affairs” (Oxford 2012).

David Krieger is a Founder of the Nuclear Age Peace Foundation, and has served as President of the Foundation since 1982. Under his leadership, the Foundation has initiated many innovative projects for building peace, strengthening international law, abolishing nuclear weapons, and em-



Figure 29: *Professor Richard Falk speaking at the United Nations. Source: www.pressenza.com [CC BY 4.0], Wikimedia Commons*

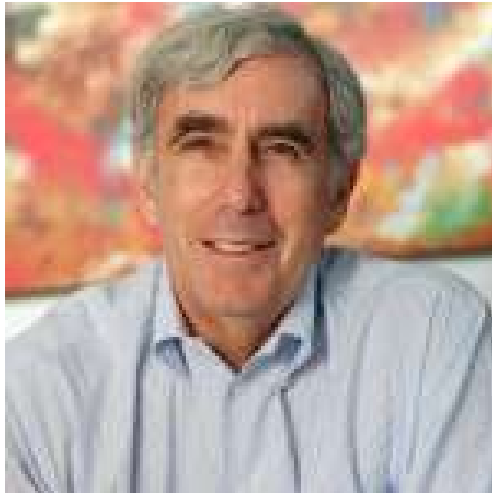


Figure 30: *Dr. David Krieger, Founder and President of the Nuclear Age Peace Foundation. Source NAPF*

powering peace leaders. Among other leadership positions, he is one of 50 Councilors from around the world on the World Future Council. He is the author and editor of numerous books and articles related to achieving peace in the Nuclear Age. A graduate of Occidental College, he holds MA and PhD degrees in political science from the University of Hawaii.

Flaws in the concept of nuclear deterrence

In discussing the concept of nuclear deterrence, the two authors emphasize the fact that it violates the fundamental ethical principles of every major religion. Dr. Krieger comments:

Krieger: “Who are we? What kind of culture would be content to base its security on threatening to murder hundreds of millions of innocent people?”

The two authors also point out that the idea of deterrence is an unproved theory, based on the assumption that accidents will not happen, and that leaders are always rational. In fact, we know historically that the world has come extremely near to accidental nuclear war on very numerous occasions, and there are also many historical instances of irrational behavior by leaders. This cannot continue indefinitely without a catastrophe.⁵⁰

⁵⁰<http://www.cadmusjournal.org/article/issue-4/flaws-concept-nuclear-deterrence>

The illegality of nuclear weapons

As Dr. Krieger and Prof. Falk point out, the threat or use of nuclear weapons violates international law. The fact that planning an aggressive war or conducting one is a crime according to the Nuremberg Principles is discussed. The two authors also review in detail the 1996 Advisory Opinion of the International Court of Justice, which was asked by the UN General Assembly and the World Health Organization to rule on the legality of the threat or use of nuclear weapons. The ICJ ruled that under almost all circumstances, the threat or use of nuclear weapons would be illegal. The only possible exception was the case where a country might be under attack and its very survival threatened. The Court gave no ruling on this extreme case. Finally, the ICJ ruled unanimously that states possessing nuclear weapons have an obligation to get rid of them within a short time-frame.

Falk: “It may be time for the General Assembly to put this question to the ICJ: What legal consequences arise from the persistent failure of the nuclear weapon states to fulfill their obligations under Article VI of the NPT? In my view, the nonnuclear states have also been irresponsible in not insisting on on mutuality of respect in the nonproliferation setting. It may be up to civil society actors to bring wider attention to this disrespect for the vital norms of international law...”⁵¹

⁵¹<http://www.icj-cij.org/docket/files/93/7407.pdf>
<http://www.currentconcerns.ch/index.php?id=711>
<https://www.wagingpeace.org/author/john-avery/>
<http://human-wrongs-watch.net/2015/03/27/tactical-nuclear-weapons-in-europe-the-dangers-are-very-great-today/>
<http://www.countercurrents.org/avery250514.htm>

Colonialism and exceptionalism

Falk: “ We need to remember that the expansion of Europe at the expense of the non-Western world rested on violence and the superiority of European weaponry and strategic logistics, including naval power. This link between Western militarism and historical ascendancy is, in my view, one of the deep reasons why there is such an irrational attachment to nuclear weaponry, making it very difficult to renounce as the supreme expression of political violence.”

Krieger: “ I would like to add that there is a general orientation in much of Western society to subordinate international law to geopolitical desire, in other words, not to allow international law to be a limiting factor in seeking geopolitical advantage. International law is thus applied when useful and ignored when self-interest and convenience dictate. This is a striking manifestation of the double standards that have served the interests of the powerful in both the colonial and postcolonial worlds.”⁵²

The Nuclear Non-Proliferation Treaty

In discussing the Nuclear Non-Proliferation Treaty, Prof. Falk and Dr. Krieger point out that that it has several serious flaws: It is unsymmetrical, giving a special status to the nuclear weapons states, and forbidding all others to possess these weapons. The treaty encourages the “ peaceful” use of nuclear energy, which in practice opens the door to acquisition of nuclear weapons by many nations and which exposes the world to radioactive fallout from accidents like Chernobyl and Fukushima, and very long-term dangers from

⁵²<http://www.informationclearinghouse.info/article41866.htm>
<http://www.informationclearinghouse.info/article36494.htm>

radioactive wastes. Finally, membership in the NPT is not universal. Here are some comments by the two authors:

Falk: “ In my view, the failure of the nuclear weapon states to pursue nuclear disarmament over a period of more than forty years, despite the injunction to do so by the International Court of Justice, is a material breach of the NPT that would give any party the option of pronouncing the treaty void.”

Krieger: “ It would be wonderful to see a strong and concerted effort by non-nuclear-weapon states to challenge the nuclear weapons club. I think that the most effective thing that such states could do would be to start the process of negotiating a nuclear weapons convention and, if necessary, to do it without the nuclear weapon states.”

Falk: “ My proposal is a two-year ultimatum by as many nonnuclear states as possible, threatening to withdraw from the NPT unless serious nuclear disarmament negotiations get underway.”

Dr. Krieger is not in complete agreement with Prof. Falk regarding such an ultimatum. He feels that even though it is flawed in many ways, the NPT is still so valuable that its continuation ought not to be threatened.

Krieger: “ One of the great problems with the NPT is that it encourages the peaceful use of nuclear energy, which actually opens the door to nuclear weapons proliferation. It ends up making the treaty work against itself. Of course, Israel is not a party to the treaty, nor are India and Pakistan. This demonstrates a fundamental weakness of international

law, that is, the exemption of nations that do not sign a treaty from the law. This would be unworkable in domestic law, and it is equally so in international law.”

Krieger: “ The nuclear plant operators are willing to downplay for short-term gain the catastrophic risks that are involved in the use of nuclear reactors to boil water. They are willing to generate wastes that will adversely affect the health and well-being of untold generations to follow us on the planet. The tragedy is that governments embrace and support this industry, demonstrating that they also do not place the interests of their people and the future at the forefront of their planning and decision making.”⁵³

No first use; no hair-trigger alerted missiles

In their concluding chapter, the two authors agree that a No First Use declaration could be a useful first step. Prof. Falk comments:

Falk: “ What conceivable justification, consistent with a deterrence rationale for the retention of nuclear weapons, is there for not assuring other governments that the United States will only use such weaponry in retaliation a prior attack with nuclear weaponry? It is rather clear that such a declaration, especially if backed up by non-nuclear deployments, would both give the United States some new claim to leadership with respect to the weaponry and exert enormous psychological pressure on other nuclear weapon states to follow the American lead.”

This, of course, could be linked to taking all nuclear

⁵³<http://www.baselpeaceoffice.org/article/global-wave-2015-and-peace-planet-un-nuclear-non-proliferation-conference>

weapons systems off hair-trigger alert, which is probably the most important first step towards avoiding the catastrophe of an accidental nuclear war. Dr Krieger comments:

Krieger: “ Those responsible for maintaining nuclear arsenals on hair-trigger alert are delusional if they think that it can be maintained indefinitely without dire consequences.”

Developments since the publication of the book

Since the publication of Prof. Falk and Dr. Krieger’s book in 2012, several events have taken place which the authors probably would have discussed if they had occurred earlier. For example, on 2 April, 2013, the Arms Trade Treaty was passed by a massive majority by a direct vote in the UN General Assembly. The ATT had remained blocked for more than 10 years in the consensus-bound Conference on Disarmament in Geneva. Its passage gives us hope that a Nuclear Weapons Convention can similarly be passed by a direct vote in the UN General Assembly, where the vast majority of nations are in favor of the complete abolition of nuclear weapons. Even if bitterly opposed by the nuclear weapons states, a Nuclear Weapons Convention would have great normative value.⁵⁴

Another development which Prof. Falk and Dr. Krieger would certainly have discussed, had it occurred earlier, is an heroic law suit by the Republic of the Marshall Islands, suing the nuclear weapons states for violation of Article VI of the Nuclear Non-Proliferation Treaty. In fact Dr. Krieger and his organization, the Nuclear Age Peace Foundation,

⁵⁴<http://www.cadmusjournal.org/article/issue-6/arms-trade-treaty-opens-new-possibilities-un>

are actively supporting the Marshall Islands in this David-versus-Goliath-like law suit.⁵⁵

Finally, the two authors would probably have discussed the hubris of Washington's power-holders in threatening war with both Russia and China. The effect of this colossally misguided US action has been to firmly unite China and Russia. In fact the BRICS countries, with their vast resources, are now moving away from using the dollar as a reserve currency for international trade. The probable effect will be the collapse of the already-strained US economy, and as a consequence, the fall of the US Empire. Prof. Falk and Dr. Krieger both wonder whether they have been too America-centric in their discussions of nuclear abolition. The probable fall of the United States from its present position of global hegemony may mean that US leadership will not, in the future, be the key to nuclear abolition.⁵⁶

Some conclusions

When the Cold War ended in 1991, many people heaved a sigh of relief and concluded that they no longer had to worry about the threat of a nuclear Armageddon. Prof. Falk and Dr. Krieger show us that this comforting belief is entirely false, that the dangers are greater than ever before, and that it is vital to bring this fact to the urgent attention of today's young people, who were born long after the tragic nuclear destruction of Hiroshima and Nagasaki, or perhaps even born after the end of the Cold War.

⁵⁵<http://www.wagingpeace.org/tag/marshall-islands/>

⁵⁶<http://www.countercurrents.org/roberts110515.htm>

<http://www.truth-out.org/opinion/item/19734-hubris-versus-wisdom>
<http://beforeitsnews.com/alternative/2014/04/wolfowitz-doctrine-us-plans-for-russia-2945824.html>

Ultimately, the complete abolition of nuclear weapons is linked with a change of heart, the replacement of narrow nationalism by loyalty to humanity as a whole, and the replacement of militarism by a just and enforceable system of international law.

Suggestions for further reading:

1. Ban Ki-moon. “The United Nations and security in a nuclear-weapon-free world.” Address to the East-West Institute, October 24, 2008.
2. Green, Robert, “Breaking Free from Nuclear Deterrence.” Santa Barbara: Nuclear Age Peace Foundation, 10th Annual Frank K. Kelly Lecture on Humanity’s Future, 2011,
3. “Legality of the Threat or Use of Nuclear Weapons.” Advisory Opinion of the International Court of Justice, The Hague, July 8, 1996.⁵⁷
4. McCloy-Zorin Accords. “Joint Statement of Agreed Principles for Disarmament Negotiations,” signed on September 20, 1961, unanimously adopted by the United Nations General Assembly on December 20, 1961.
5. Model Nuclear Weapons Convention. “Convention on the Prohibition of the Development, Testing, Production, Stockpiling, Transfer, Use and Threat of Use of Nuclear Weapons and their Elimination, April 2007.”⁵⁸
6. Obama, Barak, Remarks of President Barak Obama, Hradcany Square, Prague, Czech Republic, April 5, 2009.⁵⁹

⁵⁷<http://www.icj-cij.org/docket/files/93/7407.pdf>

⁵⁸<http://www.inesap.org/publications/nuclear-weapons-convention>

⁵⁹<http://prague.usembassy.gov/obama.html>

7. Rotblat, Joseph, “Remember Your Humanity”, Nobel Lecture, Oslo, Norway, December 10, 1995.
8. Russell-Einstein Manifesto, issued in London, July 9, 1955.⁶⁰
9. Santa Barbara Declaration, “Reject Nuclear Deterrence: An Urgent Call to Action,”⁶¹
10. Treaty on the Non-Proliferation of Nuclear Weapons, entered into force on March 5, 1970.⁶²
11. Vancouver Declaration. “Law’s Imperative for the Urgent Achievement of a Nuclear-Weapon-Free World,” Vancouver, Canada, March 21, 2011.⁶³

⁶⁰<http://www.pugwash.org/about/manifesto.htm>

⁶¹<http://www.wagingpeace.org/santa-barbara-declaration-reject-nuclear-deterrence-an-urgent-call-to-action/>

⁶²<http://www.state.gov/www/global/arms/treaties/npt1.html>

⁶³<http://www.lcnp.org/wcourt/Feb2011VancouverConference/vancouverdeclaration>

ALBERT EINSTEIN, SCIENTIST AND PACIFIST

“The unleashed power of the atom has changed everything except our ways of thinking, and thus we drift towards unparalleled catastrophes.”

“I don’t know what will be used in the next world war, but the 4th will be fought with stones.”

Albert Einstein (1879-1955)

Besides being one of the greatest physicists of all time, Albert Einstein was a lifelong pacifist, and his thoughts on peace can speak eloquently to us today. We need his wisdom today, when the search for peace has become vital to our survival as a species.

Family background

Albert Einstein was born in Ulm, Germany, in 1879. He was the son of middle-class, irreligious Jewish parents, who sent him to a Catholic school. Einstein was slow in learning to speak, and at first his parents feared that he might be retarded; but by the time he was eight, his grandfather could say in a letter: “Dear Albert has been back in school for a week. I just love that boy, because you cannot imagine how good and intelligent he has become.”

