

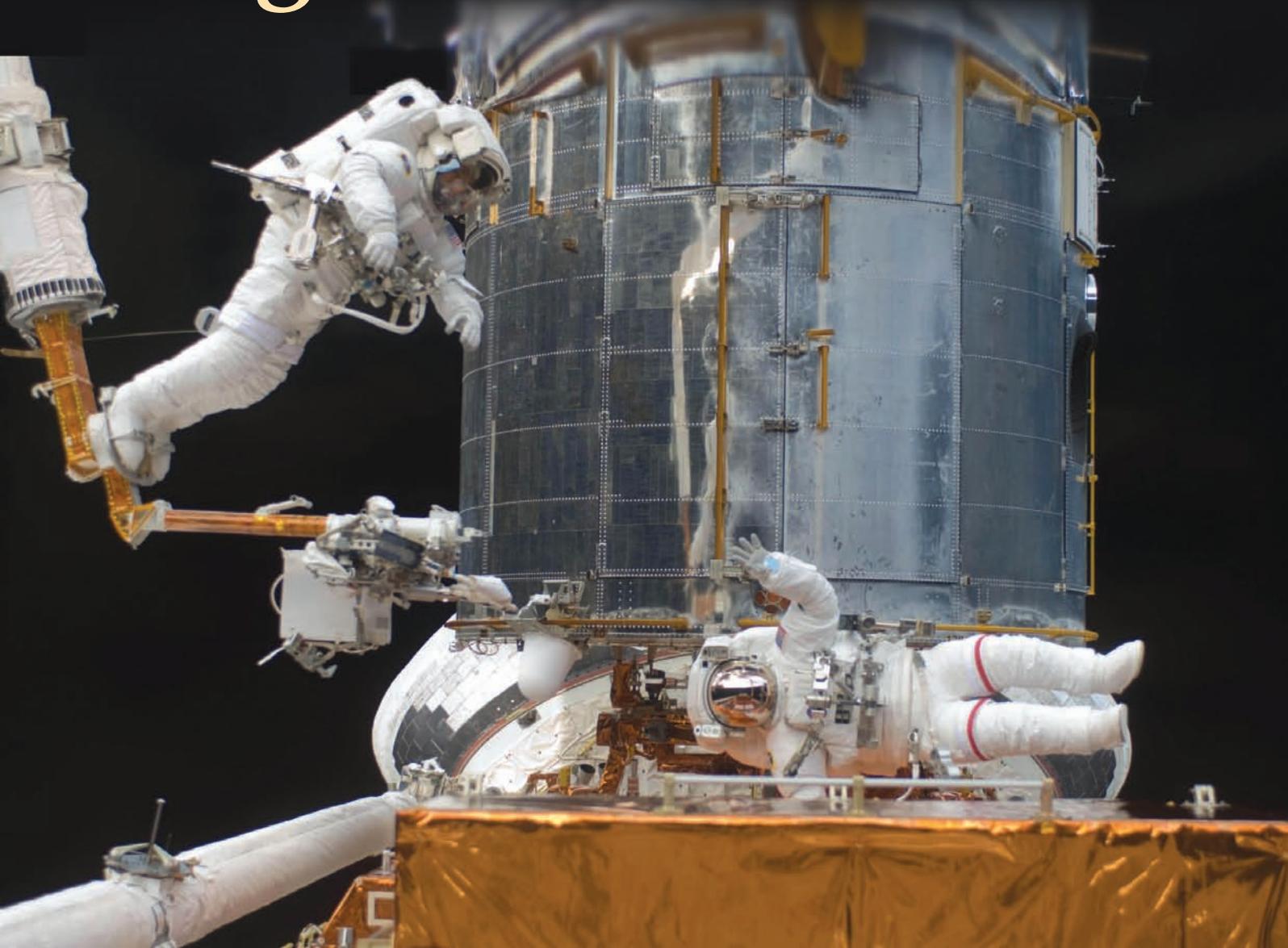
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Science Against Green Nazis



- How to Feed the World
- The Sun Rules Climate
- Stimulate the Economy with Nuclear Plants

21st CENTURY SCIENCE & TECHNOLOGY

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Astronauts Andrew Feustel, tethered to the end of the remote manipulator system arm, and John Grunsfeld, a few feet away, servicing the Hubble Space Telescope during the third spacewalk of the Shuttle mission, May 16, 2009. The Hubble is locked down in the cargo bay of the shuttle. Photo courtesy of NASA; cover design by Alan Yue.

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A Manned Space Program Is Our Future

Unleashing the power of the atom, and lifting man into space are the keys to a science-driver economic recovery for the United States and the world. The alternative is a Dark Age collapse of globally extended civilization, and decline of the human population from the present 6.7 billion to the 1 to 2 billion as prescribed by Britain's Prince Philp and other leaders of the Nazi reincarnation known as the environmental movement.

On July 20, mankind will celebrate the 40th anniversary of the greatest technical achievement of the 20th Century—the first landing of men on the Moon. For the first time, man expanded his sphere of activity beyond the Earth, demonstrating dramatically that, as there are no limits to man's creative capabilities, there are no limits. Period.

But before the first American astronauts had even left Earth orbit, the manned space exploration program was facing a crisis. Consumed by the cost of the failing war in Vietnam, President Lyndon Johnson would make no commitment for a post-Apollo space exploration program. When the development of the Saturn V Moon rocket was essentially completed, in 1965, layoffs began at NASA's Marshall Space Flight Center in "Rocket City," Huntsville, Alabama.

President Nixon threw away the heritage of Apollo, just as he threw away President Franklin Roosevelt's Bretton Woods system. The United States was put on the road to economic catastrophe.

After the last Saturn rocket flew, in 1975, and the launch pads at Cape Canaveral fell silent, thousands lost their jobs. The cost, in human terms, was one of the highest rates in the country of divorce, alcoholism, and suicide, the waste of a generation of the country's most precious scientists and engineers.

For six years, until the maiden flight of

the Space Shuttle in April of 1981, the country that had landed men on the Moon could not launch astronauts into space.

Continuing Bush's Flawed Space Program

Today, the space program again faces an existential crisis. As things now stand, there will be a continuation of the flawed Moon/Mars program of President George W. Bush. The Space Shuttle will be retired in 2010, and in order to "save money," the next-generation manned space vehicle, Orion, will not be ready until 2015. And while many pledged that there would not be a repeat of the post-Apollo destruction of the space program, that is exactly what is unfolding. Over the next few years, the workforce that has made it possible to launch human beings into space over the past quarter century will, in large part, disappear.

So far, the Obama Administration has taken no steps to either preserve the infrastructure that exists, by extending Shuttle flights past 2010, or to ensure that there will be a continuity of exploration missions, by increasing funds to accelerate the Orion program.

Rather, the fiscal year 2010 budget submitted to Congress in early May, calls for yet another in a long line of "space policy reviews," which will further delay a reversal of a long line of failed policies.

Why does this matter?

Every civilization has progressed by undertaking great projects. These challenge a society to mobilize its scientific, technological, and material resources for new breakthroughs, creating economic and cultural quantum leaps into the future.

Such were the great astronomical observatories of the ancient world, the Renaissance cathedrals, and the exploration of space, all of which lifted man's



eyes toward the unknown, and beckoned him to discover the fundamental principles of the universe.

There are many reasons to explore space. One, often cited, is the array of new technologies that then are deployed in to the economy. More than half of the real growth in the physical economy over the period of Apollo development, and through the 1970s, is attributable to advances in science and technology, for the most part, through the space program.

The Surest Path to Growth

How foolish, therefore, to argue that there is “not enough money” in the deficit-ridden Federal budget for space exploration,” when it is our nation’s surest pathway to economic growth. Even leaving aside the trillions of dollars of bank bailouts, which will lead to a hyperinflation not seen since Germany in the 1920s, there is *nothing* that Federal tax dollars can be spent on that will have a more dramatic, and long-lasting positive impact on the economy today, than space exploration.

But even more crucial than the economic benefits of such a national great project, is the philosophical and cultural paradigm shift that it creates.

Former NASA Administrator Mike Griffin has pointed out that exploring space requires the same “constancy of purpose across years and decades” as that of the cathedral builders, 600 years ago. Work on space exploration missions require

that “you have to be willing to defer gratification, and to spend years doing what we do, and then stand back and see if it works. We learn how to leave a legacy,” he continued, “because we work on things that all of us will not live to see—and we know it.”

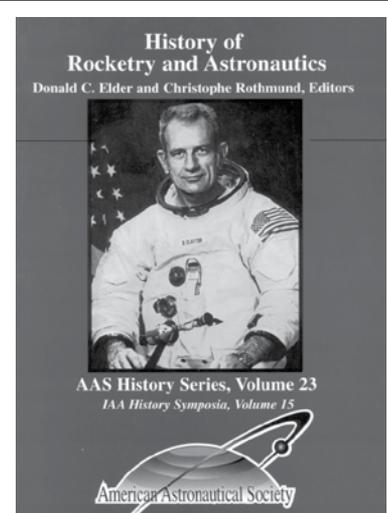
As economist Lyndon LaRouche has repeatedly stressed, unlike any other species of life on the Earth, man is immortal. This is so, because, in a life well lived, man leaves behind the creative contributions he has made, to be built upon by his posterity.

The present policies of the Obama Administration not only will rob the majority of Americans of their present livelihood (through cuts in health-care services, Social Security, and other benefits, and energy shortages that are promoted under the guise of “saving the planet” with 17th Century technologies, and overall hyperinflation), but also they will rob us of our future.

No nation has achieved greatness by conserving, tightening its belt, or turning back the hands of time. These are prescriptions for disaster.

There is precious little time to stop in midfield, make a 180-degree turn-around, and return the United States to a commitment toward great projects. And the greatest great project for humanity in the 21st century, is the exploration of space.

—Marsha Freeman



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Fourth-Generation HTRs And Recycling: A Dialogue

Dr. George Stanford, a retired nuclear reactor physicist from Argonne National Laboratory, commented on the feature in the Fall-Winter 2008 issue "The Nuclear Power Revolution: Modular High-Temperature Reactors," http://www.21stcenturysciencetech.com/Articles%202008/F-W_2008/HTRpackage.pdf. Dr. Stanford helped develop the Integral Fast Reactor, a liquid metal breeder reactor that was stopped before it could be commercially introduced. Here he raises the difficulties in recycling the used fuel particles in the modular HTR designs.

The issues he posed are responded to by Dr. Ken Schultz for the General Atomics GT-MHR and Dr. Albert Koster for South Africa's PBMR. Instead of our usual letters format, we print the letter from Dr. Stanford with the responses interpolated.

GEORGE STANFORD

Recycling is the elephant in the living room.

The pebble-bed reactor is appealing in many ways, and might well have useful applications. But I can't get enthusiastic about it until there is convincing indication that the spent fuel can be economically recycled.

Here's the situation. The fuel enrichment is not given in the article (at least I can't find it), but values in the range of 8 percent to 20 percent are quoted elsewhere for PBMRs. Let's say it's 12 percent (the bottom line isn't very sensitive to the enrichment). Enriching natural uranium to 12 percent leaves about 95 percent of the ore's energy in the depleted uranium (DU). The article says that the burnup is 65 percent, and 65 percent of 5 percent is 3.2 percent—which is indeed better than the ~0.8 percent that current thermal reactors give us, but even so,



some 97 percent of the ore's energy remains unused.

KEN SCHULTZ

Well, he's right, this is the magic of the breeder reactor, but the 97 percent is really "potential energy": You have to convert it into plutonium to turn it into available energy.

ALBERT KOSTER

The argument is disingenuous. Even when (if ever) breeder reactors become economical and technically proven, there will be a large amount of depleted uranium left over as it will be impossible to convert everything to Pu. It is in any case possible, and proven in the THTR [Germany's Thorium High Temperature Reactor] that a reactor like the pebble bed can become a near-breeder; it is all a question of economics. As light-water reactor (LWR) fuel has to be recycled in some way to encase the fission products, it may make economic sense to extract the Pu and make it into mixed oxide (MOX) fuel, but this is far from a certainty [The British plant at] Sellafield is closing down a 10-year old MOX fuel plant.

Spent Fuel

GEORGE STANFORD

The article says, "The HTRs produce just a tiny amount of spent fuel, the less to store or bury." I think "tiny amount" overstates the case. Maybe someone more conversant with reactor dynamics than I am will estimate

the amount of transuranics left in the used fuel. I suspect that the amount must be ~50 percent or more of the 240 kg/GWe-yr that remains in LWR spent fuel, and considerably more than that in terms of heat generation, because of a larger proportion of higher actinides—and it is the rate of heat generation that determines the capacity of an underground repository.

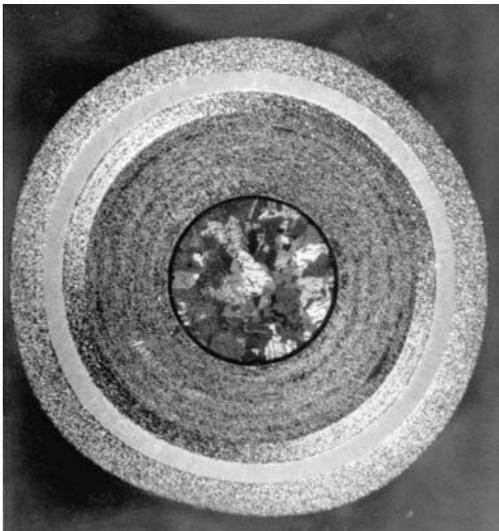
In other words, if the PBMR's spent fuel is not recycled, there will still be a significant amount of long-term, transuranic waste to be dealt with. Quantitative info here would be helpful.

KEN SCHULTZ

The HTGR (pebble or block) has higher thermal efficiency (48 percent) than a light water reactor (32 percent), so it produces less waste per unit of electricity produced. It also has deeper burnup of the fuel and so produces about 40 percent as much actinides as a light water reactor.

The big benefit of an HTGR for actinides is that the spent fuel—or even spent light water reactor fuel—can be recycled ("self-generated recycle") without the uranium (so no additional actinides are produced). The final spent fuel actinide waste volume would be reduced 87 percent and the heat load by 94 percent, compared to once-through LWR fuel.

So, each year, fresh fuel is put in, once-through fuel removed and repro-



General Atomics

Inside a fuel particle: This is a magnified photograph of a .03-inch fuel particle for an HTR, cut away to show the layers of ceramic materials and graphite surrounding a kernel of uranium oxycarbide fuel. The fission fuel stays intact in its "containment building" up to 2,000°C (3,632°F). This containment makes recycling the fuel more difficult, but not impossible.

cessed, and the actinides are put back in (separate blocks or pebbles from the fresh), and the twice-through fuel is retired with about a 90 percent reduction

in the amount of long-lived stuff to take care of.

ALBERT
KOSTER

Figures for the amount of transuranics are available, but it is a fallacy to think they can be used on their own to produce power without mixing with uranium, as such fuel will exhibit a positive temperature coefficient which can only be corrected by adding other metals in a way never yet tried and proven except for thorium in the THTR.

The only way to get rid of transuranics is with an accelerator and it leaves open the question of transporting significant amounts of dangerous materials to such installations, which are, in any case, far into the future. Removing transuranics has the only advantage that it reduces the time that spent fuel needs to be stored from 100,000 years to a few thousand, which is hardly worth the effort as a permanent storage is still needed.

KEN
SCHULTZ

The concern that Dr. Koster raises about avoiding a positive tempera-

ture reactivity coefficient is valid, and for a light water reactor or a fast neutron spectrum reactor does indeed mean that plutonium cannot be burned without adding uranium-238 or some other material to provide a negative temperature reactivity coefficient.

However, with the epithermal neutron spectrum of the graphite-moderated GT-MHR or PBMR, a negative temperature coefficient of reactivity can be maintained, even with pure plutonium or spent light water reactor plutonium plus actinides. Thus the GT-MHR or PBMR can achieve a high degree of burnup while not producing additional plutonium.

This idea, called "Deep Burn," would allow the current store of spent light water reactor fuel to be burned down by about 90 percent, while producing useful energy. The remaining 10 percent could be eventually incinerated completely by continual recycling in a fast spectrum reactor or by use of an external source of neutrons, such as an accelerator or a fusion reactor.

Fast Reactors to the Rescue

GEORGE
STANFORD

Without recycling, perhaps more serious than the waste prob-

HTR FUEL CONFIGURATIONS FOR THE PBMR AND GT-MHR

The HTR fuel particles for South Africa's Pebble Bed Modular Reactor are coated with containment layers and then inserted into a graphite sphere to form pebbles the size of tennis balls (at left). Each pebble contains about 15,000 fuel particles. Pebbles travel around the reactor core about 10 times in their lifetime. During normal operation, the reactor will be loaded with 450,000 fuel pebbles.

In the General Atomics GT-MHR, the fuel particles are fashioned into cylindrical fuel rods, about two inches long. These fuel rods are then inserted into holes drilled into the hexagonal graphite fuel element blocks, which measure 14 inches wide by 31 inches high. The fuel blocks, which also have helium coolant channels, are then stacked in the reactor core.

lem is the loss to the nation of valuable fissile material. But all is forgiven if the fuel can be recycled into fast reactors, because then the transuranic inventory becomes an important fissile resource that can be used as seed material for priming fast reactors to meet the growing energy demand, and the long-term waste problem disappears.

KEN SCHULTZ • YES!

ALBERT KOSTER • While the statement is correct, the economics of extracting and reusing the fuel will depend on the cost of fresh uranium (of which there is plenty) and the cost of recycling. Economics rather than politics should dictate how the fuel is used. Intermediate storage for a few hundred years would retain the usable part (fertile material) if it should become economic to reuse.

Is Recycling Feasible?

GEORGE STANFORD • In the Hecht article, the comparison depicted in Figure 1 does, in fact, assume recycling into fast reactors. But so far, I have seen nothing but hand-waving to indicate that recycling is practical. Here's a quote from the article: "As one longtime General Atomics nuclear engineer told me, reprocessing used HTR fuel is absolutely possible—you just have to want to figure out how to do it." (Emphasis added.)

ALBERT KOSTER • In the last three HTR conferences of 2004, 2006, and 2008, there were several articles describing how used HTR fuel can be deconsolidated and recycled. As pebble fuel is ideal for direct disposal and more proliferation-resistant than LWR fuel, the decision to reprocess or not has many facets and is not determined particularly by the remaining fuel.

Not recycling implies a large volume with a low heat content. After reprocessing, the volume is smaller but has a high heat content, posing problems with heat load on the intermediate and final storage solutions.

An Engineering Challenge

GEORGE STANFORD • It's also worth noting that, in other PBMR literature, one of-

ten sees the difficulty of reprocessing cited as a proliferation advantage. The microparticle cross-section on page 22 gives one an inkling as to why reprocessing might be a significant engineering challenge.

KEN SCHULTZ • Both views are right. We developed a reprocessing line for HTGR fuel and operated it with non-radioactive fuel here in San Diego in the early 1970s. The fuel rods were pushed out of the blocks, the coated particles were separated from the rod binder material by crushing and burning, the coated particles were crushed to expose the fuel kernels, which were dissolved in acid to recover the fuel.

So it is possible—we've done it. However, it is more difficult to do than simply dissolving an LWR fuel rod in acid; it requires specialized equipment and more effort, which would make it more difficult to do without detection.

Transuranics

GEORGE STANFORD • Without recycle, the PBMR waste stream will inevitably contain transuranic isotopes—neptunium, plutonium, americium, curium. Per GWe-yr, the amount of transuranics will presumably be somewhere in the range of 100-600 kg (an LWR produces about 250 kg per GWe-yr). It would be useful to have a more accurate estimate of the amount and the heat load per kg.

KEN SCHULTZ • The actinides for a once-through HTGR would be about 100 kg/GWe-yr. For the "deep burn" self recycle it would be about 30 kg/GWe-yr.

ALBERT KOSTER • The assumption that transuranics increase linearly with burnup is wrong, as they will in turn burn off and reach a constant level long before the fuel is removed from the reactor. Indicative values are available in paper HTR-2008-58054.

Repository Requirements

GEORGE STANFORD • You need to know that the capacity of a waste repository does not depend on the weight of the waste products, but on the heat generated by their radioactive decay. And the long-term capacity of the repository is determined,

not by the fission products, but by the heat generated by that small amount of transuranics, which tend to have very long half-lives. The worry that Yucca Mountain might not contain the waste safely for a million years is almost entirely due to the activity of the at-first-sight trivial transuranic content. Predictably, the heat load from PBMR high-burnup waste will be significantly greater, per kg, than from light water reactor transuranics.

Without recycle, the PBMR waste is far from "tiny," being comparable with light water reactor waste in terms of the repository requirements. If the transuranics are recycled into fast reactors such as IFRs [integral fast reactors], the waste from nuclear power—LWRs and PBMRs and IFRs—consists essentially of nothing but a ton of (relatively short-lived) fission products.

In short, PBMRs without recycle will have much greater repository requirements than light water reactors with recycle. With recycle, the PBMR waste does not differ from light water reactor waste, in either nature or quantity.

KEN SCHULTZ • Well, a factor of two improvement without recycle is certainly better than nothing, but he's right, we need to go to reprocessing both to get rid of virtually all the long-lived waste and to access the huge fuel reserves of uranium and thorium. The ideal system is to have our current light water reactors and future HTGRs creating spent fuel (and energy!), the HTGR "deep-burning" the spent fuel, and the fast breeder reactor incinerating the final residue.

Eventually using fusion to do that final incineration and to breed new fuel from uranium and thorium would be better yet. And pure fusion would be best, finally ending all the squabbling.

ALBERT KOSTER • Both writers assume that there is a huge cost of storage for PBMR fuel. In fact, the cost is in the transport of large quantities when not recycled. PBMR policy is to store all the fuel for about 40 years after the core is emptied. This makes it about 100 years from now to make a decision, and the world is going to be much different. Until then the decision on recycling or not is merely academic and/or political.

Compiled by Gregory Murphy

Moon, Not Sun Is Solution To Energy Problems

Former Apollo astronaut Harrison Schmitt gave a real sense of optimism when he told the Heartland Institute's Second International Conference on Climate Change, that the U.S. should stop funding the research and development of renewable energy sources like wind and solar. Instead, Schmitt said, we should be funding the research into developing fusion energy, which uses helium-3 as its fuel source.

In the deuterium-helium-3 reaction, energy is produced in the form of high-velocity protons, which eventually will be able to be converted directly to electricity without first heating a fluid.

"Helium-3 is abundant on the Moon, and that would mean that we will have to go back, and the good thing is, we know how to get there," said Schmitt, a geologist and one-term Senator from New Mexico, who landed on the Moon aboard Apollo 17.

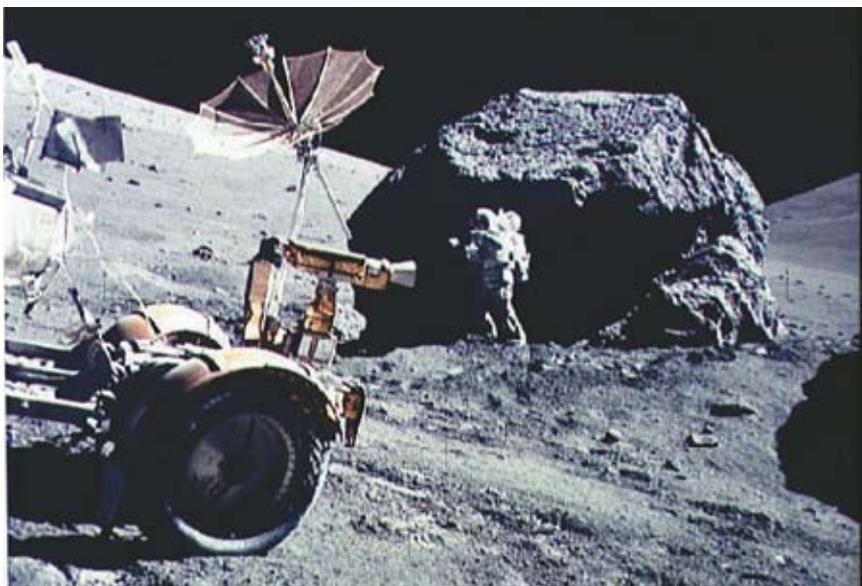
Schmitt said that fusion would provide enormous amounts of energy, as opposed to the uncertain energy produced by wind and solar, which must have a base-load power station to back them up for the times that the wind does not blow and the Sun doesn't shine.

The conference took place in early March in New York City.

Monckton: Environmental Movement Has to Be Outlawed

"The environmental movement has to be outlawed, because their policies have murdered 40 million people, mainly children, with the ban on DDT," Lord Christopher Monckton, a leading science figure in Britain and outspoken opponent of global warming, told a conference in New York sponsored by the Heartland Institute in early March.

"The forces of darkness in the environmental movement want to create a new dark age in which humanity is pushed back to the Stone Age and without the right to light a fire," Monckton said. "They have caused mass starvation and food riots



NASA/Johnson Space Center

Scientist-Astronaut Harrison H. Schmitt standing next to a huge boulder during the third extravehicular activity of the Apollo 17 mission, Dec. 13, 1972. Astronaut Eugene A. Cernan took the photo. Instead of so-called renewable energy, we should be investing in developing fusion, and mining one of its fuels, helium-3, on the Moon, Schmitt told the Heartland Institute climate conference.

with their nonsensical drive for bio-fuels."

Monckton has special authority in describing the genocidal nature of environmentalism. A member of his family played a key role in arranging the 1936 abdication of that chief symbol of Britain's Nazi-loving aristocracy, King Edward VIII.

Monckton called Al Gore's science advisor, James Hansen, the Dr. Strangelove

of NASA, saying, "Hansen's big scare of a sea level rise of 426 feet was too preposterous to be believed" and that "the only threat from sea-level rise is the one being created by the bedwetters."

Monckton said: "There never was a climate crisis, there is not a climate crisis, and there will be no climate crisis. Since there is no climate crisis, the leaders of the world must have the courage to do nothing."

Robinson: Withdrawing Technology Is Genocide

Monckton's sentiments were seconded by Dr. Arthur Robinson, Director of the Oregon Institute of Science and Medicine and the originator of the petition against Al Gore's genocidal global warming hoax, signed by 32,000 scientists (www.oism.org/project/).

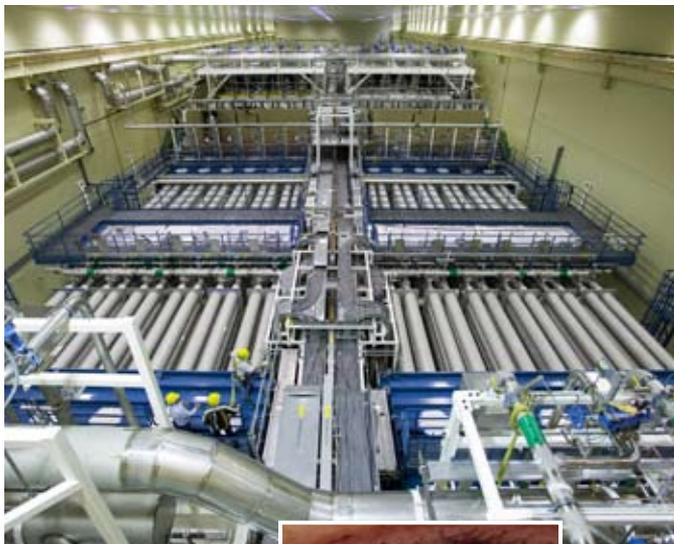
Robinson told the same conference on March 9 that the people like Al Gore who promote global warming alarmism

Continued on page 58



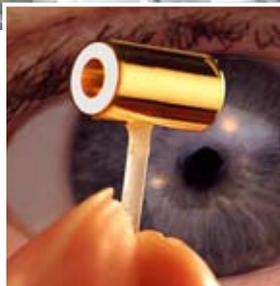
Heartland Institute video

Lord Monckton: "The forces of darkness in the environmental movement want to create a new dark age...."



LLNL

The NIF laser bay comprised of 192 lasers. Inset: The fusion target: a small metal cylinder, called a hohlraum, surrounding a capsule containing a tiny amount of deuterium-tritium fuel.



NIF, WORLD'S LARGEST LASER, READY FOR FUSION!

The National Ignition Facility (NIF) at Lawrence Livermore National Laboratory (LLNL), which was begun in 1995, expects to reach ignition in 2010, when it begins firing its 192 laser beams at the tiny target of deuterium-tritium fusion fuel. The infrared energy from the beams will be converted to 1.8 million joules of ultraviolet energy, delivered to the millimeter-size target (see inset) in a pulse that lasts only 25 billionths of a second. This is equivalent to 1,000 times the electrical generating power of the United States in the same brief time period!

To achieve fusion, the beams compress a hollow shell filled with the hydrogen isotopes deuterium and tritium, to up to 100 times the density of lead, resulting in temperatures more than 100 million degrees celsius and pressures about 100 billion times the Earth's atmosphere. The fusion fuel implodes, releasing much more energy than the amount deposited by the laser beams.

The NIF ignition experiments also will provide data for astrophysics research and the nation's weapons program. For more on NIF, see <https://lasers.llnl.gov/>.

Anticipating success with NIF, LLNL scientists are planning a next step: a fusion-fission hybrid power plant based on a laser fusion source that would drive a blanket of fission material (used fission fuel) surrounding the fusion reactor core. The reactor concept is known as LIFE, for Laser Inertial Fusion-Fission Energy. The timetable is for a pilot plant in 2020 and a demonstration LIFE reactor by 2030. Watch an animation of the LIFE plant at https://lasers.llnl.gov/missions/energy_for_the_future/life/.

KOREAN NUCLEAR PLANTS EACH UPPED PER CAPITA INCOME BY \$1,000

During the 1950s after the Korean War, South Korea's per capita income was a meager \$876. Since the beginning of the nuclear power era in Korea, during the 1970s, this figure rose to \$1,597 per capita and by 2007, the nation's GDP was at an astonishing \$20,000 per capita! This was the message Korean nuclear pioneer Dr. Jong H. Kim conveyed to a student audience at a Malaysian University in May.

According to our student correspondent, Professor Kim explained that economic growth is directly proportional to nuclear development. More electricity enables more factories to be opened and a higher standard of living for the population. This then generates diverse science and high technology-driven sectors coupled with even better living standards for all. Korea now has 20 nuclear plants, with 6 in construction, producing 17,716 megawatts.

The message for Malaysia became clear, our correspondent wrote, Malaysia has to follow South Korea's example and go nuclear! For more on Korea's nuclear program, see http://www.21stcenturysciencetech.com/Articles%202008/Korea_Nuclear.pdf.



Courtesy of Argonne National Laboratory

RFID project manager Dr. Yung Liu examines data on his laptop from the radio frequency identification device, which allows users to track nuclear materials, and remotely monitor environmental and physical conditions such as temperature and humidity.

RADIO FREQUENCY TECHNOLOGY TO MONITOR NUCLEAR MATERIALS

Argonne National Laboratory has developed a unique radio frequency identification (RFID) device that can track and monitor the environmental and physical conditions of containers of nuclear materials in storage and transportation. The system is comprised of active transponders, or tags with long-life batteries, and also has applications outside the nuclear field.

"The Argonne system can simultaneously monitor thousands of drums 24 hours a day, seven days a week. Any abnormal situation, such as a loss of seal, a sudden shock, a rise in temperature or humidity, can trigger an alarm for immediate action," said Dr. Yung Liu, Argonne senior nuclear engineer and manager of the RFID project. The Department of Energy will use the technology, expected to be patented, to modernize its existing management systems for tens of thousands of radioactive and fissile material packages to ensure safety.

MALTHUSIANS RALLY TO BAN DDT—AND INCREASE DEATH RATES AGAIN

The anti-DDT Malthusians within the World Health Organization and the United Nations Environment Program announced a new campaign in May to thwart the use of DDT in spraying the inside walls of houses to stop the spread of malaria. The stated aim is to cut the use of DDT by 30 percent by 2014 and then phase it out entirely. Instead, non-chemical methods of mosquito control and bednets are proposed—with no mention of the fact that these methods have failed over the past 10 years to “roll-back malaria.”

The anti-DDT lobby was unhappy that in September 2006, WHO’s malaria chief, Dr. Arata Kochi, reversed a 30-year policy against DDT, advocating its use in indoor residual spraying because, as he stated, “Of the dozen or so insecticides WHO has approved as safe for house spraying, the most effective is DDT.” DDT not only kills mosquitoes, but repels them, so that even DDT-resistant mosquitoes will avoid entering a house that has been sprayed.

The anti-DDT scientists meanwhile continue to claim that their tendentious studies show that DDT is harmful to human beings. In two separate U.S. studies, we are told that DDT causes lack of infant development and leads to obesity in children, respectively. Meanwhile, one child in Africa dies every 30 seconds from malaria. *21st Century* will have more on this subject in the Summer issue. See also <http://www.21stcenturysciencetech.com/DDT.html>.

ANIMAL RESEARCH NECESSARY TO SAVE HUMAN LIVES!

The Foundation for Biomedical Research has launched a new video campaign to let people know why animal research is necessary in fighting disease, featuring real medical researchers telling their stories. You can watch “Jen’s story” at <http://www.youtube.com/watch?v=NT4ILIDsjGA> and Gail’s story at <http://www.youtube.com/watch?v=oqzhH7DfKsY>. The foundation website offers other short videos, including “Survivor Tales,” a series for television that highlights the impact of translational research on both human and animal health.

