THE ECOLOGICAL IMPACT OF MILITARISM

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Introduction¹

Against the Institution of 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.

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.

Because the world spends 1.8 trillion dollars each year on armaments, it follows that very many people make their living from war. This is the reason why it is correct to speak of war as a social institution, and also the reason why war persists, although everyone realizes that it is the cause of much of the suffering that inflicts humanity. We know that war is madness, but it persists. We know that it threatens the future survival of our species, but it persists, entrenched in the attitudes of historians, newspaper editors and television producers, entrenched in the methods by which politicians finance their campaigns, and entrenched in the financial power of arms manufacturers, entrenched also in the ponderous and costly hardware of war, the fleets of warships, bombers, tanks, nuclear missiles and so on.

Science cannot claim to be guiltless: In Eisenhower's farewell address, he

¹This book draws heavily on chapters that I have previously published in various books, but a considerable amount of new material has been added

warned of the increasing power of the industrial-military complex, a threat to democratic society. If he were making the same speech today, he might speak of the industrial-military-scientific complex. Since Hiroshima, we have known that new knowledge is not always good. There is a grave danger that nuclear weapons will soon proliferate to such an extent that they will be available to terrorists and even to the Mafia. Chemical and biological weapons also constitute a grave threat.

Besides a humane, democratic and just framework of international law and governance, we urgently need a new global ethic, - an ethic where loyalty to family, community and nation will be supplemented by a strong sense of the brotherhood of all humans, regardless of race, religion or nationality. Schiller expressed this feeling in his "Ode to Joy", the text of Beethoven's Ninth Symphony. Hearing Beethoven's music and Schiller's words, most of us experience an emotion of resonance and unity with its message: All humans are brothers and sisters - not just some - all! It is almost a national anthem of humanity. The feelings which the music and words provoke are similar to patriotism, but broader. It is this sense of a universal human family, which we need to cultivate in education, in the mass media, and in religion.

No Warming, No War: How Militarism Fuels the Climate Crisis and Visa Versa

Here is a quotation from an article by Lorah Steichen and Lindsay Koshgarian²:

"In this report, we'll lay out how militarism and the climate crisis are deeply intertwined and mutually reinforcing. The military itself, we explain, is a huge polluter - and is often deployed to sustain the very extractive industries that destabilize our climate. This climate chaos, in turn, leads to massive displacement, militarized borders, and the prospect of further conflict.

"True climate solutions, we argue, must have antimilitarism at their core.

"In the face of both COVID-19 and the climate crisis, we urgently

²https://ips-dc.org/climate-militarism-primer/

need to shift from a culture of war to a culture of care. Funneling trillions into the military to wage endless wars and project military dominance has prevented us from investing in true security and cooperation. If we don't transform our society and the way we confront crises, we will face even more unjust and inhumane realities in a climate-changed future."

Rebuilding after the pandemic

The COVID-19 pandemic has thrown light on the shortcomings of our militaristic concept of security. Our military establishments could not protect us from the virus. Indeed, even without the pandemic, our "defense departments" do not really defend us. This is most obvious when we think of a nuclear war, in which hundreds of millions of innocent civilians might be killed. At present, civilians are hostages in the power struggles of politicians. When we rebuild the world after the pandemic, it must not merely be "back to normal". The old normal was part of the problem. We must build a new world in which the climate emergency is addressed, and rapid action is taken to prevent it. The Green New Deal, in which jobs are created producing urgently-needed renewable energy infrastructure, offers the best model for the new world that we want. Those who say that there is not enough money to finance the Green New Deal, forget the unimaginable amounts of money wasted. or worse than wasted, on militarism. We must divert this vast river of money from its present evil use, to the constructive task of saving our planet from the existential threat of catastrophic climate change.

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Chapter 1

JAN OBERG AND TFF: WORKING AGAINST MILITARISM

1.1 TFF Articles on Militarism and Environment

Pentagon's own map of U.S. bases in Africa contradicts its claim of "light" footprint

Here is a quotation from and an article by Nick Turse:

"...Where there are U.S. bases, there is the potential for such attacks, because bases are not just launching pads for offensive military operations, but targets for them too. Since 9/11, the U.S. military has built a sprawling network of outposts in more than a dozen African countries. The Intercept has obtained U.S. military documents and a set of accompanying maps that provide the locations of these African bases in 2019, including the one at Manda Bay. These formerly secret documents, created by the Pentagon's Africa Command and obtained via the Freedom of Information Act, offer an exclusive window into the footprint of American military operations in Africa..."

No Warming, No War: How Militarism Fuels the Climate Crisis and Visa Versa

Here are some quotations from an article by Lorah Steichen and Lindsay Koshgarian¹:

"In a strange twist, it has taken a global pandemic to significantly reduce the world's fossil fuel emissions.

¹https://ips-dc.org/climate-militarism-primer/

"The COVID-19 pandemic has utterly changed life as we know it - but it's also laid bare how Washington's militaristic budget priorities have left the country woefully unprepared for a crisis. With massive shortages in public health resources and shocks to the broader economy throwing Americans off their health care, states are left clamoring for help from the military to cope.

"All this could be a preview of shocks to come as our climate crisis continues unabated.

"While meaningful climate action has stalled on Capitol Hill and in the White House, planners at the Pentagon have been quietly preparing a militarized, 'armed lifeboat' response to climate chaos for years. Unfortunately, the tendency to understand climate change as just another national security issue has misdirected resources away from the programs that we need to mitigate and adapt to a warming climate.

"In this report, we'll lay out how militarism and the climate crisis are deeply intertwined and mutually reinforcing. The military itself, we explain, is a huge polluter - and is often deployed to sustain the very extractive industries that destabilize our climate. This climate chaos, in turn, leads to massive displacement, militarized borders, and the prospect of further conflict.

"True climate solutions, we argue, must have antimilitarism at their core.

"In the face of both COVID-19 and the climate crisis, we urgently need to shift from a culture of war to a culture of care. Funneling trillions into the military to wage endless wars and project military dominance has prevented us from investing in true security and cooperation. If we don't transform our society and the way we confront crises, we will face even more unjust and inhumane realities in a climate-changed future.

Key Findings

- The Pentagon is a major polluter. U.S. Militarism degrades the environment and contributes directly to climate change. The Pentagon is the world's largest institutional user of petroleum; just one of the military's jets, the B-52 stratofortress, consumes about as much fuel in an hour as the average car driver uses in seven years. Plans to confront climate change must address militarization, but 'greening the military' misses the point entirely. Militarism and climate justice are fundamentally at odds.
- The United States has a well-known history of fighting wars for oil. The

fossil fuel industry relies on militarization to uphold its operations around the globe. Oil is the leading cause of war: An estimated one-quarter to one-half of all interstate wars since 1973 have been linked to oil. And all over the world, those who fight to protect their lands from extractive industries are often met with state and paramilitary violence.

- Climate change and border militarization are inextricably linked. It is clear that on a warming planet, cross-border migration will rise. Estimates project that around 200 million people will be displaced by the middle of century due to climate change. As the U.S. continues to ramp up border security, so do threats to all people's freedom to move and stay. Immigrant justice is climate justice, and challenging militarism is critical to achieving both.
- Over-investment in the military comes at the high cost of under-investing in other needs, including climate. For decades, the U.S. has invested in military adventurism and prioritized military threats above all over threats to human life. Compared to the \$6.4 trillion spent on war in the past two decades, the cost of shifting the U.S. power grid to 100% renewable is an estimate \$4.5 trillion. The bloated U.S. war economy presents an opportunity to redirect significant military resources, including money, infrastructure, and people, toward implementing solutions to climate change.
- Workers need a way out. The fossil fuel and military sectors mirror each other in the way that workers frequently end up funneled into lethal work due to limited options. We need a Just Transition for workers and communities in both sectors. In order to rapidly transition to a green economy, we must fund millions of jobs in the green economy. Funding the green economy instead of a bloated military budget would be a net job creator; for the same level of spending, clean energy and infrastructure create over 40% more jobs and energy efficiency retrofits create nearly twice the level of job creation.
- Racism and racial oppression form the foundation for both the extractive fossil fuel economy and the militarized economy. Neither could exist without the presumption that some human lives are worth less than others, and racial justice would undermine the foundations of both.

1.2 Nomination for the Nobel Peace Prize

Here is the text of the most recent nomination of Dr. Oberg:

Oslo, January 31, 2020 The Norwegian Nobel Committee postmaster@nobel.no Oslo

NOBEL PEACE PRIZE NOMINATION2020 - JAN OBERG

I would once again like to nominate Jan Oberg, Sweden, referring to earlier nominations and materials submitted.

During 2019 Dr. Oberg has renewed, expanded and refashioned his unique and extensive global network of highly qualified peace experts under the name "The Transnational", see https://transnational.live/about/mission/

Dr. Oberg continued, in 2019, to give the principle of peace by peaceful means practical application, in particular in the most important interface for peace efforts in the world today, ensuring that the relation between the cultures east and west will develop along constructive and peaceful lines. I will refer primarily to his various articles on the TFF websites, www.transnational.org [old] and [from January 1, 2018] https://transnational.live.

Oberg's endeavours in developing an innovative project depicting the emerging new and potentially more peaceful Chinese-initiated Belt and Road Initiative (BRI), is illustrative of the permanently, almost restless, experimenting that Oberg, working through the Transnational Foundation for Peace and Future Research (TFF), has practised since 1985 - all based on the UN Charter's Article 1 that peace shall be created by peaceful means. Building on earlier work in China and experience from peacebuilding missions in Africa and West Asia he devoted his time to promoting peace-building and co-operation, deeply dedicated to positive relations with China. He visited China in 1983 and again, in 2018, spent 6 weeks traveling the country extensively, including its two poorest provinces and interviewed hundreds of people about their lives and the immense changes over only 35 years. He did this as part of a new project to let art assist politics. The "Silk Peace Art Road", described here: https://obergphotographics.com/spar-project/, is an innovative project in the sense that it combines field research and network creation in the focal country. During 2019 the result was reported in the usual form, via research articles and reports, but also through a rather large photo-based, multi-media art installation at The European Cultural Centre (ECC) in Palazzo Mora, during the Venice biennale, lasting from May to November 2019. By this Oberg is experimenting with a fundamentally new way of bridging research and art.

Sincerely yours,

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1.2. NOMINATION FOR THE NOBEL PEACE PRIZE



Figure 1.1: Jan Oberg.

Kristian Andenæs, Professor em., dr. philos., UiO



Figure 1.2: An oil fire and tank in Kuwait.

1.3 An appeal

Here is the text of an appeal, written by Jan Oberg and other TFF board members, and signed by members of Transcend:

We've likely only seen the beginnings of the worldwide economic consequences of the Coronavirus. For those who want to see, there are forecasts of a deep economic crisis written on all the walls.

Before the Corona, the world faced huge problems that - among other resources - require funds to solve: huge sums. Think the 17 UN Development Goals, think technological innovation; think the global climate/warming crisis; think the rebuilding of war-torn countries and think the reduction towards zero and repatriation of the world's 80 million displaced people.

And think funds to convert the present military systems towards another, less costly way of creating security. We have just experienced how the outdated non-human security has deprived us of the needed resources when the Corona hit. Recklessly, virtually all governments had ignored a predictable civilian challenge but wasted billions of taxpayer money for weapons and war.

The Corona should be a wake-up call.

So we ask: Where are the funds going to come from to solve humanity's most urgent problems before they become too big to solve?

It seems that most governments believe that the annual world military expenditures - ranging around US\$ 2000 billion, the highest ever - can be maintained. Some even believe their national expenditures must increase substantially.

1.3. AN APPEAL

The same governments believe that the world's most important organisation of which they are all members - the United Nations and its organisations can do what it must on a regular budget of US\$ 3 billion and total annual expenditures of US\$ 50-60 billion. That is 3 per cent of the costs of global militarism.

Those are the priorities of our world. It's not sustainable in Corona times if it ever were. It is ethically indefensible too. And it produces neither security nor peace.

Perhaps the incomprehensible sum of US\$ 2000 billion would be justified if the world experienced solid defence and security as well as trust, cooperation and peace. But the fact is that there are more tension, hatred, dominance attempts, new kinds of wars added to old ones and much more terrorism than before the US-led Global War on Terror.

Furthermore, one country after the other has been destroyed since the end of the First Cold War in 1989-90. It has been possible thanks to a systematic violation of international law, including in particular the UN Charter.

What to do?

Imagine that every country in the world would reduce its military expenditures by at least 50%. Then you would have US\$ 1000 billion.

Is it a large or small sum?

It's equivalent to what China in 2013 put behind the Belt and Road Initiative, BRI - a cooperative effort around infrastructure, fast physical and digital communication, sea and land transport, education and cultural exchange, and much more. Today it involves around 80 countries, some on all continents and it is open to everyone.

The philosophy behind it is, at least theoretically, one of peace. It dates back to the Panchsheel Treaty of 1954, the five principles of peaceful coexistence.

Beyond doubt, this is the largest and most positive cooperation project in today's world. It is the project that will give birth to - if it has not already? - a new multi-polar world order based more on cooperation than confrontation.

There is, therefore, no doubt that a substantial conversion of, say, US\$ 1000 billion from the military to the solution of humanity's common problems would provide a desperately needed boost for the common good. (This argument does not rest on any assumption that money is the primary tool to solve problems; that takes lots of non-material qualities. But with economies falling apart at a moment when all economies need funds for" rebooting humanity," this is a straightforward thing to do with a rather large bang for the buck).

Additionally, lots of human and other resources, knowledge, experience and equipment today operated by the military could be converted and put to civilian tasks. Such a conversion would boost employment - as there exists no documentation for the often-stated assertion that military investments boost employment more than civilian investments. It is, rather, comparatively wasteful. Ours is not the time for more militarism, warfare and antagonism. The net effect of military investments is suffering, destruction (of lives, capital and property) and unavoidable environmental destruction.

Furthermore, every military dollar stands in the way of precisely that global cooperation without which we are doomed. And it is not matched by a security or peace effect.

Time is up for those who strut about and try to master others by violence or the threat of it. Militarism and warfare are now as outdated and indefensible as is slavery, absolute monarchy, dictatorship, child labour, rape and discrimination. These are phenomena we have decided, in the name of civilisation, to abolish or condemn.

If you feel we cannot, very quickly, reduce or abolish militarism, nuclearism and warfare but should uphold at least some self-defensive military capacity, that should be discussed. It's in line with Article 51 of the UN Charter.

That would mean much more dis-armament than the suggested 50% and it would mean trans-armament toward a new way of handling our unavoidable conflicts, create security in diversity and with defensive military and civilian means, and - thereby - realise the peaceful future which 99% of citizens around the world strongly desire.

There are, indeed, alternatives. But minds, as well as other resources, need to be liberated before it's too late.

So, to begin with: Reduce everybody's military expenditures equally much, say 50%. And see the marvellous positive results - politically, economically and in terms of peace. Then move on. A better world is possible. And the Corona is a benign wake-up call compared with World War III.

We need to use the Corona crisis constructively. In this 11th hour, humanity's situation makes it abundantly clear to us that it is either cooperation and coexistence or destruction and no existence.

Signed by

Roger D. Harris Richard Falk John Scales Avery Ravi P. Bhatia Ambika Roshan Biljana Vankovska David Loy David Swanson Jens Jørgen Nielsen Shastri Ramachandaran Chantal Mutamuriza Hans-Christof von Sponeck

1.3. AN APPEAL

David Krieger Radmila Nakarada Jesper Munk Jakobsen Kamran Mofid Brajna Greenhalgh Mairead Maguire Elaheh Pooyandeh Tim Hayward ECOLOGICAL IMPACT OF MILITARISM

Chapter 2 COSTS OF WAR

2.1 The training of soldiers

Within individual countries, murder is rightly considered to be the worst of crimes. But the institution of war tries to convince us that if a soldier murders someone from another country, whom the politicians have designated as an "enemy", it is no longer a crime, no longer a violation of the common bonds of humanity. It is "heroic".

In their hearts, soldiers know that this is nonsense. Murder is always murder. The men, women and children who are supposed to be the "enemy", are just ordinary people, with whom the soldier really has no quarrel. Therefore when the training of soldiers wears off a little, so that they realize what they have done, they have to see themselves as murderers, and many commit suicide.

A recent article in the journal "Epidemiology" pointed out a startling statistic: for every American soldier killed in combat this year, 25 will commit suicide. The article also quotes the Department of Veterans Affairs, which says that 18 veterans commit suicide every day.

Obviously, the training of soldiers must overwrite fundamental ethical principles. This training must make a soldier abandon his or her individual conscience and sense of responsibility. It must turn the soldier from a compassionate human being into an automaton, a killing machine. How is this accomplished? Through erosion of of the soldier's self-respect. Through the endless repetition of senseless rituals where obedience is paramount and from which rational thought and conscience are banished.

In his book on fanaticism, The True Believer (1951), the American author Eric Hoffer gives the following description of the factors promoting self-sacrifice:

"To ripen a person for self-sacrifice, he must be stripped of his individual identity. He must cease to be George, Hans, Ivan or Tado - a human atom with an existence bounded by birth and death. The most drastic way to achieve this end is by the complete assimilation of the individual into a collective body. The fully assimilated individual does not see himself and others as human beings. When asked who he is, his automatic response is that he is a German, a Russian, a Japanese, a Christian, a Muslim, a member of a certain tribe or

family. He has no purpose, worth or destiny apart from his collective body, and as long as that body lives, he cannot really die. ..."

"The effacement of individual separateness must be thorough. In every act, however trivial, the individual must, by some ritual, associate himself with the congregation, the tribe, the party, etcetera. His joys and sorrows, his pride and confidence must spring from the fortunes and capacities of the group, rather than from his individual prospects or abilities. Above all, he must never feel alone. Though stranded on a desert island, he must feel that he is under the eyes of the group. To be cast out from the group must be equivalent to being cut off from life."

"This is undoubtedly a primitive state of being, and its most perfect examples are found among primitive tribes. Mass movements strive to approximate this primitive perfection, and we are not imagining things when the anti-individualist bias of contemporary mass movements strikes us as being a throwback to the primitive."

The conditioning of a soldier in a modern army follows the pattern described in Eric Hoffer's book. The soldier's training aims at abolishing his sense of individual separateness, individual responsibility, and moral judgment. It is filled with rituals, such as saluting, by which the soldier identifies with his tribe-like army group. His uniform also helps to strip him of his individual identity and to assimilate him into the group. The result of this psychological conditioning is that the soldier's mind reverts to a primitive state. He surrenders his moral responsibility, and when the politicians tell him to kill, he kills.

2.2 Killing civilians

Between 2 September and 5 September, 1807, the civilian population of Copenhagen was subjected to a bombardment by British military forces, without any declaration of war. The purpose of the bombardment was to induce terror in the population, and to thereby force the surrender of the Danish fleet, which the British feared might otherwise fall into the hands of Napoleon. It was one of the first occasions on which civilians were deliberately targeted in this manner.

Copenhagen was almost undefended, since the Danish army was positioned at the southern boundary of the country, ready to repel a possible attack by Napoleon's army. British troops and artillery were thus easily able to surround the city, while the British fleet occupied the harbor. On the first night of the bombardment, 5000 rounds were fired into the city, on the second night 2000, and on the third night 7000. New incendiary rockets developed by William Congreve were also used. More than 2000 civilians were killed by the bombardment, and about 30 percent of Copenhagen's buildings were destroyed. The bicentenary of this barbaric event might be an appropriate time to think about state-sponsored terror, in which innocent civilians are deliberately targeted.



The erosion of ethical principles during World War II

When Hitler invaded Poland in September, 1939, US President Franklin Delano Roosevelt appealed to Great Britain, France, and Germany to spare innocent civilians from terror bombing. "The ruthless bombing from the air of civilians in unfortified centers of population during the course of the hostilities", Roosevelt said (referring to the use of air bombardment during World War I) "...has sickened the hearts of every civilized man and woman, and has profoundly shocked the conscience of humanity." He urged "every Government which may be engaged in hostilities publicly to affirm its determination that its armed forces shall in no event, and under no circumstances, undertake the bombardment from the air of civilian populations or of unfortified cities."

Two weeks later, British Prime Minister Neville Chamberlain responded to Roosevelt's appeal with the words: "Whatever the lengths to which others may go, His Majesty's Government will never resort to the deliberate attack on women and children and other civilians for purposes of mere terrorism."

Much was destroyed during World War II, and among the casualties of the war were the ethical principles that Roosevelt and Chamberlain announced at its outset. At the time of Roosevelt and Chamberlain's declarations, terror bombing of civilians had already begun in the Far East. On 22 and 23 September, 1937, Japanese bombers attacked civilian populations in Nanjing and Canton. The attacks provoked widespread protests. The British Under Secretary of State for Foreign Affairs, Lord Cranborne, wrote: "Words cannot express the feelings of profound horror with which the news of these raids has been received by the whole civilized world. They are often directed against places far from the actual area of hostilities. The military objective, where it exists, seems to take a completely second place. The main object seems to be to inspire terror by the indiscriminate slaughter of civilians..."

On the 25th of September, 1939, Hitler's air force began a series of intense attacks on Warsaw. Civilian areas of the city, hospitals marked with the Red Cross symbol, and fleeing refugees all were targeted in a effort to force the surrender of the city through terror. On the 14th of May, 1940, Rotterdam was also devastated. Between the 7th of September 1940 and the 10th of May 1941, the German Luftwaffe carried out massive air attacks on targets in Britain. By May, 1941, 43,000 British civilians were killed and more than a million houses destroyed.

Although they were not the first to start it, by the end of the war the United States and Great Britain were bombing of civilians on a far greater scale than Japan and Germany had ever done. For example, on July 24-28, 1943, British and American bombers attacked Hamburg with an enormous incendiary raid whose official intention "the total destruction" of the city.

The result was a firestorm that did, if fact, lead to the total destruction of the city. One airman recalled, that "As far as I could see was one mass of fire. 'A sea of flame' has been the description, and that's an understatement. It was so bright that I could read the target maps and adjust the bomb-sight." Another pilot was "...amazed at the awe-inspiring sight of the target area. It seemed as though the whole of Hamburg was on fire from one end to the other and a huge column of smoke was towering well above us - and we were on 20,000 feet! It all seemed almost incredible and, when I realized that I was looking at a city with a population of two millions, or about that, it became almost frightening to think of what must be going on down there in Hamburg."

Below, in the burning city, temperatures reached 1400 degrees Fahrenheit, a temperature at which lead and aluminum have long since liquefied. Powerful winds sucked new air into the firestorm. There were reports of babies being torn by the high winds from their mothers' arms and sucked into the flames. Of the 45,000 people killed, it has been estimated that 50 percent were women and children and many of the men killed were elderly, above military age. For weeks after the raids, survivors were plagued by "...droves of vicious rats, grown strong by feeding on the corpses that were left unburied within the rubble as well as the potatoes and other food supplies lost beneath the broken buildings."

The German cities Kassel, Pforzheim, Mainz, Dresden and Berlin were similarly destroyed, and in Japan, US bombing created firestorms in many cities, for example Tokyo, Kobe and Yokohama. In Tokyo alone, incendiary bombing caused more than 100,000 civilian casualties.

Hiroshima and Nagasaki

On August 6, 1945, at 8.15 in the morning, a nuclear fission bomb was exploded in the air over the civilian population of Hiroshima in an already virtually defeated Japan. The force of the explosion was equivalent to fifteen thousand tons of TNT. Out of a city of two hundred and fifty thousand, one hundred thousand were killed immediately, and another hundred thousand were hurt. Many of the injured died later from radiation sickness. A few days later, Nagasaki was similarly destroyed.

The tragic destruction of the two Japanese cities was horrible enough in itself, but it also marked the start of a nuclear arms race that continues to cast a very dark shadow over the future of civilization. Not long afterwards, the Soviet Union exploded its own atomic

2.2. KILLING CIVILIANS





bomb, creating feelings of panic in the United States. President Truman authorized an all-out effort to build superbombs based on thermonuclear reactions, the reactions that heat the sun and stars.

In March, 1954, the US tested a thermonuclear bomb at Bikini Atoll in the Pacific Ocean. It was 1000 times more powerful than the Hiroshima bomb. The Japanese fishing boat, Lucky Dragon, was 135 kilometers from the Bikini explosion, but radioactive fallout from the explosion killed one crew member and made all the others seriously ill. The distance to the Marshall Islands was equally large, but even today, islanders continue to suffer from the effects of fallout from the test, for example frequent birth defects.

Driven by the paranoia of the Cold War, the number of nuclear weapons on both sides reached truly insane heights. At the worst point, there were 50,000 nuclear weapons in the world, with a total explosive power roughly a million times the power of the Hiroshima bomb. This was equivalent to 4 tons of TNT for every person on the planet - enough to destroy human civilization many times over - enough to threaten the existence of all life on earth.

At the end of the Cold War, most people heaved a sigh of relief and pushed the problem of nuclear weapons away from their minds. It was a threat to life too horrible to think about. People felt that they could do nothing in any case, and they hoped that the problem had finally disappeared.

Today, however, many thoughtful people realize that the problem of nuclear weapons has by no means disappeared, and in some ways it is even more serious now than it was during the Cold War. There are still over 15,000 nuclear weapons in the world, many of them hydrogen bombs, many on hair-trigger alert, ready to be fired with only a few minutes warning. The world has frequently come extremely close to accidental nuclear war. If nuclear weapons are allowed to exist for a long period of time, the probability for such a catastrophic accident to happen will grow into a certainty.

Current dangers also come from proliferation. Recently, more and more nations have come to possess nuclear weapons, and thus the danger that they will be used increases. For example, if Pakistan's less-than-stable government should fall, its nuclear weapons might find their way into the hands of terrorists, and against terrorism deterrence has no effect.

Thus we live at a special time in history - a time of crisis for civilization. We did not ask to be born at a moment of crisis, but such is our fate. Every person now alive has a special responsibility: We owe it, both to our ancestors and to future generations, to build a stable and cooperative future world. It must be a war-free world, from which nuclear weapons have been completely abolished. No person can achieve these changes alone, but together we can build the world that we desire. This will not happen through inaction, but it can happen through the dedicated work of large numbers of citizens.

Civilians have for too long played the role of passive targets, hostages in the power struggles of politicians. It is time for civil society to make its will felt. If our leaders continue to enthusiastically support the institution of war, if they will not abolish nuclear weapons, then let us have new leaders.

2.3 The direct and indirect costs of war

The costs of war, both direct and indirect, are so enormous that they are almost beyond comprehension. We face a direct threat because a thermonuclear war may destroy human civilization and much of the biosphere, and an indirect threat because the institution of war interferes seriously with the use of tax money for constructive and peaceful purposes.

Today, despite the end of the Cold War, the world spends roughly 1.7 trillion (i.e. 1.7 million million) US dollars each year on armaments. This colossal flood of money could have been used instead for education, famine relief, development of infrastructure, or on urgently needed public health measures.

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

A new drug-resistant form of tuberculosis has recently become widespread in Asia and in the former Soviet Union. In order to combat this new and highly dangerous form of tuberculosis and to prevent its spread, WHO needs \$500 million, an amount equivalent to 1.2 hours of world arms spending.

Today's world is one in which roughly ten million children die every year from starvation or from diseases related to poverty. Besides this enormous waste of young lives through malnutrition and preventable disease, there is a huge waste of opportunities through inadequate education. The rate of illiteracy in the 25 least developed countries is 80%, and the total number of illiterates in the world is estimated to be 800 million. Meanwhile every 60 seconds the world spends \$6.5 million on armaments.

It is plain that if the almost unbelievable sums now wasted on the institution of war were used constructively, most of the pressing problems of humanity could be solved, but today the world spends more than 20 times as much on war as it does on development.

2.4 Medical and psychological consequences; loss of life

While in earlier epochs it may have been possible to confine the effects of war mainly to combatants, in the 20th century the victims of war were increasingly civilians, and especially children. For example, according to Quincy Wright's statistics, the First and Second World Wars cost the lives of 26 million soldiers, but the toll in civilian lives was much larger: 64 million.

2.5. EFFECTS OF WAR ON CHILDREN

Since the Second World War, despite the best efforts of the UN, there have been over 150 armed conflicts; and, if civil wars are included, there are on any given day an average of 12 wars somewhere in the world. In the conflicts in Indo-China, the proportion of civilian victims was between 80% and 90%, while in the Lebanese civil war some sources state that the proportion of civilian casualties was as high as 97%.

Civilian casualties often occur through malnutrition and through diseases that would be preventable in normal circumstances. Because of the social disruption caused by war, normal supplies of food, safe water and medicine are interrupted, so that populations become vulnerable to famine and epidemics.¹

2.5 Effects of war on children

According to UNICEF figures, 90% of the casualties of recent wars have been civilians, and 50% children. The organization estimates that in recent years, violent conflicts have driven 20 million children from their homes. They have become refugees or internally displaced persons within their own countries.

During the last decade 2 million children have been killed and 6 million seriously injured or permanently disabled as the result of armed conflicts, while 1 million children have been orphaned or separated from their families. Of the ten countries with the highest rates of death of children under five years of age, seven are affected by armed conflicts. UNICEF estimates that 300,000 child soldiers are currently forced to fight in 30 armed conflicts throughout the world. Many of these have been forcibly recruited or abducted.

Even when they are not killed or wounded by conflicts, children often experience painful psychological traumas: the violent death of parents or close relatives, separation from their families, seeing family members tortured, displacement from home, disruption of ordinary life, exposure to shelling and other forms of combat, starvation and anxiety about the future.²

2.6 Refugees

Human Rights Watch estimates that in 2001 there were 15 million refugees in the world, forced from their countries by war, civil and political conflict, or by gross violations of human rights. In addition, there were an estimated 22 million internally displaced persons, violently forced from their homes but still within the borders of their countries.

In 2001, 78% of all refugees came from ten areas: Afghanistan, Angola, Burma, Burundi, Congo-Kinshasa, Eritrea, Iraq, the Palestinian territories, Somalia and Sudan. A quarter of all refugees are Palestinians, who make up the world's oldest and largest refugee

¹http://www.cadmusjournal.org/article/volume-2/issue-2-part-3/lessons-world-war-i http://www.truth-out.org/opinion/item/27201-the-leading-terrorist-state

²http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2080482/

population. 45% of the world's refugees have found sanctuaries in Asia, 30% in Africa, 19% in Europe and 5% in North America.

Refugees who have crossed an international border are in principle protected by Article 14 of the Universal Declaration of Human Rights, which affirms their right "to seek and to enjoy in other countries asylum from persecution". In 1950 the Office of the High Commissioner for Refugees was created to implement Article 14, and in 1951 the Convention Relating to the Status of Refugees was adopted by the UN. By 2002 this legally binding treaty had been signed by 140 nations. However the industrialized countries have recently adopted a very hostile and restrictive attitude towards refugees, subjecting them to arbitrary arrests, denial of social and economic rights, and even forcible return to countries in which they face persecution.

The status of internally displaced persons is even worse than that of refugees who have crossed international borders. In many cases the international community simply ignores their suffering, reluctant to interfere in the internal affairs of sovereign states. In fact, the United Nations Charter is self-contradictory in this respect, since on the one hand it calls for non-interference in the internal affairs of sovereign states, but on the other hand, people everywhere are guaranteed freedom from persecution by the Charter's Universal Declaration of Human Rights.³

2.7 Damage to infrastructure

Most insurance policies have clauses written in fine print exempting companies from payment of damage caused by war. The reason for this is simple. The damage caused by war is so enormous that insurance companies could never come near to paying for it without going bankrupt.

We mentioned above that the world spends 1.7 trillion dollars each year on preparations for war. A similarly colossal amount is needed to repair the damage to infrastructure caused by war. Sometimes this damage is unintended, but sometimes it is intentional.

During World War II, one of the main aims of air attacks by both sides was to destroy the industrial infrastructure of the opponent. This made some sense in a war expected to last several years, because the aim was to prevent the enemy from producing more munitions. However, during the Gulf War of 1990, the infrastructure of Iraq was attacked, even though the war was expected to be short. Electrical generating plants and water purification facilities were deliberately destroyed with the apparent aim of obtaining leverage over Iraq after the war.

In general, because war has such a catastrophic effect on infrastructure, it can be thought of as the opposite of development. War is the greatest generator of poverty.⁴

³https://www.hrw.org/topic/refugees

⁴https://www.wsws.org/en/articles/2002/11/iraq-n04.html

http://www.globalresearch.ca/crimes-against-humanity-the-destruction-of-iraqs-electricity-infrastructure-the-social-economic-and-environmental-impacts/5355665

http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/00157630-EN-ERP-48.PDF

2.8 Ecological damage

Warfare during the 20th century has not only caused the loss of 175 million lives (primarily civilians) - it has also caused the greatest ecological catastrophes in human history. The damage takes place even in times of peace. Studies by Joni Seager, a geographer at the University of Vermont, conclude that "a military presence anywhere in the world is the single most reliable predictor of ecological damage".

Modern warfare destroys environments to such a degree that it has been described as an "environmental holocaust." For example, herbicides use in the Vietnam War killed an estimated 6.2 billion board-feet of hardwood trees in the forests north and west of Saigon, according to the American Association for the Advancement of Science. Herbicides such as Agent Orange also made enormous areas of previously fertile land unsuitable for agriculture for many years to come. In Vietnam and elsewhere in the world, valuable agricultural land has also been lost because land mines or the remains of cluster bombs make it too dangerous for farming.

During the Gulf War of 1990, the oil spills amounted to 150 million barrels, 650 times the amount released into the environment by the notorious Exxon Valdez disaster. During the Gulf War an enormous number of shells made of depleted uranium were fired. When the dust produced by exploded shells is inhaled it often produces cancer, and it will remain in the environment of Iraq for decades.

Radioactive fallout from nuclear tests pollutes the global environment and causes many thousands of cases of cancer, as well as birth abnormalities. Most nuclear tests have been carried out on lands belonging to indigenous peoples. Agent Orange also produced cancer, birth abnormalities and other serious forms of illness both in the Vietnamese population and among the foreign soldiers fighting in Vietnam⁵

2.9 Links between poverty and war

There are several relationships between intolerable economic inequality and war. Today 2.7 billion people live on less than 2 dollars a day - 1.1 billion on less than 1 dollar 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 waterbourne 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.

Meanwhile, in 2011, world military budgets reached 1,700,000,000,000 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

 $^{^{5}} http://www.dailymail.co.uk/news/article-2401378/Agent-Orange-Vietnamese-children-suffering-effects-herbicide-sprayed-US-Army-40-years-ago.html$

know very well that it is a threat to civilization and that it responsible for much of the suffering that humans experience.

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.

Military might is used by powerful industrialized nations to maintain economic hegemony over less developed countries. This is true today, even though the colonial era is supposed to be over (as has been amply documented by Professor Michael Klare in his books on "Resource Wars").

The way in which the 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.

One might think that taxation of foreign resource-extracting firms would provide developing countries with large incomes. However, there is at present no international law governing multinational tax arrangements. These are usually agreed to on a bilateral basis, and the industrialized countries have stronger bargaining powers in arranging the bilateral agreements.

Another important poverty-generating factor in the developing countries is war - often civil war. The five permanent members of the U.N. Security Council are, ironically, the five largest exporters of small arms. Small arms have a long life. The weapons poured into Africa by both sides during the Cold War are still there, and they contribute to political chaos and civil wars that block development and cause enormous human suffering.

The United Nations website on Peace and Security through Disarmament states that "Small arms and light weapons destabilize regions; spark, fuel and prolong conflicts; obstruct relief programmes; undermine peace initiatives; exacerbate human rights abuses; hamper development; and foster a 'culture of violence'."

An estimated 639 million small arms and light weapons are in circulation worldwide, one for every ten people. Approximately 300,000 people are killed every year by these weapons, many of them women and children.

There is also another, less obvious, link between intolerable economic inequality war: Abolition of the institution of war will require the replacement of "might makes right" by the rule international law. It will require development of effective global governance. But reform and strengthening of the United Nations is blocked by wealthy countries because they are afraid of loosing their privileged positions. If global economic inequality were less enormous, the problem of unifying the world would be simplified.

Let us work to break the links between poverty and war! To do that, we must work for laws that will restrict the international sale of small arms; we must work for a fair relationship between developing countries and multinational corporations; and above all, we must question the need for colossal military budgets. 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.

2.10 The threat of nuclear war

As bad as conventional arms and conventional weapons may be, it is the possibility of a catastrophic nuclear war that poses the greatest threat to humanity. There are today roughly 16,000 nuclear warheads in the world. The total explosive power of the warheads that exist or that could be made on short notice is approximately equal to 500,000 Hiroshima bombs.

To multiply the tragedy of Hiroshima by a factor of half a million makes an enormous difference, not only quantitatively, but also qualitatively. Those who have studied the question believe that a nuclear catastrophe today would inflict irreversible damage on our civilization, genetic pool and environment.

Thermonuclear weapons consist of an inner core where the fission of uranium-235 or plutonium takes place. The fission reaction in the core is able to start a fusion reaction in the next layer, which contains isotopes of hydrogen. It is possible to add a casing of ordinary uranium outside the hydrogen layer, and under the extreme conditions produced by the fusion reaction, this ordinary uranium can undergo fission. In this way, a fissionfusion-fission bomb of almost limitless power can be produced.

For a victim of severe radiation exposure, the symptoms during the first week are nausea, vomiting, fever, apathy, delirium, diarrhoea, oropharyngeal lesions and leukopenia. Death occurs during the first or second week.

We can perhaps be helped to imagine what a nuclear catastrophe means in human terms by reading the words of a young university professor, who was 2,500 meters from the hypocenter at the time of the bombing of Hiroshima: "Everything I saw made a deep impression: a park nearby covered with dead bodies... very badly injured people evacuated in my direction... Perhaps most impressive were girls, very young girls, not only with their clothes torn off, but their skin peeled off as well. ... My immediate thought was that this was like the hell I had always read about. ... I had never seen anything which resembled it before, but I thought that should there be a hell, this was it."

One argument that has been used in favor of nuclear weapons is that no sane political leader would employ them. However, the concept of deterrence ignores the possibility of war by accident or miscalculation, a danger that has been increased by nuclear proliferation and by the use of computers with very quick reaction times to control weapons systems.

Recent nuclear power plant accidents remind us that accidents frequently happen through human and technical failure, even for systems which are considered to be very "safe." We must also remember the time scale of the problem. To assure the future of humanity, nuclear catastrophe must be avoided year after year and decade after decade. In the long run, the safety of civilization cannot be achieved except by the abolition of nuclear weapons, and ultimately the abolition of the institution of war. In 1985, International Physicians for the Prevention of Nuclear War received the Nobel Peace Prize. IPPNW had been founded in 1980 by six physicians, three from the Soviet Union and three from the United States. Today, the organization has wide membership among the world's physicians. Professor Bernard Lowen of the Harvard School of Public Health, one of the founders of IPPNW, said in a recent speech:

"...No public health hazard ever faced by humankind equals the threat of nuclear war. Never before has man possessed the destructive resources to make this planet uninhabitable... Modern medicine has nothing to offer, not even a token benefit, in the event of nuclear war..."

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

The danger of a catastrophic nuclear war casts a dark shadow over the future of our species. It also casts a very black shadow over the future of the global environment. The environmental consequences of a massive exchange of nuclear weapons have been treated in a number of studies by meteorologists and other experts from both East and West. They predict that a large-scale use of nuclear weapons would result in fire storms with very high winds and high temperatures, which would burn a large proportion of the wild land fuels in the affected nations. The resulting smoke and dust would block out sunlight for a period of many months, at first only in the northern hemisphere but later also in the southern hemisphere.

Temperatures in many places would fall far below freezing, and much of the earth's plant life would be killed. Animals and humans would then die of starvation. The nuclear winter effect was first discovered as a result of the Mariner 9 spacecraft exploration of Mars in 1971. The spacecraft arrived in the middle of an enormous dust-storm on Mars, and measured a large temperature drop at the surface of the planet, accompanied by a heating of the upper atmosphere. These measurements allowed scientists to check their theoretical models for predicting the effect of dust and other pollutants distributed in planetary atmospheres.

Using experience gained from the studies of Mars, R.P. Turco, O.B. Toon, T. Ackerman, J.B. Pollack and C. Sagan made a computer study of the climatic effects of the smoke and dust that would result from a large-scale nuclear war. This early research project is sometimes called the TTAPS Study, after the initials of the authors.

In April 1983, a special meeting was held in Cambridge, Massachusetts, where the results of the TTAPS Study and other independent studies of the nuclear winter effect were discussed by more than 100 experts. Their conclusions were presented at a forum in Washington, D.C., the following December, under the chairmanship of U.S. Senators Kennedy and Hatfield. The numerous independent studies of the nuclear winter effect all agreed of the following main predictions:

High-yield nuclear weapons exploded near the earth's surface would put large amounts of dust into the upper atmosphere. Nuclear weapons exploded over cities, forests, oilfields and refineries would produce fire storms of the type experienced in Dresden and Hamburg after incendiary bombings during the Second World War. The combination of high-altitude dust and lower altitude soot would prevent sunlight from reaching the earth's surface, and the degree of obscuration would be extremely high for a wide range of scenarios.

A baseline scenario used by the TTAPS study assumes a 5,000-megaton nuclear exchange, but the threshold for triggering the nuclear winter effect is believed to be much lower than that. After such an exchange, the screening effect of pollutants in the atmosphere might be so great that, in the northern and middle latitudes, the sunlight reaching the earth would be only 1% of ordinary sunlight on a clear day, and this effect would persist for many months. As a result, the upper layers in the atmosphere might rise in temperature by as much as 100 °C, while the surface temperatures would fall, perhaps by as much a 50 °C.

The temperature inversion produced in this way would lead to superstability, a condition in which the normal mixing of atmospheric layers is suppressed. The hydrological cycle (which normally takes moist air from the oceans to a higher and cooler level, where the moisture condenses as rain) would be strongly suppressed. Severe droughts would thus take place over continental land masses. The normal cleansing action of rain would be absent in the atmosphere, an effect which would prolong the nuclear winter.

In the northern hemisphere, forests would die because of lack of sunlight, extreme cold, and drought. Although the temperature drop in the southern hemisphere would be less severe, it might still be sufficient to kill a large portion of the tropical forests, which normally help to renew the earth's oxygen.

The oxygen content of the atmosphere would then fall dangerously, while the concentration of carbon dioxide and oxides of nitrogen produced by firestorms would remain high. The oxides of nitrogen would ultimately diffuse to the upper atmosphere, where they would destroy the ozone layer.

Thus, even when the sunlight returned after an absence of many months, it would be sunlight containing a large proportion of the ultraviolet frequencies which are normally absorbed by the ozone in the stratosphere, and therefore a type of light dangerous to life. Finally, after being so severely disturbed, there is no guarantee that the global climate would return to its normal equilibrium.

Even a nuclear war below the threshold of nuclear winter might have climatic effects very damaging to human life. Professor Paul Ehrlich, of Stanford University, has expressed this in the following words:

"...A smaller war, which set off fewer fires and put less dust into the atmosphere, could easily depress temperatures enough to essentially cancel grain production in the northern hemisphere. That in itself would be the greatest catastrophe ever delivered upon Homo Sapiens, just that one thing, not worrying about prompt effects. Thus even below the threshold, one cannot think of survival of a nuclear war as just being able to stand up after the bomb has gone off."⁶

 $^{^{6}} http://www.voanews.com/content/pope-francis-calls-for-nuclear-weapons-ban/2909357.html http://www.cadmusjournal.org/article/issue-4/flaws-concept-nuclear-deterrance$

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Figure 2.1: U.N. Secretary General Antonio Guterres addressed the Human Rights Council at the United Nations in Geneva, Switzerland February 26, 2018.

Speaking to the Conference on Disarmament at the U.N. complex in Geneva, Guterres said many states still wrongly thought that nuclear weapons made the world safer.

"There is great and justified anxiety around the world about the threat of nuclear war,"

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http://human-wrongs-watch.net/2015/08/03/why-nuclear-weapons/

he said.

"Countries persist in clinging to the fallacious idea that nuclear arms make the world safer ... At the global level, we must work towards forging a new momentum on eliminating nuclear weapons."

Two World War I poems by Wilfred Owen

Wilfred Owen and his mentor, Siegfried Sassoon were two poets who eloquently described the horrors of World War I. They met in a military hospital, after both had been wounded in the war. Owen had been writing poetry since the age of 11, but not about war. When he became friends with Sassoon during their hospital stay, Owen was inspired by Sassoon's example and realized that the horrors of trenches and gas warfare deserved to be described realistically in poetry. Against the strong advice of Sassoon, Owen insisted on returning to active duty in France, where he wrote the eloquent and bitter war poems for which he is remembered.

Owen was killed in action exactly one week before the end of the war. His mother received the telegram informing her of his death on Armistice Day, as the church bells were ringing out in celebration. Here are two of Owen's poems:

Dulce et decorum Est

Bent double, like old beggars under sacks, Knock-kneed, coughing like hags, we cursed through sludge, Till on the haunting flares we turned out backs, And towards our distant rest began to trudge. Men marched asleep. Many had lost their boots, But limped on, blood-shod. All went lame, all blind; Drunk with fatigue; deaf even to the hoots Of gas-shells dropping softly behind.

Gas! GAS! Quick, boys! - An ecstasy of fumbling Fitting the clumsy helmets just in time, But someone still was yelling out and stumbling And flound'ring like a man in fire or lime. Dim through the misty panes and thick green light, As under a green sea, I saw him drowning. In all my dreams before my helpless sight He plunges at me, guttering, choking, drowning.

If in some smothering dreams, you too could pace Behind the wagon that we flung him in, And watch the white eyes writhing in his face, His hanging face, like a devil's sick of sin,

ECOLOGICAL IMPACT OF MILITARISM

If you could hear, at every jolt, the blood Come gargling from the froth-corrupted lungs Obscene as cancer, bitter as the cud Of vile, incurable sores on innocent tongues, My friend, you would not tell with such high zest To children ardent for some desperate glory, The old Lie: Dulce et decorum est Pro patria mori.

The parable of the old man and the young

So Abram rose, and clave the wood, and went, And took the fire with him, and a knife. And as they sojourned both of them together, Isaac the first-born spake and said, My Father, Behold the preparations, fire and iron, But where the lamb for this burnt-offering? Then Abram bound the youth with belts and straps, and builded parapets and trenches there, And stretchèd forth the knife to slay his son. When lo! an angel called him out of heaven, Saying, Lay not thy hand upon the lad, Neither do anything to him. Behold, A ram, caught in a thicket by its horns; Offer the Ram of Pride instead of him.

But the old man would not so, but slew his son, And half the seed of Europe, one by one.

We condemn human sacrifice in primitive cultures, but does not our modern industrial society also practice this abominable custom? We sacrifice countless young men and women in endless and unnecessary wars.

World War II: a continuation of World War I

In the Second World War, the number of soldiers killed was roughly the same as in World War I, but the numbers of civilian deaths was much larger. In the USSR alone, about 20 million people are thought to have been killed, directly or indirectly, by World War II, and of these only 7.5 million were battle deaths. Many of the USSR's civilian deaths were caused by starvation, disease or exposure. Civilian populations also suffered greatly in the devastating bombings of cities such as London, Coventry, Rotterdam, Warsaw, Dresden, Cologne, Berlin, Tokyo, Hiroshima and Nagasaki. In World War II, the total number of deaths, civilian and military, is estimated to have been between 62 and 78 million.
2.10. THE THREAT OF NUCLEAR WAR

Do Benjamin Netanyahu and Ehud Barak, who are contemplating starting what might develop into World War III, have any imaginative concept of what it would be like? Netanyahu has told the Israeli people that only 500 of their citizens would be killed, and that the conflict would be over in a month. One is reminded of the Austrian leaders in 1914, who started a what they thought would be a small action to punish the Serbian nationalists for their Pan-Slavic ambitions. When the result was a world-destroying war, they said "That is not what we intended." Of course it is not what they intended, but nobody can control the escalation of conflicts. The astonishing unrealism of the Netanyahu-Barak statements also reminds one of Kaiser Wilhelm's monumentally unrealistic words to his departing troops: "You will be home before the leaves are off the trees."

The planned attack on Iran would not only violate international law, but would also violate common sense and the wishes of the people of Israel. The probable result would be a massive Iranian missile attack on Tel Aviv, and Iran would probably also close the Straits of Hormuz. If the United States responded by bombing Iranian targets, Iran would probably use missiles to sink one or more of the US ships in the Persian Gulf. One can easily imagine other steps in the escalation of the conflict: a revolution in Pakistan; the entry of nuclear-armed Pakistan into the war on the side of Iran; a preemptive nuclear strike by Israel against Pakistan's nuclear weapons; and Chinese-Russian support of Iran. In the tense atmosphere of such a war, the danger of a major nuclear exchange, due to accident or miscalculation, would be very great.

Today, because the technology of killing has continued to develop, the danger of a catastrophic war with hydrogen bombs hangs like a dark cloud over the future of human civilization. The total explosive power of today's 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 are more than 15,000 nuclear weapons in the world today, about 4,000 of them on hair-trigger alert. The phrase "hair trigger alert" means that the person in charge has only 15 minutes to decide whether the warning from the radar system was true of false, and to decide whether or not to launch a counterattack. The danger of accidental nuclear war continues to be high. Technical failures and human failures have many times brought the world close to a catastrophic nuclear war. Those who know the system of "deterrence" best describe it as "an accident waiting to happen".

No one can win a nuclear war, just as no one can win a natural catastrophe like an earthquake or a tsunami. The effects of a nuclear war would be global, and all the nations of the world would suffer - also neutral nations.

Recent studies by atmospheric scientists have shown that the smoke from burning cities produced by even a limited nuclear war would have a devastating effect on global agriculture. The studies show that the smoke would rise to the stratosphere, where it would spread globally and remain for a decade, blocking sunlight, blocking the hydrological cycle and destroying the ozone layer. Because of the devastating effect on global agriculture, darkness from even a small nuclear war could result in an estimated billion deaths from famine. This number corresponds to the fact that today, a billion people are chronically



undernourished. If global agriculture were sufficiently damaged by a nuclear war, these vulnerable people might not survive. A large-scale nuclear war would be an even greater global catastrophe, completely destroying all agriculture for a period of ten years.

The tragedies of Chernobyl and Fukushima remind us that a nuclear war would make large areas of the world permanently uninhabitable because of long-lasting radioactive contamination.

The First World War was a colossal mistake. Today, the world stands on the threshold of an equally enormous disaster. Must we again be lead into a world-destroying war by a few blind individuals who do not have the slightest idea of what such a war would be like?