Remembering his boyhood, Einstein himself later wrote: “When I was 12, a little book dealing with Euclidian plane geometry came into my hands at the beginning of the school year. Here were assertions, as for example the intersection of the altitudes of a triangle in one point, which, though by no

means self-evident, could nevertheless be proved with such certainty that any doubt appeared to be out of the question. The lucidity and certainty made an indescribable impression on me.”

When Albert Einstein was in his teens, the factory owned by his father and uncle began to encounter hard times. The two Einstein families moved to Italy, leaving Albert alone and miserable in Munich, where he was supposed to finish his course at the gymnasium. Einsteins classmates had given him the nickname “Beidermeier”, which means something like “Honest John”; and his tactlessness in criticizing authority soon got him into trouble. In Einsteins words, what happened next was the following: “When I was in the seventh grade at the Lutpold Gymnasium, I was summoned by my home-room teacher, who expressed the wish that I leave the school. To my remark that I had done nothing wrong, he replied only, ‘Your mere presence spoils the respect of the class for me’.”

Einstein left gymnasium without graduating, and followed his parents to Italy, where he spent a joyous and care-free year. He also decided to change his citizenship. “The over-emphasized military mentality of the German State was alien to me, even as a boy”, Einstein wrote later. “When my father moved to Italy, he took steps, at my request, to have me released from German citizenship, because I wanted to be a Swiss citizen.”

Special and general relativity theory

The financial circumstances of the Einstein family were now precarious, and it was clear that Albert would have to think seriously about a practical career. In 1896, he entered the

famous Zürich Polytechnic Institute with the intention of becoming a teacher of mathematics and physics. However, his undisciplined and nonconformist attitudes again got him into trouble. His mathematics professor, Hermann Minkowski (1864-1909), considered Einstein to be a “lazy dog”; and his physics professor, Heinrich Weber, who originally had gone out of his way to help Einstein, said to him in anger and exasperation: “You’re a clever fellow, but you have one fault: You won’t let anyone tell you a thing! You won’t let anyone tell you a thing!”

Einstein missed most of his classes, and read only the subjects which interested him. He was interested most of all in Maxwells theory of electro-magnetism, a subject which was too “modern” for Weber. There were two major examinations at the Zürich Polytechnic Institute, and Einstein would certainly have failed them had it not been for the help of his loyal friend, the mathematician Marcel Grossman.

Grossman was an excellent and conscientious student, who attended every class and took meticulous notes. With the help of these notes, Einstein managed to pass his examinations; but because he had alienated Weber and the other professors who could have helped him, he found himself completely unable to get a job. In a letter to Professor F. Ostwald on behalf of his son, Einsteins father wrote: “My son is profoundly unhappy because of his present joblessness; and every day the idea becomes more firmly implanted in his mind that he is a failure, and will not be able to find the way back again.”

From this painful situation, Einstein was rescued (again!) by his friend Marcel Grossman, whose influential father obtained for Einstein a position at the Swiss Patent Office: Technical Expert (Third Class). Anchored at last in a safe, though humble, position, Einstein married one of his class-

mates. He learned to do his work at the Patent Office very efficiently; and he used the remainder of his time on his own calculations, hiding them guiltily in a drawer when footsteps approached.

In 1905, this Technical Expert (Third Class) astonished the world of science with five papers, written within a few weeks of each other, and published in the *Annalen der Physik*. Of these five papers, three were classics: One of these was the paper in which Einstein applied Plancks quantum hypothesis to the photoelectric effect. The second paper discussed “Brownian motion”, the zig-zag motion of small particles suspended in a liquid and hit randomly by the molecules of the liquid. This paper supplied a direct proof of the validity of atomic ideas and of Boltzmanns kinetic theory. The third paper was destined to establish Einsteins reputation as one of the greatest physicists of all time. It was entitled *On the Electrodynamics of Moving Bodies*, and in this paper, Albert Einstein formulated his special theory of relativity. Essentially, this theory maintained that all of the fundamental laws of nature exhibit a symmetry with respect to rotations in a 4-dimensional space-time continuum.

Gradually, the importance of Einsteins work began to be realized, and he was much sought after. He was first made Assistant Professor at the University of Zürich, then full Professor in Prague, then Professor at the Zürich Polytechnic Institute; and finally, in 1913, Planck and Nernst persuaded Einstein to become Director of Scientific Research at the Kaiser Wilhelm Institute in Berlin. He was at this post when the First World War broke out

While many other German intellectuals produced manifestos justifying Germanys invasion of Belgium, Einstein dared to write and sign an anti-war manifesto. Einsteins manifesto appealed for cooperation and understanding am-

ong the scholars of Europe for the sake of the future; and it proposed the eventual establishment of a League of Europeans. During the war, Einstein remained in Berlin, doing whatever he could for the cause of peace, burying himself unhappily in his work, and trying to forget the agony of Europe, whose civilization was dying in a rain of shells, machine-gun bullets, and poison gas.

The work into which Einstein threw himself during this period was an extension of his theory of relativity. He already had modified Newtons equations of motion so that they exhibited the space-time symmetry required by his Principle of Special Relativity. However, Newtons law of gravitation. remained a problem.

Obviously it had to be modified, since it disagreed with his Special Theory of Relativity; but how should it be changed? What principles could Einstein use in his search for a more correct law of gravitation? Certainly whatever new law he found would have to give results very close to Newtons law, since Newtons theory could predict the motions of the planets with almost perfect accuracy. This was the deep problem with which he struggled.

In 1907, Einstein had found one of the principles which was to guide him, the Principle of Equivalence of inertial and gravitational mass. After turning Newtons theory over and over in his mind, Einstein realized that Newton had used mass in two distinct ways: His laws of motion stated that the force acting on a body is equal to the mass of the body multiplied by its acceleration; but according to Newton, the gravitational force on a body is also proportional to its mass. In Newtons theory, gravitational mass, by a coincidence, is equal to inertial mass; and this holds for all bodies. Einstein decided to construct a theory in which gravitational and inertial mass necessarily have to be the same.

He then imagined an experimenter inside a box, unable to see anything outside it. If the box is on the surface of the earth, the person inside it will feel the pull of the earth's gravitational field. If the experimenter drops an object, it will fall to the floor with an acceleration of 32 feet per second per second. Now suppose that the box is taken out into empty space, far away from strong gravitational fields, and accelerated by exactly 32 feet per second per second. Will the enclosed experimenter be able to tell the difference between these two situations? Certainly no difference can be detected by dropping an object, since in the accelerated box, the object will fall to the floor in exactly the same way as before.

With this "thought experiment" in mind, Einstein formulated a general Principle of Equivalence: He asserted that no experiment whatever can tell an observer enclosed in a small box whether the box is being accelerated, or whether it is in a gravitational field. According to this principle, gravitation and acceleration are locally equivalent, or, to say the same thing in different words, gravitational mass and inertial mass are equivalent.

Einstein soon realized that his Principle of Equivalence implied that a ray of light must be bent by a gravitational field. This conclusion followed because, to an observer in an accelerated frame, a light beam which would appear straight to a stationary observer, must necessarily appear very slightly curved. If the Principle of Equivalence held, then the same slight bending of the light ray would be observed by an experimenter in a stationary frame in a gravitational field.

Another consequence of the Principle of Equivalence was that a light wave propagating upwards in a gravitational field should be very slightly shifted to the red. This followed because in an accelerated frame, the wave crests would be

slightly farther apart than they normally would be, and the same must then be true for a stationary frame in a gravitational field. It seemed to Einstein that it ought to be possible to test experimentally both the gravitational bending of a light ray and the gravitational red shift.

This seemed promising; but how was Einstein to proceed from the Principle of Equivalence to a formulation of the law of gravitation? Perhaps the theory ought to be modeled after Maxwells electromagnetic theory, which was a field theory, rather than an “action at a distance” theory. Part of the trouble with Newtons law of gravitation was that it allowed a signal to be propagated instantaneously, contrary to the Principle of Special Relativity. A field theory of gravitation might cure this defect, but how was Einstein to find such a theory? There seemed to be no way.

From these troubles Albert Einstein was rescued (a third time!) by his staunch friend Marcel Grossman. By this time, Grossman had become a professor of mathematics in Zürich, after having written a doctoral dissertation on tensor analysis and non-Euclidian geometry, the very things that Einstein needed. The year was then 1912, and Einstein had just returned to Zürich as Professor of Physics at the Polytechnic Institute. For two years, Einstein and Grossman worked together; and by the time Einstein left for Berlin in 1914, the way was clear. With Grossmans help, Einstein saw that the gravitational field could be expressed as a curvature of the 4-dimensional space-time continuum.

In 1919, a British expedition, headed by Sir Arthur Eddington, sailed to a small island off the coast of West Africa. Their purpose was to test Einsteins prediction of the bending of light in a gravitational field by observing stars close to the sun during a total eclipse. The observed bending agreed exactly with Einsteins predictions; and as a result he became

world-famous. The general public was fascinated by relativity, in spite of the abstruseness of the theory (or perhaps because of it). Einstein, the absent-minded professor, with long, uncombed hair, became a symbol of science. The world was tired of war, and wanted something else to think about.

Einstein met President Harding, Winston Churchill and Charlie Chaplin; and he was invited to lunch by the Archbishop of Canterbury. Although adulated elsewhere, he was soon attacked in Germany. Many Germans, looking for an excuse for the defeat of their nation, blamed it on the pacifists and Jews; and Einstein was both these things.

Einstein's letter to Freud: Why war?

Because of his fame, Einstein was asked to make several speeches at the Reichstag. and in all these speeches he condemned violence and nationalism, urging that these be replaced by and international cooperation and law under an effective international authority. He also wrote many letters and articles pleading for peace and for the renunciation of militarism and violence.

Einstein believed that the production of armaments is damaging, not only economically, but also spiritually. In 1930 he signed a manifesto for world disarmament sponsored by the Womans International League for Peace and Freedom. In December of the same year, he made his famous statement in New York that if two percent of those called for military service were to refuse to fight, governments would become powerless, since they could not imprison that many people. He also argued strongly against compulsory military service and urged that conscientious objectors should be protected by the international community. He argued that peace, freedom of individuals, and security of societies could only be

achieved through disarmament, the alternative being “slavery of the individual and annihilation of civilization”.

In letters, and articles, Einstein wrote that the welfare of humanity as a whole must take precedence over the goals of individual nations, and that we cannot wait until leaders give up their preparations for war. Civil society, and especially public figures, must take the lead. He asked how decent and self-respecting people can wage war, knowing how many innocent people will be killed.

In 1931, the International Institute for Intellectual Cooperation invited Albert Einstein to enter correspondence with a prominent person of his own choosing on a subject of importance to society. The Institute planned to publish a collection of such dialogues. Einstein accepted at once, and decided to write to Sigmund Freud to ask his opinion about how humanity could free itself from the curse of war. A translation from German of part of the long letter that he wrote to Freud is as follows:

“Dear Professor Freud, The proposal of the League of Nations and its International Institute of Intellectual Cooperation at Paris that I should invite a person to be chosen by myself to a frank exchange of views on any problem that I might select affords me a very welcome opportunity of conferring with you upon a question which, as things are now, seems the most important and insistent of all problems civilization has to face. This is the problem: Is there any way of delivering mankind from the menace of war? It is common knowledge that, with the advance of modern science, this issue has come to mean a matter of life or death to civilization as we know it; nevertheless, for all the zeal displayed, every attempt at its solution has ended in a lamentable breakdown.”

“I believe, moreover, that those whose duty it is to tackle

the problem professionally and practically are growing only too aware of their impotence to deal with it, and have now a very lively desire to learn the views of men who, absorbed in the pursuit of science, can see world-problems in the perspective distance lends. As for me, the normal objective of my thoughts affords no insight into the dark places of human will and feeling. Thus in the enquiry now proposed, I can do little more than seek to clarify the question at issue and, clearing the ground of the more obvious solutions, enable you to bring the light of your far-reaching knowledge of man's instinctive life upon the problem..”

“As one immune from nationalist bias, I personally see a simple way of dealing with the superficial (i.e. administrative) aspect of the problem: the setting up, by international consent, of a legislative and judicial body to settle every conflict arising between nations... But here, at the outset, I come up against a difficulty; a tribunal is a human institution which, in proportion as the power at its disposal is... prone to suffer these to be deflected by extrajudicial pressure...”

Freud replied with a long and thoughtful letter in which he said that a tendency towards conflict is an intrinsic part of human emotional nature, but that emotions can be overridden by rationality, and that rational behavior is the only hope for humankind.

The fateful letter to Roosevelt

Albert Einsteins famous relativistic formula, relating energy to mass, soon yielded an understanding of the enormous amounts of energy released in radioactive decay. Marie and Pierre Curie had noticed that radium maintains itself at a temperature higher than its surroundings. Their measurements and calculations showed that a gram of radium pro-

duces roughly 100 gram-calories of heat per hour. This did not seem like much energy until Rutherford found that radium has a half-life of about 1,000 years. In other words, after a thousand years, a gram of radium will still be producing heat, its radioactivity only reduced to one-half its original value. During a thousand years, a gram of radium produces about a million kilocalories, an enormous amount of energy in relation to the tiny size of its source! Where did this huge amount of energy come from? Conservation of energy was one of the most basic principles of physics. Would it have to be abandoned?

The source of the almost-unbelievable amounts of energy released in radioactive decay could be understood through Einsteins formula equating the energy of a system to its mass multiplied by the square of the velocity of light, and through accurate measurements of atomic weights. Einsteins formula asserted that mass and energy are equivalent. It was realized that in radioactive decay, neither mass nor energy is conserved, but only a quantity more general than both, of which mass and energy are particular forms. Scientists in several parts of the world realized that Einstein's discovery of the relationship between mass and energy, together with the discovery of fission of the heavy element uranium meant that it might be possible to construct a uranium-fission bomb of immense power.

Meanwhile night was falling on Europe. In 1929, an economic depression had begun in the United States and had spread to Europe. Without the influx of American capital, the postwar reconstruction of the German economy collapsed. The German middle class, which had been dealt a severe blow by the great inflation of 1923, now received a second heavy blow. The desperate economic chaos drove German voters into the hands of political extremists.