GROCERY MANUFACTURERS ASSOC. ISSUES FOOD IRRADIATION REPORT

The Grocery Manufacturers Association has published an 18-page pamphlet on food irradiation, available electronically, which summarizes the state of the research, safety, and world use of irradiation: http://www.gmabrands.com/publications/SPP_Irradiation5.pdf. Intended for consumers, suppliers, and policy-makers, the report includes scientific references, many with electronic links. Each year millions of Americans are sickened by foodborne pathogens, and the U.S. Agriculture Department estimates that at least 5,000 of these people die. Medical costs and losses in productivity from the seven most common pathogens are estimated at between \$6.6 billion and \$37.1 billion annually.

NEW VIDEO TAKES STUDENTS BEHIND THE SCENES OF THE ARES ROCKET

The Futures Channel released a new documentary in May, “Designing and Engineering Rockets,” the third in a series produced to show students what’s involved in building the next generation of rockets that will take man back to the Moon and on to Mars. The film stars the engineers at NASA’s Marshall Space Flight Center who are designing and building the new Ares Launch Vehicle, a 325-foot, 2-million-pound rocket that will go from 0 to 1,000 miles per hour in less than 60 seconds.

The first two documentaries have already been shown in 4,000 classrooms. You can watch the new video at http://www.the-futureschannel.com/dockets/space/engineering_rockets/. We recommend “Revisiting the Moon,” with planetary scientist Dr. Paul Spudis, as another Futures Channel feature that conveys a sense of scientific optimism. The Futures Channel was founded in 1999 with the goal linking the “scientists, engineers, explorers and visionaries who are shaping the future, and today’s learners who will one day succeed them.”

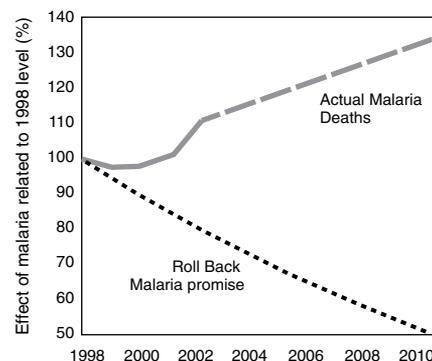


NASA



The Futures Channel

Engineers in front of a model of the Ares launch vehicle. Inset: Artist's drawing of a launch vehicle in flight.



MALARIA DEATHS INCREASED UNDER THE 'ROLL BACK MALARIA' PROGRAM,

The new anti-DDT Malthusian policy means more malaria deaths: The Roll Back Malaria program, a partnership of WHO and UN organizations, has pointedly avoided any use of DDT, and has been an abysmal failure. Since the RBM founding in 1998, deaths from malaria have steadily increased.

Source: Adapted from the *British Medical Journal*, May 8, 2004



NOAA

Sun and ice on a National Oceanographic and Atmospheric Administration expedition to the Arctic.

The Sun, Not Man, Still Rules Our Climate

by Zbigniew Jaworowski, M.D., Ph.D., D.Sc.

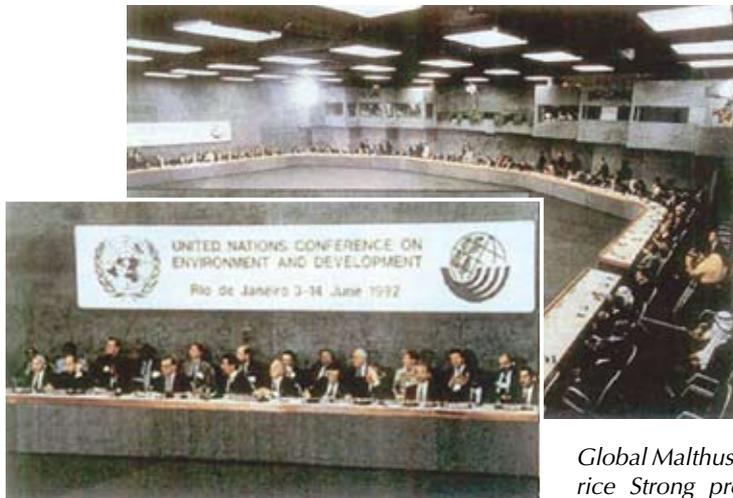
In an op-ed in the Polish weekly *Polityka*,¹ I commented on a remarkable decrease of global temperature in 2008 and over the past decade. Not surprisingly, the op-ed evoked a strong reaction from the Polish co-workers of the Intergovernmental Panel on Climate Change, IPCC, denying the existence of cooling. Surprisingly, however, the criticism dwelled upon a “global climatic conspiracy,” and “colossal inter-

A leading scientist dissects the false “fingerprint” of man-made warming and the Malthusian hand promoting it.

national plot.” I did not use these words nor even hint at such an idea. This idea, however, was probably apparent from the data and facts I presented, showing the weaknesses of the man-made global warming hypothesis.

Without considering the irrational political or ideological factors, in fact, it is very difficult to understand why so many people believe in the human causation of today’s Modern Warm Period, which was never plausibly proven by scientific evidence. I will discuss some of these factors here.

1. *Polityka*, April 12, 2008.



U.N. Photo

Suicidal Conspiracy

A conspiracy stratagem was openly presented by Maurice Strong, a godfather of the global environmental movement, and a former senior advisor to Kofi Annan, U.N. Secretary-General. In 1972, Strong was a Secretary-General of the United Nations Conference on the Human Environment in Stockholm, which launched the world environment movement, and he has played a critical role in its globalization. Twenty years later, Strong was the Secretary-General of the Earth Summit conference in Rio de Janeiro, where, on his instigation, the foundations for Kyoto Protocol were laid.

In an interview Strong disclosed his mindset:

What if a small group of world leaders were to conclude that the principal risk to the Earth comes from the actions of rich countries? And if the world is to survive, those rich countries would have to sign an agreement reducing their impact on the environment. Will they do it? The group's conclusion is "no." The rich countries won't do it. They won't change. So, in order to save the planet, the group decides: Isn't the only hope for the planet that the industrialized civilizations collapse? Isn't it our responsibility to bring that about? This group of world leaders forms a secret society to bring about an economic collapse (Wood 1990).

Strong is listed by Wikipedia in its entry on global warming conspiracy as one of the main partners in the global warming plot, together with Kofi Annan, Al Gore, George Soros, Mikhail Gorbachev, Jacques Chirac, the United Nations, the Bilderberg Group, the Club of Rome, and the ecological movement (Wikipedia 2008)).

The misanthropic ideology professed by Strong, a representa-

tive of the top echelon of the United Nations Organization, is probably more dangerous than any former intellectual aberrations of humanity. It seems that the fear of a population explosion is what motivates it. At the 1992 Earth Summit Conference in Rio, Maurice Strong stated:

We have been the most successful species ever; we are now a species out of control. Population must be stabilized, and rapidly.

Many proposals have preceded and followed this statement, starting with Thomas Huxley's advice that "the surplus population must be disposed of some-

how" and that the unfit "should be chloroformed" (Huxley 1898), followed in 1974 by a rather mild and balanced (in comparison) classified document of the U.S. National Security Council, under the direction of then National Security Advisor Henry Kissinger (Kissinger 1974). This document, National Security Study Memorandum 200 or NSM 200, targeted 13 countries for depopulation by mass sterilization, abortion, family planning, and restriction of food aid. Obviously none of the countries were European.

Influenced by the Malthusian ideology of Club of Rome, the United Nations suggested 1 billion people as the ideal sustainable population (UNEP 1995). Others went even further:

- The outspoken media mogul and owner of CNN, Ted Turner, in a 1992 interview with *Audubon* magazine said: "A total world population of 250-300 million people, a 95 percent decline from present levels, would be ideal.

- The oceanographer Jacques Cousteau suggested: "In order to stabilize world population, we must eliminate 350,000 people per day, as quoted in the *UNESCO Courier*, Nov. 1, 1991.

- A biological method was proposed by Prince Philip: "In the event that I am reincarnated, I would like to return as a deadly virus, in order to contribute something to solve overpopulation" (Prince Philip, 1988).

- Less drastic, but in a similar vein, are recommendations for the medical profession on population control by Prof. Maurice King published in the prestigious British scientific journal *The Lancet*: "... a deliberate quest of poverty ... reduced resources consumption ... setting levels of mortality control." As a new global strategy, King advised: "The birth rate is unlikely to be lowered by measures designed to reduce the child death rate ... by programmes ... for mass immunization. Arguing for "sustainable development," King demands: "Reduced childhood mortality must no longer be promoted.... We should re-



Government of Japan

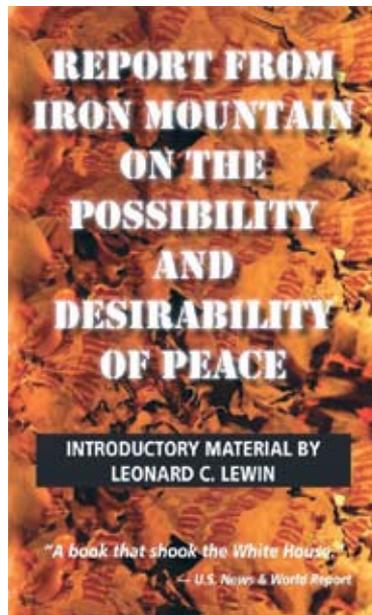
frain from advocating public health policies for other communities ... such desustaining measures as oral rehydration should not be introduced on the public health scale" (King 1990).

This sounds like a faithful repetition of Thomas Malthus's hair-raising recommendations (Malthus 1798).²

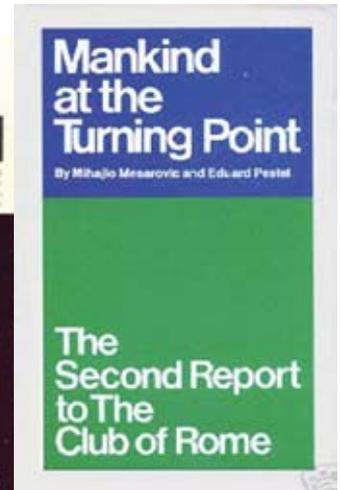
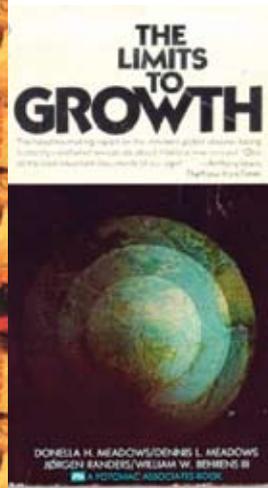
Strong's interview mentioned above, along with similar pronouncements by top American environmentalist bureaucrats,³ explain the motives of the IPCC and of some climatologists, politicians, and the media. The issue of climate was politicized decades ago (Lindzen 2005), and lost its purely scientific character, in the service of ideological, political, and economic aims. Involved in this game are the interests of scientists, whose professional integrity clashes with prospects of lavish projects and esteem.

The source of Strong's ideology may be found in the *Report from Iron Mountain*, which was advertised as the result of a four-year study by a group of 15 American intellectuals, including the future editors of *The Nation* Victor Navasky and Richard Lingeman, novelist E.L Doctorov, and economist John Kenneth Galbraith (Lewin 1967). This 152-page report, reedited in 2002 by DIANE Publishing Company, discussed the long-term perspectives of the end of the epoch of wars, and the need for introducing substitutes to counter the risks caused by standing peace.

At first the *Report from Iron Mountain* was supposedly classified by President Lyndon Johnson, but after a few years it was published in book form as a leak, and immediately became a



The common theme here is that mankind is the global enemy.



bestseller. Although "fictional," the report probably was accurate in reflecting the opinions of the American intellectual and political elites of the time. Later on, many of the programs and institutions it called for became actual policy within the national and international agenda.

The *Report from Iron Mountain* proposed the creation of global police forces, the introduction of a modern form of slavery, eugenics, mass euthanasia, mass welfare, the invention of a new quasi-religious myth on planetary risks, and exaggerated environmental protection, including widespread government spending and controls. What followed were a string of events that led to an explosion of ecological movements including the current climatic hysteria.

Soon after the report's publication in 1967, the U.S. Congress passed the National Environmental Protection Act (1969), and on Dec. 2, 1970, President Richard Nixon established the giant U.S. Environmental Protection Agency (by 2003 the EPA had 17,648 employees), the first environment ministry in the world.

Internationally, such bodies as the U.N. Development Programme, U.N. Environmental Programme (with Maurice Strong as its first chairman), and U.N. Commission on Population and Development all promoted international environmental controls, worldwide social welfare programs, and abortion and population control measures—which seemed to fulfill the message from Iron Mountain.

One of the most important recommendations of the *Report from Iron Mountain* was a need to concentrate public opinion on the contamination of the planetary environment, and on fictitious global enemies. This recommendation was realized by the Club of Rome in its misanthropic report *The Limits to Growth* (Meadows et al. 1972) of which 3 million copies were published. In *Nature* magazine, the Club of Rome report was defined as ludicrous study (Beckerman 1994), and all its predictions of the catastrophic effects of pollution (for example, a total loss of life in the Baltic sea in 2000, caused by pollution and lack of oxygen) and of the depletion of resources, have been proved

2. Malthus wrote: "All the children born, beyond what would be required to keep up the population to this level, must necessarily perish, unless room be made for them by the deaths of grown persons.... To act consistently, therefore, we should facilitate, instead of foolishly and vainly endeavoring to impede, the operation of nature in producing this mortality, and if we dread the too frequent visitation of the horrid form of famine, we should sedulously encourage the other forms of destruction, which we compel nature to use. Instead of recommending cleanliness to the poor, we should encourage contrary habits. In our towns we should make the streets narrower, crowd more people into the houses, and court the return of the plague. In the country we should build our villages near stagnant pools, and particularly encourage settlements in all marshy and unwholesome situations. But above all, we should reprobate specific remedies for ravaging diseases: and those benevolent, but much mistaken men, who have thought they were doing a service to mankind by projecting schemes for the total extirpation of particular disorders. If by these and similar means the annual mortality were increased ... we might probably every one of us marry at the age of puberty and yet few be absolutely starved."

3. Timothy Wirth, President Clinton's Assistant Secretary for Global Affairs, stated: "We've got to ride the global warming issue. Even if the theory of global warming is wrong, we will be doing the right thing, in terms of economic policy and environmental policy."

Richard E. Benedick, Special Advisor to the Secretary General of the 1992 U.N. Earth Summit, and the President of the Committee for the National Institute for the Environment, stated: "A global climate treaty must be implemented even if there is no scientific evidence to back the greenhouse effect."

false.⁴ However, this did not hinder publication of its second report, under the title, *Mankind at the Turning Point* (Mesarovic and Pestel 1976). Its extremely dangerous, paranoid motto: “The World has Cancer and the Cancer is Man,” was widely accepted by the Greens, together with the recommendation to limit everything, which is euphemistically called “sustainable development.”

This policy of intimidation, with its endless procession of menacing specters—all imagined—was continued in the third Club of Rome report (King and Schneider 1991). Its message is as follows:

In searching for a new enemy to unite us, we came up with the idea that pollution, the threat of global warming, water shortages, famine and the like would fit the bill. . . . All these dangers are caused by human intervention. . . . *The real enemy, then is humanity itself. . . .*”

Thus, the “fictitious global enemy” was found, as recommended in the *Report from Iron Mountain*. This is really dangerous, because the suicidal war on such an enemy, appeals to the best altruistic instincts and good will of people, many of whom are ready to sacrifice their prosperity and future to defend the planet Earth against nonexistent threats. This trick ensured the worldwide range of eco-ideology.

The climate issue now became perhaps the most important agenda of the United Nations and politicians—at least they say so.⁵ It also became a moral issue. In 2007, Gro Harlem Brundtland, the U.N. Secretary-General’s Special Envoy on Climate Change, told the U.N. General Assembly, “It is irresponsible, reckless, and deeply immoral to question the seriousness of the real danger of climate change.” Earlier, however, the scare-them-to-death morality of the “climatists”⁶ was explained by Stephen Schneider, a top global warming guru, in an interview with *Discover* magazine:

On the one hand, as scientists we are ethically bound to the scientific method, in effect promising to tell the truth, the whole truth, and nothing but. . . . On the other hand, we are not just scientists but human beings as well. . . . we

4. It was demonstrated already in 1968 that modern civilization had reduced the lead level in 20th Century human beings by a factor of 10 to 100, from the mass of sub-acute lead levels which had existed from the Middle Ages to the end of 19th Century. In 1981, it was demonstrated that the global atmospheric pollution with lead and some other heavy metals was lower in the 20th Century than in the pre-industrial period. See Jaworowski, 1968, 1990a, and Jaworowski et al. 1981.

5. For example: Angela Merkel stated, “Climate Change is the greatest threat that human civilization has ever faced.” President Barack Obama stated: “Climate change is real. Not only is it real, its here, and its effects are giving rise to frighteningly new global phenomenon: the man-made natural disaster.” Prince Charles stated: “Climate change should be seen as the greatest challenge to ever face mankind.” Britain’s Prime Minister Gordon Brown stated: “Climate change makes us all global citizens, we are truly all in this together.” Former British Prime Minister Tony Blair stated: “We have reached the critical moment of decision on climate change. Failure to act to now would be deeply and unforgivably irresponsible. We urgently require a global environmental revolution.”

6. We use the term climatist as defined by an anonymous observer: “Climatology is a science. Climatism is an ideology. Climatologists are scientists. Climatists are social or political organizers who abuse climatology in service of ideologies. Climatology was and still is an investigation of nature. Climatism is the exploitation of the fear of nature to gain power, wealth and social esteem.”



Remy Steinegger/swiss-image.ch

Shock treatment, not science: Rajendra K. Pachauri, IPCC chairman, speaking at the World Economic Forum in 2008.

need to get some broadbased support, to capture the public’s imagination. That, of course, entails getting loads of media coverage. *So we have to offer up scary scenarios, make simplified, dramatic statements, and make little mention of any doubts we might have. . . . Each of us has to decide what the right balance is between being effective and being honest [emphasis added] (Schneider 1989).*

The same moral standard is offered by Al Gore: “I believe it is appropriate to have an over-representation of factual presentations on how dangerous [global warming] is, as a predicate for opening up the audience to listen to what the solutions are” (Gore 2006). In similar vein, Rajendra K. Pachauri, the chairman of the IPCC, commented on the last Fourth PCCC Report: “I hope this will shock people and governments into taking more serious action” (Crook 2007). Thus, the IPCC does not intend to present an objective climatic situation, but rather to shock the people into taking actions which would bring no climatic effects (NIPCC 2008), but rather disastrous global economic and societal consequences. Implementation of these actions would dismantle the global energy system, the primary driving force of our civilization. This is what Maurice Strong and other leaders of Green Movement apparently have in mind.

The political and economic scale of the problem is reflected by the sums planned or already spent to counter the blessed

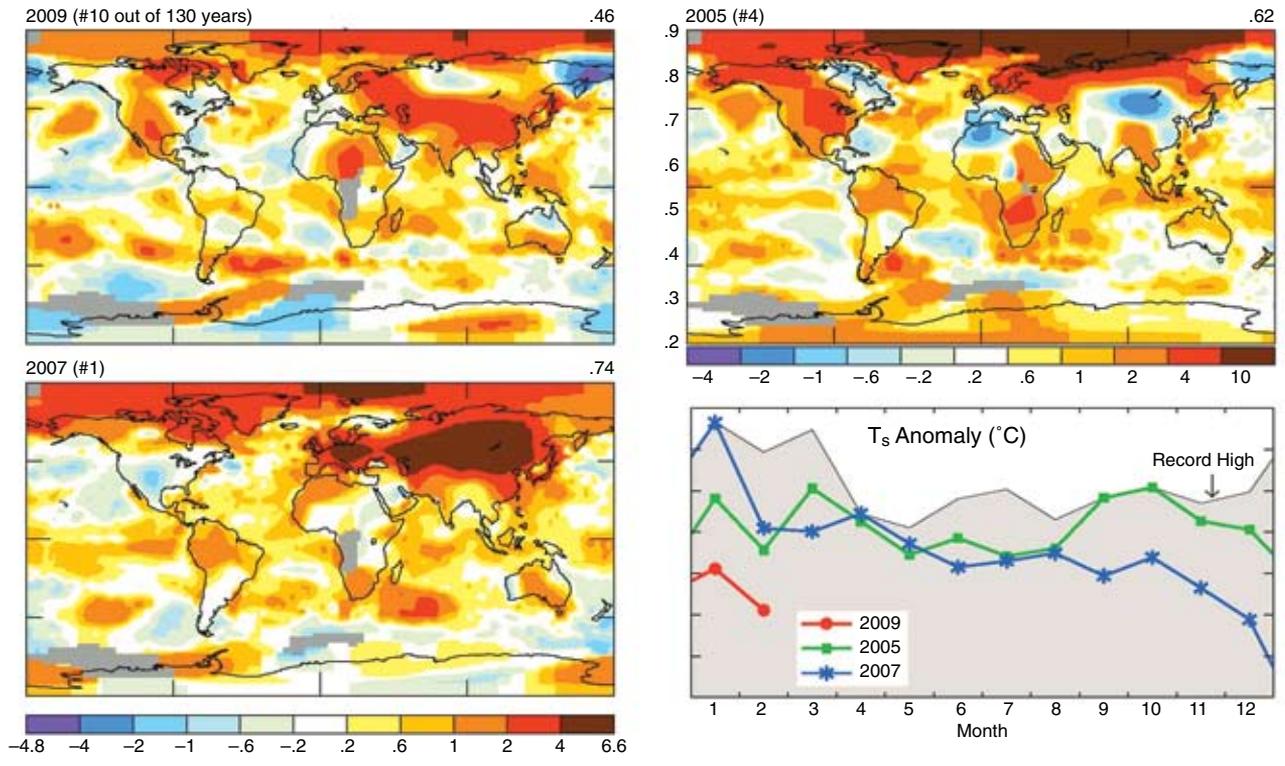


Figure 1
MEAN TEMPERATURE ANOMALY (°C) JAN.-JULY
(Base Period 1951-1980)

Source: <http://data.giss.nasa.gov/gistemp/graphs/>

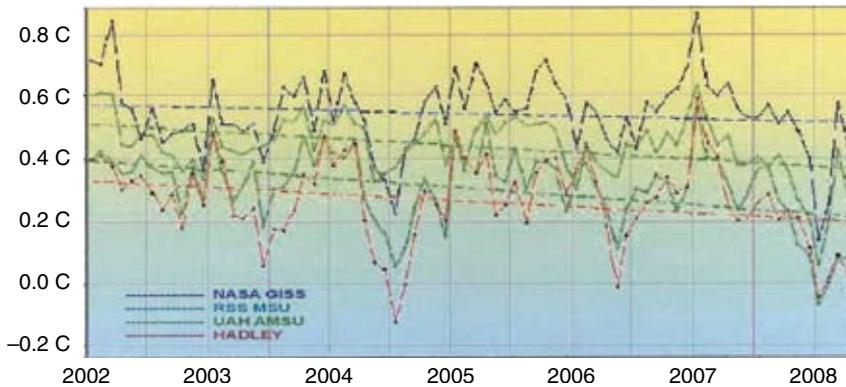


Figure 2
GLOBAL COOLING, JAN. 2002 TO MAY 2008

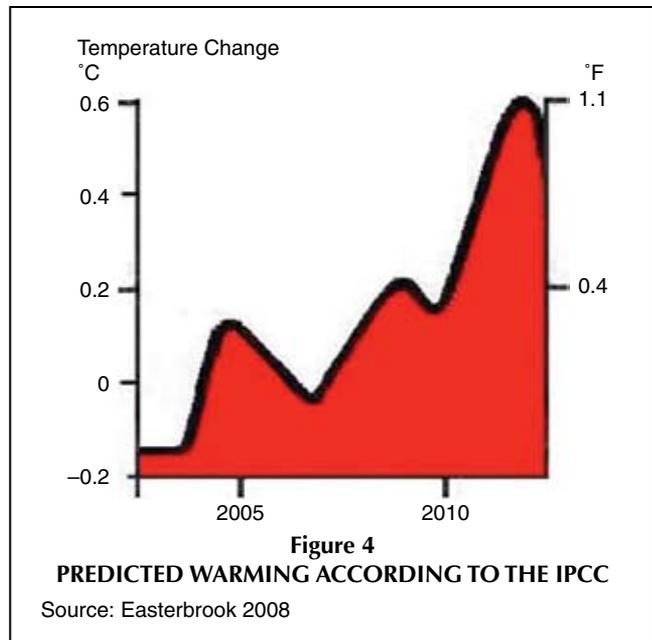
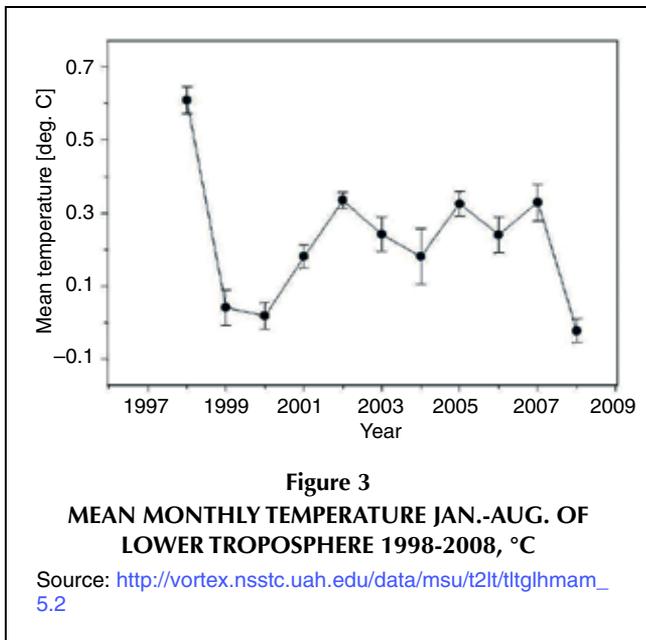
There has been no increase in worldwide temperatures since 1998. In the first five months of 2008, global temperatures were within the error-margin for temperatures in 1940 (McLean 2008).

The global mean surface temperature anomaly (from NASA GISS and Hadley Center model data) and lower troposphere temperature anomaly from RSS MSU and UAH AMSU model data, in °C, from January 2002 to May 2008. Note that all four data sets show a pronounced downtrend since the beginning of 2002. None of the climate models relied upon by the IPCC had predicted this cooling.

natural Modern Warm Period, one of several similar periods enjoyed by the biosphere over the current interglacial.⁷ According to the U.S. Senate Committee on Environment and Public Works, during the past 10 years, promoters of the man-made global warming hypothesis received more than \$50 billion in funding in the United States alone. On the other hand, the skeptics who doubt that this hypothesis is true, received only \$19 million over the past 20 years from Exxon-Mobile, i.e. 0.04 percent of what promoters gained in half that time (EPW 2007).

The International Energy Agency announced in June that cutting CO₂ emissions by half will cost the world

7. During the Holocene Warming 7,800 to 9,500 years ago, at the dawn of the agriculture and great civilizations, the temperature of the Arctic was up to 7°C higher than now, and the polar bears and many other species survived there, and were better off than in colder periods (Jaworowski 1990b).



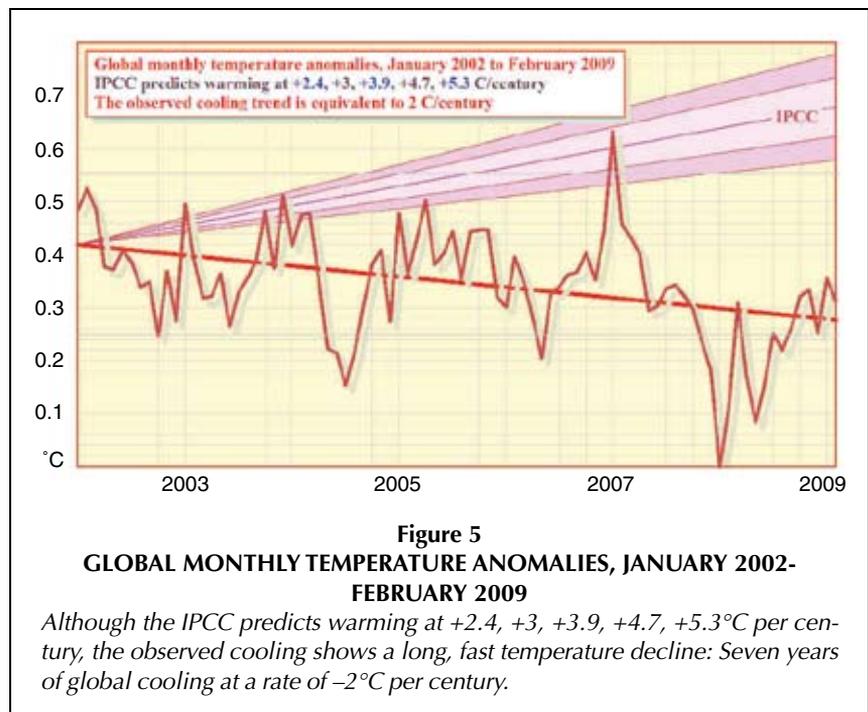
\$45 trillion up to 2050; that is, 1.1 percent of the global GNP each year (Kanter 2008). For this expenditure, one may expect only a trifling climatic effect. Even if a substantial part of global warming were due to CO₂—and it is not—any control efforts currently contemplated, including the punctiliously observed Kyoto Protocol, would decrease future temperatures by *only* 0.02°C, an undetectable amount (NIPCC 2008).

Recent and Future Cooling

The maps in Figure 1 show an increasing cooling of the near-surface atmosphere in January to July of 2005, 2007, and 2008 in the Arctic, Antarctica, North America, Australia, Africa, Southern Asia, and the Pacific and Indian Oceans. This figure also shows the global temperature trends for the whole year, which in most of this period was lower than in the “record high” year of 1998, and in January 2008 was lower by about 0.8°C. Data from four major data sets show a decrease in temperature of both near-surface air and of the lower troposphere between 2001 and 2008 (Figure 2).

In the lower troposphere, the mean temperature of the first eight months of 2008 was cooler by 0.35°C than in 2007. Since 1998, there was a decreasing trend in the lower troposphere temperature. Between 1998 and 2008, the temperature in the first eight months dropped by 0.63°C (Figure 3). The year 2008 was cooler than 2007, and the cooling trend persisted during January, February, and March 2009. Both surface and troposphere observations may suggest that we are entering a cool phase of climate.

These observations are in a total disagreement with IPCC climatic model projections, based on an assumption that the current Modern Warm Period is caused by anthropogenic emissions of CO₂ (IPCC-AR4 2007). The annual increment of global industrial CO₂ emissions increased from 1.1 percent in 1990-1999 to more than 3 percent in 2000-2004 (Raupach et al. 2007), and is still increasing. Thus, according to the IPCC projections (Figure 4), the global temperature should be increasing now more rapidly than before, but instead we see a cold spell (Figures 5 and 6).



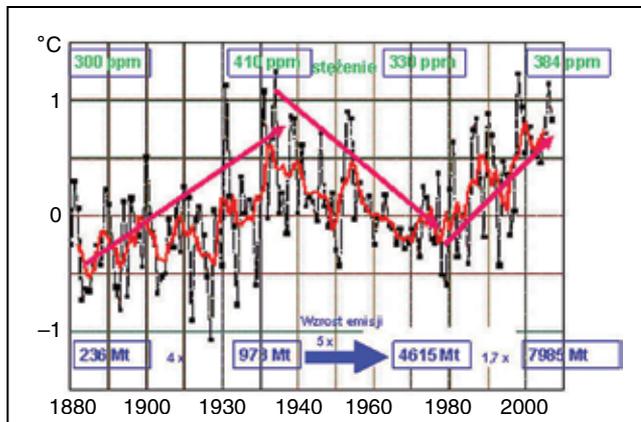


Figure 6
SURFACE TEMPERATURE IN THE UNITED STATES (1880-2007)

The fluctuations of CO_2 concentrations in air (green line) and temperature fluctuations (red line and arrows) are completely unrelated to the rate of increasing CO_2 anthropogenic emissions (in Mt)—blue line. The highest U.S. temperature occurred in 1934; then temperature was decreasing from 1950 to 1975, although at that time the emission of man-made CO_2 increased by a factor of 4.7. From 1975 to 2007, the temperature increased again, but was accompanied by CO_2 emissions that increased at a much lower rate—by a factor of 1.5.

The lack of causative influence on climate change is visible at the geological scale (Figure 7).

The recent cooling observed after 1998 is probably caused by the Sun's activity, which recently dropped precipitously from its 60-year-long record in the second half of the 20th Century, the highest in the past 11 centuries (Usoskin et al. 2003), to an extremely low current level.

The Sun's activity is reflected in the number of sunspots, which normally shows an 11-year periodicity (or 131 months plus or minus 14 months). We are probably still in sunspot cycle No. 23, which had a maximum in 2001 (150 sunspots in September). NASA officially declared this sunspot cycle over in March 2006, with a forecast that the next cycle, No. 24, would be 20 to 50 percent stronger than the preceding one. But the Sun has remained quiet, with only a few sunspots sighted both from the old cycle, and from the new one, which was declared by NASA to start on Dec. 11, 2007. The Sun's activity was still low in the first part of 2008 (NOAA 2008), and August 2008 was (probably) the first month without sunspots since 1913. (Some observations noticed not a spot, but a tiny short-lived pore on August 21-22.) In January, February, and March 2009, the sunspot numbers were 1.5, 1.4, and 0.7 respectively, up to 13 times lower than in corresponding months of 2008 (<http://anhonestclimatedebate.wordpress.com/2009/04/11/sunspot-numbers-for-march-2009/>).