2.11 Atoms for peace?

"Atoms for Peace", the title of U.S. President Dwight D. Eisenhower's 1953 speech to the U.N. General Assembly, may be regarded by future generations as being tragically self-contradictory. Nuclear power generation has led not only to dangerous proliferation of nuclear weapons, but also to disasters which have made large areas of the world permanently uninhabitable because of long-lived radioactive contamination.

2.11. ATOMS FOR PEACE?

According to Wikipedia, "...Under Atoms for Peace related programs, the US exported 25 tons of highly enriched uranium to 30 countries, mostly to fuel research reactors....The Soviet Union also exported 11 tons of HEU under a similar program." This enormous quantity of loose weapons-usable highly enriched uranium, is now regarded as very worrying because of proliferation and terrorism risks.

A recent article in "The Examiner" (http://www.examiner.com/article/nuclear-securityu-s-fails-to-protect-its-nuclear-materials-overseas) pointed out that "...NRC and DOE could not account for the current location and disposition of U.S. HEW overseas in response to a 1992 congressional mandate. U.S. agencies, in a 1993 report produced in response to the mandate, were able to verify the location of only 1.160 kilograms out of 17,500 kilograms of U.S. HEW estimated to have been exported."

The dangers of nuclear power generation are exemplified by the Chernobyl disaster: On the 26th of April, 1986, during the small hours of the morning, the staff of the Chernobyl nuclear reactor in Ukraine turned off several safety systems in order to perform a test. The result was a core meltdown in Reactor 4, causing a chemical explosion that blew off the reactor's 1,000-ton steel and concrete lid. 190 tons of highly radioactive uranium and graphite were hurled into the atmosphere.

The resulting radioactive fallout was 200 times greater than that caused by the nuclear bombs that destroyed Hiroshima and Nagasaki. The radioactive cloud spread over Belarus, Ukraine, Russia, Finland, Sweden and Eastern Europe, exposing the populations of these regions to levels of radiation 100 times the normal background. Ultimately, the radioactive cloud reached as far as Greenland and parts of Asia.

The exact number of casualties resulting from the Chernobyl meltdown is a matter of controversy, but according to a United Nations report, as many as 9 million people have been adversely affected by the disaster. Since 1986, the rate of thyroid cancer in affected areas has increased ten-fold. An area of 155,000 square kilometers (almost half the size of Italy) in Belarus, Ukraine and Russia is still severely contaminated. Even as far away as Wales, hundreds of farms are still under restrictions because of sheep eating radioactive grass.

The more recent disaster of 11 March, 2011, may prove to be very much worse than Chernobyl. According to an article by Harvey Wasserman

(http://www.commondreams.org/view/2014/02/03-3),

the ongoing fallout from the Fukushima catastrophe is already far in excess of that from Chernobyl. Ecosystems of the entire Pacific ocean are being contaminated by the 300 tons of radioactive water from Fukushima.that continue to pour into the Pacific every day.

Meanwhile, the increasingly militaristic government of Japan's Prime Minister Shinzo Abe has passed a State Secrets Act that makes it an offense punishable by 5 year's imprisonment for journalists to report on the situation. Under this cloak of secrecy, attempts are being made to remove highly radioactive used fuel rods balanced precariously in a partially destroyed container hanging in the air above the stricken Unit Four. If an accident should occur, the released radioactivity could dwarf previous disasters.

Public opinion turned against nuclear power generation as a result of the Chernobyl and Fukushima catastrophes. Nevertheless, many governments insist on pushing forward



their plans for opening new nuclear power plants, despite popular opposition. Nuclear power could never compete in price with solar energy or wind energy if it were not heavily subsidized by governments. Furthermore, if a careful accounting is made of the CO2 released in the construction of nuclear power plants, the mining, refining and transportation of uranium ore, and the final decommissioning of the plants, the amount of CO2 released is seen to be similar to that of coal-fired plants.

There are three basic reasons why nuclear power generation is is one of the worst ideas ever conceived: First is the danger of proliferation of nuclear weapons, which will be discussed in detail below. Secondly, there is the danger of catastrophic accidents, such as the ones that occurred at Chernobyl and Fukushima. Finally, the problem of how to safely dispose of or store used fuel rods has not been solved.

In thinking about the dangers posed by radioactive waste, we should remember that many of the dangerous radioisotopes involved have half-lives of hundreds of thousands of years. Thus, it is not sufficient to seal them in containers that will last for a century, or even a millennium. We must find containers that will last for a hundred thousand years or more, longer than any human structure has ever lasted.

Of the two bombs that destroyed Hiroshima and Nagasaki, one made use of the rare isotope of uranium, U-235, while the other used plutonium. Both of these materials can be made by a nation with a nuclear power generation program.

Uranium has atomic number 92, i.e., a neutral uranium atom has a nucleus containing 92 positively-charged protons, around which 92 negatively-charged electrons circle. All of the isotopes of uranium have the same number of protons and electrons, and hence the same chemical properties, but they differ in the number of neutrons in their nuclei. For example, the nucleus of U-235 has 143 neutrons, while that of U-238 has 146. Notice that 92+143=235, while 92+146=238. The number written after the name of an element to



J. SMITH & N. A. BERESFORD CHERNOBYL: CATASTROPHE AND CONSEQUENCES (PRAXIS, CHICHESTER, 2005)







Figure 2.2: People evacuated from the region near to Fukushima wonder when they will be able to return to their homes. The honest answer is "never".

specify a particular isotope is the number of neutrons plus the number of protons. This is called the "nucleon number", and the weight of an isotope is roughly proportional to it. This means that U-238 is slightly heavier than U-235. If the two isotopes are to be separated, difficult physical methods dependent on mass must be used, since their chemical properties are identical. In natural uranium, the amount of the rare isotope U-235 is only 0.7 percent.

A paper published in 1939 by Niels Bohr and John A. Wheeler indicated that it was the rare isotope of uranium, U-235, that undergoes fission. A bomb could be constructed, they pointed out, if enough highly enriched U-235 could be isolated from the more common isotope, U-238 Calculations later performed in England by Otto Frisch and Rudolf Peierls showed that the "critical mass" of highly enriched uranium needed is quite small: only a few kilograms.

The Bohr-Wheeler theory also predicted that an isotope of plutonium, Pu-239, should be just as fissionable as U-235. Both U-235 and Pu-239 have odd nucleon numbers. When U-235 absorbs a neutron, it becomes U-236, while when Pu-239 absorbs a neutron it becomes Pu-240. In other words, absorption of a neutron converts both these species to nuclei with even nucleon numbers.

According to the Bohr-Wheeler theory, nuclei with even nucleon numbers are especially tightly-bound. Thus absorption of a neutron converts U-235 to a highly-excited state of U-236, while Pu-239 is similarly converted to a highly excited state of Pu-240. The excitation energy distorts the nuclei to such an extent that fission becomes possible. Instead of trying to separate the rare isotope, U-235, from the common isotope, U-238, physicists could just operate a nuclear reactor until a sufficient amount of Pu-239 accumulated, and then separate it out by ordinary chemical means.

Thus in 1942, when Enrico Fermi and his coworkers at the University of Chicago produced the world's first controlled chain reaction within a pile of cans containing ordinary (nonenriched) uranium powder, separated by blocks of very pure graphite, the chainreacting pile had a double significance: It represented a new source of energy, but it also had a sinister meaning. It represented an easy path to nuclear weapons, since one of the by-products of the reaction was a fissionable isotope of plutonium, Pu-239. The bomb dropped on Hiroshima in 1945 used U-235, while the Nagasaki bomb used Pu-239.

By reprocessing spent nuclear fuel rods, using ordinary chemical means, a nation with a power reactor can obtain weapons-usable Pu-239. Even when such reprocessing is performed under international control, the uncertainty as to the amount of Pu-239 obtained is large enough so that the operation might superficially seem to conform to regulations while still supplying enough Pu-239 to make many bombs.

The enrichment of uranium, i.e. production of uranium with a higher percentage of U-235 than is found in natural uranium is also linked to reactor use. Many reactors of modern design make use of low enriched uranium (LEU) as a fuel. Nations operating such a reactor may claim that they need a program for uranium enrichment in order to produce LEU for fuel rods. However, by operating their ultracentrifuges a little longer, they can easily produce highly enriched uranium (HEU), i.e. uranium containing a high percentage of the rare isotope U-235, and therefore usable in weapons.

2.11. ATOMS FOR PEACE?

Nuclear power generation is not a solution to the problem of obtaining energy without producing dangerous climate change: Known reserves of uranium are only sufficient for the generation of about 25 terawatt-years of electrical energy (Craig, J.R., Vaugn, D.J. and Skinner, B.J., "Resources of the Earth: Origin, Use and Environmental Impact, Third Edition", page 210). This can be compared with the world's current rate of energy use of over 14 terrawatts. Thus, if all of our energy were obtained from nuclear power, existing reserves of uranium would only be sufficient for about 2 years.

It is sometimes argued that a larger amount of electricity could be obtained from the same amount of uranium through the use of fast breeder reactors, but this would involve totally unacceptable proliferation risks. In fast breeder reactors, the fuel rods consist of highly enriched uranium. Around the core, is an envelope of natural uranium. The flux of fast neutrons from the core is sufficient to convert a part of the U-238 in the envelope into Pu-239, a fissionable isotope of plutonium.

Fast breeder reactors are prohibitively dangerous from the standpoint of nuclear proliferation because both the highly enriched uranium from the fuel rods and the Pu-239 from the envelope are directly weapons-usable. It would be impossible, from the standpoint of equity, to maintain that some nations have the right to use fast breeder reactors, while others do not. If all nations used fast breeder reactors, the number of nuclear weapons states would increase drastically.

It is interesting to review the way in which Israel, South Africa, Pakistan, India and North Korea obtained their nuclear weapons, since in all these cases the weapons were constructed under the guise of "atoms for peace", a phrase that future generations may someday regard as being tragically self-contradictory.

Israel began producing nuclear weapons in the late 1960's (with the help of a "peaceful" nuclear reactor provided by France, and with the tacit approval of the United States) and the country is now believed to possess 100-150 of them, including neutron bombs. Israel's policy is one of visibly possessing nuclear weapons while denying their existence.

South Africa, with the help of Israel and France, also weaponized its civil nuclear program, and it tested nuclear weapons in the Indian Ocean in 1979. In 1991 however, South Africa destroyed its nuclear weapons and signed the Nuclear Non-Proliferation Treaty.

India produced what it described as a "peaceful nuclear explosion" in 1974. By 1989 Indian scientists were making efforts to purify the lithium-6 isotope, a key component of the much more powerful thermonuclear bombs. In 1998, India conducted underground tests of nuclear weapons, and is now believed to have roughly 60 warheads, constructed from Pu-239 produced in "peaceful" reactors.

Pakistan's efforts to obtain nuclear weapons were spurred by India's 1974 "peaceful nuclear explosion". As early as 1970, the laboratory of Dr. Abdul Qadeer Khan, (a metallurgist who was to become Pakistan's leading nuclear bomb maker) had been able to obtain from a Dutch firm the high-speed ultracentrifuges needed for uranium enrichment. With unlimited financial support and freedom from auditing requirements, Dr. Khan purchased restricted items needed for nuclear weapon construction from companies in Europe and the United States. In the process, Dr. Khan became an extremely wealthy man. With additional help from China, Pakistan was ready to test five nuclear weapons in 1998.



Figure 2.3: Radioactive contamination from the Fukushima disaster is spreading through the food chain of marine life throughout the Pacific region.



Figure 2.4: The Israeli nuclear technician and whistleblower Mordechai Vanunu called public attention to Israel's nuclear weapons while on a trip to England. He was lured to Italy by a Mossad "honey trap", where he was drugged, kid-napped and transported to Israel by Mossad.



Figure 2.5: Vanunu was imprisoned for 18 years, during 11 of which he was held in solitary confinement and subjected to psychological torture, such as not being allowed to sleep for long periods.

2.11. ATOMS FOR PEACE?

The Indian and Pakistani nuclear bomb tests, conducted in rapid succession, presented the world with the danger that these devastating weapons would be used in the conflict over Kashmir. Indeed, Pakistan announced that if a war broke out using conventional weapons, Pakistan's nuclear weapons would be used "at an early stage".

In Pakistan, Dr. A.Q. Khan became a great national hero. He was presented as the person who had saved Pakistan from attack by India by creating Pakistan's own nuclear weapons. In a Washington Post article (1 February, 2004) Pervez Hoodbhoy wrote: "Nuclear nationalism was the order of the day as governments vigorously promoted the bomb as the symbol of Pakistan's high scientific achievement and self- respect..." Similar manifestations of nuclear nationalism could also be seen in India after India's 1998 bomb tests.

Early in 2004, it was revealed that Dr. Khan had for years been selling nuclear secrets and equipment to Libya, Iran and North Korea, and that he had contacts with Al Qaeda. However, observers considered that it was unlikely that Khan would be tried, since a trial might implicate Pakistan's army as well as two of its former prime ministers.

There is a danger that Pakistan's unpopular government may be overthrown, and that the revolutionists might give Pakistan's nuclear weapons to a subnational organization. This type of danger is a general one associated with nuclear proliferation. As more and more countries obtain nuclear weapons, it becomes increasingly likely that one of them will undergo a revolution, during the course of which nuclear weapons will fall into the hands of criminals or terrorists.

There is also a possibility that poorly-guarded fissionable material could fall into the hands of subnational groups, who would then succeed in constructing their own nuclear weapons. Given a critical mass of highly-enriched uranium, a terrorist group, or an organized criminal (Mafia) group, could easily construct a crude gun-type nuclear explosive device. Pu-239 is more difficult to use since it is highly radioactive, but the physicist Frank Barnaby believes that a subnational group could nevertheless construct a crude nuclear bomb (of the Nagasaki type) from this material.

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, or by organized criminals for the purpose of extortion. 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 criminals or 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.

Finally we must remember that if the number of nations possessing nuclear weapons becomes very large, there will be a greatly increased chance that these weapons will be used in conflicts between nations, either by accident or through irresponsible political decisions. The slogan "Atoms for Peace" has proved to be such a misnomer that it would be laughable if it were not so tragic. Nuclear power generation has been a terrible mistake. We must stop before we turn our beautiful earth into a radioactive wasteland.

2.12 Cancer threat from radioactive leaks at Hanford

On August 9, 1945, a nuclear bomb was dropped on the Japanese city of Nagasaki. Within a radius of one mile, destruction was total. People were vaporized so that the only shadows on concrete pavements were left to show where they had been. Many people outside the radius of total destruction were trapped in their collapsed houses, and were burned alive by the fire that followed. By the end of 1945, an estimated 80,000 men, women, young children, babies and old people had died as a result of the bombing. As the years passed more people continued to die from radiation sickness.

Plutonium for the bomb that destroyed Nagasaki had been made at an enormous nuclear reactor station located at Hanford in the state of Washington. During the Cold War, the reactors at Hanford produced enough weapons-usable plutonium for 60,000 nuclear weapons. The continued existence of plutonium and highly-enriched uranium-235 in the stockpiles of nuclear weapons states hangs like a dark cloud over the future of humanity. A full scale thermonuclear war would be the ultimate ecological catastrophe, threatening to make the world permanently uninhabitable.

Besides playing a large role in the tragedy of Nagasaki, the reactor complex at Hanford has damaged the health of many thousands of Americans. The prospects for the future are even worse. Many millions of gallons of radioactive waste are held in Hanford's aging storage tanks, the majority of which have exceeded their planned lifetimes. The following quotations are taken from a Wikipedia article on Hanford, especially the section devoted to ecological concerns:

"A huge volume of water from the Columbia River was required to dissipate the heat produced by Hanford's nuclear reactors. From 1944 to 1971, pump systems drew cooling water from the river and, after treating this water for use by the reactors, returned it to the river. Before being released back into the river, the used water was held in large tanks known as retention basins for up to six hours. Longer-lived isotopes were not affected by this retention, and several tetrabecquerels entered the river every day. These releases were kept secret by the federal government. Radiation was later measured downstream as far west as the Washington and Oregon coasts."

"The plutonium separation process also resulted in the release of radioactive isotopes into the air, which were carried by the wind throughout southeastern Washington and into parts of Idaho, Montana, Oregon and British Colombia. Downwinders were exposed to radionuclide's, particularly Iodine 131... These radionuclide's filtered into the food chain via contaminated fields where dairy cows grazed; hazardous fallout was ingested by communities who consumed the radioactive food and drank the milk. Most of these airborne releases were a part of Hanford's routine operations, while a few of the larger releases occurred in isolated incidents." "In response to an article in the Spokane Spokesman Review in September 1985, the Department of Energy announced its intent to declassify environmental records and in February, 1986 released to the public 19,000 pages of previously unavailable historical documents about Hanford's operations. The Washington State Department of Health collaborated with the citizen-led Hanford Health Information Network (HHIN) to publicize data about the health effects of Hanford's operations. HHIN reports concluded that residents who lived downwind from Hanford or who used the Columbia River downstream were exposed to elevated doses of radiation that placed them at increased risk for various cancers and other diseases."

"The most significant challenge at Hanford is stabilizing the 53 million U.S. Gallons (204,000 m3) of high-level radioactive waste stored in 177 underground tanks. About a third of these tanks have leaked waste into the soil and groundwater. As of 2008, most of the liquid waste has been transferred to more secure double-shelled tanks; however, 2.8 million U.S. Gallons (10,600 m3) of liquid waste, together with 27 million U.S. gallons (100,000 m3) of salt cake and sludge, remains in the single-shelled tanks. That waste was originally scheduled to be removed by 2018. The revised deadline is 2040. Nearby aquifers contain an estimated 270 billion U.S. Gallons (1 billion m3) of contaminated groundwater as a result of the leaks. As of 2008, 1 million U.S. Gallons (4,000 m3) of highly radioactive waste is traveling through the groundwater toward the Columbia River."

The documents made public in 1986 revealed that radiation was intentionally and secretly released by the plant and that people living near to it acted as unknowing guinea pigs in experiments testing radiation dangers. Thousands of people who live in the vicinity of the Hanford Site have suffered an array of health problems including thyroid cancers, autoimmune diseases and reproductive disorders that they feel are the direct result of these releases and experiments.

In thinking about the dangers posed by leakage of radioactive waste, we should remember that many of the dangerous radioisotopes involved have half-lives of hundreds of thousands of years. Thus, it is not sufficient to seal them into containers that will last for a century or even a millennium. We must find containers that will last for a hundred thousand years or more, longer than any human structure has ever lasted. This logic has lead Finland to deposit its radioactive waste in a complex of underground tunnels carved out of solid rock. But looking ahead for a hundred thousand years involves other problems: If humans survive for that long, what language will they speak? Certainly not the languages of today. How can we warn them that the complex of tunnels containing radioactive waste is a death trap? The reader is urged to see a film exploring these problems, "Into Eternity", by the young Danish film-maker Michael Madsen. Here is the link: http://dotsub.com/view/8e40ebda-5966-4212-9b96-6abbce3c6577.

We have already gone a long way towards turning our beautiful planet earth into a nuclear wasteland. In the future, let us be more careful, as guardians of a precious heritage, the natural world and the lives of all future generations.

2.13 An accident waiting to happen

In Stanley Kubrick's film, "Dr. Strangelove", a paranoid ultra-nationalist brigadier general, Jack D. Ripper, orders a nuclear attack on the Soviet Union because he believes that the Soviets are using water fluoridation as a means to rob Americans of their "precious bodily fluids". Efforts are made to recall the US bombers, but this proves to be impossible, and the attack triggers the Soviet "Doomsday Machine". The world is destroyed.

Kubrick's film is a black comedy, and we all laugh at it, especially because of the brilliant performance of Peter Sellers in multiple roles. Unfortunately, however, the film comes uncomfortably close to reality. An all-destroying nuclear war could very easily be started by an insane or incompetent person whose hand happens to be on the red button.

This possibility (or probability) has recently come to public attention through newspaper articles revealing that 11 of the officers responsible for launching US nuclear missiles have been fired because of drug addiction. Furthermore, a larger number of missile launch officers were found to be cheating on competence examinations. Three dozen officers were involved in the cheating ring, and some reports state that an equal number of others may have known about it., and remained silent. Finally, it was shown that safety rules were being deliberately ignored. The men involved, were said to be "burned out".

According to an article in The Guardian (Wednesday, 15 January, 2014), "Revelations of misconduct and incompetence in the nuclear missile program go back at least to 2007, when six nuclear-tipped cruise missiles were accidentally loaded onto a B-52 bomber in Minot, North Dakota, and flown to a base in Louisiana."

"Last March, military inspectors gave officers at the ICBM base in Minot the equivalent of a 'D' grade for launch mastery. Â A month later, 17 officers were stripped of their authority to launch the missiles."

"In October, a senior air force officer in charge of 450 ICBM's, major general Michael Carey, was fired after accusations of drunken misconduct during a summer trip to Moscow. An internal investigation found that Carey drank heavily, cavorted with two foreign women and visited a nightclub called La Cantina, where Maj. Gen. Carey had alcohol and kept trying to get the band to let him play with them."

The possibility that a catastrophic nuclear war could be triggered by a madman gains force from the recent statements of Benjamin Netanyahu, who has said repeatedly that, with or without US help, Israel intends to attack Iran. Such an attack, besides being a war crime, would be literally insane.

If Netanyahu believes that a war with Iran would be short or limited, he is ignoring several very obvious dangers. Such a war would most probably escalate into a widespread general war in the Middle East. It could cause a revolution in Pakistan, and the new revolutionary government of Pakistan would be likely to enter the war on the side of Iran, bringing with it Pakistan's nuclear weapons. Russia and China, both staunch allies of Iran, might be drawn into the conflict. There is a danger that the conflict could escalate into a Third World War, where nuclear weapons might easily be used, either by accident or intentionally.



Figure 2.6: Peter Sellers (left) listens while Brigadier General Jack D. Ripper tells him about the Soviet conspiracy to steal his "precious bodily fluids".



Figure 2.7: Peter Sellers as Dr. Strangelove. He has to restrain his black-gloved crippled hand, which keeps trying to give a Nazi salute.



Figure 2.8: General Buck Turgidson (George C. Scott) struggles with the Russian Ambassador. Peter Sellers (right) playing the US President, rebukes them for fighting in the War Room.



Figure 2.9: Major T. "King" Kong rides a nuclear bomb on its way down, where it will trigger the Soviet Doomsday Machine and ultimately destroy the world.



Figure 2.10: Benjamin Netanyahu has stated repeatedly that, with or without US support, Israel will attack Iran, an action that could escalate uncontrollably into World War III.



China could do grave economic damage to the United States through its large dollar holdings. Much of the world's supply of petroleum passes through the Straits of Hormuz, and a war in the region could greatly raise the price of oil, triggering a depression that might rival or surpass the Great Depression of the 1920's and 1930's. \hat{A}

The probability of a catastrophic nuclear war occurring by accident is made greater by the fact that several thousand nuclear weapons are kept on "hair-trigger alert" with a quasi-automatic reaction time measured in minutes. There is a constant danger that a nuclear war will be triggered by an error in evaluating a signal on a radar screen.

2.14 Nuclear weapons are criminal! Every war is a crime!

War was always madness, always immoral, always the cause of unspeakable suffering, economic waste and widespread destruction, and always a source of poverty, hate, barbarism and endless cycles of revenge and counter-revenge. It has always been a crime for soldiers to kill people, just as it is a crime for murderers in civil society to kill people. No flag has ever been wide enough to cover up atrocities.

But today, the development of all-destroying modern weapons has put war completely beyond the bounds of sanity and elementary humanity.

Today, war is not only insane, but also a violation of international law. Both the United Nations Charter and the Nuremberg Principles make it a crime to launch an aggressive war. According to the Nuremberg Principles, every soldier is responsible for the crimes that he or she commits, even while acting under the orders of a superior officer.

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

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

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ECOLOGICAL IMPACT OF MILITARISM

Chapter 3 DRIVING FORCES BEHIND WAR

3.1 Militarism and money

Military-industrial complexes throughout the world involve a circular flow of money. The vast profits from arms industries are used to buy the votes of politicians, who then vote for obscenely bloated "defence" budgets. Military-industrial complexes need enemies. Without them they would wither. Thus, tensions are manufactured by corrupt politicians in the pay of arms industries. As Arundhati Roy famously observed, "Once weapons were manufactured to fight wars. Now wars are manufactured to sell weapons." Donald Trump has recently threatened to attack both Iran and North Korea with nuclear weapons. The United States, under Trump, is also threatening both Russia and China. Any such conflict could escalate uncontrollably into an all-destroying global thermonuclear war.

3.2 Ethology

In the long run, because of the terrible weapons that have already been produced through the misuse of science, and because of the even more terrible weapons that are likely to be invented in the future, the only way in which we can ensure the survival of civilization is to abolish the institution of war. But is this possible? Or are the emotions that make war possible so much a part of human nature that we cannot stop humans from fighting any more than we can stop cats and dogs from fighting? Can biological science throw any light on the problem of why our supposedly rational species seems intent on choosing war, pain and death instead of peace, happiness and life? To answer this question, we need to turn to the science of ethology - the study of inherited emotional tendencies and behavior patterns in animals and humans.

In *The Origin of Species*, Charles Darwin devoted a chapter to the evolution of instincts, and he later published a separate book on *The Expression of the Emotions in Man and Animals*. Because of these pioneering studies, Darwin is considered to be the founder of ethology.

The study of inherited behavior patterns in animals (and humans) was continued in



Figure 3.1: Because of Charles Darwin's book "The Expression of Emotions in Man and Animals", he is considered to be the founder of the field of Ethology, the study of inherited behavior patterns.



Figure 3.2: Nikolaas Tinbergen (1907-1988) on the left, with Konrad Lorenz (1903-1989). Together with Karl von Frisch (1886-1982) they shared the 1973 Nobel Prize in Physiology and Medicine for their pioneering work in Ethology.

the 20th century by such researchers as Karl von Frisch (1886-1982), Nikolaas Tinbergen (1907-1988), and Konrad Lorenz (1903-1989), three scientists who shared a Nobel Prize in Medicine and Physiology in 1973.

The third of the 1973 prizewinners, Konrad Lorenz, is controversial, but at the same time very interesting in the context of studies of the causes of war and discussions of how war may be avoided. As a young boy, he was very fond of animals, and his tolerant parents allowed him to build up a large menagerie in their house in Altenberg, Austria. Even as a child, he became an expert on waterfowl behavior, and he discovered the phenomenon of imprinting. He was given a one day old duckling, and found, to his intense joy, that it transferred its following response to his person. As Lorenz discovered, young waterfowl have a short period immediately after being hatched, when they identify as their "mother" whomever they see first. In later life, Lorenz continued his studies of imprinting, and there exists a touching photograph of him, with his white beard, standing waist-deep in a pond, surrounded by an adoring group of goslings who believe him to be their mother. Lorenz also studied bonding behavior in waterfowl.

It is, however, for his controversial book *On Aggression* that Konrad Lorenz is best known. In this book, Lorenz makes a distinction between intergroup aggression and intragroup aggression. Among animals, he points out, rank-determining fights are seldom fatal. Thus, for example, the fights that determine leadership within a wolf pack end when the loser makes a gesture of submission. By contrast, fights between groups of animals are often fights to the death, examples being wars between ant colonies, or of bees against intruders, or the defense of a rat pack against strange rats.

Many animals, humans included, seem willing to kill or be killed in defense of the communities to which they belong. Lorenz calls this behavioral tendency a "communal



Figure 3.3: Konrad Lorenz with geese who consider him to be their mother.

3.2. ETHOLOGY

defense response". He points out that the "holy shiver" - the tingling of the spine that humans experience when performing a heroic act in defense of their communities - is related to the prehuman reflex for raising the hair on the back of an animal as it confronts an enemy - a reflex that makes the animal seem larger than it really is.

In his book *On Aggression*, Konrad Lorenz gives the following description of the emotions of a hero preparing to risk his life for the sake of the group:

"In reality, militant enthusiasm is a specialized form of communal aggression, clearly distinct from and yet functionally related to the more primitive forms of individual aggression. Every man of normally strong emotions knows, from his own experience, the subjective phenomena that go hand in hand with the response of militant enthusiasm. A shiver runs down the back and, as more exact observation shows, along the outside of both arms. One soars elated, above all the ties of everyday life, one is ready to abandon all for the call of what, in the moment of this specific emotion, seems to be a sacred duty. All obstacles in its path become unimportant; the instinctive inhibitions against hurting or killing one's fellows lose, unfortunately, much of their power. Rational considerations, criticisms, and all reasonable arguments against the behavior dictated by militant enthusiasm are silenced by an amazing reversal of all values, making them appear not only untenable, but base and dishonorable.

Men may enjoy the feeling of absolute righteousness even while they commit atrocities. Conceptual thought and moral responsibility are at their lowest ebb. As the Ukrainian proverb says: 'When the banner is unfurled, all reason is in the trumpet'."

"The subjective experiences just described are correlated with the following objectively demonstrable phenomena. The tone of the striated musculature is raised, the carriage is stiffened, the arms are raised from the sides and slightly rotated inward, so that the elbows point outward. The head is proudly raised, the chin stuck out, and the facial muscles mime the 'hero face' familiar from the films. On the back and along the outer surface of the arms, the hair stands on end. This is the objectively observed aspect of the shiver!"

"Anybody who has ever seen the corresponding behavior of the male chimpanzee defending his band or family with self-sacrificing courage will doubt the purely spiritual character of human enthusiasm. The chimp, too, sticks out his chin, stiffens his body, and raises his elbows; his hair stands on end, producing a terrifying magnification of his body contours as seen from the front. The inward rotation of the arms obviously has the purpose of turning the longest-haired side outward to enhance the effect. The whole combination of body attitude and hair-raising constitutes a bluff. This is also seen when a cat humps its back, and is calculated to make the animal appear bigger and more dangerous than it really is. Our shiver, which in German poetry is called a 'heiliger Schauer', a 'holy' shiver, turns out to be the vestige of a prehuman vegetative response for making a fur bristle which we no longer have. To the humble seeker for biological truth, there cannot be the slightest doubt that human militant enthusiasm evolved out of a communal defense response of our prehuman ancestor."

Lorenz goes on to say, "An impartial visitor from another planet, looking at man as he is today - in his hand the atom bomb, the product of his intelligence - in his heart the aggression drive, inherited from his anthropoid ancestors, which the same intelligence cannot control - such a visitor would not give mankind much chance of survival."

In an essay entitled *The Urge to Self-Destruction*¹, Arthur Koestler says:

"Even a cursory glance at history should convince one that individual crimes, committed for selfish motives, play a quite insignificant role in the human tragedy compared with the numbers massacred in unselfish love of one's tribe, nation, dynasty, church or ideology... Wars are not fought for personal gain, but out of loyalty and devotion to king, country or cause..."

"We have seen on the screen the radiant love of the Führer on the faces of the Hitler Youth... They are transfixed with love, like monks in ecstasy on religious paintings. The sound of the nation's anthem, the sight of its proud flag, makes you feel part of a wonderfully loving community. The fanatic is prepared to lay down his life for the object of his worship, as the lover is prepared to die for his idol. He is, alas, also prepared to kill anybody who represents a supposed threat to the idol." The emotion described here by Koestler is the same as the communal defense mechanism ("militant enthusiasm") described in biological terms by Lorenz.

Generations of schoolboys have learned the Latin motto: "Dulce et decorum est pro patria mori" - it is both sweet and noble to die for one's country. Even in today's world, death in battle in defense of country and religion is still praised by nationalists. However, because of the development of weapons of mass destruction, both nationalism and narrow patriotism have become dangerous anachronisms.

In thinking of violence and war, we must be extremely careful not to confuse the behavioral patterns that lead to wife-beating or bar-room brawls with those that lead to episodes like the trench warfare of the First World War, or to the nuclear bombing of Hiroshima and Nagasaki. The first type of aggression is similar to the rank-determining fights of animals, while the second is more akin to the team-spirit exhibited by a football side. Heroic behavior in defense of one's community has been praised throughout the ages, but the tendency to such behavior has now become a threat to the survival of civilization, since tribalism makes war possible, and war with thermonuclear weapons threatens civilization with catastrophe.

Warfare involves not only a high degree of aggression, but also an extremely high degree of altruism. Soldiers kill, but they also sacrifice their own lives. Thus patriotism and duty are as essential to war as the willingness to kill. As Arthur Koestler points out, "Wars are not fought for personal gain, but out of loyalty and devotion to king, country or cause..."

Tribalism involves passionate attachment to one's own group, self-sacrifice for the sake of the group, willingness both to die and to kill if necessary to defend the group from its enemies, and belief that in case of a conflict, one's own group is always in the right.

¹in The Place of Value in a World of Facts, A. Tiselius and S. Nielsson editors, Wiley, New York, (1970)

3.3 Population genetics

If we examine altruism and aggression in humans, we notice that members of our species exhibit great altruism towards their own children. Kindness towards close relatives is also characteristic of human behavior, and the closer the biological relationship is between two humans, the greater is the altruism they tend to show towards each other. This profile of altruism is easy to explain on the basis of Darwinian natural selection since two closely related individuals share many genes and, if they cooperate, the genes will be more effectively propagated.

To explain from an evolutionary point of view the communal defense mechanism discussed by Lorenz - the willingness of humans to kill and be killed in defense of their communities - we have only to imagine that our ancestors lived in small tribes and that marriage was likely to take place within a tribe rather than across tribal boundaries. Under these circumstances, each tribe would tend to consist of genetically similar individuals. The tribe itself, rather than the individual, would be the unit on which the evolutionary forces of natural selection would act. The idea of group selection in evolution was proposed in the 1930's by J.B.S. Haldane and R.A. Fisher, and more recently it has been discussed by W.D. Hamilton and E.O. Wilson.

According to the group selection model, a tribe whose members showed altruism towards each other would be more likely to survive than a tribe whose members cooperated less effectively. Since several tribes might be in competition for the same territory, intertribal aggression might, under some circumstances, increase the chances for survival of one's own tribe. Thus, on the basis of the group selection model, one would expect humans to be kind and cooperative towards members of their own group, but at the same time to sometimes exhibit aggression towards members of other groups, especially in conflicts over territory. One would also expect intergroup conflicts to be most severe in cases where the boundaries between groups are sharpest - where marriage is forbidden across the boundaries.



Figure 3.4: Sir Ronald Aylmer Fischer (1890-1962). Together with J.B.S Haldane he pioneered the theory of population genetics. Recent contributions to this theory have been made by W.D. Hamilton and E.O. Wilson.
3.4 Hope for the future

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 multiethnic.

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. These tribal markings will be discussed in more detail below.

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.

On our small but beautiful earth. made small by technology, made beautiful by nature, there is room for one group only: the all-inclusive family of humankind.

3.5 Religion and ethnic identity

An acceleration of human cultural development seems to have begun approximately 70,000 years ago. The first art objects date from that period, as do migrations that ultimately took modern man across the Bering Strait to the western hemisphere. A land bridge extending from Siberia to Alaska is thought to have been formed approximately 70,000 years ago, disappearing again roughly 10,000 years before the present. Cultural and genetic studies indicate that migrations from Asia to North America took place during this period. Shamanism,² which is found both in Asia and the new world, as well as among the Sami (Lapps) of northern Scandinavia, is an example of the cultural links between the hunting societies of these regions.

Before the acceleration of human cultural development just mentioned, genetic change and cultural change went hand in hand, but during the last 70,000 years, the constantly accelerating rate of information-accumulation and cultural evolution has increasingly outdistanced the rate of genetic change in humans. Genetically we are almost identical with our hunter-gatherer ancestors of 70,000 years ago, but cultural evolution has changed our way of life beyond recognition.

 $^{^{2}}$ A shaman is a special member of a hunting society who, while in a trance, is thought to be able pass between the upper world, the present world, and the lower world, to cure illnesses, and to insure the success of a hunt.

Humans are capable of cultural evolution because it is so easy to overwrite and modify our instinctive behavior patterns with learned behavior. Within the animal kingdom, humans are undoubtedly the champions in this respect. No other species is so good at learning as we are. During the early stages of cultural evolution, the tendency of humans to be religious may have facilitated the overwriting of instinctive behavior with the culture of the tribe. Since religions, like languages, are closely associated with particular cultures, they serve as marks of ethnic identity.

3.6 Tribal markings; ethnicity; pseudospeciation

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-Ebesfeldt, 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 the 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, fashions, veils, chadors, and headdresses; caste markings in India; use or nonuse of perfumes; codes of honor and value systems; traditions of hospitality and manners; peculiarities of diet (certain foods forbidden, others preferred); giving traditional names to children; knowledge of dances and songs; knowledge of recipes; knowledge of common stories, literature, myths, poetry or common history; festivals, ceremonies, and rituals; burial customs, treatment of the dead and ancestor worship; methods of building and decorating homes; games and sports peculiar to a culture;



Figure 3.5: A tatooed face can help to establish tribal identity



Figure 3.6: An example of the dueling scars that Prussian army officers once used to distinguish their caste from outsiders.

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". Undoubtedly there many people in New York who would never think of marrying someone who could not appreciate the the paintings of Jasper Johns, and many in London who would consider anyone had not read all the books of Virginia Wolfe to be entirely outside the bounds of civilization.

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.

Within a particular language, dialects and accents mark the boundaries of subgroups. For example, in England, great social significance is attached to accents and diction, a tendency that George Bernard Shaw satirized in his play, *Pygmalion*, which later gained greater fame as the musical comedy, *My Fair Lady*. This being the case, we can ask why all citizens of England do not follow the example of Eliza Doolittle in Shaw's play, and improve their social positions by acquiring Oxford accents. However, to do so would be to run the risk of being laughed at by one's peers and regarded as a traitor to one's own local community and friends. School children everywhere can be very cruel to any child who does not fit into the local pattern. At Eton, an Oxford accent is compulsory; but in a Yorkshire school, a child with an Oxford accent would suffer for it.

Next after language, the most important "tribal marking" is religion. As mentioned above, 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, or at any rate, the needs that religion satisfies seem to be a part of our inherited makeup. Otherwise, religion would not be so universal as it is.

Religion is often strongly associated with ethnicity and nationalism, that is to say, it is associated with the demarcation of a particular group of people by its culture or race. For example, the Jewish religion is associated with Zionism and with Jewish nationalism. Similarly Islam is strongly associated with Arab nationalism. Christianity too has played an important role in in many aggressive wars, for example in the Crusades, in the European conquest of the New World, in European colonial conquests in Africa and Asia, and in the wars between Catholics and Protestants within Europe. We shall see in a later chapter how the originators of the German nationalist movement (the precursors of the Nazis), used quasi-religious psychological methods.

Human history seems to be saturated with blood. It would be impossible to enumerate the conflicts with which the story of humankind is stained. Many of the atrocities of history have involved what Irenäus Eibl-Eibesfeldt called "pseudospeciation", that is to say, they were committed in conflicts involving groups between which sharply marked cultural barriers have made intermarriage difficult and infrequent. Examples include the present conflict between Israelis and Palestinians; "racial cleansing" in Kosovo; the devastating wars between Catholics and Protestants in Europe; the Lebanese civil war; genocide committed against Jews and Gypsies during World War II; recent genocide in Rwanda; current intertribal massacres in the Ituri Provence of Congo; use of poison gas against Kurdish civilians by Saddam Hussein's regime in Iraq; the massacre of Armenians by Turks; massacres of Hindus by Muslims and of Muslims by Hindus in post-independence India; massacres of Native Americans by white conquerors and settlers in all parts of the New World; and massacres committed during the Crusades. The list seems almost endless.

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.

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. Our political leaders have the duty to move away from nationalism and militarism. If they fail to do this, they will have failed humankind at a time of great danger and crisis.



Figure 3.7: An illustration from Darwin's book, "The Expression of Emotions in Man and Animals". Here a cat raises its back and fur when confronting an enemy to make itself seem larger and more dangerous. This reflex was later discussed by the ethologist Konrad Lorenz.



Figure 3.8: Professor E.O. Wilson of Harvard is famous for his books on Sociobiology.



Figure 3.9: Professor Richard Dawkins of Oxford, controversial author of "The Selfish Gene" and many other books. He has contributed much to the debate on relationships between science, religion, aggression and altruism.



Figure 3.10: William Donald Hamilton was a Royal Society Research Professor at Oxford University until his death in 2000. He contributed importantly to our understanding of altruism from the standpoint of genetics.

3.7 The arms race prior to World War 1

The inherited tendency towards tribalism in human nature makes war possible. Humans are willing to kill and to be killed to defend their own group ahainst perceived enemies. However, there is another element that drives and perpetuates the institution of war - the enoumous amounts of money earned by arms manufacturers - the military-industrial complec against which Dwight D. Eisenhower warned in his famus farewell address.

In an article entitled Arms Race Prior to 1914, Armament Policy³, Eric Brose writes: "New weapons produced during the Industrial Revolution in the late 1800s heightened existing tensions among European nations as countries strove to outpace their enemies technologically. This armaments race accelerated in the decade before 1914 as the Triple Alliance of Germany, Austria-Hungary, and Italy squared off against the Triple Entente of France, Russia, and Britain. Germany's fears of increases in Russian armaments, and British fears of the German naval buildup, contributed heavily to the outbreak and spread of the First World War in 1914."

The Wikipedia article on *Arms race* states that "From 1897 to 1914, a naval arms race between the United Kingdom and Germany took place. British concern about rapid increase in German naval power resulted in a costly building competition of Dreadnoughtclass ships. This tense arms race lasted until 1914, when the war broke out. After the war, a new arms race developed among the victorious Allies, which was temporarily ended by the Washington Naval Treaty.

"In addition to the British and Germans, contemporaneous but smaller naval arms races also broke out between Russia and the Ottoman Empire; the Ottomans and Greece; France and Italy; the United States and Japan; and Brazil, Argentina, and Chile.

"The United Kingdom had the largest navy in the world. In accord with Wilhelm II's enthusiasm for an expanded German navy and the strong desires of Grand Admiral Alfred von Tirpitz, Secretary of State of the German Imperial Naval Office, four Fleet Acts from 1898 and 1912 greatly expanded the German High Seas Fleet. The German aim was to build a fleet that would be two thirds the size of the British navy. The plan was sparked by the threat of the British Foreign Office in March 1897, after the British invasion of Transvaal that started the Boer War, of blockading the German coast and thereby crippling the German economy if Germany intervened in the conflict in Transvaal. From 1905 onward, the British navy developed plans for such a blockade, which was a central part of British strategy.

"In reaction to the challenge to its naval supremacy, from 1902 to 1910, the British Royal Navy embarked on a massive expansion to keep ahead of the Germans. The competition came to focus on the revolutionary new ships based on HMS Dreadnought, which was launched in 1906."

³International Encyclopedia of the First World War



Figure 3.11: Left to right, US, Britain, Germany, France and Japan, engage in a "no limits" game for naval supremacy.

3.8 Krupp, Thyssen and Germany's steel industry

The Krupp family business, known as Friedrich Krupp AG, was the largest company in Europe at the beginning of the 20th century. It was important to weapons development and production in both world wars. One of the most powerful dynasties in European history, for 400 years Krupp flourished as the premier weapons manufacturer for Germany. From the Thirty Years' War until the end of the Second World War, they produced everything from battleships, U-boats, tanks, howitzers, guns, utilities, and hundreds of other commodities.

The Thyssen family similarly profited from the arms races prior to World War I and World War II. August Thyssen (1842-1925) founded a large iron and steel company in the Ruhr district of Germany, and was succeeded by his son Fritz Thyssen, who greatly aided Hitler's rise to power.

3.9 Colonialism and the outbreak of the First World War

The First World War broke out approximately 100 years ago, and much thought has been given to the causes of this tragic event, whose consequences continue to cast a dark shadow over the human future. When the war ended four years later, ten million young men had been killed and twenty million wounded, of whom six million were crippled for life. The war had cost 350,000,000,000 1919 dollars. This was a calculable cost; but the cost in human suffering and brutalization of values was incalculable.

It hardly mattered whose fault the catastrophe had been. Perhaps the Austrian government had been more to blame than any other. But blame for the war certainly did not rest with the Austrian people nor with the young Austrians who had been forced to fight. However, the tragedy of the First World War was that it created long-lasting hatred between the nations involved; and in this way it lead, only twenty years later, to an even more catastrophic global war, during the course of which nuclear weapons were developed.

Most scholars believe that competing colonial ambitions played an important role in setting the stage for the First World War. A second factor was an armaments race between European countries, and the huge profits gained by arms manufacturers. Even at that time, the Military-industrial complex was firmly established; and today it continues to be the greatest source of war, together with neocolonialism.⁴

⁴http://alphahistory.com/worldwar1/imperialism/ http://www.flowofhistory.com/units/etc/19/26 http://alphahistory.com/worldwar1/militarism/

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Figure 3.12: Map of European colonies in Africa in 1914, just before the First World War. Source: www.createdebate.com

3.10 Prescott Bush and Hitler

Prescott Sheldon Bush (1895-1972), the father of George H.W. Bush and grandfather of George W. Bush, actively supported the revival of Germany's armament's industry in the 1930's, as well as supplying large amounts of money to Adolf Hitler's Nazi Party.⁵

An article in *The Guardian*⁶, Ben Aris and Dubcab Campbell write that "George Bush's grandfather, the late US senator Prescott Bush, was a director and shareholder of companies that profited from their involvement with the financial backers of Nazi Germany.

"The Guardian has obtained confirmation from newly discovered files in the US National Archives that a firm of which Prescott Bush was a director was involved with the financial architects of Nazism.

"His business dealings, which continued until his company's assets were seized in 1942 under the Trading with the Enemy Act, has led more than 60 years later to a civil action for damages being brought in Germany against the Bush family by two former slave laborers at Auschwitz and to a hum of pre-election controversy.

"The debate over Prescott Bush's behavior has been bubbling under the surface for some time. There has been a steady Internet chatter about the "Bush/Nazi" connection,

⁵https://www.youtube.com/watch?v=TnHnjmCYjy4

 $https://www.youtube.com/watch?v{=}7BZCfbrXKs4$

https://www.youtube.com/watch?v=7BZCfbrXKs4

http://www.georgewalkerbush.net/bushfamilyfundedhitler.htm

http://www.theguardian.com/world/2004/sep/25/usa.secondworldwar

 $^{^{6}}$ September 25, 2004



Figure 3.13: Prescott Bush, the father of George H.W. Bush and grandfather of George W. Bush, supported Hitler's rise to power with large financial contributions to the Nazi Party. The photo shows them together. Source: topinfopost.com

much of it inaccurate and unfair. But the new documents, many of which were only declassified last year, show that even after America had entered the war and when there was already significant information about the Nazis' plans and policies, he worked for and profited from companies closely involved with the very German businesses that financed Hitler's rise to power. It has also been suggested that the money he made from these dealings helped to establish the Bush family fortune and set up its political dynasty.

"Bush was also on the board of at least one of the companies that formed part of a multinational network of front companies to allow [Fritz] Thyssen to move assets around the world.

"Thyssen owned the largest steel and coal company in Germany and grew rich from Hitler's efforts to re-arm between the two world wars. One of the pillars in Thyssen's international corporate web, UBC, worked exclusively for, and was owned by, a Thyssencontrolled bank in the Netherlands. More tantalizing are Bush's links to the Consolidated Silesian Steel Company (CSSC), based in mineral rich Silesia on the German-Polish border. During the war, the company made use of Nazi slave labor from the concentration camps, including Auschwitz. The ownership of CSSC changed hands several times in the 1930s, but documents from the US National Archive declassified last year link Bush to CSSC, although it is not clear if he and UBC were still involved in the company when Thyssen's American assets were seized in 1942."

3.11 Fritz Thyssen supports Hitler's rise to power

"In 1923, Thyssen met former General Erich Ludendorff, who advised him to attend a speech given by Adolf Hitler, leader of the Nazi Party. Thyssen was impressed by Hitler and his bitter opposition to the Treaty of Versailles, and began to make large donations to the party, including 100,000 gold marks in 1923 to Ludendorff. In this he was unusual among German business leaders, as most were traditional conservatives who regarded the Nazis with suspicion. Thyssen's principal motive in supporting the National Socialists was his great fear of communism; he had little confidence that the various German anticommunist factions would prevent a Soviet-style revolution in Germany unless the popular appeal of communism among the lower classes was co-opted by an anticommunist alternative. Postwar investigators found that he had donated 650,000 Reichsmarks to right-wing parties, mostly to the Nazis, although Thyssen himself claimed to have donated 1 million marks to the Nazi Party. Thyssen remained a member of the German National People's Party until 1932, and did not join the Nazi Party (National Socialist German Workers' Party) until 1933.

"In November, 1932, Thyssen and Hjalmar Schacht were the main organizers of a letter to President Paul von Hindenburg urging him to appoint Hitler as Chancellor. Thyssen also persuaded the Association of German Industrialists to donate 3 million Reichsmarks to the Nazi Party (National Socialist German Workers' Party) for the March, 1933 Reichstag election. As a reward, he was elected a Nazi member of the Reichstag and appointed to the Council of State of Prussia, the largest German state (both purely honorary positions).

"Thyssen welcomed the suppression of the Communist Party, the Social Democrats and the trade unions. In 1934 he was one of the business leaders who persuaded Hitler to suppress the SA, leading to the "Night of the Long Knives". Thyssen accepted the exclusion of Jews from German business and professional life by the Nazis, and dismissed his own Jewish employees. But as a Catholic, he objected to the increasing repression of the Roman Catholic Church, which gathered pace after 1935: in 1937 he sent a letter to Hitler, protesting the persecution of Christians in Germany.[4] The breaking point for Thyssen was the violent pogrom against the Jews in November 1938, known as Kristallnacht, which caused him to resign from the Council of State. By 1939 he was also bitterly criticizing the regime's economic policies, which were subordinating everything to rearmament in preparation for war."



Figure 3.14: An arms race between the major European powers contributed to the start of World War I.



Figure 3.15: World War I was called "The War to End All Wars". Today it seems more like The War that Began All Wars.



Figure 3.16: The naval arms race, which contributed to the start of World War I, enriched steel manufacturers and military shipbuilders.



Figure 3.17: Who is the leader, and who the follower?



Figure 3.18: A vicious circle.



Figure 3.19: Ready, set, go!



Figure 3.20: If our economies depend on armaments industries, it is an unhealthy dependence, analogous to drug addiction.



Figure 3.21: The nuclear arms race casts a dark shadow over the future of human civilization and the biosphere.



Figure 3.22: During the Cuban Missile Crisis, the world came close to a catastrophic thermonuclear war.