On January 30, 1933, Adolf Hitler was appointed Chancellor and leader of a coalition cabinet by President Hindenburg. Although Hitler was appointed legally to this post, he quickly consolidated his power by unconstitutional means: On May 2, Hitler's police seized the headquarters of all trade unions, and arrested labor leaders. The Communist and Socialist parties were also banned, their assets seized and their leaders arrested. Other political parties were also smashed. Acts were passed eliminating Jews from public service; and innocent Jewish citizens were boycotted, beaten and arrested. On March 11, 1938, Nazi troops entered Austria.

On March 16, 1939, the Italian physicist Enrico Fermi (who by then was a refugee in America) went to Washington to inform the Office of Naval Operations that it might be possible to construct an atomic bomb; and on the same day, German troops poured into Czechoslovakia.

A few days later, a meeting of six German atomic physicists was held in Berlin to discuss the applications of uranium fission. Otto Hahn, the discoverer of fission, was not present, since it was known that he was opposed to the Nazi regime. He was even said to have exclaimed: "I only hope that you physicists will never construct a uranium bomb! If Hitler ever gets a weapon like that, I'll commit suicide."

The meeting of German atomic physicists was supposed to be secret; but one of the participants reported what had been said to Dr. S. Flügge, who wrote an article about uranium fission and about the possibility of a chain reaction. Flügge's article appeared in the July issue of *Naturwissenschaften*, and a popular version in the *Deutsche Allgemeine Zeitung*. These articles greatly increased the alarm of American atomic scientists, who reasoned that if the Nazis permitted so much to be printed, they must be far advanced on the road to building an atomic bomb.

In the summer of 1939, while Hitler was preparing to invade Poland, alarming news reached the physicists in the United States: A second meeting of German atomic scientists had been held in Berlin, this time under the auspices of the Research Division of the German Army Weapons Department. Furthermore, Germany had stopped the sale of uranium from mines in Czechoslovakia.

The world's most abundant supply of uranium, however, was not in Czechoslovakia, but in Belgian Congo. Leo Szilard, a refugee Hungarian physicist who had worked with Fermi to measure the number of neutrons produced in uranium fission, was deeply worried that the Nazis were about to construct atomic bombs; and it occurred to him that uranium from Belgian Congo should not be allowed to fall into their hands.

Szilard knew that his former teacher, Albert Einstein, was a personal friend of Elizabeth, the Belgian Queen Mother. Einstein had met Queen Elizabeth and King Albert of Belgium at the Solvay Conferences, and mutual love of music had cemented a friendship between them. When Hitler came to power in 1933, Einstein had moved to the Institute of Advanced Studies at Princeton; and Szilard decided to visit him there. Szilard reasoned that because of Einstein's great prestige, and because of his long-standing friendship with the Belgian Royal Family, he would be the proper person to warn the Belgians not to let their uranium fall into the hands of the Nazis. Einstein agreed to write to the Belgian king and queen.

On August 2, 1939, Szilard again visited Einstein, accompanied by Edward Teller and Eugene Wigner, who (like Szilard) were refugee Hungarian physicists. By this time, Szilard's plans had grown more ambitious; and he carried with him the draft of another letter, this time to the Amer-

ican President, Franklin D. Roosevelt. Einstein made a few corrections, and then signed the fateful letter, which reads (in part) 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 a port, might very well destroy the whole port, together with some of the surrounding territory..”

The letter also called Roosevelt’s attention to the fact that Germany had already stopped the export of uranium from the Czech mines under German control. After making a few corrections, Einstein signed it. On October 11, 1939, three weeks after the defeat of Poland, Roosevelt’s economic adviser, Alexander Sachs, personally delivered the letter to the President. After discussing it with Sachs, the President commented, “This calls for action.” Later, when atomic bombs were dropped on civilian populations in an already virtually-defeated Japan, Einstein bitterly regretted having signed Szilard’s letter to Roosevelt. He said repeatedly that signing the letter was the greatest mistake of his life, and his remorse was extreme.

Throughout the remainder of his life, in addition to his scientific work, Einstein worked tirelessly for peace, international understanding and nuclear disarmament. His last public act, only a few days before his death in 1955, was to

sign the Russell-Einstein Manifesto, warning humankind of the catastrophic consequences that would follow from a war with nuclear weapons.⁶⁴

A few more things that Einstein said about peace:

“We cannot solve our problems with the same thinking that we used when we created them.”

“It has become appallingly obvious that our technology has exceeded our humanity.”

“Peace cannot be kept by force; it can only be achieved by understanding.”

“The world is a dangerous place to live; not because of the people who are evil, but because of the people who don’t do anything about it.”

“Insanity: doing the same thing over and over again and expecting to get different results.”

“Nothing will end war unless the people themselves refuse to go to war.”

“Past thinking and methods did not prevent world wars. Future thinking must prevent war.”

“You cannot simultaneously prevent and prepare for war.”

⁶⁴<http://www.umich.edu/pugwash/Manifesto.html>

“Never do anything against conscience, even if the state demands it.”

“Taken as a whole, I would believe that Gandhi’s views were the most enlightened of all political men of our time.”

“Without ethical culture, there is no salvation for humanity.”

**Albert Einstein, great physicist and lifelong pacifist,
we need your voice today!**

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 little 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 CO₂ 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.⁶⁵

Is a quick transition to 100% renewable energy technically possible? The remarkable characteristics of exponential growth can give us hope that it can indeed be done, provided that we make the necessary effort.

The Earth Policy Institute recently reported that “Between 2008 and 2013, as solar panel prices dropped by roughly two thirds, the PV installed worldwide skyrocketed from 16,000 to 139,000 megawatts... In its January 2014 solar outlook report, Deutsche Bank projected that 46,000 megawatts

⁶⁵<http://www.worldbank.org/en/news/feature/2012/11/18/Climate-change-report-warns-dramatically-warmer-world-this-century>

would be added to global PV capacity in 2014 and that new installations would jump to a record 56,000 megawatts in 2015.”

An analysis of the data given by the Earth Policy Institute shows that global installed photovoltaic capacity is now increasing by 27.8% per year. Because of the remarkable properties of exponential growth, we can predict that by 2034, the world’s installed PV capacity will have reached 47.7 terawatts, more than twice today’s global consumption of all forms of energy (provided, of course, that the present rate of growth is maintained).

We can see from this analysis, and from data presented by Lester Brown and his coauthors Janet Larsen, Mathew Roney and Emily Adams, in their recent book “The Great Transition”, that the urgently-needed replacement of fossil fuels by renewable energy is technically achievable. But it also requires political will. For example the present rapid rate of growth of global PV capacity was initiated by the German government’s enlightened financial policies. Government measures helping renewables are vital. At present, governments give billions in direct and indirect support of fossil fuel giants, which in turn sponsor massive advertising campaign to convince the public that anthropogenic climate change is not real. Our task, for the sake of future generations, is to provide the political will needed for the great transition.⁶⁶

For the sake of future generations, let us also work with dedication for the great transition to a world without nuclear weapons, a world without war, and a world with an economic system that does not depend on growth.

⁶⁶<http://www.earth-policy.org/books/tgt>
<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>

NEW HOPE FOR AVOIDING CATASTROPHIC CLIMATE CHANGE

The threat of catastrophic climate change requires prompt and dedicated action by the global community. Unless we very quickly make the transition from fossil fuels to 100% renewable energy, we will reach a tipping point after which uncontrollable feedback loops could take over, leading to a human-caused 6th geological extinction event. This might even be comparable to the Permian-Triassic event, during which 96% of all marine species and 70% of terrestrial vertebrates became extinct.

New hope that such a catastrophe for human civilization and the biosphere can be avoided comes from two recently-released documents: The Encyclical “*Laudato Si’*” by Pope Francis, and the statistics on the rate of growth of renewable energy newly released by the Earth Policy Institute.

The danger of reaching a tipping point

Arctic sea-ice is melting at an increasingly rapid rate, because of several feedback loops. One of these feedback loops, called the albedo effect, is due to the fact that white snow-covered sea-ice in the Arctic reflects sunlight, while dark water absorbs it, raising the temperature and leading to more melting.

Another feedback loop is due to the fact that rising temperatures mean that more water is evaporated. The water vapor in the atmosphere acts like a greenhouse gas, and raises the temperature still further.

If we consider long-term effects, by far the most dangerous of the feedback loops is the melting of methane hydrate crystals and the release of methane into the atmosphere, where its effects as a greenhouse gas are roughly twenty times great as those of CO₂.

When organic matter is carried into the oceans by rivers, it decays to form methane. The methane then combines with water to form hydrate crystals, which are stable at the temperatures which currently exist on ocean floors. However, if the temperature rises, the crystals become unstable, and methane gas bubbles up to the surface.

The worrying thing about methane hydrate deposits on ocean floors is the enormous amount of carbon involved: roughly 10,000 gagatons. To put this huge amount into perspective, we can remember that the total amount in world CO₂ emissions since 1751 has been only 337 gigatons.

Pope Francis and his message of hope Despite the worrying nature of the threats that we are facing, there are reasons for hope. One of the greatest of these is the beautiful, profound and powerful encyclical that has just been released by Pope Francis.⁶⁷

When he accepted the responsibility for leading the world's 1.2-billion-strong Catholic Church, Cardinal Bergoglio of Argentina adopted the name Francis, after the universally loved Saint Francis of Assisi, whose life of simplicity, love for the poor, and love of nature he chose as the model for his Papacy. The Pope's inspiring encyclical letter "Laudato Si' " takes its name from a canticle of Saint Francis, that begins with the words "Praise be to you, my Lord, through our sister, mother Earth, who sustains and governs us..."

We can remember that Saint Francis regarded birds and

⁶⁷<https://www.transcend.org/tms/2015/06/encyclical-letter-laudato-si-of-the-holy-father-francis-on-care-for-our-common-home/>



Figure 31: *Pope Francis*. Source: *Korea.net*, [CC BY-SA 2.0], *Wikimedia Commons*

animals as his brothers and sisters. He even thought of the sun, moon, clouds, rain and water as brothers and sisters. Like his chosen namesake, Pope Francis stresses the unity of all of nature, and our kinship with all of creation. Francis appeals to love. We can be saved through love.

His encyclical is addressed not only to Catholics, but also to all men and women of good will, and almost all of its 102 pages appeal to moral sensibilities and rational arguments that can be shared by all of us. Pope Francis stresses that the natural world that sustains us is in grave danger from our ruthless exploitation and greed-driven destruction of all the beauty and life that it contains: animals, forests, soil, and air.

Pope Francis tells us that the dictates of today's economists are not sacred: In the future, if we are to survive, economics must be given both a social conscience and an ecological conscience. Nor are private property and profits sacred. They must be subordinated to the common good, and the preservation of our global commons.

Less focus on material goods need not make us less happy. The quality of our lives can be increased, not decreased, if we give up our restless chase after power and wealth, and derive more of our pleasures from art, music and literature, and from conversations with our families and friends,

Please read this great encyclical in its entirety. It can give us hope and courage as we strive to make the changes that are needed to avert an ecological mega-catastrophe.

Another reason for hope: The rate of growth of renewable energy

Another reason for hope can be found in the extremely high present rate of growth of renewable energy, and in the re-

markable properties of exponential growth. According to figures recently released by the Earth Policy Institute,⁶⁸ the global installed photovoltaic capacity is currently able to deliver 242,000 megawatts, and it is increasing at the rate of 27.8% per year. Wind energy can now deliver 370,000 megawatts, and it is increasing at the rate of roughly 20% per year. Because of the astonishing properties of exponential growth, we can calculate that if these growth rates are maintained, renewable energy can give us 24.8 terawatts within only 15 years! This is far more than the world's present use of all forms of energy.

All of us must still work with dedication to provide the political will needed to avoid catastrophic climate change. However, the strong and friendly voice of Pope Francis, and the remarkable rate of growth of renewable energy can guide our work, and can give us hope and courage.⁶⁹

⁶⁸<http://www.earth-policy.org/books/tgt>

⁶⁹<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>

<http://www.worldbank.org/en/news/feature/2012/11/18/Climate-change-report-warns-dramatically-warmer-world-this-century>

<https://www.youtube.com/watch?v=sRGVTK-AAvw>

<https://www.youtube.com/watch?v=MVwmi7HCmSI>

<https://www.youtube.com/watch?v=AjZaFjXfLec>

<https://www.youtube.com/watch?v=m6pFDu7ILV4>

<https://www.youtube.com/watch?v=MVwmi7HCmSI>

<http://therightsofnature.org/universal-declaration/>

MILITARISM'S HOSTAGES

Do our “Defense Departments” really defend us? Absolutely not! Their very title is a lie. The military-industrial complex sells itself by claiming to defend civilians. It justifies vast and crippling budgets by this claim; but it is a fraud. For the military-industrial complex, the only goal is money and power. Civilians like ourselves are just hostages. We are expendable. We are pawns in the power game, the money game.

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.

A thermonuclear war today would be not only genocidal but also omnicidal. It would kill people of all ages, babies, children, young people, mothers, fathers and grandparents, without any regard whatever for guilt or innocence. Such a war would be the ultimate ecological catastrophe, destroying not only human civilization but also much of the biosphere.

There is much worry today about climate change, but an ecological catastrophe of equal or greater magnitude could be produced by a nuclear war. One can gain a small idea of what this would be like by thinking of the radioactive contamination that has made an area half the size of Italy near to Chernobyl permanently uninhabitable. It is too soon to know the full effects of the Fukushima disaster, but it appears that it will be comparable with Chernobyl.

The testing of hydrogen bombs in the Pacific half a century ago continues to cause cancer and birth defects in the

Marshall Islands today. This too can give us a small idea of the environmental effects of a nuclear war.

In 1954, the United States tested a hydrogen bomb at Bikini. The bomb was 1,300 times more powerful than the bombs that destroyed Hiroshima and Nagasaki. Fallout from the bomb contaminated the island of Rongelap, one of the Marshall Islands 120 kilometers from Bikini. The islanders experienced radiation illness, and many died from cancer. Even today, half a century later, both people and animals on Rongelap and other nearby islands suffer from birth defects. The most common defects have been “jelly fish babies”, born with no bones and with transparent skin. Their brains and beating hearts can be seen. The babies usually live a day or two before they stop breathing.