It seems that we still remain in cycle No. 23. William Livingston and Matthew Penn from the U.S. National Solar Observatory in Tucson, Arizona, found that not only has the number of sunspots decreased, but also the strength of their magnetic field. Between 1998 and 2005, the magnetic strength of sun-

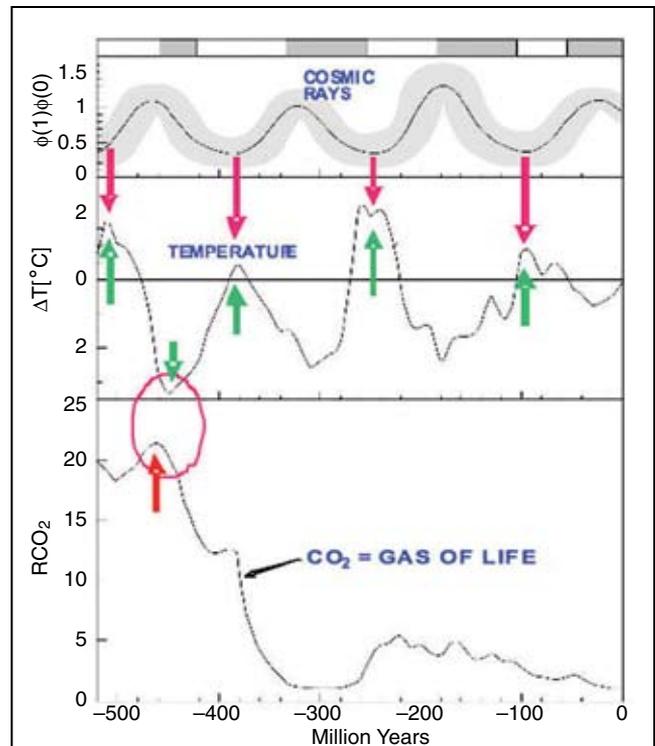


Figure 7

LOWER ATMOSPHERE TEMPERATURES CORRESPOND TO FLUCTUATIONS OF GALACTIC COSMIC RADIATION, NOT CO_2

From a geological perspective, during the past 545 million years, fluctuations of climate were in tune with the cosmic ray flux and not with CO_2 concentrations in the atmosphere. In ancient times, temperature increased when the cosmic ray flux was low, as is observed now. Note that 450 million years ago, when CO_2 levels in the atmosphere were about 20 times higher than now, the temperature was some 3°C lower than now, and Ordovician glaciers covered large parts of the land.

In the past 800,000 years, as in more recent time, there is no causative relationship between temperature and CO_2 ; Temperature changes came first, followed later by changes in the atmospheric concentration of CO_2 .

spots decreased linearly with a slope of 77 gauss per year, and extrapolation showed that it will reach a minimum value in 2015. Livingston and Penn concluded that "this date is when sunspots will disappear from the solar surface" (Livingston and Penn 2008). In 2005, they submitted their study for publication in *Science* magazine, but their paper was rejected on the grounds that it was purely statistical, although their projection fits current observations.

The unusually long period of low activity of the Sun suggests that we may be entering another Maunder Minimum, a period from 1645 to 1715 when almost no sunspots were visible. This was the coldest part of the Little Ice Age (1250-1900), when rivers in Europe and America were often frozen, and the Baltic Sea was

crossed on ice by armies and travellers. Other authors suggest that the Earth will be facing a slow decrease in temperatures in 2012-2015, reaching a deep freeze around 2050-2060, similar to the cooling that took place in 1645-1715, when temperature decreased by 1° to 2°C (Abdussamatov 2004, 2005, and 2006).

Another analysis of sunspot cycles for the period 1882-2000, projected that the cooling will start in solar cycle 25, resulting in a minimum temperature around 2021-2026 (Bashkirtsev and Mashnich 2003). A long-term cooling, related to the Sun's activity, was also projected for the period around 2100 and 2200 (Landscheidt 1995 and 2003).

The current Modern Warm Period is one of innumerable former natural warm climatic phases. Its temperature is lower than in the four former warm periods over the past 1,500 years (Grudd 2008). Unfortunately it seems that the warm period is coming to an end, and recent climatic fluctuations suggest that perhaps a new, full-scale ice age is imminent. It may come in the next 50 to 400 years (Broecker 1995, Bryson 1993), with ice caps covering northern parts of America and Eurasia.

The Reliability of the IPCC

Each of four IPCC reports became a holy book for the U.N., the European Union, and national bureaucracies. The IPCC's credulously accepted reports are now the basis of long-term political and economic decisions. If implemented, the decisions will bring a global-scale disaster. The credulity is astonishing, as many impartial perusals of the IPCC work demonstrated that its assessments and foundations, notwithstanding an impressive numerical and graphic façade, are clearly biased, and should be rejected as not providing adequate climatic information for policymakers.

Criticism of IPCC publications and methods of work comes from both outside and inside. More than a decade ago, two editorials in *Nature* (Anonymous 1994, Maddox 1991) listed similar arguments against the IPCC, as has a long string of recent critics (for example: Henderson 2006 and 2007, Castles 2008, and NIPCC 2008). The flawed process, deep-seated problems of bias and lack of objectivity, factual errors, important omissions, and "green-pledge card" were apparent from the very first report of IPCC. Among the critics are a dozen members of the IPCC, including its deputy chairman Yuri Izrael, a member of the Russian Academy of Sciences; Richard Lindzen, one of the leading meteorologists and lead author of an IPCC report; Vincent Gray, official reviewer of all IPCC reports; Paul Reiter, malaria specialist at the Pasteur Institute, who resigned from the IPCC in protest against the exaggerated and always negative assessments of the medical effects of warming;⁸

8. Professor Paul Reiter is a member of the World Health Organization's Expert Advisory Committee on Vector Biology and Control. He found himself at loggerheads with persons who insisted on authoritative statements, although they had little or no knowledge of his specialty. At a hearing in the United States Senate, Reiter commented on the abuse of the public by the IPCC: "A galling aspect of the debate is that this spurious 'science' is endorsed in the public forum by influential panels of 'experts.' I refer particularly to the Intergovernmental Panel on Climate Change. Every five years, this U.N.-based organization publishes a 'consensus of the world's top scientists' on all aspects of climate change. Quite apart from the dubious process by which these scientists are selected, such consensus is the stuff of politics, not of science. Science proceeds by observation, hypothesis, and experiment. The complexity of this process, and the uncertainties involved, are a major obstacle to a meaningful understanding of scientific issues by non-scientists. In reality, a genuine concern for mankind and the

and John Christy, a lead author of the IPCC.

Christy, the director of the Earth System Science Center in Huntsville, Alabama, is one of the founders of the satellite system of global temperature measurements. In an op-ed in the *Wall Street Journal* on Nov. 1, 2007, Christy told the world that he does not believe that it is proven that humans cause global warming, and he also refused his slice of the 2007 Nobel Peace Prize awarded to IPCC (Christy 2007). He said:

... the award honor[s] promoting the message that the Earth's temperature is rising due to human-based emissions of greenhouse gases ... but I see neither the developing catastrophe nor the smoking gun proving that human activity is to blame for most of the warming we see.

An effort by academics is now under way to reform this U.N. organization, and have it follow established scientific norms. Dr. Vincent Gray, who refused to endorse this reform effort, said, "The IPCC is fundamentally corrupt. The only 'reform' I could envisage would be its abolition" (Solomon 2007). This agrees with my diagnosis of IPCC: The disease seems to be persistent (Jaworowski 2004).

The name of the IPCC, Intergovernmental Panel on Climate Change, tacitly suggests that it is only just now that our climate changes. This notion, in various forms (for example, "climate change is now upon us" (CCSP-USP 2008) is repeated *ad nauseam* in the names of institutions, programs, scientific papers, and the media. This, however, is not true. Without human intervention and without the influence of CO₂, climate has been changing constantly over the past several billion years, sometimes much more, and much faster than now. The rapidity with which the Modern Warm Period appeared is often invoked as a proof of its human cause. However, the Dansgaard-Oeschger events (D-Os), extremely rapid changes of climate, occurred without human intervention about 20 times during the past 100,000 years.

The last of them, the so called "Younger Dryas," happened 12,800 years ago, when the warm climate switched rapidly to a cold one, and then after 1,300 years, almost immediately returned back into warm phase. Both times, the change occurred in just a few years, much less than the recovery from the Little Ice Age after the year 1900, which is now upon us.

Proofs of Human Causation of the Modern Warm Period

The most important argument of the IPCC report (IPCC-AR4 2007) for man-made climate warming is based on climatic models combined with observations of temperature in the period 1906-2005, over the five continents and the whole globe. However, not quite correct observations (Gray 2008), and not quite reliable models (NIPCC 2008), were used. According to IPCC-AR4 (Figure SPM.4), the highest temperature in North America was measured in 2005, whereas in reality, the highest temperature in the United States occurred in 1934 (see GISS 2007 and Figure 6).

environment demands the inquiry, accuracy, and skepticism that are intrinsic to authentic science. A public that is unaware of this is vulnerable to abuse" (P. Reiter 2006). <http://commerce.senate.gov/pdf/reiter-042606.pdf>.

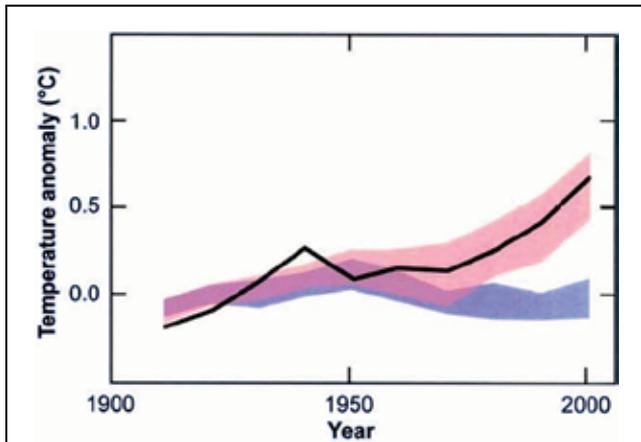


Figure 8
IPCC MODELLING OF GLOBAL CLIMATE VS. MEASURED TEMPERATURE

Shown are the results of the IPCC modelling of global climate with 10 anthropogenic radiative forcings (pink), and only 1 natural forcing (blue). The black line represents the measured temperature for 1906-2005. Although this figure is an exercise in arbitrary selection and playing with data to fit a preconceived idea, which neglects natural factors that are more powerful than all anthropogenic forcings, it is used by the IPCC as a “proof” of man-made global warming.

Source: Adapted from IPCC-AR4 2007, Figure SPM.4.

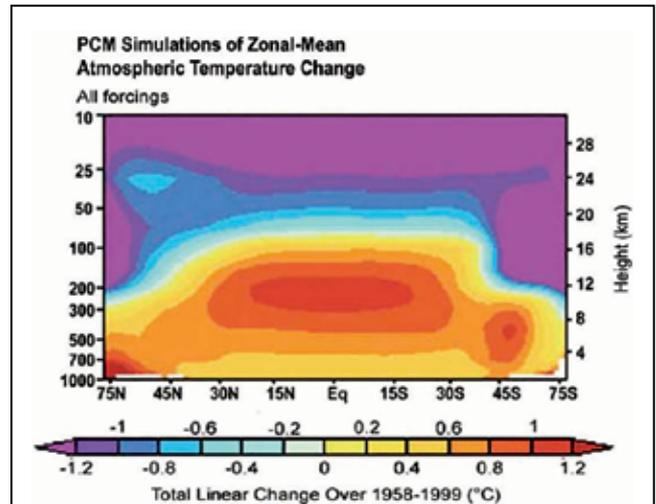


Figure 9
MODEL PREDICTED TEMPERATURE TRENDS VS LATITUDE AND ALTITUDE

These are trends predicted by the greenhouse-models. Note the increased temperature trends in the tropical mid-troposphere (~10 km). This figure is from a report issued by the U.S. Climate Change Science Program (CCSP) in April 2006, which is similar to an analogous figure in Chapter 9, p. 675 of the IPCC-AR4, 2007.

Source: NIPCC 2008.

The IPCC’s Figure SPM.4 (<http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>) shows the surface temperature in North America higher in 2000 than in 1934 by 0.44°C. However, the corrected GISS data show the opposite: The 1934 U.S. temperature was higher than in 2000 by 0.774°C (GISS 2007).

According to the IPCC Figure SPM.4, between 1975 and 2000, temperature in North America increased by 0.884°C. However, an advanced statistical analysis of annual temperature data from a homogenous U.S.-Canadian network of 120 radiosonde stations, covering latitude bands extending from 20°N to 80°N (Angell 1999), showed that in 1975-1995, a temperature trend in North America that was not significantly different from zero, at a 95 percent level of confidence (Watkins 2008).

The Figure SPM.4 is essential for the IPCC’s “fingerprint” argument that the Modern Warm Period is caused by human activities, particularly by the burning of fossil fuels. The argument is that computer models which use only natural climatic factors, “such as volcanic activity and variations in solar [radiative] output,” are unable to simulate the past temperature trends, but “When the effects of increasing levels of greenhouse gases are included in the models, as well as natural external factors, the models produce good simulations of the warming that has occurred over the past century (IPCC-AR4 2007).”

This is not true, however, but rather represents a classic example of a biased selection of data and of unilateral interpretation. The models are unable to correctly match the real warming in long-term global temperature trends, and in vertical and

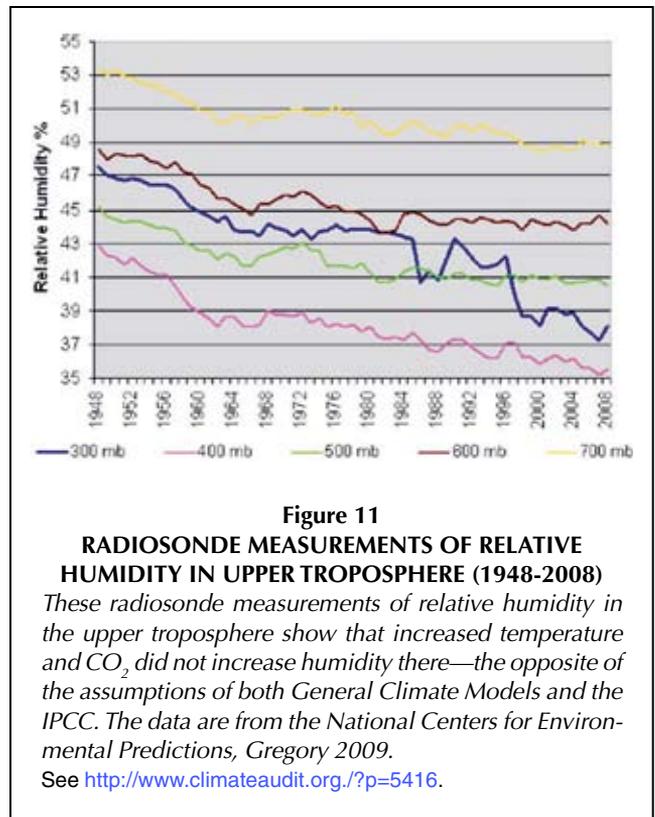
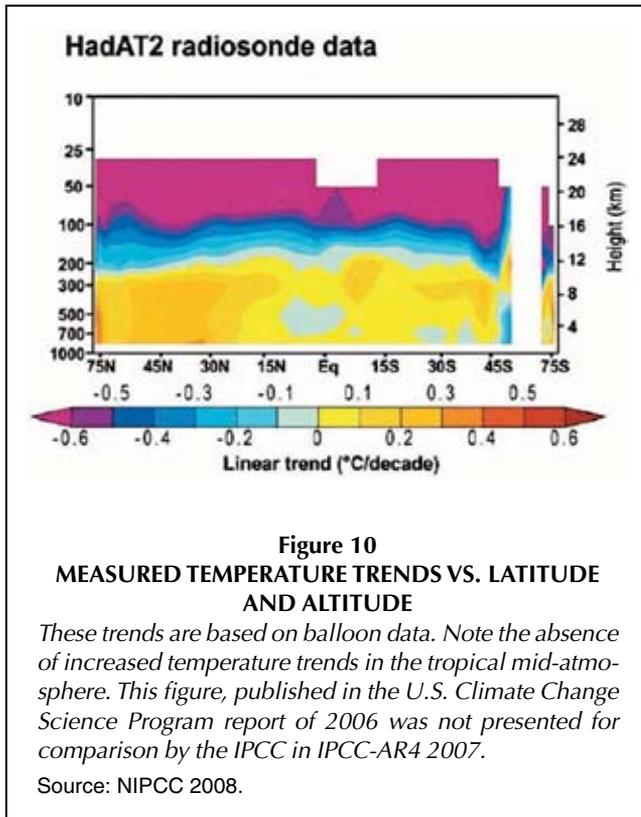
horizontal distribution of temperature. Both the the long-term global trends from Figure SPM.4 in IPCC 2007 (Figure 8) and the IPCC’s vertical and horizontal distribution of temperature (Figure 9) are a result of the modelling of global climate based on 10 anthropogenic radiative forcings and only 1 weak natural forcing. In these simulations, the greenhouse effect of man-made CO₂ was assumed to be a most important and best understood forcing, 14 times more powerful than natural solar irradiance.

The values of the radiative forcings used by the IPCC are given in Table 1. In this list, the IPCC ignored the forcing of the natural content of water in the troposphere and stratosphere (assuming that it is stable), which contributes about 95 percent of the global greenhouse effect, and ignored the forcings of natural clouds, probably the most important agent for temperature fluctuations.

Using all the anthropogenic and natural factors listed in Figure SPM.2 in the IPCC-AR4 report, the models are unable to correctly match the real warming trends with altitude (Figure 10).

The greenhouse models predicted about two times higher temperature at 10 kilometers than at the surface (Figure 9), and a strong warming at 45°S and in polar regions, while the balloon measurements gave the opposite result: no increase of warming, but rather a cooling, both vertically and horizontally (Figure 10).

There are three errors in the IPCC “fingerprint argument”: First, it limits natural factors only to solar irradiance and ignores other cosmic factors. Second, it incorrectly assumes—



on the basis of unreliable ice core studies, and after rejecting a large body of direct measurements of CO₂ in the 19th and most of the 20th Century atmosphere—that during the past 650,000 years the natural concentration of atmospheric CO₂ never exceeded the concentration of 180 to 300 ppm (parts per million), that the pre-industrial value was about 280 ppm, and that human activity increased it to about 380 ppm, i.e. by about 36 percent.

The third important error is the “water vapor feedback prob-

lem.” In the general circulation models (GCM) used by the IPCC, this feedback is large and positive. The models assume that the relative humidity remains constant under the influence of global warming, at all heights in the troposphere (IPCC 2007, Chapter 8, p. 632). The tiny increment of anthropogenic CO₂ contribution to the greenhouse warming of about 0.15 percent, is supposedly enough to increase evaporation from the ocean, and thus to increase the humidity of the upper troposphere, and to unrealistically multiply the small initial CO₂ warming by a factor of 2, 4, or more.

As explained recently by Professor William Gray:

The predicted global warming due to a doubling of CO₂ has been erroneously exaggerated by the GCMs due to this water vapor feedback. CO₂ increases without positive water vapor feedback could only have been responsible for about 0.1-0.2°C of the 0.6-0.7°C global mean surface temperature warming that has been observed since the early 20th century. Assuming a doubling of CO₂ by the late 21st century (assuming no positive water vapor feedback), we should likely expect to see no more than about 0.3-0.5°C global surface warming and certainly not the 2-5°C warming that has been projected by the GCMs.

However, the real world is different from GCMs and the assumptions of the IPCC: For the past half century, the increased temperature and steadily increasing CO₂ emissions did not increase humidity of the upper troposphere, but rather decreased it, as was already proposed years ago by Professor Richard Lindzen (Lindzen 1990). Lindzen’s proposition was recently con-

Table 1
THE MAIN RADIATIVE FORCINGS USED IN THE IPCC MODELS (in watts per square meter)

Anthropogenic— 10 forcings	
CO ₂	1.66
CH ₄ , N ₂ O, halocarbons	0.98
Ozone in stratosphere and troposphere	0.30
Stratospheric water vapor from CH ₄	0.07
Surface albedo	-0.1
Aerosols	-1.2
Linear contrails	0.01
Total net anthropogenic	1.6 W/m²
Nature—1 forcing	
Solar irradiance	0.12 W/m ²

Source: IPCC-AR 2007, Figure SPM.2.

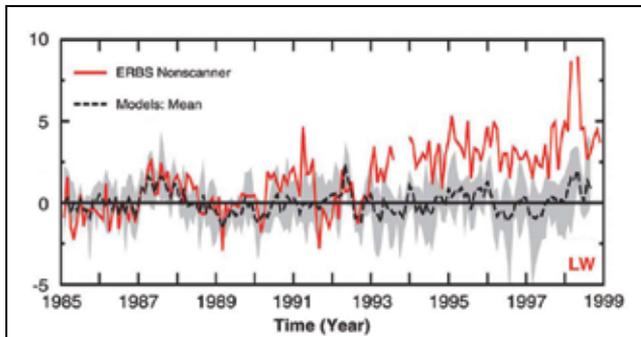


Figure 12
EMISSION OF LONG-WAVE RADIATION FROM THE ATMOSPHERE TO OUTER SPACE (in watts per square meter)

Thermal radiation emitted to space at the top of the tropical atmosphere increased by about 4 watts/m² between the 1980s and the 1990s, the opposite of the IPCC model predictions.

Source: Wielicki et al. 2002.

firmed by a reanalysis of the balloon measurements of atmospheric humidity: In the upper troposphere the humidity decreased greatly in 1973-2006 (Paltridge et al. 2009), and in 1948-2008 it decreased from 48 percent to 37 percent (Gregory 2009). (See Figure 11.) This caused a negative climatic feedback, opposite to the assumptions of the GCMs and the IPCC, reflected in the long-wave radiation outgoing from the atmosphere into the cosmic space (Figure 12).

In discussing Figure 12, Lindzen stated:

From 1985 until 1989 the (five) models and observations are more or less the same—they have, in fact, been tuned to be so. However, with the warming after 1989, the observations (of the thermal radiation emitted to space at the top of the tropical atmosphere) characteristically exceeded 7 times the model values. Recall that if the observations were only 2-3 times what the models

Table 2
ANNUAL FLUXES OF CO₂ INTO THE GLOBAL ATMOSPHERE (in gigatonnes of carbon = 10¹⁵ gC)

Natural	170.00
Man-made	
Fossil fuels, cement production, land use	6.73
Cars	0.57
Human respiration	0.65
Total	7.95

Man-made flux of CO₂ is equal to 4.7 percent of the natural sources, and contributes about 0.15 percent to the global greenhouse effect.

Source: Jaworowski 2007a.

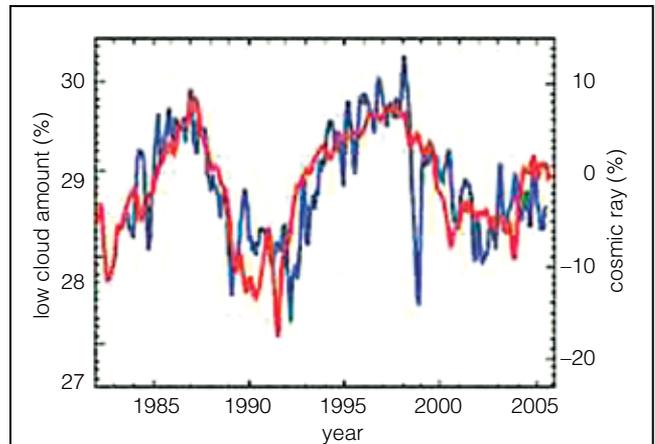


Figure 13
CORRESPONDENCE BETWEEN GLOBAL CLOUD COVER AND COSMIC RAY COUNTS AT HUANCAYO STATION, 1982-2005

There is a close correspondence between monthly variations of global low-cloud cover at <3.2 km altitude (blue), and cosmic-ray counts at the Huancayo station (red), 1982-2005. Decreasing cosmic-ray flux cause a decrease of low cloud cover, resulting in warming on Earth.

Source: Svensmark 2007.

produce, it would correspond to no feedback. What we see is much more than this—implying strong negative feedback... Alarming climate predictions depend critically on the fact that models have large positive feedbacks. The crucial question is whether nature actually behaves this way? The answer, as we have seen, is unambiguously “no.” (Lindzen 2009)

If the models and the IPCC are unable to paint an accurate picture of the present modes of climate variability, how can they be a reliable basis for projecting into the future, and for taking responsible political decisions which may impact the 2100s and beyond?

To fit these data into a global carbon cycle, the IPCC assumed a speculative lifetime for man-made CO₂ in the atmosphere of 50 to 200 years, ignoring observational evidence from 37 studies (based on natural and nuclear bomb carbon-14, Suess effect, radon-222, solubility data and carbon-13/carbon-12 mass balance), documenting that the real lifetime is about 5 years.⁹ With a CO₂ atmospheric lifetime of about 5 years, the maximum amount of man-made CO₂ remaining now in the atmosphere is only 4 percent, and not 36 percent (see review in Segalstad 1998).

Table 2 compares the annual fluxes into the atmosphere of man-made CO₂ with those from natural sources. As discussed above, the current 4.7 percent anthropogenic fraction of the total CO₂ flux contributes probably about 0.15 percent to the total

9. The CO₂ atmospheric lifetime of 5 years was determined in 1959 by Bert Bolin. Apparently he forgot it three decades later, as the first chairman of IPCC (1988-1998).

planetary greenhouse effect.

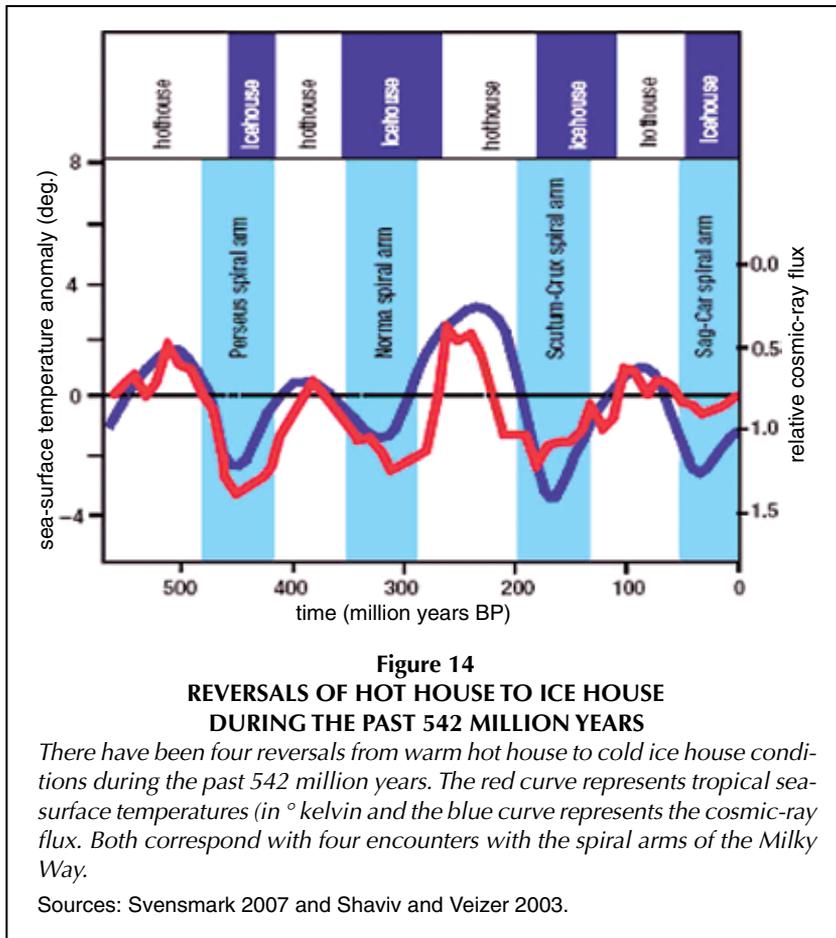
Ignoring Cosmic Rays

IPCC-AR4 limited the natural “radiation forcing”¹⁰ to only 1 factor (solar irradiance), and based its estimates on 10 anthropogenic factors, listed in Table 1. The IPCC regards the anthropogenic CO₂ emission as the most important factor, and assumed it to be 13.8 times more powerful than the solar irradiance. This list propagates the idea that human-made emissions of CO₂, not nature, rule the climate. But the glaciological studies clearly demonstrated that it is climate that influences the atmospheric CO₂ level, and not *vice versa*. Over the past 800,000 years, increases of temperature always preceded increases in CO₂ concentration, and climatic cooling always preceded decreases of CO₂ (Caillon et al. 2003, Fischer et al. 1999, Idso 1988, Indermuhle et al. 1999, Monnin et al. 2001, Mudelsee 2001).

The CO₂ direct measurements in the 19th and 20th Century atmosphere also show that CO₂ changes lag behind the temperature. Multi-decadal heating of the oceanic CO₂ absorption area of the Northern Atlantic Ocean was followed by approximately five-year lags in increase of the atmospheric CO₂ concentrations, to about 400 ppm in the 1930s, and to about 360 ppm today (Beck 2008). This suggests that changes of temperature of the atmosphere are the causative factor for CO₂ changes, probably by influencing the rate of land erosion and the solubility of gas in oceanic waters (which is lower in warm water than in cold water).

In its almost monothematic concentration on greenhouse gases, especially on CO₂, the IPCC underestimated water vapor—the main greenhouse gas contributing about 95 percent to the global greenhouse effect (Ellingson et al. 1991, Lindzen 1991). About 95 percent of the total annual emission of CO₂ into the atmosphere is natural, coming from the land and sea, and only 5 percent comes from human sources. According to isotopic mass balance (carbon-13/carbon-12) calculations, the mass of all past fossil CO₂ remaining the atmosphere is around 4 percent, corresponding to an atmospheric concentration of 14 ppm (Segalstad 1996, Segalstad 1998, Segalstad and Jaworowski 1991), almost 10 times less than that assumed by the IPCC. Thus, the anthropogenic CO₂ contributes only a tiny fraction to the total greenhouse effect, probably less than 0.15 percent.

The IPCC ignores the dominant climatic effect of incoming cosmic rays governed by solar activity, well known for the past 17 years (Friis-Christensen and Lassen 1991). Recent studies demonstrate that the climate of the Earth is completely deter-



mined by the Sun, via insolation and the action of galactic cosmic rays, and that the so-called anthropogenic “CO₂ doubling” problem is practically absent (Rusov et al. 2008).

In opposition to the IPCC message, the natural forces that are driving the climate are 4 to 5 orders of magnitude greater than the corresponding anthropogenic impact, and humans may be responsible for less than 0.01°C of warming during the last century (Khilyuk and Chilingar 2006). The cosmoclimatologic studies demonstrate a powerful influence on climate of fluctuations of the moon fraction of cosmic rays, caused by short-term variations of the Sun’s activity (Svensmark 2007, Svensmark and Calder 2008), shown in Figure 13, and in the geological time scale by the migration of the Solar System through the spiral arms of the Milky Way, with different concentrations of dust and activity of novae (Shaviv and Veizer 2003), as shown in Figure 14.

In the 20th Century, the reduction of cosmic rays was such that the maximal fluxes towards the end of the century were similar to the minima seen around 1900 (Figure 15). Decreasing cosmic-ray flux caused a decrease of low cloud cover (Figure 13) and resulted in warming the Earth.

Low-level clouds cover more than 25 percent of the Earth’s surface and exert a strong cooling at the surface. The change in radiative forcing by a 3 percent change in low cloud cover over one solar cycle (Figure 13, blue line) will vary the input of heat to the Earth’s surface by about 2 watts per square meter. This can be

10. Change in difference between the incoming radiation energy and the outgoing radiation energy.

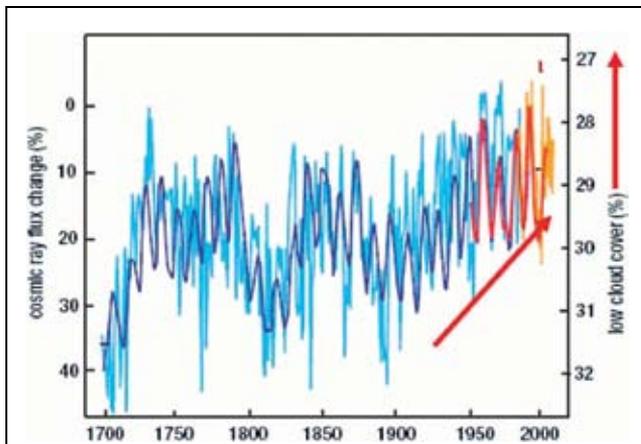


Figure 15
GALACTIC COSMIC RAY FLUX SINCE 1700

Galactic cosmic-ray flux estimated from two proxies (blue and light blue) since 1700 and also directly measured (red) from 1953-2004, along with low cloud cover (orange). Decreasing cosmic-ray flux caused a decrease in low cloud cover, thus warming the Earth. Note that both Y scales are inverted.

Source: Svensmark 2007.

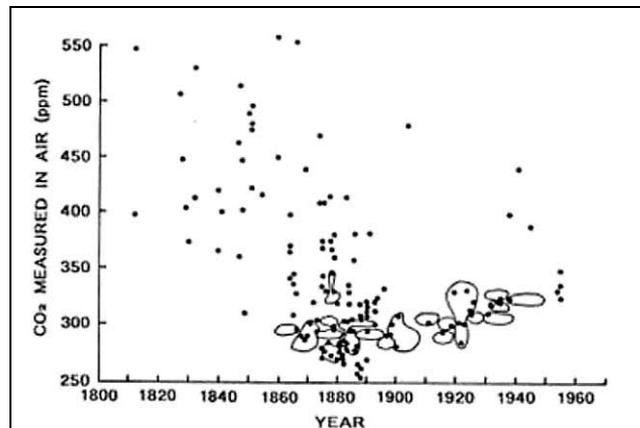


Figure 16
AVERAGE ATMOSPHERIC CO₂ CONCENTRATIONS MEASURED AND REJECTED BY CALLENDAR

Average atmospheric CO₂ concentrations measured in the 19th and 20th centuries. The values used by Callendar are circled; the remaining measurements were rejected.