Figure 3.23: Dr. Helen Caldecott has worked to document the dangers of both nuclear weapons and nuclear power generation.



Figure 3.24: We must listen to the wise words of Dr. Martin Luther King, Jr.

3.12 Eisenhower's farewell address

In his famous farewell address, US President Dwight Eisenhower eloquently described the terrible effects of an overgrown Military-industrial complex. Here are his words:

"We have been compelled to create a permanent armaments industry of vast proportions.... This conjunction of an immense military establishment and a large arms industry is new in the American experience. The total influence, economic, political, even spiritual, is felt in every city, every State house, every office of the Federal government...[and] 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.

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

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

Today the world spends more than 1.7 trillion dollars (\$1,700,000,000,000) every year on armaments. This vast river of money, almost too large to be imagined, is the "devil's dynamo" driving the institution of war. Politicians notoriously can be bought with a tiny fraction of this enormous amount; hence the decay of democracy. It is also plain that if the almost unbelievable sums now wasted on armaments were used constructively, most of the pressing problems now facing humanity could be solved.

Because the world spends almost two thousand billion dollars each year on armaments, it follows that very many people make their living from war. This is the reason why it is correct to speak of war as an institution, and why it persists, although we know that it is the cause of much of the suffering that inflicts humanity.



Figure 3.25: "In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the Militaryindustrial complex. The potential for the disastrous rise of misplaced power exists and will persist."

3.13 The nuclear arms race

Flaws in the concept of nuclear deterrence

Before discussing other defects in the concept of deterrence, it must be said very clearly that the idea of "massive nuclear retaliation" is completely unacceptable from an ethical point of view. The doctrine of retaliation, performed on a massive scale, violates not only the principles of common human decency and common sense, but also the ethical principles of every major religion. Retaliation is especially contrary to the central commandment of Christianity which tells us to love our neighbor, even if he or she is far away from us, belonging to a different ethnic or political group, and even if our distant neighbor has seriously injured us. This principle has a fundamental place not only in Christianity but also in all other major religions. "Massive retaliation" completely violates these very central ethical principles, which are not only clearly stated and fundamental but also very practical, since they prevent escalatory cycles of revenge and counter-revenge.

Contrast Christian ethics with estimates of the number of deaths that would follow a US nuclear strike against Russia: Several hundred million deaths. These horrifying estimates shock us not only because of the enormous magnitude of the expected mortality, but also because the victims would include people of every kind: women, men, old people, children and infants, completely irrespective of any degree of guilt that they might have. As a 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 devoted to clarifying the question of guilt or innocence. Punishment only follows if guilt can be proved beyond any reasonable doubt. Contrast this with the totally indiscriminate mass slaughter that results from a nuclear attack!

It might be objected that disregard for the guilt or innocence of victims is a universal characteristic of modern war, since statistics show that, with time, a larger and larger percentage of the victims have been civilians, and especially children. For example, the air attacks on Coventry during World War II, or the fire bombings of Dresden and Tokyo, produced massive casualties which involved all segments of the population with complete disregard for the question of guilt or innocence. The answer, I think, is that modern war has become generally unacceptable from an ethical point of view, and this unacceptability is epitomized in nuclear weapons.

The enormous and indiscriminate destruction produced by nuclear weapons formed the background for an historic 1996 decision by the International Court of Justice in the Hague. In response to questions put to it by WHO and the UN General Assembly, the Court ruled that "the threat and use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and particularly the principles and rules of Humanitarian law."

The only *possible* exception to this general rule might be "an extreme circumstance of self-defense, in which the very survival of a state would be at stake". But the Court refused to say that even in this extreme circumstance the threat or use of nuclear weapons



would be legal. It left the exceptional case undecided. In addition, the World Court added unanimously that "there exists an obligation to pursue in good faith *and bring to a conclusion* negotiations leading to nuclear disarmament in all its aspects under strict international control."

This landmark decision has been criticized by the nuclear weapon states as being decided "by a narrow margin", but the structuring of the vote made the margin seem more narrow than it actually was. Seven judges voted against Paragraph 2E of the decision (the paragraph which states that the threat or use of nuclear weapons would be generally illegal, but which mentions as a possible exception the case where a nation might be defending itself from an attack that threatened its very existence.) Seven judges voted for the paragraph, with the President of the Court, Muhammad Bedjaoui of Algeria casting the deciding vote. Thus the Court adopted it, seemingly by a narrow margin. But three of the judges who voted against 2E did so because they believed that no possible exception should be mentioned! Thus, if the vote had been slightly differently structured, the result would have be ten to four.

Of the remaining four judges who cast dissenting votes, three represented nuclear weapons states, while the fourth thought that the Court ought not to have accepted the questions from WHO and the UN. However Judge Schwebel from the United States, who voted against Paragraph 2E, nevertheless added, in a separate opinion, "It cannot be accepted that the use of nuclear weapons on a scale which would - or could - result in the deaths of many millions in indiscriminate inferno and by far-reaching fallout, have pernicious effects in space and time, and render uninhabitable much of the earth, could be lawful." Judge Higgins from the UK, the first woman judge in the history of the Court, had problems with the word "generally" in Paragraph 2E and therefore voted against it, but she thought that a more profound analysis might have led the Court to conclude in favor of illegality in all circumstances. Judge Fleischhauer of Germany said in his separate

opinion, "The nuclear weapon is, in many ways, the negation of the humanitarian considerations underlying the law applicable in armed conflict and the principle of neutrality. The nuclear weapon cannot distinguish between civilian and military targets. It causes immeasurable suffering. The radiation released by it is unable to respect the territorial integrity of neutral States."

President Bedjaoui, summarizing the majority opinion, called nuclear weapons "the ultimate evil", and said "By its nature, the nuclear weapon, this blind weapon, destabilizes Humanitarian law, the law of discrimination in the use of weapons... The ultimate aim of every action in the field of nuclear arms will always be nuclear disarmament, an aim which is no longer utopian and which all have a duty to pursue more actively than ever."

Thus the concept of nuclear deterrence is not only unacceptable from the standpoint of ethics; it is also contrary to international law. The World Court's 1996 advisory Opinion unquestionably also represents the opinion of the majority of the world's peoples. Although no formal plebiscite has been taken, the votes in numerous resolutions of the UN General Assembly speak very clearly on this question. For example the New Agenda Resolution (53/77Y) was adopted by the General Assembly on 4 December 1998 by a massively affirmative vote, in which only 18 out of the 170 member states voted against the resolution.⁷ The New Agenda Resolution proposes numerous practical steps towards complete nuclear disarmament, and it calls on the Nuclear-Weapon States "to demonstrate an unequivocal commitment to the speedy and total elimination of their nuclear weapons and without delay to pursue in good faith and bring to a conclusion negotiations leading to the elimination of these weapons, thereby fulfilling their obligations under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)". Thus, in addition to being ethically unacceptable and contrary to international law, nuclear weapons also contrary to the principles of democracy.

Having said these important things, we can now turn to some of the other defects in the concept of nuclear deterrence. One important defect is that nuclear war may occur through accident or miscalculation - through technical defects or human failings. This possibility is made greater by the fact that despite the end of the Cold War, thousands of missiles carrying nuclear warheads are still kept on a "hair-trigger" state of alert with a quasi-automatic reaction time measured in minutes. There is a constant danger that a nuclear war will be triggered by error in evaluating the signal on a radar screen. For example, the BBC reported recently that a group of scientists and military leaders are worried that a small asteroid entering the earths atmosphere and exploding could trigger a nuclear war if mistaken for a missile strike.

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. Grey⁸ expressed this concern as follows: "The problem, indeed the enduring problem, is that we are resting our future upon a nuclear

⁷Of the 18 countries that voted against the New Agenda resolution, 10 were Eastern European countries hoping for acceptance into NATO, whose votes seem to have been traded for increased probability of acceptance.

⁸Chairman, National Institute for Public Policy

deterrence system concerning which we cannot tolerate even a single malfunction." General Curtis E. LeMay⁹ has written, "In my opinion a general war will grow through a series of political miscalculations and accidents rather than through any deliberate attack by either side." Bruce G. Blair¹⁰ 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."

"But nobody can predict that the fatal accident or unauthorized act will never happen", Fred Ikle of the Rand Corporation has written, "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."

Another serious failure of the concept of nuclear deterrence is that it does not take into account the possibility that atomic bombs may be used by terrorists. Indeed, the threat of nuclear terrorism has today become one of the most pressing dangers that the world faces, a danger that is particularly acute in the United States.

Since 1945, more than 3,000 metric tons (3,000,000 kilograms) of highly enriched uranium and plutonium have been produced - enough for several hundred thousand nuclear weapons. Of this, roughly a million kilograms are in Russia, inadequately guarded, in establishments where the technicians are poorly paid and vulnerable to the temptations of bribery. There is a continuing danger that these fissile materials will fall into the hands of terrorists, or organized criminals, or irresponsible governments. Also, an extensive black market for fissile materials, nuclear weapons components etc. has recently been revealed in connection with the confessions of Pakistan's bomb-maker, Dr. A.Q. Khan. Furthermore, if Pakistan's less-than-stable government should be overthrown, complete nuclear weapons could fall into the hands of terrorists.

On November 3, 2003, Mohamed ElBaradei, Director General of the International Atomic Energy Agency, made a speech to the United Nations in which he called for "limiting the processing of weapons-usable material (separated plutonium and high enriched uranium) in civilian nuclear programmes - as well as the production of new material through reprocessing and enrichment - by agreeing to restrict these operations to facilities exclusively under international control." It is almost incredible, considering the dangers of nuclear proliferation and nuclear terrorism, that such restrictions were not imposed long ago. Nuclear reactors used for "peaceful" purposes unfortunately also generate fissionable isotopes of plutonium, neptunium and americium. Thus all nuclear reactors must be regarded as ambiguous in function, and all must be put under strict international control. One might ask, in fact, whether globally widespread use of nuclear energy is worth the danger that it entails.

The Italian nuclear physicist Francesco Calogero, who has studied the matter closely, believes that terrorists could easily construct a simple gun-type nuclear bomb if they were in possession of a critical mass of highly enriched uranium. In such a simple atomic bomb,

⁹Founder and former Commander in Chief of the United States Strategic Air Command

¹⁰Brookings Institute



Figure 3.26: Recent studies by atmospheric scientists have shown that the smoke from burning cities produced by even a limited nuclear war would have a devastating effect on global agriculture. The studies show that the smoke would rise to the stratosphere, where it would spread globally and remain for a decade, blocking sunlight and destroying the ozone layer. Because of the devastating effect on global agriculture, darkness from even a small nuclear war (e.g. between India and Pakistan) would result in an estimated billion deaths from famine. Nuclear darkness resulting from a large-scale war involving all of the nuclear weapons that are now on high alert status would destroy all agriculture on earth for a period of ten years, and almost all humans would die of starvation. (See O. Toon , A. Robock, and R. Turco, "The Environmental Consequences of Nuclear War", Physics Today, vol. 61, No. 12, 2008, p. 37-42).

two grapefruit-sized subcritical portions of HEU are placed at opposite ends of the barrel of an artillery piece and are driven together by means of a conventional explosive. Prof. Calogero estimates that the fatalities produced by the explosion of such a device in the center of a large city could exceed 100,000.

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.

Today we must give special weight to the danger that a catastrophic nuclear war may occur through the mental instability of a political leader or an error of judgement, since we now are living with Donald Trump and Kim Jong-un. In the words of ICAN's Executive Director Beatrice Finn, the end of human civilization and much of the biosphere is "only a tantrum away". Donald Trump has repeatedly expressed his desire for more "usable" nuclear weapons. and if nuclear weapons are ever used, there is a strong danger of escalation to a full-scale thermonuclear war.

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

In this perilous situation, the only logical thing for the world to do is to get rid of both fissile materials and nuclear weapons as rapidly as possible. We must acknowledge that the idea of nuclear deterrence is a dangerous fallacy, and acknowledge that the development of military systems based on nuclear weapons has been a terrible mistake, a false step that needs to be reversed. If the most prestigious of the nuclear weapons states can sincerely acknowledge their mistakes and begin to reverse them, nuclear weapons will seem less glamorous to countries like India, Pakistan, North Korea and Iran, where they now are symbols of national pride and modernism.

Civilians have for too long played the role of passive targets, hostages in the power struggles of politicians. It is time for civil society to make its will felt. If our leaders continue to enthusiastically support the institution of war, if they will not abolish nuclear weapons, then let us have new leaders.

3.14 Global famine produced by nuclear war

The danger of a catastrophic nuclear war casts a dark shadow over the future of our species. It also casts a very black shadow over the future of the global environment. The environmental consequences of a massive exchange of nuclear weapons have been treated in a number of studies by meteorologists and other experts from both East and West. They predict that a large-scale use of nuclear weapons would result in fire storms with very high winds and high temperatures, which would burn a large proportion of the wild land fuels in the affected nations. The resulting smoke and dust would block out sunlight for a period of many months, at first only in the northern hemisphere but later also in the southern hemisphere.

Temperatures in many places would fall far below freezing, and much of the earth's plant life would be killed. Animals and humans would then die of starvation. The nuclear winter effect was first discovered as a result of the Mariner 9 spacecraft exploration of Mars in 1971. The spacecraft arrived in the middle of an enormous dust-storm on Mars, and measured a large temperature drop at the surface of the planet, accompanied by a heating of the upper atmosphere. These measurements allowed scientists to check their theoretical models for predicting the effect of dust and other pollutants distributed in planetary atmospheres.

Using experience gained from the studies of Mars, R.P. Turco, O.B. Toon, T. Ackerman, J.B. Pollack and C. Sagan made a computer study of the climatic effects of the smoke and dust that would result from a large-scale nuclear war. This early research project is sometimes called the TTAPS Study, after the initials of the authors.

In April 1983, a special meeting was held in Cambridge, Massachusetts, where the results of the TTAPS Study and other independent studies of the nuclear winter effect were discussed by more than 100 experts. Their conclusions were presented at a forum in Washington, D.C., the following December, under the chairmanship of U.S. Senators Kennedy and Hatfield. The numerous independent studies of the nuclear winter effect all agreed of the following main predictions:

High-yield nuclear weapons exploded near the earth's surface would put large amounts of dust into the upper atmosphere. Nuclear weapons exploded over cities, forests, oilfields and refineries would produce fire storms of the type experienced in Dresden and Hamburg after incendiary bombings during the Second World War. The combination of high-altitude dust and lower altitude soot would prevent sunlight from reaching the earth's surface, and the degree of obscuration would be extremely high for a wide range of scenarios.

A baseline scenario used by the TTAPS study assumes a 5,000-megaton nuclear exchange, but the threshold for triggering the nuclear winter effect is believed to be much lower than that. After such an exchange, the screening effect of pollutants in the atmosphere might be so great that, in the northern and middle latitudes, the sunlight reaching the earth would be only 1% of ordinary sunlight on a clear day, and this effect would persist for many months. As a result, the upper layers in the atmosphere might rise in temperature by as much as 100 °C, while the surface temperatures would fall, perhaps by as much a 50 °C.

The temperature inversion produced in this way would lead to superstability, a condition in which the normal mixing of atmospheric layers is suppressed. The hydrological cycle (which normally takes moist air from the oceans to a higher and cooler level, where the moisture condenses as rain) would be strongly suppressed. Severe droughts would thus take place over continental land masses. The normal cleansing action of rain would be absent in the atmosphere, an effect which would prolong the nuclear winter.

In the northern hemisphere, forests would die because of lack of sunlight, extreme cold, and drought. Although the temperature drop in the southern hemisphere would be less severe, it might still be sufficient to kill a large portion of the tropical forests, which normally help to renew the earth's oxygen.

The oxygen content of the atmosphere would then fall dangerously, while the concentration of carbon dioxide and oxides of nitrogen produced by firestorms would remain high. The oxides of nitrogen would ultimately diffuse to the upper atmosphere, where they would destroy the ozone layer.

Thus, even when the sunlight returned after an absence of many months, it would be sunlight containing a large proportion of the ultraviolet frequencies which are normally absorbed by the ozone in the stratosphere, and therefore a type of light dangerous to life. Finally, after being so severely disturbed, there is no guarantee that the global climate would return to its normal equilibrium.

Even a nuclear war below the threshold of nuclear winter might have climatic effects very damaging to human life. Professor Paul Ehrlich, of Stanford University, has expressed this in the following words:

"...A smaller war, which set off fewer fires and put less dust into the atmosphere, could easily depress temperatures enough to essentially cancel grain production in the northern hemisphere. That in itself would be the greatest catastrophe ever delivered upon Homo Sapiens, just that one thing, not worrying about prompt effects. Thus even below the threshold, one cannot think of survival of a nuclear war as just being able to stand up after the bomb has gone off."¹¹

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 $[\]label{eq:linear} {}^{11} http://www.voanews.com/content/pope-francis-calls-for-nuclear-weapons-ban/2909357.html http://www.cadmusjournal.org/article/issue-4/flaws-concept-nuclear-deterrence$

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 $[\]label{eq:http://human-wrongs-watch.net/2015/03/30/europe-must-not-be-forced-into-a-nuclear-war-with-russia/http://www.truth-out.org/opinion/item/32073-the-us-should-eliminate-its-nuclear-arsenal-not-modernize-it$

A 2012 report published by International Physicians for the Prevention of Nuclear War states that even a small local nuclear war between India and Pakistan would put two billion people at risk of starvation.

3.15 Military-industrial complexes today

"We're going to take out seven countries in five years"

In an interview with Amy Goodman¹², retired 4-star General Wesley Clark said: "About ten days after 9/11, I went through the Pentagon and I saw Secretary Rumsfeld and Deputy Secretary Wolfowitz. I went downstairs just to say hello to some of the people on the Joint Staff who used to work for me, any one of the generals called me in. He said, "Sir, you've got to come in and talk to me a second." I said, "Well, you're too busy." He said, "No, no." He says, "We've made the decision we're going to war with Iraq." This was on or about the 20th of September. I said, "We're going to war with Iraq? Why?" He said, "I don't know." He said, "I guess they don't know what else to do." So I said, "Well, did they find some information connecting Saddam to al-Qaeda?" He said, "No, no." He says, "There's nothing new that way. They just made the decision to go to war with Iraq." He said, "I guess it's like we don't know what to do about terrorists, but we've got a good military and we can take down governments." And he said, "I guess if the only tool you have is a hammer, every problem has to look like a nail.

So I came back to see him a few weeks later, and by that time we were bombing in Afghanistan. I said, "Are we still going to war with Iraq?" And he said, "Oh, it's worse than that." He reached over on his desk. He picked up a piece of paper. And he said, "I just got this down from upstairs" - meaning the Secretary of Defense's office - "today." And he said, "This is a memo that describes how we're going to take out seven countries in five years, starting with Iraq, and then Syria, Lebanon, Libya, Somalia, Sudan and, finishing off, Iran." I said, "Is it classified?" He said, "Yes, sir." I said, "Well, don't show it to me." And I saw him a year or so ago, and I said, "You remember that?" He said, "Sir, I didn't show you that memo! I didn't show it to you!"

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http://human-wrongs-watch.net/2015/08/03/why-nuclear-weapons/

¹²https://genius.com/General-wesley-clark-seven-countries-in-five-years-annotated

3.15. MILITARY-INDUSTRIAL COMPLEXES TODAY



Figure 3.27: General Wesley Clark

The global trade in light arms

An important poverty-generating factor in the developing countries is war - often civil war. The five permanent members of the U.N. Security Council are, ironically, the five largest exporters of small arms. Small arms have a long life. The weapons poured into Africa by both sides during the Cold War are still there, and they contribute to political chaos and civil wars that block development and cause enormous human suffering.

The United Nations website on Peace and Security through Disarmament states that "Small arms and light weapons destabilize regions; spark, fuel and prolong conflicts; obstruct relief programmes; undermine peace initiatives; exacerbate human rights abuses; hamper development; and foster a 'culture of violence'."

An estimated 639 million small arms and light weapons are in circulation worldwide, one for every ten people. Approximately 300,000 people are killed every year by these weapons, many of them women and children.

Examples of endemic conflict

In several regions of Africa, long-lasting conflicts have prevented development and caused enormous human misery. These regions include Ethiopia, Eritiria, Somalia (Darfur), Chad, Zimbabwe and the Democratic Republic of Congo. In the Congo, the death toll reached 5.4 million in 2008, with most of the victims dying of disease and starvation, but with war



Figure 3.28: 40,000 children die each day from starvation or from poverty-related diseases. Meanwhile, the world spends more than \$1,700,000,000,000 each year on armaments.

as the root cause. In view of these statistics, the international community can be seen to have a strong responsibility to stop supplying small arms and ammunition to regions of conflict. There is absolutely no excuse for the large-scale manufacture and international sale of small arms that exists today.

The Wolfowitz Doctrine

The Wolfowitz Doctrine is the unofficial name given to the early version of the Defense Strategy for the 1990s: The Regional Defense Strategy report for the 1994-99 fiscal years. It was later released by then Secretary of Defense Dick Cheney in 1993. It brazenly advocates that America do everything in its power to retain its global hegemony and superpower status, including ensuring that Russia, China, Iran and other regional powers - but especially Russia - be prevented from attaining enough power to seriously challenge the US. In short, it's another US blueprint for total global supremacy.

There are many quotable passages from the Wolfowitz Doctrine. Here's one which sums up its aims:

"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 resources would, under consolidated control, be sufficient to generate global power. These regions include Western Europe, East Asia, the territory of the former Soviet Union, and Southwest Asia."

Similar motives guide US policy today. In February, 2018, US Secretary of Defense James Mattas said: "We will continue to prosecute the campaign against terrorists, but great-power competition - not terrorism - is now the primary focus of US national security."

Militarism in North Korea

The following states are now believed to currently possess nuclear weapons: The United states, Russia, The United Kingdom, France, China, India, Pakistan, North Korea and Israel. The way in which North Korea obtained its nuclear weapons is described by Wikipedia in the following paragraphs:

"The nuclear program can be traced back to about 1962, when North Korea committed itself to what it called 'all-fortressization', which was the beginning of the hyper-militarized North Korea of today. In 1963, North Korea asked the Soviet Union for help in developing nuclear weapons, but was refused. The Soviet Union agreed to help North Korea develop a peaceful nuclear energy program, including the training of nuclear scientists. Later, China, after its nuclear tests, similarly rejected North Korean requests for help with developing nuclear weapons.

"Soviet engineers took part in the construction of the Yongbyon Nuclear Scientific Research Center and began construction of an IRT-2000 research reactor in 1963, which



Figure 3.29: Countries by estimated nuclear warhead stockpiles according to the Federation of American scientists.



Figure 3.30: North Korea's dictator, Kim Jong-un. The doctrine of nuclear deterrence rests on the assumption that political leaders will always act rationally, an assumption that seems very uncertain in the case of the U.S.-North Korean conflict.

became operational in 1965 and was upgraded to 8 MW in 1974. In 1979 North Korea indigenously began to build in Yongbyon a second research reactor, an ore processing plant and a fuel rod fabrication plant.Soviet engineers took part in the construction of the Yongbyon Nuclear Scientific Research Center, and began construction of an IRT-2000 research reactor in 1963, which became operational in 1965 and was upgraded to 8 MW in 1974. In 1979 North Korea indigenously began to build in Yongbyon a second research reactor, an ore processing plant and a fuel rod fabrication plant. "

Thus like other new nuclear weapons states, North Korea obtained nuclear weapons by misuse of nuclear power generation facilities donated by other countries. In addition, North Korea spend a large fraction of its GDP on conventional armaments. Under the Songun policy, the Korean Peoples Army is the central institution of North Korean society. As of 2016, the Korean Peoples Army had 5,889,000 paramilitary personelle (25% of the population of North Korea) making it the largest paramilitary organization on earth.
| Rank | Country | Annual Spending \$ Bn. | % of GDP |
|------|----------------|------------------------------|----------|
| 1 | United State | 611.2 | 3.3 |
| 2 | China | 215.7 | 1.9 |
| 3 | Russia | 69.2 | 5.3 |
| 4 | Saudi Arabia | 63.7 | 10 |
| 5 | India | 55.9 | 2.5 |
| 6 | France | 55.7 | 2.3 |
| 7 | United Kingdom | 48.3 | 1.9 |
| 8 | Japan | 46.1 | 1.0 |
| 9 | Germany | 41.1 | 1.2 |
| 10 | South Korea | 36.8 | 2.7 |
| 11 | Italy | 27.9 | 1.5 |
| 12 | Australia | 24.3 | 2.0 |

Table 3.1: SIPRI Military Expenditure Database, 2016

| Rank | Company | Country | Annual Arms Sales \$ Mn. |
|------|---------------------------------|----------------|--------------------------------|
| 1 | Lockheed Martin | United States | 40,830 |
| 2 | Boeing | United States | 29,510 |
| 3 | Raytheon | United States | 22,910 |
| 4 | BAE Systems | United Kingdom | 22.700 |
| 5 | Northrop Grumman | United States | 21,400 |
| 6 | General Dynamics | United States | 19,230 |
| 7 | Airbus | European Union | 12,520 |
| 8 | L-3 Communications | United States | 8,890 |
| 9 | Leonardo-Finmeccanica | Italy | 8,500 |
| 10 | Thales Group | France | 8,170 |
| 11 | United Technologies Corporation | United States | 6,870 |
| 12 | Huntington Ingalls Industries | United States | 6,720 |

Table 3.2: SIPRI List of arms manufacturers, 2016

The SIPRI Yearbook, 2017

Dan Smith of the Stockholm International Peace Research Institute (SIPRI) wrote the following Introduction to the organization's yearbook for 2017:

"An overall perspective on 2016 finds a balance between negative developments and the continued functioning of the international system. However, the year ended with clear grounds for concern that the balance sheet seemed to be tipping towards the negative amid growing unease about the durability of key parts of the international security architecture.

"Conflicts in the Middle East continued to generate humanitarian tragedies and largescale movement of refugees, and violent conflict continued in several other parts of the world, most notably Africa, Asia and to a lesser extent Eastern Europe. Develop- ments in North Korea's nuclear programme contributed to international political instability with potentially serious knock-on effects. On the positive side, the 2015 Paris Climate Agreement entered into force in November 2016, the 2015 Iran nuclear deal began implementation on time in early 2016 and the United Nations General Assembly adopted a resolution to start negotiations in 2017 on eliminating nuclear weapons. Progress was also made on work to monitor the unfolding implementation of the UN's Agenda 2030 for international social and economic development. A major contribution to the positive side of the balance sheet in 2016 was the peace agreement in Colombia.

"Nonetheless, virtually all the major global indicators for peace and security have moved in a negative direction: more military spending, increased arms trading, more violent conflicts and the continuing forward march of military technology.

"Existing multilateral and bilateral arms control agreements and processes are also under challenge-not least due to the deteriorating relationship between Russia and the United States-raising questions of global concern and potentially epochal scope. Were the great gains in peaceful relations since the end of the cold war now being reversed? Would the return of strategic competition between the major powers have negative implications for managing increased conflict risk? These uncertainties, combined with political developments in Europe and the USA- especially the vote by the United Kingdom to leave the European Union and the election of Donald J. Trump as US President-seemed to reveal a much decreased commitment to international institutions and a renewed emphasis in several key states on a narrowly defined national interest.

"The scale of the challenges facing humanity has been summed up in the proposal to adopt the label of 'the Anthropocene' for the current era, thus designating it as one in which human activity is the dominant influence on climate and the environment. It is disconcerting to note that such cooperation risks becoming more elusive than it has seemed for most of the time since the end of the cold war, at a time when it is more needed than ever. Experience has shown that international cooperation can work. But is the international cooperative urge as persistent as the problems it needs to address?"

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Figure 3.31: Tom Cruse in "Top Gun".



Figure 3.32: A culture of violence supports the Devil's Dynamo.

3.16 A culture of violence

Links with the entertainment industry

Here are a few films that glorify war:

- Black Hawk Down
- Top Gun
- Behind Enemy Lines
- Red Dawn (1984)
- American Sniper
- Iron Eagle
- Pearl Harbor



Figure 3.33: A culture of violence: In the United States the National Rifle Association has proposed guns in schools as the answer to the epidemic of school shootings.

- Act of Valor
- We Were Soldiers
- The Green Berets

Making a game of killing

The mass media are an important part of our educational system. Perhaps it is time to look more closely at the values that they are transmitting. In particular, we should perhaps look at computer games designed for young boys. They often give the strongest imaginable support to a culture of violence.

For example, a game entitled "Full Spectrum Warrior" was recently reviewed in a Danish newspaper. According to the reviewer, "...An almost perfect combination of graphics, sound, band design, and gameplay makes it seem exactly like the film Black Hawk Down - with the player as the main character. This is not just a coincidence, because the game is based on an army training program... Full Spectrum Warrior is an extremely intense experience, and despite the advanced possibilities, the controls are simple enough so that young children can play it... The player is completely drawn into the screen, and remains there until the end of the mission." The reviewer gave the game six stars (the maximum).

Another genre of computer games has to do with building empires, ignoring the fact that imperialism is morally indefensible. For example, "Forge of Empires" is a browserbased strategy game. It is described as follows: "The game offers a single-player campaign



Figure 3.34: A culture of violence. Guns in schools?

3.17. THE THREATS AND COSTS OF WAR

for players to explore and conquer several provinces, gaining resources and new technology as they progress." Conquering countries for the sake of gaining their resources is an all-toofamiliar feature of the modern world. In the game "Forge of Empires", our young people are indoctrinated with the ethos of resource wars.

During his trial, the Norwegian mass-murderer Anders Behring Breivik described how he trained for his attack on young people on the Island of UtÃ, ya using the computer game "Call of Duty: Modern Warfare". The court also heard how he took what he called a "sabatical" for a year between the summers of 2006 and 2007. During this year, he played a game called "World of Warcraft" full-time, in the bedroom of his mother's Oslo flat, spending up to 16 hours a day using the game to distance himself from the human and moral significance of killing.

Is this not similar to the frame of mind of drone operators, sitting in comfort in their Nevada bunkers, distanced from the reality of killing? They are playing a computer game that kills targeted individuals and their families, in remote countries, by remote control. There is no need to look into the eyes of the victims. They are just abstract symbols in a computer game.

3.17 The threats and costs of war

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

Modern warfare has become prohibitively dangerous and destructive because of the enormously powerful weapons that scientists and engineers have developed. The institution of war could not continue without their cooperation. Thus, scientists and engineers throughout the world have a special responsibility.

Wars are driven by the collective paranoia of voters, who are willing to allow colossal sums to be spent by ' 'Defense Departments''. But are civilians really defended? Absolutely not!

We can see this most clearly if we think of nuclear war. Nations threaten each other with "Mutually Assured Destruction", which has the very appropriate acronym MAD. What does this mean? Does it mean that civilians are being protected? Not at all. Instead they are threatened with complete destruction. Civilians here play the role of hostages in the power games of their leaders. Those leaders' goal is not protection of ordinary people, but rather protection of the gargantuan profits of the military-industrial complex. As the Indian writer Arundhati Roy put it, "Once weapons were manufactured to fight wars. Now wars are manufactured to sell weapons."

If a thermonuclear war occurs, it will be the end of human civilization and much of the biosphere. This will definitely happen in the future unless the world rids itself of nuclear weapons, since, in the long run, the finite chance of accidental nuclear war happening due to a technical or human failure during a given year will gradually build up into a certainty of disaster. Scientists and engineers must not sell their knowledge and talents to this march

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Figure 3.35: Children born with birth defects due to the US use of Agent Orange during the Vietnam War. Source: stopwarcoalition.org

towards the precipice.

The direct and indirect costs of war

The costs of war, both direct and indirect, are so enormous that they are almost beyond comprehension. We face a direct threat because a thermonuclear war may destroy human civilization and much of the biosphere, and an indirect threat because the institution of war interferes seriously with the use of tax money for constructive and peaceful purposes.

Today, despite the end of the Cold War, the world spends roughly 1.7 trillion (i.e. 1.7 million million) US dollars each year on armaments. This colossal flood of money could have been used instead for education, famine relief, development of infrastructure, or on urgently needed public health measures.

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

A new drug-resistant form of tuberculosis has recently become widespread in Asia and in the former Soviet Union. In order to combat this new and highly dangerous form of tuberculosis and to prevent its spread, WHO needs \$500 million, an amount equivalent to 1.2 hours of world arms spending.

Today's world is one in which roughly ten million children die every year from starvation or from diseases related to poverty. Besides this enormous waste of young lives through malnutrition and preventable disease, there is a huge waste of opportunities through inadequate education. The rate of illiteracy in the 25 least developed countries is 80%, and the total number of illiterates in the world is estimated to be 800 million. Meanwhile every 60 seconds the world spends \$6.5 million on armaments.



Figure 3.36: A little girl cries as medics attend to her injuries at al-Shifa hospital in Gaza in 2014, during the conflict. Photo: UNICEF/Eyad El Baba

It is plain that if the almost unbelievable sums now wasted on the institution of war were used constructively, most of the pressing problems of humanity could be solved, but today the world spends more than 20 times as much on war as it does on development.

Medical and psychological consequences; loss of life

While in earlier epochs it may have been possible to confine the effects of war mainly to combatants, in the 20th century the victims of war were increasingly civilians, and especially children. For example, according to Quincy Wright's statistics, the First and Second World Wars cost the lives of 26 million soldiers, but the toll in civilian lives was much larger: 64 million.

Since the Second World War, despite the best efforts of the UN, there have been over 150 armed conflicts; and, if civil wars are included, there are on any given day an average of 12 wars somewhere in the world. In the conflicts in Indo-China, the proportion of civilian victims was between 80% and 90%, while in the Lebanese civil war some sources state that the proportion of civilian casualties was as high as 97%.

Civilian casualties often occur through malnutrition and through diseases that would be preventable in normal circumstances. Because of the social disruption caused by war, normal supplies of food, safe water and medicine are interrupted, so that populations become vulnerable to famine and epidemics.¹³

 $[\]label{eq:13} http://www.cadmusjournal.org/article/volume-2/issue-2-part-3/lessons-world-war-ihttp://www.truth-out.org/opinion/item/27201-the-leading-terrorist-state$



Figure 3.37: Asylum-seekers in a holding centre on Greece's Samos Island.

Effects of war on children

According to UNICEF figures, 90% of the casualties of recent wars have been civilians, and 50% children. The organization estimates that in recent years, violent conflicts have driven 20 million children from their homes. They have become refugees or internally displaced persons within their own countries.

During the last decade 2 million children have been killed and 6 million seriously injured or permanently disabled as the result of armed conflicts, while 1 million children have been orphaned or separated from their families. Of the ten countries with the highest rates of death of children under five years of age, seven are affected by armed conflicts. UNICEF estimates that 300,000 child soldiers are currently forced to fight in 30 armed conflicts throughout the world. Many of these have been forcibly recruited or abducted.

Even when they are not killed or wounded by conflicts, children often experience painful psychological traumas: the violent death of parents or close relatives, separation from their families, seeing family members tortured, displacement from home, disruption of ordinary life, exposure to shelling and other forms of combat, starvation and anxiety about the future.¹⁴

Refugees

Human Rights Watch estimates that in 2001 there were 15 million refugees in the world, forced from their countries by war, civil and political conflict, or by gross violations of human rights. In addition, there were an estimated 22 million internally displaced persons, violently forced from their homes but still within the borders of their countries.

In 2001, 78% of all refugees came from ten areas: Afghanistan, Angola, Burma, Burundi, Congo-Kinshasa, Eritrea, Iraq, the Palestinian territories, Somalia and Sudan. A

¹⁴http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2080482/

quarter of all refugees are Palestinians, who make up the world's oldest and largest refugee population. 45% of the world's refugees have found sanctuaries in Asia, 30% in Africa, 19% in Europe and 5% in North America.

Refugees who have crossed an international border are in principle protected by Article 14 of the Universal Declaration of Human Rights, which affirms their right "to seek and to enjoy in other countries asylum from persecution". In 1950 the Office of the High Commissioner for Refugees was created to implement Article 14, and in 1951 the Convention Relating to the Status of Refugees was adopted by the UN. By 2002 this legally binding treaty had been signed by 140 nations. However the industrialized countries have recently adopted a very hostile and restrictive attitude towards refugees, subjecting them to arbitrary arrests, denial of social and economic rights, and even forcible return to countries in which they face persecution.

The status of internally displaced persons is even worse than that of refugees who have crossed international borders. In many cases the international community simply ignores their suffering, reluctant to interfere in the internal affairs of sovereign states. In fact, the United Nations Charter is self-contradictory in this respect, since on the one hand it calls for non-interference in the internal affairs of sovereign states, but on the other hand, people everywhere are guaranteed freedom from persecution by the Charter's Universal Declaration of Human Rights.¹⁵

Damage to infrastructure

Most insurance policies have clauses written in fine print exempting companies from payment of damage caused by war. The reason for this is simple. The damage caused by war is so enormous that insurance companies could never come near to paying for it without going bankrupt.

We mentioned above that the world spends 1.7 trillion dollars each year on preparations for war. A similarly colossal amount is needed to repair the damage to infrastructure caused by war. Sometimes this damage is unintended, but sometimes it is intentional.

During World War II, one of the main aims of air attacks by both sides was to destroy the industrial infrastructure of the opponent. This made some sense in a war expected to last several years, because the aim was to prevent the enemy from producing more munitions. However, during the Gulf War of 1990, the infrastructure of Iraq was attacked, even though the war was expected to be short. Electrical generating plants and water purification facilities were deliberately destroyed with the apparent aim of obtaining leverage over Iraq after the war.

In general, because war has such a catastrophic effect on infrastructure, it can be thought of as the opposite of development. War is the greatest generator of poverty.¹⁶

¹⁵https://www.hrw.org/topic/refugees

¹⁶https://www.wsws.org/en/articles/2002/11/iraq-n04.html

http://www.globalresearch.ca/crimes-against-humanity-the-destruction-of-iraqs-electricity-infrastructure-the-social-economic-and-environmental-impacts/5355665

http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/00157630-EN-ERP-48.PDF



Figure 3.38: Image source: Greenpeace

Ecological damage

Warfare during the 20th century has not only caused the loss of 175 million lives (primarily civilians) - it has also caused the greatest ecological catastrophes in human history. The damage takes place even in times of peace. Studies by Joni Seager, a geographer at the University of Vermont, conclude that "a military presence anywhere in the world is the single most reliable predictor of ecological damage".

Modern warfare destroys environments to such a degree that it has been described as an "environmental holocaust." For example, herbicides use in the Vietnam War killed an estimated 6.2 billion board-feet of hardwood trees in the forests north and west of Saigon, according to the American Association for the Advancement of Science. Herbicides such as Agent Orange also made enormous areas of previously fertile land unsuitable for agriculture for many years to come. In Vietnam and elsewhere in the world, valuable agricultural land has also been lost because land mines or the remains of cluster bombs make it too dangerous for farming.

During the Gulf War of 1990, the oil spills amounted to 150 million barrels, 650 times the amount released into the environment by the notorious Exxon Valdez disaster. During the Gulf War an enormous number of shells made of depleted uranium were fired. When the dust produced by exploded shells is inhaled it often produces cancer, and it will remain in the environment of Iraq for decades.

Radioactive fallout from nuclear tests pollutes the global environment and causes many thousands of cases of cancer, as well as birth abnormalities. Most nuclear tests have been carried out on lands belonging to indigenous peoples. Agent Orange also produced cancer, birth abnormalities and other serious forms of illness both in the Vietnamese population and among the foreign soldiers fighting in Vietnam¹⁷

 $^{^{17} \}rm http://www.dailymail.co.uk/news/article-2401378/Agent-Orange-Vietnamese-children-suffering-effects-herbicide-sprayed-US-Army-40-years-ago.html$



Figure 3.39: The 15 megaton explosion detonated by the United States at Bikini Atoll in 1954 produced lasting biological damage to humans and animals living on the distant Marshall Islands. Today, half a century later, the islanders still experience radiation sickness in the form of leukemia and birth defects. Source: www.theguardian.com

3.18 The threat of nuclear war

As bad as conventional arms and conventional weapons may be, it is the possibility of a catastrophic nuclear war that poses the greatest threat to humanity. There are today roughly 16,000 nuclear warheads in the world. The total explosive power of the warheads that exist or that could be made on short notice is approximately equal to 500,000 Hiroshima bombs.

To multiply the tragedy of Hiroshima by a factor of half a million makes an enormous difference, not only quantitatively, but also qualitatively. Those who have studied the question believe that a nuclear catastrophe today would inflict irreversible damage on our civilization, genetic pool and environment.

Thermonuclear weapons consist of an inner core where the fission of uranium-235 or plutonium takes place. The fission reaction in the core is able to start a fusion reaction in the next layer, which contains isotopes of hydrogen. It is possible to add a casing of ordinary uranium outside the hydrogen layer, and under the extreme conditions produced by the fusion reaction, this ordinary uranium can undergo fission. In this way, a fissionfusion-fission bomb of almost limitless power can be produced.

For a victim of severe radiation exposure, the symptoms during the first week are nausea, vomiting, fever, apathy, delirium, diarrhoea, oropharyngeal lesions and leukopenia. Death occurs during the first or second week.

We can perhaps be helped to imagine what a nuclear catastrophe means in human terms by reading the words of a young university professor, who was 2,500 meters from the hypocenter at the time of the bombing of Hiroshima: "Everything I saw made a deep impression: a park nearby covered with dead bodies... very badly injured people evacuated

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Figure 3.40: A nuclear war would be an ecological disaster, making large portions of the world permanently uninhabitable because of long-lasting radioactivity. Chernobyl radiation map 1996 30km zone by CIA Factbook. Licensed under CC BY-SA 2.5 via Wikimedia Commons.

in my direction... Perhaps most impressive were girls, very young girls, not only with their clothes torn off, but their skin peeled off as well. ... My immediate thought was that this was like the hell I had always read about. ... I had never seen anything which resembled it before, but I thought that should there be a hell, this was it."

One argument that has been used in favor of nuclear weapons is that no sane political leader would employ them. However, the concept of deterrence ignores the possibility of war by accident or miscalculation, a danger that has been increased by nuclear proliferation and by the use of computers with very quick reaction times to control weapons systems.

Recent nuclear power plant accidents remind us that accidents frequently happen through human and technical failure, even for systems which are considered to be very "safe." We must also remember the time scale of the problem. To assure the future of humanity, nuclear catastrophe must be avoided year after year and decade after decade. In the long run, the safety of civilization cannot be achieved except by the abolition of nuclear weapons, and ultimately the abolition of the institution of war.

In 1985, International Physicians for the Prevention of Nuclear War received the Nobel



Figure 3.41: Sculpture depicting Saint George slaying the dragon. The dragon is created from fragments of Soviet SS-20 and United States Pershing nuclear missiles. UN Photo/Milton Grant

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

"...No public health hazard ever faced by humankind equals the threat of nuclear war. Never before has man possessed the destructive resources to make this planet uninhabitable... Modern medicine has nothing to offer, not even a token benefit, in the event of nuclear war..."

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

The danger of a catastrophic nuclear war casts a dark shadow over the future of our species. It also casts a very black shadow over the future of the global environment. The environmental consequences of a massive exchange of nuclear weapons have been treated in a number of studies by meteorologists and other experts from both East and West. They predict that a large-scale use of nuclear weapons would result in fire storms with very high winds and high temperatures, which would burn a large proportion of the wild land fuels in the affected nations. The resulting smoke and dust would block out sunlight for a period of many months, at first only in the northern hemisphere but later also in the southern hemisphere.

Temperatures in many places would fall far below freezing, and much of the earth's plant life would be killed. Animals and humans would then die of starvation. The nuclear winter effect was first discovered as a result of the Mariner 9 spacecraft exploration of Mars in 1971. The spacecraft arrived in the middle of an enormous dust-storm on Mars, and measured a large temperature drop at the surface of the planet, accompanied by a heating of the upper atmosphere. These measurements allowed scientists to check their

theoretical models for predicting the effect of dust and other pollutants distributed in planetary atmospheres.

Using experience gained from the studies of Mars, R.P. Turco, O.B. Toon, T. Ackerman, J.B. Pollack and C. Sagan made a computer study of the climatic effects of the smoke and dust that would result from a large-scale nuclear war. This early research project is sometimes called the TTAPS Study, after the initials of the authors.

In April 1983, a special meeting was held in Cambridge, Massachusetts, where the results of the TTAPS Study and other independent studies of the nuclear winter effect were discussed by more than 100 experts. Their conclusions were presented at a forum in Washington, D.C., the following December, under the chairmanship of U.S. Senators Kennedy and Hatfield. The numerous independent studies of the nuclear winter effect all agreed of the following main predictions:

High-yield nuclear weapons exploded near the earth's surface would put large amounts of dust into the upper atmosphere. Nuclear weapons exploded over cities, forests, oilfields and refineries would produce fire storms of the type experienced in Dresden and Hamburg after incendiary bombings during the Second World War. The combination of high-altitude dust and lower altitude soot would prevent sunlight from reaching the earth's surface, and the degree of obscuration would be extremely high for a wide range of scenarios.

A baseline scenario used by the TTAPS study assumes a 5,000-megaton nuclear exchange, but the threshold for triggering the nuclear winter effect is believed to be much lower than that. After such an exchange, the screening effect of pollutants in the atmosphere might be so great that, in the northern and middle latitudes, the sunlight reaching the earth would be only 1% of ordinary sunlight on a clear day, and this effect would persist for many months. As a result, the upper layers in the atmosphere might rise in temperature by as much as 100 °C, while the surface temperatures would fall, perhaps by as much a 50 °C.

The temperature inversion produced in this way would lead to superstability, a condition in which the normal mixing of atmospheric layers is suppressed. The hydrological cycle (which normally takes moist air from the oceans to a higher and cooler level, where the moisture condenses as rain) would be strongly suppressed. Severe droughts would thus take place over continental land masses. The normal cleansing action of rain would be absent in the atmosphere, an effect which would prolong the nuclear winter.

In the northern hemisphere, forests would die because of lack of sunlight, extreme cold, and drought. Although the temperature drop in the southern hemisphere would be less severe, it might still be sufficient to kill a large portion of the tropical forests, which normally help to renew the earth's oxygen.

The oxygen content of the atmosphere would then fall dangerously, while the concentration of carbon dioxide and oxides of nitrogen produced by firestorms would remain high. The oxides of nitrogen would ultimately diffuse to the upper atmosphere, where they would destroy the ozone layer.

Thus, even when the sunlight returned after an absence of many months, it would be sunlight containing a large proportion of the ultraviolet frequencies which are normally absorbed by the ozone in the stratosphere, and therefore a type of light dangerous to life. Finally, after being so severely disturbed, there is no guarantee that the global climate would return to its normal equilibrium.

Even a nuclear war below the threshold of nuclear winter might have climatic effects very damaging to human life. Professor Paul Ehrlich, of Stanford University, has expressed this in the following words:

"...A smaller war, which set off fewer fires and put less dust into the atmosphere, could easily depress temperatures enough to essentially cancel grain production in the northern hemisphere. That in itself would be the greatest catastrophe ever delivered upon Homo Sapiens, just that one thing, not worrying about prompt effects. Thus even below the threshold, one cannot think of survival of a nuclear war as just being able to stand up after the bomb has gone off."¹⁸

3.19 Flaws in the concept of nuclear deterrence

Before discussing other defects in the concept of deterrence, it must be said very clearly that the idea of "massive nuclear retaliation" is completely unacceptable from an ethical point of view. The doctrine of retaliation, performed on a massive scale, violates not only

¹⁸http://www.voanews.com/content/pope-francis-calls-for-nuclear-weapons-ban/2909357.html

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http://human-wrongs-watch.net/2015/08/04/atomic-bombing-hear-the-story-yasuaki-yamashita/2015/08/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/04/2015/08/04/2015/08/04/2015/08/04/2015/08/04/04/201

http://human-wrongs-watch.net/2015/08/03/why-nuclear-weapons/

the principles of common human decency and common sense, but also the ethical principles of every major religion. Retaliation is especially contrary to the central commandment of Christianity which tells us to love our neighbor, even if he or she is far away from us, belonging to a different ethnic or political group, and even if our distant neighbor has seriously injured us. This principle has a fundamental place not only in in Christianity but also in Buddhism. "Massive retaliation" completely violates these very central ethical principles, which are not only clearly stated and fundamental but also very practical, since they prevent escalatory cycles of revenge and counter-revenge.

Contrast Christian ethics with estimates of the number of deaths that would follow a US nuclear strike against Russia: Several hundred million deaths. These horrifying estimates shock us not only because of the enormous magnitude of the expected mortality, but also because the victims would include people of every kind: women, men, old people, children and infants, completely irrespective of any degree of guilt that they might have. As a 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 devoted to clarifying the question of guilt or innocence. Punishment only follows if guilt can be proved beyond any reasonable doubt. Contrast this with the totally indiscriminate mass slaughter that results from a nuclear attack!

It might be objected that disregard for the guilt or innocence of victims is a universal characteristic of modern war, since statistics show that, with time, a larger and larger percentage of the victims have been civilians, and especially children. For example, the air attacks on Coventry during World War II, or the fire bombings of Dresden and Tokyo, produced massive casualties which involved all segments of the population with complete disregard for the question of guilt or innocence. The answer, I think, is that modern war has become generally unacceptable from an ethical point of view, and this unacceptability is epitomized in nuclear weapons.

The enormous and indiscriminate destruction produced by nuclear weapons formed the background for an historic 1996 decision by the International Court of Justice in the Hague. In response to questions put to it by WHO and the UN General Assembly, the Court ruled that "the threat and use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and particularly the principles and rules of humanitarian law." The only *possible* exception to this general rule might be "an extreme circumstance of self-defense, in which the very survival of a state would be at stake". But the Court refused to say that even in this extreme circumstance the threat or use of nuclear weapons would be legal. It left the exceptional case undecided. In addition, the World Court added unanimously that "there exists an obligation to pursue in good faith *and bring to a conclusion* negotiations leading to nuclear disarmament in all its aspects under strict international control."

This landmark decision has been criticized by the nuclear weapon states as being decided "by a narrow margin", but the structuring of the vote made the margin seem more narrow than it actually was. Seven judges voted against Paragraph 2E of the decision (the paragraph which states that the threat or use of nuclear weapons would be generally illegal, but which mentions as a possible exception the case where a nation might be defending itself from an attack that threatened its very existence.) Seven judges voted for the paragraph, with the President of the Court, Muhammad Bedjaoui of Algeria casting the deciding vote. Thus the Court adopted it, seemingly by a narrow margin. But three of the judges who voted against 2E did so because they believed that no possible exception should be mentioned! Thus, if the vote had been slightly differently structured, the result would have be ten to four.

