

Glaciers, Graves, and Stratosphere Tracing the Prophets of Gloom

by Zbigniew Jaworowski

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'We shall humanize the biosphere of the Earth, and then the worlds beyond. This our future role, as the discovery of radioactivity itself, is a result of natural evolution.'



Dr. Jaworowski's colleague, K. Cielecki, excavating an ice sample from a shaft in the middle of an ice cliff at Jatunjampa Glacier in the Peruvian Andes. The black lines reflect a summer deposition of dust on top of particular annual ice layers. The black layer near the top of Cielecki's head was formed after the 1963 eruption of volcano Gunung Agung in Bali, Indonesia, causing the highest volcanic dust veil in the atmosphere since 1895. Some of the other black lines reflect local eruptions.

EDITOR'S NOTE

In 2006, Dr. Jaworowski began to write an autobiography in Polish, a project that he did not live to complete. Here is his outline for the autobiography, in his own English. It was written as a book proposal for circulation to English-language publishers. We publish the outline here, along with his curriculum vitae, because the two documents convey so much of Dr. Jaworowski's spirit and accomplishments. Subheads have been added.

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Audience

Glaciers, Graves, and Stratosphere is intended as a popular science book, addressed to a general public interested in environmental problems. It will summarize research on the current and pre-industrial contamination of the global atmosphere and population, based in large part on my own field and laboratory work, interlaced with narratives of the glacier expeditions (including my encounter with Idi Amin, the President of Uganda, who arrested all the members of the Ruwenzori expedition), of collecting human bones in such places as the Cathedral of Notre Dame de Paris, ruins of monasteries smashed up by the French Revolution, in catacombs of the Cathedral of San Francisco in Lima, in the oldest Christian churches in the then-Soviet Georgia, and in many sacred and archaeological sites in Poland.

The book will discuss the common fears and myths cultivated



Zbigniew Jaworowski (right) working with ion exchange columns in a laboratory tent at Kahiltna Glacier, Alaska, 1977.

by extreme environmentalists, such as radiophobia, chemiphobia, global warming, destruction of the ozone layer, and overpopulation, and will expose the origin of misanthropic catastrophism, as professed by leading representatives of the United Nations, of some governments, and of environmental movement.

Publication of the book will be timely, as the disastrous economic and social consequences of implementations of the Kyoto Protocol and former environmental restrictions imposed on industry, and especially on nuclear energy, are now becoming more interesting topics for the informed public than before.

Overview

Background

Glaciers of the world are a kind of history book that keeps a record of past natural and man-made pollution of the atmosphere—the annual ice layers that form the glaciers preserve ancient precipitation, together with impurities leached from the air by falling snowflakes. Contamination of the humans who lived in past ages is recorded in their bones.

Some forty years ago I started to analyze these layers, and ancient and contemporary human bones. In 1968, I published in *Nature* the first account of the secular changes of the lead content found in glacial ice and in man. I was looking for information about how modern industry changed the natural levels of heavy metals and radioactivity in the environment and the human body. For this aim, in cooperation with the U.S. Environmental Protection Agency, the Norwegian Polar Institute, and other institutions in several countries, I organized 11 expeditions to 17 glaciers in the Arctic, Antarctic, Alaska, Norway, the Alps, the Himalayas, the Rwenzori Mountains in Uganda, the Peruvian Andes, and in the Tatra Mountains in Poland.

Using Soviet-made MIG fighter planes, I measured the long-term changes of radioactive dust and stable lead content in the troposphere and stratosphere, and the rate and range of the quiescent upward transport of particulate pollutants from the Earth's surface to high altitudes. I used the radioactive substances dispersed by nuclear test explosions and by the Chernobyl accident as tracers for a quantitative estimate of this trans-

port, and of the flow of heavy metals from natural and anthropogenic sources into the global atmosphere.

This enabled a comparison of the mass of natural and man-made chlorine ascending to the ozone layer.

In churches, caves, and archaeological sites in Poland, France, Georgia, and Peru, I also collected hundreds of ancient human bones from the past 5,000 years, to find out, for the first time, what is the level of lead and other metals in modern man in comparison with that in our ancestors.

The results of these studies suggest that concentrations of lead, cadmium, vanadium, mercury, uranium, and radium in the global atmosphere were lower in the 20th Century than in the pre-industrial period (probably due to higher volcanic activity in the past ages); and that in contemporary snow, their highest concentrations were not in the European glaciers, but in remote regions of Africa and the Andes.

