

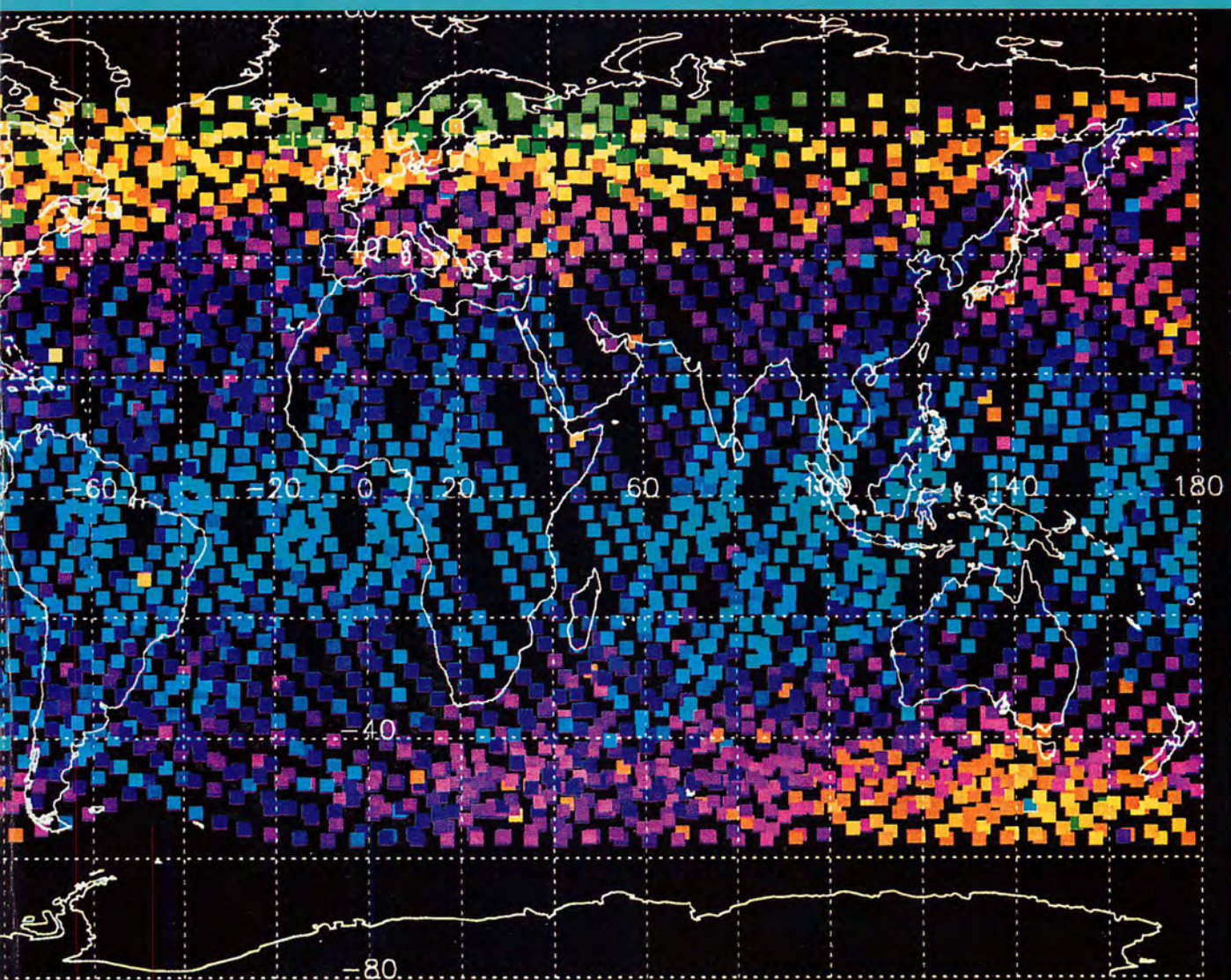
21st CENTURY SCIENCE & TECHNOLOGY

SPRING 1996

\$3.50/IN CANADA \$4.50

LAROCHE ON
ENVIRONMENTAL
MYTH-MAKING
P. 36

Why Classroom Mathematics Makes You Stupid



New Ozone Data Prove
Depletion Models False

Expand your horizon!

Subscribe to **21st CENTURY** SCIENCE & TECHNOLOGY



NASA

Subscriptions:

U.S.—6 issues for \$25
Foreign—6 issues for \$50

Books

***The Holes in the Ozone Scare:
The Scientific Evidence***

That the Sky Isn't Falling

by Rogelio A. Maduro and
Ralf Schauerhammer

\$15 each, plus \$3 shipping OR \$10
postpaid with a subscription

How We Got to the Moon:

The Story of the German Space Pioneers

by Marsha Freeman

\$15 each, plus \$3 shipping OR \$10
postpaid with a subscription

Global Warming:

The Rest of the Story

by Dr. Gerd Weber

\$11 each, postpaid OR \$8 postpaid
with a subscription

Hermann Oberth:

The Father of Space Flight

by Boris V. Rauschenbach

\$15 each, plus \$3 shipping OR \$12
postpaid with a subscription

Video on the ozone hoax

"Fair Skin—Stay In"

1-hour documentary produced by the
Belgian television network BRTN. VHS,
English narration, some subtitles.

\$20 each, plus \$3 shipping

Special offer: Get a subscription to
21st Century Science & Technology
magazine and save up to
\$8 per book!

Give *21st Century* subscriptions and gifts

ORDER FORM

Enclosed is \$ _____ for:

_____ 6 issues/ U.S.—\$25

_____ 12 issues/ U.S.—\$48

_____ 6 issues/ foreign airmail—\$50

_____ 12 issues/ foreign—\$98

_____ \$10 for *The Holes in the Ozone Scare* with a subscription

_____ \$18 postpaid for *The Holes in the Ozone Scare*

_____ \$10 for *How We Got to the Moon* with a subscription

_____ \$18 postpaid for *How We Got to the Moon*

_____ \$8 for *Global Warming* with a subscription

_____ \$11 postpaid for *Global Warming*

_____ \$12 for *Hermann Oberth* with a subscription

_____ \$18 postpaid for *Hermann Oberth*

_____ \$23 postpaid for ozone video

Please print or type name and address of gift recipients on a separate paper. Gift cards are available.
Note: Back issues are available at \$5 each (\$6 foreign)

Name _____

Address _____

City _____ State _____ Zip _____

Daytime telephone (_____) _____

Send check or money order (U.S. currency only) to:
21st Century, P.O. Box 16285, Washington, D.C. 20041.

21st CENTURY SCIENCE & TECHNOLOGY

Vol. 9, No. 1

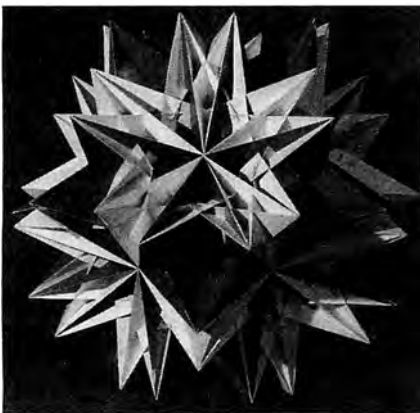
Spring 1996

Features

- 21** **How Hobbes's Mathematics Misshaped Modern History**
Lyndon H. LaRouche, Jr.
No area of academia today is untouched by the false axiomatic of Sarpi, Galileo, and Hobbes.
- 24** **Paolo Sarpi and the Fraud of the Enlightenment: Why 'Standard Classroom Mathematics' Makes People Stupid**
Jonathan Tennenbaum, Ph.D.
The 'lazy reason' of mathematics fools us into thinking that our structure of assumptions constitutes reality.

THE OZONE STORY

- 36** **Pythia Drops the Ball**
Lyndon H. LaRouche, Jr.
Prince Philip's revival of the pagan worship of Gaia begets acceptance of hoaxes and hoaxsters in place of science.
- 40** **New Scientific Evidence Proves Ozone Depletion Theory False**
Rogelio A. Maduro
New scientific evidence continues to demonstrate that the ozone depletion models—and the resulting ban on CFCs—are based on a Big Lie.
- 51** **Why the U.S. Should Withdraw From the Montreal Protocol**
Hugh W. Ellsaesser, Ph.D.
There is too little knowledge and too much misrepresentation of ozone depletion.
- 54** **Montreal Protocol Enforcers in Flight Forward**
Marjorie Mazel Hecht
The Montreal Protocol may still be alive, but it is not well.
- 56** **The Nobel Fraud**
Rogelio A. Maduro and Torbjoern Jerlerup
This year's Nobel Prize in Chemistry was intended to squelch opposition to the ozone depletion theory.
- 58** **Alfred Nobel's Honor Upheld in Stockholm**
- 59** **French Scientist: This Nobel Prize Is a 'Scandal'**



Bruce Chilton

A reader tells the story of how he built the most complicated uniform polyhedron, composed of 3,060 pieces. See the Geometry section, p. 60.

News

- 8** **SPECIAL REPORT: BIOLOGICAL HOLOCAUST**
Barbara Tuchman's Distant Mirror
- 14** Budget Cuts and Environmentalism Speed Rise of Disease
- 60** **GEOMETRY**
Reminiscences of a Model Builder:
The Story of the Most Complicated Uniform Polyhedron
- 64** 'Beyond Numbers' Bans Leibniz:
Geometrical Model Exhibit Misses Point
- 68** **ASTRONOMY**
The Solar-Terrestrial Campaign
- 70** **INDEX**
The 1995 Index to *21st Century* by Subject and Author

Departments

- 2** EDITORIAL
4 VIEWPOINT

- 5** IN MEMORIAM:
Arthur Rudolph

- 6** NEWS BRIEFS

EDITORIAL STAFF

Editor-in-Chief
Carol White

Managing Editor
Marjorie Mazel Hecht

Associate Editors

David Cherry
Marsha Freeman
Laurence Hecht
Carol Hugunin
Rogelio A. Maduro
Jim Olson
Charles B. Stevens
Mark Wilsey

Books

David Cherry

Art Director

Rosemary Moak

Advertising Manager

Marsha Freeman

SCIENTIFIC ADVISORY BOARD

Francesco Celani, PhD
Hugh W. Elsaesser, PhD
Bertha Farfán, MD
James Frazer, PhD
Emmanuel Grenier
Wilford Hansen, PhD
Lyndon H. LaRouche, Jr.
Wolfgang Lillge, MD
Ramtanu Maitra
Giuliano Preparata, PhD
B.A. Soldano, PhD
B.P. Sonnenblick, PhD
Jonathan Tennenbaum, PhD
Daniel R. Wells, PhD

21st Century Science & Technology (ISSN 0895-6820) is published 4 times a year in 1996, every third month, by 21st Century Science Associates, 60 Sycolin Road, Suite 203, Leesburg, Va. 22075. Tel. (703) 777-7473.

Address all correspondence to **21st Century**, P.O. Box 16285, Washington, D.C. 20041.

Second-class postage is paid at Leesburg, Va. and additional mailing offices.

Dedicated to providing accurate and comprehensive information on advanced technologies and science policy, **21st Century** is committed to restoring American scientific and technological leadership. **21st Century** covers the frontiers of science, focusing on the self-developing qualities of the physical universe in such areas as plasma physics—the basis for fusion power—as well as biology and microphysics, and including groundbreaking studies of the historical development of science and technology. Opinions expressed in articles are not necessarily those of 21st Century Science Associates or the scientific advisory board.

Subscriptions by mail are \$25 for 6 issues or \$48 for 12 issues in the USA and Canada. Airmail subscriptions to other countries are \$50 for 6 issues. Back issues are \$5 each (\$6 foreign). Payments must be in U.S. currency.

POSTMASTER: Send address changes to 21st Century, P.O. Box 16285, Washington, D.C. 20041-0285.

Copyright © 1996
21st Century Science Associates

Printed in the USA ISSN 0895-6820

Winning the Ozone Fight

The new ozone studies reported in this issue provide more scientific evidence to justify a pull-out from the Montreal Protocol and a reversal of the ban on CFCs. Ironically, the danger is that ideological agendas of some of the anti-foaxters—not the environmentalists—might sabotage a U.S. pullout from the Montreal Protocol and a reversal of the CFC ban, by miring ozone in the so-called states' rights issue.

Understandably enraged about the costly and irrational federal ban on CFCs, many ozone activists have pushed for state bills that "nullify" the federal ban. While the science backing such actions is impeccable, the politics are reprehensible: These bills have forced the ozone issue into the states' rights battlefield, where it does not belong.

Most ozone bill supporters, of course, do not intend by such bills to break up the United States, but this is the explicit aim of some conservative ideologues, who want to crush the federal government and are using the states' rights issue to do it. In fact, the idea of these radical conservatives to split up the United States into regional, autonomous areas is remarkably similar to the "nine nations" and other regionalist schemes put forward by the radical greens and the liberal establishment.