Of the remaining four judges who cast dissenting votes, three represented nuclear weapons states, while the fourth thought that the Court ought not to have accepted the questions from WHO and the UN. However Judge Schwebel from the United States, who voted against Paragraph 2E, nevertheless added, in a separate opinion, "It cannot be accepted that the use of nuclear weapons on a scale which would - or could - result in the deaths of many millions in indiscriminate inferno and by far-reaching fallout, have pernicious effects in space and time, and render uninhabitable much of the earth, could be lawful." Judge Higgins from the UK, the first woman judge in the history of the Court, had problems with the word "generally" in Paragraph 2E and therefore voted against it, but she thought that a more profound analysis might have led the Court to conclude in favor of illegality in all circumstances. Judge Fleischhauer of Germany said in his separate opinion, "The nuclear weapon is, in many ways, the negation of the humanitarian considerations underlying the law applicable in armed conflict and the principle of neutrality. The nuclear weapon cannot distinguish between civilian and military targets. It causes immeasurable suffering. The radiation released by it is unable to respect the territorial integrity of neutral States."

President Bedjaoui, summarizing the majority opinion, called nuclear weapons "the ultimate evil", and said "By its nature, the nuclear weapon, this blind weapon, destabilizes humanitarian law, the law of discrimination in the use of weapons... The ultimate aim of every action in the field of nuclear arms will always be nuclear disarmament, an aim which is no longer utopian and which all have a duty to pursue more actively than ever."

Thus the concept of nuclear deterrence is not only unacceptable from the standpoint of ethics; it is also contrary to international law. The World Courts 1996 advisory Opinion unquestionably also represents the opinion of the majority of the worlds peoples. Although no formal plebiscite has been taken, the votes in numerous resolutions of the UN General Assembly speak very clearly on this question. For example the New Agenda Resolution (53/77Y) was adopted by the General Assembly on 4 December 1998 by a massively affirmative vote, in which only 18 out of the 170 member states voted against the resolution.¹⁹ The New Agenda Resolution proposes numerous practical steps towards complete nuclear disarmament, and it calls on the Nuclear-Weapon States "to demonstrate an unequivocal commitment to the speedy and total elimination of their nuclear weapons and without delay to pursue in good faith and bring to a conclusion negotiations leading to the elimi-

¹⁹Of the 18 countries that voted against the New Agenda resolution, 10 were Eastern European countries hoping for acceptance into NATO, whose votes seem to have been traded for increased probability of acceptance.

nation of these weapons, thereby fulfilling their obligations under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)". Thus, in addition to being ethically unacceptable and contrary to international law, nuclear weapons also contrary to the principles of democracy.

More recently, on 7 July, 2017, the Treaty on the Prohibition of Nuclear Weapons was passed by a massive majority in the Gernaral Assembly of the United Nations, It was opposed only by the nuclear weapons states and a few of their allies. The Nuclear Ban Treaty makes it very clear that nuclear weapons are illegal under international law. Although the nuclear weapons states still cling to their world-destroying weapons, it is to be hoped that the force of global public opinion will eventually force them to comply with the law.

Having said these important things, we can now turn to some of the other defects in the concept of nuclear deterrence. One important defect is that nuclear war may occur through accident or miscalculation - through technical defects or human failings. This possibility is made greater by the fact that despite the end of the Cold War, thousands of missiles carrying nuclear warheads are still kept on a "hair-trigger" state of alert with a quasi-automatic reaction time measured in minutes. There is a constant danger that a nuclear war will be triggered by error in evaluating the signal on a radar screen. For example, the BBC reported recently that a group of scientists and military leaders are worried that a small asteroid entering the earths atmosphere and exploding could trigger a nuclear war if mistaken for a missile strike.

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. Grey²⁰ 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." General Curtis E. LeMay²¹ has written, "In my opinion a general war will grow through a series of political miscalculations and accidents rather than through any deliberate attack by either side." Bruce G. Blair²² 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."

Today, the system that is supposed to give us security is called Mutually Assured Destruction, appropriately abbreviated as MAD. It is based on the idea of deterrence, which maintains that because of the threat of massive retaliation, no sane leader would start a nuclear war.

One important defect in the concept of deterrence is the fact that nuclear war may occur through accident or miscalculation, through technical defects or human failings, or by terrorism. This possibility is made greater by the fact that despite the end of the Cold War, thousands of missiles carrying nuclear warheads are still kept on "hair-trigger alert"

²⁰Chairman, National Institute for Public Policy

²¹Founder and former Commander in Chief of the United States Strategic Air Command

²²Brookings Institute

with a quasi-automatic reaction time measured in minutes. There is a constant danger that a nuclear war will be triggered by error in evaluating the signal on a radar screen.

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. "The computer showed that the Americans had launched a strike against us", Petrov remembered later. His 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 coolheaded decision and 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. We urgently need new political structures and new ethics to match our advanced technology.

3.20 Dangers of nuclear power generation

The Chernobyl disaster

The dangers of nuclear power generation are exemplified by the Chernobyl disaster: On the 26th of April, 1986, during the small hours of the morning, the staff of the Chernobyl nuclear reactor in Ukraine turned off several safety systems in order to perform a test. The result was a core meltdown in Reactor 4, causing a chemical explosion that blew off the reactor's 1,000-ton steel and concrete lid. 190 tons of highly radioactive uranium and graphite were hurled into the atmosphere. The resulting radioactive fallout was 200 times greater than that caused by the nuclear bombs that destroyed Hiroshima and Nagasaki. The radioactive cloud spread over Belarus, Ukraine, Russia, Finland, Sweden and Eastern Europe, exposing the populations of these regions to levels of radiation 100 times the normal background. Ultimately, the radioactive cloud reached as far as Greenland and parts of Asia.

The exact number of casualties resulting from the Chernobyl meltdown is a matter of controversy, but according to a United Nations report, as many as 9 million people have been adversely affected by the disaster. Since 1986, the rate of thyroid cancer in affected areas has increased ten-fold. An area of 155,000 square kilometers (almost half the size of Italy) in Belarus, Ukraine and Russia is still severely contaminated. Even as far away as Wales, hundreds of farms are still under restrictions because of sheep eating radioactive

grass.

Public opinion turned against nuclear power generation as a result of the Chernobyl disaster. Had the disaster taken place in Western Europe or North America, its effect on public opinion would have been still greater. Nevertheless, because of the current energy crisis, and because of worries about global warming, a number of people are arguing that nuclear energy should be given a second chance. The counter-argument is that a large increase in the share of nuclear power in the total spectrum of energy production would have little effect on climate change but it would involve unacceptable dangers, not only dangers of accidents and dangers associated with radioactive waste disposal, but above all, dangers of proliferation of nuclear weapons.

Of the two bombs that destroyed Hiroshima and Nagasaki, one made use of the rare isotope of uranium, U-235, while the other used plutonium. Both of these materials can be made by a nation with a nuclear power generation program.

Reactors and nuclear weapons

Uranium has atomic number 92, i.e., a neutral uranium atom has a nucleus containing 92 positively-charged protons, around which 92 negatively-charged electrons circle. All of the isotopes of uranium have the same number of protons and electrons, and hence the same chemical properties, but they differ in the number of neutrons in their nuclei. For example, the nucleus of U-235 has 143 neutrons, while that of U-238 has 146. Notice that 92+143=235, while 92+146=238. The number written after the name of an element to specify a particular isotope is the number of neutrons plus the number of protons. This is called the "nucleon number", and the weight of an isotope is roughly proportional to it. This means that U-238 is slightly heavier than U-235. If the two isotopes are to be separated, difficult physical methods dependent on mass must be used, since their chemical properties are identical. In natural uranium, the amount of the rare isotope U-235 is only 0.7 percent.

A paper published in 1939 by Niels Bohr and John A. Wheeler indicated that it was the rare isotope of uranium, U-235, that undergoes fission. A bomb could be constructed, they pointed out, if enough highly enriched U-235 could be isolated from the more common isotope, U-238 Calculations later performed in England by Otto Frisch and Rudolf Peierls showed that the "critical mass" of highly enriched uranium needed is quite small: only a few kilograms.

The Bohr-Wheeler theory also predicted that an isotope of plutonium, Pu-239, should be just as fissionable as U-235²³. Instead of trying to separate the rare isotope, U-235, from the common isotope, U-238, physicists could just operate a nuclear reactor until a

²³Both U-235 and Pu-239 have odd nucleon numbers. When U-235 absorbs a neutron, it becomes U-236, while when Pu-239 absorbs a neutron it becomes Pu-240. In other words, absorption of a neutron converts both these species to nuclei with even nucleon numbers. According to the Bohr-Wheeler theory, nuclei with even nucleon numbers are especially tightly-bound. Thus absorption of a neutron converts U-235 to a highly-excited state of U-236, while Pu-239 is similarly converted to a highly excited state of Pu-240. The excitation energy distorts the nuclei to such an extent that fission becomes possible.

sufficient amount of Pu-239 accumulated, and then separate it out by ordinary chemical means.

Thus in 1942, when Enrico Fermi and his coworkers at the University of Chicago produced the world's first controlled chain reaction within a pile of cans containing ordinary (nonenriched) uranium powder, separated by blocks of very pure graphite, the chainreacting pile had a double significance: It represented a new source of energy for mankind, but it also had a sinister meaning. It represented an easy path to nuclear weapons, since one of the by-products of the reaction was a fissionable isotope of plutonium, Pu-239. The bomb dropped on Hiroshima in 1945 used U-235, while the Nagasaki bomb used Pu-239.

By reprocessing spent nuclear fuel rods, using ordinary chemical means, a nation with a power reactor can obtain weapons-usable Pu-239. Even when such reprocessing is performed under international control, the uncertainty as to the amount of Pu-239 obtained is large enough so that the operation might superficially seem to conform to regulations while still supplying enough Pu-239 to make many bombs.

The enrichment of uranium²⁴ is also linked to reactor use. Many reactors of modern design make use of low enriched uranium (LEU) as a fuel. Nations operating such a reactor may claim that they need a program for uranium enrichment in order to produce LEU for fuel rods. However, by operating their ultracentrifuges a little longer, they can easily produce highly enriched uranium (HEU), i.e., uranium containing a high percentage of the rare isotope U-235, and therefore usable in weapons.

Known reserves of uranium are only sufficient for the generation of 8×10^{20} joules of electrical energy ²⁵, i.e., about 25 TWy. It is sometimes argued that a larger amount of electricity could be obtained from the same amount of uranium through the use of fast breeder reactors, but this would involve totally unacceptable proliferation risks. In fast breeder reactors, the fuel rods consist of highly enriched uranium. Around the core, is an envelope of natural uranium. The flux of fast neutrons from the core is sufficient to convert a part of the U-238 in the envelope into Pu-239, a fissionable isotope of plutonium.

Fast breeder reactors are prohibitively dangerous from the standpoint of nuclear proliferation because both the highly enriched uranium from the fuel rods and the Pu-239 from the envelope are directly weapons-usable. It would be impossible, from the standpoint of equity, to maintain that some nations have the right to use fast breeder reactors, while others do not. If all nations used fast breeder reactors, the number of nuclear weapons states would increase drastically.

It is interesting to review the way in which Israel, South Africa, Pakistan, India and North Korea²⁶ obtained their nuclear weapons, since in all these cases the weapons were constructed under the guise of "atoms for peace", a phrase that future generations may someday regard as being tragically self-contradictory.

Israel began producing nuclear weapons in the late 1960's (with the help of a "peaceful"

²⁴i.e. production of uranium with a higher percentage of U-235 than is found in natural uranium

²⁵Craig, J.R., Vaugn, D.J. and Skinner, B.J., *Resources of the Earth: Origin, Use and Environmental Impact, Third Edition*, page 210.

²⁶Israel, India and Pakistan have refused to sign the Nuclear Non-Proliferation Treaty, and North Korea, after signing the NPT, withdrew from it in 2003.

nuclear reactor provided by France, and with the tacit approval of the United States) and the country is now believed to possess 100-150 of them, including neutron bombs. Israel's policy is one of visibly possessing nuclear weapons while denying their existence.

South Africa, with the help of Israel and France, also weaponized its civil nuclear program, and it tested nuclear weapons in the Indian Ocean in 1979. In 1991 however, South Africa destroyed its nuclear weapons and signed the NPT.

India produced what it described as a "peaceful nuclear explosion" in 1974. By 1989 Indian scientists were making efforts to purify the lithium-6 isotope, a key component of the much more powerful thermonuclear bombs. In 1998, India conducted underground tests of nuclear weapons, and is now believed to have roughly 60 warheads, constructed from Pu-239 produced in "peaceful" reactors.

Pakistan's efforts to obtain nuclear weapons were spurred by India's 1974 "peaceful nuclear explosion". As early as 1970, the laboratory of Dr. Abdul Qadeer Khan, (a metallurgist who was to become Pakistan's leading nuclear bomb maker) had been able to obtain from a Dutch firm the high-speed ultracentrifuges needed for uranium enrichment. With unlimited financial support and freedom from auditing requirements, Dr. Khan purchased restricted items needed for nuclear weapon construction from companies in Europe and the United States. In the process, Dr. Khan became an extremely wealthy man. With additional help from China, Pakistan was ready to test five nuclear weapons in 1998. The Indian and Pakistani nuclear bomb tests, conducted in rapid succession, presented the world with the danger that these devastating weapons would be used in the conflict over Kashmir. Indeed, Pakistan announced that if a war broke out using conventional weapons, Pakistan's nuclear weapons would be used "at an early stage".

In Pakistan, Dr. A.Q. Khan became a great national hero. He was presented as the person who had saved Pakistan from attack by India by creating Pakistan's own nuclear weapons. In a Washington Post article²⁷ Pervez Hoodbhoy wrote: "Nuclear nationalism was the order of the day as governments vigorously promoted the bomb as the symbol of Pakistan's high scientific achievement and self-respect..." Similar manifestations of nuclear nationalism could also be seen in India after India's 1998 bomb tests.

Early in 2004, it was revealed that Dr. Khan had for years been selling nuclear secrets and equipment to Libya, Iran and North Korea, and that he had contacts with Al-Qaeda. However, observers considered that it was unlikely that Khan would be tried, since a trial might implicate Pakistan's army as well as two of its former prime ministers.

Recent assassination attempts directed at Pakistan's President, Pervez Musharraf, emphasize the precariousness of Pakistan's government. There a danger that it may be overthrown, and that the revolutionists would give Pakistan's nuclear weapons to a subnational organization. This type of danger is a general one associated with nuclear proliferation. As more and more countries obtain nuclear weapons, it becomes increasingly likely that one of them will undergo a revolution, during the course of which nuclear weapons will fall into the hands of criminals or terrorists.

If nuclear reactors become the standard means for electricity generation as the result of

²⁷1 February, 2004

a future energy crisis, the number of nations possessing nuclear weapons might ultimately be as high as 40. If this should happen, then over a long period of time the chance that one or another of these nations would undergo a revolution during which the weapons would fall into the hands of a subnational group would gradually grow into a certainty.

There is also a possibility that poorly-guarded fissionable material could fall into the hands of subnational groups, who would then succeed in constructing their own nuclear weapons. Given a critical mass of highly-enriched uranium, a terrorist group, or an or-ganized criminal (Mafia) group, could easily construct a crude gun-type nuclear explosive device. Pu-239 is more difficult to use since it is highly radioactive, but the physicist Frank Barnaby believes that a subnational group could nevertheless construct a crude nuclear bomb (of the Nagasaki type) from this material.

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, or by organized criminals for the purpose of extortion. 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 criminals or 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.

Finally we must remember that if the number of nations possessing nuclear weapons becomes very large, there will be a greatly increased chance that these weapons will be used in conflicts between nations, either by accident or through irresponsible political decisions.

On November 3, 2003, Mohamed ElBaradei, Director General of the International Atomic Energy Agency, made a speech to the United Nations in which he called for "limiting the processing of weapons-usable material (separated plutonium and high enriched uranium) in civilian nuclear programs - as well as the production of new material through reprocessing and enrichment - by agreeing to restrict these operations to facilities exclusively under international control." It is almost incredible, considering the dangers of nuclear proliferation and nuclear terrorism, that such restrictions were not imposed long ago.

From the facts that we have been reviewing, we can conclude that if nuclear power generation becomes widespread during a future energy crisis, and if equally widespread proliferation of nuclear weapons is to be avoided, the powers and budget of the IAEA will have to be greatly increased. All enrichment of uranium and Reprocessing fuel rods throughout the world will have to be placed be under direct international control, as has been emphasized by Mohamed ElBaradei. Because this will need to be done with fairness, such regulations will have to hold both in countries that at present have nuclear weapons and in countries that do not. It has been proposed that there should be an international fuel rod bank, to supply new fuel rods and reprocess spent ones. In addition to this excellent proposal, one might also consider a system where all power generation reactors and all research reactors would be staffed by the IAEA.

Nuclear reactors used for "peaceful" purposes unfortunately also generate fissionable isotopes of not only of plutonium, but also of neptunium and americium. Thus all nuclear reactors must be regarded as ambiguous in function, and all must be put under strict international control. One must ask whether globally widespread use of nuclear energy is worth the danger that it entails.

Let us now examine the question of whether nuclear power generation would appreciably help to prevent global warming. The fraction of nuclear power in the present energy generation spectrum is at present approximately 1/16. Nuclear energy is used primarily for electricity generation. Thus increasing the nuclear fraction would not affect the consumption of fossil fuels used directly in industry, transportation, in commerce, and in the residential sector. Coal is still a very inexpensive fuel, and an increase in nuclear power generation would do little to prevent it from being burned. Thus besides being prohibitively dangerous, and besides being unsustainable in the long run (because of finite stocks of uranium and thorium), the large-scale use of nuclear power cannot be considered to be a solution to the problem of anthropogenic climate change.

Optimists point to the possibility of using fusion of light elements, such as hydrogen, to generate power. However, although this can be done on a very small scale (and at great expense) in laboratory experiments, the practical generation of energy by means of thermonuclear reactions remains a mirage rather than a realistic prospect on which planners can rely. The reason for this is the enormous temperature required to produce thermonuclear reactions. This temperature is comparable to that existing in the interior of the sun, and it is sufficient to melt any ordinary container. Elaborate "magnetic bottles" have been constructed to contain thermonuclear reactions, and these have been used in successful very small scale experiments. However, despite 50 years of heavily-financed research, there has been absolutely no success in producing thermonuclear energy on a large scale, or at anything remotely approaching commercially competitive prices.

Nuclear weapons are criminal! Every war is a crime!

War was always madness, always immoral, always the cause of unspeakable suffering, economic waste and widespread destruction, and always a source of poverty, hate, barbarism and endless cycles of revenge and counter-revenge. It has always been a crime for soldiers to kill people, just as it is a crime for murderers in civil society to kill people. No flag has ever been wide enough to cover up atrocities.

But today, the development of all-destroying modern weapons has put war completely beyond the bounds of sanity and elementary humanity.

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

3.21 Militarism is the US national religion

Here are some quotations from an article by William Astore entitled *Military Might Is Our* National Religion²⁸. He lists the following facts to support his thesis:

- We believe in wars. We may no longer believe in formal declarations of war (not since December 1941 has Congress made one in our name), but that sure hasn't stopped us from waging them. From Korea to Vietnam, Afghanistan to Iraq, the Cold War to the War on Terror, and so many military interventions in between, including Grenada, Panama, and Somalia, Americans are always fighting somewhere as if we saw great utility in thumbing our noses at the Prince of Peace. (That's Jesus Christ, if I remember my Catholic catechism correctly.)
- We believe in weaponry, the more expensive the better. The underperforming F-35 stealth fighter may cost \$1.45 trillion over its lifetime. An updated nuclear triad (land-based missiles, nuclear submarines, and strategic bombers) may cost that already mentioned \$1.7 trillion. New (and malfunctioning) aircraft carriers cost us more than \$10 billion each. And all such weaponry requests get funded, with few questions asked, despite a history of their redundancy, ridiculously high price, regular cost overruns, and mediocre performance. Meanwhile, Americans squabble bitterly over a few hundred million dollars for the arts and humanities.
- We believe in weapons of mass destruction. We believe in them so strongly that we're jealous of anyone nibbling at our near monopoly. As a result, we work overtime to ensure that "infidels" and atheists (that is, the Iranians and North Koreans, among others) don't get them. In historical terms, no country has devoted more research or money to deadly nuclear, biological, and chemical weaponry than the United States. In that sense, we've truly put our money where our mouths are (and where a devastating future might be).
- We believe with missionary zeal in our military and seek to establish our "faith" everywhere. Hence, our global network of perhaps 800 overseas military bases. We don't hesitate to deploy our elite missionaries, our equivalent to the Jesuits, the Special Operations forces to more than 130 countries annually. Similarly, the foundation for what we like to call foreign assistance is often military training and foreign military sales. Our present supreme leader, Pope Trump I, boasts of military sales across the globe, most notably to the "infidel" Saudis. Even when Congress makes what, until recently, was the rarest of attempts to rein in this deadly trade

²⁸Truthout, August 13, 2019

in arms, Pope Trump vetoes it. His rationale: weapons and profits should rule all.

- We believe in our college of cardinals, otherwise known as America's generals and admirals. We sometimes appoint them (or anoint them?) to the highest positions in the land. While Trump's generals - Michael Flynn, James Mattis, H.R. McMaster, and John Kelly - have fallen from grace at the White House, America's generals and admirals continue to rule They inhabit proconsul-like positions in sweeping geographiglobally. cal commands that (at least theoretically) cover the planet and similarly lead commands aimed at dominating the digital-computer realm and special operations. One of them will head a new force meant to dominate space through time eternal. A "strategic" command (the successor to the Strategic Air Command, or SAC, so memorably satirized in Stanley Kubrick's Dr. Strangelove) continues to ensure that, at some future moment, the U.S. will be able to commit mass genocide by quite literally destroying the world with nuclear weapons. Indeed, Pope Trump recently boasted that he could end America's Afghan War in a week, apparently through the mass nuclear genocide of (his figure) 10 million Afghans. Even as he then blandly dismissed the idea of wiping that country "off the face of the earth," he openly reflected the more private megalomania of those military professionals funded by the rest of us to think about "the unthinkable". In sum, everything is - theoretically at least - under the thumbs of our unelected college of cardinals. Their overblown term for it is "full-spectrum dominance," which, in translation, means they grant themselves god-like powers over our lives and that of our planet (though the largely undefeated enemies in their various wars don't seem to have acknowledged this reality).
- We believe that freedom comes through obedience. Those who break ranks from our militarized church and protest, like Chelsea Manning, are treated as heretics and literally tortured.
- We believe military spending brings wealth and jobs galore, even when it measurably doesn't. Military production is both increasingly automated and increasingly outsourced, leading to far fewer good-paying American jobs compared to spending on education, infrastructure repairs of and improvements in roads, bridges, levees, and the like, or just about anything else for that matter.
- We believe, and our most senior leaders profess to believe, that our military represents the very best of us, that we have the "finest" one in human history.



Figure 3.42: The peoples of the world must revolt against the endless wars of their governments. All-destroying modern weapons have made the institution of war prohibitively dangerous.

• We believe in planning for a future marked by endless wars, whether against terrorism or "godless" states like China and Russia, which means our military church must be forever strengthened in the cause of winning ultimate victory.

3.22 The world came close to thermonuclear destruction

Here are some quotations from Wikipedia's article on the Cuban Missile Crisis:

The Cuban Missile Crisis, also known as the October Crisis of 1962 (Spanish: Crisis de Octubre), the Caribbean Crisis... was a 13-day (October 16-28, 1962) confrontation between the United States and the Soviet Union initiated by Soviet ballistic missile deployment in Cuba. The confrontation is often considered the closest the Cold War came to escalating into a full-scale nuclear war.

In response to the failed Bay of Pigs Invasion of 1961 and the presence of American Jupiter ballistic missiles in Italy and Turkey, Soviet leader Nikita Khrushchev agreed to Cuba's request to place nuclear missiles on the island to deter a future invasion. An agreement was reached during a secret meeting between Khrushchev and Fidel Castro in July 1962, and construction of a number of missile launch facilities started later that summer.

Meanwhile, the 1962 United States elections were under way, and the White House had denied charges for months that it was ignoring dangerous Soviet missiles 90 miles (140 km) from Florida. The missile preparations were confirmed when an Air Force U-2 spy plane produced clear photographic evidence of medium-range (SS-4) and intermediate-range (R-14) ballistic missile facilities.

When this was reported to President John F. Kennedy he then convened a meeting of the nine members of the National Security Council and five other key advisers in a group that became known as the Executive Committee of the National Security Council (EXCOMM). After consultation with them, Kennedy ordered a naval blockade on October 22 to prevent further missiles from reaching Cuba. The US announced it would not permit offensive weapons to be delivered to Cuba and demanded that the weapons already in Cuba be dismantled and returned to the Soviet Union.

After several days of tense negotiations, an agreement was reached between Kennedy and Khrushchev. Publicly, the Soviets would dismantle their offensive weapons in Cuba and return them to the Soviet Union, subject to United Nations verification, in exchange for a US public declaration and agreement to avoid invading Cuba again. Secretly, the United States agreed that it would dismantle all US-built Jupiter MRBMs, which had been deployed in Turkey against the Soviet Union; there has been debate on whether or not Italy was included in the agreement as well.

When all offensive missiles and Ilyushin Il-28 light bombers had been withdrawn from Cuba, the blockade was formally ended on November 21, 1962. The negotiations between the United States and the Soviet Union pointed out the necessity of a quick, clear, and direct communication line between the two Superpowers. As a result, the Moscow-Washington hotline was established. A series of agreements later reduced US-Soviet tensions for several years until both parties began to build their nuclear arsenals even further.

3.23 The Joint Chiefs of Staff advocate invading Cuba

One of the circumstances that made the Cuban Missile Crisis so dangerous was the fact that U.S. military leaders advocated an invasion of Cuba. Luckily Kennedy rejected this idea. Here are more quotations from the Wikipedia article:



Figure 3.43: More than 100 US-built missiles having the capability to strike Moscow with nuclear warheads were deployed in Italy and Turkey in 1961.

The Joint Chiefs of Staff unanimously agreed that a full-scale attack and invasion was the only solution. They believed that the Soviets would not attempt to stop the US from conquering Cuba. Kennedy was sceptical:

'They, no more than we, [Kennedy said] can let these things go by without doing something. They can't, after all their statements, permit us to take out their missiles, kill a lot of Russians, and then do nothing. If they don't take action in Cuba, they certainly will in Berlin.'

Kennedy concluded that attacking Cuba by air would signal the Soviets to presume 'a clear line' to conquer Berlin. Kennedy also believed that US allies would think of the country as 'trigger-happy cowboys' who lost Berlin because they could not peacefully resolve the Cuban situation.



Figure 3.44: A U-2 reconnaissance photograph of Cuba, showing Soviet nuclear missiles, their transports and tents for fueling and maintenance.



Figure 3.45: One of the first U-2 reconnaissance images of missile bases under construction shown to President Kennedy on the morning of October 16, 1962.



Figure 3.46: President Kennedy meets in the Oval Office with General Curtis LeMay and the reconnaissance pilots who found the missile sites in Cuba.



Figure 3.47: President Kennedy and Secretary of Defense McNamara in an EX-COMM meeting.



Figure 3.48: President Kennedy meets with Soviet Foreign Minister Andrei Gromyko in the Oval Office (October 18, 1962).



Figure 3.49: A US Navy P-2H Neptune of VP-18 flying over a Soviet cargo ship with crated Il-28s on deck during the Cuban Crisis.



Figure 3.50: President Kennedy signs the Proclamation for Interdiction of the Delivery of Offensive Weapons to Cuba at the Oval Office on October 23, 1962.

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ECOLOGICAL IMPACT OF MILITARISM

Chapter 4

ECOLOGY AND THE VIETNAM WAR

4.1 McNamara's Evil Lives On

Here are some quotations from an article by Robert Sheer entitled *McNamara's Evil Lives* On, published in The Nation on July 8, 2008.¹

Why not speak ill of the dead?

Robert McNamara, who died this week, was a complex man - charming even, in a blustery way, and someone I found quite thoughtful when I interviewed him. In the third act of his life he was often an advocate for enlightened positions on world poverty and the dangers of the nuclear arms race. But whatever his better nature, it was the stark evil he perpetrated as secretary of defense that must indelibly frame our memory of him.

To not speak out fully because of respect for the deceased would be to mock the memory of the millions of innocent people McNamara caused to be maimed and killed in a war that he later freely admitted never made any sense. Much has been made of the fact that he recanted his support for the war, but that came 20 years after the holocaust he visited upon Vietnam was over.

Is holocaust too emotionally charged a word? How many millions of dead innocent civilians does it take to qualify labels like holocaust, genocide or terrorism? How many of the limbless victims of his fragmentation bombs and land mines whom I saw in Vietnam during and after the war? Or are America's leaders always to be exempted from such questions? Perhaps if McNamara had been held legally accountable for his actions, the architects of the Iraq debacle might have paused.

Instead, McNamara was honored with the Medal of Freedom by President Lyndon Johnson, to whom he had written a private memo nine months earlier

¹https://www.thenation.com/article/archive/mcnamaras-evil-lives/

offering this assessment of their Vietnam carnage: 'The picture of the world's greatest superpower killing or seriously injuring 1,000 noncombatants a week, while trying to pound a tiny backward nation into submission on an issue whose merits are hotly disputed, is not a pretty one.'

He knew it then, and, give him this, the dimensions of that horror never left him. When I interviewed him for the Los Angeles Times in 1995, after the publication of his confessional memoir, his assessment of the madness he had unleashed was all too clear:

'Look, we dropped three to four times the tonnage on that tiny little area as were dropped by the Allies in all of the theaters in World War II over a period of five years. It was unbelievable. We killed - there were killed - 3,200,000 Vietnamese, excluding the South Vietnamese military. My God! The killing, the tonnage - it was fantastic. The problem was that we were trying to do something that was militarily impossible - we were trying to break the will; I don't think we can break the will by bombing short of genocide.'

We - no, he - couldn't break their will because their fight was for national independence. They had defeated the French and would defeat the Americans who took over when French colonialists gave up the ghost. The war was a lie from the first. It never had anything to do with the freedom of the Vietnamese (we installed one tyrant after another in power), but instead had to do with our irrational cold war obsession with 'international communism.' Irrational, as President Richard Nixon acknowledged when he embraced detente with the Soviet communists, toasted China's fierce communist Mao Tse-tung and then escalated the war against 'communist' Vietnam and neutral Cambodia.

It was always a lie and our leaders knew it, but that did not give them pause. Both Johnson and Nixon make it quite clear on their White House tapes that the mindless killing, McNamara's infamous body count, was about domestic politics and never security.

The lies are clearly revealed in the Pentagon Papers study that McNamara commissioned, but they were made public only through the bravery of Daniel Ellsberg. Yet when Ellsberg, a former Marine who had worked for McNamara in the Pentagon, was in the docket facing the full wrath of Nixon's Justice Department, McNamara would lift not a finger in his defense. Worse, as Ellsberg reminded me this week, McNamara threatened that if subpoenaed to testify at the trial by Ellsberg's defense team, 'I would hurt your client badly.'

Not as badly as those he killed or severely wounded. Not as badly as the almost 59,000 American soldiers killed and the many more horribly hurt. One of them was the writer and activist Ron Kovic, who as a kid from Long Island was seduced by McNamara's lies into volunteering for two tours in Vietnam. Eventually, struggling with his mostly paralyzed body, he spoke out against the war in the hope that others would not have to suffer as he did (and still does). Meanwhile, McNamara maintained his golden silence, even as Richard Nixon managed to kill and maim millions more. What McNamara did was evil - deeply so.

4.2 The Pentagon Papers

Wikipedia states that:

The Pentagon Papers, officially titled *Report of the Office of the Secretary* of Defense Vietnam Task Force, is a United States Department of Defense history of the United States' political and military involvement in Vietnam from 1945 to 1967. The papers were released by Daniel Ellsberg, who had worked on the study; they were first brought to the attention of the public on the front page of The New York Times in 1971.A 1996 article in The New York Times said that the Pentagon Papers had demonstrated, among other things, that the Johnson Administration 'systematically lied, not only to the public but also to Congress.'

More specifically, the papers revealed that the U.S. had secretly enlarged the scope of its actions in the Vietnam War with the bombings of nearby Cambodia and Laos, coastal raids on North Vietnam, as well as Marine Corps attacks, none of which were reported in the mainstream media. For his disclosure of the Pentagon Papers, Ellsberg was initially charged with conspiracy, espionage, and theft of government property, but the charges were later dismissed after prosecutors investigating the Watergate scandal discovered that the staff members in the Nixon White House had ordered the so-called White House Plumbers to engage in unlawful efforts to discredit Ellsberg...

To ensure the possibility of public debate about the papers' content, on June 29, US Senator Mike Gravel, an Alaska Democrat, entered 4,100 pages of the papers into the record of his Subcommittee on Public Buildings and Grounds. These portions of the papers, which were edited for Gravel by Howard Zinn and Noam Chomsky, were subsequently published by Beacon Press, the publishing arm of the Unitarian Universalist Association of Congregations. A federal grand jury was subsequently empaneled to investigate possible violations of federal law in the release of the report. Leonard Rodberg, a Gravel aide, was subpoenaed to testify about his role in obtaining and arranging for publication of the Pentagon Papers. Gravel asked the court (in Gravel v. United States) to quash the subpoena on the basis of the Speech or Debate Clause in Article I, Section 6 of the United States Constitution.

Daniel Ellesberg believed that when U.S. citizens discovered that the Vietnam War was based on lies, the war would end. However, it continued for many more years.



Figure 4.1: Victems of the Mai Lai Massacre.

4.2. THE PENTAGON PAPERS



Figure 4.2: Napalm burn victims during the war being treated at the 67th Combat Support Hospital. 1967-1968 Innocent children become burn victims in the Vietnam War.



Figure 4.3: Frightened children flee from an air attack in Vietnam.

4.3 Effects of Agent Orange

Wikipedia states that:

"Up to four million people in Vietnam were exposed to the defoliant. The government of Vietnam says as many as three million people have suffered illness because of Agent Orange,[4] and the Red Cross of Vietnam estimates that up to one million people are disabled or have health problems as a result of Agent Orange contamination. The United States government has described these figures as unreliable, while documenting higher cases of leukemia, Hodgkin's lymphoma, and various kinds of cancer in exposed US military veterans. An epidemiological study done by the Centers for Disease Control and Prevention showed that there was an increase in the rate of birth defects of the children of military personnel as a result of Agent Orange. Agent Orange has also caused enormous environmental damage in Vietnam. Over 3,100,000 hectares (31,000 km2 or 11,969 mi2) of forest were defoliated. Defoliants eroded tree cover and seedling forest stock, making reforestation difficult in numerous areas. Animal species diversity sharply reduced in contrast with unsprayed areas."



Figure 4.4: Nguyen Xuan Minh lies in a crib at the Tu Du Hospital May 2, 2005 in Ho Chi Minh City, Vietnam.

4.3. EFFECTS OF AGENT ORANGE



Figure 4.5: A disabled and malformed victim of foliant Agent Orange, begs on the streets of Saigon to make a living, 1996.

4.4 Bombing of Cambodia and Laos

According to an article by Jessica Pearce Rotondi entitled Why Laos Has Been Bombed More Than Any Other Country²,

"The U.S. bombing of Laos (1964-1973) was part of a covert attempt by the CIA to wrest power from the communist Pathet Lao, a group allied with North Vietnam and the Soviet Union during the Vietnam War.

"The officially neutral country became a battleground in the Cold War between the United States and Soviet Union, with American bombers dropping over two million tons of cluster bombs over Laos - more than all the bombs dropped during WWII combined. Today, Laos is the most heavily bombed nation in history. Here are facts about the so-called secret war in Laos.

"Laos is a landlocked country bordered by China and Myanmar to the North, Vietnam to the East, Cambodia to the South and Thailand and the Mekong River to the West.

"Its proximity to Mao Zedong's China made it critical to Dwight D. Eisenhower's Domino Theory of keeping communism at bay. 'If Laos were lost, the rest of Southeast Asia would follow,' Eisenhower told his National Security Council. On the day of his farewell address in 1961, President Eisenhower approved the CIA's training of anti-communist forces in the mountains of Laos. Their mission: To disrupt communist supply routes across the Ho Chi Minh Trail to Vietnam.

"Eisenhower's successors in the White House: John F. Kennedy, Lyndon B. Johnson and Richard Nixon, all approved escalating air support for the guerrilla fighters, but not publicly. The 1962 International Agreement on the Neutrality of Laos, signed by China, the Soviet Union, Vietnam, the United States and 10 other countries, forbid signees from directly invading Laos or establishing military bases there. The secret war in Laos had begun...

"In Laos, the legacy of U.S. bombs continues to wreak havoc. Since 1964, more than 50,000 Lao have been killed or injured by U.S. bombs, 98 percent of them civilians. An estimated 30 percent of the bombs dropped on Laos failed to explode upon impact, and in the years since the bombing ended, 20,000 people have been killed or maimed by the estimated 80 million bombs left behind."

By 1975, one tenth of the population of Laos had been killed by the bombs, and a quarter of the population were refugees.

²https://www.history.com/news/laos-most-bombed-country-vietnam-war

Cambodia

Here are some quotations from an article by Maximillian Wechsler entitled America's 'Secret War' and the Bombing of Southeast Asia³:

"On March 18, 1969, USAF Strategic Air Command (SAC) B-52 bombers began carpet bombing Cambodia on the order of President Nixon. The overall covert operation was code-named 'Operation Menu', with various phases named 'Breakfast', 'Lunch', 'Dinner', 'Snack', 'Supper' and 'Dessert'.

"President Nixon ordered the campaign without consulting Congress and even kept it secret from top military officials. Five members of Congress were informed several months after the start of Operation Menu, but it was kept secret from the American people until The New York Times broke the story in May 1969. Henry Kissinger, President Nixon's National Security Adviser, was reportedly outraged over the leaked information in the story and ordered the FBI to wiretap the phones of top White House aides and reporters to find the source.

"More reports of the secret bombing campaign surfaced in the press and records of Congressional proceedings, but it was not until 2000 that official the USAF records of US bombing activity over Indochina from 1964 to 1973 were declassified by President Bill Clinton.

"Some sources say that during the first phase of the bombings lasting until April 1970, 'Operation Breakfast', the SAC conducted 3,630 sorties and dropped 110,000 tons of bombs and that in the entire four-year campaign the US dropped about 540,000 tons of bombs. In the book Bombs Over Cambodia, historians Ben Kiernan and Taylor Owen state that, based on their analysis of the declassified documents, 2,756,941 tons of ordnance was dropped during Operation Menu, more than the US dropped on Japan during World War II.

"The authors also say that US planes flew 230,516 sorties over 113,716 sites. Estimates of casualties vary widely as well, but it is believed that somewhere between 100,000 and 600,000 civilians died in the bombing and two million became homeless. Some sources say that hundreds of thousands more Cambodians died from the effects of displacement, illness or starvation as a direct result of the bombings.

"The carpet bombing of Cambodia lasted until August 1973. It devastated the countryside and the chaos and upheaval it unleashed played a big part in the installation of the genocidal Khmer Rouge regime led by Pol Pot. The Khmer Rouge was responsible for the deaths of up to two million Cambodians through executions, forced labour and starvation."

 $^{{}^{3}}https://www.the bigchilli.com/feature-stories/americas-secret-war-and-the-bombing-of-southeast-asia$





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Chapter 5

AGAINST NUCLEAR POWER GENERATION

5.1 The Chernobyl disaster

The dangers of nuclear power generation are exemplified by the Chernobyl disaster: On the 26th of April, 1986, during the small hours of the morning, the staff of the Chernobyl nuclear reactor in Ukraine turned off several safety systems in order to perform a test. The result was a core meltdown in Reactor 4, causing a chemical explosion that blew off the reactor's 1,000-ton steel and concrete lid. 190 tons of highly radioactive uranium and graphite were hurled into the atmosphere. The resulting radioactive fallout was 200 times greater than that caused by the nuclear bombs that destroyed Hiroshima and Nagasaki. The radioactive cloud spread over Belarus, Ukraine, Russia, Finland, Sweden and Eastern Europe, exposing the populations of these regions to levels of radiation 100 times the normal background. Ultimately, the radioactive cloud reached as far as Greenland and parts of Asia.

The exact number of casualties resulting from the Chernobyl meltdown is a matter of controversy, but according to a United Nations report, as many as 9 million people have been adversely affected by the disaster. Since 1986, the rate of thyroid cancer in affected areas has increased ten-fold. An area of 155,000 square kilometers (almost half the size of Italy) in Belarus, Ukraine and Russia is still severely contaminated. Even as far away as Wales, hundreds of farms are still under restrictions because of sheep eating radioactive grass.

Public opinion turned against nuclear power generation as a result of the Chernobyl disaster. Had the disaster taken place in Western Europe or North America, its effect on public opinion would have been still greater. Nevertheless, because of the current energy crisis, and because of worries about global warming, a number of people are arguing that nuclear energy should be given a second chance. The counter-argument is that a large increase in the share of nuclear power in the total spectrum of energy production would have little effect on climate change but it would involve unacceptable dangers, not only

dangers of accidents and dangers associated with radioactive waste disposal, but above all, dangers of proliferation of nuclear weapons.

Of the two bombs that destroyed Hiroshima and Nagasaki, one made use of the rare isotope of uranium, U-235, while the other used plutonium. Both of these materials can be made by a nation with a nuclear power generation program.

5.2 Reactors and nuclear weapons

Uranium has atomic number 92, i.e., a neutral uranium atom has a nucleus containing 92 positively-charged protons, around which 92 negatively-charged electrons circle. All of the isotopes of uranium have the same number of protons and electrons, and hence the same chemical properties, but they differ in the number of neutrons in their nuclei. For example, the nucleus of U-235 has 143 neutrons, while that of U-238 has 146. Notice that 92+143=235, while 92+146=238. The number written after the name of an element to specify a particular isotope is the number of neutrons plus the number of protons. This is called the "nucleon number", and the weight of an isotope is roughly proportional to it. This means that U-238 is slightly heavier than U-235. If the two isotopes are to be separated, difficult physical methods dependent on mass must be used, since their chemical properties are identical. In natural uranium, the amount of the rare isotope U-235 is only 0.7 percent.

A paper published in 1939 by Niels Bohr and John A. Wheeler indicated that it was the rare isotope of uranium, U-235, that undergoes fission. A bomb could be constructed, they pointed out, if enough highly enriched U-235 could be isolated from the more common isotope, U-238 Calculations later performed in England by Otto Frisch and Rudolf Peierls showed that the "critical mass" of highly enriched uranium needed is quite small: only a few kilograms.

The Bohr-Wheeler theory also predicted that an isotope of plutonium, Pu-239, should be just as fissionable as U-235¹. Instead of trying to separate the rare isotope, U-235, from the common isotope, U-238, physicists could just operate a nuclear reactor until a sufficient amount of Pu-239 accumulated, and then separate it out by ordinary chemical means.

Thus in 1942, when Enrico Fermi and his coworkers at the University of Chicago produced the world's first controlled chain reaction within a pile of cans containing ordinary (nonenriched) uranium powder, separated by blocks of very pure graphite, the chainreacting pile had a double significance: It represented a new source of energy for mankind, but it also had a sinister meaning. It represented an easy path to nuclear weapons, since one of the by-products of the reaction was a fissionable isotope of plutonium, Pu-239. The

¹Both U-235 and Pu-239 have odd nucleon numbers. When U-235 absorbs a neutron, it becomes U-236, while when Pu-239 absorbs a neutron it becomes Pu-240. In other words, absorption of a neutron converts both these species to nuclei with even nucleon numbers. According to the Bohr-Wheeler theory, nuclei with even nucleon numbers are especially tightly-bound. Thus absorption of a neutron converts U-235 to a highly-excited state of U-236, while Pu-239 is similarly converted to a highly excited state of Pu-240. The excitation energy distorts the nuclei to such an extent that fission becomes possible.

5.2. REACTORS AND NUCLEAR WEAPONS

bomb dropped on Hiroshima in 1945 used U-235, while the Nagasaki bomb used Pu-239.

By reprocessing spent nuclear fuel rods, using ordinary chemical means, a nation with a power reactor can obtain weapons-usable Pu-239. Even when such reprocessing is performed under international control, the uncertainty as to the amount of Pu-239 obtained is large enough so that the operation might superficially seem to conform to regulations while still supplying enough Pu-239 to make many bombs.

The enrichment of uranium² is also linked to reactor use. Many reactors of modern design make use of low enriched uranium (LEU) as a fuel. Nations operating such a reactor may claim that they need a program for uranium enrichment in order to produce LEU for fuel rods. However, by operating their ultracentrifuges a little longer, they can easily produce highly enriched uranium (HEU), i.e., uranium containing a high percentage of the rare isotope U-235, and therefore usable in weapons.

Known reserves of uranium are only sufficient for the generation of 8×10^{20} joules of electrical energy ³, i.e., about 25 TWy. It is sometimes argued that a larger amount of electricity could be obtained from the same amount of uranium through the use of fast breeder reactors, but this would involve totally unacceptable proliferation risks. In fast breeder reactors, the fuel rods consist of highly enriched uranium. Around the core, is an envelope of natural uranium. The flux of fast neutrons from the core is sufficient to convert a part of the U-238 in the envelope into Pu-239, a fissionable isotope of plutonium.

Fast breeder reactors are prohibitively dangerous from the standpoint of nuclear proliferation because both the highly enriched uranium from the fuel rods and the Pu-239 from the envelope are directly weapons-usable. It would be impossible, from the standpoint of equity, to maintain that some nations have the right to use fast breeder reactors, while others do not. If all nations used fast breeder reactors, the number of nuclear weapons states would increase drastically.

It is interesting to review the way in which Israel, South Africa, Pakistan, India and North Korea⁴ obtained their nuclear weapons, since in all these cases the weapons were constructed under the guise of "atoms for peace", a phrase that future generations may someday regard as being tragically self-contradictory.

Israel began producing nuclear weapons in the late 1960's (with the help of a "peaceful" nuclear reactor provided by France, and with the tacit approval of the United States) and the country is now believed to possess 100-150 of them, including neutron bombs. Israel's policy is one of visibly possessing nuclear weapons while denying their existence.

South Africa, with the help of Israel and France, also weaponized its civil nuclear program, and it tested nuclear weapons in the Indian Ocean in 1979. In 1991 however, South Africa destroyed its nuclear weapons and signed the NPT.

India produced what it described as a "peaceful nuclear explosion" in 1974. By 1989 Indian scientists were making efforts to purify the lithium-6 isotope, a key component of

²i.e. production of uranium with a higher percentage of U-235 than is found in natural uranium

³Craig, J.R., Vaugn, D.J. and Skinner, B.J., *Resources of the Earth: Origin, Use and Environmental Impact, Third Edition*, page 210.

⁴Israel, India and Pakistan have refused to sign the Nuclear Non-Proliferation Treaty, and North Korea, after signing the NPT, withdrew from it in 2003.

the much more powerful thermonuclear bombs. In 1998, India conducted underground tests of nuclear weapons, and is now believed to have roughly 60 warheads, constructed from Pu-239 produced in "peaceful" reactors.

Pakistan's efforts to obtain nuclear weapons were spurred by India's 1974 "peaceful nuclear explosion". As early as 1970, the laboratory of Dr. Abdul Qadeer Khan, (a metallurgist who was to become Pakistan's leading nuclear bomb maker) had been able to obtain from a Dutch firm the high-speed ultracentrifuges needed for uranium enrichment. With unlimited financial support and freedom from auditing requirements, Dr. Khan purchased restricted items needed for nuclear weapon construction from companies in Europe and the United States. In the process, Dr. Khan became an extremely wealthy man. With additional help from China, Pakistan was ready to test five nuclear weapons in 1998. The Indian and Pakistani nuclear bomb tests, conducted in rapid succession, presented the world with the danger that these devastating weapons would be used in the conflict over Kashmir. Indeed, Pakistan announced that if a war broke out using conventional weapons, Pakistan's nuclear weapons would be used "at an early stage".

In Pakistan, Dr. A.Q. Khan became a great national hero. He was presented as the person who had saved Pakistan from attack by India by creating Pakistan's own nuclear weapons. In a Washington Post article⁵ Pervez Hoodbhoy wrote: "Nuclear nationalism was the order of the day as governments vigorously promoted the bomb as the symbol of Pakistan's high scientific achievement and self-respect..." Similar manifestations of nuclear nationalism could also be seen in India after India's 1998 bomb tests.

Early in 2004, it was revealed that Dr. Khan had for years been selling nuclear secrets and equipment to Libya, Iran and North Korea, and that he had contacts with Al-Qaeda. However, observers considered that it was unlikely that Khan would be tried, since a trial might implicate Pakistan's army as well as two of its former prime ministers.

Recent assassination attempts directed at Pakistan's President, Pervez Musharraf, emphasize the precariousness of Pakistan's government. There a danger that it may be overthrown, and that the revolutionists would give Pakistan's nuclear weapons to a subnational organization. This type of danger is a general one associated with nuclear proliferation. As more and more countries obtain nuclear weapons, it becomes increasingly likely that one of them will undergo a revolution, during the course of which nuclear weapons will fall into the hands of criminals or terrorists.

If nuclear reactors become the standard means for electricity generation as the result of a future energy crisis, the number of nations possessing nuclear weapons might ultimately be as high as 40. If this should happen, then over a long period of time the chance that one or another of these nations would undergo a revolution during which the weapons would fall into the hands of a subnational group would gradually grow into a certainty.

There is also a possibility that poorly-guarded fissionable material could fall into the hands of subnational groups, who would then succeed in constructing their own nuclear weapons. Given a critical mass of highly-enriched uranium, a terrorist group, or an organized criminal (Mafia) group, could easily construct a crude gun-type nuclear explosive

⁵1 February, 2004
5.2. REACTORS AND NUCLEAR WEAPONS

device. Pu-239 is more difficult to use since it is highly radioactive, but the physicist Frank Barnaby believes that a subnational group could nevertheless construct a crude nuclear bomb (of the Nagasaki type) from this material.

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, or by organized criminals for the purpose of extortion. 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 criminals or 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.

Finally we must remember that if the number of nations possessing nuclear weapons becomes very large, there will be a greatly increased chance that these weapons will be used in conflicts between nations, either by accident or through irresponsible political decisions.