Source: Redrawn after Fonselius et al. 1956.

compared with the 1.4 watts per square meter estimated by the IPCC for the greenhouse effect of all human-made CO₂ added to atmosphere since the Industrial Revolution (Svensmark 2007).

The low cloud formation which depends on fluctuations of cosmic rays, is ignored by the IPCC, but is a much more plausible cause of the Modern Warming Period than changes in CO₂ concentration. As always so in the past, so also today, changes in CO₂ lag behind temperature. Not a single publication on cosmoclimatologic effects was cited in the IPCC report. This disqualifies the IPCC as an impartial and a reliable source of information for policymakers and the scientific community.

Proxy Ice Data Instead of Atmospheric CO₂

The foundation of the hypothesis that the Modern Warm Period is induced by human beings is an assumption that the pre-industrial level of CO₂ was 280 ppm, i.e. about 100 ppm lower than it is now. British engineer G.S. Callendar may be truly regarded as the father of this hypothesis, and of this assumption (Callendar 1938, 1940, 1949, and 1958). This assumption was made possible by an arbitrary rejection of the more than 90,000 technically excellent, direct measurements of CO₂ in the atmosphere, carried out in America, Asia, and Europe, during the 149 years between 1812 and 1961. Some of these direct measurements were carried out by Nobel Prize winners. Specifically, Callendar rejected more than 69 percent from a smaller set of 19th Century CO₂ measurements

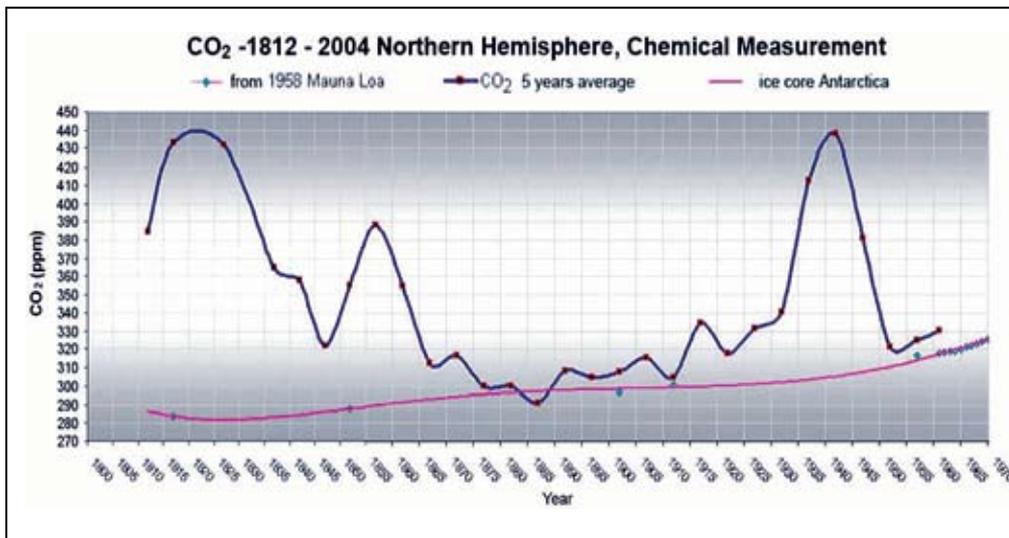


Figure 17
CHEMICAL MEASUREMENTS OF CO₂ IN NORTHERN HEMISPHERE, 1812-2004

Direct chemical measurements of CO₂ (blue line) and infrared measurements (Mauna Loa after 1958) CO₂ measurements in the 19th and 20th Century, compared with proxy ice core data (magenta line).

Source: Beck 2007.

ranging from 250 to 550 ppm (Figure 16).

Similarly, from a set of 26 19th Century CO₂ averages, ranging from 250 to 550 ppm, Callendar rejected 16 averages that were higher than 292 ppm, and only two that were lower. On the other hand, from the 20th Century set of measurements, Callendar rejected 3 averages that were lower than his global average of 317 ppm, and none that was higher. This shows a bias in the selection method. Without such a biased selection, the 19th Century CO₂ data averaged 335 ppm (Slocum 1955). Similarly biased selections were later applied in proxy ice core studies of greenhouse gases (Jaworowski 1994).

However, a recent meticulous study by Ernst-Georg Beck of more than 90,000 direct measurements of CO₂ in the atmosphere, from the period 1812 to 1961, demonstrated that the 5-year average CO₂ concentrations fluctuated widely, with a minimum of 290 ppm in 1885, peaking up to 440 ppm around 1820, to about 390 ppm around 1855, and then up to about 440 ppmv around 1940 (Beck 2007) (Figure 17). These CO₂ fluctuations are in agreement with temperature trends in five Antarctic regions, reconstructed from ice core stable isotope records between 1800 and 1999 (Schneider et al. 2006) (Figure 18), and also with the HadCRUT3 2006 data on global surface temperature (Beck 2008).

Rapid large spells of atmospheric CO₂ increases by up to 150 ppm, caused by upwelling of deep oceanic water, were postulated for the Benguela Current by Takahashi (1961).

Also the current measurements in the air over the land-fast Arctic sea ice in Franklin Bay, Canada, in March and April 2004 demonstrated that the CO₂ concentration fluctuations ranged there from 315.88 ppm to 724.87 ppm. This study suggests that sea ice does not prevent the exchange of gas between the atmosphere and the ocean, as has been assumed. On the contrary, the brine present in ice can be supersaturated with CO₂ with respect to air upon the freezing of seawater. Therefore, sea ice may play an important role in the global carbon cycle, a phenomenon neglected until now (Owens 2008).

The direct CO₂ measurements in the 19th Century and the first half of the 20th Century atmosphere completely disagree with the proxy CO₂ data from the ice cores collected in the Antarctic by Neftel et al. (1985) (Figures 17 and 18). The lack of reliability of these ice core data is discussed below.

The ice core proxy data for CO₂ also disagree with other proxy CO₂ determinations for the past 10,000 years, based on leaf stomata (Figure 19). The stomata estimates fluctuated up to 459 ppm (Kurschner et al. 1996, Royer et al. 2001, Wagner et al. 1999, Wagner et al. 2002), that is, similarly as the direct chemical CO₂ measurements in the 19th and 20th Century atmosphere.

The low, flat CO₂ ice-core concentrations, never reaching above 300 ppm during the past several hundred thousand years and six interglacials (Siegenthaler et al. 2005), even in periods when the global temperature was much warmer than now, suggest either that atmospheric CO₂ has no discernible influence on climate, or that the proxy ice core reconstructions of the chemical composition of the ancient atmosphere are false. Both

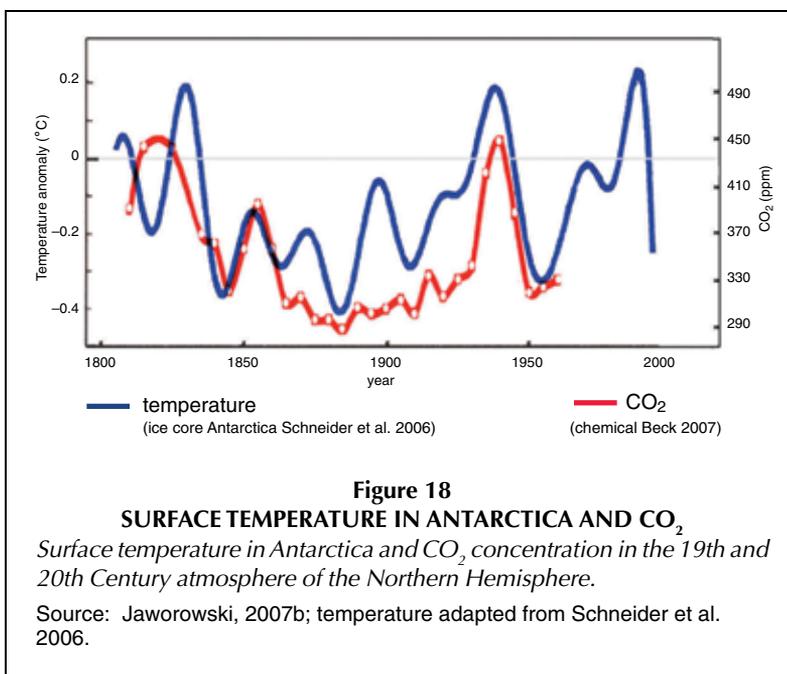


Figure 18
SURFACE TEMPERATURE IN ANTARCTICA AND CO₂
Surface temperature in Antarctica and CO₂ concentration in the 19th and 20th Century atmosphere of the Northern Hemisphere.

Source: Jaworowski, 2007b; temperature adapted from Schneider et al. 2006.

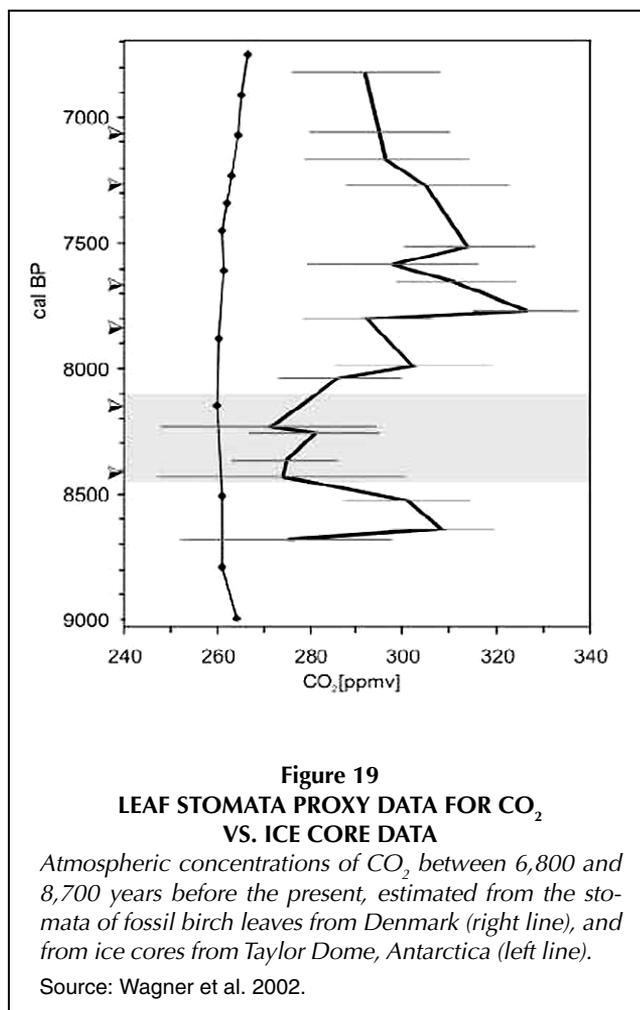
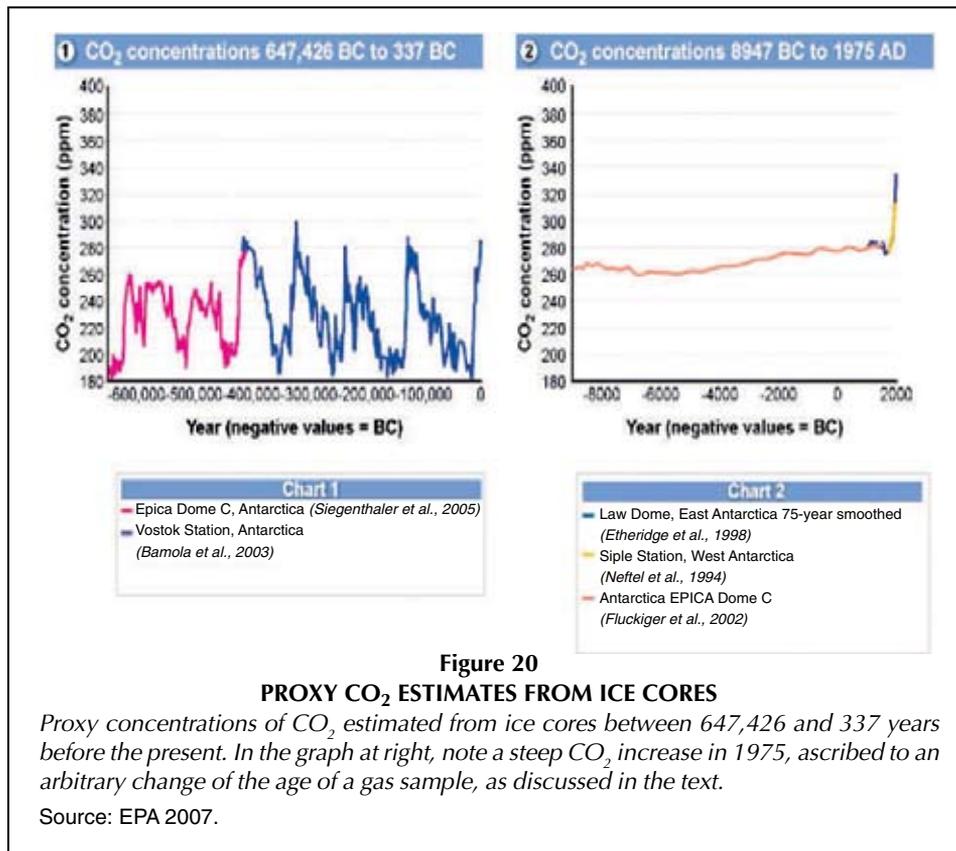


Figure 19
LEAF STOMATA PROXY DATA FOR CO₂
VS. ICE CORE DATA

Atmospheric concentrations of CO₂ between 6,800 and 8,700 years before the present, estimated from the stomata of fossil birch leaves from Denmark (right line), and from ice cores from Taylor Dome, Antarctica (left line).

Source: Wagner et al. 2002.



propositions are probably true.

The very long-term ice core data, combined with more recent 19th Century data, and with direct atmospheric measurements since 1958 (Figure 20), are widely used for propagating the idea of man-made global warming.

The Ice Core Foundation of Greenhouse Warming

The proxy estimates of past CO₂ atmospheric concentrations, based on analysis of air bubbles recovered from ice deposited in the 17th, 18th, and 19th centuries at the ice caps of Greenland and Antarctica, are regarded as the strongest proof that human beings increased the CO₂ content in the atmosphere, causing the Modern Warm Period. However, polar ice is an improper matrix for reconstruction of the chemical composition of the pre-industrial and ancient atmosphere. No efforts to improve the analytic excellence of CO₂ determinations can change this situation.

It is deeply improper that, before experimentally checking whether the ice is, or is not, a correct matrix for such a reconstruction, hundreds of glaciologists spent decades studying the CO₂ in ice, and helped to create the widely accepted false dogma on man-made global warming. Until now, such a scrutiny has not been conducted. A project for such an experimental study was dumped before its start in 1994, in Gro Harlem Brundtland's Norway, because it was defined as "immoral" (Chapter 7, Solomon 2008).

Ice and the ice cores do not fulfill the essential closed-system criteria, indispensable for a reliable estimate of the past CO₂ levels. One of them is a lack of liquid water in ice. This criterion is

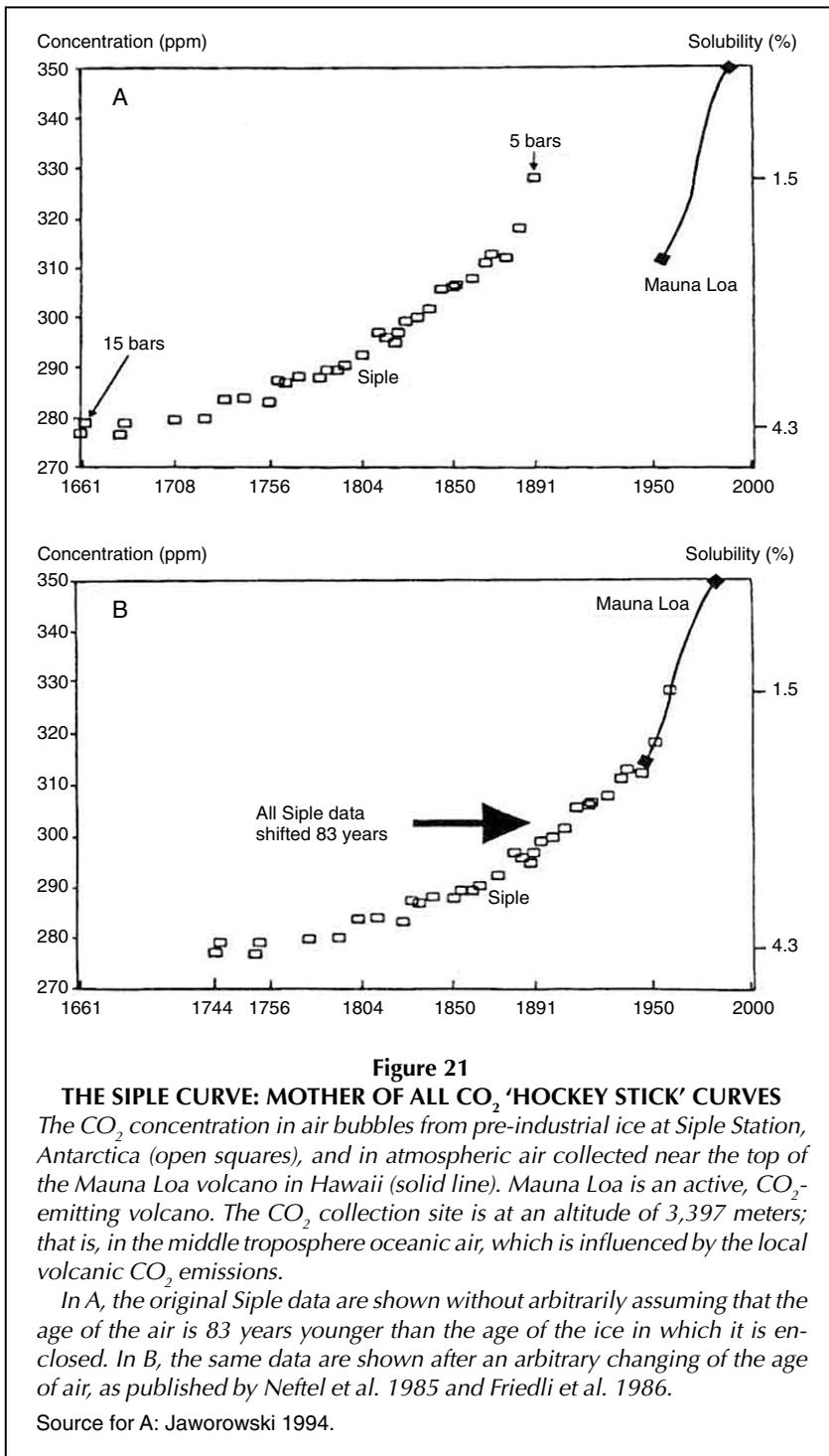
not met, as there is an ample evidence that even the coldest Antarctic ice contains liquid water, in which the solubility of CO₂ is about 73 times, and 26 times higher than that of nitrogen (N₂) and oxygen (O₂), respectively. This dramatically changes the chemical composition of the gas inclusions in polar ice, in comparison to atmospheric air.

More than 20 physical and chemical processes, mostly related to the presence of liquid water, contribute to the alteration of the original air in gas inclusions (see review in Jaworowski et al. 1992). One of these processes is formation of clathrates (gas hydrates), solid crystals formed at high pressure by the interaction of gas with water molecules. In the ice sheets, CO₂, O₂, and N₂ start to form clathrates at about 5 bars, 75 bars, and 100 bars, respectively. As a result of this process, CO₂ starts to leave air bubbles at a depth of about 200 meters, and the air bubbles themselves

disappear completely at a depth below 1,000 meters, when oxygen and nitrogen also enter the clathrate form.

Drilling, which is an extremely brutal procedure, decompresses the ice cores, in which the solid clathrates decompose back into gas form, exploding in the process as if they were microscopic grenades. In the decompressed, bubble-free ice, the explosions form new gas cavities and mini-cracks. Decompression of air bubbles in the recovered ice cores, is rapid at the beginning but later proceeds slowly and incompletely. Even 15 years after the recovery of cores, the pressure in the air bubbles remained up to 9 bars, i.e. above the dissociation pressure of CO₂ clathrates, depending on temperature of storage, and on the original crystalline texture and fabrics of the enclosing ice and the history of ice deformation (Gow and Williamson 1975). That means that even in the old ice cores, not all CO₂ clathrates are decomposed, and remain imbedded in the ice crystals, outside the original air bubbles or secondary new gas cavities formed at an earlier stage of decompression by explosive decomposition of O₂ and N₂ clathrates. This contributes to depletion of CO₂ from gaseous inclusions.

The ice cores, however, are earlier exposed to a more coarse cracking by vibration in the drilling barrel, and by the sheeting phenomenon at the bottom of the borehole, induced by the pressure difference between the drilling fluid and the ice (Norwegian Rock Mechanics Group 2000, Johnson 1970). These cracks open the gate to extreme pollution of the inside of ice cores with heavy metals from the drilling fluid, and they also allow for the escape of gas from its inclusions.



For example, in the very center of the classic Vostok core, from a depth of 1,850 meters, the concentration of lead was five times higher than in the contemporary snow at the surface; and in the center of the core, from a depth of 851 meters, the level of zinc was 400,000 times higher than in surface snow (Boutron et al. 1990, Boutron et al. 1987). It is astonishing that these ice cores were commonly used to estimate the natural environmental levels of heavy metals, and that they passed the reviewing

process in such journals as *Nature*, *Science*, and a host of Earth sciences journals (Boutron et al. 1991, Boutron and Patterson 1986, Boutron et al. 1988, Dickson 1972, Hong et al. 1994a and 1994b).

The information about the enormous contamination of the innermost parts of ice cores demonstrated that these cores are not a closed system. It should preclude their use as a matrix for establishing the natural benchmarks of metals and gases in the global environment. The opposite, however, happened: Glaciers and ice cores are still incorrectly regarded as holy books preserving reliable information. They do not.

The glaciological CO₂ records are strongly influenced by natural processes in the ice sheets and man-made artifacts in the ice cores, which lead to the depletion of CO₂ by 30 percent to 50 percent, probably mostly in the upper layers of the ice sheets. These records are also beset with an arbitrary selection of data, experimentally unfounded assumptions of gas age, one-sided interpretations ascribing the observed trends to human factors, and the ignoring of other explanations. A classic example of such manipulations of ice core data is Figure 21, presenting the famous Siple curve, the mother of many other "CO₂ hockey stick curves."

The problem with the Siple data is that the CO₂ concentration found in this locality in pre-industrial ice, from a depth of 68 meters (i.e., above the depth of clathrate formation), was "too high" to fit the man-made warming hypothesis. In this ice, deposited in the year 1890, the CO₂ concentration was 328 ppmv, not about 290 ppmv, as needed by the hypothesis. The CO₂ atmospheric concentration of about 328 ppmv was measured at Mauna Loa, Hawaii, in 1973 (Boden et al. 1990), that is, 83 years after the ice was deposited at Siple. Instead of rejecting the assumption of a low pre-industrial concentration of CO₂ in the atmosphere, the glaciologists found a "solution."

An *ad hoc* speculative assumption, not supported by any factual evidence solved the problem: The average age of air was arbitrarily decreed to be exactly 83 years younger than the ice in which it was trapped (Jaworowski 1994a, Jaworowski et al. 1992). The corrected ice data were made to smoothly overlay the recent Mauna Loa record (Figure 21b), and then were reproduced in countless publications as a famous "Siple curve," and a proof of man-made global warming.

Eight years after the first publication of the Siple curve, and a year after its criticism (Jaworowski et al. 1992), glaciologists at-

tempted to experimentally prove the age assumption (Schwander et al. 1993), but they failed (Jaworowski 1994a). A similar manipulation of data was also applied to ice cores from other polar sites, to make the “CO₂ hockey stick curves” cover the past 1,000 and even the past 400,000 years (IPCC 2001, Wolff 2003). For some of these curves, a much longer air/ice age difference was arbitrarily assumed, without any experimental support, reaching up to 5,500 years! The apparent aim of these manipulations, and of ignoring other proxy CO₂ determinations and ignoring the approximately 90,000 direct CO₂ determinations in the pre-industrial and 20th Century atmosphere, was to induce in the public the false conviction that the 20th Century level of CO₂ was unprecedented in the past hundreds of thousands of years.

The CO₂ hockey stick curves were used as an “indicator of human influence on the atmosphere during the Industrial Era” (IPCC 2001, IPCC-AR4 2007). Also, in the report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research, these same curves were used as evidence of “human influences” and “human fingerprint” and to argue that the “observed [current] warming could not have been caused by natural forces alone” (CCSP-USP 2008). In fact, this is the only “proof” of the human causation of the Modern Warm Period presented in the Report. This proof is false.

Back to the Sun

Figure 21 demonstrates an unacceptable distortion of science. During the past 16 years, I have presented it in many publications, together with data demonstrating that polar ice does not fulfill the closed-system criteria that are essential for reconstruction of the chemical composition of the ancient atmosphere. This has had practically no effect on a worldwide acceptance of the false, ice-core based dogma on the human causation of the Modern Warm Period. This should not be astonishing in view of Principle 15 of the United Nations “Rio Declaration on Environment and Development” (U.N. 1992), virtually rejecting any scientific reality and stating that a “lack of full scientific certainty shall not be used for postponing” environmental decisions.

The recent climatic cooling might perhaps shake this foundation of environmentalism and open the ears of the public and decision-makers to what astronomers have said for years: Our Sun enters a long period of slumber, cooling the Earth and its fellow planets. We cannot enhance this cooling or stop it. But we can adjust, taking a less haughty approach to our robust biosphere.

Zbigniew Jaworowski is a multidisciplinary scientist who has published more than 300 scientific papers, four books, and scores of popular science articles, including many in 21st Century. He been a member of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) since 1973, and served as its chairman from 1980-1982. He organized 10 expeditions to the polar and high-altitude temperate glaciers, to make the first measurements of the mass of stable heavy metals and the activity of natural radionuclides entering the global atmosphere from natural and man-made sources, and to determine their pre-industrial and contemporary annual

flows. He has also been the principal investigator for several research projects of the IAEA and the U.S. Environmental Protection Agency.

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Zbigniew Jaworowski

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How Developing Countries Can Produce Emergency Food And Gain Self-Sufficiency

by Mohd Peter Davis and N. Yogendran

Malaysia's revolutionary Deep Tropical agricultural system is a model for feeding the world—fast—and bringing the developing nations out of feudal poverty.



(a)

Google Maps

Although Malaysia has developed fairly well since independence from the British in 1957, it still only produces one-half of its food.¹ What the rather complacent and well-fed Malaysian population unfortunately does not know is that the country, caught up in the midst of an orchestrated collapse in world food production and the global



(b)

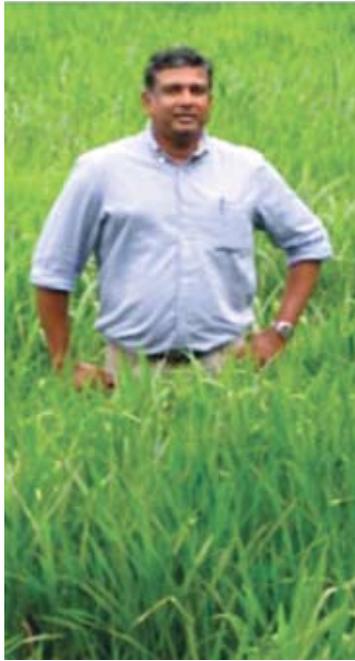
Google Earth



(c)

Earth Observatory/NASA

Crop circles, in (a) Libya, (b) Jordan, and (c) Kansas, using center pivot irrigation systems. Today these crop circles use underground water for irrigation. But with cheap and abundant electricity and desalinated water produced by fourth-generation modular nuclear reactors, irrigated crop circles can spread throughout the vast tropical zone, solving the world food crisis and improving the nutrition of a much larger world population.



Courtesy of Mohd Peter Davis

Fast-growing grass is key to the Deep Tropical agriculture system. Here, co-author N. Yogendran (who is 6-feet tall) stands in 3-foot grass, which took only 38 days to grow on his Malaysian grass farm. Grass cut at this age is perfect for feeding ruminants. The grass can be cut 10 times per year for three years before re-plowing and re-seeding.

nations as nuclear-powered desalinated water comes on stream.

Malaysia is now making great advances with its Deep Tropical agricultural system that “double leapfrogs” both the backyard farming in developing countries and the grazing systems in more advanced temperate countries.² A Deep Tropical intensive dairy farm in Malaysia, based on grass plantation and climate-controlled-housed cows, which started from scratch in September 2007, is today selling commercial quantities of top quality milk and by December 2009 will be well on target to produce 15,000 liters of milk per day, from a 150-hectare grass plantation employing just 25 staff. (See box for milestones in the Deep Tropical system.)

The time to clear the land, establish a plantation, build a mod-

meltdown of the economy, is now in a precarious situation and faces a repeat of the starvation which occurred in the wartime naval blockade during the Japanese occupation of Malaya. The danger is that the British Empire is now poised to re-colonize and bring to heel its former colony, which has become an inspiring role model for downtrodden developing nations.

The need for food self-sufficiency and the threat to national survival has driven us to find a fast solution for producing emergency food for Malaysia. We believe that our Deep Tropical agricultural system, which has blossomed only in the last year or so, after 20 years of rather lonely research and entrepreneurship, can also be adopted immediately by those developing tropical countries that have sufficient rainfall or underground water, and later by the rest of the tropical



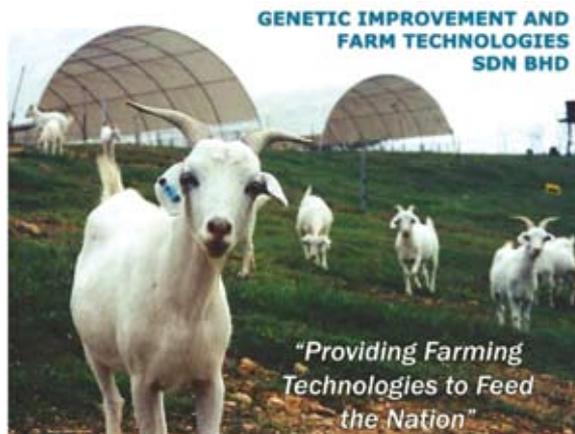
Ministry of Tourism, Malaysia

Bukit Malawati, a former British fort in Malaysia. The cannon stands as a reminder of British colonialism, which remains today in the form of Malaysia’s vast plantations. These plantation lands will be perfect for establishing Deep Tropical animal husbandry, sustained by fast-growing grass farms.

ern dairy, and achieve full-scale milk production from 1,200 cows is therefore expected to be only 27 months. The anticipated return on investment is 3-4 years, better than many modern factories, and government circles and investors are getting interested.

Malaysia’s first large-scale Deep Tropical dairy farm is well on target to produce 5.7 million liters milk per year from 150 hectares grass plantation, or 38,000 liters per hectare per year. A team of 5 management staff and 20 workers will run the farm. The productivity per person is expected to be 625 liters of milk per day, a tremendous leap in productivity compared to backyard farming. For instance, South African researchers have reported, “In many situations the household has to milk several cows to get only a few liters of milk.”

We are now able to report the milestones and current and targeted performance of this Deep Tropical dairy farm in Malaysia, and the Vernadsky-inspired Biosphere thinking behind it, as an exemplary model for other developing countries to consider.



Courtesy of Mohd Peter Davis

Goats from an experimental herd on one of the Malaysian grass farms feed on the farm’s fast-growing grass.

Comparison with New Zealand Grazing System

While Malaysia is on target by the end of 2009 to produce 38,000 liters of milk per year per hectare of grass plantation (supplemented with concentrate feeding), New Zealand produces on average 8,880 liters milk per year per hectare of grazing land (albeit with minimal concentrate feeding). This leap in milk production for Malaysia demonstrates a world agricultural break-



Courtesy of N. Yogendran

The Deep Tropical grass farm maximizes plant use for feed, by harvesting fast-growing grass before it becomes more fibrous and indigestible. The cut grass on the Deep Tropical plantation, shown here, will grow again and be ready for feeding cows in about 35 days.

through. Newcomer Malaysia, with little expertise in modern dairy farming, is producing around four times more milk per hectare compared to New Zealand, with its 200 years of dairy skills.

New Zealand operates the world's most efficient grazing systems and its 3.5 million cows supply 2 percent of the world's milk, exporting 95 percent as milk, butter, and cheese. This temperate region grazing system is already near its peak of perfection, and there is little more land for agriculture. Producing more milk in New Zealand to satisfy export demand means converting long established sheep farms to dairy farms and sacrificing prime lamb production.

The much more productive and profitable Deep Tropical animal production system can spread fast, but should not be seen as a commercial threat to New Zealand; instead, it is a golden opportunity. The rate-limiting step for the mass production of ruminants in Malaysia and Indonesia is not land, which is plentiful, but the high-quality breeding animals that New Zealand and Australia can supply in very large numbers, surplus to their own requirements. The export of breeding animals with top genetics will provide profitable new markets to supplement New Zealand and Australia's established exports of milk, meat, and wool. This could be a happy union between former colonial countries to greatly boost high quality food production in Southeast Asia.