But no matter who is supporting the regional scheme, the states' rights argument means a confrontation with the federal government and is a dead-end for the United States, not an end to the ban on CFCs. Think back to this nation's colonial history, and to how hard the British tried to break up the early United States. Whether the issue was taxes, trade, or slavery, it was the British who funded and instigated states' rights activities, including full support for the Confederacy in the Civil War. The British aim still is to prevent this nation from exercising an independent industrial and anti-colonial role in the world.

Exemplary of the British role in states' rights is Lord William Rees-Mogg, a

long-time British intelligence agent and former editor of *The London Times*. Rees-Mogg, an elitist who argues that only 5 percent of the population should be educated and rule over the masses, uses his so-called conservative newsletter, *Strategic Investment*, to rail against "big government" and warn that federal regulations are leading to militia violence—violence that he and his friends are instigating.

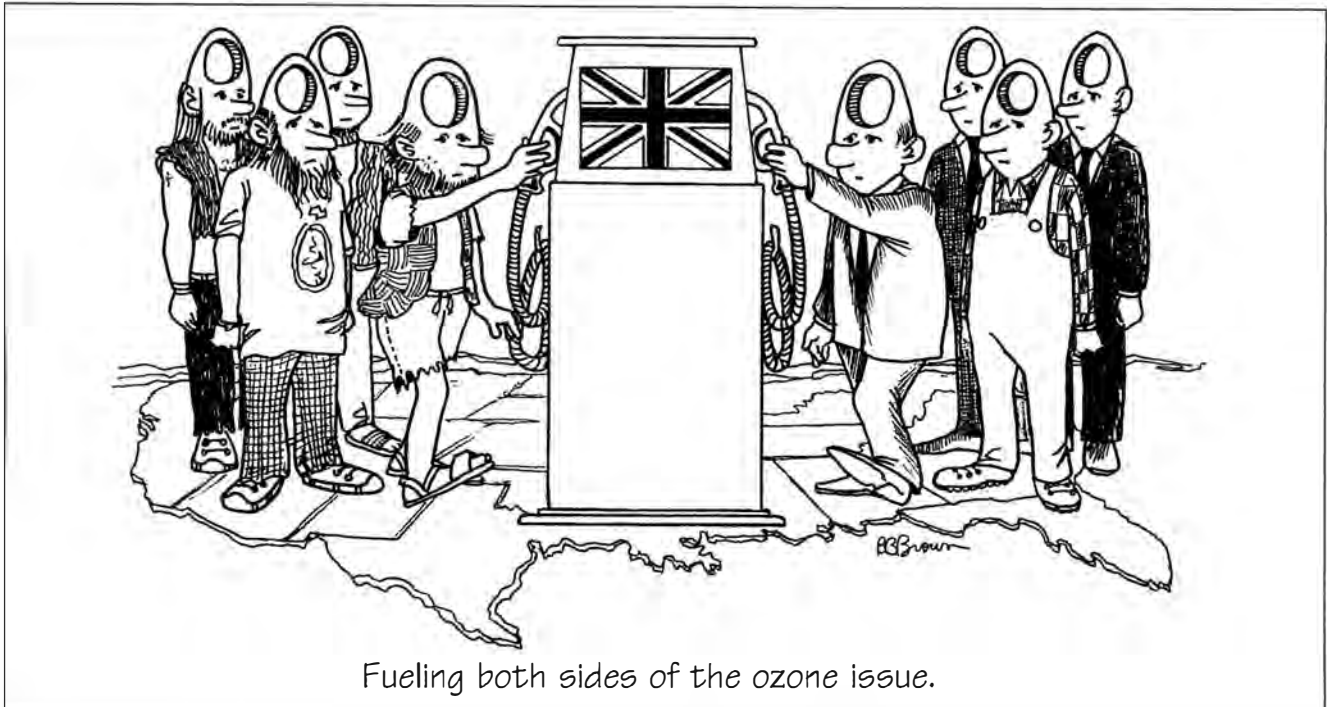
Populist Dupes

States' rights on the ozone issue are easily manipulated, because objection to unscientific environmental regulations is legitimate. The duped populist victim can gripe against the federal government, and rant about the crazy environmentalists, without ever having to think about how to solve the real economic problems facing the country, much less the world. In fact, such victims don't have to think at all. And therein lies the problem. It's easier to be a radical populist than to take on the actual enemy by fighting to defeat the elitist British Malthusian ideology that guides both the environmentalist movement and the conservative revolution.

The British parentage of both the greens and conservatives is nowhere clearer than in the Green Scissors project led by Lord William Rees-Mogg's close collaborator and newsletter co-editor, James Dale Davidson. Davidson's National Taxpayers Union, along with Friends of the Earth and other environmentalist groups, formed the Green Scissors project to promote budget cuts that eliminate advanced nuclear and fusion research and other advanced technology programs.

British Colonial Ideology

This country did not suddenly sink into the mush of anti-industrial environmentalism. It was driven there by the European royal families and oligarchs whose feudal and pagan beliefs, and the continuation of their power over the masses, require the eradication of populations who operate on the basis of science and reason and who believe in



Fueling both sides of the ozone issue.

progress. The organizations formed by Prince Philip, Belgium's King Bernhard, and their friends—the Club of the Isles, the Club of Rome, the International Union for the Conservation of Nature, the World Wildlife Fund, and their terrorist offspring such as Greenpeace and Earth First—targeted America's cultural optimism for destruction, and most Americans tolerated the paradigm shift. Prince Philip and friends have played a personal role in overseeing the strategy of the environmental movement they started and in furthering the pagan worship of the Earth goddess, Gaia.

"That may be true," say many anti-environmentalist leaders, "but we can't say that, because it sounds like a conspiracy, and besides," many will add, "nobody tells *us* what to do." And so we have a battlefield where both sides, whether they know it or not, are set up to mouth ideological positions created by the same small group of oligarchs—and no one attacks the real enemy.

On the one hand are greens of various shades, including the terrorists, promoting paganism and Malthusianism. And on the other side are the anti-environmentalists of various degrees, including the free-enterprise, "property-protection is primary" extremists. On the one side, the extremists say there are too many people, so let some die, while on the other side, the extremists

say. "I made it, so if others can't, that's just tough—let them die." Both philosophies have a thoroughly British and thoroughly royal lineage—but even those few anti-environmentalists who have figured this out are afraid to say it.

This country was founded by philosophical supporters of Leibniz who were in total opposition to the British philosophy of John Locke, Isaac Newton, and Adam Smith. Human progress, not property rights, motivated the framers of the constitution; protective tariffs, not free trade, enabled this nation to break the bonds of imperial Britain and later, under Lincoln, to foster the scientific and technological advances and the scientific culture that made this nation the greatest industrial power on Earth. The opportunities for American entrepreneurship were made possible by a nation in which government built infrastructure—railways, ports, highways, bridges, and so on—to enable it to thrive, and that educated all its citizens. Free enterprise, like free trade, was merely a euphemism for the British license to loot the colonies of raw materials and to shackle the minds of its populations to a British colonial ideology.

What Can Be Done

State legislators who want to change the ban on CFCs should put their views in the form of memorials to the U.S.

Congress, conveying the demands of the state, and organize their constituents to pressure Congress to change the federal regulations and pull out of the Montreal Protocol. Now is also the time to pursue bipartisan alliances for a sane review of environmental legislation. In the past few weeks, leading Democratic congressmen and state legislators have spoken out in defense of the American System of economics—as opposed to the British colonial system—and the need to return to a policy of building infrastructure and promoting industrial production so that Americans can have productive jobs and the country can have the economic growth that will rebuild the tax base. Although these Democrats have not raised the question of environmental excesses, the door is open for having a sane discussion on the CFC ban, its scientific absurdity, and its unwarranted \$4 trillion cost to the U.S. economy.

And, finally, for our readers who see free enterprise and protection of property rights as the essence of America, we send them back to read some original historical sources—Franklin, Hamilton, Lincoln, Mathew Carey, Henry Carey, E. Peshine Smith and others—to find out why this nation fought a revolution to found a Republic instead of kowtowing to a one-world empire ruled by an oligarchy.

Schrödinger's Cat Revisited

Ideally, every hypothesis requires a strict regimen of supportive experimentation before graduating to theory status—a theory being, after all, nothing more than a well proven hypothesis. Illustrative abstractions, however, are not subject to such rigorous verification. Rather, they enjoy a special place in critical thought. They are considered quaint, colorful expressions intended to clarify a point and not to be taken as strict conceptualizations.

This, at least, is the typical textbook approach to hypothesis, theory, and illustrative abstractions. In practice, matters are different. Illustrative abstractions, for example can become sacred cows, rising inviolate on up-swellings of scientific faith to share equal billing with popular, unquestioned theories.

A wonderful example of abstraction ascending to near theoretical acceptance is the lovely little allegory called Schrödinger's Cat.

To illustrate the effects of human observation on quantum level experiments, the great physicist Erwin Schrödinger used an exegesis that has since become the stuff of legend. In his explanation, a cat is sealed into an opaque box with a device. This device consists of an emitter that radiates quantum level particles. The emitter is aimed at a sensor plate which serves as a trigger. Once the sensor registers a particle hit, a lethal gas is released into the box, killing the cat.

As this quantum parable unfolds, at every moment there is a 50/50 chance that a particle will be emitted. Since the gas cannot be released until the particle is emitted, at any moment the cat has a 50 percent chance of being alive. (Remember, all that's discernible from out-



Glenn Searfoss

side the box are its walls. There's no way for the observer to tell what's happening inside.)

Schrödinger postulated that the cat would remain suspended in this quantum limbo until direct observation confirmed its life or death status. The cat may have died within the first quarter second, but it may also be alive. We'll never know for certain, until some frustrated researcher rips the lid from the box. At which point either a snarling, biting fury would erupt from the box (I've never known a cat to take enforced confinement with equanimity), or the fuzzy fur ball would remain motionless on the box floor, dead.

Thus, the causal effect of human observation on experimentation and hence the universe is illustrated. A twist on Descartes' "I think, therefore I am." The researcher's almost god-like credo: "I observe, therefore an event occurs."

And so we spend eternity in blind wonder. Is the cat dead? Is it alive? Is it both? Afraid to open the box, we knuckle under to the precept: if we never look, the cat never really dies. A pretty bit of reasoning by the trained mind.

A Serious Flaw

However, it has come to my attention through the pragmatic visualization of a pre-teen relation, that there exists a serious flaw in our unthinking acceptance of this postulate.

While attempting to explain the analogy of Schrödinger's cat and its implications to my 7-year-old niece (she's very smart), I found myself set on my ear by her vehement protestations, most of which centered around the cat's long-term welfare.

"Look Cindy," I explained for the fifth time, "there's really no cat. Its all make believe. Okay?"

Head bobbing, her solemn eyes stared up into mine.

"Now, the cat is sealed into a box."

"Are there holes poked in the lid so it can breath?" she interrupted.

"No," I shook my head in exasperation, "but there's more than enough air inside."

"How about food?" She inched forward, hands clasped tightly in her lap. "They taught us in school that everything has to eat or else it will die."

"That's true," I agreed. "Okay, there's an unlimited supply of food in the box. It can't starve."

"And water." She insisted. "It's got to have water to drink. That's another thing I learned in school. Dehy. . . dehy. . ."

"Dehydration." I added, hoping to speed things along.

Cindy nodded furiously. "Yeah that. Things die real fast with no water."

"Okay." I sighed. "There's unlimited water too."

"And a ball."

"Why a ball?"

" 'Cause the kitty's got to have something to play with."

She had me there. I get bored being stuck in an elevator for a few minutes, let alone eternity. "Okay, we'll make sure there's a ball, a quiet one with no bells."

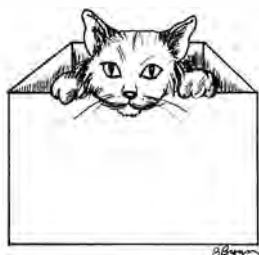
"All right." Frowning, she kicked her foot at my shoe.

"Now what's wrong?"

"How could anybody be so mean?" She sniffed. "Sticking a kitty in a box."

"Look Cindy." I chided. "This is all just an idea. It's make-believe. Nobody's really done it. No cat's been hurt."

Glenn Searfoss is a professional writer, artist, computer consultant, and naturalist, living in Denver. His published works include short fiction, articles, and books on computer technology, international communications, and environmental studies.



IN MEMORIAM



She nodded slowly, and I noticed a slight puckering around the corners of her eyes.

"Okay," I began again. "So the cat's sealed in a box."

Lower lip thrust defiantly forward, she bunched a fist and hit me. "You're mean!" She yelled and stomped away.

I sat there a moment, stunned, holding a hand to my stomach. It hadn't hurt, but her uncompromising view of reality made me think. She was correct, of course.