On November 3, 2003, Mohamed ElBaradei, Director General of the International Atomic Energy Agency, made a speech to the United Nations in which he called for "limiting the processing of weapons-usable material (separated plutonium and high enriched uranium) in civilian nuclear programs - as well as the production of new material through reprocessing and enrichment - by agreeing to restrict these operations to facilities exclusively under international control." It is almost incredible, considering the dangers of nuclear proliferation and nuclear terrorism, that such restrictions were not imposed long ago.

From the facts that we have been reviewing, we can conclude that if nuclear power generation becomes widespread during a future energy crisis, and if equally widespread proliferation of nuclear weapons is to be avoided, the powers and budget of the IAEA will have to be greatly increased. All enrichment of uranium and reprocessing of fuel rods throughout the world will have to be placed be under direct international control, as has been emphasized by Mohamed ElBaradei. Because this will need to be done with fairness, such regulations will have to hold both in countries that at present have nuclear weapons and in countries that do not. It has been proposed that there should be an international fuel rod bank, to supply new fuel rods and reprocess spent ones. In addition to this excellent proposal, one might also consider a system where all power generation reactors and all research reactors would be staffed by the IAEA.

Nuclear reactors used for "peaceful" purposes unfortunately also generate fissionable isotopes of not only of plutonium, but also of neptunium and americium. Thus all nuclear reactors must be regarded as ambiguous in function, and all must be put under strict international control. One must ask whether globally widespread use of nuclear energy is worth the danger that it entails.

Let us now examine the question of whether nuclear power generation would appreciably help to prevent global warming. The fraction of nuclear power in the present energy generation spectrum is at present approximately 1/16. Nuclear energy is used primarily for electricity generation. Thus increasing the nuclear fraction would not affect the consumption of fossil fuels used directly in industry, transportation, in commerce, and in the residential sector. Coal is still a very inexpensive fuel, and an increase in nuclear power generation would do little to prevent it from being burned. Thus besides being prohibitively dangerous, and besides being unsustainable in the long run (because of finite stocks of uranium and thorium), the large-scale use of nuclear power cannot be considered to be a solution to the problem of anthropogenic climate change.

Optimists point to the possibility of using fusion of light elements, such as hydrogen, to generate power. However, although this can be done on a very small scale (and at great expense) in laboratory experiments, the practical generation of energy by means of thermonuclear reactions remains a mirage rather than a realistic prospect on which planners can rely. The reason for this is the enormous temperature required to produce thermonuclear reactions. This temperature is comparable to that existing in the interior of the sun, and it is sufficient to melt any ordinary container. Elaborate "magnetic bottles" have been constructed to contain thermonuclear reactions, and these have been used in successful very small scale experiments. However, despite 50 years of heavily-financed research, there has been absolutely no success in producing thermonuclear energy on a large scale, or at anything remotely approaching commercially competitive prices.

5.3 Cancer threat from radioactive leaks at Hanford USA

On August 9, 1945, a nuclear bomb was dropped on the Japanese city of Nagasaki. Within a radius of one mile, destruction was total. People were vaporized so that the only shadows on concrete pavements were left to show where they had been. Many people outside the radius of total destruction were trapped in their collapsed houses, and were burned alive by the fire that followed. By the end of 1945, an estimated 80,000 men, women, young children, babies and old people had died as a result of the bombing. As the years passed more people continued to die from radiation sickness.

Plutonium for the bomb that destroyed Nagasaki had been made at an enormous nuclear reactor station located at Hanford in the state of Washington. During the Cold War, the reactors at Hanford produced enough weapons-usable plutonium for 60,000 nuclear weapons. The continued existence of plutonium and highly-enriched uranium-235 in the stockpiles of nuclear weapons states hangs like a dark cloud over the future of humanity. A full scale thermonuclear war would be the ultimate ecological catastrophe, threatening to make the world permanently uninhabitable.

Besides playing a large role in the tragedy of Nagasaki, the reactor complex at Hanford has damaged the health of many thousands of Americans. The prospects for the future are even worse. Many millions of gallons of radioactive waste are held in Hanford's aging storage tanks, the majority of which have exceeded their planned lifetimes. The following quotations are taken from a Wikipedia article on Hanford, especially the section devoted to ecological concerns:

"A huge volume of water from the Columbia River was required to dissipate the heat produced by Hanford's nuclear reactors. From 1944 to 1971, pump systems drew cooling water from the river and, after treating this water for use by the reactors, returned it to the river. Before being released back into the river, the used water was held in large tanks known as retention basins for up to six hours. Longer-lived isotopes were not affected by this retention, and several tetrabecquerels entered the river every day. These releases were kept secret by the federal government. Radiation was later measured downstream as far west as the Washington and Oregon coasts."

"The plutonium separation process also resulted in the release of radioactive isotopes into the air, which were carried by the wind throughout southeastern Washington and into parts of Idaho, Montana, Oregon and British Colombia. Downwinders were exposed to radionuclide's, particularly iodine-131... These radionuclide's filtered into the food chain via contaminated fields where dairy cows grazed; hazardous fallout was ingested by communities who consumed the radioactive food and drank the milk. Most of these airborne releases were a part of Hanford's routine operations, while a few of the larger releases occurred in isolated incidents."

"In response to an article in the Spokane Spokesman Review in September 1985, the Department of Energy announced its intent to declassify environmental records and in February, 1986 released to the public 19,000 pages of previously unavailable historical documents about Hanford's operations. The Washington State Department of Health collaborated with the citizen-led Hanford Health Information Network (HHIN) to publicize data about the health effects of Hanford's operations. HHIN reports concluded that residents who lived downwind from Hanford or who used the Columbia River downstream were exposed to elevated doses of radiation that placed them at increased risk for various cancers and other diseases."

"The most significant challenge at Hanford is stabilizing the 53 million U.S. Gallons $(204,000 \text{ m}^3)$ of high-level radioactive waste stored in 177 underground tanks. About a third of these tanks have leaked waste into the soil and groundwater. As of 2008, most of the liquid waste has been transferred to more secure double-shelled tanks; however, 2.8 million U.S. Gallons $(10,600 \text{ m}^3)$ of liquid waste, together with 27 million U.S. gallons $(100,000 \text{ m}^3)$ of salt cake and sludge, remains in the single-shelled tanks. That waste was originally scheduled to be removed by 2018. The revised deadline is 2040. Nearby aquifers contain an estimated 270 billion U.S. Gallons (1 billion m^3) of contaminated groundwater as a result of the leaks. As of 2008, 1 million U.S. Gallons $(4,000 \text{ m}^3)$ of highly radioactive waste is traveling through the groundwater toward the Columbia River."

The documents made public in 1986 revealed that radiation was intentionally and secretly released by the plant and that people living near to it acted as unknowing guinea pigs in experiments testing radiation dangers. Thousands of people who live in the vicinity of the Hanford Site have suffered an array of health problems including thyroid cancers, autoimmune diseases and reproductive disorders that they feel are the direct result of these releases and experiments. In thinking about the dangers posed by leakage of radioactive waste, we should remember that many of the dangerous radioisotopes involved have half-lives of hundreds of thousands of years. Thus, it is not sufficient to seal them into containers that will last for a century or even a millennium. We must find containers that will last for a hundred thousand years or more, longer than any human structure has ever lasted. This logic has lead Finland to deposit its radioactive waste in a complex of underground tunnels carved out of solid rock. But looking ahead for a hundred thousand years involves other problems: If humans survive for that long, what language will they speak? Certainly not the languages of today. How can we warn them that the complex of tunnels containing radioactive waste is a death trap? The reader is urged to see a film exploring these problems, "Into Eternity", by the young Danish film-maker Michael Madsen.

We have already gone a long way towards turning our beautiful planet earth into a nuclear wasteland. In the future, let us be more careful, as guardians of a precious heritage, the natural world and the lives of all future generations.

Chapter 6

AGAINST THE INSTITUTION OF WAR

6.1 Science and technology are double-edged

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

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

6.2 A crisis of civilization

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.

While in earlier epochs it may have been possible to confine the effects of war mainly to combatants, in our own century the victims of war have increasingly been civilians, and especially children. For example, according to Quincy Wright's statistics, the First and Second World Wars together cost the lives of 26 million soldiers, but the toll in civilian lives was much larger: 64 million.

6.3 Civilians victems of war

Since the Second World War, despite the best efforts of the U. N., there have been over 150 armed conflicts; and, if civil wars are included, there are on any given day an average of 12 wars somewhere in the world. In the conflicts in Indo-China, the proportion of civilian victims was between 80% and 90%, while in the Lebanese civil war some sources state that the proportion of civilian casualties was as high as 97%.

Civilian casualties often occur through malnutrition and through diseases, which would be preventable in normal circumstances. Because of the social disruption caused by war, normal supplies of food, safe water and medicine are interrupted, so that populations become vulnerable to famine and epidemics. In the event of a catastrophic nuclear war, starvation and disease would add greatly to the loss of life caused by the direct effects of nuclear weapons.

6.4 Indirect costs of war

The indirect effects of war are also enormous. Globally, preparations for war interfere seriously with the use of tax money for constructive and peaceful purposes. Today, despite the end of the Cold War, the world spends roughly a trillion (i.e. a million million) US dollars each year on armaments. This enormous flood of money, which is almost too large to imagine, could have been used instead for urgently needed public health measures.

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

A new and drug-resistant form of tuberculosis has recently become widespread, and is increasing rapidly in the former Soviet Union. In order to combat this new form of tuberculosis, and in order to prevent its spread to Western Europe, WHO needs 450 mil-



Figure 6.1: The World Health Organization could carry out its vitally important work much more effectively if it were given more money.

lion US dollars, an amount equivalent to 4 hours of world arms spending. By using this money to combat tuberculosis in the former Soviet Union, WHO would be making a far greater contribution to global peace and stability than is made by spending the money on armaments.

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

It is plain that if the almost unbelievable sums now wasted on armaments were used constructively, most of the pressing problems now facing humanity could be solved, but today the world spends more than 20 times as much per year on weapons as it does on development.

6.5 War as an institution

Because the world spends 1.8 thousand billion dollars each year on armaments, it follows that very many people make their living from war. This is the reason why it is correct to speak of war as a social institution, and also the reason why war persists, although everyone realizes that it is the cause of much of the suffering that inflicts humanity. We know that war is madness, but it persists. We know that it threatens the future survival of our species, but it persists, entrenched in the attitudes of historians, newspaper editors and television producers, entrenched in the methods by which politicians finance their campaigns, and entrenched in the financial power of arms manufacturers, entrenched also in the ponderous and costly hardware of war, the fleets of warships, bombers, tanks, nuclear missiles and so on.

Science cannot claim to be guiltless: In Eisenhower's farewell address, he warned of the increasing power of the industrial-military complex, a threat to democratic society. If he were making the same speech today, he might speak of the industrial-military-scientific complex. Since Hiroshima, we have known that new knowledge is not always good. There is a grave danger that nuclear weapons will soon proliferate to such an extent that they will be available to terrorists and even to the Mafia. Chemical and biological weapons also constitute a grave threat. The eradication of smallpox in 1979 was a triumph of medical science combined with international cooperation. How sad it is to think that military laboratories cultivate smallpox and that the disease may soon be reintroduced as a biological weapon!

The institution of war seems to be linked to a fault in human nature, to our tendency to exhibit altruism towards members of our own group but aggression towards other groups if we perceive them to be threatening our own community. This tendency, which might be called "tribalism", was perhaps built into human nature by evolution during the long prehistory of our species, when we lived as hunter-gatherers in small genetically homogeneous tribes, competing for territory on the grasslands of Africa. However, in an era of nerve gas and nuclear weapons, the anachronistic behavior pattern of tribal altruism and intertribal aggression now threatens our survival.

Fortunately, our behavior is only partly determined by inherited human nature. It is also, and perhaps to a larger extent, determined by education and environment; and in spite of all the difficulties just mentioned, war has been eliminated locally in several large regions of the world. Taking these regions as models, we can attempt to use the same methods to abolish war globally. For example, war between the Scandinavian nations would be unthinkable today, although the region once was famous for its violence. Scandinavia is especially interesting as a model for what we would like to achieve globally, because it is a region in which it has been possible not only to eradicate war, but also poverty; and at the same time, death from infectious disease has become a rarity in this region.

6.6 Poverty, disease and war

If we consider the problem of simultaneously eliminating poverty, war and frequent death from infectious disease, we are lead inevitably to the problem of population stabilization. At the time when poverty, disease and war characterized Scandinavia, the average fertility in the region was at least 6 children per woman-life. Equilibrium was maintained at this high rate of fertility, because some of the children died from disease without leaving progeny, and because others died in war. Today, poverty and war are gone from the Nordic countries, and the rate of premature death from infectious disease is very low. The simultaneous elimination of poverty, disease and war would have been impossible in Scandinavia if the rate of fertility had not fallen to the replacement level. There would then have been no alternative except for the population to grow, which it could not have continued to do over many centuries without environmental degradation, bringing with it the recurrence of poverty, disease and war.

In Scandinavia today, democratic government, a high level of education, economic prosperity, public health, high social status for women, legal, economic and educational equality for women, a low birth rate, and friendly cooperation between the nations of the region are mutually linked in loops of cause and effect. By contrast, we can find other regions of the world where low status of women, high birth rates, rapidly increasing population, urban slums, low educational levels, high unemployment levels, poverty, ethnic conflicts and the resurgence of infectious disease are equally linked, but in a vicious circle. The three age-old causes of human suffering, poverty, infectious disease and war are bound together by complex causal relationships involving also the issues of population stabilization and woman's rights. The example of Scandinavia shows us that it is possible to cure all these diseases of society; but to do so we must address all of the problems simultaneously.

Scandinavia was once a region that was famous for its violence. Today, war within Scandinavia would be unthinkable. This fact demonstrates the maliability of human nature. Under changed circumstances, and with changed education, people who were once extremely violent have become very peaceful. Scandinavia's low birth-rate has contributed to this transition.

6.7 International governance

Abolition of the institution of war will require the construction of structures of international government and law to replace our present anarchy at the global level. Today's technology has shrunken the distances, which once separated nations; and our present system of absolutely sovereign nation-states has become both obsolete and dangerous.

Professor Elie Kedourie of the University of London has given the following definition of nationalism: "...a doctrine invented in Europe at the beginning of the 19th century. It pretends to supply a criterion for the determination of the unit of population proper to enjoy a government exclusively its own, for the legitimate exercise of power in the state, and for the right organization of a society of states. Briefly, the doctrine holds that humanity is naturally divided into nations, that nations are known by certain characteristics which can be ascertained, and that the only legitimate type of government is national self-government."

A basic problem with this doctrine is that throughout most of the world, successive waves of migration, conquest and intermarriage have left such a complicated ethnic mosaic that attempts to base political divisions on ethnic homogeneity often meet with trouble. In Eastern Europe, for example, German-speaking and Slavic-speaking peoples are mixed together so closely that the Pan-German and Pan-Slavic movements inevitably clashed over the question of who should control the regions where the two populations lived side by side. This clash was one of the main causes of the First World War.

Similarly, when India achieved independence from England, a great problem arose in the regions where Hindus and Moslems lived side by side; and even Gandhi was unable to prevent terrible violence from taking place between the two communities. This problem is still present, and it has been made extremely dangerous by the acquisition of nuclear weapons by India and Pakistan.

More recently, nationalist movements in Asia and Africa have derived their force and popularity from a reaction against the years of European political and economic domination. Thus, at first sight, they seem to deserve our sympathy and support. However, in building states, the new nationalists have often used hate for outsiders as mortar. For example, Israel is held together by hostility towards its Arab neighbors, while the Pan-Arab movement is held together by hostility towards Israel; and in this inflamed political climate of mutual fear and hatred, even clandestine nuclear weapons appear to either side to be justified.

A basic problem rooted in nationalist mythology exists in the concept of sanctions, which treat nations as if they were individuals. We punish nations as a whole by sanctions, even when only the leaders are guilty, even though the burdens of the sanctions often fall most heavily on the weakest 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.

It is becoming increasingly clear that the concept of the absolutely sovereign nationstate is an 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 which 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 military and legal powers necessary to guarantee the human rights of ethnic minorities within nations.

A strengthened UN would 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%. He believed that even this extremely low rate of taxation would have the 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 World Federation with between 100 billion and 300 billion dollars annually. By strengthening the activities of various UN agencies, such as WHO, UNESCO and FAO, 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.



Figure 6.2: Today, the existence of all-destroying modern weapons makes war prohibitively dangerous. If human civilization is to survive, the institution of war must be abolished. This will require effective governance at the global level. The United Nations must be strengthened and given many times the amount of money that it presently has. The UN must also be given the power to make laws that are binding on individuals.

6.8 The success of federations

A federation is, by definition, a limited union of states, where the federal government has the power to make laws which 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 reserved for the several 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.

For example, if the nations of the world considered the control of narcotics to be a matter of mutual concern; if they agreed to set up a commission with the power to make laws preventing the growing, refinement and distribution of harmful drugs, and with the power to arrest individuals for violating those laws, then we would have a world federation in the area of narcotics control.

If, in addition, the world community considered terrorism to be a matter of mutual concern; if an international commission were also set up with the power to make global anti-terrorist laws, and to arrest individuals violating those laws, then we would have a world federation with somewhat broader powers. If the community of nations decided to give the federal authority the additional power to make laws defining the rights and obligations of multinational corporations, and the power to arrest individuals violating those laws, then we would have a world federation with still broader powers; but these powers would still be carefully defined and limited.

In 1998, in Rome, representatives of 120 countries signed a statute establishing a Permanent International Court, with jurisdiction over war crimes and genocide. 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. The jurisdiction of the Permanent International Court is at present limited to a very narrow class crimes. The global community will have a chance to see how the court works in practice, and in the future, the community may decide to broaden its jurisdiction.

In setting up a federation, the member states can decide which powers they wish to delegate to it; and all powers not expressly delegated are retained by the individual states. We are faced with the problem of constructing a new world order which will preserve the advantages of local self-government while granting certain carefully-chosen powers to larger regional or global authorities. Which things should be decided locally, or regionally, and which globally?

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 solved 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 unfair 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 the issues to be decided locally.

Security, and controls on the manufacture and export of armaments will require an effective authority at the global level. It should also be the responsibility of the international community to intervene to prevent gross violations of human rights. Since the end of the Cold War, the United Nations has more and more frequently been called upon to send armed forces to troubled parts of the world. In many instances, these calls for U. N. intervention have been prompted by clear and atrocious violations of human rights, for example by "ethnic cleansing" in Bosnia and by genocide in Rwanda. In the examples just named, the response of the United Nations would have been much more effective, and many lives would have been saved, if the action which was finally taken had come sooner. Long and complex diplomatic negotiations were required to muster the necessary political and physical forces needed for intervention, by which time the original problems had become much more severe. For this reason, it has been suggested that the U. N. Secretary General, the Security Council and the General Assembly ought to have at their disposal a permanent, highly trained and highly mobile emergency force, composed of volunteers from all nations. Such an international police force would be able to act rapidly to prevent gross violations of human rights or other severe breaches of international law.

In evaluating the concept of an international police force directly responsible to the United Nations, it is helpful to examine the way in which police act to enforce laws and to prevent violence and crime at local and national levels. Within a community which is characterized by good government, police are not highly armed, nor are they very numerous. Law and order are not maintained primarily by the threat of force, but by the opinion of the vast majority of the citizens that the system of laws is both just and necessary. Traffic stops when the signal light is red and moves when it is green whether or not a policeman is present, because everyone understands why such a system is necessary. Nevertheless, although the vast majority of the citizens in a well-governed community support the system of laws and would never wish to break the law, we all know that the real world is not heaven. The total spectrum of human nature includes evil as well as a good. If there were no police at all, and if the criminal minority were completely unchecked, every citizen would be obliged to be armed. No one's life or property would be safe. Robbery, murder and rape would flourish.

Within a society with a democratic and just government, whose powers are derived from the consent of the governed, a small and lightly armed force of police is able to maintain the system of laws. One reason why this is possible has just been mentioned - the force of public opinion. A second reason is that the law acts on individuals. Since obstruction of justice and the murder of policemen both rank as serious crimes, an individual criminal is usually not able to organize massive resistance against police action.

Edith Wynner, one of the pioneers of the World Federalist movement, lists the following characteristics of police power in a well-governed society:

- 1. "A policeman operates within a framework of organized government having legislative, executive and judicial authority operating on individuals. His actions are guided by a clearly stated criminal code that has the legislative sanction of the community. Should he abuse the authority vested in him, he is subject to discipline and court restraint."
- 2. "A policeman seeing a fight between two men does not attempt to determine which of them is in the right and then help him beat up the one he considers wrong. His function is to restrain violence by both, to bring them before a judge who has authority to determine the rights of the dispute, and to see that the court's decision is carried out."
- 3. "In carrying out his duties, the policeman must apprehend the suspected individual without jeopardizing either the property or the lives of the community where the suspect is to be arrested. And not only is the community safeguarded against destruction of property and loss of life but the rights of the suspect are also carefully protected by an elaborate network of judicial safeguards."

Edith Wynner also discusses the original union of the thirteen American colonies, which was a confederation, analogous to the present United Nations. This confederation was found to be too weak, and after eleven years it was replaced by a federation, one of whose key powers was the power to make and enforce laws which acted on individuals. 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 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. This 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."

The United Nations is at present a confederation rather than a federation, and thus it acts by attempting to coerce states, a procedure which Alexander Hamilton characterized as "one of the maddest projects that was ever devised". Whether this coercion takes the form of economic sanctions, or whether it takes the form of military intervention, the practicability, the justice and the efficacy of the UN's efforts are hampered because they are applied to people collectively and not individually. It is obvious that the United Nations actions to stop aggression of one state against another in the Korean War and in the Gulf War fail to match the three criteria for police action listed above. What is the cure for this great evil? "Nothing", Hamilton tells us, "but to enable the laws to act on individuals, in the same manner as those of states do."

Historically, confederations have always proved to be too weak; but federations have on the whole been very successful, mainly because a federation has the power to make laws which act on individuals. At the same time, a federation aims at leaving as many powers as possible in the hands of local authorities. Recent examples of federations include the United States of America, the United States of Brazil, the United States of Mexico, the United States of Venezuela, the Argentine Nation, the Commonwealth of Australia, the Dominion of Canada, the Union of South Africa, Switzerland, the Union of Soviet Socialist Republics and the European Federation. Thus we are rich in historical data on the strengths and weaknesses of federations, and we can make use of this data as we attempt to construct good government at the global level.

Looking towards the future, we can perhaps foresee a time when the United Nations will have been converted to a federation and given the power to make international laws which are binding on individuals. Under such circumstances, true international law enforcement will be possible, incorporating all of the needed safeguards for lives and property of the innocent. One can hope for a future world where the institution of war will be abolished, and where public opinion will support international law to such an extent that a new Hitler or a future Melosovic 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.

6.8. THE SUCCESS OF FEDERATIONS



Figure 6.3: This painting shows a debate during the drafting of the Constitution of the United States. After achieving independence from England, the 13 former colonies became a confederation. However, this proved to be too weak, and in 1788, a federal constitution was ratified. Under the Federal Constitution of the United States, Congress has the power to make laws that are binding on individuals. This is th most important power of federations, and the reason why they are so successful.

6.9 A new global ethic

Besides a humane, democratic and just framework of international law and governance, we urgently need a new global ethic, - an ethic where loyalty to family, community and nation will be supplemented by a strong sense of the brotherhood of all humans, regardless of race, religion or nationality. Schiller expressed this feeling in his "Ode to Joy", the text of Beethoven's Ninth Symphony. Hearing Beethoven's music and Schiller's words, most of us experience an emotion of resonance and unity with its message: All humans are brothers and sisters - not just some - all! It is almost a national anthem of humanity. The feelings which the music and words provoke are similar to patriotism, but broader. It is this sense of a universal human family, which we need to cultivate in education, in the mass media, and in religion.

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

We urgently need to replace this indoctrination in chauvinism by a reformed view of history, where the slow development of human culture is described, giving adequate credit to all those who have contributed. Our modern civilization is built on the achievements of ancient cultures. China, India, Mesopotamia, ancient Egypt, Greece, the Islamic world, Christian Europe, and Jewish intellectual traditions all have contributed. Potatoes, corn and squash are gifts from the American Indians. Human culture, gradually built up over thousands of years by the patient work of millions of hands and minds, should be presented to students of history as a precious heritage - far too precious to be risked in a thermonuclear war.

In the teaching of science too, reforms are needed. Graduates in science and technology should be conscious of their responsibilities. They must resolve never to use their education in the service of war, or in any way which might be harmful to society or to the environment.

In modern societies, mass media play an extremely important role in determining behavior and attitudes. This role can be a negative one when the media show violence and enemy images, but if used constructively, the mass media can offer a powerful means for creating international understanding. If it is indeed true that tribalism is part of human nature, it is extremely important that the mass media be used to the utmost to overcome the barriers between nations and cultures. Through increased communication, the world's peoples can learn to accept each other as members of a single family.



Figure 6.4: Beethoven's 9th symphony is almost a national anthem of humanity, All people belong to a great family. Not just some. ALL!.

6.10 Love your enemies

Finally, let us turn to religion, with its enormous influence on human thought and behavior. Christianity, for example, offers a strongly stated ethic, which, if practiced, would make war impossible. In Mathew, the following passage occurs: "Ye have heard it said: Thou shalt love thy neighbor and hate thy enemy. But I say unto you: Love your enemies, bless them that curse you, do good to them that hate you, and pray for them that spitefully use you and persecute you."

This seemingly impractical advice, that we should love our enemies, is in fact of the greatest practicality, since acts of unilateral kindness and generosity can stop escalatory cycles of revenge and counter-revenge such as those which characterize the present conflict in the Middle East and the recent troubles of Northern Ireland. However, Christian nations, while claiming to adhere to the ethic of love and forgiveness, have adopted a policy of "massive retaliation", involving systems of thermonuclear missiles whose purpose is to destroy as much as possible of the country at which the retaliation is aimed. It is planned that entire populations shall be killed in a "massive retaliation", innocent children along with the guilty politicians. The startling contradiction between what the Christian nations profess and what they do was obvious even before the advent of nuclear weapons, at the time when Leo Tolstoy, during his last years, was exchanging letters with a young Indian lawyer in South Africa. In one of his letters to Gandhi, Tolstoy wrote:

"The whole life of the Christian peoples is a continuous contradiction between that which they profess and the principles on which they order their lives, a contradiction between love accepted as the law of life, and violence, which is recognized and praised, acknowledged even as a necessity."

"This year, in the spring, at a Scripture examination at a girls' high school in Moscow, the teacher and the bishop present asked the girls questions on the Commandments, and especially on the sixth. After a correct answer, the bishop generally put another question, whether murder was always in all cases forbidden by God's law; and the unhappy young ladies were forced by previous instruction to answer 'Not always' - that murder was permitted in war and in the execution of criminals. Still, when one of these unfortunate young ladies (what I am telling is not an invention but a fact told to me by an eye witness) after her first answer, was asked the usual question, if killing was always sinful, she, agitated and blushing, decisively answered 'Always', and to the usual sophisms of the bishop, she answered with decided conviction that killing was always forbidden in the Old Testament and forbidden by Christ, not only killing but every wrong against a brother. Notwithstanding all his grandeur and arts of speech, the bishop became silent and the girl remained victorious."

As everyone knows, Gandhi successfully applied the principle of non-violence to the civil rights struggle in South Africa, and later to the political movement, which gave India its freedom and independence. The principle of non-violence was also successfully applied by Martin Luther King, and by Nelson Mandela. It is perhaps worthwhile to consider Gandhi's comment on the question of whether the end justifies the means: "The means may be likened to a seed", Gandhi wrote, "and the end to a tree; and there is the same



Figure 6.5: Count Leo Tolstoy said "The sharpest of all contradictions can be seen between the government's professed faith in the Christian law of the brotherhood of all humankind, and the military laws of the state, which force each young man to prepare himself for enmity and murder, so that each must be simultaneously a Christian and a gladiator." inviolable connection between the means and the end as there is between the seed and the tree." In other words, a dirty method produces a dirty result; killing produces more killing; hate leads to more hate. Everyone who reads the newspapers knows that this is true. But there are positive feedback loops as well as negative ones. A kind act produces a kind response; a generous gesture is returned; hospitality results in reflected hospitality. Buddhists call this principle of reciprocity "the law of karma".

The religious leaders of the 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.

It is useful to consider the analogy between the institution of war and the institution of slavery. We might be tempted to say, "There has always been war, throughout human history; and war will always continue to exist." As an antidote for this kind of pessimism, we can think of slavery, which, like war, has existed throughout most of recorded history. The cultures of ancient Egypt, Greece and Rome were all based on slavery, and, in more recent times, 13 million Africans were captured and forced into a life of slavery in the New World. Slavery was as much an accepted and established institution as war is today. Many people made large profits from slavery, just as arms manufacturers today make enormous profits. Nevertheless, in spite of the weight of vested interests, slavery has now been abolished throughout most of the world.

Today we look with horror at drawings of slave ships, where human beings were packed together like cord-wood; and we are amazed that such cruelty could have been possible. Can we not hope for a time when our descendants, reading descriptions of the wars of the twentieth century, will be equally amazed that such cruelty could have been possible? If we use them constructively, the vast resources now wasted on war can initiate a new era of happiness and prosperity for the family of man. It is within our power to let this happen. The example of the men and women who worked to rid the world of slavery can give us courage as we strive for a time when war will exist only as a dark memory fading into the past.



Figure 6.6: Diagram of a slave shop. We can hope and work for a time when war, like slavery, will exist only as a dark memory, fading into the past.

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Chapter 7 THE CLIMATE EMERGENCY

7.1 Two time-scales

Why did Prof. Noam Chomsky call the US Republican Party "The most dangerous organization in the history of the world"? He did so because the party is characterized by climate change denial and by support for giant fossil fuel corporations. According to the 2018 IPCC Report, the world has only a very short time left in which to stop the extraction and use of fossil fuels. If we collectively fail to do this within a decade or so, feedback loops may be initiated which will make human efforts to avoid catastrophic climate change useless. Much of the world could become uninhabitable, and a very large-scale mass extinction could be initiated. Although the worst effects of global warming lie in the long-term future, children alive today are at risk. We give our children loving care, but it makes no sense to do so unless we also do everything in our power to ensure that they, and all future generations, will inherit a world in which they can survive.

7.2 The world is on fire

Although the worst threats from catastrophic climate change lie in the long-term future, we are starting to see the effects of climate change today. California is burning! As of August 28, 2020, 7175 fires have burned 1,660,332 acres, according to the California Department of Forestry and Fire Protection.

The Arctic is burning! A northeastern Siberian town, north of the Arctic Circle, is likely to have set a record for the highest temperature documented in the Arctic Circle, with a reading of 100.4 degrees (38 Celsius) recorded in June, 2020. The dangerous greenhouse gas methane is bubbling up from melting permafrost in the Arctic and from the shallow seas north of Siberia. Furthermore, wildfires in the Arctic are emitting an unprecedented amount of CO2. Around 600 active fires have been observed in the region in late July, 2020, compared with 400 in 2019 and about 100 on average between 2003-2018.

The 2020 hurricane season has started early, notably with Laura, and it is predicted to be unusually severe. Greenland's ice sheet is melting. Ice shelves are collapsing in the



Figure 7.1: California wildfires.

Antarctic. But despite these obvious signs of danger, the climate emergency is hardly mentioned in the 2020 political campaigns, or in U.S. mass media. It ought to be a central issue.

With Global Heating, Expect Inferno Seasons in the American West

Here are some quotations from an article by Peter Kalmus and Natasia Stavros, published in $LA \ times$ on September 14, 2020¹:

"More than 3.1 million acres have burned in California this year - some 3% of the state - with many wildfires still at zero containment and months of fire season left to go. This far exceeds the previous record set in 2018, when 1.7 million acres burned, including the town of Paradise.

"These raging fires, some exacerbated by the blistering heat last weekend, are the direct result of climate change. The planet is currently 1.0° C to 1.2° C (about 2° F) hotter than it ought to be. This excess heat is entirely due to humans, mainly from burning fossil fuels and destroying forests. These activities release carbon dioxide into the atmosphere, which blocks some of the infrared heat photons that otherwise would radiate away into space.

"Global heating now makes heat waves more extreme and more than three

¹https://popularresistance.org/with-global-heating-expect-inferno-seasons-in-the-american-west/

times as frequent as they were in the 1960s. Heat records are being shattered everywhere. Even talking about records is starting to feel pointless when every year is practically guaranteed to be hotter than the last.

"Attribution studies now routinely connect individual heat waves to human activity. For example, Siberia's searing 2020 heat wave was made 600 times more likely because of climate change, and Europe's record 2019 heat wave was made up to 100 times more likely. These blasts of intense heat create hot and dry conditions that are ideal for fires, especially in ecosystems that thrived under cooler, damper conditions.

"Global heating also causes earlier spring snow melt and increases the likelihood of drought, making extremely dry soil and fuel conditions more likely. Drought and heat, in turn, stress trees, making them susceptible to attacks from beetles whose populations are less suppressed by warmer winters. Hundreds of millions of dead, dried-out trees throughout the western United States don't just burn more easily, they explode.

"We may be experiencing an irreversible ecological tipping point, with forests in the West dying, to be replaced by scrub and grass.

"Tragically, even this year's disasters are not the worst we can expect. In fact, heat waves and fires like what we are seeing in California, Oregon and Washington will continue to worsen as long as humanity continues to burn fossil fuels..."

Climate crisis: An emerging new Arctic

Here are some quotations from an article by the Countercurrents Collective, published on September 16. 2020^2 :

"A new Arctic is emerging. The regions landscape is changing rapidly. Temperatures are skyrocketing, sea ice is dwindling and many experts believe the far north is quickly transforming into something unrecognizable.

"This week, new research confirms that a new Arctic climate system is emerging.

"A new Arctic will be warmer, rainier and substantially less frozen. Animals that used to be common may disappear, while new species may move in to take their place. Opportunities for hunting and fishing by sea ice could dwindle.

²https://countercurrents.org/2020/09/climate-crisis-an-emerging-new-arctic/

Shipping in the Arctic Ocean may significantly increase as the ice disappears...

"The scientists have found: Sea ice has already declined beyond the bounds of anything that would have been seen even a few decades ago. In other words, at least one signal of the new Arctic - driven by climate change - has already emerged.

"And sea ice declines will only get worse as time goes on. Under the extreme climate scenario, summer sea ice extent will fall below 1 million square kilometers - a threshold so low most scientists consider the Arctic Ocean 'ice free' at that point - by the 2070s at the latest, and potentially decades earlier...

"Sea ice can have a profound effect on Arctic temperatures. Ice has a bright, reflective surface that helps beam sunlight away from the Earth. Thick sea ice also helps insulate the ocean, trapping heat below the surface in the winter and preventing it from escaping into the cold Arctic air.

What happens in the Arctic and the Antarctic will have a profound effect on temperatures and sea levels throughout the world.

7.3 Only immediate climate action can save the future

Immediate action to halt the extraction of fossil fuels and greatly reduce the emission of CO_2 and other greenhouse gasses is needed to save the long-term future of human civilization and the biosphere.

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

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

Swedish student Greta Thunberg, is a 16-year-old who has launched a climate protest movement in her country. She said, in a short but very clear speech after that of UN leader Antonio Guterres: "Some people say that I should be in school instead. Some people say that I should study to become a climate scientist so that I can 'solve the climate crisis'. But the climate crisis has already been solved. We already have all the facts and solutions."

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



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

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

Appearing among billionaires, corporate CEO's and heads of state at the Davos Economic Forum in Switzerland, like a new Joan of Arc, 16-year-old Swedish climate activist Greta Thunberg called on decision-makers to fulfil their responsibilities towards future generations. Here are some excerpts from her speech:

7.4 Greta Thunberg's speech at Davos

Our house is on fire. I am here to say, our house is on fire. According to the IPCC, we are less than 12 years away from not being able to undo our mistakes. In that time, unprecedented changes in all aspects of society need to have taken place, including a reduction of our CO_2 emissions by at least 50%...

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

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

No other current challenge can match the importance of establishing a wide, public awareness and understanding of our rapidly disappearing carbon budget, that should and must become our new global currency and the very heart of our future and present economics.

We are at a time in history where everyone with any insight of the climate crisis that threatens our civilization - and the entire biosphere - must speak out in clear language, no matter how uncomfortable and unprofitable that may be.

We must change almost everything in our current societies. The bigger your carbon footprint, the bigger your moral duty. The bigger your platform, the bigger your responsibility.



Figure 7.2: Greta Thunberg on the cover of Time Magazine, The Intergovernmental Panel on Climate Change, in their October 2018 report, used strong enough language to wake up at least part of the public: the children whose future is at stake. Here is an excerpt from a speech which 16-year-old Swedish climate activist Greta Thunberg made at the Davos Economic Forum in January, 2019: "Our house is on fire. I am here to say, our house is on fire. According to the IPCC, we are less than 12 years away from not being able to undo our mistakes. In that time, unprecedented changes in all aspects of society need to have taken place, including a reduction of our CO2 emissions by at least 50%..."

7.5 Worldwide school strike, 15 March, 2019

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

Here are some of the statements by the students explaining why they took part in the strikes:

In India, no one talks about climate change. You don't see it on the news or in the papers or hear about it from government. We want global leaders to declare a climate emergency. If we don't act today, then we will have no tomorrow. - Vidit Baya, 17, Udaipur, India.

We face heartbreaking loss due to increasingly extreme weather events. We urge the Taiwanese government to implement mitigation measures and face up to the vulnerability of indigenous people, halt construction projects in the indigenous traditional realm, and recognize the legal status of Plains Indigenous People, in order to implement environmental protection as a bottom-up approach - Kaisanan Ahuan, Puli City, Taiwan.

We have reached a point in history when we have the technical capacities to solve poverty, malnutrition, inequality and of course global warming. The deciding factors for whether we take advantage of our potential will be our activism, our international unity and our ability to develop the art of making the impossible possible. Whether we succeed or not depends on our political will - Eyal Weintraub, 18, and Bruno Rodriguez, 18, Argentina.

The damage done by multinationals is enormous: the lack of transparency, dubious contracts, the weakening of the soil, the destruction of flora and fauna, the lack of respect for mining codes, the contamination of groundwater. In Mali, the state exercises insufficient control over the practices of the multinationals, and it is us, the citizens, who suffer the consequences. The climate alarm has sounded, and the time has come for us all to realize that there is still time to act locally, in our homes, our villages, our cities - Mone Fousseny, 22, Mali.

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 $^{^{3}}$ https://www.theguardian.com/environment/2019/apr/03/parents-around-the-world-mobilise-behind-youth-climate-strikes









Figure 7.3: Eve White and her children join climate protesters in Tasmania. According to an article in The Guardian, parents and grandparents around the world are mobilizing in support of the youth climate movement that has swept the globe.

Concerns of young protesters are justified

In an article in the journal *Science* dated 12 April, 2019, 4 20 prominent climate scientists stated that the concerns of student protesters around the world are fully justified. Here are some quotations from the article:

The world's youth have begun to persistently demonstrate for the protection of the climate and other foundations of human well-being. As scientists and scholars who have recently initiated similar letters of support in our countries, we call for our colleagues across all disciplines and from the entire world to support these young climate protesters. We declare: Their concerns are justified and supported by the best available science. The current measures for protecting the climate and biosphere are deeply inadequate.

Nearly every country has signed and ratified the Paris Agreement of 2015, committing under international law to hold global warming well below 2° C above preindustrial levels and to pursue efforts to limit the temperature increase to 1.5° C. The scientific community has clearly concluded that a global warming of 2° C instead of 1.5° C would substantially increase climate-related impacts and the risk of some becoming irreversible. Moreover, given the uneven distribution of most impacts, 2° C of warming would further exacerbate existing global inequalities.

It is critical to immediately begin a rapid reduction in CO_2 and other greenhouse gas emissions. The degree of climate crisis that humanity will experience in the future will be determined by our cumulative emissions; rapid reduction now will limit the damage. For example, the Intergovernmental Panel on Climate Change (IPCC) has recently assessed that halving CO_2 emissions by 2030 (relative to 2010 levels) and globally achieving net-zero CO_22 emissions by 2050 (as well as strong reductions in other greenhouse gases) would allow a 50% chance of staying below 1.5°C of warming. Considering that industrialized countries produced more of and benefited more from previous emissions, they have an ethical responsibility to achieve this transition more quickly than the world as a whole.

Many social, technological, and nature-based solutions already exist. The young protesters rightfully demand that these solutions be used to achieve a sustainable society. Without bold and focused action, their future is in critical danger. There is no time to wait until they are in power...

The enormous grassroots mobilization of the youth climate movement including Fridays for Future, School (or Youth) Strike 4 Climate, Youth for (or 4) Climate, and Youth Climate Strike - shows that young people understand the situation. We approve and support their demand for rapid and forceful action. We see it as our social, ethical, and scholarly responsibility to state in no uncertain terms: Only if humanity acts quickly and resolutely can we limit

⁴https://science.sciencemag.org/content/364/6436/139.2



global warming, halt the ongoing mass extinction of animal and plant species, and preserve the natural basis for the food supply and well-being of present and future generations. This is what the young people want to achieve. They deserve our respect and full support.



Figure 7.4: Greta Thunberg addressing a meeting of the European Parliament in April, 2019. She complained that Brexit was treated as an emergency by the European Union, but climate change, which is a far greater emergency has been almost neglected. The 16-year-old, who is due to meet the Pope on Wednesday, said, "We face an end to civilization as we know it unless permanent changes take place in our society...European elections are coming soon and many like me who are affected most by this crisis, are not allowed to vote. That is why millions of children are taking to the street to draw attention to the climate crisis... It is not too late to act but it will take far-reaching vision and fierce determination... My plea is: Please wake up and do the seemingly impossible."
7.6 The World Meteorological Organization's report

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

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

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

7.7 Only 12 years left to limit climate change catastrophe

The world's leading scientists met at the Forty-Eighth Session of the IPCC and First Joint Session of Working Groups I, II, and III, 1-5 October 2018 in Inchon, Republic of Korea and openly declared that civilization is on track for collapse because of reckless use of fossil fuels, unless immediate action is taken to drastically cut the extraction and use of fossil fuels.

The report finds that limiting global warming to 1.5°C would require "rapid and farreaching" transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide would need to fall by about 45 percent from 2010 levels by 2030, reaching 'net zero' around 2050.

"It's a line in the sand and what it says to our species is that this is the moment and we must act now," said Debra Roberts, a co-chair of the working group on impacts. "This is the largest clarion bell from the science community and I hope it mobilizes people and dents the mood of complacency."

"We have presented governments with pretty hard choices. We have pointed out the enormous benefits of keeping to 1.5C, and also the unprecedented shift in energy systems and transport that would be needed to achieve that," said Jim Skea, a co-chair of the working group on mitigation. "We show it can be done within laws of physics and chemistry.



Figure 7.5: A firefighter battles fire in California. The world is currently 1 degree Centigrade warmer than preindustrial levels.

Then the final tick box is political will. We cannot answer that. Only our audience can and that is the governments that receive it."

Bob Ward, of the Grantham Research Institute on Climate Change, said the final document was "incredibly conservative" because it did not mention the likely rise in climatedriven refugees or the danger of tipping points that could push the world on to an irreversible path of extreme warming.

Policymakers commissioned the report at the Paris climate talks in 2016, but since then the gap between science and politics has widened. Donald Trump has promised to withdraw the US - the world's biggest source of historical emissions - from the accord. Brazil's president. Jair Bolsonaro, threatens to do the same and also open the Amazon rainforest to agribusiness.

7.8 Existential Risk to Human Civilization

In 2016, the World Economic Forum survey of the most impactful risks for the years ahead elevated the failure of climate change mitigation and adaptation to the top of the list, ahead of weapons of mass destruction, ranking second, and water crises, ranking third. By 2018, following a year characterized by high-impact hurricanes and extreme temperatures, extreme-weather events were seen as the single most prominent risk. As the survey noted: "We have been pushing our planet to the brink and the damage is becoming increasingly clear."

Climate change is an existential risk to human civilization: that is, an adverse outcome that would either annihilate intelligent life or permanently and drastically curtail its potential.

Temperature rises that are now in prospect, after the Paris Agreement, are in the range

of 3-5 °C. At present, the Paris Agreement voluntary emission reduction commitments, if implemented, would result in planetary warming of 3.4 °C by 2100, without taking into account "long-term" carbon- cycle feedbacks. With a higher climate sensitivity figure of 4.5 °C, for example, which would account for such feedbacks, the Paris path would result in around 5 °C of warming, according to a MIT study.

A study by Schroeder Investment Management published in June 2017 found - after taking into account indicators across a wide range of the political, financial, energy and regulatory sectors - the average temperature increase implied for the Paris Agreement across all sectors was 4.1 °C.

Yet 3 °C of warming already constitutes an existential risk. A 2007 study by two US national security think-tanks concluded that 3 °C of warming and a 0.5 meter sea-level rise would likely lead to "outright chaos" and "nuclear war is possible", emphasizing how "massive non-linear events in the global environment give rise to massive nonlinear societal event".

Our responsibility to future generations and to the biosphere

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

Both wind and solar energy can now compete economically with fossil fuels, and this situation will become even more pronounced if more countries put a tax on carbon emissions, as Finland, the Netherlands, Norway, Costa Rica, the United Kingdom and Ireland already have done. 5

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. 6

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

"And yes, we do need hope. Of course, we do. But the one thing we need more than hope is action. Once we start to act, hope is everywhere. So instead of

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

⁶http://steadystate.org/category/herman-daly/



Figure 7.6: "Ensuring a livable planet for future generations means getting serious about phasing out coal, oil, and gas," said Christiana Figueres, former executive secretary of the UNFCCC, "Countries such as Costa Rica, Spain, and New Zealand are already showing the way forward, with policies to constrain exploration and extraction and ensure a just transition away from fossil fuels. Others must now follow their lead."



Figure 7.7: Today the beautiful city of Venice is flooded. Tomorrow unless urgent climate action is taken, all coastal cities will be under water.

looking for hope, look for action. Then and only then, hope will come today." Greta Thunberg



Figure 7.8: On Friday, November 15, 2019, in a speech at the Vatican, Pope Francis issued a warning against the rise of fascist forces worldwide that remind him of the Nazis of the 20th Century as he also railed against corporate crimes and announced consideration of adding "sins against ecology" to the church's official teachings. "The principle of profit maximization, isolated from any other consideration, leads to a model of exclusion which violently attacks those who now suffer its social and economic costs, while future generations are condemned to pay the environmental costs", he said. In his speech, Francis condemned global corporations that are responsible for "countries' over-indebtedness and the plunder of our planet's natural resources." He said that their activities have the "gravity of crimes against humanity," especially when they lead to hunger, poverty and the eradication of indigenous peoples.



Figure 7.9: A new report indicates that half of all insects may have been lost since 1970 as a result of the destruction of nature and heavy use of pesticides. The report said 40% of the 1million known species of insect are facing extinction. Unless steps are taken to correct the excessive use of pesticides and loss of habitat, there will be profound consequences for humans and all life on Earth. "We can't be sure, but in terms of numbers, we may have lost 50% or more of our insects since 1970 - it could be much more," said Prof Dave Goulson, at the University of Sussex, UK, who wrote the report for the Wildlife Trusts. Since most crops depend on insect pollination, the insect apocalypse will make it difficult to feed the Earth's growing population unless urgent corrective steps are taken.



Figure 7.10: Swedish teen environmental activist Greta Thunberg speaks at a climate change rally in Charlotte, North Carolina, on 8 November, 2019. Returning to Europe by boat to attend climate talks in Spain, Greta said "My message to the Americans is the same as to everyone - that is to unite behind the science and to act on the science. We must realize this is a crisis, and we must do what we can now to spread awareness about this and to put pressure on the people in power. And especially, the US has an election coming up soon, and it's very important that for everyone who can vote, vote. Even if the politics needed doesn't exist today, we still need to use our voices to make sure that the people in power are focused on the right things. Because this is a democracy, and in a democracy, people are the ones who run the country. I know it doesn't seem that way, but if enough people were to decide they have had enough, then that could change everything. So don't underestimate that power."



Figure 7.11: Senator Bernie Sanders and Representative Alexandria Ocasio-Cortez field questions from audience members at the Climate Crisis Summit at Drake University on November 9, 2019, in Des Moines, Iowa. "Faced with the global crisis of climate change, the United States must lead the world in transforming our energy system away from fossil fuel to sustainable energy. The Green New Deal is not just about climate change," Sanders said, "It is an economic plan to create millions of good-paying jobs, strengthen our infrastructure, and invest in our country's frontline and vulnerable communities." The Green New Deal, which is strongly advocated by Sanders and Ocasio-Cortez in the United States, and also currently debated in many other countries, is inspired by the set of programs that Franklin D. Roosevelt used to end the Great Depression. It aims at maintaining full employment by substituting jobs in creating renewable energy infrastructure for jobs lost in the fossil fuel sector.



Figure 7.12: The World Scientists' Warning of a Climate Emergency was published in Bioscience on 5 November, 2019. The article states that "Scientists have a moral obligation to clearly warn humanity of any catastrophic threat and to 'tell it like it is.' On the basis of this obligation and the graphical indicators presented below, we declare, with more than 11,000 scientist signatories from around the world, clearly and unequivocally that planet Earth is facing a climate emergency...Despite 40 years of global climate negotiations... we have generally conducted business as usual and have largely failed to address this predicament."



Figure 7.13: Bush fires in Australia are threatening Sydney and have caused the Australian government to declare a state of emergency. But Australia's politicians continue the policies that have made their nation a climate change criminal, exporting vast quantities of coal and beef. The Deputy Prime Minister Michael McCormack said, of the fire victems: "They don't need the ravings of some pure enlightened and woke capital city greenies at this time when they are trying to save their homes." In other words, let's not talk about climate change.



Figure 7.14: A Peoples' Climate March in Amsterdam, calling for an ambitious climate policy. The *World Scientists' Warning of a Climate Emergency* called attention to a number of indicators: "The basic scientific data of these changes is presented simply and with great clarity: a 5 percent rise every 10 years in carbon emissions; a 3.65 percent rise of another powerful greenhouse gas, methane, every 10 years; a global surface temperature rise of .183 degrees Celsius every 10 years; a decline of Arctic sea ice at a rate of 11.7 percent every 10 years; significant drops in the ice mass of Greenland, Antarctica and world glaciers; an increase in ocean acidity and temperatures; an increase of 44 percent in the amount of area burned by wildfires in the U.S. every 10 years; and an 88 percent rise in extreme weather events per 10 years."