The Secret of Grass Plantations

The Deep Tropical grass plantation invention permits the mass production of really young grass that grows super fast to 1 meter high in 5 weeks, but remains highly

nutritious for ruminant livestock. This invention, although stunningly simple, has profound implications for world livestock and crop production throughout the entire tropical zone, from the Tropic of Cancer to the Tropic of Capricorn.

Milestones in Malaysia's Deep Tropical System

September-December 2007

Establishing Grass plantation

Land clearing of neglected grazing land with scattered 10-year old trees and bushes, plowing, fertilizing, and sowing with an African species of grass.

December 2007-March 2008

Farm buildings and infrastructure

Building roads, free-standing climate barns for cows, 50-bale rotary milking system, milk storage vats, feed store, rain water tank, and houses for workers.

April-June 2008

Arrival and adaptation of 284 pregnant cows

Cows were air-freighted from Australian temperate region breeding farms, adapted to fully enclosed Malaysian climate barns, and fed freshly cut chopped grass from grass plantation mixed with concentrates. Over one year, every hectare of grass plantation, cut every 35 days, will feed 8 cows, each 350 kilograms. One-meter high grass is harvested 10 times per year for an expected 3 years, before the grass plantation is re-plowed and re-seeded.

July-September 2008

First calving—5 percent pre-weaning losses

September arrival of second batch of 300 pregnant cows from Australia.

September 2008: First commercial milk production

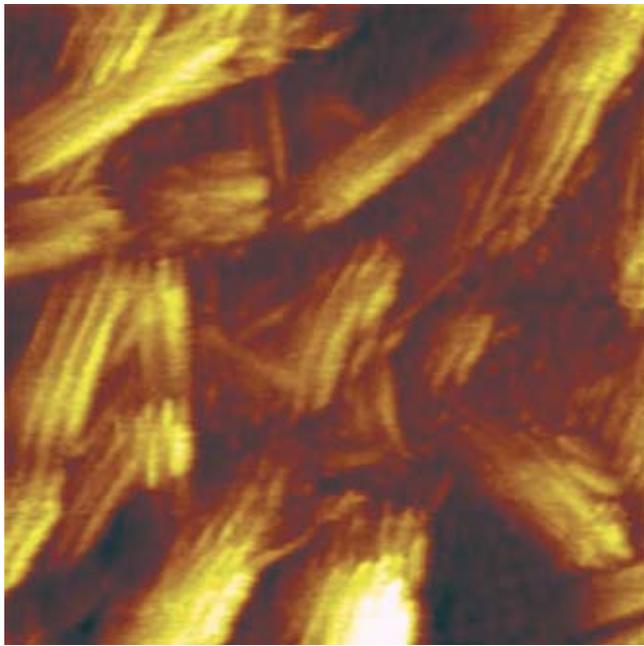
Cows milked twice per day, milk chilled to 8 degrees C in 1 minute and to 4 degrees in 60 minutes, and delivered daily to the factory for processing. The milk achieves top international standards for milk solids.

Scheduled January and May 2009

Arrival of third and fourth batch of 300-plus pregnant cows

Scheduled December 2009

Steady-state milk production from 1,200-cow dairy



Sandia National Laboratory

As plants age, they become more fibrous and indigestible, with a lignocellulose structure like reinforced concrete. Here an atomic microscopy image of lignocellulose.

As nuclear-powered desalinated water becomes plentiful with the welcomed nuclear renaissance, this vast tropical region of the Earth's biosphere, with year-round warmth and sunlight, will become a far better place to produce food than the seasonal temperate regions. Indeed, in complete defiance to the Malthusians who falsely claim that population growth exceeds food production, we are beginning to envisage how grass plantations developed in the humid tropics, and spreading to the dry tropics, will soon be able to support many times the present world population.

The production of cellulose (long structural polymers of glucose molecules), which forms the cell wall in photosynthetic microorganisms and living plants, is the primary source of food in the biosphere. Cellulose is the start of the biosphere's food chain and the meal of choice of an enormous range of microorganisms and insects, which get eaten by animal species higher in the food chain. Indeed, every species is breakfast for another species; hence the expression "all flesh is grass."

The biosphere currently produces around 10^{13} metric tonnes of cellulose per year (Colvin 1980), but even after 10,000 years of agriculture and several hundred years of intensive scientific farming, only 1 percent at most is available as feed for mankind's livestock (Davis 1988). Understanding how to make more cellulose available for livestock production, therefore, is a key step first in solving the current world food shortage, and then in supplying food for an expanding world population.

To avoid getting eaten, germinating grasses, plants, and trees that soon start producing cellulose from carbon dioxide and water by photosynthesis must grow up fast, but exceptionally fast in the humid tropics where the variety and density of rainforest species is intense. As plants grow, the cellulose they produce in their cell walls gets locked up in a complex chemical form

known as lignocellulose (fiber) and becomes less and less digestible to its predators, including the cellulose-digesting bacteria that inhabit the rumen and large intestines of mankind's livestock—cows, cattle, buffalo, sheep, goats, and rabbits.

Grasses and plants become more fibrous and indigestible as they age, and more and more useless to domestic animals. An agricultural scientist (Boyce 1984) has likened the structure of lignocellulose to reinforced concrete:

... where the microfibrils of cellulose, a rigid glucose polymer, are similar to steel rods. The hemicellulose pectins and other gums surrounding the cellulose are similar to the concrete. In addition, this matrix is impregnated with lignin which might be visualized as a coating of plastic resin.

Cellulose, therefore, serves a double role in the biosphere; it is the primary food resource and also the main component of the biological structural support that allows plant life to go "high rise." The multi-tiered canopy of a tree is a magnificently efficient collector of the weak solar radiation that reaches Earth and powers the mass production of cellulose. For every living plant, from germination to death, there is a continual contest between cellulose digestion by predators, and cellulose lignification by the plant. Most plants do not make it beyond a juvenile stage and even for those that do survive, some for tens and hundreds of years as majestic trees, their young shoots and leaves full of digestible cellulose are being continuously eaten alive by hungry predators.

Such is life. Such is the unstoppable driving force of living matter. What we see in the natural landscape is what escapes digestion, the lignified cellulose. So there is a superabundance of cellulose in the biosphere but, like the water in the oceans, it is waiting to be unlocked by mankind's technology.

In the 1980s, a large commercial-scale high-pressure steam boiler was invented (StakeTec, Minnesota) that crudely busted up the lignocellulose into more digestible cellulose and sugars for animal feed. Chopped wood or agricultural waste was fed continuously into the 250°C high-pressure boiler, resembling a giant kitchen meat grinder, which exploded the fiber, making it palatable and useful as cattle and dairy feed. The technology was adopted by various countries, but its use as a potentially gigantic new source of animal feed has fallen by the wayside, probably because of its high production costs compared to conventional fodder.

This steam-explosion technology, if refined, can today play a big role in overcoming food shortage, especially in temperate countries where the growing season is short. However, the Deep Tropical grass plantations are much more promising for tropical regions, requiring minimal machinery: a tractor and trailer for harvesting, for example. Basically, it is just a matter of watching grass grow.

The secret of the Malaysian grass plantation is that digestible cellulose is captured while the grass is still juvenile, around one-month old, just before it lignifies, and it is immediately fed to animals that love it and grow and produce splendidly, much to the delight of the farmer. By using his brain, man gets the digestible cellulose for his exclusive use before the armies of hungry predators have gotten out of bed.



Valley Irrigation

An irrigated crop circle in an arid area of Kenya. Now, underground water is used for irrigation. In the future, nuclear power-produced desalination will make it possible for the dryer tropical regions to be transformed into lush grass farms.

Transcontinental Species

By planting tropical grasses from different continents, such as Africa or South America, the imported species enjoy a honeymoon period before the native grass-eating species adapt or evolve to attack them. Historically, transcontinental species that temporarily escape being eaten in a different ecosystem have played a key role in world agriculture. Spanish Merino sheep allowed colonial Australia to become the world's outstanding wool producer, all within a 50-year period from 1850 to 1900. Likewise, colonial Malaya was able to become the world's largest producer of rubber by importing seeds from Brazilian rubber trees. And by importing oil palm seeds from West Africa, independent Malaysia, from 1960, soon became the world's number one supplier of palm oil.

These plantations still produce cheap raw materials under the British colonial poverty-producing plantation system, at prices manipulated by European futures markets. However, Malaysia and now the humid tropical regions of Indonesia, Thailand, and the Philippines, as well as the rainforest territories in West Africa and the Amazon, can better use their plantation land to grow transcontinental grass species to dramatically increase the supply of young nutritious grasses for their own livestock industries.

Vernadsky's Biosphere

Precisely because the grass production in a properly managed grass plantation is sustainable, it can be immediately scaled up anywhere in the humid tropics where rainwater is plentiful and also in the dryer tropical regions wherever underground water is still available. The world's reserves of underground water, derived not from rain but previous ice ages, are fast depleting, but

as nuclear-desalinated water becomes available, even barren deserts can be transformed into lush grass plantations.

Greening the deserts and nuclear-powered agro-industrial nuplexes were the grand vision of President Eisenhower's 1953 Atoms for Peace program. This was anticipated, well before the splitting of the atom, by the Russian biogeochemist V.I. Vernadsky (1863-1945) when he opened the Radium Institute in Petersburg in 1922, stating:

Soon man will have atomic power in his hands. This is a power source which will give him a possibility to build his life just as he wishes.

Today as the nuclear renaissance unfolds, we can think big again and mentally transform the otherwise biologically non-productive Sahara Desert into

grass plantations. No doubt the Greenies will want to preserve this pristine desert environment. But let the Greenies try living there in desert outposts and discover for themselves that their alternative energy windmills and solar panels are next to useless for desalinating water for their crops!

Meanwhile, the digestible cellulose produced in a Sahara Desert dotted with nuplexes would be sufficient to support perhaps 5 billion cattle, compared to the present world population of 1.3 billion cattle. The Sahara Desert is certainly large, but is only a small percentage of the total tropical land mass that could support grass plantations. This is good news, because mankind must prepare for the approaching ice age as the Earth's perfectly natural 10,000-year global warming period draws to an end, by around the year 2050. During the Earth's fairly regular 100,000-year-long ice ages, the evaporation of water from the oceans and hence world rainfall is greatly reduced and much of the tropical region turns into extreme deserts, except the equatorial rainforests, which survive ice ages and serve as the Earth's Noah's Ark, maintaining and guarding the biosphere's 50 million living species for warmer times.

Meanwhile, the polar ice caps expand and the temperate regions become buried in a kilometer or more of ice. The combined effect of glaciers and desertification causes a mass extermination of living matter in the biosphere. The carrying capacity of the Earth's land mass for all species is greatly reduced, and only starts to increase as the Earth warms up again in the next interglacial, the 10,000-year period of global warming.

Man's creative ability (Vernadsky's Noösphere) to discover the principles of the universe and develop new technologies based on these principles is able to transform the biosphere.



Agricultural Research Service, USDA

New Zealand sheep. Prime quality lamb for meat can be produced in 5 months in Malaysia, compared to 8 months in New Zealand. One hectare of grass in Malaysia's new grass farms can support 82 sheep throughout the year, compared the best sheep farms in New Zealand, which can carry only up to 25 sheep per hectare throughout the year.

trast, goats make resentful prisoners. With a larger brain, their instinct is to escape captivity so they can browse plants and shrubs and low lying branches as solitary animals.

Compared to sheep, which have undergone extensive genetic selection, indigenous goats are almost an unimproved wild animal and therefore have a low genetic potential for growth and a bony carcass. The African Boer goat has been selected for better growth and meat content, but demands plenty of outdoor space, increasing the cost of production and the chance of infection. An African breed of sheep confined to a Deep Tropical shelter is achieving average growth rates of 250 grams per day. This compares with 45g per day with the indigenous Malaysian sheep on grazing, or 90g per day when housed intensively.

The same is true of local versus foreign improved breeds of goats, cows, and cattle. Developing countries are therefore well advised to consider looking for high growth rate breeds from a different continent. With Deep Tropical husbandry to minimize diseases, these genetically superior breeds could be the fastest way to improve livestock production and make farming profitable.

Vernadsky was the first to recognize that man's unique ability above all the animal species for creative thinking had become, by the 20th Century, a planetary force greater than nature itself to change the biosphere. Now we have the beginnings of a survival strategy to feed mankind throughout the next ice age, and avoid the population crash that every other species will suffer, apart from chosen species like domestic food animals protected by man.

From Vernadsky's planetary perspective, each developing nation, instead of panicking in the world financial crisis, can confidently work out how to rapidly produce its own food. This calm, thoughtful, and cooperative process between nations can outflank the British Empire's brutish globalization plan to outdo the approaching ice age by depopulating the world by 80 percent, primarily through starvation and accompanying diseases.

Suitable Domestic Animals

Goats, although good for extensive grazing systems, are not the best animal in our opinion for intensive production systems. Sheep are far superior, for they are a timid grass-eating herd animal and adapt splendidly to close confinement and good husbandry. Second only to rabbits, sheep are the easiest domestic animals to look after, even by young teenagers. In con-

Mass-Producing Prime Lamb

Small scale pioneer Deep Tropical sheep farms in Malaysia support 82 sheep per hectare of grass plantation, compared to 25 sheep per hectare on New Zealand's best grazing farms. Negotiations are under way to establish a group of commercial farms for 25,000 sheep, as a model that can be replicated around



Courtesy of N. Yogendran

Jersey cows on their way to the automatic milking turntable at a Deep Tropical farm in Malaysia. Their climate-controlled shed is in the background.

Malaysia. Intensive sheep farming the Deep Tropical way is much easier than intensive dairy farming, and very suitable for new farmers and youth with no previous experience.

In Malaysia, evaporatively cooled housing is not necessary for imported sheep (or cattle), which soon turn night into day by resting and ruminating during the hot part of the day and eating during the cooler night. Sheep are housed in lots of 100 in low-cost, open-sided sheds, and fed daily with chopped grass and concentrates from outside the shed.

Good health is maintained by vaccinating the animals and good hygiene. Metal grid flooring raised 20 centimeters above the ground allows daily removal of the air-dried sheep dung, thereby preventing flies. The dung fertilizes the grass plantation minimizing the use of costly chemical fertilizer. With this simple low-labor system, novice farm workers can be easily trained to look after two sheds, and the best among them can be further trained in colleges and universities to become entrepreneur animal farmers.

Prime quality lambs for meat can be produced in Malaysia in 5 months, compared to 8 months in New Zealand. In much the same way, cattle can be fattened in open-sided feedlots. However, in a food emergency there is a biological problem with sheep, cows, and beef cattle. The twinning percentage is low, and their reproductive rate is rather slow: 5 months for sheep and 9 months for cows, which cannot be speeded up.

Mass-Producing Rabbits

Improved breeds of rabbit, fed from a grass plantation, can produce 50 offspring per year reaching slaughter weight in 3 months, although supplementing the rabbit's grass diet with protein will probably be necessary to achieve these growth rates. A crash program has been developed to the concept stage to rapidly mass-produce rabbits throughout the villages of Malaysia, 95 percent of which have adequate housing, shops, schools, sealed roads, electricity, and piped water—but not enough jobs. A rabbit animal production unit (APU) will consist of 10 low-cost single-story terrace rabbit houses, each a small breeding farm containing 1,000 or more rabbits in different stages of production. The unit is intended to be operated part-time on a contract basis by 10 families, and is especially suitable for those families with school-going children to help with the labor.

A number of animal production units, each producing 10,000 rabbits per year, and built in nearby villages will be supplied with grass daily from a central commercial grass farm serving also as the slaughter house and wholesale distribution centre. The very modest capital investment by the government for the APUs, combined with making better use of the well-established



Courtesy of Mohd Peter Davis

Happy pigs at a Deep Tropical farm in Malaysia. Hygienic, disease-free pig farming yields improved productivity and reduced mortality, savings which pay for the climate-controlled enclosed GIFT Shelter. Similar shelters can also be used for high-value stud sheep and goats.

village infrastructure, means that rabbit meat production can be quickly scaled up to support a government-directed emergency food program. Meanwhile, the large-scale breeding farms to support commercial dairy farms and sheep farms will spread more slowly, in line with the much lower reproductive rates of these animals.

Bio-security Animal Housing

The Deep Tropical animal housing is another stunningly simple concept. For the last 500 years in Malaya/Malaysia, attempts have been made to adapt grazing temperate animals to the heat and diseases of the humid tropics. Cross-breeding with hardy but non-productive local breeds has not been successful, and Malaysia, with good infrastructure and modest industrialization, currently imports 95 percent of its milk, 92 percent of its mutton, and 77 percent of its beef.

Some of this importation is because of the demand by the World Trade Organization that developing countries import their food, but there is a deeper problem. The same mistakes were made year after year, century after century, trying to copy the European grazing system in the humid tropics.

Agricultural entrepreneur N. Yogendran decided to break with this pattern. Instead of trying to change the animal's biology, Yogendran ignored the "experts" in the universities and research organizations and changed the animal's environment. Low-cost climate sheds were invented and perfected to provide animals with a perfect year-round summer Mediterranean climate, kept cool with novel evaporative cooling at a fraction of the electricity cost of air-conditioning.

The well ventilated, cool and dry barns provide suitably vaccinated cows and pigs with near human levels of comfort and

modern hygiene, where dung is efficiently removed without fouling the animals. Diseases and parasites simply disappear, without pumping the animals with medication. Now the most productive breeds of domestic animals in the world, perfected by advanced genetic selection, can be air-freighted, with all their health clearances, from the best farms in temperate countries.

Cows flown from Australia, barely touching the tarmac, are trucked immediately to their new hygienic climate sheds. Within two weeks, the animals are adapted to their new "Hilton Hotel" environment and eating well, protected from the heat and animal predators and especially the horrendous disease and parasite load of the humid tropics.

A similar hygienic shed has been designed for pigs, which transforms the dirty, smelly pig farming, characteristic of Asian backyard farming. A new enclosed pig shelter, kept cool and dry by high-ventilation evaporative cooling, is odorless and the pigs are easily trained to respect a toilet area, allowing them to be floor fed (see photo, previous page).

A small swimming pool in each pen enables two pigs at a time to wallow to stay cool and follow their natural behavior in the

wild. When a pig gets out of the pool, the rest of the pigs engage in social grooming, licking the wet pig until it is pink and dry. The pig shed is kept as dry as possible and the dung is washed daily through the swimming pool with minimal water, allowing the dung to be treated in modern sewage plants instead of open oxidation ponds.

The happy pigs can replace the revolting conditions that pigs are generally subjected to in traditional pig sheds throughout Asia. Pigs in the wild are clean and sociable animals with large litters, and we have recreated a modern form of their natural conditions at modest cost, compared to expensive modern pig farms in developed countries, which are beyond the reach of farmers in developing countries. The capital cost for climate buildings is more than recovered by lower animal losses and improved productivity.

Again, agricultural science and engineering has improved animal welfare to near human conditions while the environmentalists preach animal rights and want to ban meat altogether from the human diet. Most important, the climate-controlled buildings protect domestic animals from virus diseases such as Bird Flu, Nipah virus, and Sars, which respect no borders and can devastate world animal production, at the same time passing on mutated animal viruses to the human population, threatening viral pandemics.

Deep Tropical bio-security ruminant farms, similar to modern enclosed chicken farms, can provide a practical, affordable alternative to European grazing and Asian backyard farming. The Deep Tropical agricultural system, developed in Malaysia to cope with the highest disease load in the world, therefore marks a new standard of hygiene for animal production for the rest of the world to follow, at a cost that developing countries can afford.

The 'Carrying Capacity' of Land

What the diehard Malthusians and brainwashed environmentalists refuse to understand is that the "carrying capacity" of the land is not a fixed biological constant for each species of animal or human being, but can be increased by man's creativity. The grass plantation in Malaysia, producing 10 crops of young grass per year, dramatically increases the carrying capacity of the land. We are demonstrating this in the most practical way. One hectare of a Malaysian grass plantation can support 82 African sheep in climate sheds, growing at 250 grams per day compared to 2 indigenous Malaysian sheep growing at 45 grams per day, grazing on one hectare of a rubber plantation or one hectare of village land.

The 2 Malaysian sheep, grazing "naturally," as recommended by the less fanatical green environmentalists worldwide for livestock, will produce about 40 grams of carcass meat per day. Compare this to the nearby 82 African sheep, hygienically housed and supported by 1 hectare of grass plantation, which will produce around 11,300 grams of carcass meat per day. This represents a 282-fold increase in carcass meat supply per hectare of land!

By providing so much more food have we not increased the potential carrying capacity of human beings per hectare of land? Have we not done this in a completely sustainable way, requiring only regular fertilization to replenish the soil nitrogen and minerals consumed by the grass?

Moringa: A Green 'Superfood'

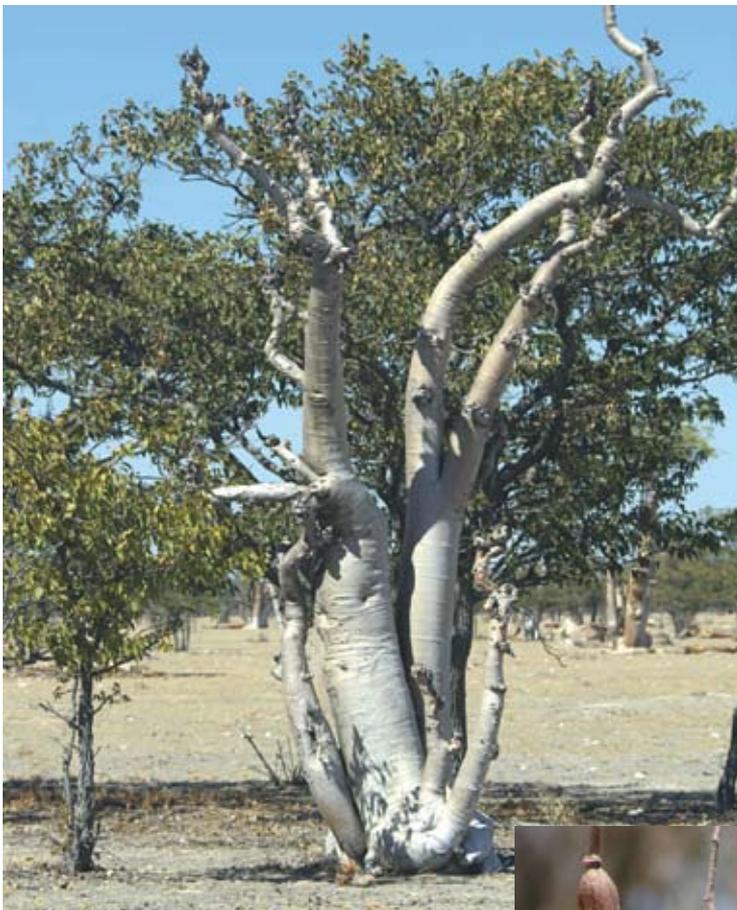
The moringanews.org website described moringa as follows in a June 18, 2008 press release:

Moringa: a small, fast-growing tree found in all tropical regions. Its leaves are among the world's richest vegetables. It is a plant food of high nutritional value, ecologically and economically beneficial and readily available in the countries hardest hit by the food crisis. It is therefore urgent that the barriers preventing the development of this green superfood be removed....

The leaves of moringa ... were recently identified by the World Vegetable Center (Taiwan) as the vegetable with the highest nutritional value among 120 types of food species studied. Easy to cultivate and resistant to drought, this tree produces abundant leaves with a high concentration of proteins, vitamins, and minerals: 100 grams of fresh moringa leaves provide the same amount of protein as an egg, as much iron as a steak, as much Vitamin C as an orange, and as much calcium as a glass of milk.

Moringa grows throughout the developing world and has already been used by programs to reduce child malnutrition in India. Its dried leaves, in powder form, can be easily preserved and used. Eating 30 grams a day, a child can satisfy all his daily requirement of Vitamin A, 80 percent of daily calcium needs, 60 percent of daily iron needs, and nearly 40 percent of protein needs.

Given the world food crisis, the use of local resources like Moringa is critical to reduce the dependence of developing countries on imported goods, and to improve nutrition among poor households.



Hans Hillewaert

A “miracle” moringa tree growing in Namibia. Moringa plantations, harvesting leaves when they are young, could supply nutrients for the world’s hungry.

Seeds from the moringa tree produce edible oil.

Yet again, science disproves the 200-year-old lie of Malthus and his co-thinkers today in the green environmental movement who chant incessantly that mankind is outstripping the Earth’s ability to produce food, and therefore deserves to be exterminated to save the environment.

Moringa: The ‘Miracle Tree’

As Henry Kissinger, a self-confessed British agent of influence, was busy back in 1974 as U.S. National Security Advisor, enacting the National Security Study Memorandum 200 to destroy Africa’s ability to grow food,³ and as environmental groups worldwide, led by the likes of Prince Philip, joined this depopulation bandwagon, others worked to develop technologies that would fight against the killer malnutrition.⁴ New strains of rice or wheat and other crops

that could withstand ultra-dry, ultra-wet, and ultra-salty soil; plants that are pest resistant or with higher vitamin levels are some of the developments to increase man’s capability of feeding the world.

One such technology that we have investigated is the production of the moringa “miracle tree” to provide a bounteous vegetarian food source of protein and vitamins (see box). The moringa is known throughout developing countries for its edible leaves and pods, oil from its seeds, wide medicinal uses, and water filtration and purification (see <http://www.moringanews.org>). Because it contains 27 percent protein and 8 essential amino acids, it is suitable as an ingredient in baby formula, as well as hard biscuits for survival rations. For countries with emergency food needs, moringa can provide a fast remedy.

Although many non-governmental organizations and missionary groups have been involved in research and promotion of moringa, the question is, why hasn’t the Food and Agriculture Organization (FAO) taken up its development on a crash basis as a weapon against hunger and starvation?

The moringa tree can be grown as a bush which can be harvested every few months by cutting the trunk 20 centimeters above ground to yield its nutritious leaves in high tonnages per hectare per year. This means that moringa can be mass produced on plantation scale.

Malaysia and Indonesia are ideal as a testbed for such mass production.

Recycling Colonial Plantations for Food Production

The 10 million hectares of oil palm and rubber plantations in the rainforest regions of Malaysia and Indonesia are a vast land resource that could be put to much higher benefit for emergency and long-term food production. Rubber and palm oil along with cotton, tea, coffee, and wool are cheap colonial raw materials, based on the lowest possible labor cost, that have long served the interests of the British Empire. Developing countries al-

though independent, are still at the mercy of the world price for these commodities, which is manipulated by so-called free trade.

Export earnings of rubber and palm oil expressed as a percentage of Malaysia’s total exports have declined steadily, from 41 percent in the 1960s to only 4 percent in 2005. Given the





Farmers in Senegal harvesting moringa leaves by hand. Keeping the tree as a bush, allows farmers to harvest juvenile trees every two months for its edible leaves. The dried and ground leaves contain 28 percent of high quality protein, which can be formulated into baby food and used as an ingredient in many dishes. Malaysian entrepreneurs are thinking: Why not grow moringa on plantation scale and mechanically harvest the leaves?

collapsing world prices of palm oil, it is now barely worthwhile to pick the fresh fruit bunches from the trees, which in November 2008 fetched only RM280 per metric tonne (\$80.00), less than half the price of the previous four months. If the price on the international stock markets gets any lower, Malaysia and Indonesia can save money by not producing rubber and palm oil!

Looking at the bright side of the situation, the insanity of the free market has, in effect, liberated vast areas of land for local food production. What a golden opportunity!

Existing plantations can be easily converted into grass plantations. Within six months, the whole process of cutting down the rubber or oil palm trees, and plowing, fertilizing, and seeding grass or moringa, the old plantation could be producing its first crop of nutritious grass or moringa.

Malaysian entrepreneurs are getting enthusiastic. Why not use some of the liberated 5 million hectares of rubber and palm oil plantations for grass plantations for animal production? Why not mass produce moringa leaf powder for baby formulations and survival biscuits for world markets?

Food technologists can modify

the formulations to suit the appearance, taste, and texture required by different cultures. Distributed as emergency food by international agencies, the protein-rich biscuits will help prevent malnutrition and even starvation, while developing countries gear up their own food production.

Why not search for other high protein plants traditionally used as food in Africa and India, grow them in plantations, and process them for world markets? Developing countries have all the available resources, so let us collaborate and quickly find the best species to propagate for emergency food.

International Scientific Collaboration

While developed countries are paralyzed in the face of the world food crisis, it is important to understand that developing countries are taking the lead and making agricultural breakthroughs, such as the moringa propagation and the Deep Tropical system, to solve their own food production problems. Now that self-funded agricultural entrepreneurs have shown the way forward, it is time for the government agricultural institutions in developing countries like Malaysia to admit their shortcom-



There are 10 million hectares of oil palm (above) and rubber plantations in the rainforest regions of Malaysia and Indonesia, some of which could be converted into grass farms or moringa plantations. Instead of being dependent on the colonial method of raw material looting, these and other developing nations could quickly stop malnutrition and starvation and become self-sufficient in food.

ings, swallow their pride, and fully support their own farmers and inventors.

Adopting the New Zealand and Australian practice of mobilizing the nation's agricultural scientists and engineers in the universities and research institutions behind its agricultural entrepreneurs will allow humid tropical Malaysia to leapfrog the European grazing system and serve as an exemplary example for other developing countries to rapidly increase their local food production.

Japan, which has long given agricultural aid to developing countries, has made a generous proposal. In June 2008, Yusuo Fukuda, then Japanese Prime Minister, announced to the 4th Tokyo International Conference on African Development:



IRRI

With a wealth of agricultural experience, Japan is willing to cooperate with countries and international organizations to develop irrigation systems, improve the varieties of crops raised, and foster workers in the field of agriculture.

A "Rice Action Plan" has been put forward by Robert Zeigler, director-general of the Philippines-based International Rice Research Institute (IRRI), whose plan won support in Hanoi in October 2008 from the 10-nation Association of South East Asian Nations (ASEAN). Rather than opening up new lands for rice cultivation, IRRI advocates a much faster approach by using its modern techniques to increase the yield on existing rice land by 2 metric tonnes per hectare. The current average yield in Asia is 3.8 metric tonnes per hectare, a miserable 1.5 metric tonnes in Africa compared with more than 10 metric tonnes per hectare, which was recently achieved on research farms in South China using super-hybrid rice.

This approach of improving crop yields was adopted for the 1960s-1970s Green Revolution, using science and technology developed at international research institutes, each specializing in a particular crop. It is the fastest way to achieve world food security, as India has proved. The best way by far to ensure the correct implementation of these scientific advances is for the scientific institutions to collaborate with proven entrepreneur farmers.

The role of government agencies is not to produce food, but to unlock the land for entrepreneurial farming and provide low-interest long term credit and incentives to make this happen. The government must also ensure that fertilizer and agricultural extension services are available, along with fair marketing of

International scientific research and collaboration with local entrepreneur farmers is key in raising the yields of major food crops, allowing developing nations to become food self-sufficient. The International Rice Research Institute (IRRI), one of major Green Revolution research institutes, has developed new rice strains and growing methods to greatly improve crop yields. Here, a Malaysian researcher with IRRI investigates weedy rice, which causes crop losses.

farm produce without the middlemen stealing the farmers' profit.

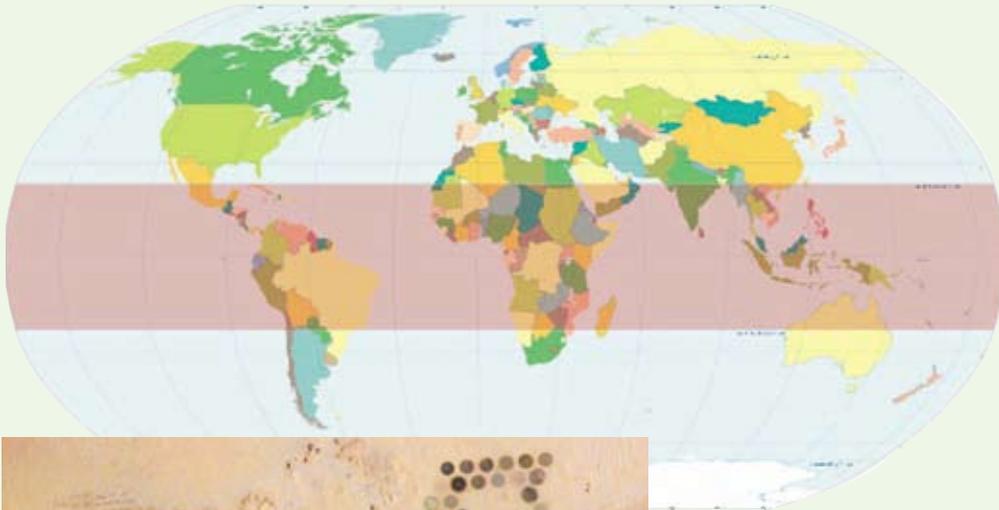
As farming becomes more efficient, much of the 40-80 percent of the population in developing countries who are currently employed in agriculture can be gradually replaced. This transition from feudal farming to scientific farming, which took several centuries in Europe, can now be greatly accelerated in developing countries, given good farming systems. Rural youth with certificates, diplomas, and degrees in modern agriculture and agricultural sciences can take over from the poverty farming practiced by their fathers and become highly productive and prosperous entrepreneurial farmers.

The overall concept is a Franklin Roosevelt-type crash science program for emergency food production.

Crop Circles for the Tropical Zone

Another great leap in world food production can take place as nuclear-power produced electricity and desalinated water comes on stream, especially from the small nuclear reactors under development by South Africa, India, China, Russia, and America. These 100- to 200-megawatt factory mass-produced modular power plants, rather than the current 1,000- to 1,500-MW reactors, which take a long time to construct on site, will be ideal for kick-starting modern agriculture.