Quantum Relationships Be Damned

Common sense and observation tell us death, unlike the emission of quantum particles, is certain. Schrödinger may be right in the cat's eternal 50/50 chance of moment-to-moment survival, but so was my niece. Quantum relationships be damned. In reality, the observer doesn't matter. After three or four days without water or food the animal, unable to escape, dies. Or surviving with a stocked larder it lives out its days until old age, not gas, ends its forced confinement. With the ultimate conclusion certain, the experiment and the allegory become moot.

Jumping to my feet, I swiftly crossed the room to where Cindy stood beside the living room bookcase, head bent low, idly fingering the spines she could reach. She sniffed once and drew a sleeve roughly across her nose. I knelt down beside her and waited until she glanced my way. "You're right." I apologized. "It is a mean thing to do."

There was a brilliant flash as she smiled and wiped away a tear. "We'll leave the box open so the kitty can get out?"

Grinning, I tousled her hair. "You betcha."

Arthur Rudolph: Space Pioneer

When the history of the 20th century is written, one of the most stunning chapters will be that of the first footsteps of men on the Moon. That accomplishment rested on the efforts of a relative handful of people, one of whom was space pioneer Arthur Rudolph. Having come to America at the end of World War II with the top specialists of the German rocket effort, Rudolph managed the production of the Saturn V rocket, which took American astronauts to the Moon. He died on Jan. 1 in Hamburg, Germany, at the age of 89.

Rudolph became involved in the development of rocket technology when he was 24, working with rocket-car enthusiast Max Valier in 1930. In early 1933, Rudolph was hired by Walter Dornberger for the German Army rocket program, which Wernher von Braun had started a few months earlier. Rudolph showed up with the "complete alcohol-oxygen rocket power-plant" he had designed, "which made two wholly successful static runs at first trial," according to von Braun.

On May 2, 1945, a few days before the end of World War II, von Braun surrendered to the American troops, offering to bring his team of rocket specialists to the United States. Rudolph and 117 other veterans of the 15-year German rocket program came to America the next year.

On to the Moon

During his work for the U.S. Army, Rudolph managed the development of new rockets, primarily for deployment by NATO in Europe. When he left Army employ for NASA, Rudolph received the Exceptional Civilian Service Award, the highest award the U.S. Army gives to civilians.

After President Kennedy's announcement on May 25, 1961, that the United States would send astronauts to the Moon, von Braun assigned Rudolph the task of managing the development and production of the huge Saturn V rocket that would take them there. The Saturn V remains

the largest, most powerful rocket system the United States has ever built, and in 32 test and mission flights, it never suffered a failure. It stood taller than the Statue of Liberty, was composed of more than 6 million parts, and its engines produced as much power as 85 Hoover Dams.

To create a rocket system that would have a 99 percent reliability (1 failure in 100 flights) required meticulous attention to detail, extensive testing, stringent quality control, and new management techniques to coordinate more than 20,000 industrial contractors employing more than 250,000 people, and 7,000 civil service employees. Rudolph once described his job as "choir director," with the task of having each participant "read from the same sheet of music." It was the most complex research and development engineering project ever undertaken.

For his management of the Saturn V program, Rudolph received the Exceptional Service Medal and the Distinguished Service Medal from NASA.

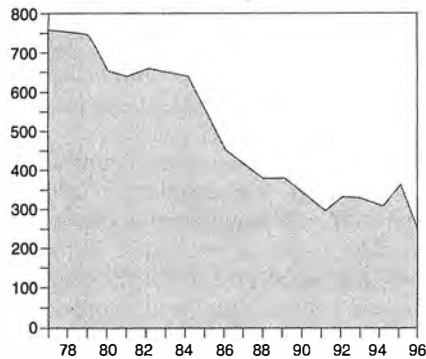
An American in Exile

Rudolph retired from the space agency in 1969, but he was not to live out his retirement years in peace. In 1982, the recently established Office of Special Investigations of the U.S. Department of Justice notified him that he was being accused of war crimes, that the Department had evidence and witnesses against him, but that it would offer him a "deal": If he would quietly leave the country and give up his American citizenship, the OSI would not prosecute and he could retain his only means of support—his government pension. At 77, in poor health, and without the means to mobilize a legal defense, Rudolph and his wife left for Germany.

In order to grant Rudolph citizenship, the German government conducted a thorough investigation, during which time the OSI produced no credible evidence of war crimes; Bonn cleared him of all charges. Rudolph died an American in exile.

—Marsha Freeman

NEWS BRIEFS



U.S. MAGNETIC FUSION BUDGET (1977-1996)
(in fiscal year 1993 dollars, in millions)

The 1997 U.S. magnetic fusion budget, as projected, drops below the threshold for operating the current or planned tokamaks, and removes the U.S. from a leadership role in fusion research.

Source: Adapted from DOE



Original mammogram



Mammogram 1 year later



Difference before alignment



Difference after alignment

National Information Display Laboratory

Military computer algorithms aid the physician's recognition of small changes in a mammogram, by precisely aligning two mammograms and highlighting the differences in a suspicious region. Before alignment, the suspicious region is cluttered by false differences caused by misalignment.

50 MEMBERS OF CONGRESS URGE INCREASED SUPPORT FOR FUSION

A bipartisan group of 50 members of the U.S. House of Representatives, led by Rep. Roscoe Bartlett (R-Md.) and Rep. Tim Roemer (D-Ind.), sent a letter Feb. 15 to Energy Secretary Hazel O'Leary and White House Science Advisor Jack Gibbons, expressing "support for a strong U.S. program in fusion energy," and urging the administration "to submit to Congress a recommendation of at least \$275 million for the Department of Energy's fusion energy program in the Fiscal Year 1997 budget." The fusion budget for 1996 is \$244 million, a \$113 million cut from 1995 funding levels. Despite the good intentions of the congressional group, at such low funding levels the U.S. fusion program is unlikely to develop fusion power in a reasonable time frame, and the United States will be reduced from its leadership position in fusion energy research to some specialty niche like computer simulations.

BIOMEDICAL SCIENTISTS URGE FEDERAL FUNDING FOR RESEARCH

The Federation of American Societies for Experimental Biology (FASEB), a coalition of 10 societies representing 44,000 biomedical research scientists, urged government policymakers to increase funding for basic biomedical research and for the next generation of scientists, in a report released Feb. 12. "The federal government is the only source capable of providing the broad, long-term support necessary for basic research," FASEB president Ralph Bradshaw stated. "The returns to investments in basic research are large, but too difficult to predict and too widely shared to attract the support of private investors." FASEB specifically recommends that the National Institutes of Health receive a 6.5 percent increase in fiscal year 1997, stressing that since World War II, more than 90 percent of the revolutionary advances in medical research resulted from NIH funding.

GREEN SCISSORS COALITION: DON'T INVEST IN SCIENCE AND TECHNOLOGY

The Green Scissors Coalition, an amalgam of environmentalists and Conservative Revolutionaries, held press conferences in 60 American cities Feb. 15, to issue its latest demands for the shutting down of many crucial infrastructure and advanced technology programs funded by the federal government, such as the advanced light water nuclear reactor, the fusion tokamak, irrigation projects, and the boll weevil eradication program, all deemed "wasteful government programs." The coalition was created three years ago by James Dale Davidson, founder and chairman of the National Taxpayers Union, and Friends of the Earth. "Environmentalists actually have a lot in common with fiscal conservatives who are trying to balance the federal budget," Friends of the Earth spokesman Gawain Kripke told the Green Scissors press conference in Washington, D.C. "We are united by the belief that Americans should not borrow from the future. Future generations should not be burdened with unbearable fiscal debt."

'MISSILES TO MAMMOGRAMS' PROGRAM IMPROVES TUMOR DETECTION

Health and Human Services Secretary Donna Shalala briefed the press Jan. 31 on a program to apply sophisticated missile guidance and target recognition techniques to increase the accuracy of imaging techniques used for breast cancer detection. The 18-month old "Missiles to Mammograms" program aims to improve old imaging methods (such as mammography), and some newer ones (such as Magnetic Resonance Imaging), and develop new approaches to diagnosis. For breast cancer, early detection is the most important factor in improving the survival rate. Among the techniques demonstrated were the application of military computer algorithms that can align multiple images more precisely for the sake of comparison, highlighting areas of difference by cancelling out areas of similarity, and making visible what the human eye could not discern.

'JURY' OF BRITISH INFLUENTIALS VOTES EQUAL RIGHTS FOR APES

There is no fundamental difference between man and ape, and so apes should be given the human right to "life, liberty and freedom from torture," determined a panel of British influentials, who met as a self-constituted "jury" on this issue in December 1995. The panel was led by Baroness Mary Warnock, an expert on existentialism. The "lawyer for the defense" of this notion, Robert Allen, presented "evidence," supposedly from DNA tests, that the "biological gap" between apes and humans is far smaller than previously thought. Evolutionary biologist Robin Dunbar asserted, "Humans and chimps are more closely related than chimps and gorillas."

GORBACHEV AND PRINCE PHILIP ALLIANCE TO CORRECT RELIGIOUS 'FLAW'

The Gorbachev Foundation and Prince Philip's Alliance for Religion and Conservation have set up a project to draft a "Charter on Human Responsibilities," to complement the United Nations Declaration on Human Rights. According to a well-informed British source, the project is intended to correct the "flaw" in leading world faiths, which talk of "rights" but ignore "responsibilities" to nature.

LESTER BROWN CALLS FOR ECOLOGICAL 'PEARL HARBOR'

The human race needs a "Pearl Harbor-like" ecological "mobilization shock" to force a massive change of behavior that will center on renouncing the values of the industrial revolution, Lester Brown told the leading French daily *Le Monde* in a full-page interview Feb. 27. The Worldwatch Institute head stressed that "the war between humans and the Earth has already begun." Brown calls for limits to growth, limits to population, limits to food consumption, and ecological taxes.

STATE OF THE CLIMATE REPORT ANNOUNCED BY WESTERN FUELS

The Western Fuels Association announced that it will release a new *State of the Climate* report April 22, to expose the "ongoing fraud" in climate scare stories "and to inject rational science into the policy debates. . . ." The report, to be edited by Dr. Patrick Michaels, will review trends in global and regional climate. For more information, call (703) 907-6160.

CO₂: 'THE INCREDIBLE LEGACY OF THE INDUSTRIAL REVOLUTION'

The increase of the vitality of the Earth's biosphere as a result of anthropogenically produced carbon dioxide is the subject of a new booklet by Dr. Sherwood B. Idso, research physicist with the U.S. Department of Agricultural Research Service's U.S. Water Conservation Laboratory. The booklet, titled "CO₂ and the Biosphere: The Incredible Legacy of the Industrial Revolution," is available free by writing the Department of Soil, Water, and Climate at the University of Minnesota, St. Paul, MN 55108.

SECOND GALAXY IS FOUND WITH COUNTER-ROTATING STAR POPULATIONS

Cornell University astronomers have discovered counter-rotating populations of stars in a spiral galaxy. Most stars in NGC 4138—mostly older ones—rotate opposite to the younger stars, according to a paper by Martha Haynes and associates, given at the American Astronomical Society meeting in San Antonio, Jan. 18. There are counter-rotating stars in an elliptical galaxy, NGC 4550, and an unknown number of galaxies have stars going opposite to the gas. Haynes says, "Counter-rotation can be understood in rare instances if two galaxies merge," but "we would expect to see some disturbance in the galaxy's appearance or some nearby companion." Here there is none. Actually, counter-rotation may be a clue to how some—or all—galaxies form, without the help of collisions.



Spiral galaxy NGC 4138. Spectroscopy shows counter-rotating star populations in this relatively featureless, smooth-armed spiral galaxy. "This galaxy appears to be completely normal," said Martha Haynes. "But what we found was a big surprise."



SPECIAL
BIOLOGICAL

Barbara Distant

by Lyndon H.

In 1978, New York publisher Alfred A. Knopf released a book by author Barbara Tuchman, *A Distant Mirror: The Calamitous Fourteenth Century*. That medieval "New Dark Age," witnessed the extermination of about half the parish communities of Europe, through such causes of increased death-rates as local wars, general economic breakdown, famines, and spread of epidemic and pandemic disease. Tuchman presented that "New Dark Age" as a precedent for the new collapse of global civilization, which had already been ushered in before 1978, by what is now the past 30 years' rise of a combination of globalist "post-industrial" utopianism, the rock-drug-sex counterculture, and a floating exchange-rate monetary order.

Four years prior to the appearance of Tuchman's book, the National Caucus of Labor Committees had published a study, successfully diagnosing the explosion of epidemics which would begin to hit the world by the mid-1980s, should the early 1970s trends in austerity be continued for an additional decade.