The environmental effects of a nuclear war would be catastrophic. A war fought with hydrogen bombs would produce radioactive contamination of the kind that we have already experienced in the areas around Chernobyl and Fukushima and in the Marshall Islands, but on an enormously increased scale. 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 by a nuclear war today is the complete breakdown of human civilization.

Besides spreading deadly radioactivity throughout the world, a nuclear war would inflict catastrophic damage on global agriculture. Firestorms in burning cities would produce many millions of tons of black, thick, radioactive smoke. The smoke would rise to the stratosphere where it would spread around the earth and remain for a decade. Prolonged cold, decreased sunlight and rainfall, and massive increases in harmful ultraviolet light would shorten or eliminate growing seasons, producing a nuclear famine. Even a small nuclear

war could endanger the lives of the billion people who today are chronically undernourished. A full-scale war fought with hydrogen bombs would mean that most humans would die from hunger. Many animal and plant species would also be threatened with extinction.

Incidents in which global disaster is avoided by a hair's breadth are constantly occurring. For example, on the night of 26 September, 1983, Lt. Col. Stanislav Petrov, a young software engineer, was on duty at a surveillance center near Moscow. Suddenly the screen in front of him turned bright red. An alarm went off. It's enormous piercing sound filled the room. A second alarm followed, and then a third, fourth and fifth, until the noise was deafening. The computer showed that the Americans had launched a strike against Russia. Petrov's orders were to pass the information up the chain of command to Secretary General Yuri Andropov. Within minutes, a nuclear counterattack would be launched. However, because of certain inconsistent features of the alarm, Petrov disobeyed orders and reported it as a computer error, which indeed it was. Most of us probably owe our lives to his brave and coolheaded decision and his knowledge of software systems. The narrowness of this escape is compounded by the fact that Petrov was on duty only because of the illness of another officer with less knowledge of software, who would have accepted the alarm as real. Narrow escapes such as this show us clearly that in the long run, the combination of space-age science and stone-age politics will destroy us.

Recently the United States has made provocative moves that seriously risk starting a war with Russia that might develop into a nuclear war. These include a proposed transfer of heavy weapons to Baltic states on Russia's border, as well as sending a fleet of warships to the Black sea.⁷⁰

⁷⁰<http://www.countercurrents.org/roberts200615.htm>

At the same time, the United States is making aggressive moves in an attempt to “contain China”.⁷¹ Thus Washington’s power-holders are threatening war with both Russia and China. The effect of these colossally misguided US actions has been to firmly unite China and Russia. In fact the BRICS countries, with their vast resources, are now moving away from using the dollar as a reserve currency for international trade. The probable effect will be the collapse of the already-strained US economy, and as a consequence, the fall of the US Empire.

What can be the reason for these actions, which seem to border on insanity? One reason can be found in the power-drunk thinking of the “Project for a New American Century”, one of whose members was US Under Secretary of Defense for Policy, Paul Wolfowitz.

The Wolfowitz Doctrine states that “Our first objective is to prevent the re-emergence of a new rival, either on the territory of the former Soviet Union or elsewhere, that poses a threat on the order of that posed formerly by the Soviet Union. This is a dominant consideration underlying the new regional defense strategy and requires that we endeavor to prevent any hostile power from dominating a region whose

<http://www.informationclearinghouse.info/article42162.htm>

<http://www.countercurrents.org/zuesse160615.htm>

<http://dissidentvoice.org/2015/06/ukraine-and-the-apocalyptic-risk-of-propagandized-ignorance/>

<http://www.informationclearinghouse.info/article42140.htm>

<http://www.informationclearinghouse.info/article42147.htm>

<http://human-wrongs-watch.net/2015/06/14/us-and-russia-playing-nuclear-chicken-with-each-other/>

⁷¹<http://www.commondreams.org/news/2015/05/26/threat-inevitable-war-looms-between-us-and-china-over-pacific-island-row>

<http://www.informationclearinghouse.info/article42171.htm>

<http://www.informationclearinghouse.info/article42176.htm>

resources would, under consolidated control, be sufficient to generate global power.”

In other words, the Wolfowitz Doctrine is a declaration that the United States intends to control the entire world through military power. No thought is given to the protection of civilian populations, either in the United States or elsewhere. Civilians are mere hostages in the power game.

The money game is important too. A great driving force behind militarism is the almost unimaginably enormous river of money that 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.

As long as tensions are maintained; as long as there is a threat of war, the military-industrial complex gets the money for which it lusts, and the politicians and journalists get their blood money. The safety of civilians plays no role in the money game. We are just hostages.

There is a danger that our world, with all the beauty and value that it contains, will be destroyed by this cynical game for power and money, in which civilians are militarism’s hostages. Will we let this happen?

WILL THE REAL ISSUES BE DISCUSSED IN 2016?

In the United States, campaigns for the presidential election of 2016 have already begun. This might be an occasion for a realistic discussion of the enormously important challenges which we now face, not only in the America, but also throughout the world. But will the central issues be discussed? Or will the campaigns focus on personalities and trivia?

The most important issues

Most thoughtful people agree that the two most important issues facing humanity today are the threat of catastrophic and uncontrollable climate change, and the threat of nuclear war. Each of these threatened disasters has the potential to destroy human civilization and much of the biosphere. But will these vitally important issues be discussed in an honest way? Or will the campaign spectacle presented to us by the mass media be washed down into the murky depths of stupidity by rivers of money from the fossil fuel giants and the military industrial complex?

The Republican presidential candidates are almost single-voiced in denying the reality of climate change, and they are almost unanimously behind foreign policy options that would push the world to the brink of nuclear war. What about the Democrats and Independents? We will discuss this question in a moment, but first let us look at the the two major issues:

The reality of climate change

Unless rapid action is taken, the world may soon pass a tipping point after which human efforts to avoid catastrophic

climate change will be useless because feedback loops will have taken over. However, our present situation is by no means hopeless, because of the extremely rapid rate of growth of renewable energy. What can governments do to help? They can stop subsidizing the fossil fuel industry! Without massive fossil fuel subsidies, renewables would be the cheaper option, and economic forces alone would drive the urgently-needed transition to 100% renewable energy.

A report by RNE21, a global renewable energy policy network, states that “Global subsidies for fossil fuels remain high despite reform efforts. Estimates range from USD 550 billion (International Energy Agency) to USD 5.6 trillion per year (International Monetary Fund), depending on how ‘subsidy’ is defined and calculated.”

“Growth in renewable energy (and energy efficiency improvements) is tempered by subsidies to fossil fuels and nuclear power, particularly in developing countries. Subsidies keep conventional energy prices artificially low, which makes it more difficult for renewable energy to compete...”

“Creating a level playing field can lead to a more efficient allocation of financial resources, helping to strengthen to advance the development of energy efficiency and renewable energy technologies. Removing fossil fuel and energy subsidies globally would reflect more accurately the true cost of energy generation.”⁷²

An Elephant in the room

There is, so to speak, an elephant in the room; but no one wants to talk about it. Everyone (with a very few exceptions) pretends not to see it. They pretend that it is not

⁷²<http://www.ren21.net/status-of-renewables/global-status-report/>

there. What is this metaphorical elephant? It is the Pentagon's colossal budget, which is far too sacred a thing to be mentioned in an election campaign.

The size of this budget is almost beyond comprehension: 610 billion dollars per year. This does not include nuclear weapons research, maintenance, cleanup and production, which are paid for by the Department of Energy. Nor does it include payments in pensions to military retirees and widows, nor interest on debt for past wars, nor the State Department's financing foreign arms sales and military-related development assistance, nor special emergency grants for current wars. Nor are the expenses of the Department of Homeland Security included in the Pentagon's budget, nor those of the CIA, nor the huge budget of NSA and other dark branches of the US government. One can only guess at the total figure if everything should be included, but it is probably well over a trillion dollars per year.

The hidden presence in the room is a trillion-dollar elephant. Perhaps we should include subsidies to fossil fuel giants. Then we would have a multi-trillion-dollar elephant. But it is too sacred to be mentioned. Cut Medicare! Cut pensions! Cut Social Security! Abolish food stamps! Sacrifice support for education! We are running out of money! (Meanwhile the elephant stands there, too holy to be seen.)

Bernie Sanders and Jill Stein

I will not say anything about Hillary Clinton, because she is almost indistinguishable from the Republican presidential candidates, both on the issues related to war and on those related to the environment. But let us now have a look at

the positions of Senator Bernie Sanders and Dr. Jill Stein.⁷³ In May, when he started his campaign for nomination as the Democratic Party's presidential candidate, Bernie Sanders, seemed to be an outsider with no chance of winning. But on June 25, the New York Times reported that, in the New Hampshire primaries, Sanders was running in a statistical dead heat with heavily financed Hillary Clinton. On July 1, Bernie Sanders made history by drawing a capacity crowd of 10,000 wildly cheering supporters to a sports stadium in Madison Wisconsin, the largest crowd assembled by any candidate in the current presidential race. Bernie now seems to have a real chance of winning the nomination, and perhaps the 2016 election, because of an avalanche of popular support.

Here is Bernie's statement about income inequality: "What we have seen is that while the average person is working longer hours for lower wages, we have seen a huge increase in income and wealth inequality, which is now reaching obscene levels. This is a rigged economy, which works for the rich and the powerful, and is not working for ordinary Americans You know, this country just does not belong to a handful of billionaires."

Sanders believes that "no single financial institution should have holdings so extensive that its failure would send the world economy into crisis. If an institution is too big to fail, it is too big to exist."

Sanders is opposed to the Trans-Pacific Partnership trade

⁷³<http://edition.cnn.com/2015/07/01/politics/bernie-sanders-crowds-wisconsin-2016/>
<http://www.commondreams.org/news/2015/07/02/sanders-draws-10000-wisconsin-support-revolution-doubles-iowa>
<http://www.commondreams.org/views/2015/07/01/bernie-sanders-too-radical-america>

agreement, which he has called “a continuation of other disastrous trade agreements, like NAFTA and CAFTA...”

Concerning jobs, Bernie Sanders has said that “America once led the world in building and maintaining a nationwide network of safe and reliable bridges and roads. Today, nearly a quarter of the nation’s 600,000 bridges have been designated as structurally deficient or functionally obsolete...Almost one-third of America’s major roads are in poor or mediocre condition...,” He believes that secure jobs can be created by developing transportation and renewable energy infrastructure. Sanders also supports the development of worker-owned cooperatives.

Sanders has stated that he believes that the Citizens United decision is “one of the Supreme Court’s worst decisions ever” and that it has allowed big money to “deflect attention from the real issues” facing voters. He has proposed a constitutional amendment to overturn the ruling, and he warns that “We now have a political situation where billionaires are literally able to buy elections and candidates.”

Sanders strongly opposed the 2003 invasion of Iraq, saying: “I am opposed to giving the President a blank check to launch a unilateral invasion and occupation of Iraq... As a caring Nation, we should do everything we can to prevent the horrible suffering that a war will cause. War must be the last recourse in international relations, not the first. ...I am deeply concerned about the precedent that a unilateral invasion of Iraq could establish in terms of international law and the role of the United Nations.”

Bernie Sanders voted against the USA Patriot Act and all of its renewals and has characterized the National Security Agency as “out of control.” He has frequently criticized warrentless wiretapping and the collection of the phone, email, library, and Internet browsing records of American citizens



Figure 32: *Senator Bernie Sanders. Regardless of whether he is elected in 2016, his candidacy has produced public discussion of important issues. Senate photograph, Public domain, Wikimedia Commons*

without due process. Bernie says: “In my view, NSA is out of control and operating in an unconstitutional manner. I worry very much about kids growing up in a society where they think ‘I’m not going to talk about this issue, read this book, or explore this idea because someone may think I’m a terrorist’. That’s not the kind of free society I want for our children.”

You can find more information about Bernie, and other planks in his platform, in the Wikipedia article.

And remember to vote for him!

But who is Jill?

In my opinion, the question of whether the most vitally important issues are properly discussed in the 2016 US election campaigns depends on whether Dr. Jill Stein can obtain reasonable access to the mainstream media. But who is she?

Dr. Jill Stein is a physician from Massachusetts, who ran twice for Governor of that state. She also ran for US President in 2012 as the Green Party’s candidate. A week ago she announced that she is running for the Green Party’s nomination as its 2016 presidential candidate. I believe that she is one of the few people who is willing to talk about the elephant in the room. Here are a few things that Dr. Stein has said:⁷⁴

“Our Power to the People Plan lays out these solutions in a blueprint to move our economy from the greed and exploitation of corporate capitalism to a human-centered system that puts people, planet and peace over profit. This plan would end unemployment and poverty; avert climate catastrophe;

⁷⁴<http://www.commondreams.org/news/2015/06/24/under-green-party-banner-jill-stein-officially-sets-sights-2016>



Figure 33: *Dr. Jill Stein, who was the Green Party candidate for President of the US in 2012. Public domain, Wikimedia Commons*

build a sustainable and just economy; and recognize the dignity and human rights of everyone in our society. The plan affirms that we have the power to take back the future."

"We have the power to create a Green New Deal, providing millions of jobs by transitioning to 100% clean renewable energy by 2030."

"We have the power to provide a living-wage job and worker's rights to every American."

"We have the power to end poverty and guarantee economic human rights."

"We have the power to make health-care a human right through an improved Medicare for All system."

"We have the power to provide education as a right and abolish student debt."

"We have the power to create a just economy."

"We have the power to protect Mother earth."

"We have the power to end institutional racism, police brutality and mass incarceration-"

"We have the power to restore our constitutional rights."

"We have the power to end our wars of aggression, close foreign bases and cut military expenditures 50%."

"We have the power to empower the people."

Let us fervently hope that in 2016 the real issues will be discussed with depth and honesty. Much depends on it, not only in the United States, but also throughout the world.

DEBT SLAVERY

At the moment, the issue of debt slavery is very topical because of the case of Greece; but it is an issue that has a far more general significance.

Usury, the charging of interest on loans, has a history of being forbidden by several major religions, including not only the three Abrahamic religions, Judaism, Christianity and Islam, but also the ancient Vedic Scriptures of India.