The human contribution to the flow of metals into the global atmosphere is small, ranging from 0.07 percent (uranium) to 7.8 percent (lead). In the Middle Ages, the level of lead increased in human bones by a factor of about 100 from a low prehistoric level, and remained high until the end of the 19th Century. In the 20th Century, at the same time when lead alkyls were introduced into automotive gasoline and the production of lead



Transporting supplies to Jatunjampa Glacier in the Peruvian Andes



Gathering ice samples at one of the 17 expeditions that Dr. Jaworowski organized. "Glaciers of the world are a kind of history book that keeps a record of the past natural and man-made pollution of the atmosphere. . . ."

increased dramatically, the content of lead in humans abruptly decreased to near the prehistoric level.

Heavy Metals

I found that the level of heavy metals in the bones and soft tissues of people living in the most polluted industrial region in Poland (Upper Silesia) is lower than that in less polluted regions. The level of metals in the Polish population depends on the geochemistry of particular regions, rather than on the pollution of the local atmosphere.

I studied the levels of radioactive lead-210 in the glaciers and in the stratosphere to elucidate a construction detail of nuclear weapons, important for estimation of risk from radioactive fallout. I was involved in studies and preparation for protection of the public against the radiation effects of nuclear attack and nuclear catastrophes.

These preparations, which were implemented in Poland, passed the exam of the Chernobyl accident well. I published several papers on radiation hormesis, i.e. the beneficial effects of ionizing radiation, and I analyzed the causes of radiophobia—an irrational fear of even

the near-zero doses of radiation and of all things nuclear.

The Global Warming Hypothesis

The ice core records of greenhouse gases became a cornerstone of the man-made climatic warming hypothesis. My experience with polar and high-altitude glaciers led me to that part of climatology. I contributed several papers on the reliability of ice-core records for recon-

struction of the chemical composition of pre-industrial and ancient atmosphere. I found that these reconstructions are biased by frequent rejections of inconvenient analytical results, unjustified assumptions, and the neglect of gas fractionation processes in the ice sheets and in the ice cores.

I also studied the influence of pollution and of the alleged man-made global warming on the Arctic biota.

Radiation and Radiophobia

My work with radiation and radioactivity convinced me that the discovery of radiation at the end of the 19th Century was one of the greatest achievements of science. It was a key to knowledge of intrinsic patterns of the micro-world and of the cosmos. Its important practical application is now nuclear energy, the fission form of which can support all the needs of humanity for several thousands of years, and the fusion form of which can extend this for billions of years.

Access to this unlimited energy source will enable the material and spiritual enrichment of humanity above what one can now imagine. It renders possible changing us from a merciless exploiter of the biosphere, into its defender and benefactor, responsible for its safety and survival for eons to come.

We shall humanize the biosphere of the Earth, and then the worlds beyond.



A glacier camp site. The highest concentrations of heavy metals, Dr. Jaworowski says, "were not in the European glaciers, but in remote regions of Africa and the Andes." Modern industry has had a detoxifying effect on the environment.



Surveying a glacier. In his studies, Dr. Jaworowski found that “concentrations of lead, cadmium, vanadium, mercury, uranium, and radium in the global atmosphere were lower in the 20th Century than in the pre-industrial period (probably due to higher volcanic activity in the past ages).”

This our future role, as the discovery of radioactivity itself, is a result of natural evolution.

Composition

I anticipate that *Glaciers, Graves, and Stratosphere* will be about 300 pages long. Writing is currently under way; about 150 pages are completed. This text is now in Polish. I shall translate it, and the rest of the book will be written in English. The book will be comprehensively illustrated by photographs from glacier expeditions, and diagrams.

I

The book will begin with an Introduction, answering the question: Do humans endanger the planet?, and address the following subjects:

(1) the fiasco of the catastrophic prophecies of the Club of Rome;

(2) current fears: radiation, nuclear war, nuclear power, heavy metals, CO₂ and climatic warming, exhaustion of raw materials and fossil fuels;

(3) causes of a negative approach to civilization;

(4) projection of local environmental disasters to the global scale, and the illusion of stability of the biosphere;

(5) illusion of the past Golden Age and of benevolent nature;

(6) how the span of human life changed between the Neolithic and present time; what were the living conditions in European cities around 1900 and before, and how moribund people suffered before the development of medicine in the 19th and 20th centuries; how old people were treated until the 19th Century in Europe and elsewhere (*Hexagenari ex ponte!*); hunger and cannibalism in Poland, Scandinavia, and elsewhere;

(7) the present period is the best in all of history—the Golden Age is now;

(8) how technology and mass enrichment caused a deep cultural change in the second half of the 20th Century, replacing the worrier virtues with more angelic ones, and changing our approach to nature, which is no longer seen as an enemy but as a precious endowment,

loved and protected, comparing Dante, Joseph Conrad, and other classics with recent literature, as examples of this change.