Tuchman's political standpoint was

deplorable, and there was a stench of mysticism in her style; but, like the Labor Committees' earlier study, her prescience of decline was based on solid fact respecting the economic and related trends already under way at the time her book was published. Today, there is an accelerating collapse in life-expectancies, combined with an increase in sickness-rates, throughout most of the world's population.

The causes of this spiralling collapse of civilized life are chiefly economic, as during the earlier "New Dark Age," but, as seen in the willfully mass-murderous cutbacks in allowed health-care in the United States, as elsewhere, the demographic impact of economic decline is aggravated by administrative actions, of both governments, and of private agencies such as some influential insurance companies. In short, the present increase of rates of sickness and death, is not man's hapless victimization by natural causes, but, is, rather the foreseeable consequence of those changes in policies whose terrible, natural consequences should have been recognized, and pro-

claimed, by the agencies employing insurance actuaries.¹

Biologist Carol Hugunin, the author of the following report, has been among the Labor Committees' international team of specialists, tracing the grim trends in growth of epidemics, and lowering of life-expectancies, during now more than 20 years.

Since March 1973, when that continuing work was prompted by a policy memorandum which I submitted to my news agency's science desk, the study

"The present increase of rates of sickness and death, is not man's hapless victimization by natural causes, but, is, rather the foreseeable consequence of those changes in policies whose terrible, natural consequences should have been recognized."

REPORT:
HOLOCAUST

Tuchman's Mirror

LaRouche, Jr.



Survivors of the Black Death in 1348, as depicted in a fragment of a fresco in Florence, Italy, at the Museum of Santa Croce.

has proceeded on two levels. Much of this work has followed the well-trodden way of epidemiology and public health practice generally; the report originally published, typifies that side of the work. At the same time, the work has followed the pathway outlined in the March 1973 memorandum, a tactic which was presented then as a blending of my discoveries in physical economy, with V.I. Vernadsky's approach to the interaction of living and non-living processes. I take this occasion to summarize some leading features of my approach then and now.

The argument on which the second approach is premised, may be summarized as follows.

Society and Economy²

On the scale within which our sense-perceptions interact with the universe around us, we encounter three distinct qualities of processes. There are processes we define as "non-living," as distinct from those we define as "living." Also, proof that valid discoveries of principles of the universe, increase man's efficient power over the universe, demon-

strates the existence of a third, distinct quality of process, *cognition*, which occurs only among some living processes—human beings, but which is not derivable from the common characteristics of action of either non-living or living processes as such. The characteristic feature of mankind's experience with each and all of these qualities of phenomena, is that they interact efficiently; thus, there can be no principle of our universe which we should consider applicable to any one of these processes, which is not an efficient principle of action within each and all of these processes.

Keep that threefoldness of the laws of the universe in the corner of the mind's eye. At first, when we turn to the subjects of demography and epidemiology as

such, our attention is focussed more narrowly, upon a phase-space of the universe as a whole: upon evidence of the efficient interaction between living and non-living processes. One focusses upon the difference between a process which is living in one moment, and the continuation of the same process a phase-shifted moment later, after the intervention of death of the organism as a functioning entirety: the difference between the organic processes which a living process comprises, and the quality of being alive. Between the suspicious, 1906 death of Ludwig Boltzmann and John Wiley's 1947-1948 publication of Norbert Wiener's *Cybernetics*, the term "negative entropy" was understood to describe this general quality of difference

1. Implicitly, according to the Nuremberg relevant code, those public and certain private agencies who "knew or should have known" that their policies would increase the death-rates among classes of persons, are guilty of "crimes against humanity."

2. Cf. G.W. Leibniz, 1671. *Society and Economy*, the first written work founding the science of physical economy, in English translation in *Executive Intelligence Review*, Jan. 4, 1991, pp. 12-13.



BIOLOGICAL HOLOCAUST



Philip Ulanowsky

The act of original discovery or its replication by a student is the efficient substance of cognition. Under the direction of Manhattan Project physicist Dr. Robert Moon, students at a Schiller Institute summer camp reproduced the 19th century electricity experiments of Ampère, winding the coils and building the equipment from scratch.

between the living and non-living state of such a complex organic process.³ Vernadsky's work of defining geobiochemistry identifies the domain within which most of the relevant investigations of this phase space have been focussed.

Unfortunately, once the field of inquiry is assigned the otherwise innocent, descriptive caption "biophysics," the relevant clinical and other experimental processes of discovery tend to be tainted by the importunate influence of today's generally accepted classroom notions of "mathematical physics." The disorientation which is introduced in this way is readily identified. Today, not only classroom mathematics and mathematical physics, but nearly every subject-matter

of the university classroom, is polluted by the two principal, axiomatic presumptions of empiricism: the assumption that mathematical discontinuities have no efficient existence, and those popularized, mechanistic notions of causality which have been handed down to modern times from Paolo Sarpi and his pupil, Galileo Galilei. In such a pathetic intellectual climate, the axiomatic distinctness of living processes is taken often as occasion for mystical rantings, such as those associated with advocacy of "Darwinism" or "vitalism."

The relative popularity of pathological doctrines of the type of Darwinism or vitalism, should impel us to resituate the phase space of the interaction between

living and and non-living processes within the domain dominated by the distinctive, and superior physical principles of *efficient human cognition*. How does mankind act, in a way unique among all species, to increase willfully our species' potential relative population-density, through those valid discoveries of natural principle by means of which we willfully alter the characteristic behavior of the human species to such successful effect? How is it possible, that this cognitive process of man, should thus dominate, efficiently, living and non-living processes?

Only in ignorant usage, is the term "science" construed to signify the mere collecting and interpretation of observed facts, a practice for which sundry lower forms of life are often better equipped than man. A meaningful use of the word "science," begins with emphasis upon the subjective side of knowing. For nearly 2,400 years, the meaningful use of the term "science" has begun with recognition of the principle of epistemology typified by the central paradox of Plato's *Parmenides* dialogue, the paradox of "the One and the Many." Given an array of facts, for example, the "Many," how do we adduce a single, efficient principle which subsumes the necessary and sufficient reason for the possible occurrence of each and all of those facts? That is the standpoint, in subjectivity, from which science must judge pathetic dogmas such as those of Darwin and the neo-Kantian vitalists.

As I have elaborated the essential argument in many published locations over the past decades, it is that act of discovery by means of which the set of axioms underlying the entirety of an ex-

3. Wiener's statistical definition of "information" supplied a mechanistic, hence farcical connotation to the term "negative entropy" (or "negentropy").
4. For example, Lyndon H. LaRouche, Jr., "Riemann Refutes Euler," *21st Century Science & Technology*, Winter 1995-1996, passim.
5. Of Plato, Nicholas of Cusa, Leonardo da Vinci, Johannes Kepler, William Gilbert, Blaise Pascal, Leibniz, and Riemann, against the Eleatics, Sophists, Galileo, Euler, and the empiricists generally.
6. Immanuel Kant, in his *Critiques*, his *Critique of Judgment* most notably, insisted that no ratio-

nal principle, but only shifting custom, operated in domains such as aesthetics. The influence of Kant upon pro-Kant and other 19th century writers produced a flurry of mystical, dangerous doctrines, generally classed as Romanticism, such as those of Fichte, G.W.F. Hegel, and Hegel's crony F. v. Savigny, associated with the use of such German terms as *Weltgeist*, *Zeitgeist*, and *Volksgeist*, each identifying some utterly irrational agency operating as *deus ex machina*.

Among the worst and most influential of these was the reactionary Professor Friedrich von Savigny, who laid down the dogma, that

there is no correspondence between science and art (between *Naturwissenschaft* and *Geisteswissenschaft*).

Darwinism is typical of those superstitions which attribute the power of such a *deus ex machina* to the principle of "free trade"; the 19th century neo-Kantian positivists, like the painter Rubens, prefer an abundance of mystical flesh in their models. To the later category, belongs "vitalism."

7. See Lyndon H. LaRouche, Jr., "That Which Underlies Motivic Thorough-composition," *Executive Intelligence Review*, Sept. 1, 1995, p. 50.



isting theorem-lattice of established learned opinion is overturned, which is the form of all of those discoveries by means of which mankind has increased our species' potential relative population-density. This act of original discovery, or its replication by a student, is the efficient substance of cognition, whether in natural science or Classical art-forms. Such a validatable act of discovery of new principle is usefully described as a "Riemann phase-shift": as of the form of change of underlying hypothesis which occurs when we proceed successfully from a formal physical science of n dimensions, to a higher hypothesis of $n+1$ dimensions.⁴ Such a Riemann phase-shift, which occurs only in the form of an *absolute mathematical discontinuity*, is the characteristic event in the domain of physical economy.

This brings us to the crux of the dispute over *causality*.⁵ There is no science which is not "promethean science"; the term, "scientific knowledge," is inseparable from the concept of "forethought." In science, our knowledge of the future is the basis upon which we know the present. That is, the application of scientific principle to a discerned set of conditions, enables us to anticipate certain relevant consequences diagnosed by such application of principle.

Here, contrary to Kant and Savigny, science mimics the best Classical forms of art.⁶ Contrary to the Romantics Kant and Savigny, in a good Classical form of strophic poem, or Classical musical composition by Mozart, Beethoven, or Brahms, generation of that form of absolute formal discontinuity we know as

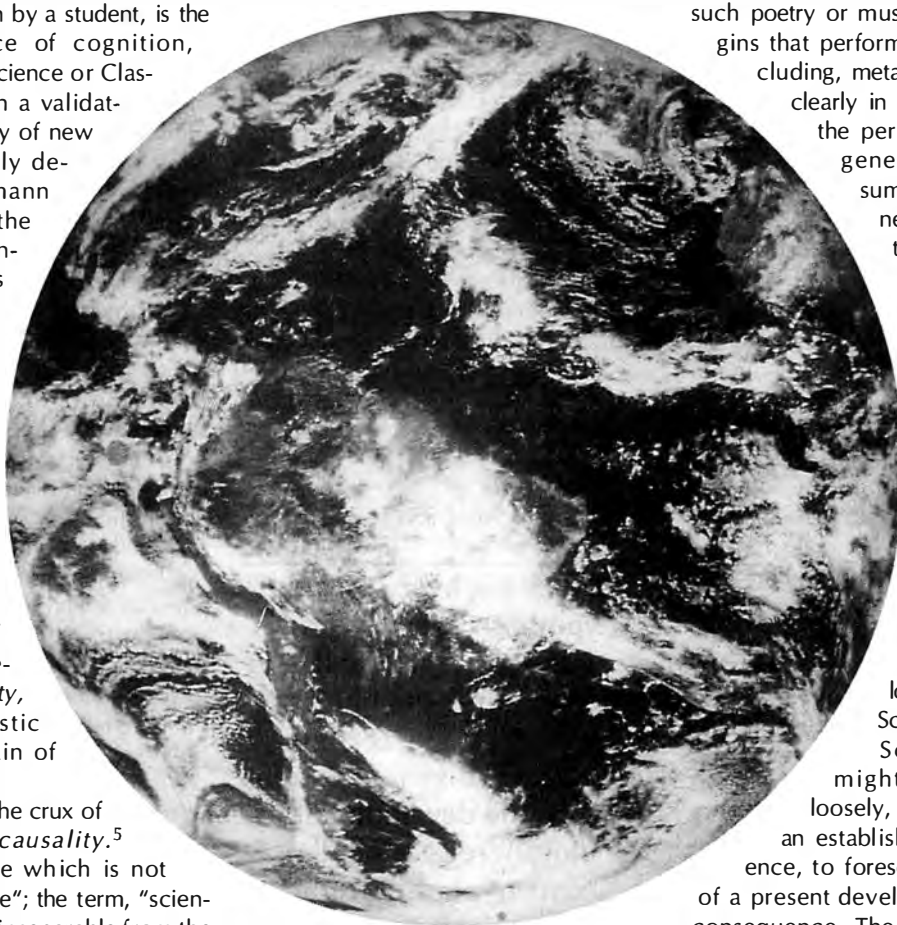
metaphor, generated in a lawful way, presents a series of such (non-symbolic) metaphors. This parade of metaphors leads to an ironical conclusion of the Classical composition, to such effect that

a concluding metaphor of metaphors is generated, which latter serves the witting audience as the indivisible, non-symbolic, Platonic idea of that artistic composition as a whole.

Thereafter, the qualified performer of such poetry or music (for example) begins that performance with the concluding, metaphorical conception clearly in mind; each phase of the performance, from the generation of one subsumed metaphor to the next, is performed in the way intended to lead the hearer of the performance to the experience of discovery of the concluding metaphor, which was the performer's intent at the beginning of the presentation, throughout. The same principles of performance are obligatory for a Marlowe, Shakespeare, or Schiller tragedy.⁷

Scientific foresight might be described, loosely, as the application of an established principle of science, to foresee the extrapolation of a present development as its future consequence. The risk in such a simplistic description, is the tendency, of many, to assume that we are discussing the cruder level, mere statistical forecasting, rather than a principle of scientific discovery. The nature of true foresight is definable as follows.