Exponential growth of debt

Perhaps the reason for these religious traditions 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*’ ”.⁷⁵

Wealth, virtual wealth, and debt

Frederik Soddy, who won the Nobel Prize in Chemistry in 1926 for the discover of isotopes, later turned his attention to economics. Soon after receiving his Nobel Prize, he published a book entitled “Wealth, virtual wealth and debt; the solution to the economic paradox”.

In this book, Soddy was extremely critical of the system of fractional reserve banking, whereby private banks keep only a small fraction of the money 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. Thus profits from any expansion of the money supply go to private corporations instead of being used to provide social services. Soddy’s criticisms of fractional reserve banking cast light on the sub-prime 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 (i.e. disorder and degradation) increases, real wealth decays. Soddy contrasted this with the behavior of debt at compound interest, which increases exponentially without any limit, and he remarked:

⁷⁵<http://dissidentvoice.org/2015/07/a-revolutionary-pope-calls-for-rethinking-the-outdated-criteria-that-rule-the-world/>
<http://www.globalissues.org/issue/28/third-world-debt-undermines-development>
<http://worldcentric.org/conscious-living/third-world-debt>
<http://econlib.org/library/Enc1/ThirdWorldDebt.html>
<http://newint.org/easier-english/money/debt.html>
<http://www.context.org/iclib/ic32/coledebt/>

“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 Soddys view, it is a fiction to maintain that being owed a large amount of money is a form of real wealth.⁷⁶

We can learn from the thoughts of Frederik Soddy in the 1920’s and from the wisdom of Pope Francis today. Most third world debts can be regarded as “odious”, i.e. incurred by governments whose actions were not in the best interests of their peoples, and therefore not legally collectible. In most cases, forgiveness and a fresh start would be of benefit to all of us.⁷⁷

⁷⁶<http://www.cadmusjournal.org/article/issue-4/entropy-and-economics/>

⁷⁷<http://endoftheamericandream.com/archives/debt-slavery-30-facts-about-debt-in-america-that-will-blow-your-mind>
<http://liveingeconomiesforum.org/systemic-debt-slavery>
<http://www.nationofchange.org/make-no-mistake-you-are-american-debt-slave-1389886420>
<http://www.commondreams.org/news/2015/07/03/referendum-looms-troika-charged-plotting-regime-change-greece>
<http://www.commondreams.org/views/2015/07/03/how-europe-played-greece>
<http://www.commondreams.org/views/2015/07/03/our-responsibility-vote-no-greek-referendum>
<http://www.countercurrents.org/bantekas030715.htm>
<http://www.countercurrents.org/singh030715.htm>
<http://dissidentvoice.org/2015/06/greek-referendum-on-imf-ultimatum/>
<http://dissidentvoice.org/2015/07/midnight-in-brussels-the-austerity-junta-and-savaging-greece/>
<https://www.transcend.org/tms/2015/06/breaking-greece/>
<https://www.transcend.org/tms/2015/06/why-we-should-all-be-indebted-to-syriza-three-victories-of-the-greek-government/>
<https://www.transcend.org/tms/2015/06/iceland-just-jailed-7-bank-executives-for-market-manipulation/>

GREED IS DRIVING US TOWARDS DISASTER

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 driving us towards economic collapse, as we see in the case of Greece.

Economics without social or environmental ethics

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 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.

Greed and fossil fuels

The Industrial Revolution marked the start of 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 into the atmosphere from the burning of fossil fuels began to duplicate the conditions which led to the 5 geologically-observed mass extinctions, during each of which more than half of all living species disappeared forever.

The Stern Report 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 catas-

trophic 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.⁷⁸

The greed of military-industrial complexes

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.⁷⁹

⁷⁸<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>
<http://www.theguardian.com/environment/2015/jul/08/exxon-climate-change-1981-climate-denier-funding>

⁷⁹<http://human-wrongs-watch.net/2015/06/25/militarisms-hostages/>

Institutionalized corporate greed.

As Institute Professor Noam Chomsky of MIT has pointed out, 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.

Occasionally, for the sake of their public image, corporations seem to do something for other motives than their own bottom line, but it is usually window dressing. For example, Shell claims to be supporting research on renewable energy. Perhaps there is indeed a small renewable energy laboratory somewhere in that vast corporation; but the real interest of the organization is somewhere else. Shell is sending equipment on a large scale to drill for more and more environment-destroying oil in the Arctic.

What does Christianity say about greed?

Wikipedia states that “The seven deadly sins, also known as capital vices or cardinal sins, is a classification of vices (part of Christian ethics) that has been used since early Christian times to educate and instruct Christians concerning fallen humanity’s tendency to sin. In the currently recognized version, the sins are usually given as wrath, greed, sloth, pride, lust, envy and gluttony. Each is a form of Idolatry-of-Self wherein the subjective reigns over the objective.”

Saint Thomas Aquinas wrote: “Greed is a sin against God, just as all mortal sins, in as much as man condemns things eternal for the sake of temporal things”.

In the New Testament, we can find many passages condemning greed, for example:

“For the love of money is the root of all evil: which while some coveted after, they have erred from the faith, and pierced themselves through with many sorrows.” Timothy 6:10

“Lay not up for yourselves treasures upon earth, where moth and rust doth corrupt, and where thieves break through and steal.” Mathew 6:19.⁸⁰

In his encyclical *Laudato Si'*, and on his recent visit to South America, Pope Francis has spoken strongly against economic activity that lacks both social and environmental ethics.⁸¹

What then must we do?

Much depends on whether we are able to break the power that corporations and extremely rich oligarchs now hold over our governments and our mass media. Pope Francis has shown by example what a world leader of courage and honesty can do. Most of us are not in such a position, but each person can do his or her best to restore democracy where it has been lost to corporate money and greed. If the mass media have sold themselves to the highest bidder, we can make our own media. If most politicians are corrupt, we can make our own political movements. As Shelly said, “We are many, they are few”.⁸²

⁸⁰<http://biblehub.com/matthew/19-23.htm>

⁸¹<http://www.commondreams.org/news/2015/07/13/pope-calls-world-youth-rise-against-global-capitalism>

⁸²<http://www.countercurrents.org/watzal300615.htm>
<http://www.countercurrents.org/roberts100715.htm>
<http://www.informationclearinghouse.info/article42371.htm>
<http://www.countercurrents.org/snefjella140715.htm>

A NUCLEAR WEAPONS CONVENTION BY MAJORITY VOTE AT THE UN

The election of Mogens Lykketoft as the new President of the United Nations General Assembly has opened the door to the solution of several of world's most pressing problems. For example, it may now be possible to achieve a Nuclear Weapons Convention by a direct majority vote.

On June 15, the United Nations General Assembly unanimously elected Mogens Lykketoft, Denmark's former parliament speaker and foreign minister, as president of its 70th anniversary session. UN Secretary-General Ban Ki-moon said that this anniversary year offers Lykketoft "an extraordinary opportunity to shape history". In September, just before the annual General Assembly ministerial meeting, world leaders will hold a special summit to adopt new goals. Their aims will be to further reduce poverty, promote economic development, and tackle the roots of climate change.

Also among the aims will be the total abolition of nuclear weapons. Mogens Lykketoft has for many years been a prominent member of the worldwide organization Parliamentarians for Nuclear Nonproliferation and Disarmament (PNND).

I vividly remember visiting M.P. Mogens Lykketoft at the Danish Parliament, together with Alyn Ware, the Global

<https://www.transcend.org/tms/2015/07/tpp-ttip-tisa-a-tipping-edge-from-democracy/>

<http://dissidentvoice.org/2015/05/secretcy-and-democracy-are-incompatible/>

<http://eruditio.worldacademy.org/issue-6/article/institutional-and-cultural-inertia> <http://human-wrongs-watch.net/2015/07/04/will-the-real-issues-be-discussed-in-20>

Coordinator of PNND, and with a member of the Danish branch of International Physicians for the Prevention of Nuclear War. We talked with Mr. Lykketoft for about an hour, and he was willing to help with the work of PNND in every possible way. We can certainly expect that as the new President of the UN General Assembly, he will be willing to work hard for nuclear abolition.⁸³

One important possibility for progress on the seemingly intractable issue of nuclear disarmament would be for a nation or group of nations to put forward a proposal for a Nuclear Weapons Convention for direct vote on the floor of the UN General Assembly. It would almost certainly be adopted by a massive majority. I believe that such a step would be a great achievement, even if bitterly opposed by some of the nuclear weapons states.⁸⁴

There are several precedents for such a step: On April 2, 2013, a historic victory was won at the United Nations, and the world achieved its first treaty limiting international trade in arms. Work towards the ATT was begun in the Conference on Disarmament in Geneva, which requires a consensus for the adoption of any measure. Over the years, the consensus requirement has meant that no real progress in arms control measures has been made in Geneva, since a consensus among 193 nations is impossible to achieve.

To get around the blockade, British U.N. Ambassador Mark Lyall Grant sent the draft treaty to Secretary-General Ban Ki-moon and asked him on behalf of Mexico, Australia and a number of others to put the ATT to a swift vote in the General Assembly, and on Tuesday, April 3, it was adopted by a massive majority.

⁸³<http://www.pnnd.org/article/pnnd-member-mogens-lykketoft-elected-president-un-general-assembly>

⁸⁴<http://www.unfoldzero.org/nuclear-weapons-convention>



Figure 34: *Mogens Lykketoft, President-elect of the United Nations General Assembly. Photo by Knud Winckelmann, [CC BY-SA 3.0], Wikimedia Commons*

The success achieved by moving discussion of the Arms Trade Treaty from the Conference on Disarmament (where it had remained blocked for decades) to the UN General Assembly points the way to progress on many other issues, especially the adoption of a Nuclear Weapons Convention. In my opinion, it is highly desirable to make a motion for the adoption of a Nuclear Weapons Convention on the floor of the General Assembly, following exactly the same procedure as was followed with the ATT. If this is done, the NWC (a draft of which is already prepared) would certainly be adopted by a large majority.

It might be objected that the nuclear weapon states would be offended by this procedure, but I believe that they deserve to be offended, since the threat or use of nuclear weapons is illegal according to the 1996 ruling of the International Court of Justice, and in fact the threat or use of force in international relations is a violation of the UN Charter. The adoption of the NWC would make clear the will of the great majority of the world's peoples, who consider the enormous threat which nuclear war poses to human civilization and the biosphere to be completely unacceptable.

It is not only the ATT that forms a precedent, but also the International Criminal Court, whose establishment was vehemently opposed by several militarily powerful states. Nevertheless, the ICC was adopted because a majority of the peoples of the world believed it to be a step forward towards a stable, peaceful and just global society.

In 1998, in Rome, representatives of 120 countries signed a statute establishing a International Criminal Court, with jurisdiction over the crime of genocide, crimes against humanity, war crimes, and the crime of aggression.

Four years were to pass before the necessary ratifications were gathered, but by Thursday, April 11, 2002, 66 nations

had ratified the Rome agreement, 6 more than the 60 needed to make the court permanent. It would be impossible to overstate the importance of the International Criminal Court. At last international law acting on individuals has become a reality! The only effective and just way that international laws can act is to make individuals responsible and punishable, since (in the words of Alexander Hamilton), "To coerce states is one of the maddest projects ever devised."

Although the ICC is in place, it has the defect that since it opposed by powerful states, it functions very imperfectly. Should the Nuclear Weapons Convention be adopted by the UN General Assembly despite the opposition of the nuclear weapon states, it would have the same defect. It would function imperfectly because despite the support of the vast majority of the world's peoples, a few powerful opponents would remain.

Another precedent can be found in the Antipersonnel Land-Mine Convention, also known as the Ottawa Treaty. In 1991, six NGO's organized the International Campaign to Ban Landmines, and in 1996, the Canadian government launched the Ottawa process to ban landmines by hosting a meeting among like-minded anti-landmine states. A year later, in 1997, the Mine Ban Treaty was adopted and opened for signatures. In the same year, Jody Williams and the International Campaign to ban Landmines were jointly awarded the Nobel Peace Prize. After the 40th ratification of the Mine Ban Treaty in 1998, the treaty became binding international law on the 1st of March, 1999.

The adoption of the Arms Trade Treaty is a great step forward; the adoption of the ICC, although it is operation is imperfect, is also a great step forward, and likewise the Antipersonnel Land-Mine Convention is a great step forward. In my opinion, the adoption of a Nuclear Weapons Conven-

tion, even in the face of powerful opposition, would also be a great step forward. When the will of the majority of the world's peoples is clearly expressed in an international treaty, even if the treaty functions imperfectly, the question of legality is clear. Everyone can see which states are violating international law. In time, world public opinion will force the criminal states to conform with the law.

In the case of a Nuclear Weapons Convention, world public opinion would have especially great force. It is generally agreed that a full-scale nuclear war would have disastrous effects, not only on belligerent nations but also on neutral countries. Mr. Javier Prez de Cullar, former Secretary-General of the United Nations, emphasized this point in one of his speeches:

"I feel", he said, "that the question may justifiably be put to the leading nuclear powers: by what right do they decide the fate of humanity? From Scandinavia to Latin America, from Europe and Africa to the Far East, the destiny of every man and woman is affected by their actions. No one can expect to escape from the catastrophic consequences of a nuclear war on the fragile structure of this planet. ..."

"No ideological confrontation can be allowed to jeopardize the future of humanity. Nothing less is at stake: today's decisions affect not only the present; they also put at risk succeeding generations. Like supreme arbiters, with our disputes of the moment, we threaten to cut off the future and to extinguish the lives of innocent millions yet unborn. There can be no greater arrogance. At the same time, the lives of all those who lived before us may be rendered meaningless; for we have the power to dissolve in a conflict of hours or minutes the entire work of civilization, with all the brilliant cultural heritage of humankind."