II

Beneficial Radiation

Natural ionizing radiation and its levels in various regions of the world. Effects of high and low radiation doses. The administrative (linear no-threshold LNT) assumption that even a near-zero radiation dose brings deleterious effects; its history and conflicts within the United Nations Scientific Committee on the Effects of Atomic Radiation UNSCEAR.

Beneficial (hormetic) effects of low doses of radiation. Radiophobia: its sources. Economic and social costs of regulations based on LNT.

III

Nuclear War and Terrorism

Real and imaginary dangers. Current nuclear arsenals, strategic plans, and possible human losses. Why the danger of atomic war is greater now than it was

during the Cold War. Vehement protests against nuclear tests and nuclear power (from which populations receive trifling radiation doses), the weak reaction against the mass production of nuclear weapons, and no movement for banning their use. Psychological effects of building enormous nuclear arsenals and nuclear war planning, their influence on

“Why the danger of atomic war is greater now than it was during the Cold War.”

public disenchantment with science, pessimism of intellectuals, and development of the ecology movement.

IV Nuclear power

Duration of global resources of nuclear fuels compared with other sources of energy. Limitations of renewable energy sources. Occupational and public health effects of various sources of energy. Radioactive wastes from global nuclear power compared with natural radioactivity in soil. Average doses of radiation received by global and regional populations, from all natural and man-made sources. Accident at Three Mile Island and strangulation of the U.S. nuclear power program. Overplaying of man-made climate warming by the atomic lobby, and ignoring of nuclear power by proponents of the Kyoto Protocol.

V The Chernobyl catastrophe

The greatest psychological catastrophe in history. Comparison with other industrial catastrophes. Dispersion of radioactive material in the troposphere and stratosphere. Local, regional, and global contamination. Radiation doses received by rescue and operational teams. Radiation doses received by local and regional population. Radiation doses received by European and global population, in comparison with doses of natural radiation. Paranoid role of mass media, and scientific reports on mass fatalities and genetic disorders.

Realistic estimates by UNSCEAR of early fatalities and late health impacts. Economic and social losses and their causes. Lessons for the future.

VI Heavy metals in ice and man

Lead and a false hypothesis of the fall of the Roman Empire. Toxic and beneficial effects of heavy metals. Natural levels of lead and other heavy metals in the environment and human population—models and reality. Secular changes of the concentration of heavy metals in the global atmosphere, based on analysis of ancient and contemporary glacier ice from both Hemispheres, and on results of the stratospheric sampling program. Changes of levels of heavy metals in humans during the past 5,000 years. Mass lead poisonings from the Middle Ages until the end of the 19th Century. Detoxification of the population by modern industry.

VII CO₂ and man-made climate warming

History of the man-made climate warming hypothesis. Climatic cycles and temperature changes during the past 545 million years. Contribution of water vapor, CO₂, and other trace gases to the global greenhouse effect. High CO₂ concentrations measured in the 19th Century atmosphere ignored by modellers. Concentration of stable isotopes of carbon in 20th Century air do not support the assumption of a dramatic increase of anthropogenic CO₂ in the atmosphere.

Low pre-industrial levels of CO₂ in air

recovered from Arctic and Antarctic ice cores became the cornerstone of the man-made warming hypothesis. However, these levels do not reflect the real chemical composition of the atmosphere, but of artifacts in ice sheets and in the ice cores.

Progress and retreat of glaciers between the 18th and 21st centuries. Lack of correlation between CO₂ concentration in air and temperature: Change in temperature precedes CO₂ change. Disagreement of model predictions of air temperature in the Arctic with measurements. Influence of solar cycles and galactic cosmic rays on the climate. Improper attribution of recent hurricanes to global warming. No danger of flooding the Maldives. Positive effects of current climate warming, which is a continuation of our emerging from the Little Ice Age.

VIII Epilogue

Replacement of old imaginary fears with new ones, and their commercialization. Short history of the environmental movement, that started in pre-war Germany, and then gained power in the United States and elsewhere with the support of politicians, bureaucracy, and the media, and by dishonest manipulation of the altruism of the public. Real danger is not the environmental doom professed by ecological fundamentalists, but rather the consequences of implementation of their environmental ideology.



A multi-national glacier expedition. The findings on lead were startling: In the 20th Century, when the production of lead increased dramatically, the content of lead in humans “abruptly decreased to near the prehistoric level.”