The core of that body of knowledge we call science, is based in the student's re-experiencing the original act of a discovery of a valid principle of nature. Each such event of that type (whether in natural science or Classical art-forms) is an act of cognition. The body of knowledge so accumulated, may then be expanded by the student's addition of some original discoveries, of



NASA

Ukrainian scientist Vladimir Vernadsky (1863-1945), basing himself on the work of Riemann, Curie, and Mendel-eyev, elaborated the idea of the biosphere: The upper envelope of the Earth's crust and impinging atmosphere, which is dynamically transformed by the development of life. Man's further transformation of the biosphere Vernadsky refers to as the noösphere, because it is driven by thought. His work began a rigorous process of studying the dynamic interaction between three distinct domains: the non-living, the living, and human cognition.



the same nature, of his or her own.

That array of accumulated discoveries has a natural order, of necessary predecessor and necessary successor, thus approximating a series of Riemannian phase-shifts of the $(n + 1)/n$ type. Each such phase-shift corresponds to a distinct *hypothesis*, as Riemann follows Plato in defining the proper usage of that latter term. Each such hypothesis has the quality of a *metaphor*, as I have addressed the rigorous implications of that latter term in various published locations.

An array of such Riemannian phase-shifts (metaphors) thus corresponds to a well-ordered [for example, $(n + 1)/n$] *Many* of the type presented by Plato's *Parmenides*. The *One* corresponding to that *Many*, is of the form and content of Plato's notion of an *higher hypothesis*. This principle of higher hypothesis corresponds to the use of the term *Reason* in the work of Johannes Kepler, or of *necessary and sufficient reason* in the work of Leibniz.

That Plato-Cusanus-Leonardo-Kepler-Leibniz notion of Reason occupies the place awarded to *causality* in the tradition of Sarpi, his pupil Galileo, and their empiricist followers.⁸ The action of Reason is comparable to the idea of a Classical performer's notion of the composition as an entirety, in terms of the composition's concluding metaphor of metaphors: the composition's higher hypothesis. In *Classical art-forms, the metaphor of metaphors is the relative future, acting to shape the process of development, during each present moment, in accord with that relative future as a cognitive goal. In natural science, the level of development of higher hypothesis existing at each stage of progress of science as a whole, is the image of the future in the present.*

The ideas which belong to the domain of Reason, are Platonic ideas formed as the singularity of "topological collision," in the present instant, between the certainty of the relative future (for example, metaphor of metaphors), and the process of past development, up to that present instant.

That view of Reason, is the central principle of the science of physical economy. That is the adducible operating principle distinguishing the successes of a government-backed, "science-driver crash program," such as the 1960s Kennedy aerospace program, from the relatively more pedestrian approach to continuing technological progress.⁹ The higher approach to problems of epidemiology, is the application of the same paradigmatic notion of Reason to comprehending the unfolding development of the Vernadsky biosphere.

'Predetermination'

In its worst expression, such as Darwinism, biophysics is premised upon the wishful delusion, that living processes will be discovered one day, to have been the consequence of percussive action within a non-living universe of the mechanical type envisaged by Sarpi, Galileo, Thomas Hobbes, "Bourbaki," and their materialist and empiricist fol-

"Just as discovery of valid hypothesis is efficient in increasing mankind's dominion over the universe, expressed as increase of potential relative population-density, the development of the biosphere as a whole has a similarly not-entropic form."

lowers. Norbert Wiener's misuse of Boltzmann's H-theorem, to misdefine "information," is a product of a crude, radically empiricist delusion. Within biophysics itself, the best efforts in such reductionist directions, are typified by the work on mathematical biophysics, more than five decades ago, of Chicago's brilliant Professor Nicholas Rashevsky, and the internationally influential Soviet biophysicist A. Oparin. A stimulating, if abortive tactic, life as a process of aperiodic crystallization, was proposed by a former student of Boltzmann, Erwin

Schrödinger.¹⁰ Among currently popularized dogmas, the very worst are the notions of biological and cognitive processes spun out of the work in systems analysis and positivist linguistics of Bertrand Russell devotees Korsch, Carnap, Harris, Wiener, John v. Neumann, Minsky, and Chomsky.

The commonly characteristic pathology of each and all of these cases, is an implied dogmatic adherence to Isaac Newton's famous piece of illiterate babbling, ". . . *et hypotheses non fingo*."¹¹ The development and evolution of species are not located within the domain of percussive interaction, but of hypothesis. The argument is, that, just as discovery of valid hypothesis is efficient in increasing mankind's dominion over the universe, expressed as increase of potential relative population-density, the development of the biosphere as a whole has a similarly not-entropic form.

That development of species within the biosphere, which raises the biosphere as a whole to higher states of efficient organization, has the same form as the impact of the development of higher hypothesis upon man's dominion over the universe. In other words, we find in the development of the biosphere a not-entropic process which has a characteristic form comparable to the effect of a self-developing higher hypothesis in human social existence.

It is in that sense, and only that sense, that one may speak of living processes as having a predetermined character.

This is so precisely characteristic of Plato's argument, that scholars are obliged, either to acknowledge that this notion of predetermination is the characteristic feature of Plato's work taken as a whole, or to expose the fact that they have no effective comprehension of Plato's work. To wit, in his *Timaeus*, Plato identifies God as "The Composer." This notion of God as Composer is intertwined with Plato's use of, and distinctions between his notions of *Good* and *Becoming*.

In the case of a work of Classical poetry or music, the metaphor of meta-



“Mankind has the power of discovery and decision, to improve or worsen the conditions of life upon this planet, to increase or to decrease sickness rates, life expectancies, and the biophysical conditions of life generally. . . . We are responsible to foster those hypotheses upon which the continued preservation and development of life depends.”



Philip Ulanowsky

Issues in public health policy have to be approached from the standpoint of higher hypothesis or Reason, as understood by Plato, Cusa, Leonardo, Kepler, and Leibniz. Here, a rescue squad brings an accident victim to a suburban hospital.

phors, the idea of the composition taken as a whole, functions from beginning to end of the performance as an unchanging conception, as the *Alpha* and *Omega* of the composition taken as an indivisible whole: That idea, the impact of the future upon each present moment within the performance, has the form of Plato's notion of the *Good*. The idea with which that *Good* collides topologically, in each ongoing moment of mid-performance, has the form of *Becoming*. This form of *Becoming*, a process of change from moment to moment, is determined by the action of the idea of the *Good* upon the process of development up to each instant of reference.

Plato prompts us to view God as the Composer, and the universe as His Classical-artistic composition. For this purpose, Plato supplies the idea of a Classical musical composition: a musical composition composed and performed according to the Classical principle of Reason. These qualities of ideas—Platonic ideas—we can most readily recognize, and apply within the domain of epistemology. The principle of necessary and sufficient reason prompts us to apply what we learn from that epistemological study of the principles of efficient cognition, to the higher understanding of living processes in general, and to proceed, next, to exam-

ining the universe itself from the same vantage-point.

Admittedly, the hypothesis thus outlined finds more virgin than settled territory within the domain of biology. Nonetheless, from the standpoint outlined here, one extremely urgent matter is defined with scientific certainty: This is the way in which we must think about the shaping and conduct of public policy in the domain of public health. Mankind has the power of discovery and decision, to improve or worsen the conditions of life upon this planet, to increase or to decrease sickness rates, life

expectancies, and the biophysical conditions of life generally. It is admittedly difficult, and often painfully slow work, to make progress upward in these matters; it is impermissible to allow conditions to slide backwards. We are responsible to foster those hypotheses upon which the continued preservation and development of life depends.

Whatever remains to be accomplished to bring to fruition the scientific hypothesis outlined here, that is demonstrably the conceptual standpoint in science from which the relevant issues of public health policy must be approached.

8. Modern existentialism, phenomenology, and pragmatism are essentially derivatives of empiricism, in the degree that the neo-Aristotelian Kant is. All, like Kant, eliminate the principle of reason, which they supplant with the empiricist notion of percussive causality.

9. As noted in Marsha Freeman's recent review of U.S. aerospace policy, a 1976 study by Chase Econometrics reported that the U.S. economy had been returned the benefit of approximately 14 cents in added national income, from each penny spent on the Kennedy "crash program" for achieving the manned

Moon landing. See *Executive Intelligence Review*, Feb. 23, 1996, pp. 10-25.

10. Schrödinger's efforts along such lines should be seen as an extension of the work in crystallization leading through Louis Pasteur and Mendeleev's periodic table, into the directions of the fresh explorations of the periodic table by Professor Robert Moon and collaborator Laurence Hecht.

11. Cf. Bernhard Riemann, "Erkenntnisstheoretisches." *Gesammelte Mathematische Werke*, ed. Heinrich Weber (New York: Dover Publications, 1953), p. 525.



Budget Cuts and Environmentalism Speed Spread of Disease

by Carol Hugunin

The U.S. medical community is sounding the alarm that proposed budget cuts will sharply reduce the health care and longevity of *all* Americans, as the collapse in infrastructure, coupled with cuts in health services, combine to allow new and old diseases to rage out of control. Americans are used to seeing reports of millions of deaths in other countries, such as the preventable famines and epidemic disasters that have beset Africa. But now these conditions are threatening home, not just in poor inner city areas or rural hamlets, but in the relatively more affluent areas of Middle America.

The rise of mortality from infectious diseases has been under way here for several years, "despite historical predictions that infectious diseases mortality would wane in the United States," according to Dr. Robert Pinner of the Centers for Disease Control (CDC) in Atlanta.¹ Pinner reported in the Jan. 17, 1996, issue of the *Journal of the American Medical Association* that from 1980 to 1992, there was a 58 percent rise in deaths from infectious diseases in the

United States. Correcting for age (that is, taking into account the increasing proportion of elderly Americans), there was a 39 percent increase in mortality from infectious diseases.

This report will review the data presented at a series of recent medical conferences, documenting the direct connection between public investment in medical infrastructure and the health of the population.² At these meetings, the nation's top medical doctors and researchers warned again and again that the further collapse of such investments, as demanded by the budget cutters, will lead to a rapid decline in the health of the U.S. population—just as it has already done in the Third World—and that the diseases of the Third World know no borders, especially when aided by the shutdown of disease monitoring, surveillance, and response facilities.

A Series of Conferences

The Institute for Medicine of the National Academy of Sciences gathered many health and epidemiology experts for a conference in Washington, D.C., Oct. 16 on "Emerging and Re-emerging

Infections." Two days later, the Senate Labor and Human Resources Committee held hearings on the same topic, titled "A Threat to the Health of the Nation."

The overall picture presented at both events can be summarized in the words of Dr. David Heymann from the World Health Organization: "The most worrisome aspect of these new diseases is their rate of increase; at least 29 new diseases have emerged during the past 20 years. . . . Despite many warnings," Heymann said, the world "is not fully equipped to contain [these outbreaks]. In general, industrialized countries have been letting down their guard in public health, even as new threats emerge."

The Senate hearing was followed by a conference on "Remote Sensing and Vector-Borne Disease Monitoring and Control" on Nov. 28-30 in Baltimore, jointly sponsored by NASA and the Third World Foundation. Next came a conference Dec. 11-14, sponsored by the National Institutes of Health (NIH) and National Institute of Allergy and Infectious Diseases on "Pandemic Influenza: Confronting a Re-Emergent Threat."



Budget Cuts, Not Climate Change

In the midst of the alarms being sounded by the medical community, many environmentalist scientists have tried in recent months to make the case that global warming is, and will be increasingly, the cause of a rise in infectious diseases, by creating more favorable breeding conditions for disease organisms.