Figure 7.15: The graphs showing increase in global temperatures and carbon dioxide follow each other closely. In an article published in Countercurrents on November 6, 2019, Dr. Andrew Glickson wrote: "As the concentration of atmospheric CO_2 has risen to 408 ppm and the total greenhouse gas level, including methane and nitrous oxide, combine to near 500 parts per million CO_2 -equivalent, the stability threshold of the Greenland and Antarctic ice sheets, currently melting at an accelerated rate, has been exceeded. The consequent expansion of tropics and the shift of climate zones toward the shrinking poles lead to increasingly warm and dry conditions under which fire storms, currently engulfing large parts of South America, California, Alaska, Siberia, Sweden, Spain, Portugal, Greece, Angola, Australia and elsewhere have become a dominant factor in the destruction of terrestrial habitats."



Figure 7.16: The Royal Society of the United Kingdom documented ExxonMobil's funding of 39 organizations that promoted "inaccurate and misleading" views of climate science. In an article published by TomDispatch on November 11. 2019, Professor Naomi Oreskes of Harvard University wrote: "Much focus has been put on ExxonMobil's history of disseminating disinformation, partly because of the documented discrepancies between what that company said in public about climate change and what its officials said (and funded) in private. Recently, a trial began in New York City accusing the company of misleading its investors, while Massachusetts is prosecuting ExxonMobil for misleading consumers as well. If only it had just been that one company, but for more than 30 years, the fossil-fuel industry and its allies have denied the truth about anthropogenic global warming. They have systematically misled the American people and so purposely contributed to endless delays in dealing with the issue by, among other things, discounting and disparaging climate science, mispresenting scientific findings, and attempting to discredit climate scientists. These activities are documented in great detail in How Americans Were Deliberately Misled about Climate Change, a report I recently co-authored, as well as in my 2010 book and 2014 film, Merchants of Doubt."



Figure 7.17: We can repair the Earth's ruptured carbon cycle by recarbonizing it with the living carbon of biodiversity. In an article published in the 11 November, 2019. edition if TMS Weekly Digest, Professor Vandana Shiva wrote: "All the coal, petroleum and natural gas we are burning and extracting to run our contemporary oil-based economy was formed over 600 million years. We are burning up millions of years of nature's work annually. This is why the carbon cycle is broken. A few centuries of fossil fuel-based civilization have brought our very survival under threat by rupturing the Earth's carbon cycle, disrupting key climate systems and self-regulatory capacity, and pushing diverse species to extinction at 1000 times the normal rate. The connection between biodiversity and climate change is intimate. Extinction is a certainty if we continue a little longer on the fossil fuel path. A shift to a biodiversity-based civilization is now a survival imperative."



Figure 7.18: A fire burns a tract of the Amazon jungle in Agua Boa, Mato Grosso state, Brazil September 4, 2019. According to a report published by teleSUR on 7 November, 2019, "Deforestation in Brazil's Amazon region increased by 80 percent in September compared to the same month last year, according to a private study released on Wednesday stating that 802 square kilometers of forest was lost in the zone... Environmental and human rights organizations have confirmed that criminal networks are behind the indiscriminate cutting of trees in the region, and that after the illegal lumbering, those deforested zones are burned to make the land suitable for livestock raising and agriculture. In August, fires in the Brazilian Amazon were the worst in a decade, a situation that was denounced worldwide, especially the anti-ecological policies of President Jair Bolsonaro and his poor response to stop the fires."



Figure 7.19: In her testimony to the US Congress, Greta Thunberg did not prepare a statement for submission to the record. Instead, she submitted the most recent scientific report, issued by the IPCC three weeks earlier. She said simply, "I am submitting this report as my testimony because I don't want you to listen to me, I want you to listen to the scientists, and I want you to unite behind the science. And then I want you to take real action. Thank you." Here is what the scientists recommend: "Excessive extraction of materials and overexploitation of ecosystems, driven by economic growth, must be quickly curtailed to maintain the long-term sustainability of the biosphere. We need a carbon-free economy that explicitly addresses human dependence on the biosphere and policies that guide economic decisions accordingly. Our goals need to shift from GDP growth and the pursuit of affluence toward sustaining ecosystems and improving human well-being by prioritizing basic needs and reducing inequality."



Figure 7.20: According to an article in the September, 2019 issue of The National Geographic, "Across 9 million square miles at the top of the planet, climate change is writing a new chapter. Arctic permafrost isn't thawing gradually, as scientists once predicted. Geologically speaking, it's thawing almost overnight." World leadership is sacrificing their constituencies on the altar of fossil fuel profits and a brand of capitalism that recklessly consumes everything in sight. Therefore the public must become aware of the consequences. Alaska's North Slope has seen temperatures spike 11° F in 30 years as temperatures hit 90°F 240 miles above the Arctic Circle, temperatures that remind us of Florida's balmy weather. Arctic sea ice is also melting rapidly, and there is a danger that a powerful albedo feedback loop will be initiated, since ice strongly reflects sunlight, but dark seawater absorbs much more energy, further increasing Arctic temperatures.



Figure 7.21: In an article published in Countercurrents on November 8, 2019, Sydney Ghazarian wrote: "We can leverage our power as workers through highimpact, disruptive labor strikes that halt the economy's gears until politicians can no longer ignore us, and are forced to cede to demands that will save the world." He had in mind the Global Climate Strikes of September, 2019, in which 7 million people participated. Swedish climate activist Greta Thunberg summarized the need for such action in a speech at the World Economic Forum in Davos in January, 2019. "Some say that we should not engage in activism, instead we should leave everything to our politicians and just vote for change instead," she said. "But what do we do when there is no political will? What do we do when the politics needed are nowhere in sight?"

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ECOLOGICAL IMPACT OF MILITARISM

Chapter 8

MILITARISM AND THE GREEN NEW DEAL

8.1 Cutting military budgets

The cost of US wars since 2001

According to the National Priorities Project¹, the total cost of US wars between November 11, 2001 and April 8, 2019 has been 4.77 trillion US dollars, or written out in detail \$4,773,527,023,293.00. Every hour US taxpayers are paying 32.08 million dollars for the total costs of war. Globally, the world spent 1.9 trillion dollars on military budgets in 2018, according to the Stockholm International Peace Research Institute.

Every war is a war against children

War was always madness, always immoral, always the cause of unspeakable suffering, economic waste and widespread destruction, and always a source of poverty, hate, barbarism and endless cycles of revenge and counter-revenge. It has always been a crime for soldiers to kill people, just as it is a crime for murderers in civil society to kill people. No flag has ever been wide enough to cover up atrocities. Every war is a war against children.

But today, the development of all-destroying modern weapons has put war completely beyond the bounds of sanity and elementary humanity. The danger of a catastrophic nuclear war casts a dark shadow over the future of our species. It also casts a very black shadow over the future of the global environment. The environmental consequences of a massive exchange of nuclear weapons have been treated in a number of studies by meteorologists and other experts from both East and West. Scientists believe that the "nuclear winter" effect could kill a large proportion of the plants, animals and humans on earth.

¹https://www.nationalpriorities.org/cost-of/war/



Figure 8.1: In the fiscal year US 2015, military spending accounted for 54 percent of all federal discretionary spending, a total of \$598.5 billion. Military spending includes: all regular activities of the Department of Defense; war spending; nuclear weapons spending; international military assistance; and other Pentagon-related spending.



Figure 8.2: U.S. military spending dwarfs the budget of the #2 country - China. For every dollar China spends on its military, the U.S. spends \$2.77. The U.S. outpaces all other nations in military expenditures. World military spending totaled more than \$1.6 trillion in 2015. The U.S. accounted for 37 percent of the total. U.S. military expenditures are roughly the size of the next seven largest military budgets around the world, combined.



Figure 8.3: An attempt was made to audit Pentagon spending, but the firm entrusted with this task eventually pronounced it impossible because of confusing records and lack of records. Trillions of dollars are unaccounted for.

8.1. CUTTING MILITARY BUDGETS



Figure 8.4: No War! No Warming! There are two important connections between war and global warming. Firstly, military organizations run on oil and are are the largest single users of fossil fuels. Secondly, and even more importantly, money saved by slashing military budgets would be more than enough to carry out programs to avoid catastrophic climate change.



Figure 8.5: Military-industrial complexes want war. Ordinary people do not want it. According to the Stockholm International Peace Research Institute, global military expenses in 2018 amounted to 1.8 trillion dollars. This almost unimaginable river of money is the basic reason why the terrible suffering and waste of war is inflicted on the world's people.

8.1. CUTTING MILITARY BUDGETS



Figure 8.6: The actress Vanessa Redgrave was part of a 1968 protest against the Vietnam War.



Figure 8.7: We must do whatever is necessary to save the future.

8.1. CUTTING MILITARY BUDGETS



Figure 8.8: Young protesters from the Sunrise Movement call on leaders to back the Green New Deal.

8.2 The Extinction Rebellion

In an open letter to governments, reported in The Guardian², leaders of the environmental mobement said:

In our complex, interdependent global ecosystem, life is dying, with species extinction accelerating. The climate crisis is worsening much faster than previously predicted. Every single day 200 species are becoming extinct. This desperate situation can't continue.

Political leaders worldwide are failing to address the environmental crisis. If global corporate capitalism continues to drive the international economy, global catastrophe is inevitable.

Complacency and inaction in Britain, the US, Australia, Brazil, across Africa and Asia - all illustrate diverse manifestations of political paralysis, abdicating humankind's grave responsibility for planetary stewardship.

International political organizations and national governments must foreground the climate-emergency issue immediately, urgently drawing up comprehensive policies to address it. Conventionally privileged nations must voluntarily fund comprehensive environment-protection policies in impoverished nations, to compensate the latter for foregoing unsustainable economic growth, and paying recompense for the planet-plundering imperialism of materially privileged nations.

With extreme weather already hitting food production, we demand that governments act now to avoid any risk of hunger, with emergency investment in agro-ecological extreme-weather-resistant food production. We also call for an urgent summit on saving the Arctic icecap, to slow weather disruption of our harvests.

We further call on concerned global citizens to rise up and organize against current complacency in their particular contexts, including indigenous people's rights advocacy, decolonization and reparatory justice - so joining the global movement that's now rebelling against extinction (eg Extinction Rebellion in the UK).

We must collectively do whatever's necessary non-violently, to persuade politicians and business leaders to relinquish their complacency and denial. Their "business as usual" is no longer an option. Global citizens will no longer put up with this failure of our planetary duty.

Every one of us, especially in the materially privileged world, must commit to accepting the need to live more lightly, consume far less, and to not only uphold human rights but also our stewardship responsibilities to the planet.

The letter was signed by 100 academics, authors, politicians and campaigners from

 $^{^{2}} https://www.theguardian.com/environment/2018/dec/09/act-now-to-prevent-an-environmental-catastrophe$



Figure 8.9: Young protesters in London demanding action to prevent catastrophic climate change.

across the world. Among them were Vandana Shiva, Noam Chomsky, Naomi Klein and Bill McKibben.

8.3 The cost of inaction

In a sense, the cost of inaction is incalculably high. At stake is the entire future of human civilization and the biosphere. Our children's future and our grandchildren's future will be lost if we do not take rapid action to avoid catastrophic climate change. Nevertheless, scientists studying two of the most dangerous feedback loops, the albedo effect from melting of Arctic sea ice, and the release of methane from melting permafrost, have attempted to put a price tag on the cost of inaction under various scenarios. Their results were recently published in Nature³, and reported in The National Geographic⁴.

The National Geographic article, written by Stephen Leahey and published on April

³https://www.nature.com/articles/s41467-019-09863-x

 $^{{}^{4}} https://www.msn.com/en-us/weather/topstories/a-warming-arctic-could-cost-the-world-trillions-of-dollars/ar-BBWcxsz?li=BBnbcA1$



GLOBAL ATMOSPHERIC CARBON DIOXIDE SETS NEW RECORD HIGH IN 2017

NOAA Climate.gov, adapted from State of the Climate 2017

Figure 8.10: Today the atmospheric concentration of CO_2 is 413 ppm., roughly double the pre-industrial concentration. The last time that it was this high was in the Pliocene Epoch 5.3 to 2.6 million years ago. Sea levels were then 20 meters higher than they are right now, and trees were growing at the South Pole. Unless we quickly lower carbon emissions, most coastal cities and low-lying countries will be lost to rising seas.
24, 2019, states the following:

Scientists have long warned that climate change is likely to bring expensive impacts, from rising seas to stronger storms. And a new study comes with a hefty price tag.

A warming Arctic is shifting from white to dark as sea ice melts and landcovered snow retreats, and that means it can absorb even more of the sun's heat. Plus, the Arctic's vast permafrost area is thawing, releasing more heattrapping carbon and methane. These climate-change-driven feedbacks in the Arctic are accelerating warming even faster and may add nearly \$70 trillion to the overall costs of climate change - even if the world meets the Paris Agreement climate targets, a new study says.

However, if efforts can be made to keep climate change limited to 2.7 degrees Fahrenheit (1.5C), the extra cost of Arctic warming drops to \$25 trillion, new research published in Nature Communications reports. A trillion is a thousand billion. For comparison, the global GDP in 2016 was around \$76 trillion.

"Massive changes are underway in the Arctic. Permafrost and loss of sea ice and snow are two known tipping elements in the climate system," said lead author Dmitry Yumashev of the Pentland Centre for Sustainability in Business, Lancaster University in the United Kingdom.

"We wanted to know what Arctic warming could do to the rest of the world," said Yumashev.

Climate "tipping elements" are also known as tipping points or feedbacks, where a change in a natural system triggers further warming. Last year, a study documented ten tipping points and noted that these can act like a row of dominoes, one pushing another system over. Once started, these tipping points are nearly impossible to stop and risk what researchers called a "Hothouse Earth" state - in which the global average temperature is 4 to 5 degrees Celsius higher, with regions like the Arctic averaging 10 degrees C higher than today.

The Arctic is warming at least twice as fast as the global average. Sea ice has been in decline since the 1990s, exposing a million square miles of ocean. As more solar energy is absorbed it creates what's called the surface albedo feedback...

The \$25 to \$70 trillion cost of Arctic warming adds four to six percent to the total cost of climate change - which is estimated to reach \$1,390 trillion by the year 2300 if emissions cuts are not better than the Paris Agreement. However, the costs of the current business-as-usual path could be more than \$2,000 trillion.



Figure 8.11: Cumulative carbon emissions in gigatons under various scenarios.

Global carbon debt increasing by \$16 trillion annually

Another estimate of the cost of climate inaction has been made by Dr. Gideon Polya in an article entitled "Inescapable \$200-250 Trillion Global Carbon Debt Increasing by \$16 Trillion Annually"⁵. Here are some quotations from the article:

Carbon Debt is simply the damage-related cost of greenhouse gas (GHG) pollution that if not addressed now will inescapably have to be paid by future generations. However GHG emissions continue to rise inexorably and there is no global program to draw down CO2 and other GHGs from the atmosphere. While young people are now vociferously demanding massive climate action, inescapable global Carbon Debt is \$200-\$250 trillion and increasing by \$16 trillion each year.

Unlike Conventional Debt that can be variously expunged by bankruptcy, printing money or default, Carbon Debt is inescapable - thus, for example, national commitments to GHG pollution reduction made to the 2015 Paris Climate Conference amount to a temperature rise of over 3 degrees Centigrade (3C), and unless huge sea walls are built Netherlands-style, coastal cities of the world housing hundreds of millions of people will be submerged by rising

 $^{^{5}} https://countercurrents.org/2019/04/27/inescapable-200-250-trillion-global-carbon-debt-increasing-by-16-trillion-annually-gideon-polya/$



Figure 8.12: Global mean temperature simulations under the range of climate scenarios considered. BAU stands for "Business As Usual".

sea levels (notably in Asia), mega-delta agricultural lands vital for feeding Humanity will be subject to inundation and salinization, and low-lying Island States will cease to exist

While outright, anti-science climate change denialism is politically entrenched in climate criminal Trump America and its climate criminal lackey Australia, most governments around the world are politically committed to effective climate change denialism through climate change inaction. That climate change inaction is most clearly quantitated in terms of Carbon Debt, but the very term has been white-washed out of public perception by US owned or subverted Mainstream media. Thus the Australian ABC (the taxpayer-funded Australian equivalent of the UK BBC) is self-assertedly "progressive" but a Search of the ABC for the term "Climate Debt" reveals zero (0) reportage. A Search of the self-assertedly "ethical" UK BBC for the term "Climate Debt" yields 9 items with none later than 2009, defining the term or quantifying global or national Carbon Debt.

Explanations for this extraordinary mainstream media lying by omission over Carbon Debt can be variously advanced, ranging from entrenched mendacity by US- and corporate- subverted media to cognitive dissonance in the face of a worsening climate emergency. However I am confident in predicting that if governments do not take action on the world's massive Carbon Debt then intergenerational justice action by the utterly betrayed and robbed young people of the world will make the present Extinction Rebellion climate demonstrations in London look like a proverbial Teddy Bear's Picnic. A young people-led Climate Revolution (non-violent one hopes) is coming...

Up to one million species face extinction

According to a recent United Nations report⁶

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report warns of "an imminent rapid acceleration in the global rate of species extinction."

The pace of loss "is already tens to hundreds of times higher than it has been, on average, over the last 10 million years," it notes.

"Half-a-million to a million species are projected to be threatened with extinction, many within decades."

⁶https://news.yahoo.com/one-million-species-risk-extinction-due-humans-draft-131407174.html

Refugees from climate change

The United Nations High Commission on Refugees

In an article on *Climate Change and Disasters* the United Nations High Commission on Refugees makes the following statement:

"The Earth's climate is changing at a rate that has exceeded most scientific forecasts. Some families and communities have already started to suffer from disasters and the consequences of climate change, forced to leave their homes in search of a new beginning.

"For UNHCR, the consequences of climate change are enormous. Scarce natural resources such as drinking water are likely to become even more limited. Many crops and some livestock are unlikely to survive in certain locations if conditions become too hot and dry, or too cold and wet. Food security, already a concern, will become even more challenging.

"People try to adapt to this situation, but for many this will mean a conscious move to another place to survive. Such moves, or the effects of climate change on natural resources, may spark conflict with other communities, as an increasing number of people compete for a decreasing amount of resources.

"Since 2009, an estimated one person every second has been displaced by a disaster, with an average of 22.5 million people displaced by climate- or weather-related events since 2008 (IDMC 2015). Disasters and slow onsets, such as droughts in Somalia in 2011 and 2012, floods in Pakistan between 2010 and 2012, and the earthquake in Nepal in 2015, can leave huge numbers of people traumatized without shelter, clean water and basic supplies."

Populations displaced by sea level rise

In a recent article⁷ discussed the long-term effects of sea level rise and the massive refugee crisis that it might create. By 2060, about 1.4 billion people could be climate change refugees, according to the paper, and that number could reach 2 billion by 2100.

The lead author, Prof. Emeritus Charles Geisler of Cornell University says: "The colliding forces of human fertility, submerging coastal zones, residential retreat, and impediments to inland resettlement is a huge problem. We offer preliminary estimates of the lands unlikely to support new waves of climate refugees due to the residues of war, exhausted natural resources, declining net primary productivity, desertification, urban sprawl, land concentration, 'paving the planet' with roads and greenhouse gas storage zones offsetting permafrost melt."

We should notice that Prof. Geisler's estimate of 2 billion climate refugees by 2100 includes all causes, not merely sea level rise. However, the number of refugees from sea level rise alone will be very large, since all the world's coastal cities, and many river deltas will be at risk.

⁷Geisler C. et al., Impediments to inland resettlement under conditions of accelerated sea level rise , Land Use Policy, Vol 55, July 2017, Pages 322-330

Populations displaced by drought and famine

Climate change could produce a refugee crisis that is "unprecedented in human history", Barack Obama has warned as he stressed global warming was the most pressing issue of the age.

Speaking at an international food conference in Milan, the former US President said rising temperatures were already making it more difficult to grow crops and rising food prices were "leading to political instability".

If world leaders put aside "parochial interests" and took action to reduce greenhouse gas emissions by enough to restrict the rise to one or two degrees Celsius, then humanity would probably be able to cope.

Failing to do this, Mr Obama warned, increased the risk of "catastrophic" effects in the future, "not only real threats to food security, but also increases in conflict as a consequence of scarcity and greater refugee and migration patterns".

"If you think about monsoon patterns in the Indian subcontinent, maybe half a billion people rely on traditional rain patterns in those areas,"

Populations displaced by rising temperatures

A new study published in Nature: Climate Change has warned that up to 75% of the world's population could face deadly heat waves by 2100 unless greenhouse gas emissions are rapidly controlled.⁸. The following is an excerpt from the article:

"Here we conducted a global analysis of documented lethal heat events to identify the climatic conditions associated with human death and then quantified the current and projected occurrence of such deadly climatic conditions worldwide. We reviewed papers published between 1980 and 2014, and found 783 cases of excess human mortality associated with heat from 164 cities in 36 countries.

"Based on the climatic conditions of those lethal heat events, we identified a global threshold beyond which daily mean surface air temperature and relative humidity become deadly. Around 30% of the world's population is currently exposed to climatic conditions exceeding this deadly threshold for at least 20 days a year.

"By 2100, this percentage is projected to increase to 48% under a scenario with drastic reductions of greenhouse gas emissions and 74% under a scenario of growing emissions. An increasing threat to human life from excess heat now seems almost inevitable, but will be greatly aggravated if greenhouse gases are not considerably reduced." ⁹

⁸Mora, C. et al., *Global risk of deadly heat*, Nature: Climate Change, 19 June 2017

⁹See also https://phys.org/news/2017-08-deadly-south-asia-century.html and

https://cleantechnica.com/2017/09/28/extreme-heatwaves-like-recent-lucifer-heatwave-become-normal-europe-2050s/

8.3. THE COST OF INACTION

Populations displaced by war

A recent article in *The Guardian*¹⁰ discusses the relationship between climate change and war, Here are some excerpts from the article:

"Climate change is set to cause a refugee crisis of 'unimaginable scale', according to senior military figures, who warn that global warming is the greatest security threat of the 21st century and that mass migration will become the 'new normal'.

"The generals said the impacts of climate change were already factors in the conflicts driving a current crisis of migration into Europe, having been linked to the Arab Spring, the war in Syria and the Boko Haram terrorist insurgency.

"Military leaders have long warned that global warming could multiply and accelerate security threats around the world by provoking conflicts and migration. They are now warning that immediate action is required.

"Climate change is the greatest security threat of the 21st century,' said Maj Gen Muniruzzaman.

"Muniruzzaman, chairman of the Global Military Advisory Council on climate change and a former military adviser to the president of Bangladesh. He said one meter of sea level rise will flood 20% of his nation. 'We're going to see refugee problems on an unimaginable scale, potentially above 30 million people.'

"Previously, Bangladesh's finance minister, Abul Maal Abdul Muhith, called on Britain and other wealthy countries to accept millions of displaced people.

"Brig Gen Stephen Cheney, a member of the US Department of State's foreign affairs policy board and CEO of the American Security Project, said: 'Climate change could lead to a humanitarian crisis of epic proportions. We're already seeing migration of large numbers of people around the world because of food scarcity, water insecurity and extreme weather, and this is set to become the new normal'.

Political reactions to migration

Brexit

Across the developed world, the reaction to threatened migration of refugees from climate change has been less than generous, to say the least. The recent decision of Britain to leave the European Union was motivated largely by the fear of British workers that EU laws would force their country to accept large numbers of refugees.

Swings to the right in Europe

In Germany, Angela Merkel's generous policies towards refugees have cost her votes, while an openly racist party, the Alternative for Germany (AfD) party, has gained in strength. Frauke Petry, 40, the party's leader, has said border guards might need to turn guns on

¹⁰Thursday, 1 December, 2016

anyone crossing a frontier illegally. The party's policy platform says "Islam does not belong in Germany" and calls for a ban on the construction of mosques.

In September, 2017, eight people from the neo-Nazi Freital Group were put on trial in Dresden for bomb attacks on homes for asylum applicants. Hundreds of similar assaults occur in Germany every year, but they had never before been tried as terrorism in a federal court.

In the German election, which took place on Sunday, October 1, 2017, Angela Merkel won a fourth term as Chancellor, but her party won only 33% of the votes, a percentage much reduced from the 41% won in the election of 2013. Angela Merkel was paying a high price for her refugee-friendly policies.

Meanwhile the far right anti-immigration AfD party made a historic breakthrough, winning 13.5% of the vote, thus becoming the first overtly nationalist party to sit in the Bundestag in 60 years. The Greens have already complained that "Nazis have returned to parliament". In fact, members of the AfD party have begun to say that Germans should stop being ashamed of their country's Nazi past.

In France, the National Front is a nationalist party that uses populist rhetoric to promote its anti-immigration and anti-European Union positions. The party favors protectionist economic policies and would clamp down on government benefits for immigrants.

Similarly, in the Netherlands, the anti-European Union, anti-Islam Party for Freedom has called for closing all Islamic schools and recording the ethnicity of all Dutch citizens. In early November, the party was leading in polls ahead of next year's parliamentary elections.

Other far-right anti-immigrant parties in Europe include Golden Dawn (Greece), Jobbic (Hungary), Sweden Democrats (Sweden), Freedom Party (Austria), and People's Party - Our Slovakia (Slovakia). All of these parties have gained in strength because of the widespread fear of immigration.

Populism in the United States

The election of Donald Trump, who ran for President in 2016 on an openly racist and anti-immigrant platform, can also be seen as the result of fear of immigration, especially on the part of industrial workers.

A more humane response to the refugee crisis

In the long-term future, climate change will make the refugee crisis much more severe. Heat and drought will make large regions of the world uninhabitable, and will threaten many populations with famine. The severity of the refugee crisis will depend on how quickly we reduce greenhouse gas emissions.

While making many parts of the world uninhabitable, long-term climate change will make other regions more suitable for human habitation and agriculture. For example, farming will become more possible in Siberia, Greenland, the Canadian Arctic, Alaska and

8.4. SOCIAL SYSTEMS IN SCANDINAVIA

Patagonia. A humane response to the refugee crisis could include the generous opening of these regions to refuges.

The global population of humans is currently increasing by almost a billion people every decade. Global population must be stabilized, and in the long run, gradually reduced. Money currently wasted (or worse than wasted) on armaments could be used instead to promote universal primary health care, and with it, universal access to the knowledge and materials needed for family planning.

Finally, reduced consumption of meat, particularly beef, would shorten the food chain thus make more food available for famine relief.

8.4 Social systems in Scandinavia

The Green New Deal can simultaneously address the climate crisis and the problem of excessive economic inequality. In this context, it is interesting to look at the social and economic systems of the Scandinavian countries, Norway, Sweden, Finland, Denmark and Iceland. In these countries the contrast between the rich and poor has been very much reduced. It is almost true to say that poverty has been eliminated in these countries. At the same time, the Scandinavians have strong policies to address the climate emergency. Thus Scandinavian successes are a counter-argument to those who say that the Green New Deal cannot be put into practice.¹¹

The Danish system today

In 2017. Denmark ranked 2nd in the world (after Norway) in the World Happiness Report. In a number of other years, Denmark has ranked 1st. In compiling the report, researchers ask people in a given country whether they are happy, and record how many say "yes". Interestingly, in Denmark, women are the most happy of all. It is therefore relevant to look at the Danish social and political system of today, and to examine the reasons why women are so satisfied with it.

Denmark has very high taxes, but in return for these, its citizens receive many social services, such as free health care. If they qualify for university education, the tuition is free, and students are given an allowance for their living expenses. Mothers or alternatively fathers, can take paid leave of up to 52 weeks after the birth of a child. After that, a *vuggestue* (cresch) is always available, so that mothers can return to their jobs. When the child become too old for the cresch, day care centers are always available. For children of school age, after-school clubs are available where children can practice arts and crafts or other activities under supervision until their parents come home from work.

It is illegal in Denmark to fire a woman because she has become pregnant, or to deny her work because the employer fears that she may become pregnant. Thus, Danish women grow up expecting to find jobs outside the home. Danish women are happy to have careers, but it is also a necessity, because with taxes so high that a single income is not enough

¹¹But, of course, it cannot be put into practice while maintaining an economic oligarchy.

to give a family the desired standard of living. Husbands are grateful to their wives for helping to support the family. In the case of single mothers, support is given by the state.

The number of births per woman-life reached a low of 1.38 in 1983, but since that time the number has gradually risen gradually and in 2017 the fertility rate was 1.77, still less than the replacement level. The other Scandinavian countries have very similar systems, and they all have high human development indices, as well as a high degree of economic equality. When US Senator Bernie Sanders declared that he is a socialist, he made the statement more precise by saying that he is in favor of the Scandinavian social and political system.

Renewable energy in Denmark

Here are some excerpts from a recent report by the Danish Ministry of Energy, Utilities and Climate:¹²

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

Denmark's energy and climate policy was also high lighted in 2017 by the International Energy Agency (IEA), as an international model because the country produces wind turbines, provides record low energy prices and good electricity connections to neighboring countries.

In 2017, Denmark achieved a world record of 43.4% power produced solely by wind turbines.

Denmark can cover the largest share of its electricity production with green power from wind turbines.

Denmark is also a European leader in the export of energy technology, as exports of energy equipment account for a larger share of total exports than in any other EU country.

The government has set ambitious goals that few other countries can match:

- At least 50% of Denmark's energy needs must be covered by renewable energy by 2030.
- Coal must be completely phased out of the power supply by 2030.
- Moratorium on all exploration and drilling activities for oil, gas and shale gas on land and inland waters of Denmark.
- Denmark must be a low-emission society independent of fossil fuels in 2050.

¹²Denmark: Energy and climate pioneer. Status of the green transition



Figure 8.13: Senator Bernie Sanders, the popular candidate for the US Presidency in 2016 and 2020, says that he is a socialist. When asked to explain this in detail, Senator Sanders said that he believes that the United States would benefit from a social system similar to the systems in present-day Scandinavia.



Figure 8.14: A day-care center in Sweden. In the Scandinavian countries, most women work, and state-provided day-care centers for pre-school children make this possible.



Figure 8.15: Finland has the best school system in the world. One reason for this is that the teachers are very highly selected and highly paid. Another reason is that the children are given frequent short rest periods, during which they may go outdoors and breath fresh air. They return from these small breaks with improved concentration.



Figure 8.16: The long-serving Danish Prime Minister Thorvald Stauning (1873-1942). He was the architect of the Danish social and economic system, which combines a free-market economy with such social benefits as universal free health care, state-provided day-care centers and free higher education. Thanks to Stauning's initiatives, those who qualify for college or university in Denmark are not only given free tuition, but also a stipend to support their living expenses. A high progressive income tax in Denmark pays for these benefits and reduces economic inequality. Stauning forged a coalition that united both labor and employers behind his reforms.

8.5 Roosevelt saves his nation and the world

Born into a very wealthy Dutch-American family Franklin Delano Roosevelt (1882-1945) attended Groton School, Harvard College and Columbia Law School. After practicing law in New York, he was elected to the NY State Senate. During World War I, he served as Assistant Secretary of the Navy. In 1920 he was the Democratic Party's Candidate for US Vice President, but he and James G. Cox were defeated by Warren Harding's ticket.

In 1921, FDR contracted polio and lost the use of his legs. His mother urged him to leave politics and return to the family estate at Hyde Park, but he vigorously resisted this suggestion and struggled to continue despite his handicap. In 1928, Roosevelt was elected Governor of New York. As Governor, he instituted many reforms to combat the economic problems that had followed the 1929 Black Friday stock market crash.

After winning a second term as Governor of New York State in 1930, FDR became the front-running candidate for the US Presidency in i932. In accepting the Democratic Party nomination at the Chicago convention, he said: "I pledge you, I pledge myself to a new deal for the American people... This is more than a political campaign. It is a call to arms."

Here are some excerpts from FDR's First Inaugural Address, Saturday, March 4th, 1933:

I am certain that my fellow Americans expect that on my induction into the Presidency I will address them with a candor and a decision which the present situation of our Nation impels. This is preeminently the time to speak the truth, the whole truth, frankly and boldly. Nor need we shrink from honestly facing conditions in our country today. This great Nation will endure as it has endured, will revive and will prosper. So, first of all, let me assert my firm belief that the only thing we have to fear is fear itself - nameless, unreasoning, unjustified terror which paralyzes needed efforts to convert retreat into advance. In every dark hour of our national life a leadership of frankness and vigor has met with that understanding and support of the people themselves which is essential to victory. I am convinced that you will again give that support to leadership in these critical days.

In such a spirit on my part and on yours we face our common difficulties. They concern, thank God, only material things. Values have shrunken to fantastic levels; taxes have risen; our ability to pay has fallen; government of all kinds is faced by serious curtailment of income; the means of exchange are frozen in the currents of trade; the withered leaves of industrial enterprise lie on every side; farmers find no markets for their produce; the savings of many years in thousands of families are gone.

More important, a host of unemployed citizens face the grim problem of existence, and an equally great number toil with little return. Only a foolish optimist can deny the dark realities of the moment. ..

Recognition of the falsity of material wealth as the standard of success goes

hand in hand with the abandonment of the false belief that public office and high political position are to be valued only by the standards of pride of place and personal profit; and there must be an end to a conduct in banking and in business which too often has given to a sacred trust the likeness of callous and selfish wrongdoing. Small wonder that confidence languishes, for it thrives only on honesty, on honor, on the sacredness of obligations, on faithful protection, on unselfish performance; without them it cannot live.

Restoration calls, however, not for changes in ethics alone. This Nation asks for action, and action now.

Our greatest primary task is to put people to work. This is no unsolvable problem if we face it wisely and courageously. It can be accomplished in part by direct recruiting by the Government itself, treating the task as we would treat the emergency of a war, but at the same time, through this employment, accomplishing greatly needed projects to stimulate and reorganize the use of our natural resources.

Hand in hand with this we must frankly recognize the overbalance of population in our industrial centers and, by engaging on a national scale in a redistribution, endeavor to provide a better use of the land for those best fitted for the land. The task can be helped by definite efforts to raise the values of agricultural products and with this the power to purchase the output of our cities. It can be helped by preventing realistically the tragedy of the growing loss through foreclosure of our small homes and our farms. It can be helped by insistence that the Federal, State, and local governments act forthwith on the demand that their cost be drastically reduced. It can be helped by the unifying of relief activities which today are often scattered, uneconomical, and unequal. It can be helped by national planning for and supervision of all forms of transportation and of communications and other utilities which have a definitely public character. There are many ways in which it can be helped, but it can never be helped merely by talking about it. We must act and act quickly.

Roosevelt's New Deal programs aimed at "the three R's": **relief** of the poor, **reform** of financial institutions, and **recovery** of confidence. New Deal programs aimed at employing people on infrastructure projects that included the following:

- The Civilian Concervation Corps
- The Civil Works Administration
- The Farm Security Administration
- The National Industrial Recovery Act of 1933
- The Social Security Administration
- The Works Progress Administration of 1937 (WPA)

Wikipedia states that "The WPA financed a variety of projects such as hospitals, schools and roads, and employed more than 8.5 million workers who built 650,000 miles of highways and roads, 125,000 public buildings as well as bridges, reservoirs, irrigation systems, parks, playgrounds and so on."



Figure 8.17: Franklin Delano Roosevelt (FDR) in 1933. Wikipedia says of him: "Roosevelt is widely considered to be one of the most important figures in American history, as well as among the most influential figures of the 20th century. Though he has been subject to substantial criticism, he is generally rated by scholars as one of the three greatest U.S. presidents, along with George Washington and Abraham Lincoln."



Figure 8.18: Eleanor and Franklin with two of their children in 1908. Eleanor was called Roosevelt even before her marriage. She was the niece of US President Theodore Roosevelt, a distant cousin of Franklin. She is remembered as an outstanding advocate of racial equality, journalistic freedom and human rights.



Figure 8.19: A photograph of FDR with his dog Fala and Ruthie Bie, the daughter of caretakers at his Hyde Park estate. Roosevelt was careful never to be seen using his wheelchair in public. Although disabled, he managed to give a public impression of buoyant energy and confidence. One of his slogans, which he used to end the depression, was "The only thing that we have to fear is fear itself!"



Figure 8.20: The 1932 electoral vote. Roosevelt also won landslide victorys in 1936, 1940 and 1944. FDR died in office, shortly before the end of World War II. His administration's support for England during the the dark hours of the Battle of Britain had prevented Hitler's forces from invading the UK. In 1945, Eleanor Roosevelt helped to carry through FDR's plans for setting up the United Nations, and she was one of the two main drafters of the Universal Declaration of Human Rights.



Figure 8.21: A photo of Eleanor Roosevelt with Charles Malik and their grandchildren. Malik and Eleanor Roosevelt worked together to draft the Universal Declaration of Human Rights.



Figure 8.22: Pete Seeger entertaining Eleanor Roosevelt (center), honored guest at a racially integrated Valentine's Day party marking the opening of a Canteen of the United Federal Labor, CIO, in then-segregated Washington, D.C., 1944.

Roosevelt's New Deal serves a model for a Green New Deal that can save human civilization and the biosphere from catastrophic climate change, an emergency even more severe than those faced by Roosevelt. We can afford the Green New Deal. What we cannot afford is inaction.

Suggestions for further reading

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ECOLOGICAL IMPACT OF MILITARISM

Chapter 9

RESOURCE WARS

9.1 Adam Smith's invisible hand is at our throats

As everyone knows, Adam Smith invented the theory that individual self-interest is, and ought to be, the main motivating force of human economic activity, and that this, in effect, serves the wider social interest. He put forward a detailed description of this concept in an immense book, "The Wealth of Nations" (1776).

Adam Smith (1723-1790) had been Professor of Logic at the University of Glasgow, but in 1764 he withdrew from his position at the university to become the tutor of the young Duke of Buccleuch. In those days a Grand Tour of Europe was considered to be an important part of the education of a young nobleman, and Smith accompanied Buccleuch to the Continent. To while away the occasional dull intervals of the tour, Adam Smith began to write an enormous book on economics which he finally completed twelve years later. He began his "Inquiry into the Nature and Causes of the Wealth of Nations" by praising division of labor. As an example of its benefits, he cited a pin factory, where ten men, each a specialist in his own set of operations, could produce 48,000 pins in a day. In the most complex civilizations, Smith stated, division of labor has the greatest utility.

The second factor in prosperity, Adam Smith maintained, is a competitive market, free from monopolies and entirely free from governmental interference. In such a system, he tells us, the natural forces of competition are able to organize even the most complex economic operations, and are able also to maximize productivity. He expressed this idea in the following words:

"As every individual, therefore, endeavors as much as he can, both to employ his capital in support of domestic industry, and so to direct that industry that its produce may be of greatest value, each individual necessarily labours to render the annual revenue of the Society as great as he can."

"He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of greatest value, he intends only his own gain; and he is in this, as in many other cases, led by an invisible hand to promote an end that was no part of his intention. Nor is it always the worse for Society that it was no part of it. By pursuing his own interest, he frequently promotes that of Society more effectively than when he really intends to promote it."

In other words, Smith maintained that self-interest (even greed) is a sufficient guide to human economic actions. The passage of time has shown that he 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 individual 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. Here is what actually happened:

In pre-industrial Europe, peasant farmers held a low but nevertheless secure position, protected by a web of traditional rights and duties. Their low dirt-floored and thatched cottages were humble but safe refuges. If a peasant owned a cow, it could be pastured on common land.

With the invention of the steam engine and the introduction of spinning and weaving machines towards the end of the 18th Century, the pattern changed, at first in England, and afterwards in other European countries. Land-owners in Scotland and Northern England realized that sheep were more profitable to have on the land than "crofters" (i.e., small tenant farmers), and families that had farmed land for generations were violently driven from their homes with almost no warning. The cottages were afterwards burned to prevent the return of their owners.

The following account of the Highland Clearances has been left by Donald McLeod, a crofter in the district of Sutherland: "The consternation and confusion were extreme. Little or no time was given for the removal of persons or property; the people striving to remove the sick or helpless before the fire should reach them; next struggling to save the most valuable of their effects. The cries of the women and children; the roaring of the affrighted cattle, hunted at the same time by the yelling dogs of the shepherds amid the smoke and fire, altogether presented a scene that completely baffles description - it required to be seen to be believed... The conflagration lasted for six days, until the whole of the dwellings were reduced to ashes and smoking ruins."

Between 1750 and 1860, the English Parliament passed a large number of "Enclosure Acts", abolishing the rights of small farmers to pasture their animals on common land that was not under cultivation. The fabric of traditional rights and duties that once had protected the lives of small tenant farmers was torn to pieces. Driven from the land, poor families flocked to the towns and cities, hoping for employment in the textile mills that seemed to be springing up everywhere.

According to the new rules by which industrial society began to be governed, traditions were forgotten and replaced by purely economic laws. Labor was viewed as a commodity, like coal or grain, and wages were paid according to the laws of supply and demand, without regard for the needs of the workers. Wages fell to starvation levels, hours of work increased,



Figure 9.1: A watercolor painting by Vincent van Gogh showing wives of Belgian miners carrying bags of coal.



Figure 9.2: London during the industrial revolution



Figure 9.3: A girl pulling a coaltub through the narrow space left by removal of coal from a seam.

and working conditions deteriorated.

John Fielden's book, "The Curse of the Factory System" was written in 1836, and it describes the condition of young children working in the cotton mills. "The small nimble fingers of children being by far the most in request, the custom instantly sprang up of procuring 'apprentices' from the different parish workhouses of London, Birmingham and elsewhere... Overseers were appointed to see to the works, whose interest it was to work the children to the utmost, because their pay was in proportion to the quantity of pay that they could exact."

"Cruelty was, of course, the consequence; and there is abundant evidence on record to show that in many of the manufacturing districts, the most heart-rending cruelties were practiced on the unoffending and friendless creatures... that they were flogged, fettered and tortured in the most exquisite refinements of cruelty, that they were in many cases starved to the bone while flogged to their work, and that they were even in some instances driven to commit suicide... The profits of manufacture were enormous, but this only whetted the appetite that it should have satisfied."

Dr. Peter Gaskell, writing in 1833, described the condition of the English mill workers as follows: "The vast deterioration in personal form which has been brought about in the manufacturing population during the last thirty years... is singularly impressive, and fills the mind with contemplations of a very painful character... Their complexion is sallow and pallid, with a peculiar flatness of feature caused by the want of a proper quantity of adipose substance to cushion out the cheeks. Their stature is low - the average height of men being five feet, six inches... Great numbers of the girls and women walk lamely or awkwardly... Many of the men have but little beard, and that in patches of a few hairs... (They have) a spiritless and dejected air, a sprawling and wide action of the legs..."

"Rising at or before daybreak, between four and five o'clock the year round, they



Figure 9.4: Child laborers during the early Industrial Revolution

swallow a hasty meal or hurry to the mill without taking any food whatever... At twelve o'clock the engine stops, and an hour is given for dinner... Again they are closely immured from one o'clock till eight or nine, with the exception of twenty minutes, this being allowed for tea. During the whole of this long period, they are actively and unremittingly engaged in a crowded room at an elevated temperature."

Dr. Gaskell described the housing of the workers as follows: "One of the circumstances in which they are especially defective is that of drainage and water-closets. Whole ranges of these houses are either totally undrained, or very partially... The whole of the washings and filth from these consequently are thrown into the front or back street, which, often being unpaved and cut into deep ruts, allows them to collect into stinking and stagnant pools; while fifty, or even more than that number, having only a single convenience common to them all, it is in a very short time choked with excrementous matter. No alternative is left to the inhabitants but adding this to the already defiled street."

"It frequently happens that one tenement is held by several families... The demoralizing effects of this utter absence of domestic privacy must be seen before they can be thoroughly appreciated. By laying bare all the wants and actions of the sexes, it strips them of outward regard for decency - modesty is annihilated - the father and the mother, the brother and the sister, the male and female lodger, do not scruple to commit acts in front of each other which even the savage keeps hid from his fellows."

The landowners of Scotland were unquestionably following self-interest as they burned the cottages of their crofters; and self-interest motivated overseers as they whipped halfstarved child workers in England's mills. Adam Smith's "invisible hand" no doubt guided their actions in such a way as to maximize production. But whether a happy and just society was created in this way is questionable. Certainly it was a society with large areas of unhappiness and injustice. Self-interest alone was not enough. A society following purely economic laws - a society where selfishness is exalted as the mainspring for action - lacks both the ethical and ecological dimensions needed for social justice, widespread happiness, and sustainability.

9.2 Our greed-based economic system today

Today our greed-based, war addicted, and growth-obsessed economic system poses even greater threats than it did during the early phases of the Industrial Revolution. Today it threatens to destroy human civilization and much of the biosphere.

According to a recently-published study by Oxfam, just 1 percent of the world's population controls nearly half of the planet's wealth. The study says that this tiny slice of humanity controls 110 trillion US dollars, or 65 times the total wealth of the poorest 3.5 billion people. The world's 85 richest people own as much as the poorest 50 percent of humanity. 70 percent of the world's people live in a country where income inequality has increased in the past three decades.

This shocking disparity in wealth has lead to the decay of democracy in many countries, because the very rich have used their money to control governments, and also to control the mass media and hence to control public opinion. The actions of many governments today tend not to reflect what is good for the people (or more crucially, what is good for the future of our planet), but rather what is good for special interest groups, for example, the fossil fuel industry and the military-industrial complex.

Today the world spends roughly 1,700,000,000,000 US dollars on armaments, almost 2 trillion. This vast river of money, almost too great to be imagined, flows into the pockets of arms manufacturers, and is used by them to control governments, which in turn vote for bloated military budgets and aggressive foreign policies which provoke the endless crises and conflicts that are necessary to justify the diversion of such vast sums of money from urgently-needed social goals into the bottomless pit of war.

The reelection of the slave-like politicians is ensured by the huge sums made available



Figure 9.5: An oxymoron: The vultures of greed never protect the dove of peace.

for their campaigns by the military-industrial complex. This pernicious circular flow of money, driving endless crises, has sometimes been called "The Devil's Dynamo". Thus the world is continually driven to the brink of thermonuclear war by highly dangerous interventions such as the recent ones in North Africa, the Middle East, Ukraine, South and Central America, and the Korean Peninsula.

It is doubtful that any of the political or military figures involved with this arrogant risking of human lives and the human future have any imaginative idea of what a thermonuclear war would be like. In fact it would be an ecological catastrophe of huge proportions, making large areas of the world permanently uninhabitable through long-lived radioactive contamination. The damage to global agriculture would be so great as to produce famine leading to a billion or more deaths from starvation. All the nations of the earth would suffer, neutrals as well as belligerents.

Besides supporting the appalling war machine, our bought-and-paid-for politicians also fail to take the actions that would be needed to prevent the worst effects of climate change. The owners of the fossil fuel industries have even mounted advertising campaigns to convince the public that the threat of anthropogenic climate change is not real. Sadly, the threat of catastrophic climate change is all too real, as 99 percent the worlds climate scientists have warned.

The world has recently passed a dangerous landmark in atmospheric CO2 concentration, 400 ppm. The last time that the earth experienced such high concentrations of this



Figure 9.6: The ship in the cartoon is drawn so as to resemble the Titanic.

greenhouse gas were several million years ago. At that time the Arctic was free from ice, and sea levels were 40 meters higher than they are today. Global warming is a slow and long-term effect, so such high sea levels will be slow in arriving, but ultimately we must expect that coastal cities and much of the world's low-lying land will be under water. We must also expect many tropical regions of the world to become uninhabitable because of high temperatures. Finally there is a threat of famine because agriculture will be hit by high temperatures and aridity.

There are several very dangerous feedback loops that may cause the earth's temperatures to rise much faster than has been predicted by the International Panel on Climate Change. By far the most dangerous of these comes from the melting of methane hydrate crystals that are currently trapped in frozen tundra and on the floor of seabeds.

At high pressures, methane combines with water to form crystals called hydrates or clathrates. These crystals are stable at the temperatures currently existing on ocean floors, but whenever the water temperature rises sufficiently, the crystals become unstable and methane gas bubbles to the surface. This effect has already been observed in the Arctic seas north of Russia. The total amount of methane clathrates on ocean floors is not precisely known, but it is estimated to be very large indeed, corresponding to between 3,000 and 11,000 gigatons of carbon. The release of even a small fraction of this amount of methane into our atmosphere would greatly accelerate rising temperatures, leading to the release of still more methane, in a highly dangerous feedback loop. We must at all costs avoid global temperatures which will cause this feedback loop to trigger in earnest.



Figure 9.7: Temperature changes will be greatest in the polar regions. Far greater changes in global temperatures are to be expected in the 22nd and 23rd centuries and in subsequent centuries, because the thermal inertia of the oceans makes climate change a very slow and long-term effect.



Figure 9.8: The isotope ratios in ice cores from the Greenland ice sheet allow us to see the close correlation between atmospheric CO2 concentration and temperatures over a very long period of time. Thus regardless of questions of cause and effect, we can expect rising concentrations of CO2 to be accompanied by rising temperatures. As we can see from the graphs, the rate of increase in carbon emissions has shown no sign of slowing in recent years.

9.3 Human motivations were not always so selfish

For the reasons mentioned above, we can see that an economic system where selfishness and greed are exalted as the mainspring for human actions lacks both a social conscience and an ecological conscience. Both these dimensions are needed for the long-term survival of human civilization and the biosphere.

We must remember, however, that the worship of the free market and the exaltation of selfishness are relatively recent developments in human history. During most of their million-year history, humans lived in small groups, not in great cities or nations, and sharing was part of their lifestyle. Perhaps that lifestyle is the one to which we should return if we wish the human future to stretch out for another million years.

9.4 Neocolonialism

In his book, "Neocolonialism, The Last Stage of Imperialism" (Thomas Nielsen, London, 1965), Kwamai Nkrumah defined neocolonialism with the following words: "The essence of neocolonialism is that the State which is subject to it is, in theory, independent, and has all the outward trappings of international sovereignty. In reality its economic system and thus its political policy is directed from the outside. The methods and form of this direction can take various shapes. For example, in an extreme case, the troops of the imperial power may garrison the territory of the neocolonial State and control the government of it. More often, however, neocolonial control is exercised through monetary means..."

"The struggle against neocolonialism is not aimed at excluding the capital of the developed world from operating in less developed countries. It is aimed at preventing the financial power of the developed countries from being used in such a way as to impoverish the less developed."

9.5 The resource curse

The way in which the 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.