Even before these fourth-generation nuclear plants come into production, irrigated crop circles are creating the market. Spectacular crop circles, one to two kilometers in diameter, are



NASA

Crop circles in the Libyan desert, as seen from space.



A center-pivot irrigation arm, traversing the crop circle.

Center-pivot irrigation for crops, Deep Tropical animal production, and fourth-generation modular nuclear reactors will enable the greening (and food self-sufficiency) of all the Earth's tropical zone (see map), from the Tropic of Cancer to the Tropic of Capricorn.



Artist's illustration of the planned Pebble Bed Modular Reactor facility at Koeberg, South Africa.

PBMR

greening the deserts of Jordan, Libya, and Saudi Arabia, as can be viewed on Google Earth. These crop circles, with their center-pivot irrigation, rely on fast-depleting underground water left over from ice ages. With cheap and abundant supplies of desalinated water and electricity from these town-sized modular nuclear reactors, the whole of the Earth's zone from the Tropic of Cancer to the Tropic of Capricorn can be transformed into productive agricultural land based on irrigated crop circles.

Different crops such as wheat, corn, soybean for humans, and also chicken, egg, and pig production and grasses for cattle, cows and sheep, can all be produced in dedicated agricultural zones to provide food for nearby population centers.

Crop circles rely on center pivot irrigation, an American invention dating from the 1950s and perfected over the decades. From a fixed center point, the huge irrigation arm slowly travels on wheels around in a circle while spraying the crops below. The sprinkler arm can be 1 kilometer in length, giving a crop circle area of 314 hectares, ideal for a grass plantation. In the few dry tropical regions where the supply of underground water is still plentiful, such as parts of Northern Africa and Northern Australia, there is no technical reason to prevent the Deep Tropical livestock system from being practiced immediately, feeding climate-controlled-housed cows, cattle, sheep, and rabbits from a grass crop circle.

Similar crop circles of corn and others of high protein legumes will support the production of nonruminant pig, chicken, and egg industries. Other crop circles will support wheat and barley and a wide range of vegetables and vegetable oil crops.

The land between the crop circles is not wasted land; it can serve as roads and a "scorched earth" barrier to other species, greatly minimizing the use of insecticides. Indeed, agricultural science can "out green" the greenies, especially that living fossil Prince Charles, who while waiting to become King of England retreats to medieval organic farming on his feudalistic royal estates.

Crop circles, combined with Deep Tropical animal production and small mass-produced nuclear reactors, are the key to ensuring world food security well into the future. The plentiful supply of electricity and desalinated water from small modular nuclear reactors, such as the General Atomics GT-MHR or the South African PBMR, or India's planned thorium reactor, or the Russian floating nuclear power plant, will allow these gigantic crop circle farms to be established almost anywhere in the Earth's tropical zone, from the Tropic of Cancer to the Tropic of Capricorn.

This is the warm climate zone with plenty of sunlight, but not enough water, where much of the world's population presently struggles to survive using primitive agricultural techniques. Making use of nuclear power, these populations can quickly advance to the high quality milk, meat, egg, and wheat diet enjoyed in developed countries, which so dramatically improved health, stature, and lifespan during the 20th Century.

Nuclear power will replace the reserves of underground fresh water left over from previous ice ages that have now been largely exhausted by modern agriculture, particularly over the last 50 years. There is no shortage of water in the world. The

nuclear desalination of the Earth's oceans will supply mankind with inexhaustible quantities of fresh water for agriculture, industry, and residential use. By the mid-21st Century, fusion reactors will be recreating the "Sun on Earth" by fusing together hydrogen isotopes, the most abundant in the universe, to gradually replace the energy obtained by splitting non-renewable uranium.

Bringing Hope to the Young Generations

Again and again, science and technology are proving Prince Philip's anti-science, anti-nuclear, and anti-human World Wildlife Fund insanity wrong. Although this international army of green environmental Malthusians has willingly chosen genocide as the "final solution" to the world food crisis, and must be defeated, their misguided young followers in schools and universities are worth salvaging. These youth passionately, but falsely, believe that the world is grossly overpopulated and cannot feed itself, and that man is depleting finite resources and "destroying" the environment with global warming.

Brainwashed by Prince Philip's aging gang, these young people can be ridiculed out of their no-future misery and encouraged to play their part in defending the human race. They have been conned into living mentally in the ignorance and brutality of the Middle Ages, stupidly rejecting the gains of the European scientific renaissance that succeeded in liberating mankind from hunger and poverty.

The last 40 years have been largely wasted. As the world economy disintegrates, we need a generation of clear-headed youth to take on the archaic British Empire and build a new world. The adoption of a New Bretton Woods financial reorganization, as proposed by economist Lyndon LaRouche,⁴ will provide the needed opportunity for the world's agricultural scientists and engineers, cooperating fully with entrepreneur farmers in each nation, to deliver a plentiful and secure supply of good quality food for the entire world population for the first time in human history.

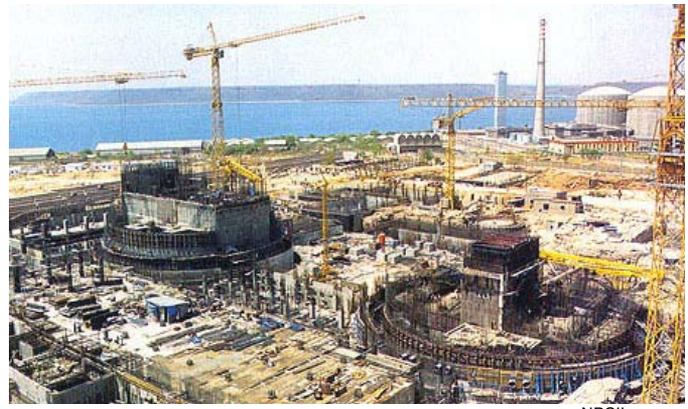
Mohd Peter Davis is an honorary visiting scientist at the Institute of Advanced Technology, Universiti Putra Malaysia, near Kuala Lumpur. N. Yogendran heads the Genetic Improvement and Farm Technologies (GIFT), Sdn Bhd. E-mail contact is mohd_peter@hotmail.com.

Footnotes

1. See "National Food Self-Sufficiency Planning: The Case of Malaysia, *EIR*, July 29, 2002.
2. "Malaysia's Agricultural Breakthrough, and Nuclear Desalination, Can Feed the World" *21st Century*, Spring 2008, http://www.21stcenturysciencetech.com/Articles%202008/Special_report-Sp2008.pdf
3. NSSM 200, the National Security Study Memorandum, prepared under Kissinger's direction, viewed population growth in the developing sector as a threat to the U.S. national security, because increased population and nationalism might limit Western access to raw materials. The text of this now declassified document can be found at <http://wlym.com/text/NSSM200.htm>.
4. Lyndon LaRouche's New Bretton Woods program can be found at www.larouchepac.com, along with many video and written presentations on the food crisis, its causes and solutions. In a short video titled "The Food Crisis," <http://larouchepac.com/node/9207>, LaRouche warns bluntly that the globalization of food has deliberately left developing countries dependent on other countries for much of their food, while the British Empire is dangerously positioned as middleman to determine who eats, and at what price, and who starves to death.

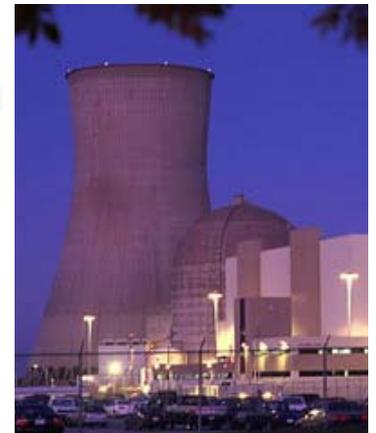
Stimulate The Economy: Build New Nuclear Plants!

by Marsha Freeman



NPCIL

Nuclear plants are the most capital-intensive investments made in the utility sector, and they produce millions of times more power in terms of energy flux density than any other power source. Here Units 5 and 6 of Nuclear Power Corporation of India Ltd.'s Rajasthan nuclear power plant under construction in Rajasthan state.



Areva

Nuclear power is essential for the United States to recover from the ongoing breakdown crisis and become economically productive again.

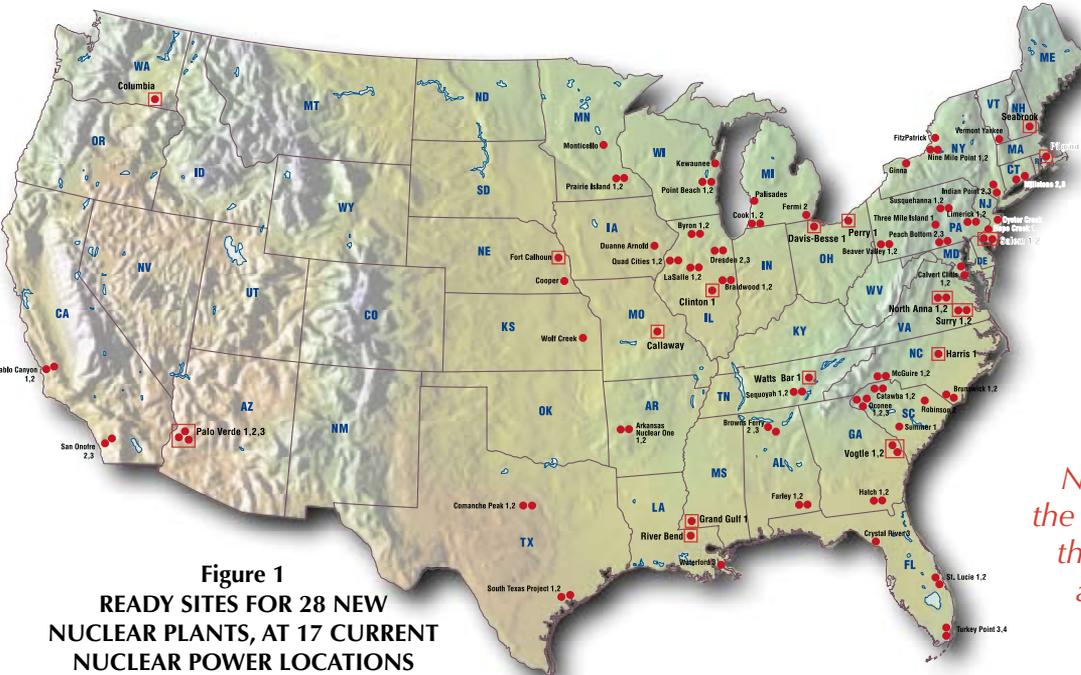


Figure 1
READY SITES FOR 28 NEW NUCLEAR PLANTS, AT 17 CURRENT NUCLEAR POWER LOCATIONS

The current 104 U.S. nuclear plants, with sites for new plants indicated.

Source: Nuclear Energy Institute

While policymakers in Washington try to determine how an infusion of Federal funds should be vectored toward an economic recovery, certain fundamental principles must be at the basis for decision making.

At the present time, no attempt to pull the U.S. banking system out of a bottomless bankruptcy will be successful without a return to the U.S. Federal budget to capital budgeting rules. All reorganization of bankrupt institutions must be premised on that general rule. This



Areva

"Shovel ready": Two of the sites at existing nuclear plants where new plants can be built. Above, Calvert Cliffs in Maryland, where UniStar Nuclear Energy has proposed to build a third nuclear plant. Above right, the Callaway Plant in Missouri, where AmerenUE plans to build a second plant.



Areva

The core of a nuclear reactor. Today, the United States has to import large nuclear components like this one, because the nuclear manufacturing industry here has all but shut down.

means that assets which meet the standard for chartered national or state banks will be protected as if Glass-Steagall rules had been still in effect.

After the financial sector is put through bankruptcy reorganization, and the fanciful financial instruments commonly known as "toxic waste" are put to one side, so as to make no further claim on the good faith and credit of the United States, the nation can return to its Constitutional duty to initiate internal improvements, in order to promote the general welfare.

It is necessary to ensure that the basic needs of the population are met, through short-term measures, such as moratoria on housing foreclosures, extended unemployment benefits, and broadened health care insurance, and that bankrupt states continue to provide basic services for their citizens.

But economic growth will depend upon trillions of dollars of Federal investment that ameliorate the immediate situation by laying the basis for the long-term increased productivity of the economy, as a whole. It is not a question of simply creating jobs, but increasing the capital-intensity of the economy, and raising the productive level of the nation's workforce. This is the function of investments in basic economic infrastructure.

There will be no economic recovery, or growth, without a massive expansion and upgrading of the nation's energy supply and distribution system. Contrary to "popular opinion," which has been shaped by scam artists like T. Boone "Windbag" Pickens, and "green" ideologues like Al Gore, only a massive expansion of nucle-

ar energy can provide the quality and quantity of energy that a 21st Century economy requires.

Although the first tentative steps have been taken by electric utilities to restart the construction of new nuclear power plants, with more than two dozen reactor license applications filed with the Nuclear Regulatory Commission, this "renaissance" in nuclear power will not materialize without a Federally directed "stimulus." Similarly, the disappearance of the U.S. nuclear manufacturing industry has begun to be reversed, but the reconstitution of a nuclear industry, based on the most modern power plant designs and advanced manufacturing techniques, will not happen without a nationally directed effort.

For decades, the mass-production auto industry, and its component manufacturers, created one out of every thirteen industrial jobs in the United States. This was the reservoir of the nation's machine tool design and industrial engineering talent.

The industry, which now lies in ruin, must be retooled and mobilized to recreate a nuclear manufacturing industry.

For the past three years, the Congress, led by mis-leadership Nancy Pelosi and her supporting cast of Anglo/Dutch/Wall Street financiers, sabotaged the initiatives by Lyndon LaRouche, to bankrupt and reorganize the banking system, and redirect credit to retool the auto/machine tool industry.

LaRouche has called for the creation of a Federal corporation to assume, employ, and expand the idled portion of the machine tool and auto manufacturing industry, not to produce more cars,



Areva

A new reactor vessel head, built by the French company Framatome for Virginia's North Anna nuclear plant, as it is loaded for air transport in 2003.



Japan Steel Works

A nuclear pressure vessel component at Japan Steel Works. JSW produces more than 80 percent of the heavy forgings needed for nuclear power plants, and there is a four-year waiting list for its forgings. Pictured is the 80-ton bottom "petal" of a reactor pressure vessel.

but high-speed rail and magnetically levitated (maglev) transport systems, advanced nuclear power plants, desalination plants, and water control and navigation infrastructure. On January 4, he described it as a "50-year, \$1 trillion-a-year technology and machine tool mission."

Why a 'Stimulus' Is Needed

There is no possibility that the dozens of nuclear power plants that need to be started immediately, will be built without Federal support.

Contrary to widespread miseducation of the public during the recent 40 years, there can be no recovery of the U.S. economy from its presently ongoing breakdown without a capital-intensive mode which places heavy emphasis on the included role of nuclear power installations.

The electric utility industry is the most capital-intensive sector of the U.S. economy, and nuclear power plants are the most capital intensive investments made in the utility sector. Nuclear reactions produce the most energy-dense form of energy; thousands-fold more dense than so-called renewables.¹ To produce usable energy from fission reactions, requires highly skilled labor for the construction and then operation of the plant, and high-quality nuclear-certified materials and components. The majority of the cost of nuclear energy is the construction of the plant. Because the amount of energy-dense fuel used is minimal

1. For details on energy flux density comparisons, see Laurence Hecht, "The Astounding High Cost of 'Free' Energy," http://www.21stcenturysciencetech.com/Articles%202008/Energy_cost.pdf.



Japan Steel Works

The main cylinder of a JSW steel forging press, which weighs 77 tons.

compared to any fossil fuel, the operating costs are modest.

Today, utilities planning to build new nuclear plants do not have billions of dollars of cash on hand for this investment; they must raise capital, and it is Wall Street which sets the terms by which companies can borrow money. High interest rates on borrowed capital can put nuclear power plant costs out of reach.

On Dec. 9, 2008, documents sent to the Nuclear Regulatory Commission revealed that the Tennessee Valley Authority (TVA) estimated that the updated cost of building two new nuclear power plants was in a range of \$9.9 to \$17.5 billion. This was *more than double* the original cost estimate, largely because of last year's artificially created hyperinflationary rise in the price of steel, concrete, metal and copper wiring, and other materials.

Responding to queries and disbelief from TVA's customers that they would have to bear the burden of that inflated cost, Terry Johnson, a TVA spokesman, had a proposal on how to lower it. He explained that if the TVA built the new plants *without having to pay interest on a loan*, they would cost \$4 billion to \$5 billion per unit, or about half.

Last June, the accounting firm Ernst & Young released research that had been commissioned by the British government, which similarly found that the cost of *financing* construction of a new nuclear plant amounts to

about 55 percent of the final cost of electricity. Bring down the interest rate, and the cost can be cut in half.

As commercial credit has been all but frozen, interest rates have risen, putting a further strain on electric utility investments. On Dec. 17, 2008, it was reported that the Virginia Electric and Power Company paid an interest rate of 8.875 percent to sell \$700 million of 30-year bonds, which was up from 6.35 percent the year before. This rise in interest rates adds hundreds of millions of dollars to any nuclear power plant cost.

The solution is to create a Federally chartered corporation, which will extend long-term credit, with a maximal 2 percent interest rate, for the most efficient construction of new nuclear plants. It is not important how much these power plants cost, per se; it is critical that they get built.

As the financial system has imploded, it has become less and less possible for U.S. utilities to gain access to credit *at any cost*. This credit crisis has become so severe, that last year, the Japanese government was asked by the Secretary of the U.S. Department of Energy to study the possibility of using the resources of the Japan Bank for International Cooperation and Nippon Ex-



Brookhaven National Laboratory

To be really “smart,” the U.S. electric grid needs modernization with advanced technologies, like superconducting cable. Here, Brookhaven National Laboratory researchers (from left) Vyacheslav Solovyov, Tom Muller, and Masaki Suenaga, who developed a high-temperature superconducting cable that uses less wire but conducts five times more power than traditional copper cable. The cables, now being tested in Long Island’s power grid, use the so-called first generation superconducting composite wires, made of a bismuth-calcium-copper-oxygen/silver compound.

port and Investment Insurance to support construction of nuclear plants in the United States!

To make matters worse, utility revenues have been declining, along with the productive economy as a whole. Houses that go into foreclosure no longer use electricity. Nor do empty factories. The millions of people who have lost their jobs have cut back on their use of energy, to try to save money.

People who are still employed, or still receiving their pension or Social Security checks, have also had to cut back. Over the first half of 2008, through pure speculative manipulation, primary energy costs spiraled out of control. Utilities raised rates in order to recover the hyperinflated costs they were paying natural gas and coal suppliers.

As utility rates increased, an increasing number of residential customers went into arrears, unable to keep up their payments. At the end of the 2007-2008 winter heating season, in April of last year, almost 40 million residential consumers held nearly \$8.7 billion in past-due utility accounts. A survey by the National Association of Regulatory Utility Commissioners reported that in calendar year 2007, 8.7 million residential consumers had their electricity or natural gas service *terminated*, due to non-payment of bills.

Nothing Smart About ‘Smart Grid’

The capital investment that is urgently required to increase generating capacity, move into next-generation high technology systems, and increase the capacity of transmission lines, is grinding to a halt.

While the Congressional economic “stimulus package” in-

cludes funding for what is described as a “smart” electric grid, do not mistake this so-called “modernization” for what is required. This “smart grid” would run time backwards—to “re-engineer” the grid to accommodate small, inefficient, unreliable, and intermittent “renewables” projects, such as wind power, solar energy, and biomass. Such a “redesign” of the grid will increase instability in the power supply, and lower the reliability of our transmission network.

The application of Internet-like communication and control technologies, touted as part of the “high technology” thrust of the stimulus plan, is simply a way for consumers to police themselves, to “adjust their energy use,” meaning cut back, when they see they are using more energy than they will be able to pay for. Other “automatic control” systems would allow the utility to shut off electricity delivery when demand is too high, which, according to the environmentalists, is the alternative to building new power plants to meet demand.

The electric grid *does* need to be modernized and expanded. The incorporation of technologies such as superconducting cable, where transmission capacity is increased multiple-fold, is being done only on a small, pilot basis. This is the kind of leap in transmission technology, which would create a real “21st Century” grid.

A Federal Corporation to Rebuild Industry

Were all of the necessary steps taken to create the policy and credit to jump start nuclear power plant construction, the nuclear renaissance would still be stalled. At the present time, there is not the manufacturing capacity to build more than a handful of new nuclear power plants per year *worldwide*.

For nearly 30 years, no new nuclear power plant has been ordered and completed in the United States. From the mid-1970s through the mid-1980s, more than 100 nuclear power plants on order were cancelled. Today’s 104 operating U.S. nuclear plants are not even a pale shadow of the “2000 by 2000” plants that the nuclear community expected to be in operation by the turn of the century, nine years ago.

By the mid-1980s, the U.S. nuclear manufacturing industry had all but disappeared. Today, not even one nuclear power plant could be built in the United States, without importing some of the largest and most important components from abroad.

But this is not just a crisis facing this country. Excluding Russia, which builds complete nuclear plants indigenously, and China and India, which are constructing the factories to also be able to do that, the rest of the world depends upon a small handful of major suppliers, which, with the upsurge in orders globally, is now stretched to the limit of its capacity.

Nuclear Regulatory Commission chairman Dale Klein observed in an Oct. 27, 2009 speech on the need to rebuild the nuclear manufacturing industry: “We can’t make a living cutting one another’s hair. At some point, you’ve got to make things. You can’t be a total service economy.” In the 1970s and 1980s, he explained, there were about 500 U.S. companies with what is called a nuclear stamp. This certifies that they meet the strict standards to manufacture nuclear plant components. Today we have 100 such companies.

As the most dramatic example, Japan Steel Works (JSW) is the only company in the world, outside of Russia, that makes the



TVO

Steam turbine at TVO's Olkiluoto nuclear power plant in Finland. Olkiluoto is a Swedish-built boiling water nuclear reactor, where steam goes directly from the reactor to the turbine.

massive forgings needed for full-sized nuclear pressure vessels, and other large components.

The ultra-heavy nuclear forgings, up to 600 tons in weight, which house the nuclear reactor core, are then machined, which is now done in a handful of plants, such as that at Chalon/Saint Marcel in northern France, of nuclear giant, Areva. Currently, JSW has a four-year waiting list for vessel forgings. Nuclear vendors planning to build new plants are now in a bidding war to make down-payments to JSW in order to reserve their place in line.

Early last year, JSW announced a \$523 million expansion plan, to double its forging capacity by mid-2011. This would enable it annually to produce 8 reactor pressure vessels, and associated components, such as steam generator parts and turbine motor shafts. At the end of last year, JSW announced a second, \$314 million expansion phase, to triple capacity to 12 units per year.

Recognizing that JSW's tripled capacity will not come close to meeting the global need, and that shortages of other components are almost as severe, a number of companies are planning to enter, or in some cases, reenter, the nuclear supply industry.

U.S. manufacturers which let their nuclear stamps expire are renewing their certificates. For example, Chicago Bridge and Iron (CB&I), in the past built 75 percent of the nuclear power plant containment vessels in the United States, and more than 130 worldwide, as well as 41 pressure vessels for nuclear plants. Last year, CB&I renewed its nuclear stamp. CB&I announced in

October that it had been awarded a contract by Westinghouse to build two containment vessels. It plans to start fabrication of the Westinghouse units this year, with completion scheduled for 2014 and 2015.

Future nuclear powerhouses—China and India—are preparing to enter the large forgings industry. China's Harbin Boiler Works, Dongfang Boiler Group, and Shanghai Electric Group are in this category. India's Larsen & Toubro hopes to export forgings in the future, in addition to serving the Indian domestic nuclear market.

South Korea's Doosan Heavy Industries announced last May that it had completed its program to become self-sufficient in nuclear power technology, a national project begun in 2001 to manufacture plants independently. A month later, Doosan signed a contract with Westinghouse to supply equipment for new reactors in the United States. It also announced plans to spend \$395 million by the end of 2011 to increase production capacity for castings and forgings.

Sheffield Forgemaster, in England, won a contract on Sept. 2, 2008 to produce nuclear-grade steel components for new Westinghouse reactors that are being built in China. Two months later, Westinghouse ordered components for new reactors that are being planned for North and South Carolina. Now, the British government is considering a \$45 million financial package for Sheffield, to enable it to purchase a larger press and increase the scope of nuclear components that it can manufacture.

Since a 1722 decree of Peter the Great, manufacturing plants



Areva

Tubing for a nuclear steam generator being manufactured at the Chalon Saint Marcel plant in France. Production capacity for smaller nuclear components must be geared up worldwide.



Areva

A reactor coolant pump on the production line at France's Jeumont Plant. Each plant requires 70-100 pumps, which will require factories for mass production.

that are part of the Izhora group have produced parts for ships for the Russian Navy. Today, the Uralmash-Izhora Group, (OMZ), or United Machine Building Plants, is Russia's leading company for the production of specialty steels and equipment and machines for the nuclear and other heavy industries.

Over the past decades, OMZ has supplied reactor containment vessels for more than 60 plants in Russia, countries of the former Soviet Union, India, China, and Iran. It is producing the containment vessels for the first floating nuclear plants in the world, which are being built in Russia.

More than a year ago, OMZ embarked upon a plan to modernize and expand its manufacturing capabilities. That five-year plan, costing hundreds of millions of dollars, will double its capacity, allowing Russia to meet its own ambitious nuclear build plans, to commission at least one new nuclear plant per year, as well as to export reactors globally.

Forges in the Czech Republic are considering retooling, to be able to produce pressure vessel forgings in two years. Additional Japanese heavy industry giants, such as Mitsubishi Heavy Industries, are planning expansions.

As impressive as some of these projects may be, they are a drop in the bucket compared to what is necessary. We must build new nuclear power plants as quickly as we can, everywhere in the world.² This cannot be done without a mobilization of the talent and potential industrial capabilities of the United States.

Auto to Nuclear

In the 1970s, the United States had an extensive nuclear industry, in breadth and depth, with the capacity to work on more than 100 nuclear plants simultaneously, in various stages of

2. Massachusetts State Nuclear Engineer James Muckerheide gives some of the dimensions of what's needed in "How to Build 6,000 Nuclear Plants by 2050," <http://www.21stcenturysciencetech.com/Articles%202005/ Nuclear2050.pdf>

LARGE-VOLUME COMPONENTS FOR A NEW ADVANCED NUCLEAR PLANT (1,200-1,500 Megawatt range)

Equipment	Number (Range)	Comments
Pumps, large	71-100	
Pumps, small	80-484	
Tanks	49-150	from 600-150,000 pounds
Heat exchangers	47-104	All sizes, types, material 2,100-250,000 pounds
Compressors, vacuum pumps	12-26	
Fans	61-123	600-45,000 pounds
Damper/louvers	730-1,170	
Cranes and hoists	25-50	
Diesel generators	2	10 MWe
Prefabricated equipment modules	64-133	Preassembled packages including mechanical equipment, piping, valves, instruments, wiring, etc.
Instruments of all kinds	1,852-3,440	
Valves of all kinds	9,633-17,891	

Source: *US. Job Creation Due to Nuclear Power Resurgence in the United States*, Volume 2, page A-125, November 2004, Idaho National Engineering and Environment Laboratory.

planning, engineering, design, and construction. That magnitude of capability must be recreated as quickly as possible.

Four years ago, Lyndon LaRouche outlined how the auto/machine tool industry should be retooled to be able to manufacture desperately needed infrastructure. Considering that six months after the start of World War II, auto parts-producing and assembly plants were manufacturing tanks, airplanes, and ammunition, this is absolutely doable.

Since 2006, more than 30 million square feet of machine tool and manufacturing capacity in the auto and related industries have been idled. More than 300,000 jobs have been lost. It is clear that reopening those plants to produce millions more cars is folly. As the reservoir of much of the engineering, design, and skilled labor resources of the United States, the auto and machine tool industries must be retooled to take the lead in rebuilding energy infrastructure.

The application of the skills of existing machine tool shops to develop the machines to convert the auto factories to nuclear manufacturing is the first step. The production of nuclear power components has been made simpler by the move from one-of-a-kind nuclear plants, typical of the 1970s and 1980s, to standardized designs and modular construction techniques.

Modular production is the approach being used in Japan, where on-site construction time has been reduced to 36 months. Integrated modules are mass produced in factories and transported to the construction site, where they are assembled. In Europe, nuclear companies expect that 18 months could be chopped off the standard construction time if modular methods,

similar to those used to build offshore oil platforms, are used for nuclear plants.

In August 2008, Westinghouse and Shaw signed a letter of intent to create a joint venture, called Global Modular Solutions LLC, for the fabrication and assembly of modules for Westinghouse AP1000 nuclear reactors. The improved AP1000 has been designed to be built with approximately 600 such standardized modules. The factory will be built at the Port of Lake Charles, Louisiana, to produce structural, piping, and equipment modules. It is scheduled to begin operating in the third quarter of this year and will employ 1,400 people. The plant will support the construction of two reactors per year. This modular approach is perfectly suited to a retooled auto/machine tool industry.

There are numerous components required for nuclear power plants that are suitable for large-scale mass production, pre-assembly into components, and then assembly into modular units. The Table indicates some of these large-volume components, including prefabricated equipment modules. Individual modules might comprise piping, electrical equipment units, structural elements, and even ready-built stairs and platforms for on-site assembly.

Smaller Reactors for Smaller Grids

Many of the new nuclear plants will be produced for deployment in nations that do not have large concentrations of population, or in-place electric grid systems. Large-scale, 1,000-megawatt plants will not be suitable there. Next, or fourth-generation reactors, will be designed in a variety of sizes, and by operating at higher temperatures than today's conventional plants, will bring desalination and other benefits to populations, in addition to electricity.

Professor Andrew Kadak, at the Nuclear Science and Engineering Department at the Massachusetts Institute of Technology (MIT), has supervised a student project, begun in 1998, to develop a conceptual design for a high-temperature pebble bed nuclear reactor that could be economically produced in small



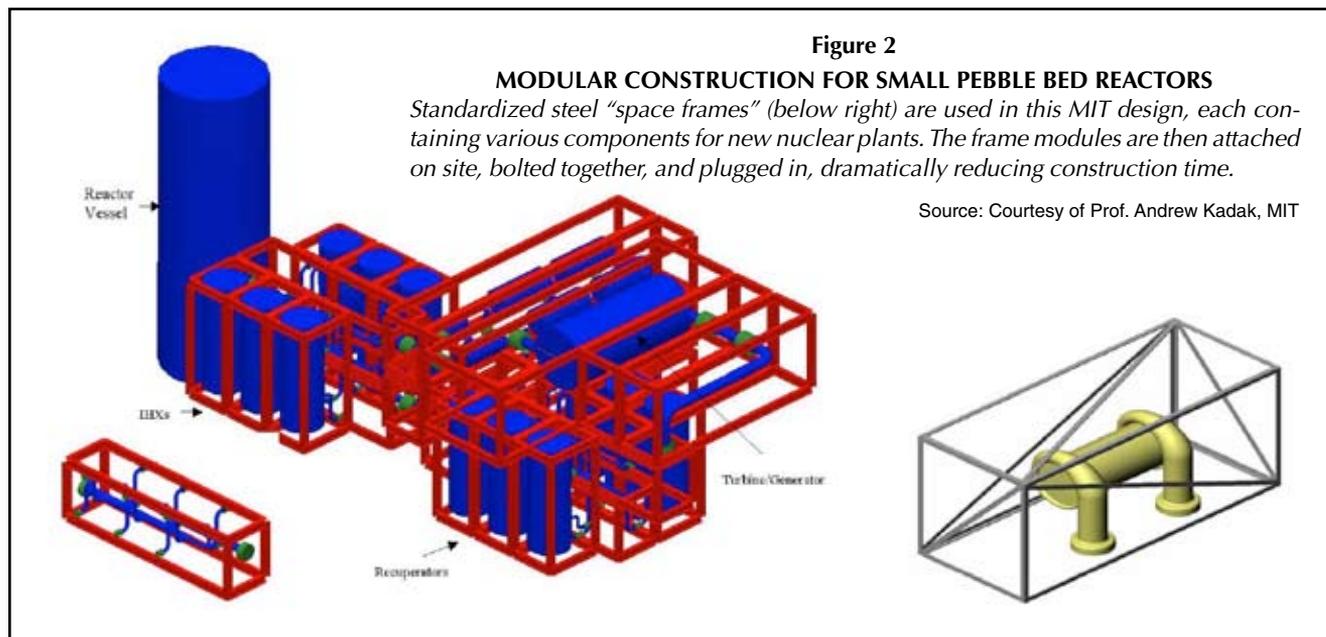
Mitsubishi Heavy Industries

A nuclear steam generator in transport. Mitsubishi delivered two replacement steam generators for the San Onofre nuclear plant in California in February, each weighing 580 metric tons and housing about 10,000 heat transfer tubes.

sizes for developing nations.

The students have focussed not only on the nuclear technology, but also how to build them most economically. In the MIT modular design, component manufacturers would provide all components, piping connections, electric power connections, and electronics to fit in a standard steel "space frame." The frames would then be assembled at the plant site, some components using a "lego-like" assembly process to bolt them together. In addition, modules could be replaced rather than having parts repaired, greatly reducing maintenance costs and down time. (See Figure 2).

In this study, the constraint on size in transporting modules was a critical factor in the design. In order to be able to deliver components for the 120-megawatt reactor, not only by barge, but by truck or rail, an upper limit was imposed, of 200,000 pounds weight, with maximum dimensions of 8 × 12 × 60 feet.