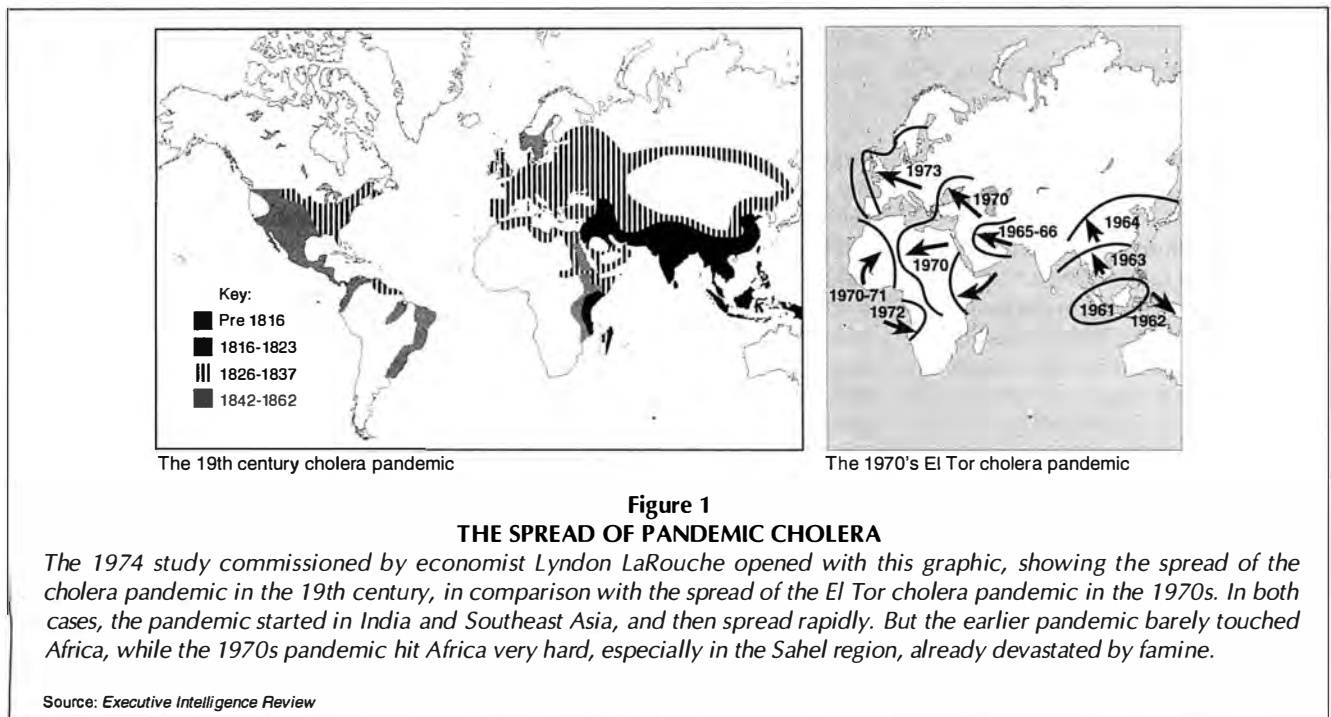
This was the theme of a National Academy of Sciences conference Sept.

11-12, 1995, on "Human Health and Global Climate Change." This media-oriented conference was run with an iron hand by Anthony McMichael, professor of epidemiology from the London School of Hygiene and Tropical Health, to make sure that the media absorbed the proper spin: Blame global warming, not destructive economic policies, for the re-emergence of infectious diseases.

But the epidemiologists in charge of

"The Dance of Death" depicted in this 15th century fresco is a reminder that infectious disease knows no boundaries. In this case, the plague is shown hitting young and old, clergy and peasant alike.

controlling these infectious diseases have made it clear in the meetings noted above, in interviews, and in articles in the medical journals: *It is not global warming, but budget cuts that are to*





BIOLOGICAL HOLOCAUST



Philip Ulanowsky

Budget and infrastructure cuts over the past 30 years have already reduced many urban areas to rubble. Here, a Manhattan scene in 1981 shows the ideal conditions for the spread of diseases like TB, as well as diseases spread by rats, cockroaches, and other pests.

blame for the spread of infectious diseases. Budget cuts and environmental regulations have all but eliminated spraying to kill mosquitos and other insects, and this is responsible for allowing the resurgence of infectious diseases in an uncontrollable form.

Equally important, the same cuts, and proposed new cuts, have destroyed, and will continue to destroy, the capability of epidemiologists and public health officials to monitor and fight deadly infectious diseases.

Malthusian Economics

In the latter half of 1974, the economist Lyndon H. LaRouche directed a task force, including this author, to study the way economic policies of austerity would foster the spread of new and re-emerging diseases. This task force developed the idea that the forced economic devolution of the Malthusian post-industrial age would generate ideal conditions for the re-emergence of old microbial threats to mankind, especially in selected triaged "Fourth World" pockets globally.

Such areas of triage would serve as the weak link, the petri dish, both for epidemics of re-emerging diseases and for generating new, previously unknown

diseases. These diseases would then spread to the more fortunate populations in industrialized countries, as the productive economy continued to collapse worldwide.

Because of a lack of political will to change those Malthusian post-industrial economic policies, these predictions have become reality, even in the United States, home of much of the most advanced medical technology in the world.

Today, the medical community is warning the nation about the impact of these economic policies. Dr. Pinner's article on mortality from infectious diseases documents how serious this situation is in the United States, a country with sufficient infrastructure to fairly accurately monitor deaths from infectious diseases.

Other articles spell out the problem in regard to specific diseases. Professor L.B. Reichman, of the National Tuberculosis Center in Newark, N.J., for example, warned in the Jan. 20, 1996, issue of the British medical journal *Lancet*: "Should block grants be reintroduced for tuberculosis (TB) control in the USA, we will experience a resurgence of TB followed by a resurgence of multiple-drug resistance."³

Block grants are lump sums from the federal government to the state governments, for use in areas of health and social welfare, without earmarking how much money should be spent on which problem. When they were tried here in the past, they led to a dramatic resurgence in TB and drug-resistant TB; thus, the block grants were replaced by funding that was targetted specifically for TB control. But block grants are the proposal of the "Contract on America" agenda of the Republican Party, along with deep cuts in all facets of medicine, including those that have an impact on the epidemiological monitoring and control of spreading diseases.

These proposed cuts come at a time when global medical infrastructure has already been collapsed to the point that it is non-functional in many areas, including that of disease-monitoring and control. Tuberculosis expert Dr. Barry Bloom, of the Department of Microbiology and Immunology at Albert Einstein

College of Medicine in New York City, told the Oct. 16 conference on Emerging and Re-emerging Diseases that although the CDC is considered the world's premier institution, both in terms of surveillance and in investigation of infectious diseases, its pathogen laboratory is falling apart and is unsafe for its researchers, because of constant budget cuts.

"Dustin Hoffman made more money from the movie *Outbreak* than [is in] the entire CDC budget for infectious diseases," Bloom said.

Hospitals Hit Hard

The Medicare cuts proposed by the budget cutters will have an impact far beyond the Medicare population itself. Medicare cuts are forcing hospitals to downsize, and in many cases will force the closure of sections of the nation's major teaching hospitals. These teaching and research institutions form the backbone of advances in medical technology and treatments, and must provide the next generation of well-trained physicians.

For hospitals faced with declining investment in medical infrastructure, the situation is especially dire, as they are confronted with a whole new category of diseases: deadly fungal infections (*Cryptococcus*, *Candida*, *Histoplasma*, *Coccidioides*) in a growing population of immuno-compromised hospital patients (AIDS patients, organ transplant patients, burn patients, and so on). Nearly 40 percent of all deaths from hospital-acquired infections are caused by these fungi, according to a 1988 study conducted by epidemiologist Richard Wenzel. Many of these fungi have become resistant to the older anti-fungal drugs available, and pharmaceutical companies have not been working on new anti-fungals, because they were previously not regarded as a threat.

Another major new problem for hospitals is *Streptococcus pneumoniae*, a bacteria responsible for 500,000 cases of pneumonia in the United States per year. Between 1991 and 1994, *Streptococcus pneumoniae* had become increasingly resistant to penicillin, bactrim, cef-tazidime, and other antibiotics, according to a study by J. Plouffe, writing in the



Jan. 17 issue of the *Journal of the American Medical Association*.⁴ This is a particularly serious problem in the wake of major flu pandemics, especially for the very young and very old, whose immune systems are somewhat weaker.

Drug-resistant tuberculosis is another increasing threat. Dr. Alan Bloch of CDC reported that roughly 14 percent of all U.S. TB cases in 1991 had become resistant to TB drugs, with 3.5 percent of TB cases resistant to both isoniazid and rifampin, the drugs of choice for TB treatment.⁵ Although some physicians have had success treating non-HIV-positive, multiply drug-resistant TB patients⁶ in an environment with sufficient medical infrastructure—where the patient can be continually monitored and followed up—the threat of drug-resistant TB is a deadly one. One third of the world's people are TB carriers.

The chronic TB problem in the United States is an example of the insanity of the current policy of budget cuts.

"If Medicaid is cut, if Proposition 187 [a California regulation, now suspended by court injunction, that would deny health care to immigrants] is allowed to stand, very possibly TB will come back again in the United States as a very serious problem," said TB epidemiologist Tim Brewer. Brewer, who is at the Harvard School of Public Health, said in an interview with *21st Century*: "TB is concentrated in marginalized groups: inner city, prisons, recent immigrants, intravenous drug users who are HIV infected, etc., and this makes it very sensitive to health care underfunding. . . . Traditionally, epidemiology, and especially TB control, has been underfunded."

The Most Serious Disease

The most serious infectious disease threat facing Americans today "is the Republican Congress," Dr. Robert Black told the conference on Remote Sensing and Vector-Borne Disease. Black is the chairman of the International Health Department of Johns Hopkins University's School of Hygiene and Public Health, and was previously an official at CDC.

Public health experts "are very scared," Black said, that Americans have no idea of the disease threats they will be facing if proposed budget cuts are im-

plemented. The problem, which the experts are acutely aware of, is that the disease surveillance capacity that once protected Americans has already been decimated by previous budget cuts, and further cuts will exacerbate an already deadly collapse of health infrastructure. Like Tim Brewer, Black cited TB and drug-resistant TB as the most dangerous disease threat for Americans.

Drug-resistant TB is an example of the necessity of having well-equipped, well-staffed teaching and research hospitals internationally, accessible to the entirety of the world's population. Without a well-equipped and well-staffed hospital, it is impossible to obtain the kind of workup necessary to determine with rigor that a patient has TB; and, more important, to determine which drugs that TB patient will respond to, and to which drugs his strain of TB is resistant.

"The most serious infectious disease threat facing Americans today is the Republican Congress."

The lack of even rudimentary infrastructure—not to mention hospital facilities—is a major factor in the spread of TB throughout the Third World. Dr. Larry Geiter, a consultant to the International Union Against Tuberculosis and Lung Diseases, who has traveled to many developing nations to assist them in fighting TB, said in an interview: "Lack of resources is more a problem than lack of technical skill. [The problem is] not just the lack of a lab at the central hospital, it's no refrigeration, no power. The patient may not be anywhere near the hospital center, and the sputum putrefies before it can arrive at the lab to be cultured. Because of lack of infrastructure, and lack of resources to build infrastructure—these things put up a barrier to doing routine TB testing, routine susceptibility testing to antibiotics. . . . I think the global TB problem is economics, and to the degree that economics is politics, it's political as well."

Geiter pointed out that in many developing countries, because of budgetary and other constraints resulting

from International Monetary Fund conditionalities, TB clinics are hardly staffed and lack drugs; they serve mainly as a registry for TB statistics. Rifampin, a TB drug of choice, is relatively expensive, given the per capita income in poor countries. While in the United States, TB services are mainly free, the TB clinics of poor countries are not always able to give TB medications out free. These clinics give out isoniazid and perhaps one other drug, while advising the patient that if he wants to be sure he survives this deadly bacillus, he should find money to buy rifampin.

Even more tragic, explained Geiter, is that the percentage of African and Asian patients resistant to both rifampin and isoniazid is much higher than it is in the United States, because of lack of medical infrastructure. Tuberculosis that is resistant to both drugs of choice, requires treatment with ethionamide and cycloserine, which are quite toxic and require careful monitoring and follow-up, and this requires patient access to a good teaching-research hospital facility. Because these drugs cannot simply be handed out with instructions for the patient to take back to his village, these patients go untreated and eventually die. In the process, drug-resistant TB is spread to many of those with whom they come in contact.

And with international travel, Geiter said, these drug-resistant forms of TB spread rapidly back to industrialized countries that have been so indifferent to the fate of those unfortunate enough to have been born in Third World countries.

Surveillance Breakdown

Over the last 30 years, the international monitoring system for infectious diseases has been a casualty of severe budget cuts. For obvious reasons, it is a system that cannot work unless it is international.

Dr. Donald Henderson, professor of International Health and Epidemiology at Johns Hopkins School of Hygiene and Public Health, warned at the Oct. 16th conference that the infectious disease "surveillance systems are between fragile and nonexistent throughout the world."

After three decades of neglect, he said,



BIOLOGICAL HOLOCAUST

these systems are in urgent need of development. "We should focus on the Third World . . . home to 75 percent of the world's population." If the rapid development of such a global infectious disease surveillance system is not given the "same priority as the defense department," Henderson told assembled physicians and others at the conference, "there will be hell to pay."

Henderson said that 10 to 15 medical centers worldwide were required to adequately monitor infectious diseases. Each had to be well equipped and well staffed, with good laboratory backup and at least one epidemiologist trained to go out into the field for follow-up in developing countries.⁷

In Europe, and in the United States, he said, doctors in the process of seeing patients clinically will pick up any unusual pattern of symptoms, discuss it with fellow physicians, and follow it up, perhaps publishing something about it. But in developing countries, the few medical centers that exist have overworked physicians too busy to follow up on anything unusual. And, they are so poorly equipped, so lacking in sanitation, that, as the recent Ebola epidemic illustrated, they tend to *foster* the spread of disease. In the Ebola case, the reuse of syringes and needles without the time or equipment to properly sterilize them—a policy forced on the hospital by lack of resources—cost hundreds of lives.