“...In a nuclear age, decisions affecting war and peace cannot be left to military strategists or even to governments. They are indeed the responsibility of every man and woman. And it is therefore the responsibility of all of us... to break the cycle of mistrust and insecurity and to respond to humanity's yearning for peace.” The eloquent words of Javier Prez de Cullar express the situation in which we now find ourselves: Accidental nuclear war, nuclear terrorism, insanity of a person in a position of power, or unintended escalation of a conflict, could at any moment plunge our beautiful world into a catastrophic thermonuclear war which might destroy not only human civilization but also much of the biosphere.

As UN Secretary-General Ban Ki-moon remarked, the General Assembly's new President, Hon. Mr. Mogens Lykke-toft, has an extraordinary opportunity to influence history and to solve the most pressing problems that humanity faces today. I believe that he has the courage and idealism to do just that. In particular, I believe that he can provide the leadership needed for the world to achieve a Nuclear Weapons Convention by direct majority vote at the United Nations General Assembly.

PARIS: A SENSE OF PROPORTION IS URGENTLY NEEDED

For more than a week after the terrorist attacks in Paris on 13 November, 2015, every television news program of any kind was completely dominated by non-stop day-and-night coverage of the “breaking news”. The attacks, in which 130 people were killed and 80-99 seriously injured, were presented by our mass media with such a concentration of hysteria that they blotted out every other type of news from the public consciousness. The rather small number of people killed or injured by the attackers did not seem to matter. Our corporate-controlled mass media succeeded in robbing us of our sense of proportion.

With the extremely important Climate Conference COP21 starting in the same city, Paris, on 30 November, we urgently need to regain our lost sense of proportion. Is terrorism a great danger to human civilization and the biosphere? Or is it something very small, that has been blow up to a completely disproportionate size by our perfidious mass media in order to sell wars, sell weapons, to undermine civil liberties, and to disenfranchise ordinary citizens? ⁸⁵

What are the real dangers? What is their comparative size, in terms of numbers of people involved? Science is unanimous in telling us that out-of-control climate change, thermonuclear war, and large-scale famine are the real threats.

Consider what would happen if the change from fossil fuels to 100% renewable energy is not completed within a

⁸⁵<http://dissidentvoice.org/2015/06/are-we-being-driven-like-cattle/>

few decades: We know from the geological record that there have been 5 mass extinction events during each of which more than half of all living organisms became extinct. The largest of these was the Permian-Triassic event, during which 96% of all marine species became extinct, together with 70% of all terrestrial vertebrates.

If we do not quickly shift from fossil fuels to renewable energy, we will be in danger of passing a tipping point, beyond which human efforts to control climate change will be useless because feed-back loops such as the albedo effect and the methane-hydrate feedback loop will have taken over. If we do not act quickly and globally to change from fossil fuels to renewable energy, there is a danger of a human-caused 6th mass extinction. The human species might survive such an event by moving to polar or high mountainous regions, but the global population would then be measured in millions rather than in billions. The family trees of most humans living today would die out. Added to this tragedy, would be the tragic loss of most of the animal and plant species which we value today and strive to protect.

Is a shift from fossil fuels to 100% renewable energy possible? Such a shift must come within a century or so because of the exhaustion of coal, oil and gas resources. However, it is vitally important that the change should come quickly, within a very few decades, to avoid a tipping point beyond which climate change would become uncontrollable. Hope that this energy revolution is indeed technically possible comes especially from the current extremely high rates of growth of wind and solar power. If these growth rates are maintained, the transition to renewable energy can be accomplished within two decades.⁸⁶

⁸⁶<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>



Figure 35: *The Paris climate conference, COP21, source economictimes.indiatimes.com*

It is important that the governmental subsidies that are currently paid to fossil fuel corporations should be discussed at COP21. In 2011, these subsidies amounted to more than \$500 billion globally, compared with only \$88 billion given to support renewable energy initiatives. These proportions must be reversed. In fact, subsidies to fossil fuel corporations ought to be abolished entirely. Given a more level playing field, renewable energy can win simply by being cheaper than fossil fuels.

<http://www.countercurrents.org/avery190714.htm>

<http://human-wrongs-watch.net/2015/06/23/new-hope-for-avoiding-catastrophic-clime-change/>

Let us turn next to the danger of thermonuclear war. Unless nuclear weapons are completely abolished, there will be a continual danger that a catastrophic war of this type may occur by accident or miscalculation. In any given year, this danger is finite, but over a long period of time, the chance that a disaster will not occur becomes vanishingly small. Such a war would be an environmental catastrophe, affecting neutral countries as well as belligerents. Agriculture might be damaged to such an extent that the resulting global famine could involve a large fraction of the world's human population.⁸⁷

Finally, we must consider the threat of a global famine partly due to climate change, but also due to explosively growing human populations and the end of fossil fuels, on which modern high-yield agriculture depends.⁸⁸

Let us hope that attention of the world and the focus of the delegates at the Paris Climate Conference will not be distracted by pseudo-threats, and will instead look seriously at the real threats which the world is facing. We urgently need a sense of proportion.

⁸⁷<https://www.wagingpeace.org/author/john-avery/>

⁸⁸<http://www.countercurrents.org/avery180815.htm>

PARIS, INDIA, AND COAL

The MIT Technology Review recently published an important article entitled “India’s Energy Crisis”.⁸⁹

The article makes alarming reading in view of the world’s urgent need to make a very rapid transition from fossil fuels to 100% renewable energy. We must make this change quickly in order to avoid a tipping point beyond which catastrophic climate change will be unavoidable.⁹⁰

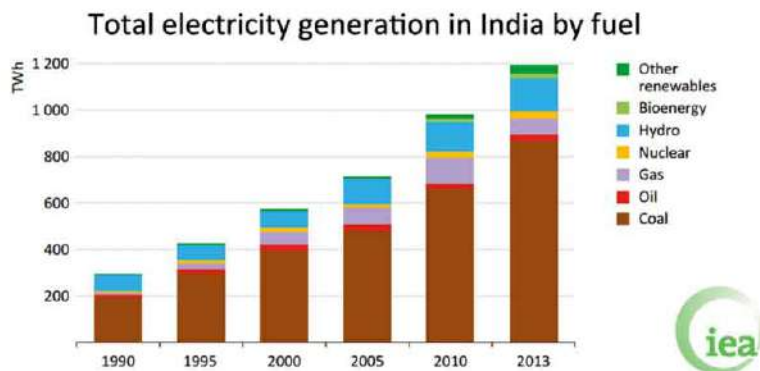
The MIT article states that “Since he took power in May, 2014, Prime Minister Narendra Modi has made universal access to electricity a key part of his administration’s ambitions. At the same time, he has pledged to help lead international efforts to limit climate change. Among other plans, he has promised to increase India’s total power generating capacity to 175 gigawatts, including 100 gigawatts of solar, by 2022. (That’s about the total power generation of Germany.)”

However India plans to expand its industrial economy, and to do this, it is planning to very much increase its domestic production and use of coal. The MIT article continues, pointing 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. (Overall, the world will need to reduce its current annual emissions of 40 billion tons by 40 to 70 percent between now and 2050.) By 2050, India will have roughly 20 percent of the worlds

⁸⁹<http://www.technologyreview.com/featuredstory/542091/indias-energy-crisis/>

⁹⁰<https://www.youtube.com/watch?v=2bRrg96UtMc>
<https://www.youtube.com/watch?v=MVwmi7HCmSI>
<https://www.youtube.com/watch?v=AjZaFjXfLec>
<https://www.youtube.com/watch?v=MVwmi7HCmSI>



population. If those people rely heavily on fossil fuels such as coal to expand the economy and raise their living standards to the level people in the rich world have enjoyed for the last 50 years, the result will be a climate catastrophe regardless of anything the United States or even China does to decrease its emissions. Reversing these trends will require radical transformations in two main areas: how India produces electricity, and how it distributes it.”

The Indian Minister of Power, Piyush Goyal, is an enthusiastic supporter of renewable energy expansion, but he also supports, with equal enthusiasm, the large-scale expansion of domestic coal production in India.

Meanwhile, the consequences of global warming are being felt by the people of India. For example, last May, a heat wave killed over 1,400 people and melted asphalt streets.⁹¹

Have India’s economic planners really thought about the long-term future? Have they considered the fact that drastic climate change could make India completely uninhabitable?

⁹¹<https://www.rt.com/news/262641-india-heat-wave-killed/>

PARIS AND THE LONG-TERM FUTURE

We give our children loving care, but it makes no sense 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. We also have a responsibility to all the other living organisms with which we share the gift of life.

Human emotional nature is such that we respond urgently to immediate temptations or dangers, while long-term considerations are pushed into the background. Thus the temptations of immediate profit or advantage motivate politicians and the executives of fossil fuel corporations; and the temptations of continued overconsumption and luxury blind the general public. Public fears of terrorism have been magnified by our perfidious mass media to such an extent that the equally perfidious French Government has been able to use this fear as an excuse to exclude democracy and proper care for the long-term future from the Paris Climate Conference.

However, our generation has an urgent duty to think of the distant future. The ultimate fate of human civilization and the biosphere is in our hands. What we really have to fear, for the sake of our children and grandchildren and their descendants, is reaching a tipping point, beyond which uncontrollable feedback loops will make catastrophic climate change inevitable despite all human efforts to prevent it.

A feedback loop is a self-reinforcing cycle. The more it goes on, the stronger it becomes. An example of how such a feedback loop could drive climate change and make it uncontrollable is the albedo effect: When sunlight falls on sea ice in the Arctic or Antarctic, most of it is reflected by

the white surface of the snow-covered ice. But when sunlight falls on dark sea water, it is almost totally absorbed. This cycle is self-reinforcing because warming the water reduces the ice cover. This is happening today, especially in the Arctic, and we have to stop it.

Another dangerous feedback loop involves the evaporation of sea water, which itself is a greenhouse gas. However, if we think of the long-term future, by far the most dangerous feedback loop is that which involves the melting of methane hydrate crystals, releasing the extremely powerful greenhouse gas methane into the atmosphere. Discussion of this highly dangerous feedback loop seems to be almost completely banned by our mass media.

When organic matter is carried into the oceans by rivers, it decays to form methane. The methane then combines with water to form hydrate crystals, which are stable at the temperatures and pressures which currently exist on ocean floors. However, if the temperature rises, the crystals become unstable, and methane gas bubbles up to the surface. Methane is a greenhouse gas which is much more potent than CO₂.

The worrying thing about the methane hydrate deposits on ocean floors is the enormous amount of carbon involved: roughly 10,000 gigatons. To put this huge amount into perspective, we can remember that the total amount of carbon in world CO₂ emissions since 1751 has only been 337 gigatons.⁹²

A runaway, exponentially increasing feedback loop involving methane hydrates could lead to one of the great ge-

⁹²<https://www.youtube.com/watch?v=2bRrg96UtMc>
<https://www.youtube.com/watch?v=MVwmi7HCmSI>
<https://www.youtube.com/watch?v=AjZaFjXfLec>
<https://www.youtube.com/watch?v=MVwmi7HCmSI>

ological extinction events that have periodically wiped out most of the animals and plants then living. This must be avoided at all costs.

The worst consequences of runaway climate change will not occur within our own lifetimes. However, we have a duty to all future human generations, and to the plants and animals with which we share our existence, to give them a future world in which they can survive.

We can also fear a catastrophic future famine, produced by a combination of climate change, population growth and the end of fossil-fuel-dependent high-yield modern agriculture.⁹³

These very real and very large long-term disasters are looming on our horizon, but small short-term considerations blind us, so that we do not take the needed action. But what is at stake is the future of everyone's children and grandchildren and their progeny, your future family tree and mine, also the families of Francois Hollande and the executives of Exxon. They should think carefully about the consequences of making our beautiful world completely uninhabitable.

⁹³<http://human-wrongs-watch.net/2015/08/19/the-need-for-a-new-economic-system-part-vii-glreadoval-food-crisis/>

PARIS: WE NEED SYSTEM CHANGE!

WE NEED SYSTEM CHANGE, NOT CLIMATE CHANGE! Civil society, excluded from the COP21 conference by the French government, carried banners with this slogan on the streets of Paris. They did so in defiance of tear-gas-using black-clad police. System change has been the motto for climate marches throughout the world. Our entire system is leading us towards disaster, and this includes both economic and governmental establishments. To save human civilization, the biosphere and the future, the people of the world must take matters into their own hands and change the system.⁹⁴

Our present situation is this: 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. All these threats are linked.

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

⁹⁴<http://www.commondreams.org/views/2015/12/11/we-are-out-time-we-need-leap>
<http://www.thenation.com/article/naomi-klein-sane-climate-policies-are-being-undermined-by-corporate-friendly-trade-deals/>
<http://www.commondreams.org/news/2015/12/08/liberte-not-just-word-klein-corbyn-call-mass-protest-cop21>
<http://www.truth-out.org/news/item/33982-the-cops-of-cop21-arrests-at-the-paris-climate-talks>
<http://www.truth-out.org/news/item/33961-climate-change-justice>
<http://www.countercurrents.org/avery280914.htm>



has failed us. The battle to save the earth from human greed and folly has to be fought through non-violent action on the streets and 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.⁹⁵

What are the links between the problems facing us? There is a link between climate change and war. We need to leave fossil fuels in the ground if we are to avoid catastrophic climate change. But nevertheless, the struggle for the world's last remaining oil and gas resources motivated the invasion of Iraq, and it now motivates the war in Syria. Both of these brutal wars have caused an almost indescribable amount of suffering.⁹⁶

ISIS runs on oil, and the unconditional support of Saudi Arabia by the West is due to greed for oil. Furthermore, military establishments are among the largest users of oil, and the largest greenhouse gas emitters. Finally, the nearly 2 trillion dollars that the world now spends on armaments and war could be used instead to speed the urgently needed transition to 100% renewable energy, and to help less-developed countries to fave the consequences of climate change.

⁹⁵<http://www.fredsakademiet.dk/library/need.pdf>

⁹⁶<http://www.truth-out.org/opinion/item/33991-end-war-ming-we-need-system-change-not-climate-change>

There are reasons for hope. Both solar energy and wind energy are growing at a phenomenal rate, and the transition to 100% renewable energy could be achieved within a very few decades if this growth is maintained. But a level playing field is needed. At present fossil fuel corporations receive half a trillion dollars each year in subsidies. Nuclear power generation is also highly subsidized (and also closely linked to the danger of nuclear war). If these subsidies were abolished, or better yet, used to encourage renewable energy development, the renewables could win simply by being cheaper.⁹⁷

We can also take inspiration from Pope Francis, whose humanitarian vision links the various problems facing us. Pope Francis also shows us what we can do to save the future, and to give both economics and government a social and ecological conscience.