One might think that taxation of foreign resource-extracting firms would provide developing countries with large incomes. However, there is at present no international law governing multinational tax arrangements. These are usually agreed to on a bilateral basis, and the industrialized countries have stronger bargaining powers in arranging the bilateral agreements.
9.6 Confessions of an economic hit-man

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A book by John Perkins, "Confessions of an Economic Hit-Man", can give us an idea of the way in which our economic system operates to further enrich wealthy nations and impoverish poor ones. Here are some excerpts:

"Economic hit men (EHMs) are highly paid professionals who cheat countries around the globe out of trillions of dollars. They funnel money from the World Bank, the U.S. Agency for International Development (USAID), and other foreign 'aid' organizations into the coffers of huge corporations and the pockets of a few wealthy families who control the planet's natural resources."

"Their tools included fraudulent financial reports, rigged elections, payoffs, extortion, sex, and murder. They play a game as old as empire, but one that has taken on new and terrifying dimensions during this time of globalization. I was initially recruited while I was in business school back in the late sixties by the National Security Agency, the nation's largest and least understood spy organization; but ultimately I worked for private corporations."

"The first real economic hit man was back in the early 1950s, Kermit Roosevelt, Jr., the grandson of Teddy, who overthrew the government of Iran, a democratically elected government, Mossadegh's government, who was Time magazine's person of the year; and he was so successful at doing this without any bloodshed, well, there was a little bloodshed, but no military intervention, just spending millions of dollars and replaced Mossadegh with the Shah of Iran."

"At that point understood that this idea of economic hit man was an extremely good one. We didn't have to worry about the threat of war with Russia when we did it this way. The problem with that was that Roosevelt was a C.I.A. agent. He was a government employee. Had he been caught, we would have been in a lot of trouble. It would have been very embarrassing. So, at that point, the decision was made to use organizations like the C.I.A. and the N.S.A. to recruit potential economic hit men like me and then send us to work for private consulting companies, engineering firms, construction companies, so that if we were caught, there would be no connection with the government."

¹http://techrig.blogspot.dk/2013/11/confessions-of-economic-hit-man.html https://www.youtube.com/watch?v=yTbdnNgqfs8 https://en.wikipedia.org/wiki/Corporatocracy



9.7 Debt slavery

At the moment, the issue of debt slavery is in the news because of the predicament of Greece and the intended fate of Ukraine, but the problem is a very general one.

If any quantity, for example indebtedness, is growing at the rate of 7% per year, the doubling time is only 9.9 years. At higher rates of interest, the doubling time is still less. If a debt remains unpaid for so long that it more than doubles, 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'.²

Dr. Michael Klare holds the post of Five Colleges Professor of Peace and World Security Studies at Hampshire College, Amherst College, Smith College, Mount Holyoke College, and the University of Massachusetts Amherst. He has written 16 books exploring the relationship between natural resources and war.³

Like Naomi Klein, Prof. Klare believes that the peace movement and the climate movement ought to join forces.⁴

9.8 Blood for oil

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."

 $^{^{2} \}rm http://dissident$ voice.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

³https://www.youtube.com/watch?v=PCXgnbTdhNo

https://www.youtube.com/watch?v=S-cdHIGFrF0

https://www.youtube.com/watch?v=LIdlm4ywAlc

https://www.youtube.com/watch?v=PCXgnbTdhNo

https://www.youtube.com/watch?v=S-cdHIGFrF0

⁴https://www.youtube.com/watch?v=LIdlm4ywAlc

"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 world's largest oil companies are located in the world's most powerful countries."

"Almost all of the world's 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 West's 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 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 region's petroleum. For example, Curzon's Cabinet 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".

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.

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 Hussein's Ba'ath Party to power. In 1979 the western-backed Shah of Iran was overthrown, and the United States regarded the fundamentalist Shi'ite regime that replaced him as a threat to supplies of oil from Saudi Arabia. Washington saw Saddam's Iraq as a bulwark against the militant Shi'ite 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 Hussein's government attacked Iran. This was the start of a extremely bloody and destructive war that lasted for eight years, inflicting almost a million casualties on the two



nations. Iraq used both mustard gas and the nerve gases Tabun and Sarin against Iran, in violation of the Geneva Protocol.

Both the United States and Britain helped Saddam Hussein's government to obtain chemical weapons. A chemical plant, called Falluja 2, was built by Britain in 1985, and this plant was used to produce mustard gas and nerve gas. 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 perusant 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 world's 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 Baker's 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 Hussein's 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 Shi'ites and Kurds were encouraged by the Allies to rebel against Saddam Hussein's government, but were later abandoned by the allies and slaughtered by Saddam.

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

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

On the morning of September 11, 2001, two hijacked airliners were deliberately crashed into New York's World Trade Center, causing the collapse of three skyscrapers and the deaths of more than three thousand people. Almost simultaneously, another hijacked airliner was driven into the Pentagon in Washington DC, and a fourth hijacked plane crashed in a field in Pennsylvania. The fourth plane probably was to have made a suicide attack on the White House or the Capitol, but passengers on the airliner became aware what was happening through their mobile telephones, and they overpowered the hijackers.

Blame for the September 11 attacks soon centered on the wealthy Saudi Arabian Islamic extremist, Osama bin Laden, and on his terrorist organization, al-Qaeda. In a later statement acknowledging responsibility for the terrorist attacks, bin Laden gave as his main reasons firstly the massive US support for Israel, a country that, in his view, was committing atrocities against the Palestinians, and secondly the presence of US troops in Saudi Arabia.

Like Saddam Hussein, Osama bin Laden was an ex-protegé of the CIA, by whom he had previously been armed, trained, and supported. The history of bin Laden's relationship with the CIA began in 1979, when the CIA, acting through Pakistan's Inter-Services Intelligence Agency, began to train and arm the Mujaheddin, an international force of Islamic fundamentalists who were encouraged to attack Afghanistan's secular socialist government.

US National Security Advisor Zbigniew Bryzinski anticipated that the Soviets would respond by sending troops to protect the socialist government of Afghanistan, and he believed that the resulting war would be the Soviet Union's version of Viet Nam: It would be a war that would fatally weaken the Soviet Union. Thus he saw the war that he was provoking in Afghanistan as an important step in the liberation of Eastern Europe. "What is most important in the history of the world?", Polish-born Bryzinski asked in a 1998 interview, "The Taliban, or the collapse of the Soviet empire? Some stirred-up Muslims, or the liberation of central Europe...?" It was, in fact, these same "stirred-up Muslims" who guided two hijacked aircraft into the Twin Towers on September 11, 2001.

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.

Looking at the present and threatened conflicts in the Middle East against the background of this history, must we not ask: To what extent are they too about oil?

9.9 Concluding remarks

From the discussion presented above, we can see that our present economic system produces an endless series of resource-motivated wars. In addition to the enormous suffering, waste, injustice and ecological destruction produced by modern wars, we must recognize that in an era of thermonuclear weapons, war has become prohibitively dangerous. Therefore we need a new economic system.

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Chapter 10

PASSION AND DEDICATION OF PROTESTERS

10.1 Progressives from the 1960's can inspire us today

It is worthwhile today to remember the passion and dedication of the progressives of the 1960's. It was an era that saw the civil rights movement, protests against the Vietnam War, and the assassinations of Martin Luther King Jr., John F. Kennedy and Robert Kennedy. The brave resistance of American progressives of that time can inspire us today.

10.2 Woodstock

Wikipedia states that "Woodstock was a music festival held on a dairy farm in the Catskill Mountains, northwest of New York City, between August 15-18, 1969, which attracted an audience of more than 400,000.

"Billed as 'An Aquarian Exposition: 3 Days of Peace & Music', it was held at Max Yasgur's 600-acre dairy farm near White Lake in Bethel, New York, 43 miles (70 km) southwest of Woodstock.

"Over the sometimes rainy weekend, 32 acts performed outdoors. It is widely regarded as a pivotal moment in popular music history, as well as the definitive nexus for the larger counterculture generation. Rolling Stone listed it as number 19 of the 50 Moments That Changed the History of Rock and Roll.

"The event was captured in the Academy Award-winning 1970 documentary movie *Woodstock*, an accompanying soundtrack album, and Joni Mitchell's song 'Woodstock', which commemorated the event and became a major hit for both Crosby, Stills, Nash & Young and Matthews Southern Comfort. Joni Mitchell said, 'Woodstock was a spark of beauty' where half-a-million kids 'saw that they were part of a greater organism'. In 2017, the festival site was listed on the National Register of Historic Places...

"There was worldwide media interest in the 40th anniversary of Woodstock in 2009. A number of activities to commemorate the festival took place around the world. On August



Figure 10.1: The Woodstock Festival, 1969: "Give peace a chance!". An estimated 400,000 people attended the event.

15, at the Bethel Woods Center for the Arts overlooking the original site, the largest assembly of Woodstock performing alumni since the original 1969 festival performed in an eight-hour concert in front of a sold-out crowd...

"Another event occurred in Hawkhurst, Kent (UK), at a Summer of Love party, with acts including two of the participants at the original Woodstock, Barry Melton of Country Joe and the Fish and Robin Williamson of The Incredible String Band, plus Santana and Grateful Dead cover bands. On August 14 and 15, 2009, a 40th anniversary tribute concert was held in Woodstock, Illinois, and was the only festival to receive the official blessing of the 'Father of Woodstock', Artie Kornfeld. Kornfeld later made an appearance in Woodstock with the event's promoters.

"Also in 2009, Michael Lang and Holly George-Warren published The Road to Woodstock, which describes Lang's involvement in the creation of the Woodstock Music & Arts Festival, and includes personal stories and quotes from central figures involved in the event...

"Reports in late 2018 confirmed the plans for a 50th Anniversary event on the original site to be operated by the Bethel Woods Centre for the Arts. The scheduled date for the *Bethel Woods Music and Culture Festival: Celebrating the golden anniversary at the historic site of the 1969 Woodstock festival* was August 16-18 2019. Partners in the event are Live Nation and INVNT. Bethel Woods described the festival as a 'pan-generational music, culture and community event'."



Figure 10.2: The Woodstock logo.



Figure 10.3: **Yes!.**



Figure 10.4: The 50th anniversary event.

10.3 Joan Baez

Joan Baez is an American folk-singer and activist who has been highly influential since her breakthrough 60 years ago. Her father was a Mexican-American physicist who is credited with inventing the X-ray microscope. While her father was working at MIT, Joan Baez gave her first concert in 1958 at Club 47 in Cambridge. In 1959, Bob Gibson invited Baez to perform at the Newport Folk Festival, where her astonishingly clear and expressive voice produced a sensation. Joan Baez promoted the career of Bob Dylan, at a time when she was a star while he was unknown, by inviting him to join her on the stage for duets. Wholeheartedly engaged in many anti-war, human rights and environmental causes, including opposition to the Viet Nam and Iraq wars, she regards her activism as more important than her singing. In 2011, Amnesty International introduced the yearly Joan Baez Award for outstanding service to human rights, giving the first award to Baez herself.

A few things that Joan Baez said

I would say that I'm a nonviolent soldier. In place of weapons of violence, you have to use your mind, your heart, your sense of humor, every faculty available to you...because no one has the right to take the life of another human being.

Action is the antidote to despair.

You don't get to choose how you're going to die, or when. You can only decide how you're going to live. Now.

I went to jail for 11 days for disturbing the peace; I was trying to disturb the war.

I think music has the power to transform people, and in doing so, it has the power to transform situations - some large and some small.

To sing is to love and affirm, to fly and to soar, to coast into the hearts of the people who listen to tell them that life is to live, that love is there, that nothing is a promise, but that beauty exists, and must be hunted for and found.

The easiest kind of relationship for me is with ten thousand people. The hardest is with one.

I have hope in people, in individuals. Because you don't know what's going to rise from the ruins.

As long as one keeps searching, the answers will come.

Only you and I can help the sun rise each coming morning. If we don't, it may drench itself out in sorrow.

All of us are survivors, but how many of us transcend survival?

If you don't have music, you have silence. There is power in both.

To sing is to praise God and the daffodils, and to praise God is to thank Him, in every note within my small range, and every color in the tones of my voice, with every look into the eyes of my audience, to thank Him. Thank you, God, for letting me be born, for giving me eyes to see the daffodils lean in the wind, all my brothers, all my sisters, for giving me ears to hear crying, legs to come running, hands to smooth damp hair, a voice to laugh with and to sing with...to sing to you and the daffodils.

The point on nonviolence is to build a floor, a strong new floor, beneath which we can no longer sink.

There's a consensus out that it's OK to kill when your government decides who to kill. If you kill inside the country you get in trouble. If you kill outside the country, right time, right season, latest enemy, you get a medal.

If you're going to sing meaningful songs, you have to be committed to living a life that backs that up.

Instead of getting hard ourselves and trying to compete, women should try and give their best qualities to men - bring them softness, teach them how to cry.

We're not really pacifists, we're nonviolent soldiers.

If it's natural to kill, how come men have to go into training to learn how?

If people have to put labels on me, I'd prefer the first label to be human being, the second label to be pacifist, and the third to be folk singer.

You may not know it, but at the far end of despair, there is a white clearing where one is almost happy.

I don't think of myself as a symbol of the sixties, but I do think of myself as a symbol of following through on your beliefs.



Figure 10.5: Joan Baez (born 1941) on the 1962 cover of Time Magazine.



What have they done to the rain?

Just a little rain falling all around The grass lifts its head to the heavenly sound Just a little rain, just a little rain What have they done to the rain Just a little boy standing in the rain The gentle rain that falls for years And the grass is gone, the boy disappears And rain keeps falling like helpless tears And what have they done to the rain Just a little breeze out of the sky The leaves nod their head as the breeze blows by Just a little breeze with some smoke in its eye What have they done to the rain

Just a little boy standing in the rain The gentle rain that falls for years And the grass is gone, the boy disappears And rain keeps falling like helpless tears And what have they done to the rain What have they done to the rain

We shall overcome

We shall overcome, We shall overcome, We shall overcome, some day.

Oh, deep in my heart, I do believe We shall overcome, some day.

We'll walk hand in hand, We'll walk hand in hand, We'll walk hand in hand, some day.

Oh, deep in my heart, I do believe We'll walk hand in hand, some day.

We shall live in peace,

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10.4. BOB DYLAN

We shall live in peace, We shall live in peace, some day.

Oh, deep in my heart, I do believe We shall live in peace, some day.

We shall all be free, We shall all be free, We shall all be free, some day.

Oh, deep in my heart, I do believe We shall all be free, some day.

We are not afraid, We are not afraid, We are not afraid, today.

Oh, deep in my heart, I do believe We are not afraid, today.

We shall overcome, We shall overcome, We shall overcome, some day.

Oh, deep in my heart, I do believe We shall overcome, some day.

10.4 Bob Dylan

An outstanding influence on music, poetry and the anti-war movement over six decades, Bob Dylan was awarded the Nobel Prize for Literature in 2016.

Bob Dylan was born in 1941 into a Jewish immigrant family named Zimmerman. He later changed his name to Dylan because of his admiration for the Welsh poet, Dylan Thomas. As a highschool student Bob Dylan initially formed a rock and roll band, but later realized that folk music was much more meaningful. Explaining this change, he said "The thing about rock'n'roll is that for me anyway it wasn't enough... There were great catch-phrases and driving pulse rhythms... but the songs weren't serious or didn't reflect life in a realistic way. I knew that when I got into folk music, it was more of a serious type of thing. The songs are filled with more despair, more sadness, more triumph, more faith in the supernatural, much deeper feelings."

Bob Dylan greatly admired folk singer Woodie Guthrie. Describing Guthrie's influence, he wrote: "The songs themselves had the infinite sweep of humanity in them... [He] was the true voice of the American spirit. I said to myself I was going to be Guthrie's greatest disciple."

Wikipedia states that "Many early songs reached the public through more palatable versions by other performers, such as Joan Baez, who became Dylan's advocate as well as his lover. Baez was influential in bringing Dylan to prominence by recording several of his early songs and inviting him on stage during her concerts. 'It didn't take long before people got it, that he was pretty damned special,' says Baez."

Here are a few things that Bob Dylan said:

Behind every beautiful thing, there's some kind of pain.

I accept chaos, I'm not sure whether it accepts me.

Don't criticize what you can't understand.

Sometimes it's not enough to know what things mean, sometimes you have to know what things don't mean.

I think women rule the world and that no man has ever done anything that a woman either hasn't allowed him to do or encouraged him to do.

People seldom do what they believe in. They do what is convenient, then repent.

Gonna change my way of thinking, make myself a different set of rules. Gonna put my good foot forward and stop being influenced by fools.

When you've got nothing, you've got nothing to lose.

You can never be wise and be in love at the same time.

When you feel in your gut what you are and then dynamically pursue it - don't back down and don't give up - then you're going to mystify a lot of folks.

It frightens me, the awful truth, of how sweet life can be...

10.4. BOB DYLAN

Blowin' in the wind

How many roads must a man walk down Before you call him a man? How many seas must a white dove sail Before she sleeps in the sand? Yes, and how many times must the cannonballs fly Before they're forever banned?

The answer, my friend, is blowin' in the wind The answer is blowin' in the wind

Yes, and how many years can a mountain exist Before it's washed to the sea? Yes, and how many years can some people exist Before they're allowed to be free? Yes, and how many times can a man turn his head And pretend that he just doesn't see?

The answer, my friend, is blowin' in the wind The answer is blowin' in the wind

Yes, and how many times must a man look up Before he can see the sky? Yes, and how many ears must one man have Before he can hear people cry? Yes, and how many deaths will it take 'til he knows That too many people have died?

The answer, my friend, is blowin' in the wind The answer is blowin' in the wind



Figure 10.6: One of Bob Dylan's paintings



Figure 10.7: Another Dylan painting. His work has been exhibited by major museums.

10.5 Pete Seeger

Here are a few things that Pete Seeger said:

Do you know the difference between education and experience? Education is when you read the fine print; experience is what you get when you don't.

Any darn fool can make something complex; it takes a genius to make something simple.

If it can't be reduced, reused, repaired, rebuilt, refurbished, refinished, resold, recycled or composted, then it should be restricted, redesigned or removed from production.

Participation - that's what's gonna save the human race.

Well, normally I'm against big things. I think the world is going to be saved by millions of small things. Too many things can go wrong when they get big.

Once upon a time, wasn't singing a part of everyday life as much as talking, physical exercise, and religion? Our distant ancestors, wherever they were in this world, sang while pounding grain, paddling canoes, or walking long journeys. Can we begin to make our lives once more all of a piece? Finding the right songs and singing them over and over is a way to start. And when one person taps out a beat, while another leads into the melody, or when three people discover a harmony they never knew existed, or a crowd joins in on a chorus as though to raise the ceiling a few feet higher, then they also know there is hope for the world.

I've never sung anywhere without giving the people listening to me a chance to join in - as a kid, as a lefty, as a man touring the U.S.A. and the world, as an oldster. I guess it's kind of a religion with me. Participation. That's what's going to save the human race.

It's a very important thing to learn to talk to people you disagree with.

This banjo surrounds hate and forces it to surrender.

Singing with children in the schools has been the most rewarding experience of my life.

The key to the future of the world, is finding the optimistic stories and letting them be known.

The nice thing about poetry is that you're always stretching the definitions of words. Lawyers and scientists and scholars of one sort or another try to restrict the definitions, hoping that they can prevent people from fooling each other. But that doesn't stop people from lying.

Cezanne painted a red barn by painting it ten shades of color: purple to yellow. And he got a red barn. Similarly, a poet will describe things many different ways, circling around it, to get to the truth.

My father also had a nice little simile. He said, "The truth is a rabbit in a bramble patch. And you can't lay your hand on it. All you do is circle around and point, and say, 'It's in there somewhere'."

Keep your sense of humor. There is a 50-50 chance the world can be saved. You - yes you - might be the grain of sand that tips the scales the right way.

The world is like a seesaw out of balance: on one side is a box of big rocks, tilting it its way. On the other side is a box, and a bunch of us with teaspoons, adding a little sand at a time. One day, all of our teaspoons will add up, and the whole thing will tip, and people will say, 'How did it happen so fast?'

Our technology and our economic system seem to produce the present bad situation: millions of people feel themselves poor and powerless; millions feel that music is something to be made only by experts.

It all boils down to what I would most like to do as a musician. Put songs on people's lips instead of just in their ears.

Where have all the flowers gone?

Where have all the flowers men gone, Long time passing, Where have all the flowers men gone, Long time ago, Where have all the flowers men gone, Young girls picked them every one, When will they ever learn? When will they ever learn?

Where have all the young girls gone, Long time passing, Where have all the young girls gone, Long time ago, Where have all the young girls gone, Gone to husbands every one, When will they ever learn? When will they ever learn?

Where have all the young men gone, Long time passing, Where have all the young men gone, Long time ago, Where have all the young men gone, Gone to soldiers every one, When will they ever learn? When will they ever learn?

Where have all the soldiers gone, Long time passing, Where have all the soldiers gone, Long time ago, Where have all the soldiers gone, They've gone to graveyards every one, When will they ever learn? When will they ever learn?

Where have all the graveyards gone, Long time passing, Where have all the graveyards gone, Long time ago, Where have all the graveyards gone, Gone to flowers every one, When will we ever learn? When will we ever learn?

What did you learn in school today?

What did you learn in school today, Dear little boy of mine? What did you learn in school today, Dear little boy of mine?

I learned that Washington never told a lie. I learned that soldiers seldom die. I learned that everybody's free, And that's what the teacher said to me.

I learned our Government must be strong; It's always right and never wrong; Our leaders are the finest men And we elect them again and again.

I learned that war is not so bad; I learned about the great ones we have had; We fought in Germany and in France And someday I might get my chance.

That's what I learned in school today, That's what I learned in school.

Die gedanken sind frei

Die gedanken sind frei My thoughts freely flower Die gedanken sind frei My thoughts give me power No scholar can map them No hunter can trap them No man can deny Die gedanken sind frei

I think as I please And this gives me pleasure My conscience decrees This right I must treasure My thoughts will not cater To duke or dictator No man can deny Die gedanken sind frei

Tyrants can take me And throw me in prison My thoughts will burst forth Like blossoms in season Foundations may crumble And structures may tumble But free men shall cry

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Figure 10.8: Pete Seeger in 1979.

Die gedanken sind frei

We will love, or we will perish

We will love or we will perish We will learn the rainbow to cherish

Dare to struggle, dare to danger Dare to touch the hand of a stranger



Figure 10.9: Pete Seeger at the Ckearwater Festival in June, 2007.



Figure 10.10: Seeger at 86 on the cover of Sing Out! (Summer 2005), a magazine he helped found in 1950.

10.6 Protests against the Vietnam War

Stay down here where you belong

Down below Down below Sat the Devil talking to his son Who wanted to go Up above Up above He cried, "It's getting too warm for me down here and so I'm going up on Earth where I can have a little fun". The Devil simply shook his head and answered to his son:

Stay down here where you belong The folks who live above you don't know right from wrong.

To please their kings they've all gone out to war And not a one of them knows what they're fighting for.

Way up above they say that I'm a Devil and I'm bad Kings up there are bigger devils than your dad.

They're breaking the hearts of mothers Making butchers out of brothers You'll find more hell up there than there is down below. Kings up there They don't care For the mothers who must stay at home Their sorrows to bear Stay at home Don't you roam Although it's warm down below, you'll find it's warmer up there If e'er you went up there, my son, I know you'd be surprised You'd find a lot of people are not civilized.

Mothers, daughters, wives

The first time it was fathers the last time it was sons



Figure 10.11: Protests against the Vietnam War in Washington, D.C., on October 21, 1967.



Figure 10.12: U.S. Marshals dragging away a Vietnam War protester in Washington, D.C., 1967.



Figure 10.13: John Filo's Pulitzer Prize-winning photograph of Mary Ann Vecchio kneeling over the body of Jeffrey Miller minutes after he was fatally shot by the Ohio National Guard.



Figure 10.14: Berkeley anti-war protests.


Figure 10.15: An anti-Vietnam War march in San Francisco on April 15, 1967.



Figure 10.16: Members of Jefferson Airplane performing at the KFRC Fantasy Fair and Magic Mountain Music Festival in Marin County, California, United States in June, 1967.



Figure 10.17: Vietnam War protesters in Vienna in 1968.

And in between your husbands marched away with drums and guns And you never thought to question you just went on with your lives because all they'd taught you who to be was mothers, daughters, wives.

You can only just remember the tears your mothers shed As they sat and read the papers through the lists and lists of dead And the gold frames held the photographs that mothers kissed each night And the doorframes held the shocked and silent strangers from the fight

And it was 21 years later with children of your own The trumpet sounded once again and the soldier boys were gone And you drove their trucks and made their guns and tended to their wounds And at night you kissed their photographs and prayed for safe returns

And after it was over you had to learn again To be just wives and mothers when you'd done the work of men So you worked to help the needy and you never trod on toes And the photos on the pianos struck a happy family pose

Then your daughters grew to women and your little boys to men And you prayed that you were dreaming when the call-up came again But you proudly smiled and held your tears as they bravely waved goodbye And the photos on the mantelpieces always made you cry And now your growing older



Figure 10.18: One of a series of prints which the German artist Käthe Kollwitz (1867-1945) made as a protest against the atrocities of World War I.

and in time the photos fade And in widowhood you sit back and reflect on the parade Of the passing of your memories as your daughters change their lives Seeing more to our existence than just mothers, daughters, wives.



Figure 10.19: Another anti-war print by Käthe Kollwitz.

Anti-war songs from the Vietnam War

Here are a few protest songs from the Vietnam War, again collected by Holger Terp.

Dodging the Draft

First you tell your draft board you're hooked on dope. You don't need the army 'cause you've seen Bob Hope. Walk around the floor kinda nice and loose. Tell 'em your fiancee's name is Bruce.

When they ask about your schooling, then you say That you studied under Cassius Clay. Then put some lipstick on when you're photographed, And that's what I call dodging the draft!

Then you show the captain a note from mom, Stand there while he reads it and suck your thumb. When he takes your family history, state with pride, "Benedict Arnold was on my father's side"

He'll hand you an IQ test, just look at it with gloom, Then fold it like an airplane and sail it 'cross the room. If they believe you don't know your fore from your aft, That's what I call...shirking your military responsibility. Clump around the floor like your feet are flat. When they ask about your hearing, just say, "How's that?" If the sergeant wants a cigarette, treat him right, Set fire to your draft card, and offer him a light.

When you see the eyechart, don't worry at all. Say, "I'll be glad to read it, just point me at the wall." And if the draft board acts in the usual way, You'll be what I call 1-A.

Fields of Vietnam

Oh brothers though we're strangers and your land and mine are far apart, And though your name lies awkwardly and strange upon my tongue. As the needle's drawn towards the pole, So I am drawn both heart and soul, To sing of your great struggle in the fields of Vietnam.

Your barefoot farmers would not wear the yoke and chains of slavery -For four long bitter years they fought the armies of Japan; Your flesh opposed their armoured might You harried them by day and night -And you drove them from the jungles and the fields of Vietnam.

Before you could draw peaceful breath more death was raining from the skies, The French came, and for nine more years your land they overran; But the enemy could not subdue.

They broke at Dien Bien Phu -

And their dead lay all around them in the fields of Vietnam.

The French had scarcely left your shores when more invading armies came, Equipped with all the latest tools men use to kill a man;

"We've come to show you," was their cry,

"All the ways a man can die -

And we'll make a bloody desert of the fields of Vietnam.

The skies by day were dark with planes, with hungry flames the nights were red,

The stench of death lay on the air with reek of spent napalm;

Death bloomed in every paddy field,

And still your people would not yield -

To American invaders in the fields of Vietnam.

For thirteen years the U.S. Army's sown your soil with blood and tears, Impartially they deal out death to women, child and man,

And still no victory - instead

They count their own dishonoured dead,

And contempt's their only harvest in the fields of Vietnam.

O, brothers, where did you find the strength to fight so long for freedom's cause?

A quarter-century has passed since first your fight began;

Long have you fought, and valiantly,

And as long as men love liberty -

They will sing of your great struggle in the fields of Vietnam.

10.7 The Greenham Common Song Book

The Women's Peace Camps at Greenham Commons, Berkshire, England, refer to a 19year-long series of women's protests against the use of common land, which ought to belong to the people, to house a base with US nuclear weapons. The women in the movement used their identity as mothers and grandmothers to protest against preparations for a nuclear war that could kill hundreds of millions of young children and make large portions of the earth uninhabitable.

The first protests began in 1981, when a Welsh group, *Women for Life on Earth* arrived at Greenham Common to protest the decision to store US Cruise Missiles at an army base there. In December, 1982, 30,000 women participated in an *Embrace the Base* event, when they joined hands to encircle the Greenham military base. Another such event took place in 1983, when 70,000 women joined hands to form a human chain between Greenham Common and the munitions plants at Aldermaston.

Frequently. during the 19 years of protests, the women chained themselves to the fence surrounding the Greenham military base, or cut down sections of the fence, or even entered the base, activities for which many of them were arrested and imprisoned.

The Greenham Commons women often composed songs, and used them as an instrument of protest. Holger Terp, the founder and editor of the Danish Peace Academy's enormous and popular website, has compiled an extensive study of the Greenham Common protests, which includes the songs composed and sung at the camps. Holger's study can be found on the following link:

http://www.fredsakademiet.dk/abase/sange/greenham/greenham.pdf

Many other peace songs, as well as their recorded performances, can be found on Holger's website by typing **fredsakademiet.dk sange** into a search engine.



Figure 10.20: A small part of the crowd of 400,000, after the rain, Woodstock, United States, August 1969.



Figure 10.21: Recording "Give Peace a Chance". Left to right: Rosemary Leary (face not visible), Tommy Smothers (with back to camera), John Lennon, Timothy Leary, Yoko Ono, Judy Marcioni and Paul Williams, June 1, 1969.



Figure 10.22: Women at Greenham Common protesting the use of common land for a US nuclear weapons base.



Figure 10.23: Although what the government was doing was illegal, many of the women were arrested.



Figure 10.24: The best defense of any country against nuclear weapons is to be free of them.



Figure 10.25: Future generations depend on our actions today.



Figure 10.26: What we all want.



10.8 Summer of Love

According to Wikipedia,

"The Summer of Love was a social phenomenon that occurred during mid-1967, when as many as 100,000 people, mostly young people sporting hippie fashions of dress and behavior, converged in San Francisco's neighborhood of Haight-Ashbury. More broadly, the Summer of Love encompassed the hippie music, drug, anti-war, and free-love scene throughout the American west coast, and as far away as New York City.

"Hippies, sometimes called flower children, were an eclectic group. Many were suspicious of the government, rejected consumerist values, and generally opposed the Vietnam War. A few were interested in politics; others were concerned more with art (music, painting, poetry in particular) or spiritual and meditative practices.

"Inspired by the Beat Generation of authors of the 1950s, who had flourished in the North Beach area of San Francisco, those who gathered in Haight-Ashbury during 1967 allegedly rejected the conformist and materialist values of modern life; there was an emphasis on sharing and community. The Diggers established a Free Store, and a Free Clinic where medical treatment was provided.

"The prelude to the Summer of Love was a celebration known as the Human Be-In at Golden Gate Park on January 14, 1967, which was produced and organized by artist Michael Bowen.

"It was at this event that Timothy Leary voiced his phrase, 'turn on, tune in, drop out'. This phrase helped shape the entire hippie counterculture, as it voiced the key ideas of 1960s rebellion. These ideas included communal living, political decentralization, and dropping out. The term "dropping out" became popular among many high school and college students, many of whom would abandon their conventional education for a summer of hippie culture.

"The event was announced by the Haight-Ashbury's hippie newspaper, the San Francisco Oracle: 'A new concept of celebrations beneath the human underground must emerge, become conscious, and be shared, so a revolution can be formed with a renaissance of compassion, awareness, and love, and the revelation of unity for all mankind.' ...

"The media's coverage of hippie life in the Haight-Ashbury drew the attention of youth from all over America. Hunter S. Thompson termed the district 'Hashbury' in The New York Times Magazine, and the activities in the area were reported almost daily.

"The event was also reported by the counterculture's own media, particularly the San Francisco Oracle, the pass-around readership of which is thought to have exceeded a half-million people that summer, and the Berkeley Barb.

"The media's reportage of the "counterculture" included other events in

California, such as the Fantasy Fair and Magic Mountain Music Festival in Marin County and the Monterey Pop Festival, both during June 1967. At Monterey, approximately 30,000 people gathered for the first day of the music festival, with the number increasing to 60,000 on the final day. Additionally, media coverage of the Monterey Pop Festival facilitated the Summer of Love as large numbers of hippies traveled to California to hear favorite bands such as The Who, Grateful Dead, the Animals, Jefferson Airplane, Quicksilver Messenger Service, The Jimi Hendrix Experience, Otis Redding, The Byrds, and Big Brother and the Holding Company featuring Janis Joplin.

"Musician John Phillips of the band The Mamas & the Papas wrote the song 'San Francisco (Be Sure to Wear Flowers in Your Hair)' for his friend Scott McKenzie. It served to promote both the Monterey Pop Festival that Phillips was helping to organize, and to popularize the flower children of San Francisco. Released on May 13, 1967, the song was an instant success. By the week ending July 1, 1967, it reached number four on the Billboard Hot 100 in the United States, where it remained for four consecutive weeks. Meanwhile, the song charted at number one in the United Kingdom and much of Europe. The single is purported to have sold more than 7 million copies worldwide."

10.9 "Hair", the musical

Wikipedia reports the following:

"Hair: The American Tribal Love-Rock Musical is a rock musical with a book and lyrics by Gerome Ragni and James Rado and music by Galt MacDermot. The work reflects the creators' observations of the hippie counterculture and sexual revolution of the late 1960s, and several of its songs became anthems of the anti-Vietnam War peace movement. The musical's profanity, its depiction of the use of illegal drugs, its treatment of sexuality, its irreverence for the American flag, and its nude scene caused much comment and controversy. The musical broke new ground in musical theatre by defining the genre of 'rock musical', using a racially integrated cast, and inviting the audience onstage for a 'Be-In' finale.

"Hair tells the story of the 'tribe', a group of politically active, long-haired hippies of the 'Age of Aquarius' living a bohemian life in New York City and fighting against conscription into the Vietnam War. Claude, his good friend Berger, their roommate Sheila and their friends struggle to balance their young lives, loves, and the sexual revolution with their rebellion against the war and their conservative parents and society. Ultimately, Claude must decide whether to resist the draft as his friends have done, or to succumb to the pressures of his parents (and conservative America) to serve in Vietnam, compromising his pacifist principles and risking his life. "After an off-Broadway debut on October 17, 1967, at Joseph Papp's Public Theater and a subsequent run at the Cheetah nightclub from December 1967 through January 1968, the show opened on Broadway in April 1968 and ran for 1,750 performances. Simultaneous productions in cities across the United States and Europe followed shortly thereafter, including a successful London production that ran for 1,997 performances. Since then, numerous productions have been staged around the world, spawning dozens of recordings of the musical, including the 3 million-selling original Broadway cast recording. Some of the songs from its score became Top 10 hits, and a feature film adaptation was released in 1979. A Broadway revival opened in 2009, earning strong reviews and winning the Tony Award and Drama Desk Award for Best Revival of a Musical. In 2008, Time wrote, 'Today Hair seems, if anything, more daring than ever.'...

"The theme of opposition to the war that pervades the show is unified by the plot thread that progresses through the book - Claude's moral dilemma over whether to burn his draft card. Pacifism is explored throughout the extended trip sequence in Act 2. The lyrics to 'Three-Five-Zero-Zero', which is sung during that sequence, evoke the horrors of war ('ripped open by metal explosion'). The song is based on Allen Ginsberg's 1966 poem, 'Wichita Vortex Sutra'. In the poem, General Maxwell Taylor proudly reports to the press the number of enemy soldiers killed in one month, repeating it digit by digit, for effect: 'Three-Five-Zero-Zero.' The song begins with images of death and dying and turns into a manic dance number, echoing Maxwell's glee at reporting the enemy casualties, as the tribe chants 'Take weapons up and begin to kill'.[The song also includes the repeated phrase 'Prisoners in niggertown/ It's a dirty little war'.

"Don't Put It Down' satirizes the unexamined patriotism of people who are 'crazy for the American flag'. 'Be In (Hare Krishna)' praises the peace movement and events like the San Francisco and Central Park Be-Ins.[Throughout the show, the tribe chants popular protest slogans like 'What do we want? Peace! - When do we want it? Now!' and 'Do not enter the induction center'. The upbeat song, 'Let the Sun Shine In', is a call to action, to reject the darkness of war and change the world for the better."

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ECOLOGICAL IMPACT OF MILITARISM

Chapter 11

A NEW SOCIAL CONTRACT

11.1 Caring for the future of our children

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 largescale global famine also has to be considered.

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.

Inaction is not an option. We have to act with courage and dedication, even if the odds are against success, because the stakes are so high. The mass media could mobilize us to action, but they have failed in their duty. Our educational system could also wake us up and make us act, but it too has failed us. The battle to save the earth from human greed and folly has to be fought in the alternative media. Hence this book, and hence urgent the tone of this final chapter.

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.

11.2 We must achieve a steady-state economic system

A steady-state economic system is necessary because neither population growth nor economic growth can continue indefinitely on a finite earth. No one can maintain that exponential industrial growth is sustainable in the long run except by refusing to look more



Figure 11.1: Nicholas Georgescu-Roegen: He showed that our present economic system is not cyclic but unidirectional, since it involves the irreversible degradation of non-renewable resources.

than a short distance into the future.

Of course, it is necessary to distinguish between industrial growth, and growth of culture and knowledge, which can and should continue to grow. Qualitative improvements in human society are possible and desirable, but resource-using and pollution-producing industrial growth is reaching its limits, both because of ecological constraints and because of the exhaustion of petroleum, natural gas and other non-renewable resources, such as metals. The threat of catastrophic climate change makes it imperative for us to stop using fossil fuels within very few decades.

Our present economic system as unidirectional and entropic: Low-entropy resources are converted into high-entropy waste, a unidirectional process. By contrast, to be sustainable in the long run, a process must be cyclic, like the growth and regeneration of a forest.

Georgescu-Roegen's list of desiderata remains valid today: We need drastic cuts in weapons production, thereby releasing productive forces for more constructive purposes. We need immediate aid to underdeveloped countries and gradual decrease in population to a level that can be maintained by organic agriculture. We also need avoidance, and strict regulation if necessary, of wasteful energy use. Finally, we need to abandon our attachment to extravagant gadgetry and fashion, and we must cure ourselves of workaholic habits by re-balancing the time spent on work and leisure.

Today, the distinguished economist Herman Daly (a student of Georgescu-Roegen) continues to write perceptive articles and books documenting the need for a steady-state economy. Among his books, the following are noteworthy: "Steady-State Economics" (1977); "For the Common Good" (1989, with John B. Cobb, Jr.); "Valuing the Earth" (1993, with Kenneth Townsend); "Beyond Growth" (1996); "Ecological Economics and the Ecology of Economics" (1999); "Local Politics of Global Sustainability" (2000, with Thomas Prugh and Robert Costanza), and "Ecological Economics: Principles and Applications" (2003,



Figure 11.2: Herman E. Daly: A student of Georgescu-Roegen the distinguished economist, Prof. H.E. Daly calls for a transition to a steady-state economic system, in which processes would be cyclic and sustainable.

with Joshua Farley.¹

¹http://steadystate.org/category/herman-daly/

https://en.wikipedia.org/wiki/Herman_Daly

 $[\]rm http://grist.org/article/bank/$

http://www.donellameadows.org/wp-content/userfiles/Limits-to-Growth-digital-scan-version.pdf http://www.clubofrome.org/?p=326

11.3 We must restore democracy

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.

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 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.

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. Censorship 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.

Snowden has already said most of what he has to say. Nevertheless, Washington was willing to break international law and the rules of diplomatic immunity by forcing its European allies to ground the plane of Bolivian President Evo Morales following a rumor that Snowden was on board. This was not done to prevent Snowden from saying more, but with the intention of making a gruesome example of him, as a warning to other whistleblowers.

In a democracy, the power of judging and controlling governmental policy is supposed to be in the hands of the people. It is completely clear that if the people do not know what their government is doing, then they cannot judge or control governmental policy, and democracy has been abolished. There has always been a glaring contradiction between democracy and secret branches of the government, such as the CIA, which conducts its assassinations and its dirty wars in South America and elsewhere without any public knowledge or control.

The gross, wholesale electronic spying on citizens revealed by Snowden seems to be specifically aimed at eliminating democracy. It is aimed at instilling universal fear and conformity, fear of blackmail and fear of being out of step, so that the public will not dare to oppose whatever the government does, no matter how criminal or unconstitutional.

We must restore democracy wherever it has been replaced by oligarchy. When we do so, we will free ourselves from many evils, including excessive economic inequality, violation of civil rights, and the suffering produced by perpetual wars.



Figure 11.3: Edward Snowden.

11.4 We must decrease economic inequality

In his Apostolic Exhortation, "Evangelii Gaudium", Pope Francis said: "In our time humanity is experiencing a turning-point in its history, as we can see from the advances being made in so many fields. We can only praise the steps being taken to improve people's welfare in areas such as health care, education and communications. At the same time we have to remember that the majority of our contemporaries are barely living from day to day, with dire consequences. A number of diseases are spreading. The hearts of many people are gripped by fear and desperation, even in the so-called rich countries. The joy of living frequently fades, lack of respect for others and violence are on the rise, and inequality is increasingly evident. It is a struggle to live and, often, to live with precious little dignity."

"This epochal change has been set in motion by the enormous qualitative, quantitative, rapid and cumulative advances occurring in the sciences and in technology, and by their instant application in different areas of nature and of life. We are in an age of knowledge and information, which has led to new and often anonymous kinds of power."



Figure 11.4: We must decrease economic inequality.

"Just as the commandment 'Thou shalt not kill' sets a clear limit in order to safeguard the value of human life, today we also have to say 'thou shalt not' to an economy of exclusion and inequality. Such an economy kills. How can it be that it is not a news item when an elderly homeless person dies of exposure, but it is news when the stock market loses two points? This is a case of exclusion. Can we continue to stand by when food is thrown away while people are starving? This is a case of inequality. Today everything comes under the laws of competition and the survival of the fittest, where the powerful feed upon the powerless. As a consequence, masses of people find themselves excluded and marginalized: without work, without possibilities, without any means of escape."

"In this context, some people continue to defend trickle-down theories which assume that economic growth, encouraged by a free market, will inevitably succeed in bringing about greater justice and inclusiveness in the world. This opinion, which has never been confirmed by the facts, expresses a crude and naive trust in the goodness of those wielding economic power and in the sacralized workings of the prevailing economic system. Meanwhile, the excluded are still waiting."

In a recent speech, Senator Bernie Sanders quoted Pope Francis extensively and added: "We have a situation today, Mr. President, incredible as it may sound, where the wealthiest 85 people in the world own more wealth than the bottom half of the world's population."²

The social epidemiologist Prof. Richard Wilkinson, has documented the ways in which societies with less economic inequality do better than more unequal societies in a number of areas, including increased rates of life expectancy, mathematical performance, literacy, trust, social mobility, together with decreased rates of infant mortality, homicides, imprisonment, teenage births, obesity and mental illness, including drug and alcohol addiction.³ We must also remember that according to the economist John A. Hobson, the basic problem that led to imperialism 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.

11.5 We must break the power of corporate greed

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

https://www.oxfam.org/en/tags/inequality

 $https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/cr-even-it-up-extreme-inequality-291014-en.pdf$

²https://www.youtube.com/watch?v=9_LJpN893Vg

³https://www.youtube.com/watch?v=cZ7LzE3u7Bw https://en.wikipedia.org/wiki/Richard_G._Wilkinson



Figure 11.5: We must break the power of corporate greed.



Figure 11.6: Greed is driving us towards disaster.

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.

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. 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.⁴

11.6 We must leave fossil fuels in the ground

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.

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 snowcovered 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 CO_2 .

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 CO_2 emissions since 1751 has

https://www.youtube.com/watch?v=FJUA4cm0Rck

⁴http://www.countercurrents.org/avery170715.htm

http://human-wrongs-watch.net/2015/06/25/militarisms-hostages/



Figure 11.7: We must leave fossil fuels in the ground.

been only 337 gigatons.

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.⁵

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.

Another reason for hope can be found in the extremely high present rate of growth of renewable energy, and in the remarkable properties of exponential growth. According to figures recently released by the Earth Policy Institute,⁶ 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 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.

⁵http://w2.vatican.va/content/francesco/en/encyclicals/documents

[/]papa -francesco_20150524_enciclica-laudato-si.html

⁶http://www.earth-policy.org/books/tgt

The award-winning author and activist Naomi Klein has emphasized that the climate crisis changes everything. Environmentalists and antiwar activists must unite! We need a new economic system! The people of the world don't want climate change; they want system change!⁷

11.7 We must stabilize, and ultimately reduce, global population

According to the World Resources Institute and the United Nations Environment Programme, "It is estimated that since World War II, 1.2 billion hectares...[of agricultural land] has suffered at least moderate degradation as a result of human activity. This is a vast area, roughly the size of China and India combined." This area is 27% of the total area currently devoted to agriculture 5. The report goes on to say that the degradation is greatest in Africa.

David Pimental and his associates at Cornell University pointed out in 1995 that "Because of erosion-associated loss of productivity and population growth, the per capita food supply has been reduced over the past 10 years and continues to fall. The Food and Agricultural Organization reports that the per capita production of grains which make up 80% of the world's food supply, has been declining since 1984."

Pimental et al. add that "Not only is the availability of cropland per capita decreasing as the world population grows, but arable land is being lost due to excessive pressure on the environment. For instance, during the past 40 years nearly one-third of the world's cropland (1.5 billion hectares) has been abandoned because of soil erosion and degradation. Most of the replacement has come from marginal land made available by removing forests. Agriculture accounts for 80% of the annual deforestation."

The phrase "developing countries" is more than a euphemism; it expresses the hope that with the help of a transfer of technology from the industrialized nations, all parts of the world can achieve prosperity. An important factor that prevents the achievement of worldwide prosperity is population growth.

In the words of Dr. Halfdan Mahler, former Director General of the World Health Organization, "Country after country has seen painfully achieved increases in total output,

⁷https://www.transcend.org/tms/2015/03/naomi-klein-the-economic-system-we-have-created-global-warming/

http://thischangeseverything.org/naomi-klein/

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=m6pFDu7lLV4

https://www.youtube.com/watch?v=MVwmi7HCmSI

http://therightsofnature.org/universal-declaration/



Figure 11.8: We must stabilize, and ultimately reduce, global population. If we are to avoid a large-scale famine, all countries must pass through the demographic transition.

food production, health and educational facilities and employment opportunities reduced or nullified by excessive population growth."

The growth of population is linked to excessive urbanization, infrastructure failures and unemployment. In rural districts in the developing countries, family farms are often divided among a growing number of heirs until they can no longer be subdivided. Those family members who are no longer needed on the land have no alternative except migration to overcrowded cities, where the infrastructure is unable to cope so many new arrivals. Often the new migrants are forced to live in excrement-filled makeshift slums, where dysentery, hepatitis and typhoid are endemic, and where the conditions for human life sink to the lowest imaginable level. In Brazil, such shanty towns are called "favelas".

If modern farming methods are introduced in rural areas while population growth continues, the exodus to cities is aggravated, since modern techniques are less labor-intensive and favor large farms. In cities, the development of adequate infrastructure requires time, and it becomes a hopeless task if populations are growing rapidly. Thus, population stabilization is a necessary first step for development.

It can be observed that birth rates fall as countries develop. However, development is sometimes blocked by the same high birth rates that economic progress might have prevented. In this situation (known as the "demographic trap"), economic gains disappear immediately because of the demands of an exploding population.

For countries caught in the demographic trap, government birth control programs are especially important, because one cannot rely on improved social conditions to slow birth rates. Since health and lowered birth rates should be linked, it is appropriate that familyplanning should be an important part of programs for public health and economic development. A recent study conducted by Robert F. Lapham of Demographic Health Surveys and W. Parker Maudlin of the Rockefeller Foundation has shown that the use of birth control is correlated both with socio-economic setting and with the existence of strong familyplanning programs. The implication of this study is that even in the absence of increased living standards, family planning programs can be successful, provided they have strong government support.

Education of women and higher status for women are vitally important measures, not only for their own sake, but also because in many countries these social reforms have proved to be the key to lower birth rates. As Sir Partha Dasgupta of Cambridge University has pointed out, the changes needed to break the cycle of overpopulation and poverty are all desirable in themselves. Besides education and higher status for women, they include state-provided social security for old people, provision of water supplies near to dwellings, provision of health services to all, abolition of child labor and general economic development. The money required to make these desirable changes is a tiny fraction of the amount that is currently wasted on war.

In order to avoid a catastrophic future famine, it is vitally important that all of the countries of the world should quickly pass through a demographic transition from a situation characterized by high birth rates and high death rates to a new equilibrium, where low death rates are balanced by low birth rates.

11.8 We must eliminate the institution of war

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?

But what are the methods that nations use to achieve internal peace? Firstly, every true government needs to have the power to make and enforce laws that are binding on individual citizens. Secondly the power of taxation is a necessity. Thirdly, within their own territories, almost all nations have more military power than any of their subunits. For example, the US Army is more powerful than the State Militia of Illinois.

This unbalance of power contributes to the stability of the Federal Government of the United States. When the FBI wanted to arrest Al Capone, it did not have to bomb Chicago. Agents just went into the city and arrested the gangster. Even if Capone had been enormously popular in Illinois, the the government of the state would have realized in advance that it had no chance of resisting the US Federal Government, and it still would have allowed the "Feds" to make their arrest. Similar considerations hold for almost all



Figure 11.9: We must abolish the institution of war.

nations within which there is internal peace. It is true that there are some nations within which subnational groups have more power than the national government, but these are frequently characterized by civil wars.

Of the large land areas within which internal peace has been achieved, the European Union differs from the others because its member states still maintain powerful armies. The EU forms a realistic model for what can be achieved globally in the near future by reforming and strengthening the United Nations. In the distant future, however, we can imagine a time when a world federal authority will have much more power than any of its member states, and when national armies will have only the size needed to maintain local order.

Today there is a pressing need to enlarge the size of the political unit from the nationstate 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.