"Say we had maybe 10 or 15 of these [medical centers]," Henderson said. "They might be built on existing facilities, by just getting them better equipped. If you had them in or near an area that is heavily populated, densely populated, in or near tropical rainforests. . . . Your organisms may get started, and they spread around—through rural areas, periphery and so forth—but eventually they make their way to hospitals that are near these areas. So that, you have a center, for example, in Zaire, which is a huge country, but even if it's only one hospital in all of Zaire, you have so much movement in and out of the capital city, coming from tropical rainforests, and populated areas, that you would soon detect a problem over quite a wide area.

"That does not mean you have to have clinical expertise and laboratories, and everything else, all over the world, in every city, but the more you have, the better, the more likely you are to detect it [an emerging disease threat] early, the earlier you are likely to be able to do something about it."

"Talking with our colleagues that had been in Zaire in the early 1960s," he said, "they saw these AIDS cases. In retrospect, they know looking back at it. . . they began to see quite a number of cases of younger men dying of diseases, and they didn't know what it was. They had so many people to see that they didn't have any time to do anything about it. . . . And we did not, as you know, detect this organism until 1983," Henderson said.

What might have happened if AIDS was discovered 20 years earlier, before it had had such a chance to spread so widely around the world? Would we have the same nightmare of immunocompromised AIDS patients feeding an epidemic of TB and drug-resistant TB?

The India Example

Just how fragile have the American and international disease surveillance systems become? Last year's outbreak of bubonic plague in Surrat, India, is a good example, as related by Dr. Duane Gubler, Director of the Division of Vector-Borne Infectious Diseases at the National Center for Infectious Diseases, in Fort Collins, Colorado. Gubler spoke at the November conference on "Remote Sensing and Vector-Borne Disease Monitoring" in Baltimore.

Earlier this century, Gubler said, India had a plague epidemic that killed more than 12 million people. For this reason, during the 1950s and 1960s, the Indian government conducted an aggressive

campaign to eradicate plague. By the late 1960s, when cases of human plague were no longer reported, the Indian government shut down its plague control program, so that by last year, when the outbreak began in Surrat, there were no qualified medical experts on plague anywhere in India!

India then issued an international plea for help. But the two remaining interna-

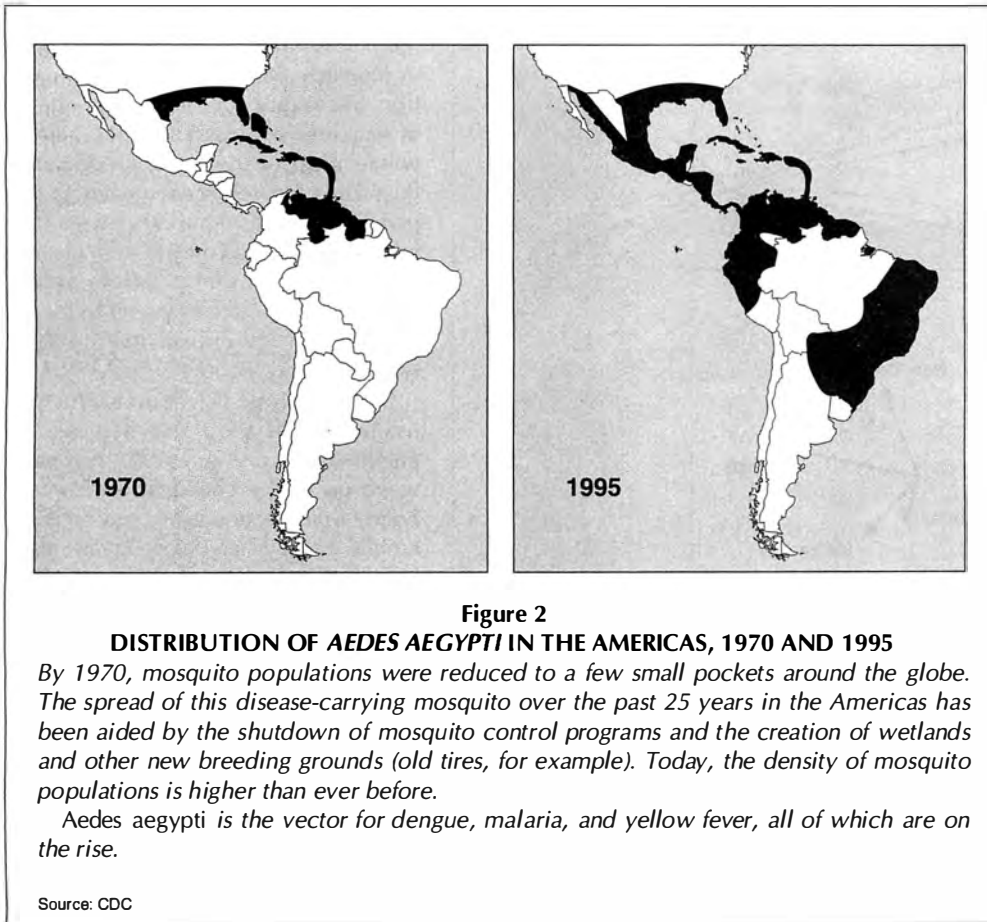


An emergency hospital in Brookline, Massachusetts, during the 1918 Spanish flu pandemic. Health officials at a recent conference warned that the conditions of economic collapse just after World War I that caused the 1918 pandemic are remarkably similar to global conditions developing today.

tional plague centers had also been shut down: Russia's plague center had closed for lack of funds, while the U.S. plague center had been closed because plague was no longer considered a priority medical problem—even though the largest reservoir for plague vectors in the world is the Western half of the United States, home to many protected wildlife species that carry bubonic plague.

The only place in the world that had maintained the proper reagents (chemicals) necessary to properly identify the strain of plague—a crucial step before proper treatment can begin—was Gubler's laboratory in Fort Collins. Gubler said that he got a frantic 3 A.M. phone call requesting samples of the reagents, and he helped put together a 15-man response team to bring the plague under control in India.

The U.S. health officials involved were very worried: The Surrat plague



cans—mainly those in the productive 20- to 40-year-old age range. The 1918 epidemic occurred in the context of the economic collapse and chaos left by World War I, coupled with an increase in untreatable bacterial infections.

Current economic conditions—generated by several decades of post-industrial policies—have brought us similar conditions: global food shortage, economic collapse, institutional chaos, and even increasing drug-resistant bacterial infections. And so, many epidemiologists are worried that an influenza pandemic could strike again. One of the crucial steps called for at this conference was increased funding for a group of influenza strain monitoring stations in southern China, which is crucial to the successful development of new vaccines each year.

Insect-borne diseases, and particularly mosquito-borne diseases (such as malaria, dengue and yellow fever) are another area in which post-industrial economic policies—coupled with environmentalist policies that have banned harmless pesticides like DDT, and protected mosquito breeding wetlands—have put even North America on the edge of potential epidemics.

The technology exists to bring mosquito-borne diseases under control. Remote sensing can track mosquito populations and find where there are hot spots—high densities of disease-bearing mosquitos—anywhere on the globe, at any season. Pesticides like DDT (which was banned for political, not scientific reasons)⁸ still exist that can kill mosquitos; swamps can be drained; and other mosquito-breeding grounds eliminated.

But the combination of environmentalism and budget cuts has caused a threat from mosquito-borne diseases greater than at any time in this century, according to Gubler. By the 1970s, traditional policies of mosquito control

was transmitted, in some cases pneumonically, from germs in the air, rather than just by infected fleas. What if it spread to a major Indian city and from there, via international travel, globally? CDC's map (Figure 3) shows what health officials feared: that budget cuts that had made various serious infectious threats, like plague, non-priority diseases, came within a hair's breadth of destroying the capacity to treat a potential deadly, fast-spreading global pandemic of pneumonic plague.

Another example of the penny-wise and pound-foolish mentality of the budget cutters was given by Dr. Karl Johnson, former chief of the Special Pathogens Branch of CDC, at the Oct. 16 conference. Johnson pointed out that the study of zoonotic diseases—animal diseases, such as bubonic plague, transmittable to man—had dangerously collapsed. The only academic research laboratory that the United States had for this purpose was in the Panama Canal Zone,

and this was closed in 1982, for political reasons. Since then, "two entire generations of zoonotic investigators have been lost," Johnson said.

At present, the medical community has no serious capacity to defend against zoonotic diseases, he said, even though the Aum sect in Japan had planned to release Ebola in the Japanese subway system. Johnson called for increased support for Level 4 (high containment) laboratories both at CDC and at Fort Detrick, Maryland, referring to both of these labs as "endangered species." He also called for the creation of at least one academic research center for training of future zoonotic researchers.

Pandemic Influenza

At the conference on "Pandemic Influenza; Confronting a Re-emergent Threat," held in December, epidemiologists warned of the potential for another deadly influenza pandemic like the one in 1918. In one month alone, that epidemic killed almost 200,000 Ameri-

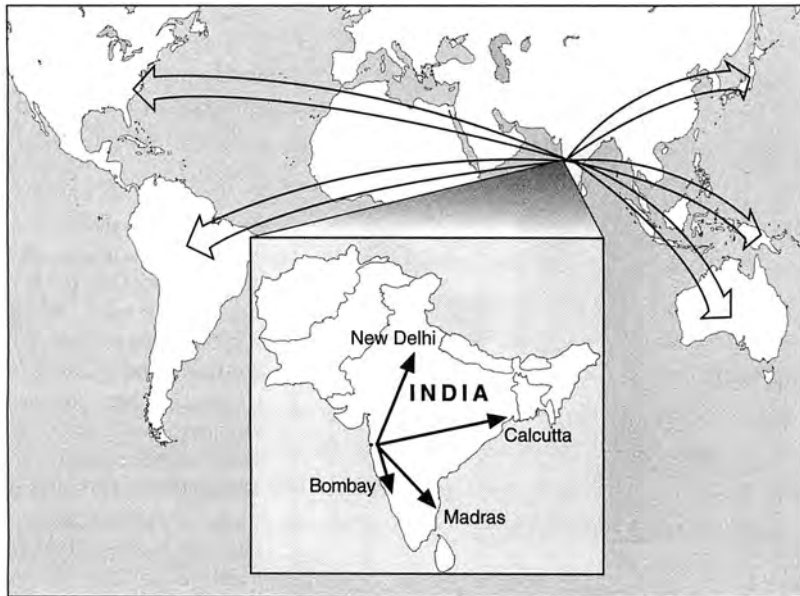


Figure 3

POTENTIAL SPREAD OF PNEUMONIC PLAGUE

Health officials feared that the collapse of funding to monitor and treat deadly diseases could have allowed a global pandemic of pneumonic plague to develop, from the Surat epidemic. The only place in the world that had retained a capability for identifying the plague strain was the CDC Division of Vector-Borne Infectious Diseases in Ft. Collins, Colorado.

Source: CDC

and swamp drainage had reduced the mosquito population to just a few small pockets globally. When mosquito eradication programs were phased out, deadly mosquito-borne diseases, like dengue, malaria, and yellow fever rebounded from virtually no cases in 1981, to pandemic proportions in 1996.

Dengue in the Americas is now "hyper-endemic": four kinds of serotypes of dengue are occurring at the same time, for the first time in history. This means that in the Americas, someone who suffers from one serotype of dengue has no immunity to the three other types, and is still vulnerable to three other endemic forms of break bone fever.

Globally, Gubler told conference participants at the Remote Sensing conference, the "density of mosquito populations is higher than ever before." Speaking at the same conference, Dr. Don Roberts, a malaria expert from the Uniformed Services University of Health

Sciences, Department of Preventive Medicine of the Department of Defense, reported on studies showing that DDT is still very effective in preventing malaria today, even where there are resistant mosquitos. He urged a return to this pesticide, because it is nontoxic, long-lasting, and inexpensive.

As for new pesticides for mosquito control, Dr. Robert Washino, from the Entomology Department at the University of California at Davis, said at the Remote Sensing conference that there was only one new pesticide, and that it had been developed 22 years ago! It took 20 years for it to get Food and Drug Administration approval to be used in the United States, and another 2 years to get California Environmental Protection Agency approval! With this kind of regulatory climate, he said, no new pesticides and insecticides are being developed.