None of us asked to be born in a time of crisis, but history has given great tasks to our generation. We must rise to meet the crisis. We must not fail in our duty to save the gifts of life and civilization that past generations have bequeathed to us. We must not fail in our duty future generations.

⁹⁷<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>
<http://www.worldbank.org/en/news/feature/2012/11/18/Climate-change-report-warns-dramatically-warmer-world-this-century>
<https://www.youtube.com/watch?v=AjZaFjXfLec>
<https://www.youtube.com/watch?v=m6pFDu7lLV4>
<https://www.youtube.com/watch?v=MVwmi7HCmSI>
<http://therightsofnature.org/universal-declaration/>

THE UNITED STATES DRIFTS TOWARDS POLITICAL IRRESPONSIBILITY

The recent Republican presidential debates were held in the gaudy and luxurious Venetian Casino in Los Vegas, a building whose billionaire Republican-backing owner Sheldon Adelson held a private meeting with fellow-billionaire Donald Trump before the debate.⁹⁸

In the two-hour hate-show that followed, the Republican candidates for the 2016 presidential nomination competed with each other over who could be the most avid in advocating war and racism. To worried observers, the scene was disturbingly reminiscent of the slide into fascism seen in Germany and Italy in the 1930's. At that time too, there were serious economic problems, and there was a desperate need for reassurance among populations.

Hitler and Mussolini appealed to the lower instincts of their electorates, especially to the primitive instinct of tribalism; and this is why these two hate-mongering politicians

⁹⁸<http://www.informationclearinghouse.info/article43743.htm>
<http://www.informationclearinghouse.info/article43748.htm>
<http://www.truth-out.org/opinion/item/34059-how-many-children-could-you-kill-the-gop-debates-in-brief>
<http://www.truth-out.org/opinion/item/34057-the-media-is-ignoring-economic-justice-in-the-2016-election>
<http://www.truth-out.org/news/item/34066-democracy-is-being-dismantled-before-our-eyes-bob-herbert-on-sheldon-adelson-backed-gop-debate>
<http://www.commondreams.org/news/2015/12/16/observers-slam-cnn-aiding-and-abetting-hate-speech-gop-debate>
<http://www.commondreams.org/views/2015/12/16/republicans-principle-free-presidential-debate>

of the 1930's were genuinely popular, just as Donald Trump is today.

There are other parallels with the 1930's: The Nazis used the Reichstag fire as an excuse for attacks on civil rights, just as terrorism today is used as an excuse for suspending civil liberties.

The dominant role of corporations today also parallels their role in the rise of fascism in the 1930's. According to Benito Mussolini, "Fascism should more properly be called corporatism because it is the merger of state and corporate power".

For those of us who feel affection for the United States, it is sad to see the country slide towards political irresponsibility and fascism. Even more importantly, just as in the 1930's, political irresponsibility led to an all-destroying world war, so today there is a great danger of a world war; and the threat today is far greater because of the terrible power of thermonuclear weapons.

But there are many very good people in the United States. We know this because of the great popularity of Bernie Sanders. It is time for them to speak out and act. We cannot have a situation where, as Yeats put it, "the best lack all conviction, while the worst are filled with passionate intensity." We must prevent the rough beast of fascism from slouching towards Bethlehem to be born.

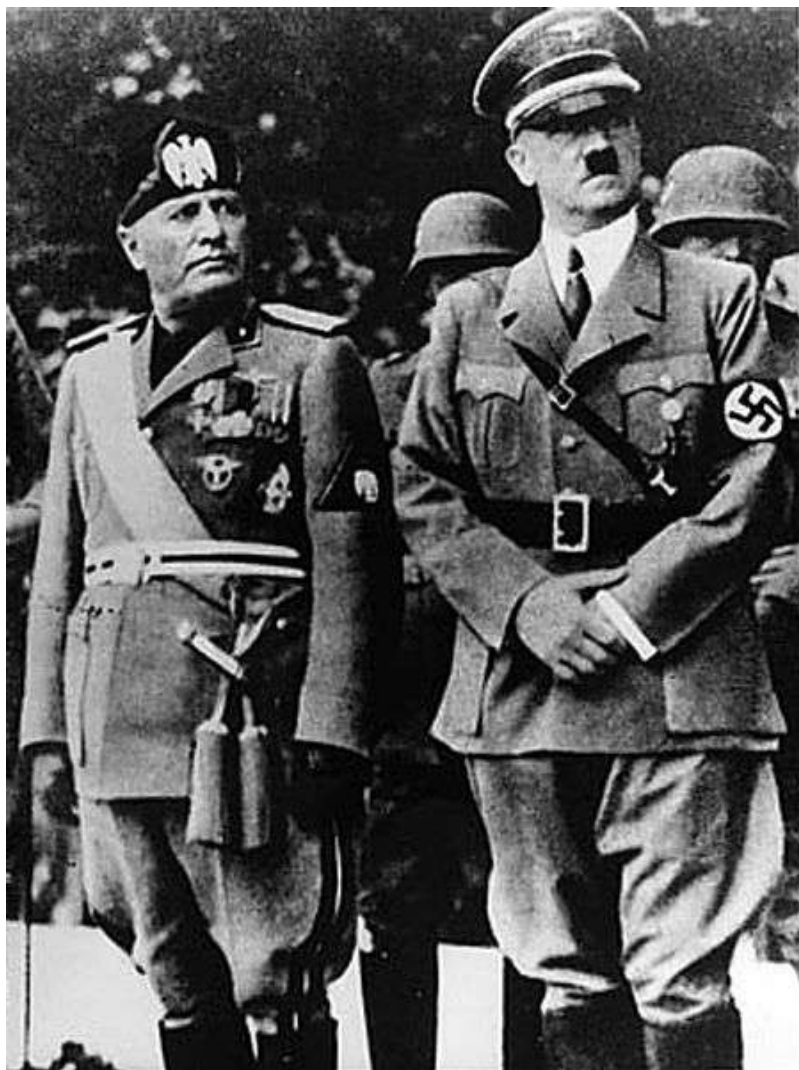


Figure 36: *Public domain, Wikimedia Commons*

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 little 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 CO₂ 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.⁹⁹

Is a quick transition to 100% renewable energy technically possible? The remarkable characteristics of exponential growth can give us hope that it can indeed be done, provided that we make the necessary effort.

The Earth Policy Institute recently reported that “Between 2008 and 2013, as solar panel prices dropped by roughly two thirds, the PV installed worldwide skyrocketed from 16,000 to 139,000 megawatts... In its January 2014 solar outlook report, Deutsche Bank projected that 46,000 megawatts

⁹⁹<http://www.worldbank.org/en/news/feature/2012/11/18/Climate-change-report-warns-dramatically-warmer-world-this-century>

would be added to global PV capacity in 2014 and that new installations would jump to a record 56,000 megawatts in 2015.”

An analysis of the data given by the Earth Policy Institute shows that global installed photovoltaic capacity is now increasing by 27.8% per year. Because of the remarkable properties of exponential growth, we can predict that by 2034, the world’s installed PV capacity will have reached 47.7 terawatts, more than twice today’s global consumption of all forms of energy (provided, of course, that the present rate of growth is maintained).

We can see from this analysis, and from data presented by Lester Brown and his coauthors Janet Larsen, Mathew Roney and Emily Adams, in their recent book “The Great Transition”, that the urgently-needed replacement of fossil fuels by renewable energy is technically achievable. But it also requires political will. For example the present rapid rate of growth of global PV capacity was initiated by the German government’s enlightened financial policies. Government measures helping renewables are vital. At present, governments give billions in direct and indirect support of fossil fuel giants, which in turn sponsor massive advertising campaign to convince the public that anthropogenic climate change is not real. Our task, for the sake of future generations, is to provide the political will needed for the great transition.¹⁰⁰

For the sake of future generations, let us also work with dedication for the great transition to a world without nuclear weapons, a world without war, and a world with an economic system that does not depend on growth.

¹⁰⁰<http://www.earth-policy.org/books/tgt>
<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>

CULTURE, EDUCATION AND HUMAN SOLIDARITY

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.¹⁰¹

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

¹⁰¹<http://www.fredsakademiet.dk/library/need.pdf>
<http://eruditio.worldacademy.org/issue-5/article/urgent-need-renewable-energy>

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.¹⁰²


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.

We have to extend our loyalty to the whole of the human race, and to work for a world not only free from nuclear weapons, but free from war. A war-free world is not utopian but very practical, and not only practical but necessary. It is something that we can achieve and must achieve. Today there are large regions, such as the European Union, where war would be inconceivable. What is needed is to extend these.

Nor is a truly sustainable economic system utopian or impossible. To achieve it, we should begin by shifting jobs

¹⁰²<http://eruditio.worldacademy.org/article/evolution-cooperation>

THIS EDITION AIMS TO PROMOTE FRATERNITY BETWEEN NATIONS



Let us pick up our
books and our pens.
They are our most
powerful weapons.
One child, one
teacher, one book,
and one pen can
change the world.



Malala Yousafzai
Nobel Peace Prize 2014



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.

THE EVOLUTION OF COOPERATION

Introduction

The success of humans as a species is due to our genius for cooperation. Cultural evolution, a new form of evolution, in which information is passed between generations in the form of linguistic symbols rather than genetically, has been the key to human success. Cultural evolution depends on the sharing of knowledge, and humans have developed remarkable linguistic and cooperative abilities.

At the same time, human nature also has a darker side, inherited from our ancestors who were hunter-gatherers, living in small genetically homogeneous tribes, competing for territory, on the grasslands of Africa. The pattern of intra-tribal altruism and inter-tribal aggression, which humans have inherited from their remote ancestors, has been explained by the theories of population genetics and group selection put forward in the 1930's by R.A. Fischer and J.B.S Haldane, and discussed more recently by W.D. Hamilton and E.O. Wilson. In this picture, the tribe itself, rather than the individual, is the unit on which evolutionary forces acted.

This essay will try to show that symbiosis and cooperation have been responsible for all of the great upward steps in evolution, including the development of the first prokaryotic cells, the first eukaryotes, the first multi-cellular organisms, and the first cooperative groups of multicellular organisms. The views of T.H. Huxley, who stressed competition as an evolutionary force, will be contrasted with the ideas of Charles Darwin, Peter Kropotkin and Lynn Margulis and others, who fully understood the importance of symbiosis and cooperation in evolution.

The explosion of human knowledge

Cultural evolution depends on the non-genetic storage, 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.

Every species changes gradually through genetic evolution; but with humans, cultural evolution has rushed ahead with such a speed that it has completely outstripped the slow rate of genetic change. Genetically we are quite similar to 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 (as Malthus put it, the "passions of mankind") are not completely adapted to our new way of life. They still reflect the way of life of our hunter-gatherer ancestors.

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 in-

stantaneous 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 threatens 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.

Tribal emotions and nationalism

In discussing conflicts, we must be very careful to distinguish between two distinct types of aggression exhibited by both humans and animals. The first is intra-group aggression, which is often seen in rank-determining struggles, for example when two wolves fight for pack leadership, or when males fight for the privilege of mating with females. Another, completely different, type of aggression is seen when a group is threatened by outsiders. Most animals, including humans, then exhibit a communal defense response - self-sacrificing and heroic combat against whatever is perceived to be an external threat. It is this second type of aggression that makes war possible.

Arthur Koestler has described inter-group aggression in an essay entitled *The Urge to Self-Destruction*¹⁰³, where he

¹⁰³in *The Place of Value in a World of Facts*, A. Tiselius and S. Nielsson editors, Wiley, New York, (1970)

writes: "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."

Members of tribe-like groups are bound together by strong bonds of altruism and loyalty. Echos of these bonds can be seen in present-day family groups, in team sports, in the fellowship of religious congregations, and in the bonds that link soldiers to their army comrades and to their nation.

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.

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. Unfortunately these emotions make war possible; and today a Third World War might lead to the destruction of civilization.

The mystery of self-sacrifice in war

At first sight, the willingness of humans to die defending their social groups seems hard to explain from the standpoint of Darwinian natural selection. After the heroic death of such a human, he or she will be unable to produce more children, or to care for those already born. Therefore one might at first suppose that natural selection would work strongly to eliminate the trait of self-sacrifice from human nature. However, the theory of population genetics and group selection can explain both the willingness of humans to sacrifice themselves for their own group, and also the terrible aggression that they sometimes exhibit towards competing groups. It can explain both intra-group altruism and inter-group aggression.

Fisher, Haldane and Hamilton

The idea of group selection in evolution was proposed in the 1930's by J.B.S. Haldane and R.A. Fischer, and more recently it has been discussed by W.D. Hamilton.

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 - 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



Figure 37: *A photo of the statistician R.A. Fisher, who proposed the idea of group selection in the 1930's, together with J.B.S. Haldane. Group selection explains the profile of tribal altruism and inter-tribal aggression that we observe in humans. Public domain, Wikimedia Commons*

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.

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, successful aggression against a neighboring group could 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.

Language, religion and tribal markings

In biology, a species is defined to be a group of mutually fertile organisms. Thus all humans form a single species, since mixed marriages between all known races will produce children, and subsequent generations in mixed marriages are also fertile. However, although there is never a biological barrier to marriages across ethnic and racial boundaries, there are often very severe cultural barriers.

Irenäus Eibl-Eibesfeldt, a student of Konrad Lorenz, introduced the word *pseudospeciation* to denote cases where cultural barriers between two groups of humans are so strongly

marked that marriages across the boundary are difficult and infrequent. In such cases, he pointed out, the two groups function as though they were separate species, although from a biological standpoint this is nonsense. When two such groups are competing for the same land, the same water, the same resources, and the same jobs, the conflicts between them can become very bitter indeed. Each group regards the other as being “not truly human”.