11.9 Educational reforms

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

We urgently need to replace this indoctrination in chauvinism by a reformed view of history, where the slow development of human culture is described, giving adequate credit to all those who have contributed. Our modern civilization is built on the achievements of ancient cultures. China, India, Mesopotamia, ancient Egypt, Greece, the Islamic world, Christian Europe, and Jewish intellectual traditions all have contributed. Potatoes, corn and squash are gifts from the American Indians. Human culture, gradually built up over thousands of years by the patient work of millions of hands and minds, should be presented to students of history as a precious heritage - far too precious to be risked in a thermonuclear war.

In the teaching of science too, reforms are needed. Graduates in science and technology should be conscious of their responsibilities. They must resolve never to use their education in the service of war, or in any way which might be harmful to society or to the environment.

In modern societies, mass media play an extremely important role in determining behavior and attitudes. This role can be a negative one when the media show violence and enemy images, but if used constructively, the mass media can offer a powerful means for creating international understanding. If it is indeed true that tribalism is part of human nature, it is extremely important that the mass media be used to the utmost to overcome the barriers between nations and cultures. Through increased communication, the world's peoples can learn to accept each other as members of a single family.

Finally, let us turn to religion, with its enormous influence on human thought and behavior. Christianity, for example, offers a strongly stated ethic, which, if practiced, would make war impossible. In Mathew, the following passage occurs: "Ye have heard it said: Thou shalt love thy neighbor and hate thy enemy. But I say unto you: Love your enemies, bless them that curse you, do good to them that hate you, and pray for them that spitefully use you and persecute you."

This seemingly impractical advice, that we should love our enemies, is in fact of the greatest practicality, since acts of unilateral kindness and generosity can stop escalatory cycles of revenge and counter-revenge such as those which characterize the present conflict in the Middle East and the recent troubles of Northern Ireland. However, Christian nations, while claiming to adhere to the ethic of love and forgiveness, have adopted a policy of "massive retaliation", involving systems of thermonuclear missiles whose purpose is to destroy as much as possible of the country at which the retaliation is aimed. It is planned that entire populations shall be killed in a "massive retaliation", innocent children along with the guilty politicians. The startling contradiction between what the Christian nations profess and what they do was obvious even before the advent of nuclear weapons, at the time when Leo Tolstoy, during his last years, was exchanging letters with a young Indian lawyer in South Africa. In one of his letters to Gandhi, Tolstoy wrote:

"...The whole life of the Christian peoples is a continuous contradiction between that which they profess and the principles on which they order their lives, a contradiction between love accepted as the law of life, and violence, which is recognized and praised, acknowledged even as a necessity..."

"This year, in the spring, at a Scripture examination at a girls' high school in Moscow,

the teacher and the bishop present asked the girls questions on the Commandments, and especially on the sixth. After a correct answer, the bishop generally put another question, whether murder was always in all cases forbidden by God's law; and the unhappy young ladies were forced by previous instruction to answer 'Not always' - that murder was permitted in war and in the execution of criminals. Still, when one of these unfortunate young ladies (what I am telling is not an invention but a fact told to me by an eye witness) after her first answer, was asked the usual question, if killing was always sinful, she, agitated and blushing, decisively answered 'Always', and to the usual sophisms of the bishop, she answered with decided conviction that killing was always forbidden in the Old Testament and forbidden by Christ, not only killing but every wrong against a brother. Notwithstanding all his grandeur and arts of speech, the bishop became silent and the girl remained victorious."

As everyone knows, Gandhi successfully applied the principle of non-violence to the civil rights struggle in South Africa, and later to the political movement, which gave India its freedom and independence. The principle of non-violence was also successfully applied by Martin Luther King, and by Nelson Mandela. It is perhaps worthwhile to consider Gandhi's comment on the question of whether the end justifies the means: "The means may be likened to a seed", Gandhi wrote, "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." In other words, a dirty method produces a dirty result; killing produces more killing; hate leads to more hate. Everyone who reads the newspapers knows that this is true. But there are positive feedback loops as well as negative ones. A kind act produces a kind response; a generous gesture is returned; hospitality results in reflected hospitality. Buddhists call this principle of reciprocity "the law of karma".

The religious leaders of the 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.

It is useful to consider the analogy between the institution of war and the institution of slavery. We might be tempted to say, "There has always been war, throughout human history; and war will always continue to exist." As an antidote for this kind of pessimism, we can think of slavery, which, like war, has existed throughout most of recorded history. The cultures of ancient Egypt, Greece and Rome were all based on slavery, and, in more recent times, 13 million Africans were captured and forced into a life of slavery in the New World. Slavery was as much an accepted and established institution as war is today. Many people made large profits from slavery, just as arms manufacturers today make enormous profits. Nevertheless, in spite of the weight of vested interests, slavery has now been abolished throughout most of the world.

Today we look with horror at drawings of slave ships, where human beings were packed together like cord-wood; and we are amazed that such cruelty could have been possible. Can we not hope for a time when our descendants, reading descriptions of the wars of the twentieth century, will be equally amazed that such cruelty could have been possible? If we use them constructively, the vast resources now wasted on war can initiate a new era of happiness and prosperity for the Family of man. It is within our power to let this happen. The example of the men and women who worked to rid the world of slavery can give us courage as we strive for a time when war will exist only as a dark memory fading into the past.

11.10 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.⁸

Human nature has two sides: It has a dark side, to which nationalism and militarism appeal; but our species also has a genius for cooperation, which we can see in the growth of culture. Our modern civilization has been built up by means of a worldwide exchange of ideas and inventions. It is built on the achievements of many ancient cultures. China, Japan, India, Mesopotamia, Egypt, Greece, the Islamic world, Christian Europe, and the Jewish intellectual traditions all have contributed. Potatoes, corn, squash, vanilla, chocolate, chilli peppers, and quinine are gifts from the American Indians.⁹

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,

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

⁸http://www.fredsakademiet.dk/library/need.pdf

⁹http://eruditio.worldacademy.org/article/evolution-cooperation



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 their 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 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.



11.11 Construction versus destruction

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



Figure 11.10: The second law of thermodynamics tells us that disorder is statistically favored over order, and that life is always balancing above a sea of chaos. It is easier to burn down a house than to build one, easier to burn down the Great Library at Alexandria than to accumulate the knowledge that once filled it, and easier to start a thermonuclear war than to rebuild civilization from the radioactive ashes.

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 the planned illegal and insane Israeli attack of Iran, which threatens to lead to a world-destroying conflict. We must oppose these things by working with dedication, as though our lives depended on it. In fact, they do.

11.12 New ethics to match new technology

Modern science has, for the first time in history, offered humankind the possibility of a life of comfort, free from hunger and cold, and free from the constant threat of death through infectious disease. At the same time, science has given humans the power to obliterate their civilization with nuclear weapons, or to make the earth uninhabitable





through overpopulation and pollution.

The question of which of these paths we choose is literally a matter of life or death for ourselves and our children. Will we use the discoveries of modern science constructively, and thus choose the path leading towards life? Or will we use science to produce more and more lethal weapons, which sooner or later, through a technical or human failure, may result in a catastrophic nuclear war? Will we thoughtlessly destroy our beautiful planet through unlimited growth of population and industry? The choice among these alternatives is ours to make. We live at a critical moment of history, a moment of crisis for civilization.

No one living today asked to be born at such a moment, but by an accident of birth, history has given us an enormous responsibility, and two daunting tasks: If civilization is to survive, we must not only stabilize the global population but also, even more importantly, we must eliminate the institution of war. We face these difficult tasks with an inherited emotional nature that has not changed much during the last 40,000 years. Furthermore, we face the challenges of the 21st century with an international political system based on the anachronistic concept of the absolutely sovereign nation-state. However, the human brain has shown itself to be capable of solving even the most profound and complex problems. The mind that has seen into the heart of the atom must not fail when confronted with paradoxes of the human heart.

We must replace the old world of international anarchy, chronic war and institutionalized injustice, by a new world of law. The United Nations Charter, the Universal Declaration of Human Rights and the International Criminal Court are steps in the right direction,
11.12. NEW ETHICS TO MATCH NEW TECHNOLOGY

but these institutions need to be greatly strengthened and reformed.¹⁰

We also need a new global ethic, where loyalty to one's family and nation is supplemented by a higher loyalty to humanity as a whole. The Nobel laureate biochemist Albert Szent-Györgyi once wrote:

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

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

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

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ECOLOGICAL IMPACT OF MILITARISM

Appendix A

ICAN AWARDED THE 2017 NOBEL PEACE PRIZE

What is ICAN?

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

ICAN was founded in 2007 by the International Physicians for the Prevention of Nuclear War, an organization which itself received a Nobel Peace Prize in 1985. IPPNW was inspired by the success of the campaign that achieved the Ottawa Treaty in 1997, a treaty which banned antipersonnel land-mines against bitter opposition from the worst offenders. Thus, from the start. ICAN envisioned a treaty passed and without the participation or signatures of the nuclear weapons states. ICAN believed that such a treaty would have the great value of unambiguously underlining the illegality, immorality and omnicidal nature of nuclear weapons. Nuclear weapons states would eventually be forced to yield to the will of the vast majority of humankind.

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

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



Figure A.1: From left to right: Berit Reiss-Andersen, Chairman of the Norwegian Nobel Committee, Setsuko Thurlow, an 85-year-old survivor of the 1945 atomic bombing of Hiroshima, and ICAN Executive Director Beatrice Fihn.

Beatrice Fihn, "only a tantrum away".



Figure A.2: Celebrating the award.

The ICAN Nobel Lecture by Beatrice Fihn

Your Majesties, Members of the Norwegian Nobel Committee, Esteemed guests,

Today, it is a great honour to accept the 2017 Nobel Peace Prize on behalf of thousands of inspirational people who make up the International Campaign to Abolish Nuclear Weapons.

Together we have brought democracy to disarmament and are reshaping international law.

We most humbly thank the Norwegian Nobel Committee for recognizing our work and giving momentum to our crucial cause.

We want to recognize those who have so generously donated their time and energy to this campaign.

We thank the courageous foreign ministers, diplomats, Red Cross and Red Crescent staff, UN officials, academics and experts with whom we have worked in partnership to advance our common goal.

And we thank all who are committed to ridding the world of this terrible threat.

At dozens of locations around the world - in missile silos buried in our earth, on submarines navigating through our oceans, and aboard planes flying high in our sky - lie 15,000 objects of humankind's destruction.

Perhaps it is the enormity of this fact, perhaps it is the unimaginable scale of the consequences, that leads many to simply accept this grim reality. To go about our daily lives with no thought to the instruments of insanity all around us.

For it is insanity to allow ourselves to be ruled by these weapons. Many critics of this movement suggest that we are the irrational ones, the idealists with no grounding in reality. That nuclear-armed states will never give up their weapons.

But we represent the only rational choice. We represent those who refuse to accept nuclear weapons as a fixture in our world, those who refuse to have their fates bound up in a few lines of launch code.

Ours is the only reality that is possible. The alternative is unthinkable.

The story of nuclear weapons will have an ending, and it is up to us what that ending will be.

Will it be the end of nuclear weapons, or will it be the end of us?

One of these things will happen.

The only rational course of action is to cease living under the conditions where our mutual destruction is only one impulsive tantrum away.

Today I want to talk of three things: fear, freedom, and the future.

By the very admission of those who possess them, the real utility of nuclear weapons is in their ability to provoke fear. When they refer to their "deterrent" effect, proponents of nuclear weapons are celebrating fear as a weapon of war.

They are puffing their chests by declaring their preparedness to exterminate, in a flash, countless thousands of human lives.

Nobel Laureate William Faulkner said when accepting his prize in 1950, that "There is only the question of 'when will I be blown up?" But since then, this universal fear has given way to something even more dangerous: denial.

Gone is the fear of Armageddon in an instant, gone is the equilibrium between two blocs that was used as the justification for deterrence, gone are the fallout shelters.

But one thing remains: the thousands upon thousands of nuclear warheads that filled us up with that fear.

The risk for nuclear weapons use is even greater today than at the end of the Cold War. But unlike the Cold War, today we face many more nuclear armed states, terrorists, and cyber warfare. All of this makes us less safe.

Learning to live with these weapons in blind acceptance has been our next great mistake.

Fear is rational. The threat is real. We have avoided nuclear war not through prudent leadership but good fortune. Sooner or later, if we fail to act, our luck will run out.

A moment of panic or carelessness, a misconstrued comment or bruised ego, could easily lead us unavoidably to the destruction of entire cities. A calculated military escalation could lead to the indiscriminate mass murder of civilians.

If only a small fraction of today's nuclear weapons were used, soot and smoke from the firestorms would loft high into the atmosphere - cooling, darkening and drying the Earth's surface for more than a decade.

It would obliterate food crops, putting billions at risk of starvation.

Yet we continue to live in denial of this existential threat.

But Faulkner in his Nobel speech also issued a challenge to those who came after him. Only by being the voice of humanity, he said, can we defeat fear; can we help humanity endure.

ICAN's duty is to be that voice. The voice of humanity and humanitarian law; to speak up on behalf of civilians. Giving voice to that humanitarian perspective is how we will create the end of fear, the end of denial. And ultimately, the end of nuclear weapons.

That brings me to my second point: freedom.

As the International Physicians for the Prevention of Nuclear War, the first ever anti-nuclear weapons organisation to win this prize, said on this stage in 1985:

"We physicians protest the outrage of holding the entire world hostage. We protest the moral obscenity that each of us is being continuously targeted for extinction."

Those words still ring true in 2017.

We must reclaim the freedom to not live our lives as hostages to imminent annihilation.

Man - not woman! - made nuclear weapons to control others, but instead we are controlled by them.

They made us false promises. That by making the consequences of using these weapons so unthinkable it would make any conflict unpalatable. That it would keep us free from war.

But far from preventing war, these weapons brought us to the brink multiple times throughout the Cold War. And in this century, these weapons continue to escalate us towards war and conflict.

In Iraq, in Iran, in Kashmir, in North Korea. Their existence propels others to join the nuclear race. They don't keep us safe, they cause conflict.

As fellow Nobel Peace Laureate, Martin Luther King Jr, called them from this very stage in 1964, these weapons are "both genocidal and suicidal".

They are the madman's gun held permanently to our temple. These weapons were supposed to keep us free, but they deny us our freedoms.

It's an affront to democracy to be ruled by these weapons. But they are just weapons. They are just tools. And just as they were created by geopolitical context, they can just as easily be destroyed by placing them in a humanitarian context.

That is the task ICAN has set itself - and my third point I wish to talk about, the future.

I have the honour of sharing this stage today with Setsuko Thurlow, who has made it her life's purpose to bear witness to the horror of nuclear war.

She and the hibakusha were at the beginning of the story, and it is our collective challenge to ensure they will also witness the end of it.

They relive the painful past, over and over again, so that we may create a better future.

There are hundreds of organisations that together as ICAN are making great strides towards that future. There are thousands of tireless campaigners around the world who work each day to rise to that challenge.

There are millions of people across the globe who have stood shoulder to shoulder with those campaigners to show hundreds of millions more that a different future is truly possible.

Those who say that future is not possible need to get out of the way of those making it a reality.

As the culmination of this grassroots effort, through the action of ordinary people, this year the hypothetical marched forward towards the actual as 122 nations negotiated and concluded a UN treaty to outlaw these weapons of mass destruction.

The Treaty on the Prohibition of Nuclear Weapons provides the pathway forward at a moment of great global crisis. It is a light in a dark time.

And more than that, it provides a choice.

A choice between the two endings: the end of nuclear weapons or the end of us.

It is not naive to believe in the first choice. It is not irrational to think nuclear states can disarm. It is not idealistic to believe in life over fear and destruction; it is a necessity.

All of us face that choice. And I call on every nation to join the Treaty on the Prohibition of Nuclear Weapons.

The United States, choose freedom over fear. Russia, choose disarmament over destruction. Britain, choose the rule of law over oppression. France, choose human rights over terror. China, choose reason over irrationality. India, choose sense over senselessness. Pakistan, choose logic over Armageddon. Israel, choose common sense over obliteration. North Korea, choose wisdom over ruin.

To the nations who believe they are sheltered under the umbrella of nuclear weapons, will you be complicit in your own destruction and the destruction of others in your name?

To all nations: choose the end of nuclear weapons over the end of us!

This is the choice that the Treaty on the Prohibition of Nuclear Weapons represents. Join this Treaty.

We citizens are living under the umbrella of falsehoods. These weapons are not keeping us safe, they are contaminating our land and water, poisoning our bodies and holding hostage our right to life.

To all citizens of the world: Stand with us and demand your government side with humanity and sign this treaty. We will not rest until all States have joined, on the side of reason.

No nation today boasts of being a chemical weapon state. No nation argues that it is acceptable, in extreme circumstances, to use sarin nerve agent. No nation proclaims the right to unleash on its enemy the plague or polio. That is because international norms have been set, perceptions have been changed.

And now, at last, we have an unequivocal norm against nuclear weapons.

Monumental strides forward never begin with universal agreement.

With every new signatory and every passing year, this new reality will take hold.

This is the way forward. There is only one way to prevent the use of nuclear weapons: prohibit and eliminate them.

Nuclear weapons, like chemical weapons, biological weapons, cluster munitions and land mines before them, are now illegal. Their existence is immoral. Their abolishment is in our hands.

The end is inevitable. But will that end be the end of nuclear weapons or the end of us? We must choose one.

We are a movement for rationality. For democracy. For freedom from fear.

We are campaigners from 468 organisations who are working to safeguard the future, and we are representative of the moral majority: the billions of people who choose life over death, who together will see the end of nuclear weapons.

Thank you.

The Nobel Lecture continued by Setsuko Thurlow

Your Majesties, Distinguished members of the Norwegian Nobel Committee, My fellow campaigners, here and throughout the world, Ladies and gentlemen,

It is a great privilege to accept this award, together with Beatrice, on behalf of all the remarkable human beings who form the ICAN movement. You each give me such tremendous hope that we can - and will - bring the era of nuclear weapons to an end.

I speak as a member of the family of hibakusha - those of us who, by some miraculous chance, survived the atomic bombings of Hiroshima and Nagasaki. For more than seven decades, we have worked for the total abolition of nuclear weapons.

We have stood in solidarity with those harmed by the production and testing of these horrific weapons around the world. People from places with longforgotten names, like Moruroa, Ekker, Semipalatinsk, Maralinga, Bikini. People whose lands and seas were irradiated, whose bodies were experimented upon, whose cultures were forever disrupted.

We were not content to be victims. We refused to wait for an immediate fiery end or the slow poisoning of our world. We refused to sit idly in terror as the so-called great powers took us past nuclear dusk and brought us recklessly close to nuclear midnight. We rose up. We shared our stories of survival. We said: humanity and nuclear weapons cannot coexist.

Today, I want you to feel in this hall the presence of all those who perished in Hiroshima and Nagasaki. I want you to feel, above and around us, a great cloud of a quarter million souls. Each person had a name. Each person was loved by someone. Let us ensure that their deaths were not in vain.

I was just 13 years old when the United States dropped the first atomic bomb, on my city Hiroshima. I still vividly remember that morning. At 8:15, I saw a blinding bluish-white flash from the window. I remember having the sensation of floating in the air.

As I regained consciousness in the silence and darkness, I found myself pinned by the collapsed building. I began to hear my classmates' faint cries: "Mother, help me. God, help me."

Then, suddenly, I felt hands touching my left shoulder, and heard a man saying: "Don't give up! Keep pushing! I am trying to free you. See the light coming through that opening? Crawl towards it as quickly as you can." As I crawled out, the ruins were on fire. Most of my classmates in that building were burned to death alive. I saw all around me utter, unimaginable devastation.

Processions of ghostly figures shuffled by. Grotesquely wounded people, they were bleeding, burnt, blackened and swollen. Parts of their bodies were missing. Flesh and skin hung from their bones. Some with their eyeballs hanging in their hands. Some with their bellies burst open, their intestines hanging out. The foul stench of burnt human flesh filled the air.

Thus, with one bomb my beloved city was obliterated. Most of its residents were civilians who were incinerated, vaporized, carbonized - among them, members of my own family and 351 of my schoolmates.

In the weeks, months and years that followed, many thousands more would die, often in random and mysterious ways, from the delayed effects of radiation. Still to this day, radiation is killing survivors.

Whenever I remember Hiroshima, the first image that comes to mind is of my four-year-old nephew, Eiji - his little body transformed into an unrecognizable melted chunk of flesh. He kept begging for water in a faint voice until his death released him from agony.

To me, he came to represent all the innocent children of the world, threatened as they are at this very moment by nuclear weapons. Every second of every day, nuclear weapons endanger everyone we love and everything we hold dear. We must not tolerate this insanity any longer.

Through our agony and the sheer struggle to survive - and to rebuild our lives from the ashes - we hibakusha became convinced that we must warn the world about these apocalyptic weapons. Time and again, we shared our testimonies.

But still some refused to see Hiroshima and Nagasaki as atrocities - as war crimes. They accepted the propaganda that these were "good bombs" that had ended a "just war". It was this myth that led to the disastrous nuclear arms race - a race that continues to this day.

Nine nations still threaten to incinerate entire cities, to destroy life on earth, to make our beautiful world uninhabitable for future generations. The development of nuclear weapons signifies not a country's elevation to greatness, but its descent to the darkest depths of depravity. These weapons are not a necessary evil; they are the ultimate evil.

On the seventh of July this year, I was overwhelmed with joy when a great majority of the world's nations voted to adopt the Treaty on the Prohibition of Nuclear Weapons. Having witnessed humanity at its worst, I witnessed, that day, humanity at its best. We hibakusha had been waiting for the ban for seventy-two years. Let this be the beginning of the end of nuclear weapons.

All responsible leaders will sign this treaty. And history will judge harshly those who reject it. No longer shall their abstract theories mask the genocidal reality of their practices. No longer shall "deterrence" be viewed as anything but a deterrent to disarmament. No longer shall we live under a mushroom cloud of fear.

To the officials of nuclear-armed nations - and to their accomplices under the so-called "nuclear umbrella" - I say this: Listen to our testimony. Heed our warning. And know that your actions are consequential. You are each an integral part of a system of violence that is endangering humankind. Let us all be alert to the banality of evil.

To every president and prime minister of every nation of the world, I beseech you: Join this treaty; forever eradicate the threat of nuclear annihilation.

When I was a 13-year-old girl, trapped in the smouldering rubble, I kept pushing. I kept moving toward the light. And I survived. Our light now is the ban treaty. To all in this hall and all listening around the world, I repeat those words that I heard called to me in the ruins of Hiroshima: "Don't give up! Keep pushing! See the light? Crawl towards it."

Tonight, as we march through the streets of Oslo with torches aflame, let us follow each other out of the dark night of nuclear terror. No matter what obstacles we face, we will keep moving and keep pushing and keep sharing this light with others. This is our passion and commitment for our one precious world to survive. ECOLOGICAL EFFECTS OF MILITARISM

Appendix B

HIROSHIMA: A SILENCE BROKEN

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.



Figure B.1: 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

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 that 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 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:



Figure B.2: It was like a scene from hell. Source: SGI International.

"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 horrifying.

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.



Figure B.3: Burned beyond recognition. Source: SGI International.



Figure B.4: Memories of August 6. Source: SGI International.



Figure B.5: The effects lasted a lifetime. Source: SGI International.



Figure B.6: After the bombing. Source: SGI International.

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 explosive 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

A SILENCE BROKEN

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"

Appendix C

THE RUSSELL-EINSTEIN MANIFESTO

Pugwash Conferences on Science and World Affairs

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 radioactive fallout from the test killed one crew member and made all the others seriously ill.

In England, Prof. Joseph Rotblat, a Polish scientist who had resigned from the Manhattan Project for 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 became 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,



Figure C.1: Joseph Rotblat believed that the Bikini bomb was of a fission-fusion-fission type. Besides producing large amounts of fallout, such a bomb can be made enormously powerful at very little expense.

THE RUSSELL-EINSTEIN MANIFESTO



 ${\rm Figure~C.2:}$ Signing the Russell-Einstein declaration was the last act of Einstein's life.



Figure C.3: 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.

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."

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 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.

In addition to the large annual meeting, the Pugwash organization also arranges about



Figure C.4: 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.

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 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 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.

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 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



Figure C.5: Hans-Peter Durr, (1929-2014).

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.

Text of the Russell-Einstein Manifesto

Issued in London, 9 July, 1955

In the tragic situation which confronts humanity, we feel that scientists should assemble in conference to appraise the perils that have arisen as a result of the development of weapons of mass destruction, and to discuss a resolution in the spirit of the appended draft.

We are speaking on this occasion, not as members of this or that nation, continent, or creed, but as human beings, members of the species Man, whose continued existence is in doubt. The world is full of conflicts; and, overshadowing all minor conflicts, the titanic struggle between Communism and anti-Communism.

Almost everybody who is politically conscious has strong feelings about one or more of these issues; but we want you, if you can, to set aside such feelings and consider yourselves only as members of a biological species which has had a remarkable history, and whose disappearance none of us can desire.

We shall try to say no single word which should appeal to one group rather than to another. All, equally, are in peril, and, if the peril is understood, there is hope that they may collectively avert it.

We have to learn to think in a new way. We have to learn to ask ourselves, not what steps can be taken to give military victory to whatever group we prefer, for there no longer are such steps; the question we have to ask ourselves is: what steps can be taken to prevent a military contest of which the issue must be disastrous to all parties?

The general public, and even many men in positions of authority, have not realized what would be involved in a war with nuclear bombs. The general public still thinks in terms of the obliteration of cities. It is understood that the new bombs are more powerful than the old, and that, while one A-bomb could obliterate Hiroshima, one H-bomb could obliterate the largest cities, such as London, New York, and Moscow.

No doubt in an H-bomb war great cities would be obliterated. But this is one of the minor disasters that would have to be faced. If everybody in London, New York, and Moscow were exterminated, the world might, in the course of a few centuries, recover from the blow. But we now know, especially since the Bikini test, that nuclear bombs can gradually spread destruction over a very much wider area than had been supposed.

It is stated on very good authority that a bomb can now be manufactured which will be 2,500 times as powerful as that which destroyed Hiroshima. Such a bomb, if exploded near the ground or under water, sends radioactive particles into the upper air. They sink gradually and reach the surface of the earth in the form of a deadly dust or rain. It was this dust which infected the Japanese fishermen and their catch of fish. No one knows how widely such lethal radioactive particles might be diffused, but the best authorities are unanimous in saying that a war with H-bombs might possibly put an end to the human race. It is feared that if many H-bombs are used there will be universal death, sudden only for a minority, but for the majority a slow torture of disease and disintegration.

Many warnings have been uttered by eminent men of science and by authorities in military strategy. None of them will say that the worst results are certain. What they do say is that these results are possible, and no one can be sure that they will not be realized. We have not yet found that the views of experts on this question depend in any degree upon their politics or prejudices. They depend only, so far as our researches have revealed, upon the extent of the particular expert's knowledge. We have found that the men who know most are the most gloomy.

Here, then, is the problem which we present to you, stark and dreadful and inescapable: Shall we put an end to the human race; or shall mankind renounce war? People will not face this alternative because it is so difficult to abolish war.

The abolition of war will demand distasteful limitations of national sovereignty. But what perhaps impedes understanding of the situation more than anything else is that the term "mankind" feels vague and abstract. People scarcely realize in imagination that the danger is to themselves and their children and their grandchildren, and not only to a dimly apprehended humanity. They can scarcely bring themselves to grasp that they, individually, and those whom they love are in imminent danger of perishing agonizingly. And so they hope that perhaps war may be allowed to continue provided modern weapons are prohibited.

This hope is illusory. Whatever agreements not to use H-bombs had been reached in time of peace, they would no longer be considered binding in time of war, and both sides would set to work to manufacture H-bombs as soon as war broke out, for, if one side manufactured the bombs and the other did not, the side that manufactured them would inevitably be victorious.

Although an agreement to renounce nuclear weapons as part of a general reduction of armaments would not afford an ultimate solution, it would serve certain important purposes. First: any agreement between East and West is to the good in so far as it tends to diminish tension. Second: the abolition of thermonuclear weapons, if each side believed that the other had carried it out sincerely, would lessen the fear of a sudden attack in the style of Pearl Harbour, which at present keeps both sides in a state of nervous apprehension. We should, therefore, welcome such an agreement though only as a first step. Most of us are not neutral in feeling, but, as human beings, we have to remember that, if the issues between East and West are to be decided in any manner that can give any possible satisfaction to anybody, whether Communist or anti-Communist, whether Asian or European or American, whether White or Black, then these issues must not be decided by war. We should wish this to be understood, both in the East and in the West. There lies before us, if we choose, continual progress in happiness, knowledge, and wisdom. Shall we, instead, choose death, because we cannot forget our quarrels? We appeal, as human beings, to human beings: Remember your humanity, and forget the rest. If you can do so, the way lies

THE RUSSELL-EINSTEIN MANIFESTO

open to a new Paradise; if you cannot, there lies before you the risk of universal death.

Resolution

We invite this Congress, and through it the scientists of the world and the general public, to subscribe to the following resolution: "In view of the fact that in any future world war nuclear weapons will certainly be employed, and that such weapons threaten the continued existence of mankind, we urge the Governments of the world to realize, and to acknowledge publicly, that their purpose cannot be furthered by a world war, and we urge them, consequently, to find peaceful means for the settlement of all matters of dispute between them."

The document was signed by Max Born, Perry W. Bridgman, Albert Einstein, Leopold Infeld, Frederic Joliot-Curie, Herman J. Muller, Linus Pauling, Cecil F. Powell, Joseph Rotblat, Bertrand Russell, and Hideki Yukawa
Appendix D

ALBERT SCHWEITZER'S DECLARATION

Dr. Albert Schweitzer (1875-1965) was a a French-German theologian, organist, writer, humanitarian, philosopher, and physician. He was known especially for his books promoting the ethical principle which he called "Reverence for Life". Two and a half years after Dr. Schweitzer gave his Nobel Peace Prize Lecture, leaders and scientists from many countries chose Dr. Schweitzer to be their voice against the nuclear danger and it was Norman Cousins who persuaded him to do so. On April 24, 1957, Dr. Schweitzer's statement, "Declaration of Conscience", was broadcast worldwide from Oslo, Norway, under the auspices of the Nobel Peace Prize Committee for the consideration of the world's peoples.

The text of Dr. Schweitzer's Declaration of Conscience

Since March 1, 1954 hydrogen bombs have been tested by the United States at the Pacific island of Bikini in the Marshall group and by Soviet Russia in Siberia. We know that testing of atomic weapons is something quite different from testing of non-atomic ones. Earlier,



Figure D.1: Dr. Albert Schweitzer (1875-1965).

when a new type of giant gun had been tested, the matter ended with the detonation. After the explosion of a hydrogen bomb that is not the case. Something remains in the air, namely, an incalculable number of radioactive particles, emitting radioactive rays. This was also the case with the uranium bombs dropped on Nagasaki and Hiroshima and those which were subsequently tested. However, because these bombs were of smaller size and less effectiveness compared with the hydrogen bombs, not much attention was given to this fact.

Since radioactive rays of sufficient amount and strength have harmful effects on the human body, it must be considered whether the radiation resulting from the hydrogen explosions that have already taken place represents a danger which would increase with new explosions.

In the course of the three-and-a-half years that have passed since then [the test explosions of the early hydrogen bombs] representatives of the physical and medical sciences have been studying the problem. Observations on the distribution, origin, and nature of radiation have been made. The processes through which the human body is harmfully affected have been analyzed. The material collected, although far from complete, allows us to draw the conclusion that radiation resulting from the explosions which have already taken place represents a danger to the human race - a danger not to be underrated - and that further explosions of atomic bombs will increase this danger to an alarming extent. This conclusion has repeatedly been expressed, especially during the last few months. However, it has not, strange to say, influenced public opinion to the extent that one might have expected. Individuals and peoples have not been aroused to give to this danger the attention which it unfortunately deserves. It must be demonstrated and made clear to them.

I raise my voice, together with those of others who have lately felt it their duty to act, through speaking and writing, in warning of the danger. My age and the generous understanding so many people have shown of my work permit me to hope that my appeal may contribute to the preparing of the way for the insights so urgently needed.

My thanks go to the radio station in Oslo, the city of the Nobel Peace Prize, for making it possible for that which I feel I have to say to reach far-off places.

What is radioactivity?

Radioactivity consists of rays differing from those of light in being invisible and in being able to ass not only through glass but also through thin metal discs and through layers of cell tissue in the human and animal bodies. Rays of this kind were first discovered in 1895 by the physicist Wilhelm Roentgen of Munich, and were named after him.

In 1896 the French physicist Henri Becquerel demonstrated that rays of this kind occur in nature. They are emitted from uranium, an element known since 1786. In 1898 Pierre Curie and his wife discovered in the mineral pitchblende, a uranium ore, the strongly radioactive element radium.

The joy caused by the fact that such rays were at the disposal of humanity was at first unmixed. It appeared that they influence the relatively rapidly growing and relatively rapidly decaying cells of malignant tumors and sarcomas. If exposed to these rays repeatedly for a longer period, some of the terrible neoplasms can be destroyed.

After a time it was found, however, that the destruction of cancer cells does not always

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mean the cure of cancer and also, that the normal cells of the body may be seriously damaged if long exposed to radioactivity. When Mme. Curie, after having handled uranium ore for four years, finally held the first gram of radium in her hand there appeared abrasions in the skin which no treatment could cure. With the years she grew steadily sicker from a disease caused by radioactive rays which damaged her bone marrow and through this her blood. In 1934 death put an end to her suffering.

Even so, for many years we were not aware of the grave risks involved in X-rays to those constantly exposed to them. Through operating X-ray apparatus thousands of doctors and nurses have incurred incurable diseases.

Radioactive rays are material things. Through them the radioactive element constantly and forcefully emits tiny particles of itself. There are three kinds. They are named after the three first letters of the Greek alphabet, alpha, beta, and gamma. The gamma rays are the hardest ones and have the strongest effect. The reasons why elements emit radioactive rays is that they are in a continuous state of decaying. The radioactivity is the energy liberated little by little. There are other elements besides uranium and radium which are radioactive. To the radiation from the elements in the earth is added some radiation from space. Fortunately, the air mass 400 kilometers high, that surrounds our earth, protects us against this radiation. Only a very small fraction of it reaches us.

We are, then, constantly being exposed to radioactive radiation coming from the earth and from space. It is so weak, however, that it does not hurt us. Stronger sources of radiation, as for instance X-ray machines and exposed radium, have, as we know, harmful effects if one is exposed to them for some time. The radioactive rays are, as I said, invisible. How can we tell that they are there and how strong they are?

Thanks to the German physicist Hans Geiger, who died in 1945 as a victim to X-rays, we have an instrument which makes that possible. This instrument is called the Geiger counter; it consists of a metal tube containing rarefied air. In it are two metal electrodes between which there is a high potential. Radioactive rays from the outside affect the tube and release a discharge between the two electrodes. The stronger the radiation the quicker the discharges follow one another. A small device connected to the tube makes the discharge audible. The Geiger counter performs a veritable drum-roll when the discharges are strong.

There are two kinds of atom bomb - uranium bombs and hydrogen bombs. The effect of a uranium bomb is due to a process which liberates energy through the fission of uranium. In the hydrogen bomb the liberation of energy is the result of the transformation of hydrogen into helium.

It is interesting to note that this latter process is similar to that which takes place in the center of the sun, supplying it with the self-renewing energy which it emits in the form of light and heat.

In principle, the effect of both bombs is the same. But, according to various estimates the effect of one of the latest hydrogen bombs is 2,000 times stronger than the one which was dropped on Hiroshima. To these two bombs has recently been added the cobalt bomb, a kind of super atom-bomb. It is a hydrogen bomb surrounded by a layer of cobalt. The effect of this bomb is estimated to be many times stronger than that of hydrogen bombs that have been made so far.

The explosion of an atom bomb creates an inconceivably large number of exceedingly small particles of radioactive elements which decay like uranium or radium. Some of these particles decay very quickly, others more slowly, and some of them extraordinarily slowly. The strongest of these elements cease to exist only ten seconds after the detonation of the bomb. But in this short time they may have killed a great number of people in a circumference of several miles.

What remains are the less powerful elements. In our time it is with these we have to contend. It is of the danger arising from the radioactive rays emitted by these elements that we must be aware. Of these elements some exit for hours, some for weeks, or months, or years, or millions of years, undergoing continuous decay. They float in the higher strata of air as clouds of radioactive dust. The heavy particles fall down first. The lighter ones will stay in the air for a longer time or come down with rain or snow. How long it will take before everything carried up in the air by the explosions which have taken place till now has disappeared no one can say with any certainty. According to some estimates, this will be the case not earlier than thirty or forty years from now.

When I was a boy I witnessed how dust hurled into the air from the explosion in 1883 of the island Krakatoa in the Sunda group was noticeable for two years afterwards to such an extent that sunsets were given extraordinary splendor by it.

What we can state with certainty, however, is that the radioactive clouds will constantly be carried by the winds around the globe and that some of the dust, by its own weight, or by being brought down by rain, snow, mist, and dew, little by little, will fall down on the hard surface of the earth, into the rivers, and into the oceans.

Of what nature are these radioactive elements, particles of which were carried up in the air by the explosion of atom bombs and which are now falling down again?

They are strange variants of the usual non-radioactive elements. They have the same chemical properties but a different atomic weight. Their names are always accompanied by their atomic weights. The same element can occur in several radioactive variants. Besides Iodine 131, which lives for sixteen days only, we have Iodine 129, which lives for 200,000,000 years.

Dangerous elements of this kind are: Phosphorus 32, Calcium 45, Iodine 131, Iron 55, Bismuth 210, Plutonium 239, Cerium 144, Strontium 89, and Cesium 137. If the hydrogen bomb is covered by cobalt, Cobalt 60 must be added to the list.

Particularly dangerous are the elements combining long life with a relatively strong efficient radiation. Among them Strontium 90 takes the first place. It is present in very large amounts in the radioactive dust. Cobalt 60 must also be mentioned as particularly dangerous.

The radioactivity in the air, increased through these elements, will not harm us from the outside, not being strong enough to penetrate the skin. It is another matter with respiration, through which radioactive elements can enter our bodies. But the danger which has to be stressed above all the others is the one which arises from our drinking radioactive water and our eating radioactive food as a consequence of the increased radioactivity in the air.

Following the explosions of Bikini and Siberia rain falling over Japan has, from time

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to time, been so radioactive that the water from it cannot be drunk. Not only that: Reports of radioactive rainfall are coming from all parts of the world where analyses have recently been made. In several places the water has proved to be so radioactive that it was unfit for drinking.

Well-water becomes radioactive to any considerable extent only after longer periods of heavy rainfall. Wherever radioactive rainwater is found the soil is also radioactive and in a higher degree. The soil is made radioactive not only by the downpour, but also from radioactive dust falling on it. And with the soil the vegetation will also have become radioactive. The radioactive elements deposited in the soil pass into the plants, where they are stored. This is of importance, for as a result of this process it may be the case that we are threatened by a considerable amount of radioactive elements.

The radioactive elements in grass, when eaten by animals whose meat is used for food, will be absorbed and stored in our bodies.

In the case of cows grazing on contaminated soil, the absorption is affected when we drink their milk. In that way, small children run an especially dangerous risk of absorbing radioactive elements.

When we eat contaminated cheese and fruits the radioactive elements stored in them are transferred to us.

What this storing of radioactive material implies is clearly demonstrated by the observations made when, on one occasion, the radioactivity of the Columbia River in North America was analyzed. The radioactivity was caused by the atomic plants at Hanford, which produce plutonium for atomic bombs and which empty their waste water into the river. The radioactivity of the river water was insignificant. But the radioactivity of the river plankton was 2,000 times higher, that of the ducks eating plankton 40,000 times higher, that of the fish 15,000 times higher. In young swallows fed on insects caught by their parents in the river the radioactivity was 500,000 times higher, and in the egg yolks of water birds more than 1,000,000 times higher.

From official and unofficial sources we have been assured, time and time again, that the increase in radioactivity of the air does not exceed the amount which the human body can tolerate without any harmful effects. This is just evading the issue. Even if we are not directly affected by the radioactive material in the air, we are indirectly affected through that which has fallen down, is falling down, and will fall down. We are absorbing this through radioactive drinking water and through animal and vegetable foodstuffs, to the same extent as radioactive elements are stored in the vegetation of the region in which we live. Unfortunately for us, nature hoards what is falling down from the air.

None of the radioactivity of the air, created by the explosion of atomic bombs, is so unimportant that it may not, in the long run, become a danger to us through increasing the amount of radioactivity stored in our bodies.

What we absorb of radioactivity is not spread evenly in all cellular tissue. It is deposited in certain parts of our body, particularly in the bone tissue and also in the spleen and in the liver. From those sources the organs which are especially sensitive to it are exposed to radiation. What the radiation lacks in strength is compensated for by time. It works day and night without interruption. How does radiation affect the cells of an organ? Through being ionized, that is to say, electrically charged. This change means that the chemical processes which make it possible for the cells to do their job in our body no longer function as they should. They are no longer able to perform the tasks which are of vital importance to us. We must also bear in mind that a great number of the cells of an organ may degenerate or die as a result of radiation.

What are the diseases caused by internal radiation? The same diseases that are known to be caused by external radiation.

They are mainly serious blood diseases. The cells of the red bone marrow, where the red and the white blood corpuscles are formed, are very sensitive to radioactive rays. It is these corpuscles, found in great numbers in the blood, which make it possible for it to play such an important part. If the cells in the bone marrow are damaged by radiation they will produce too few or abnormal, degenerating blood corpuscles. Both cases lead to blood diseases and, frequently, to death. These were the diseases that killed the victims of X-rays and radium rays.

It was one of these diseases that attacked the Japanese fishermen who were surprised in their vessel by radioactive ashes falling down 240 miles from Bikini after the explosion of a hydrogen bomb. With one exception, they were all saved, being strong and relatively mildly affected, through continuous blood transfusions.

In the cases cited the radiation came from the outside. It is unfortunately very probable that internal radiation affecting the bone marrow and lasting for years will have the same effect, particularly since the radiation goes from the bone tissue to the bone marrow. As I have said, the radioactive elements are by preference stored in the bone tissue.

Not our own health only is threatened by internal radiation, but also that of our descendants. The fact is that the cells of the reproductive organs are particularly vulnerable to radiation which in this case attacks the nucleus to such an extent that it can be seen in the microscope.

To the profound damage of these cells corresponds a profound damage to our descendants.

It consists in stillbirths and in the births of babies with mental or physical defects.

In this context also, we can point to the effects of radiation coming from the outside.

It is a fact - even if the statistical material being published in the press needs checking that in Nagasaki, during the years following the dropping of the atom bomb, an exceptionally high occurrence of stillbirths and of deformed children was observed.

In order to establish the effect of radioactive radiation on posterity, comparative studies have been made between the descendants of doctors who have been using X-ray apparatus over a period of years and descendants of doctors who have not. The material of this study comprises about 3,000 doctors in each group. A noticeable different was found. Among the descendants of radiologists a percentage of stillbirths of 1.403 was found, while the percentage among the non-radiologists was 1.222.

In the first group 6.01 per cent of the children had congenital defects, while only 4.82 per cent in the second.

The number of healthy children in the first group was 80.42 per cent; the number in the other was significantly higher, viz. 83.23 per cent. It must be remembered that even the

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weakest of internal radiation can have harmful effects on our descendants.

The total effect of the damage done to descendants of ancestors who have been exposed to radioactive rays will not, in accordance with the laws of genetics, be apparent in the generations coming immediately after us. The full effects will appear only 100 or 200 years later.

As the matter stands we cannot at present cite cases of serious damage done by internal radiation. To the extent that such radiation exists it is not sufficiently strong and has not lasted long enough to have caused the damage in question. We can only conclude from the harmful effects known to be caused by external radiation to those we must expect in the future from internal radiation.

If the effect of the latter is not as strong as that of the former, it may become so, through working little by little and without interruption. The final result will be the same in both cases. Their effects add up.

We must also remember that internal radiation, in contrast to that coming from the outside, does not have to penetrate layers of skin, tissues, and muscles to hit the organs. It works at close range and without any weakening of its force.

When we realize under what conditions the internal radiation is working, we cease to underrate it. Even if it is true that, when speaking of the dangers of internal radiation, we can point to no actual case, only express our fear, that fear is so solidly founded on facts that it attains the weight of reality in determining our attitude. We are forced to regard every increase in the existing danger through further creation of radioactive elements by atom bomb explosions as a catastrophe for the human race, a catastrophe that must be prevented.

There can be no question of doing anything else, if only for the reason that we cannot take the responsibility for the consequences it might have for our descendants.

They are threatened by the greatest and most terrible danger.

That radioactive elements created by us are found in nature is an astounding event in the history of the earth and of the human race. To fail to consider its importance and its consequences would be a folly for which humanity would have to pay a terrible price. We are committing a folly in thoughtlessness. It must not happen that we do not pull ourselves together before it is too late. We must muster the insight, the seriousness, and the courage to leave folly and to face reality.

This is at bottom what the statesmen of the nations producing atomic bombs are thinking, too. Through the reports they are receiving they are sufficiently informed to form their own judgments, and we must also assume that they are alive to their responsibility.

At any rate, America and Soviet Russia and Britain are telling one another again and again that they want nothing more than to reach an agreement to end the testing of atomic weapons. At the same time, however, they declare that they cannot stop the tests as long as there is no such agreement.

Why do they not come to an agreement? The real reason is that in their own countries there is no public opinion asking for it. Nor is there any such public opinion in other countries with the exception of Japan. This opinion has been forced upon the Japanese people because, little by little, they will be hit in a most terrible way by the evil consequences of all the tests.

An agreement of this kind presupposes reliability and trust. There must be guarantees preventing the agreement from being signed by anyone intending to win important tactical advantages foreseen only by him. Public opinion in all nations concerned must inspire and accept the agreement.

When public opinion has been created in the countries concerned and among all nations - an opinion informed of the dangers involved in going on with the tests and led by the reason which this information imposes -, then the statesmen may reach an agreement to stop the experiments.

A public opinion of this kind stands in no need of plebiscites or of forming of committees to express itself. It works through just being there.

The end of further experiments with atom bombs would be like the early sunrays of hope which suffering humanity is longing for.

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Appendix E

THE MESSAGE OF POPE FRANCIS

MESSAGE OF HIS HOLINESS POPE FRANCIS ON THE OC-CASION OF THE VIENNA CONFERENCE ON THE HUMAN-ITARIAN IMPACT OF NUCLEAR WEAPONS

To His Excellency Mr Sebastian Kurz Federal Minister for Europe, Integration and Foreign Affairs of the Republic of Austria President of the Conference on the Humanitarian Impact of Nuclear Weapons

I am pleased to greet you, Mr President, and all the representatives from various Nations and International Organizations, as well as civil society, who are participating in the Vienna Conference on the Humanitarian Impact of Nuclear Weapons.

Nuclear weapons are a global problem, affecting all nations, and impacting future generations and the planet that is our home. A global ethic is needed if we are to reduce the nuclear threat and work towards nuclear disarmament. Now, more than ever, technological, social and political interdependence urgently calls for an ethic of solidarity (cf. John Paul II, Sollicitudo Rei Socialis, 38), which encourages peoples to work together for a more secure world, and a future that is increasingly rooted in moral values and responsibility on a global scale.

The humanitarian consequences of nuclear weapons are predictable and planetary. While the focus is often placed on nuclear weapons' potential for mass-killing, more attention must be given to the "unnecessary suffering" brought on by their use. Military codes and international law, among others, have long banned peoples from inflicting unnecessary suffering. If such suffering is banned in the waging of conventional war, then it should all the more be banned in nuclear conflict. There are those among us who are victims of these weapons; they warn us not to commit the same irreparable mistakes which have devastated populations and creation. I extend warm greetings to the Hibakusha, as well as other victims of nuclear weapons testing who are present at this meeting. I encourage them all to be prophetic voices, calling the human family to a deeper appreciation of beauty, love, cooper-



Figure E.1: HH Pope Francis I.

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ation and fraternity, while reminding the world of the risks of nuclear weapons which have the potential to destroy us and civilization.

Nuclear deterrence and the threat of mutually assured destruction cannot be the basis for an ethics of fraternity and peaceful coexistence among peoples and states. The youth of today and tomorrow deserve far more. They deserve a peaceful world order based on the unity of the human family, grounded on respect, cooperation, solidarity and compassion. Now is the time to counter the logic of fear with the ethic of responsibility, and so foster a climate of trust and sincere dialogue.

Spending on nuclear weapons squanders the wealth of nations. To prioritize such spending is a mistake and a misallocation of resources which would be far better invested in the areas of integral human development, education, health and the fight against extreme poverty. When these resources are squandered, the poor and the weak living on the margins of society pay the price.

The desire for peace, security and stability is one of the deepest longings of the human heart. It is rooted in the Creator who makes all people members of the one human family. This desire can never be satisfied by military means alone, much less the possession of nuclear weapons and other weapons of mass destruction. Peace cannot "be reduced solely to maintaining a balance of power between enemies; nor is it brought about by dictatorship" (Gaudium et Spes, 78). Peace must be built on justice, socio-economic development, freedom, respect for fundamental human rights, the participation of all in public affairs and the building of trust between peoples. Pope Paul VI stated this succinctly in his Encyclical Populorum Progressio: "Development is the new name for peace" (76). It is incumbent on us to adopt concrete actions which promote peace and security, while remaining always aware of the limitation of short-sighted approaches to problems of national and international security. We must be profoundly committed to strengthening mutual trust, for only through such trust can true and lasting peace among nations be established (cf. John XXIII, Pacem in Terris, 113).

In the context of this Conference, I wish to encourage sincere and open dialogue between parties internal to each nuclear state, between various nuclear states, and between nuclear states and non-nuclear states. This dialogue must be inclusive, involving international organizations, religious communities and civil society, and oriented towards the common good and not the protection of vested interests. "A world without nuclear weapons" is a goal shared by all nations and echoed by world leaders, as well as the aspiration of millions of men and women. The future and the survival of the human family hinges on moving beyond this ideal and ensuring that it becomes a reality.

I am convinced that the desire for peace and fraternity planted deep in the human heart will bear fruit in concrete ways to ensure that nuclear weapons are banned once and for all, to the benefit of our common home. The security of our own future depends on guaranteeing the peaceful security of others, for if peace, security and stability are not established globally, they will not be enjoyed at all. Individually and collectively, we are responsible for the present and future well-being of our brothers and sisters. It is my great hope that this responsibility will inform our efforts in favour of nuclear disarmament, for a world without nuclear weapons is truly possible. From the Vatican, 7th December 2014 FRANCISCUS PP.

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