Doosan Heavy Industries

This nuclear reactor vessel, built by Doosan Heavy Industries in South Korea, is for the Qinshan phase 2 nuclear power station in the Chinese province of Zhejiang. South Korea now has the capability to manufacture nuclear plants independently, and is ready to export.

For their current reactor design, 27 modules are required, each of which is rail and truck transportable.

The Manpower Shortage

A reconstructed nuclear industry will face the immediate problem of a lack of skilled manpower, from nuclear engineers to construction workers, welders, and electricians. At the peak of construction, approximately 4,000 workers are needed at each site, and each new plant requires 400-700 employees. Building about 35 new reactors will create about 38,000 jobs in the nuclear manufacturing industry.

Over the next five years, 35 percent of the current nuclear workforce will be eligible to retire. So, in addition to the tens of thousands of new workers required for the expansion of plant construction and operation, more than 20,000 are needed just to replace those who will leave the workforce.

To start to meet the demand for skilled jobs, Mark Ayers, president of the Building and Construction Trades Department of the AFL-CIO, has proposed that the nuclear industry “set up on-site training centers,” that the union itself would build. “We would recruit from the local community and help train them to be craftsmen,” he stated. The Building Trades already spend \$800 million per year for job training, Ayers reported, and Federal “stimulus” support would speed the process.

‘Shovel Ready’

The Congress is necessarily concerned with initiating programs that “stimulate” the economy, as quickly as possible. But this should not be an excuse to put people to work doing less-than-useless non-productive jobs, such as cleaning off solar energy reflectors.

While major modes of transportation must move from liquid fuel—in cars, trucks, and airplanes—to electric systems, such as rail, maglev transport, and electric cars, as the *Detroit News* observed in a Jan. 13 editorial: “the nation remains clueless about

where the electricity will come from.” The editorial adds that “anyone who thinks the additional demand can be met solely by alternative energy sources—windmills, etc.—is delusional.”

There are two dozen new nuclear plants that could be built quickly on what are called brownfield sites. These are sites where there is at least one reactor in operation, and where additional reactors had been planned, but were never built. Construction could start almost immediately, because unlike new greenfield sites, much of the transport, energy, and manpower infrastructure is already there.

The recommendation to immediately start plant construction on these 28 sites was made in the June 17, 2005 issue of *EIR*, and was reiterated recently by nuclear engineer Joseph Somsel, in an article published in the Jan. 23, 2009 issue of *American Thinker*. Infrastructure investments, he points out, greatly increase economic productivity, which should be the criterion upon which “stimulus” investments are made.

All that is needed, he suggests, is “tweaking” current regulations for limited work authorizations. This would mean that companies could start “turning dirt” within a couple of months, as they start site preparation.

While construction begins on the first few dozen nuclear plants, an Apollo-style mobilization to rebuild America’s steel and specialty steel industries, machine tool capabilities, and auto-related plus additional manufacturing facilities, using the most advanced technologies, must get under way. It will take some time, and trillions of dollars of credit, to restore the physical economy to a pathway of growth. The longer we wait to start, the more difficult it is going to be.

This is an expanded version of an article that appeared in Executive Intelligence Review, Feb. 13, 2009.



NRC

Nuclear manpower demand: In the next five years, more than one-third of the U.S. nuclear workforce will reach retirement age, which means that in addition to the tens of thousands of workers needed to expand the nuclear industry, another 20,000 nuclear workers will be needed to replace the retiring workers. Here, Nuclear Regulatory Commission chairman Dale Klein (center) visiting the control room at the Three Mile Island nuclear plant.

PLHINO: Water to Green Mexico's Farmland

by Alberto Vizcarra Osuna

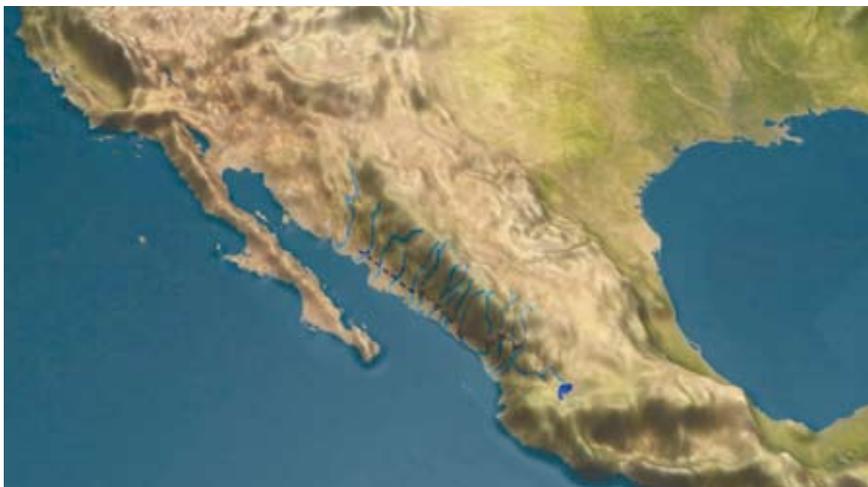
In the south, runoff from Mexico's high mountains delivers abundant water to land of low agricultural potential in a tropical climate. In the north, vast expanses of open land lack sufficient water to realize their great potential for growing grains and other crops to feed the nation. So, in the 1950s and 1960s, inspired by the earlier successes of the United States under Franklin Delano Roosevelt, Mexico drew up plans for great engineering projects which would transfer the water from the rainy south to the drier, agricultural north.

The outlook was shaped by the can-do attitude of the neighbor to the north, where FDR's use of public investment in economic structure, dams and waterways in particular, had been crucial to reversing the Great Depression. Under Roosevelt, entities such as the Columbia River, Colorado River, and Tennessee Valley authorities, had transformed flood plains threatened by uncontrolled rivers into productive farms, and allowed the growth of cities and factories in areas where water had been scarce. At one point during the Roosevelt years, 20 great infrastructure projects were under way simultaneously.

In the 1950s, under a system of collaboration between the government and private sectors, the United States drew up a plan for transferring huge volumes of water from the rivers of Alaska and northern Canada to the vast expanses that comprise the Great American Desert, covering the entire southern border of the United States. This project was

A great infrastructure project to move water from the mountains of the south to nourish the abundant farmland of Mexico's dry north.

The maps and description of the PLHINO, PHLIGON, and NAWAPA below can be found in greater detail in *Executive Intelligence Review*, Dec. 7, 2007, in an article by Dennis Small, "U.S. and Mexico: Cooperate on Great Water Projects."



Mexico's great project, PLHINO, *The Water Plan of the Northwest*, as depicted in a video produced by the LaRouche Youth Movement and available at <http://www.larouchepac.com/node/9257>. The 40-minute video, "NAWAPA-PLHINO: The Future of the Americas," reports on the history of these water projects and the current political movement to bring them to life.

known as the North American Water and Power Alliance, or NAWAPA.

The economic success of these policies inspired a similar impulse in Mexico, and there arose a generation of young engineers, inspired to create great infrastructure projects for the transference of water. It was in this way that projects like the Northwest Hydraulic Plan (*Plan Hidraulico Noroeste*, or PLHINO) and the Northern Gulf Hydraulic Plan (*Plan Hidraulico del Golfo Norte*, or PLHIGON) were conceived.

The Water Projects Take Shape

Since the 1940s, in the Northwest region of the country, Mexican engineers of the then National Irrigation Commission had the idea of interconnecting two basins, one with an abundance of water and scarcity of soil, and the other with a greater amount of soil and lesser availability of water. They conceived of con-

veying water from the Humaya River, in the state of Sinaloa, to irrigate the land on the right bank of the Mocorito River, in the same state.

In the 1960s, the first approximation of the idea of the PLHINO was born, which proposed the interconnection of the hydrological basins included between the Piaxtla River in Sinaloa and the Sonora River in the state of Sonora.

In 1968, the idea of interconnecting the rivers in Nayarit, which possess large volumes of water (the Santiago, San Pedro, and Acajoneta) was consolidated, thus endowing the project with extraordinary potential, inasmuch as it put forward the concept that interconnecting the 16 consecutive rivers and 7 streams of the states of Nayarit, Sinaloa, and Sonora, would allow the use of a total annual run-off of 28 billion cubic meters.

This would provide the region with the means to efficiently sustain itself, generating productive jobs, water for urban and industrial usage, and water for electric energy. It would enable the region to develop fish farming and tour-



Figure 1
MEXICO'S MAJOR RIVERS

Mexico's great challenge has been to take water from where it is abundant, and transfer it to where it is not. In the most recent design for the PLHINO, Mexican engineer Manuel Frías Alcaraz makes use of about 75 percent of the runoff from five underutilized rivers on the central Pacific Coast of Mexico to feed a canal running northwest along the Pacific Coast. These rivers are San Pedro, Acaponeta, Baluarte, Presidio, and Piaxtla, as shown here.

Each of these rivers would have new dams constructed upstream, and would be connected by a series of four tunnels, (ranging from 21 to 33 km in length, with 7-meter-diameter tubing). The tunnels would gradually bring the water

down by gravity from 570 meters above sea level at the first dam, to 370 meters above sea level at the last one.

From the Piaxtla reservoir, at 370 meters above sea level, Frías has proposed a series of canals, pumping stations, and smaller dams and tunnels that would transfer the accumulated 220 cubic meters/second of water to Sonora's Yaqui River in the north.

The 10-year project would cost about \$1 billion per year—"monetary resources equivalent to [Mexico's] purchase of food for only one year," Frías said. The transferred water would open up 800,000 hectares of new farmland in the states of Sinaloa and Sonora, made possible by PLHINO's irrigation.

ism, regularize the pattern of crop cycles, and increase the hydrologic cycle, which would increase the chances of rain in the region. In this way, it would improve the ecology and growth of life in general; as well as significantly increase the land under cultivation for producing the basic grains that the nation so urgently needs.

The prevailing criteria of political economy over the last 25 years, however, held to the idea that the strengthening of public finance is achieved with a simple scheme of "balanced-budgeting," and placing the fate of economic growth in the so-called "foreign sector." This caused governments to substantially decrease

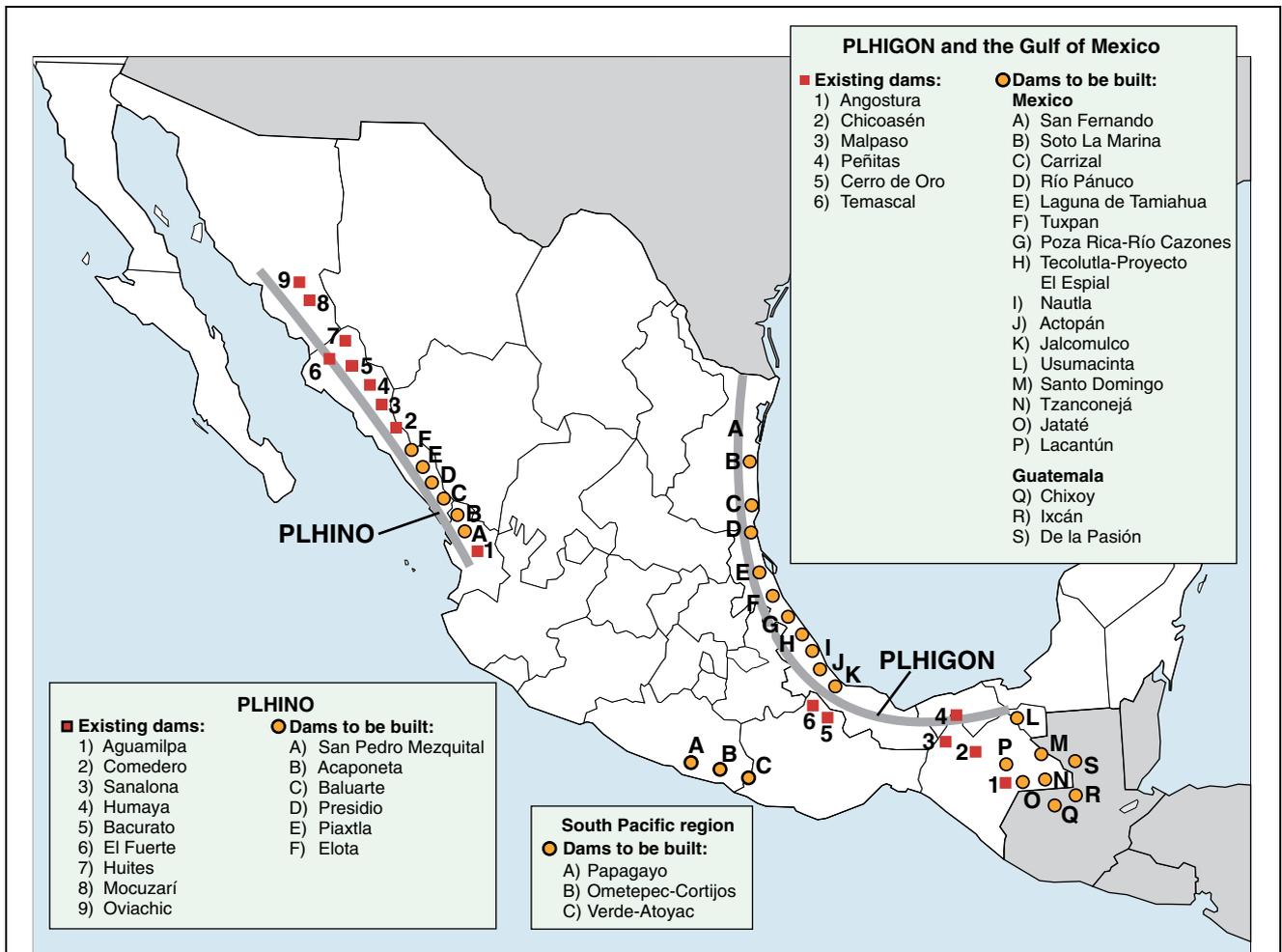
investment in basic economic infrastructure. It is because of this, that projects as important as the PLHINO were abandoned, and governments went along with a public investment policy of austerity, which disregards the economic necessities of the country.

Today we are faced with a national and international economic reality, which by its very nature demands that we again take up a vigorous policy of public investment directed towards great infrastructure projects. There is no other route for reestablishing the rates of growth that the country has lost throughout all these years, leaving dramatic unemployment and poverty in its wake.

A Matter of National Security

Under these adverse circumstances, one of the principal vulnerabilities of the national economy is our marked dependency on food imports. International financial instability is causing a hyperinflationary escalation of food prices. This is a situation made even worse by the fact that the United States, the principal grain-exporting nation, decided to use corn for the production of bio-fuels, thus converting it into material for the energy speculation markets.

We have entered a critical phase on the food front, such that worldwide, we face a moment in which grain reserves have fallen significantly, at the same time



Source: EIR, January 7, 2000.

Figure 2
THE PLHINO AND THE PLHIGON

On the Gulf of Mexico, the Northern Gulf Hydraulic Plan, PLHIGON, is designed to control the historic flooding problem in the southeast region, produce significant amounts of hydroelectric power, and move vast quantities of fresh water northward, along the Gulf Coast of Mexico, with complementary projects to pump it up to Mexico's north-central plateau, which is part of the Great American Desert.

The southeast's four large rivers, Grijalva-Usumacinta, Papaloapan, Coatzacoalcos, and Tonalá (which are the first, second, third, and sixth largest in the country, respectively),

jointly produce 204 cubic kilometers of runoff, of which only 15 percent will be used in the PLHIGON.

The six major dams planned on the Usumacinta River and its tributaries will create hydroelectric installed capacity of about 9.5 gigawatts, out of a national total of 50 gigawatts from all sources. In addition to producing electricity, the dams will be designed to control the rivers' runoff and prevent future flooding. This will allow the recovery of more than 1.5 million hectares of the vast coastal flood plain in Tabasco and Campeche states for agricultural production, both crops and pastureland.

that the tendency of the North American market is to reduce its massive exports, mainly of grains such as corn, of which we are the chief importer worldwide.

What a dramatic convergence this is for Mexico: scarce and expensive food! We must take heed of reality with a sense of urgency, in order to avoid the problems of shortage and the inherent threat

of social instability which this represents.

With all of this in mind, defining a strategy of public investment with a sense of emergency for completing projects such as the PLHINO becomes a matter of state and of national security.

The author is a longtime leader of the LaRouche movement in Mexico, and

currently the coordinator of the Pro-PLHINO Committee, which brings together dozens of groups and associations in the state of Sonora, including peasant groups, trade unions, producers, and others. His article was translated from Spanish by Tarrajna Dorsey of the LaRouche Youth Movement, who visited Mexico to campaign for the PLHINO program.

Figure 3
NORTH AMERICA:
'NAWAPA-PLUS'

The great North American water project, the North American Water and Power Alliance or NAWAPA was designed by the Parsons Engineering firm in the 1960s to harness about 17 percent of unused runoff from Alaska and northern Canada and bring it southward. Most of that 1,000 cubic kilometers of runoff water now flows unused into the Arctic Ocean.

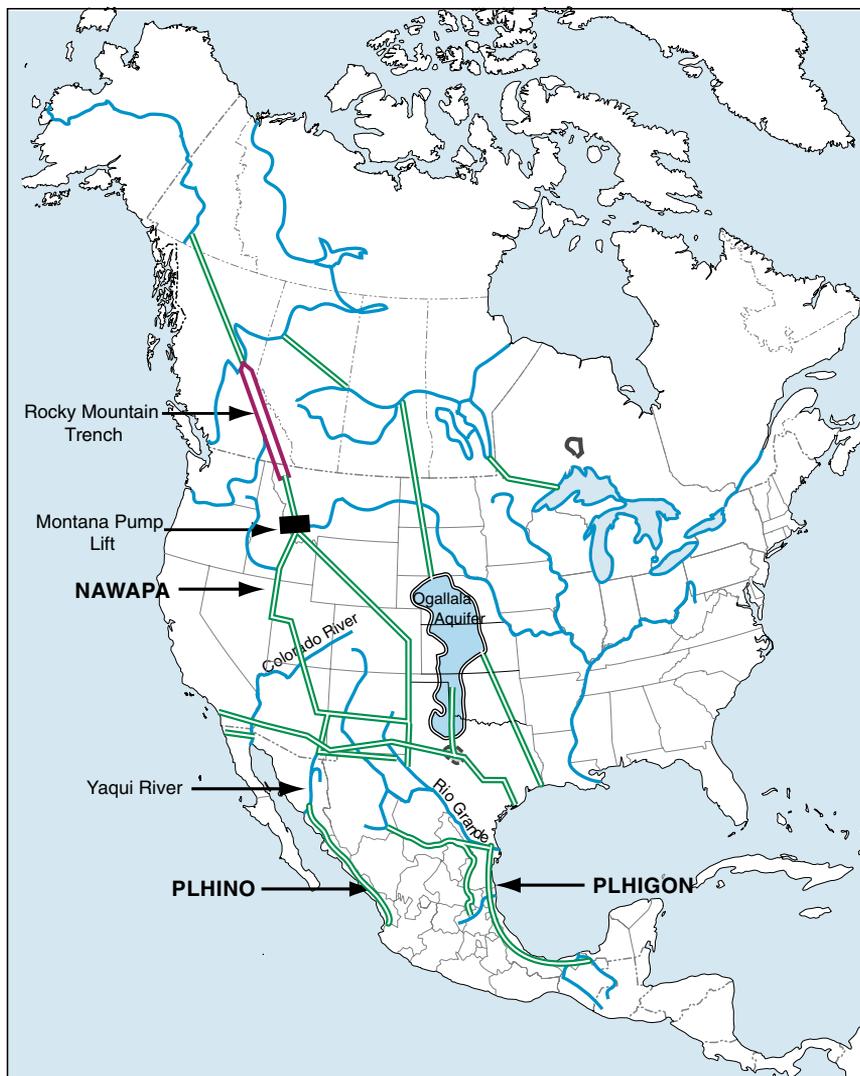
NAWAPA-Plus, as conceived by EIR, would extend the original NAWAPA design to link up in Mexico with both the PLHINO and the PLHIGON, creating a single, integrated North American water project.

In the original NAWAPA design by Parsons, the water would be channelled into the Rocky Mountain Trench, a natural reservoir about 800 km in length, which runs from the center of Canada down into the northern United States. It is about 15 km wide and 100 meters deep, on average, and could store some 400 to 500 cubic kilometers of water, at a height of about 900 meters above sea level.

At the northern tip of the Trench, a navigable waterway would be built in Canada, from Vancouver in the West to Lake Superior and the St. Lawrence Seaway in the East—a great waterway that would connect the Pacific with the Atlantic.

NAWAPA's Eastern Branch

The eastern branch of NAWAPA would run south from this waterway, through the central United States, to help recharge the gigantic Ogallala Aquifer, which today is overexploited. From there the Montana Pump Lift would be built, a pumping station that would lift the water from 900 meters above sea level to some 1,500 meters above sea level, on both sides of the Continental Divide in the Rockies. This would require some 80 gigawatts of power, to be supplied by the numerous hydroelectric dams planned along NAWAPA's entire route, which would



Sources: Parsons Company, *North American Water and Power Alliance Conceptual Study*, Dec. 7, 1964; Hal Cooper; Manuel Frías Alcaraz; EIR.

produce a total of 180 gigawatts of power.

The Parsons design planned a central branch of NAWAPA to run along the eastern side of the Rockies, cutting across the Great American Desert, through Wyoming, Colorado, New Mexico, and Texas. It would connect with the tributaries of the Rio Grande, which forms the border between the United States and Mexico at that point. In all, according to the Parsons design, it would transfer some 6.8 cubic kilometers of fresh water to the arid Center-North of Mexico.

NAWAPA and the PLHIGON meet at the Rio Grande.

NAWAPA's Western Branch

The western branch of NAWAPA would also cut through the Great American Desert, crossing Nevada, Utah, Arizona, and New Mexico, where it would also feed into the Rio Grande and reconnect with NAWAPA's central branch. From Arizona, a canal would be built to carry water across the border to Mexico. This is where NAWAPA and PLHINO meet.

The western stretch of NAWAPA would also supply water to the north and center of California, and to the Colorado River, which, in turn, would carry more than 5 cubic kilometers of water a year to northern Baja California.

Where Is Punt, the 'Land of God'?

by Rick Sanders

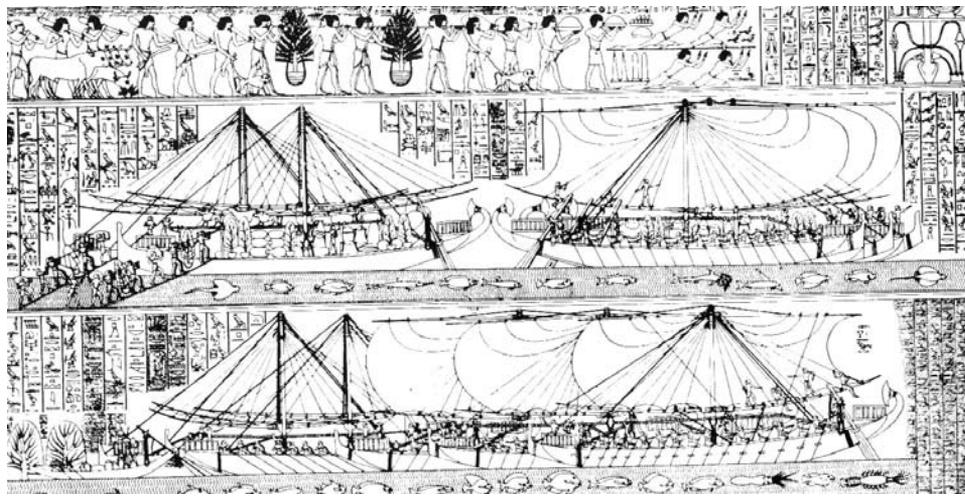
In late 2006, archaeologists excavating man-made caves on the coast of the Red Sea found well-preserved cedar timbers, together with limestone block-anchors, curved cedar steering oars, rigging ropes of sea-going vessels dating back 3,800 years old, buried at what is today called Wadi Gawasis, near what was a port on the Red Sea in pharaonic times.¹

Also found were references to the "Land of God," or Punt, which caused more than a little excitement, since the very existence of Punt had become obscured in the mists of the time.

The question that has not yet been answered is: Where is Punt? Egyptian scholars do not agree on its location: The University of Cairo says it's Yemen, Somalia, Ethiopia, Eritrea, or Sudan. Others add Zimbabwe, Hadhramaut, or India. But in our judgment, even India is too close, for none of these destinations would require a return trip of three years, which is the time agreed upon by most Egyptian historical sources for the journey to and from Punt. Nor would you need 10,000 men, the number cited by historical sources.

And then there's the question of the minerals that the Egyptians brought back from Punt—antimony and gold. The nearest antimony to Egypt is only 3,000 miles away, in Madagascar. But where did the gold come from?

As you will see below, the late Paul Gallez, an ancient map scholar, believed that the land of Punt was in the Puno region of Peru. The geographer, historian, intellectual troublemaker, and Barry Fell



www.ethiopianhistory.com

Egyptian boats depicted on the wall of the funerary temple of Queen Hatshepsut in the Eighteenth Dynasty (1540-1304 B.C.). The largest expedition during her dynasty had at least five large ships, with 30 oarsmen in each, on a journey that lasted three years.

associate, George F. Carter² translated a work from German by H. Quiring, who believes that Punt was the island of Sumatra, where the Egyptians mined gold between 1200 and 500 B.C.

Quiring mentioned two French sinologists, Pauthier and Bazin, who reported that in 1113 B.C., the Chinese emperor Chou-Kung received ambassadors from the kingdom of Ni-li, probably Egyptians, who had made a long voyage in "swimming houses" and who could determine their position by means of observation of the Sun and heavenly bodies. Carter then did a calculation, taking the average speed of a ship during the 1600s (from Francesco Carletti's *My Voyage Around the World*), and concluded that in three years you could go around the world at a leisurely pace. Therefore, Punt could be half the world away.

2. Carter wrote *Pleistocene Man at San Diego* (Johns Hopkins Press, 1957) and *Earlier Than You Think: A Personal View of Man in America* (College Station: Texas A. and M. University Press, 1981). See also Carter's article, "Egyptian Gold Seekers and Exploration in the Pacific," *The Epigraphic Society Bulletin*, Vol. 2, No 27 (Feb. 1975).

Nito Verdera, the Ibizan journalist and indefatigable investigator of Christopher Columbus, has summarized the theory of his historian friend, the now deceased Paul Gallez,³ which he has given us permission to include here.

Nito Verdera: The Egyptian Theory

"In *La Cola del Dragón*, Paul Gallez tells us that the theory referring to the earliest travels to distant lands as yet not identified with total certainty, is that of the expeditions to the Land of Punt (Richard Hennig, *Terrae Incognitae*, 4 vols, Leiden, Brill 1950, in vol. I, pages 5-13). The first known voyage to this region is that organized by the pharaoh Sahure of the fifth dynasty (circa 2550 B.C.). His ships brought back incense, myrrh, gold, silver, precious woods and slaves from Punt and the many other lands and islands they called at during the voyage. Not all these items came from the Land

3. Paul Gallez's book *La Cola del Dragón*, *The Tail of the Dragon*, (Bahía Blanca, Argentina, 1990), was reviewed in the Winter 2005-2006 *21st Century*, Winter 2005 ("A Pre-Columbus View of the Americas," by Rick Sanders, p. 70).

1. For a description of the expedition, see http://www.eurekalert.org/pub_releases/2006-03/fsuwos030606.php.



Courtesy of Nito Verdera

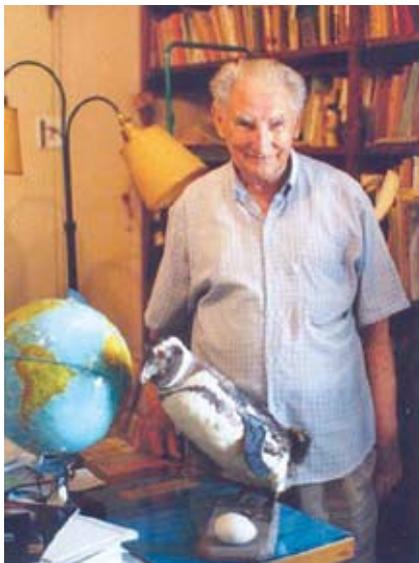
Nito Verdera, lecturing on Christopher Columbus.

of Punt, so we do not have to look for just one country producing all these riches.

"The pharaoh Asa (Ilesi) followed Sature's example, and around 2400 B.C. he also sent out his fleets to the Land of Punt. One of the princesses of the sixth dynasty was placed in her tomb, ready for her journey to the Land of the Dead, wearing a lip colouring with an antimony base, though this metal was totally unknown in Egypt and any of its neighbouring countries. The stone on the tomb of Knemhopet, a pilot from the island of Elephantine who had been on eleven voyages to the Land of Punt, dates back to the same period..."

"The best-known and possibly the most fruitful voyages, are those organised by Queen Hatshepsut (also called Hacheput, Hatcheposut, Hushpeswa, Hatashopsitu, Hachepsowe, Hatasuput and Hatscheposut, 1501-1482 B.C.) whose deeds are engraved in the temple of Deir-el-Bahari, which she herself ordered to be built in Thebes to honour Amen-Ra. Hatshepsut's main expedition was made up of at least five large ships with thirty oarsmen in each of them. They sailed from somewhere on the Red Sea and were away for three years.

"One of the inscriptions in the temple of Deir-el-Bahari reads: *The inhabitants of Punt asked: How have you reached this country unknown to man? Have you flown here through the sky, or have you sailed across the Great Ocean from the*



Courtesy of Nito Verdera

Paul Gallez, an expert in ancient maps, located Punt in Peru.

Land of the Gods? (Richard Hennig: *Terrae Incognitae*, 4 vols, Leiden, Brill 1950, I, 5, Ophir)....

"How can one not feel tempted by interpretations that immediately spring to mind and would seem to give each other mutual support? The expression 'Great Ocean' is what we know today as the Pacific Ocean. The Land of the Gods is the name given to the West in all mythologies, which would place the Pacific to the west of Punt and would therefore place Punt in America.

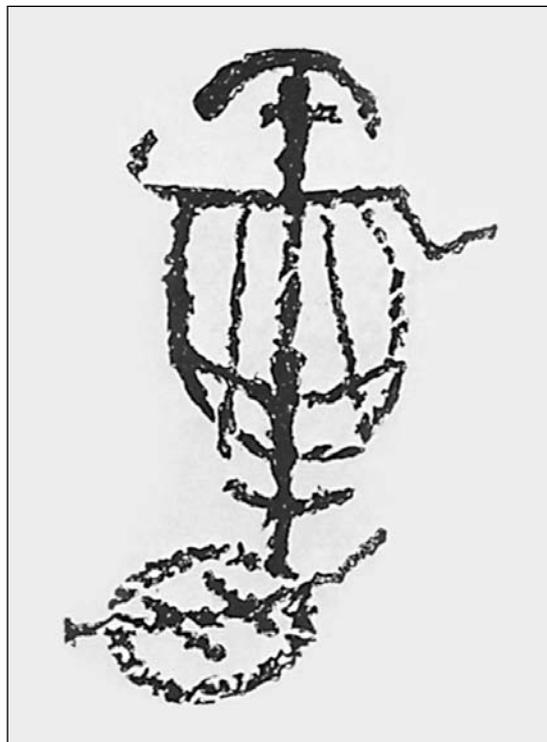
"According to the tales of the life of Ramses IV in the Harris Papyrus kept in the British Library, the pharaoh Ramses III sent an expedition of 10,000 men to Punt in 1180 B.C. The last expedition that we know of, which set off at around the middle of the second century B.C., was arranged with the help of traders and bankers from Massilia, our modern-day Marseilles (Hans Philip: article on "Massilia" in Pauly's *Real-Encyclopädie der classichen Altertumswissenschaft*/ XIV/2, Stuttgart, Druckenmüller, 1930).

"The Egyptian ships built for ocean going were about thirty meters long and up to eighty-five tons in capacity. Under favorable weather conditions, their flat bottoms enabled them to sail at great speed. When the wind dropped, the oarsmen would take over the job of propelling the vessel, so that the voyage could continue without having to wait for a change of wind.

"Egyptian scholars do not agree on the location of the Land of Punt. Some of them suggest Eritrea, others Somalia, Zimbabwe, Hadhramaut, or India. However, all these places are far too close to the Red Sea to justify the length of the voyage; three years according to all the relevant Egyptian records.

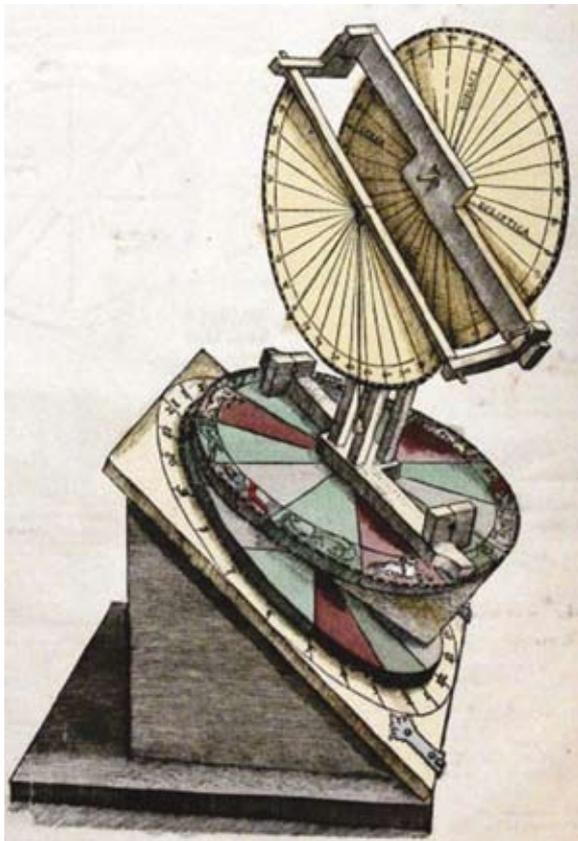
Paul Gallez: Punt Is in Peru

"In his article 'Trois thèses de predecouverte de l'Amérique du Sud par le Pacifique' (*Gesnerus* 33, 1976, Aarau, Zurich), Paul Gallez offers a new interpretation. He locates the Land of Punt in South America, probably, in the Puno region of Peru, on the shores of Lake Titicaca. 70% of Peru's annual gold pro-



From America B.C., © Barry Fell (New York: Simon & Schuster, 1976), p. 118

This drawing by Maui of his tanawa or calculator, was found in the Caves of the Navigators, Sosorra, Irian Jaya (West New Guinea). The tanawa serves as an analog computer, integrating three different measurements.