In his book *The Biology of War and Peace*, Eibl-Eibesfeldt discusses the “tribal markings” used by groups of humans to underline their own identity and to clearly mark the boundary between themselves and other groups. One of the illustrations in his book shows the marks left by ritual scarification on the faces of the members of certain African tribes. These scars would be hard to counterfeit, and they help to establish and strengthen tribal identity. Seeing a photograph of the marks left by ritual scarification on the faces of African tribesmen, it is impossible not to be reminded of the dueling scars that Prussian army officers once used to distinguish their caste from outsiders.

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, kilts, tartans, school ties, 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 sto-

ries, 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”.

By far the most important mark of ethnic identity is language, and within a particular language, dialect and accent. If the only purpose of language were communication, it would be logical for the people of a small country like Denmark to stop speaking Danish and go over to a more universally-understood international language such as English. However, language has another function in addition to communication: It is also a mark of identity. It establishes the boundary of the group.

Next after language, the most important “tribal marking” is religion. It seems probable that in the early history of our hunter-gatherer ancestors, religion evolved as a mechanism for perpetuating tribal traditions and culture. Like language, and like the innate facial expressions studied by Darwin, religion is a universal characteristic of all human societies. All known races and cultures practice some sort of religion. Thus a tendency to be religious seems to be built into human nature.

Formation of group identity

Although humans originally lived in small, genetically homogeneous tribes, the social and political groups of the modern world are much larger, and are often multiracial and multi-ethnic.

There are a number of large countries that are remarkable for their diversity, for example Brazil, Argentina and the United States. Nevertheless it has been possible to establish social cohesion and group identity within each of these enormous nations. India and China too, are mosaics of diverse peoples, but nevertheless, they function as coherent societies. Thus we see that group identity is a social construction, in which artificial “tribal markings” define the boundaries of the group.

As an example of the use of tribal markings to establish social cohesion over a large group of genetically dissimilar humans, one can think of the role of baseball and football in the United States. Affection for these sports and knowledge of their intricacies is able to establish social bonds that transcend racial and religious barriers.

One gains hope for the future by observing how it has been possible to produce both internal peace and social cohesion over very large areas of the globe - areas that contain extremely diverse populations. The difference between making large, ethnically diverse countries function as coherent sociopolitical units and making the entire world function as a unit is not very great.

Since group identity is a social construction, it is not an impossible goal to think of enlarging the already-large groups of the modern world to include all of humanity.

The social insects

The social insects, ants, bees, wasps and termites, exhibit nearly perfect altruism towards members of their own group. This extreme form of altruism towards near relations (kin altruism) is closely connected with the peculiar method of reproduction of the social insects. The workers are sterile

or nearly sterile, while the queen is the only reproductive female. The result of this special method of reproduction is that very nearly perfect altruism is possible within a hive or nest, since genetic changes favoring antisocial behavior would be detrimental to the hive or nest as a whole. The hive or nest can, in some sense, be regarded as a superorganism, with the individuals cooperating totally in much the same way that cells cooperate within a multicellular organism. The social insects exhibit aggression towards members of their own species from other hives or nests, and can be said to engage in wars. Interestingly a similar method of reproduction, associated with extreme intra-group altruism has evolved among mammals, but is represented by only two species: the naked mole rat and Damaraland mole rat.

From Thomas Huxley to Lynn Margulis and symbiosis

Charles Darwin (1809-1882) was acutely aware of close and mutually beneficial relationships between organisms. For example, in his work on the fertilization of flowers, he studied the ways in which insects and plants can become exquisitely adapted to each other's needs.

On the other hand Thomas Henry Huxley (1825-1895), although he was a strong supporter of Darwin, saw competition as the main mechanism of evolution. In his essay *Struggle for Existence and its Bearing Upon Man* Huxley wrote: "From the point of view of the moralist, the animal world is about on the same level as a gladiators' show. The creatures are fairly well treated and set to fight; hereby the strongest, the swiftest, and the cunningest live to fight another day. The spectator has no need to turn his thumbs down, as no quarter is granted."

Prince Peter Kropotkin (1842-1921) argued strongly against Huxley's point of view in his book *Mutual Aid; A Factor of Evolution*. "If we ask Nature", Kropotkin wrote, "who are the fittest: those who are continually at war with each other, or those who support one another?", we at once see that those animals that acquire habits of mutual aid are undoubtedly the fittest. They have more chances to survive, and they attain, in their respective classes, the highest development of intelligence and bodily organization."

Today, the insights of modern biology show that although competition plays an important role, most of the great upward steps in evolution have involved cooperation. The biologist Lynn Margulis (1938-2011) has been one of the pioneers of the modern viewpoint which recognizes symbiosis as a central mechanism in evolution.

One-celled organisms seen as examples of cooperation

The first bacterial cells (prokaryotic cells) can be thought of as cooperative communities in which autocatalytic molecules thrived better together than they had previously done separately.

The next great upward step in evolution, the development of large and complex (eukaryotic) cells, also involved cooperation: Many of their components, for example mitochondria (small granular structures that are needed for respiration) and chloroplasts (the photosynthetic units of higher plants) are believed to have begun their existence as free-living prokaryotic cells. They now have become components of complex cells, cooperating biochemically with the other subcellular structures. Both mitochondria and chloroplasts possess their own DNA, which shows that they were once



Figure 38: *The biologist Lynn Margulis (1938-2011), who contributed importantly to our modern understanding of symbiosis as a central mechanism of evolution. Source: Lynn-Margulis.jpg, [CC BY-SA 2.5], Wikimedia Commons*

free-living bacteria-like organisms, but they have survived better in a cooperative relationship.

Cooperation between cells; multicellular organisms

Multicellular organisms evolved from cooperative communities of eukaryotic cells. Some insights into how this happened can be gained from examples which are just on the borderline between the multicellular organisms and single-celled ones. The cooperative behavior of a genus of unicellular eukaryotes called slime molds is particularly interesting because it gives us a glimpse of how multicellular organisms may have originated. The name of the slime molds is misleading, since they are not fungi, but are similar to amoebae.

Under ordinary circumstances, the individual cells wander about independently searching for food, which they draw into their interiors and digest. However, when food is scarce, they send out a chemical signal of distress. (Researchers have analyzed the molecule which expresses slime mold unhappiness, and they have found it to be cyclic adenosine monophosphate.) At this signal, the cells congregate and the mass of cells begins to crawl, leaving a slimy trail. At it crawls, the community of cells gradually develops into a tall stalk, surmounted by a sphere - the "fruiting body". Inside the sphere, spores are produced by a sexual process. If a small animal, for example a mouse, passes by, the spores may adhere to its coat; and in this way they may be transported to another part of the forest where food is more plentiful.

Slime molds represent a sort of missing link between unicellular and multicellular organisms. Normally the cells behave as individualists, wandering about independently, but when challenged by a shortage of food, the slime mold cells

join together into an entity which closely resembles a multicellular organism.

The cells even seem to exhibit altruism, since those forming the stalk have little chance of survival, and yet they are willing to perform their duty, holding up the sphere at the top so that the spores will survive and carry the genes of the community into the future.

Multicellular organisms often live in a symbiotic relationship with other species. For example, in both animals and humans, bacteria are essential for the digestion of food. Fungi on the roots of plants aid their absorption of water and nutrients. Communities of bacteria and other organisms living in the soil are essential for the recycling of nutrients. Insects are essential to many plants for pollination.

Cooperation in groups of animals and human groups

The social behavior of groups of animals, flocks of birds and communities of social insects involves cooperation as well as rudimentary forms of language. Various forms of language, including chemical signals, postures and vocal signals, are important tools for orchestrating cooperative behavior.

The highly developed language of humans made possible an entirely new form of evolution. In cultural evolution (as opposed to genetic evolution), information is passed between generations not in the form of a genetic code, but in the form of linguistic symbols. With the invention of writing, and later the invention of printing, the speed of human cultural evolution greatly increased. Cooperation is central to this new form of evolution. Cultural advances can be shared by all humans.



Figure 39: *The invention of writing was prompted by the necessities of trade. Public domain, Wikimedia Commons*

Trading in primitive societies

Although primitive societies engaged in frequent wars, they also cooperated through trade. Peter Watson, an English historian of ideas, believes that long-distance trade took place as early as 150,000 before the present. There is evidence that extensive trade in obsidian and flint took place during the stone age. Evidence for wide ranging prehistoric obsidian and flint trading networks has been found in North America. Ancient burial sites in Southeast Asia show that there too, prehistoric trading took place across very large distances. Analysis of jade jewelry from the Phillipines, Thailand, Malaysia and Viet Nam shows that the jade originated in Taiwan.

The invention of writing was prompted by the necessities of trade. In prehistoric Mesopotamia, clay tokens marked with simple symbols were used for accounting as early as 8,000 BC. Often these tokens were kept in clay jars, and symbols on the outside of the jars indicated the contents. About 3,500 BC, the use of such tokens and markings led to the development of pictographic writing in Mesopotamia, and this was soon followed by the cuneiform script, still using soft clay as a medium. The clay tablets were later dried and baked to ensure permanency. The invention of writing led

to a great acceleration of human cultural evolution. Since ideas could now be exchanged and preserved with great ease through writing, new advances in technique could be shared by an ever larger cooperating community of humans. Our species became more and more successful as its genius for cooperation developed.

Gracilization and decreasing sexual dimorphism

Early ancestors of modern humans had a relatively heavy (robust) bone structure in relation to their height. This robust bone structure seems to have been favored by frequent combat. During their evolution, modern humans became less robust and more gracile. In other words, their skeletons became lighter in relation to their height. Simultaneously the height and weight of males became less different from the height and weight of females. These trends are generally interpreted as indicating that combat became less important as present-day humans evolved.

Ethics and growth of the social unit

Early religions tended to be centered on particular tribes, and the ethics associated with them were usually tribal in nature. However, the more cosmopolitan societies that began to form after the Neolithic agricultural revolution required a more universal code of ethics. It is interesting to notice that many of the great ethical teachers of human history, for example Moses, Socrates, Plato, Aristotle, Lao Tzu, Confucius, Buddha, and Jesus, lived at the time when the change to larger social units was taking place. Tribalism was no longer appropriate. A wider ethic was needed.

Today the size of the social unit is again being enlarged, this time enlarged to include the entire world. Narrow loyalties have become inappropriate and there is an urgent need for a new ethic - a global ethic. Loyalty to one's nation needs to be supplemented by a higher loyalty to humanity as a whole.

Interdependence in modern human society

All of the great upward steps in the evolution of life on earth have involved cooperation: Prokaryotes, the first living cells, can be thought of as cooperative communities of autotautylists; large, complex eukaryote cells are now believed to have evolved as cooperative communities of prokaryotes; multicellular organisms are cooperative communities of eukaryotes; multicellular organisms cooperate to form societies; and different species cooperate to form ecosystems. Indeed, James Lovelock has pointed out that the earth as a whole is a complex interacting system that can be regarded as a huge organism.

The enormous success of humans as a species is due to their genius for cooperation. The success of humans is a success of cultural evolution, a new form of evolution in which information is passed between generations, not in the form of DNA sequences but in the form of speech, writing, printing and finally electronic signals. Cultural evolution is built on cooperation, and has reached great heights of success as the cooperating community has become larger and larger, ultimately including the entire world.

Without large-scale cooperation, modern science would never have evolved. It developed as a consequence of the invention of printing, which allowed painfully gained detailed knowledge to be widely shared. Science derives its

great power from concentration. Attention and resources are brought to bear on a limited problem until all aspects of it are understood. It would make no sense to proceed in this way if knowledge were not permanent, and if the results of scientific research were not widely shared. But today the printed word and the electronic word spread the results of research freely to the entire world. The whole human community is the repository of shared knowledge.

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.

An isolated sponge cell can survive, but an isolated human could hardly do so. Like an isolated bee, a human would quickly die without the support of the community. The comfort and well-being that we experience depends on far-away friendly hands and minds, since trade is global, and the exchange of ideas is also global.

Finally, we should be conscious of our cooperative relationships with other species. We could not live without the bacteria that help us to digest our food. We could not live without the complex communities of organisms in the soil that convert dead plant matter into fertile topsoil. We could not live without plants at the base of the food chain, but plants require pollination, and pollination frequently requires insects. An intricate cooperative network of inter-species relationships is necessary for human life, and indeed necessary for all life. Competition plays a role in evolution, but the role of cooperation is greater.

Two sides of human nature

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

As an example of the two sides of human nature, we can think of Scandinavia. The Vikings were once feared throughout Europe. The Book of Common Prayer in England contains the phrase "Protect us from the fury of the Northmen!". Today the same people are so peaceful and law-abiding that they can be taken as an example for how we would like a future world to look. Human nature has the possibility for both kinds of behavior depending on the circumstances. 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.

Suggestions for further reading

1. C. Darwin, *The Expression of Emotions in Man and Animals*, The University of Chicago Press (1965).

2. P. Kropotkin, *Mutual Aid, A Factor in Evolution*, Walter Heinemann, London, (1902).
3. R.A. Fischer, *The Genetical Theory of Natural Selection*, Clarendon, Oxford, (1930).
4. J.B.S. Haldane, *Population genetics*, New Biology **18**, 34-51, (1955).
5. L. Margulis, *Symbiosis as a Source of Evolutionary Innovation: Speciation and Morphogenesis*, The MIT Press, (1991).
6. L. Margulis, *Symbiosis in Cell Evolution: Microbial Communities in the Archean and Proterozoic Eons*, W.H. Freeman, (1992).
7. N. Tinbergen, *The Study of Instinct*, Oxford University Press, (1951).
8. I. Eibl-Eibesfeldt, *The Biology of Peace and War*, Thames and Hudson, New York (1979).
9. E.O. Wilson, *On Human Nature*, Bantham Books, New York, (1979).
10. R.A. Hinde, *Biological Bases of Human Social Behavior*, McGraw-Hill, New York (1977).
11. R.A. Hinde, *Individuals, Relationships and Culture: Links Between Ethology and the Social Sciences*, Cambridge University Press, (1987).
12. W.M. Senner, editor, *The Origins of Writing*, University of Nebraska Press, Lincoln and London, (1989).