The tanawa, or torquetum, as pictured centuries after Maui.



Rick Sanders

The degree circle on a recent torquetum built by the author. The torquetum was used to determine longitude and the equatorial circumference of the Earth using lunar distances.

duction comes from there, together with antimony, mercury, zinc, tin, and cobalt. Old gold and antimony mines can be found in the area, though archaeologists disagree as to their exact age. The boats used to sail on Lake Titicaca, made of *cat-tail* (a long-stemmed, reed-like, grassy plant of the Typhaceae family with a cylindrical ear) are so similar to those used in ancient Egypt that Thor Heyerdahl went to Puno to recruit workers to build him his papyrus boat Ra II on the banks of the Nile."

Astrognation

We need not be surprised at all this since as long ago as the 19th Century B.C., Pharaoh Senusret II built a canal that connected the river Nile to the Red Sea, a canal which has survived until the present day as an irrigation canal. Herodotus tells us that the pharaoh Necho II (circa 600 B.C.) sent out a fleet which took three years to circumnavigate Africa (clockwise).

There is much other evidence of Egyptian voyages to the Americas, as *21st*

Century has reported in previous issues.⁴

4. Among many articles on this topic are:

Julian Fell, "Barry Fell, Epigrapher: Biography of a Renaissance Man," *21st Century*, Winter 1999-2000.

Marjorie Mazel Hecht, "Eratosthenes in Action: The Decipherment and Discovery of a Voyage to America in 232 B.C.," *21st Century*, Winter 1998-1999.

_____, "Eratosthenes' Astronomical Instruments Guided Maui's Voyage in 3rd Century B.C.," *21st Century*, Spring 1999.

Lyndon H. LaRouche, Jr., "On Eratosthenes, Maui's Voyage of Discovery, and Reviving the Principle of Discovery Today," *21st Century*, Spring 1999.

Ross Perfect, "Pitcairn Island Petroglyph Deciphered," *21st Century*, Winter 2001-2002.

Ross Perfect, "Pitcairn Island Petroglyph Shows Knowledge Of Lunar Eclipse for Finding Longitude," *21st Century*, Winter 2001-2002.

Sentiel Rommel, Ph.D., "Maui's Tanawa: A Torquetum of 232 B.C.," *21st Century*, Spring 1999.

Rick Sanders and Bertram Cooper. "Building and Using Maui's Tanawa," *21st Century*, Fall 2001. <http://www.21stcenturysciencetech.com/articles/fall01/Tanawa/tanawa.html>

Rick Sanders, "Ancient Navigators Could Have Measured Longitude," *21st Century*, Fall 2001 <http://www.21stcenturysciencetech.com/articles/fall01/navigators/navigators.html>

_____, "When Thor Heyerdahl Was Delighted to Be Wrong: The Case of the Guara or Centerboard," *21st Century*, Fall 2003.

In 232 B.C., Captain Rata and Navigator Maui set out with a flotilla of ships from Egypt in an attempt to circumnavigate the Earth. The Maui expedition was under the guidance of Eratosthenes, the great scientist who was also the chief librarian of the library at Alexandria.

This expedition left cave drawings discovered in modern times, showing one of the navigational instruments, a tanawa (or torquetum as it later became known) which Maui had brought with him, along with an inscription deciphered in the 1970s by epigrapher Barry Fell: "The Earth is tilted. Therefore, the signs of half of the ecliptic watch over the south, the other (half) rise in the ascendant. This is the calculator of Maui."

At that time, Eratosthenes had just measured the polar circumference of the Earth. Finding your latitude is easy, but finding your longitude, and the cir-

_____, "Was the Antikythera an Ancient Instrument for Longitude Determination?," *21st Century*, Spring 2003 <http://www.21stcenturysciencetech.com/articles/Spring03/Antikythera.html>



Stonehenge: Remnants of an orderly circular arrangement of posts and marker stones, dating to about 2600 B.C., give evidence that Stonehenge was a sophisticated luni-solar observatory, capable of eclipse prediction among other measurements. Imagine the half-degree marks on the edge of the torquetum's equatorial circle as each representing a vertical post in the Stonehenge observatory.

cumference of the Earth near the equator, as a function of your latitude and the equatorial circumference, is difficult. We know that Maui was thinking about this, because his cave drawings also include a proof of Eratosthenes' experiment to measure the Earth's circumference.

Our hypothesis is that the torquetum was used to determine longitude and the equatorial circumference of the Earth using lunar distances. To do that job, the navigator would have to carry with him an almanac that gave the lunar distances from prominent places for each relevant night of the year, for about 19 years.

Ancient Observatories

We have no proof yet that those almanacs existed, but we do know that the data required could be provided by a conceptual use of the Great Pyramid in Egypt and the Stonehenge, built so close to each other in time (2450 and 2300 B.C. respectively), and of some of the South American pyramids built in the same rough time frame. Imagine the little lines representing the half degrees on the edge of the torquetum's equatorial circle as all representing huge vertical posts or stones.

The torquetum could also be used to gather data sufficient to predict eclipses, which are a relatively easy way to find

your relative longitude (unfortunately, they are very infrequent). All you have to have is a relatively precise local *time* of observation of the eclipse at two points, east and west of each other.

The most famous example of finding relative longitude is the eclipse which took place during the battle of Arbela (in ancient Assyria), Sept. 20, 331 B.C., recorded at both Arbela and Carthage (Tunisia)—at the "fifth hour" at Arbela and the "second hour" at Carthage, which would put Carthage at the approximately correct 45 degrees west of Arbela.

Now, if you can predict eclipses, you can send out expeditions to observe them and kindred events as we have done many times in the last 500 years. Kepler's Rudolphine tables predicted the transit of Mercury for Nov. 7, 1631, and he encouraged observers to be on the lookout for it. Because of the bad weather, only three people saw it, but that was the first time in human history.

Captain Cook's long trip to the South Seas (1769) to observe the transit of Venus is another case in point. These events can be used to determine longitude, and to evaluate various methods used to determine longitude; and also measure the absolute distance of the planets from the Sun.

So do not look around the corner for the land of Punt; it might be halfway

around the world. Man, as Lyndon LaRouche keeps reminding us, and as his Youth Movement has demonstrated, is not a monkey.

Put global warming on ice
—with 21st Century Science & Technology's
SPECIAL REPORT
The Coming Ice Age
Why Global Warming Is
A Scientific Fraud

This authoritative, 100-page report (November 1997) puts climate science in proper perspective: Based on the past several million years of climate history, the Earth is now coming out of an interglacial period and entering a new ice age.

Partial contents:

- **Orbital Cycles, Not CO₂, Determine Earth's Climate** by Rogelio A. Maduro
- **The Coming (or Present) Ice Age** by Laurence Hecht
- **An Oceanographer Looks at the Non-Science of Global Warming** by Robert E. Stevenson, Ph.D.
- **Ice Core Data Show No Carbon Dioxide Increase** by Zbigniew Jaworowski, Ph.D.
- **What Man-Induced Climate Change?** and **What You Never Hear about Greenhouse Warming** by Hugh Ellsaesser, Ph.D.
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Global Warming Update

Continued from page 7

are committing genocide by the withdrawal of technology from the developing world. "There is a current example of genocide by the removal of technology, and that is the ban on DDT, and that has resulted in the deaths of 30 to 40 million people and has left half a billion infected with malaria."

But the policies that the alarmists are promoting, are much worse than the ban on DDT, Robinson said, because they will lead to rationing of energy. This rationing of energy will have the biggest impact on the Third World populations, who are trying to uplift their standard of living by the application of energy and technology. He noted that, "the billions of people who live at the lowest level of human existence will suffer greatly from the rationing of energy, and this, in turn, will lead to the death of hundreds of millions, or possibly billions."



Hearland institute video

Arthur Robinson: The removal of technology is genocide.

Four British Enviros Endorse Nuclear Power

Four top British environmentalists came out of the anti-nuclear-power closet in an article published in the London-based *Independent*, saying that Britain must embrace nuclear power: Stephen Tindale, former director of Greenpeace UK; Lord Chris Smith of Finsbury, the chairman of the Environment Agency; Mark Lynas, author of the Royal Society's science book of the year;¹ and Chris Goodall, a Green Par-

1. A review of Lynas's book, *Six Degrees: Our Future on a Hotter Planet*, can be found in the Spring 2008 *21st Century*.



NASA

Global warming fruitcake James Hansen: Even his former NASA boss says global warming is not man-made.

ty activist and prospective parliamentary candidate.

Even though the argument of these environmentalists for nuclear is that it is a good solution to the false danger of global warming, their change of heart marks an important turn in the fight over nuclear power in Britain.



www.greenpeace.org.uk

Former Greenpeace UK director Stephen Tindale: Britain must go nuclear.

the scale of the challenge, Goodall wrote. "Yes, Britain has enormous renewable resources, but as David MacKay's excellent new book, *Sustainable Energy Without the Hot Air* shows, we will need country-sized energy investments to extract them. You hear a lot about wave and wind, but if 1,000 km of Atlantic coastline were completely filled with Pelamis wave machines, this would generate enough electricity to cover less than 10 per cent of our current consumption.

"Delivering two thirds of today's electricity supply from wind would require a 30-fold increase in British wind power. Both of these are technically feasible,



Hearland institute video

NASA's John Theon: No rational reason to use climate model forecasts to determine policy.

but would require massive and sustained investment as well as higher prices for electricity."

Hansen's Former NASA Supervisor Declares Global Warming a Fraud

NASA's leading global-warming fruitcake James Hansen (who, by the way, is former Vice President Al Gore's science advisor on the subject), was publicly rebuked on Jan. 15 by his former NASA supervisor Dr. John S. Theon, a retired senior NASA atmospheric scientist, was Hansen's supervisor from 1982-1994.

In a letter to Sen. James Inhofe, the ranking Republican on the Senate Environment and Public Works Committee, Theon wrote: "I appreciate the opportunity to add my name to those who disagree that global warming is man-made." The growing list of scientists who don't believe in Al Gore's genocidal global warming hoax was started by the Minority Staff of the Senate Environment and Public Works Committee last year, and now includes more than 650 scientists.

James Hansen was never "muzzled," Theon wrote, even though he violated NASA's official agency position on climate forecasting (that is, we didn't know enough to forecast climate change or mankind's effect on it). Hansen thus embarrassed NASA by coming out with his claims of global warming in 1988 in testimony to Congress.

It should be noted that during the time that Hansen says he was "muzzled," he received \$100,000 from George Soros's

Open Society's Politicization of Science program to help with legal expenses and media appearances.

Climate Models Useless

Theon declared that climate models are useless. "My own belief concerning anthropogenic climate change is that the models do not realistically simulate the climate system because there are many very important sub-grid scale processes that the models either replicate poorly or completely omit," Theon explained.

"Furthermore, some scientists have manipulated the observed data to justify their model results. In doing so, they neither explain what they have modified in the observations, nor explain how they did it. They have resisted making their work transparent so that it can be replicated independently by other scientists. This is clearly contrary to how science should be done. Thus there is no rational justification for using climate model forecasts to determine public policy," Theon added.

Winter Storm Disrupts Global Warming Demo

A large, late-winter snow storm that struck the Washington, D.C. area March 1-2, put a crimp in what was supposed to be the largest global warming demo ever, including a sit-in at a coal-fired power plant.

Greenpeace was hyping the demonstration for months, saying that hundreds of thousands would take part in the demonstration. In the snowy reality, only about 1,200 demonstrators showed up for the rally and many fewer marched to the Capitol Hill power plant to take part in blocking the gates.

In the build-up to the demonstration, Dr. James Hansen of NASA produced a video posted on the Capital Climate Action website, encouraging citizens to take part in acts of civil disobedience. With this action, Hansen may have violated the Hatch Act, which prohibits Federal employees from participating in partisan political activity.

One of Hansen's former supervisors, Dr. John Theon (see above), told Fox News, when informed of the video, "Why he has not been fired I don't understand and as a civil servant, when you go on



EIRNS

This Schiller Institute banner and a leaflet on global warming as genocide greeted attendees at the international conference on "Climate Change: global Risks, Challenges and Decisions" in Copenhagen, March 10-12. Lord Nicholas Stern, was asked by a Schiller Institute organizer, "What do you say about the charges from us, as well as third world countries, that your policy of reducing CO2 emissions is leading to genocide?" Stern stated that the policy to reduce emissions is "clear," and "I don't see an explicit population policy as part of this story...."

the Internet and call for people to break the law, that's a problem."

How to Win a Debate On Global Warming

Mohd Peter Davis, a collaborator of Lyndon LaRouche and *21st Century* in Malaysia, sent this delightful report on his son's victory against the greens:

"I am pleased to inform you that our son Danny (a first-year physics undergraduate) and his Sixth College Team won the Universiti Putra Malaysia Inter-College English Debate in a knock-out competition over the weekend.

"Winning the final round was particularly sweet. The topic, announced 24 hours before the mock Parliamentary debate was "The Government should make Global Warming a priority issue."

"The Government side had to argue for the motion, the Opposition against the motion. It was hailed by the teams as a walkover win for whichever team got the Government motion since nearly everyone in Malaysia, especially the youth (but not Danny), believes in the Global Warming fraud.

Danny was alone in hoping to be able to argue for the Opposition against the Government Global Warming motion and his wish came true, much to the dismay of his team. Danny had two hours to bring his team up to speed on the real sci-

ence to counter the fraudulent Global Warming claims.

"I got an urgent message. 'We need your information fast! But Rule Number One from the Judges limits our scope—No politics on the universities, this is Malaysia!' So it was either Science or defeat. E-mails flashed between father and son.

"[Danny showed the team]: Graphs from *21st Century Science & Technology* showing the Earth was 2 degrees warmer 1,000 years ago in the Medieval Warm Period of lush vegetation, when Greenland got its name. (For Al Gore, let's rename it Whiteland!) Elliptical orbits of the Earth around the Sun, the changing tilt of the Earth, the long passage of the Solar System through the Milky Way, sun flares and cosmic radiation from exploding stars all combining and interacting to determine the natural cycles for at least the last 2 million years. Some 10,000 years of global warming with the release of carbon dioxide from the oceans creating springtime on Earth, followed by around 100,000 years of ice ages where most land based living matter is exterminated under kilometers of ice and bone dry deserts, except in our lush Malaysian and Amazon equatorial rainforests—the Noah's Ark for the 50 million species on Earth.

"'Ok, Ok we get it! Global Warming is a natural, not a man-made phenomenon.



MIT



Dr. Roy Spencer

Are chicken bones next for making global warming forecasts?

Above left are the authors of a Massachusetts Institute of Technology study with the roulette wheel of how hot it will get, depending on what the world does to cut carbon emissions. The wheel was used at a press conference to release their alarmist report on climate—"Probabilistic forecast for 21st century climate based on uncertainties in emissions (without policy) and climate parameters"—which states that temperature increases will exceed those predicted by the Intergovernmental Panel on Climate Change by 2 or 3 degrees in the next 100 years, killing billions. <http://ams.allenpress.com/perlserv/?request=get-abstract&doi=10.1175%2F2009JCLI2863.1&ct=1>

At right is a "Photoshopped" version of the MIT roulette wheel by Dr. Roy Spencer, former NASA climate scientist, who used his version of the wheel to show the fallacy of climate models. According to Spencer, The MIT report comes from failed computer models that are based on assumptions that have little connection to the real world processes that determine the Earth's climate. <http://www.climatechange-fraud.com/behind-the-science/4123-the-mit-global-warming-gamble>

But we haven't got a killer argument to win the debate.'

"Then, according to Danny, a light bulb moment occurred. 'The debate says the government should make global warming a priority; but what about the global economic crisis—isn't that more important? At the most, the natural global warming will cause the oceans to rise a few millimeters; that won't kill us. But not getting a job when we graduate certainly will.'

'Reality Strikes'

"Then, scrambling through the internet, finding a recent survey showing that Americans actually voted the economy number one, and global warming last, in their list of concerns. 'Reality strikes. With that information, now we can win!'

"And to their amazement they did, against the student body that had fallen victim to the Global Warming fear-mongers. Almost a clean sweep, with 4 out of 5 judges saying they had won the debate.

"In the refreshments afterwards a college mate gave Danny a high 5. 'You were real smart making up that story. You

could never have won without it.' 'Hey, it's not a story, this is science, man; it all happens to be true,' said Danny.

"As in any battle, spoils go to the victor. 'Two really hot girls asked for my autograph,' claimed a proud Danny.

"He came home for dinner that night and between mouthfuls gave us a blow by blow account of how his team de-

molished the Global Warmers. His Sixth College had regained the English Debate trophy after 26 years. 'So what lessons did you learn?' I wanted to know, hoping perhaps for a lofty answer like the superiority of science over public opinion. Danny thought for a surprisingly long moment and then looked glum. 'I made a serious blunder,' he finally admitted.

"Oh, what was that?

"I forgot to give them my phone number!'

"Such is life."

Obama Green Stimulus Will Cost Jobs, Spanish Study Shows

For every new job created by green energy subsidies, at least 2.2 jobs in other industries will disappear, according to a report released by King Juan Carlos University in Madrid, Spain.

"The premiums paid for solar, biomass, wave, and wind power—which are charged to consumers in their bills—translates into a \$774,000 cost for each Spanish green job created since 2000," says report author Prof. Gabriel Calzada. "The loss of jobs could be greater if you account for the amount of lost industry that moves out of country due to higher energy prices," Calzada added.

The report should be a wake-up call for the Obama Administration and for all members of Congress who believe in the genocidal myth of a green energy revolution.



Windmills at Campo de Criptana in La Mancha, Spain. A Spanish study documents that windmills have caused a rise in both energy prices and job losses.

Tracking the Sea Peoples Who Settled South America

by Charles Hughes

Axis of the World: The Search for the Oldest American Civilization

by Igor Witkowski

Kempton, Ill.: Adventures Unlimited Press, 2008

Paperback, 238 pp., \$18.95

(illustrated, with 12 color plates)

In his first book in English, Igor Witkowski, a Polish author living in Warsaw, explains the archaeological mysteries of the Pacific Islands and the Pacific coast of South America, focussing on the Indus Valley civilization, Easter Island, and Pacific Coastal, and Andean Plateau civilizations of ancient South America, to mention a few.

The "Axis" in his title describes a latitude band encircling the Earth from 27 degrees North to 27 degrees South, which Witkowski thinks is the major path of colonization of the Pacific in ancient times.

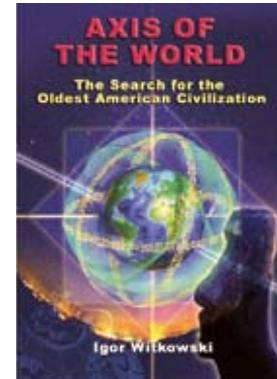
Some of the topics Witkowski explores:

Was there a landmass in the middle of the Pacific in ancient times? Did the Polynesians build the megalithic walls and statues on Easter Island; or the stone city of Nan Madol, containing more than 25 million tons of basalt stone, on the island of Pohnpei in the Carolines; or the multi-ton stone walls and buildings at Tiahuanaco in Bolivia, and similar structures in Peru? Did the dwellers of the Pacific Islands possess and employ a written script?

Is it true that the Incas and their ancestors lacked a written script, and could only keep records on knotted strings? Was there any truth to the observations of the Spaniards, that some of the Inca nobility and Polynesian chieftans were as light

skinned as the Spaniards? Or that the civilizations of the Andes could melt and work platinum metal with a melting point above that of iron, and possessed vast amounts of gold and silver, and fabricated bronze?

Witkowski deals with all these questions, but I will not, to keep this review to a reasonable length. The author believes that the people still living in the Pacific area today originated in the Indus Valley civilization, the ruins of which are found on the border of India-Pakistan, and that their ancestors were of the Dravidian language group. He also claims that Polynesian scripts, such as Easter Island's Rongo Rongo boards, descended from the Indus Valley seal inscription. That is, Indus Valley script equals Easter Island writing, and Polynesian is a Dravidian-based language.



A More Credible Model

A quite different model, which I believe is more credible, can be deduced from the researches of Barry Fell, who points out that the Indus Valley script conveys an Indo-European language, probably early Sanskrit, deciphered with the aid of Java scripts, some signs of which were like the Indus Valley seal script. The Java language was a form of Sanskrit, according to Fell.

Fell said that Easter Island Rongo Rongo was a pictographic script conveying the Polynesian language, the text explaining the early exploration and settlement



British Museum, personal photograph

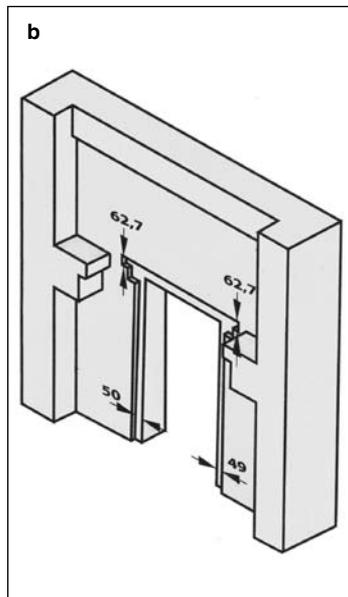
Examples of Indus Valley seal inscriptions. Witkowski thinks that the Polynesian scripts are descended from the Indus Valley scripts, while Barry Fell connected them to early Sanskrit, an Indo-European language.



Axis of the World

A stone block at Puma Punku.

Witkowski's drawing of a typical serially manufactured block at Puma Punku. The measurements are in millimeters.



Axis of the World

of Easter and other islands. Fell was fluent in Maori, a language spoken in New Zealand, where Fell grew up and went to school with Maori schoolmates.

For readers wanting to pursue this fascinating problem, I recommend reading the articles by Barry Fell on the translation of Indus Valley script and Rongo-Rongo writing, in *21st Century Science & Technology*, Summer 2001: "Let the Stones Speak," and in Winter 1999-2000, "Barry Fell, Epigrapher." Also read the translations by Professor Szalek cited by Witkowski in the references, items 7 and 8, p. 229 in the bibliography of *Axis of the World*.

An Ancient Melting Pot

One must realize, I believe, that the Polynesians are a real ancient melting pot of many different people over a vast time span. They were, and are today, an example of a sea people who were able from early times to sail over the entire Pacific Ocean.

When did they do this? When did they begin and from where? It is foolish to speculate on these questions, and postulate a hypothesis about the colonization of the Pacific, as there is archaeological proof that both New Guinea and Australia were colonized by people using boats as long ago as 40,000 years!

Was South America's Pacific coast reached by sea peoples? It surely was. A site in Southern Chile dating from 30,000 B.C. shows the remains of wooden houses and remains of crops, such as potatoes.

This site at Monte Verde, Chile, shows that South America was civilized and practicing agriculture, 20,000 years before people in the Middle East did!

The World's Strangest City

The final chapter of this book is the most interesting, as it deals with the very strange civilizations of the South American Andes plateau, and the sites of Tiahuanaco in Bolivia, and Inca Cusco in Peru. The author thinks that the push across the Pacific from the Indus Valley reached the Pacific coast of South America, and resulted in the founding of the civilizations of the Tiwanakans and the Inca. He shows examples of written scripts from the Andes, debunking the axiom that these civilizations were "illiterate" and had only knotted strings to con-

vey concepts, such as the Inca Quipu cords.

Witkowski also shows that the stone work at the Tiahuanaco site in Bolivia is fashioned to an accuracy of 0.1 millimeter, and that some stones have more than 50 surfaces—this on the world's hardest rock, basalt and andesite. Some of the stones used for building construction have cutouts which were filled with molten metal to connect two or more stone blocks together for extra strength.

The age of the Tiahuanaco and Puma Punku ruins are dated by mainstream archaeologists at about 1500 B.C. to 500 A.D. Aside from the remarkable stone work, the mystery consists of why a civilization center was built at an altitude of 12,000 feet above sea level, where crops are almost impossible to grow.

The vast lake near to Tiahuanaco, Lake Titicaca, is partially salt water and contains marine animals, but it has no connection to the ocean. Stranger still, divers have discovered ruins of stone walls and a temple on the bottom of the lake!¹

I recommend reading this provocative book, although I believe that its main hypothesis about the origin of the Polynesians is mistaken.

1. See *Ancient America: Contributions to New World Archeology*, N. Sanders, Ed. (Oxford Oxbow books, 1992, pp. 117-143.)



Axis of the World

A reconstructed wall at Tiahuanaco.

A Final Warning for Humanity—or James Lovelock

by Gregory Murphy

The Vanishing Face of Gaia: A Final Warning

by James Lovelock

New York: Basic Books, 2009

Hardcover, 278 pp., \$25.00

This latest book by the well-known environmentalist James Lovelock, leaves the reader with an unanswered question: For whom is this final warning meant, for humanity as a whole, or for the almost 90-year-old James Lovelock?

Much of the book seems to be written as an appeal to the heavens to seek amends for past wrongs. For example: his chapters on the benefits of nuclear power and the wrongheadedness of banning DDT. This is the first time, to my knowledge, that Lovelock has commented on the banning of DDT, saying that it was a wrong policy.

The rest of the book is the usual neo-Malthusian genocidalist rant that one is used to seeing in a Lovelock book. It is “too late” to stop global warming, he says, and the human population will be reduced from 6 billion down to 1 billion by the end of the century. In his totally wrong view, global warming will cull the population by 5 billion, because people will not be able to find enough food as agriculture shrinks in the heat.

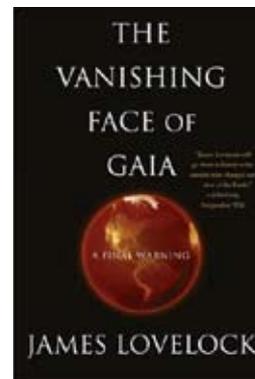
Why does he believe this nonsense? In a January 2009 interview with the British magazine *New Scientist*, Lovelock stated: “I don’t think humans react fast enough or are clever enough to handle what’s coming up. Kyoto was 11 years ago. Virtually nothing’s been done except endless talk and meetings.”

Lovelock views humanity only as an animal and not as a creature distinct from the beasts, with the power of creativity. This limited view of humanity is a main point in his book, in fact, and in the widely quoted *New Scientist* interview, Lovelock illustrated his pessimistic view by saying: “I don’t think 9 billion is better

than 1 billion. I see humans as rather like the first photosynthesizers, which when they first appeared on the planet caused enormous damage by releasing oxygen—a nasty, poisonous gas. It took a long time, but it turned out in the end to be of enormous benefit. I look on humans in much the same light. For the first time in its 3.5 billion years of existence, the planet has an intelligent, communicating species that can consider the whole system and even do things about it. They are not yet bright enough, they have still to evolve quite a way, but they could become a very positive contributor to planetary welfare.”

Lovelock: A ‘Gigantic’ Carbon Scam

With this in mind, let’s look at what Lovelock has to say about the proposed greenie fixes for global warming—cap and trade, emissions taxes, and so on. When asked by *New Scientist* whether carbon emissions could be dealt with like the global ban on CFCs, Lovelock answered: “Not a hope in hell. Most of the ‘green’ stuff is verging on a gigantic scam. Carbon trading, with its huge government subsidies, is just what finance and industry wanted. It’s not going to do a damn thing about climate change, but



it’ll make a lot of money for a lot of people and postpone the moment of reckoning. I am not against renewable energy, but to spoil all the decent countryside in the UK with wind farms is driving me mad. It’s absolutely unnecessary, and it takes 2,500 square kilometres to produce a gigawatt—that’s an awful lot of countryside.”

Lovelock’s tragically flawed view of humanity is based on the famous Gaia theory that he developed in the late 1960s, which states that the Earth and all of the forms of life that live on the Earth form a self-regulating organism. Simply put, with this theory, mankind is no different than all of the other forms of life. His theory is in direct opposition to the work of the Russian scientist Vladimir Vernadsky, whose theories embraced the idea of creativity and the power of the mind to determine the relationship of living processes.

The environmental movement has tried to show that Lovelock’s theory has a lot in common with Vernadsky, but that is simply just not so. Vernadsky’s ideas are dynamic in nature, while Lovelock’s ideas as demonstrated in this book, are rooted in reductionism of the worst kind.

Nuclear Power a High Point

The book’s most redeeming chapter is that on nuclear power. Here Lovelock dispels all of the usual myths about nuclear



Environmentalists for Nuclear Energy

James Lovelock (right) with Bruno Comby, president of Environmentalists for Nuclear Energy. Lovelock is an honorary member of the group.

power and shows that the commonly held basis to attack nuclear power is nothing more than a concatenation of lies and falsehoods, mindlessly repeated by the media until belief in the essential evil of all things nuclear has become part of an instinctive green response.

Lovelock spends a lot of time attacking the notion that nuclear power is dangerous. As a reader and as someone who often talks to public about nuclear power, I was especially glad to see how Lovelock developed the argument against the myth that surrounds the 1986 accident at the Chernobyl nuclear power plant in the Ukraine. He counters the usual scare story that hundreds of people died in that accident, saying that only 75 people died, and that they were mainly fireman and rescue workers who were the first responders.

Lovelock also puts the Chernobyl accident into context, saying that the accident was caused by a steam explosion that happened in an unstable reactor that was undergoing an unwise and improperly planned experiment. He concludes his argument on the safety of nuclear power issue by saying: "In the fifty

years in whole worldwide nuclear industry no more than one hundred have died. Compare this with the tens of thousands who have died in the coal and oil industries and the hundreds of thousands who have died in making renewable energy or from the consequences of using it."

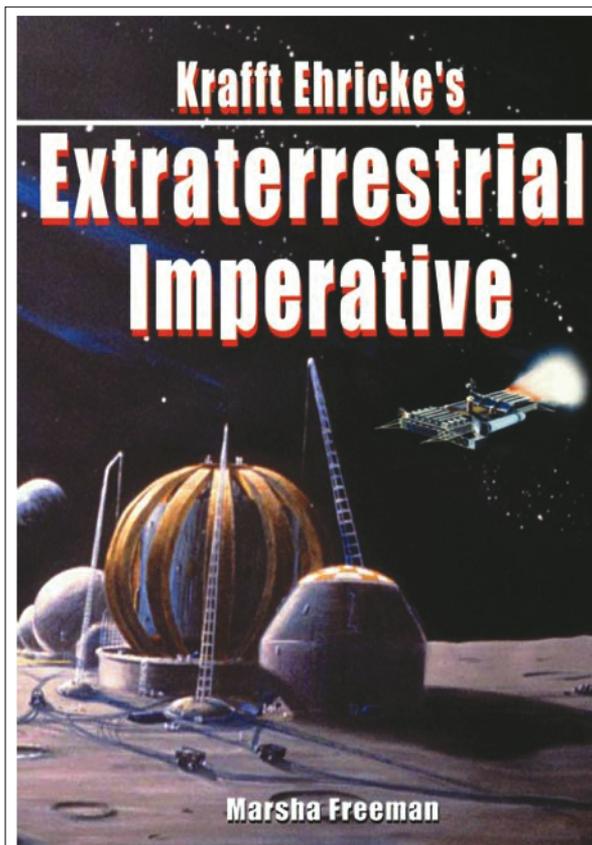
There is one statement that he makes in his section on the accident at Chernobyl that is not totally true, however. He says that scientists who could have challenged the nonsense about Chernobyl chose to keep quiet. But there is one scientist who did not keep quiet on Chernobyl: Polish scientist Zbigniew Jaworowski, a member of the United Nations Scientific Committee on the Effects of Atmospheric Radiation (a group he once chaired) who studied Chernobyl and wrote several technical and popular articles telling the truth about the effects of Chernobyl. (Some of these can be found in *21st Century*.) Jaworowski, a multidisciplinary scientist, has been attacked for debunking the lies about Chernobyl and for dissecting the fraud of global warming. It is surprising that Lovelock was not

aware of his work.

As you can see from this brief report, Lovelock's book is very confused. He is a committed Malthusian, but he wants nuclear power, DDT, and new cities for the people who remain once the population is culled. But he thinks little of today's greens, whom one might suppose were his co-thinkers. In the final chapters, Lovelock describes the current environmentalists as "cultist," and even worse, like the colonial imperialists that built the British Empire.

His assessment of the current religion of environmentalism is right on the mark. Just look at people like Britain's Prince Philip and his son Prince Charles, who state that they want to depopulate the world, and who are promoting the fraud of global warming as a way of controlling the world's energy, so that energy rationing can ensure that 4 billion or more people are eliminated.

Despite its problems, *The Vanishing Face of Gaia* is a useful reference book because of Lovelock's arguments for nuclear power and his assessment of the current green religion as fascist and imperialist.



**Krafft Ehricke's
Extraterrestrial Imperative
by Marsha Freeman**

ISBN 978-1-894959-91-9, Apogee Books, 2009, 302pp, \$27.95

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