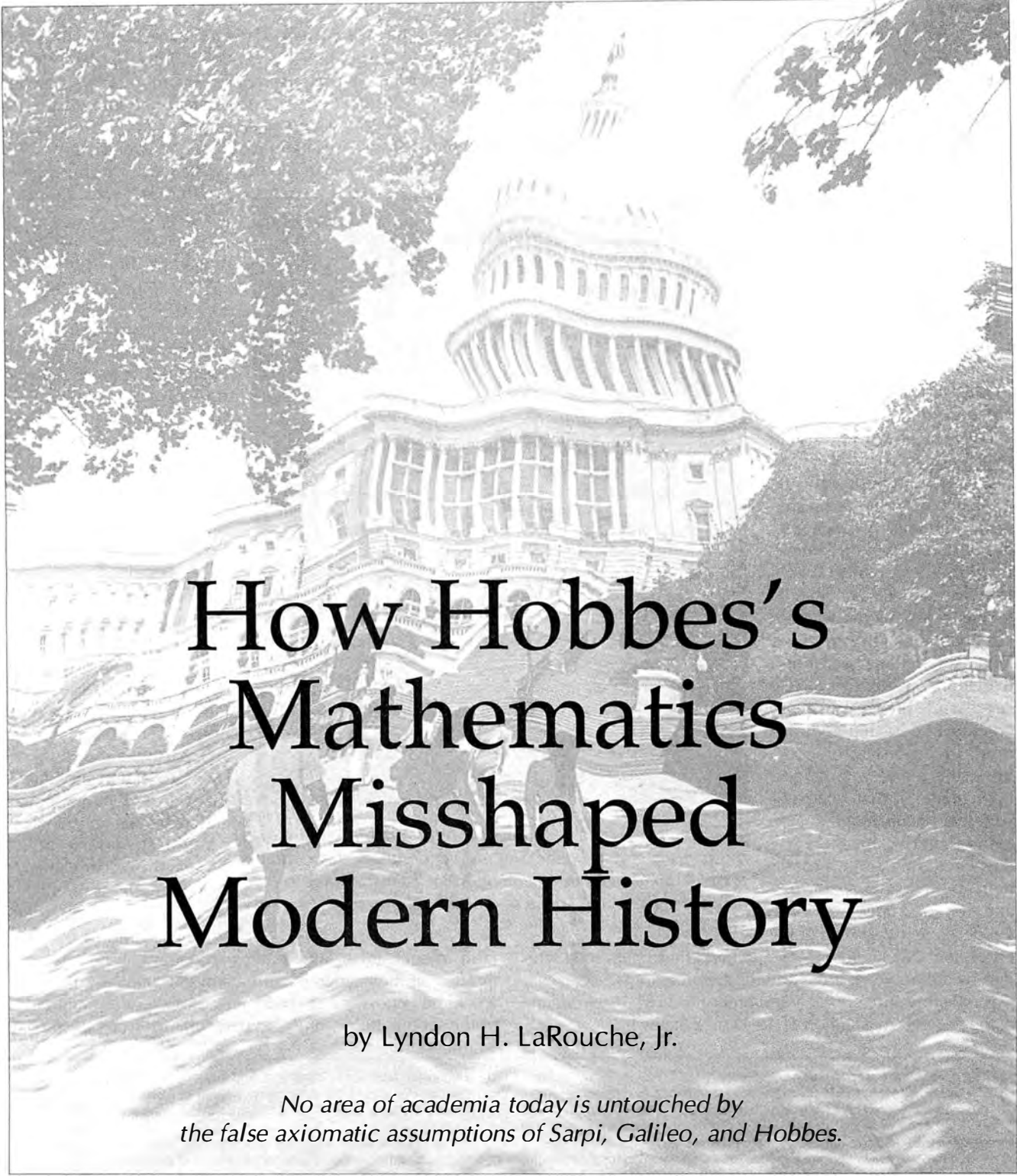
Some experts have hoped to rely on new and better vaccines to control

many difficult diseases, like malaria. But the ban on the refrigerant freon has put in jeopardy the cold chain of refrigeration necessary for the transportation of vaccines in less developed areas—where most of the world's population live. Thus far, replacement refrigerants perform poorly, with a 30 percent drop in efficiency. According to John Lloyd, a WHO technical officer, in the tropics, such a drop could easily lead to the denaturing of vaccines, making them worthless.⁹

Epidemiologists, medical doctors, health officials and researchers are raising the alarm, and Americans had better wake up to the changes in economic policy that are needed to fight this microbial threat. Microbes don't care about balanced budgets; they thrive on budget cuts. Budget cuts kill people, and they don't just kill "other people"; they are aimed at Middle America.

Notes

1. R. Pinner, 1996. "Trends in Infectious Diseases Mortality in the United States," *JAMA*, Vol. 275, No. 3 (Jan. 17), pp. 189-193.
2. For a report on the impacts of advanced technology on health care and health costs, see C. Hugunin, "Innovations in Technology Can Reduce Medical Costs," *21st Century Science and Technology* (Summer 1994), pp. 56-65.
3. L.B. Reichman, 1996. "How to Ensure the Continued Resurgence of Tuberculosis," *Lancet*, Vol. 347 (Jan. 20), pp. 175-177.
4. J. Plouffe, 1996. "Bacteremia With *Streptococcus pneumoniae*: Implications for Therapy and Prevention," *JAMA*, Vol. 275, No. 3 (Jan. 17), pp. 194-198.
5. Alan Bloch, 1994. "Nationwide Survey of Drug-Resistant Tuberculosis in the United States," *JAMA*, Vol. 271, No. 9 (March 2), pp. 665-671.
6. Edward Telzak, 1995. "Multidrug-Resistant Tuberculosis in Patients Without HIV Infection," *New England J. of Medicine*, Vol. 333 (Oct. 5), pp. 907-911.
7. For an elaboration of this idea, see Donald Henderson, "Surveillance Systems and Inter-government Cooperation," in *Emerging Viruses*, ed. Stephen Morse, (New York: Oxford University Press, 1993), pp. 283-289. Henderson's proposal, in brief, appears in a letter to the editor of *Technology Review*, Jan. 8, 1996.
8. For an account of the DDT story, see J. Gordon Edwards, "The Lies of Rachel Carson," *21st Century*, Summer 1992, and "Malaria: The Killer That Could Have Been Conquered," *21st Century*, Summer 1993; and Thomas H. Jukes, "DDT," *The New York Times*, and Judge Irving Kaufman, *21st Century*, Spring 1992; and "Silent Spring and the Betrayal of Environmentalism," *21st Century*, Fall 1994.
9. A short report on the vaccine situation can be found in Gary Stix, "Keeping Vaccines Cold, Travails of Immunizing the World's Children," *Scientific American*, February 1996, pp. 14-15.



How Hobbes's Mathematics Misshaped Modern History

by Lyndon H. LaRouche, Jr.

*No area of academia today is untouched by
the false axiomatic assumptions of Sarpi, Galileo, and Hobbes.*

Putting to one side, as diversionary, the topic of today's aggressive fungus of trash curricula:¹ There is virtually no academic subject-matter currently taught in universities, which is not derived from the root of that specific strain of mathematics associated with Galileo Galilei, Thomas Hobbes, René Descartes, Isaac Newton, Leonhard Euler, the Marquis de Laplace, or Augustin Cauchy. The significance of Dr.

Jonathan Tennenbaum's presentation (page 24) on the subject of Paolo Sarpi's influence, from the standpoint of mathematics, is to be located accordingly.

Typical are the varieties of social theory spun out of the common root of Thomas Hobbes and such among his succes-

1. Sometimes referenced as "socially significant basket-weaving."

sors as John Locke, Bernard Mandeville, François Quesnay, Pierre-Louis Maupertuis, Giannaria Ortes, Adam Smith, Jeremy Bentham, Bentham's James Mill, and Mill's nephew and godfather of Bertrand Russell, John Stuart Mill. All of these belong to the type frequently described by mid-18th century specialists as "Newtonian social theory," or what Bentham identified as a "felicific calculus,"² and J. S. Mill, et al., as a general theory of utility. All modern empiricist (for example, behaviorist, positivist, existentialist, American-pragmatist) versions of modern academic social theory, is derived from the same mechanistic dogma of society—as a many-particle, "kinematic" interaction—which was presented as the social theory of Galileo's mathematics pupil, Thomas Hobbes.³

No area of the traditional academic curriculum has been left untouched by the influence of Galileo's mechanistic thinking. For example, during the mid-17th century, Hobbes and his circle launched an attempt, virtually to outlaw the use of metaphor and the subjunctive from the English language. Although that effort was not completely successful, the result of the continuation of that and kindred, empiricist influences, upon the modern language curriculum, is, that relatively very few university graduates among English speakers today, including some prominent members of Congress and Federal judges, exhibit the developed cognitive powers of literacy sufficient to comprehend those published writings by aid of which a majority of the ordinary U.S. citizenry was rallied to support the adoption of the 1787-1789 drafting of the Federal Constitution of the United States.⁴

Again, overlooking the trivial course-topics proliferating in today's politically correct academic curriculum, the fact is: *There is no area of prevailing opinion in the fine arts, the so-called "social sciences," in political-economy, in the teaching of theology, in doctrines of historiography, within the departments of philosophy, and so on, which is not premised upon the same, false, axiomatic assumptions which are derived from the mathematical-physics presumptions of the mathematicians Sarpi, Galileo, Hobbes, et al.*

The topic we are addressing here, the role of so-called "Enlightenment" mathematics, in misshaping the teaching of non-mathematical learnings, is not an exotic sort of topic, relevant only to the specialists trained in the philosophy underlying mathematics.⁵ When we examine the way in which virtually all popular belief, even among the putatively uneducated, is hewn into either the empiricist, or the kindred, materialist form, we must find, that this issue of mathematics' influence on social theory, accounts for the characteristics of response of most of our citizens, as voters, and otherwise. This shapes those citizens' response to issues in virtually every area of public policy and individual behavior.⁶

Without understanding the way in which Galileo's pathetic tradition in mathematics has induced the unwitting adoption of blind

faith in such false, axiomatic mathematical assumptions, throughout the academic curriculum and popular opinion, it would be impossible to render any competent account of the history of the 20th century, in particular, or to produce com-



Bodleian Library

Thomas Hobbes is the common root of modern empiricist, mechanistic social theory. The inscription under this portrait reads, "Thomas Hobbes the famous Englishman, Tutor to his Serene Highness, the Prince of Wales."

2. The generic term is "hedonistic calculus."

3. For example, some quiddling victim of indoctrination in empiricism, might propose the correction of our text: that instead of, "All modern empiricist . . . versions of modern academic social theory, is derived . . .," the plural of the verb, "are derived," should be employed.

In defense of that critic, we concede, that a spokesman for the relevant, pathological standpoint in method, such as Aristotle, or the Ockhamite Aristotelianism known as "empiricism," would be inconsistent with his own deepest principle, if he neglected to demand that grammatical "correction." As Tennenbaum pointed out on an earlier occasion, that is the import of Aristotle's lunatic *Metaphysics*, a book which is essentially a maenad's rant against Plato's *Parmenides* dialogue.

4. Cf. H. Graham Lowry, *How the Nation Was Won* (Washington: Executive Intelligence Review, 1987), p. 50: quotation from Cotton Mather on the distressed state of the intellect and morals of the 1696 Massachusetts Bay Colony, after the capitulation to the "reforms" imposed by William of Orange: "There seems to be a shameful *Shrink*, in all sorts of men

among us, from that *Greatness*, and *Goodness*, which adorned our ancestors: We grow *Little* every way; *Little* in our Civil Matters, *Little* in our Military Matters, *Little* in our Ecclesiastical Matters; we dwindle away, to *Nothing*."

The present writer knew his grandparents, who were born during the 1860s, and had bare acquaintance with one great-grandparent, born a generation earlier. He knew, of course, his parents' generation, born at the end of the last century, and, also, his own generation of young veterans of World War II. He knew each of these four generations better, by knowing the literature and art which informed the opinion of relevant strata in each. He considers the "baby-boomer" generation, and its progeny, now entering adult occupations, in similar terms. Relative to the degree to which the American people have descended in cultural level over the course of these six generations, bridging the 1840s to the present, closing decade of the century, the *Little* Massachusetts citizens of 1696 were as intellectual and moral giants, relative to the level to which we have descended, as a people, over the course of the present century.



The title-page to Hobbes's *Philosophical Elements of Government and Civil Society*, depicting Liberty, Dominion, and Religion surrounding a portrait of Hobbes.

petent speculation on mankind's immediate future. Those pathological axiomatics, which the (mostly) unwitting citizen has adopted as principles of blind faith, act upon the citizen's will, to cause him or her to tend to ignore or to reject, as if instinctively, those options of policy and decision which are inconsistent with the empiricist's dogmas respecting causality.

Galileo's Sarpian axiomatics is analogous, thus, to a mass psychosis, which has created a virtual reality in the victim's mind. To the degree he or she is acting under that influence,

the victim refuses to acknowledge any evidence of the real world which is inconsistent with that virtual reality. In that sense, these often hidden axiomatic beliefs, are, thus, to modern society, as the goldfish bowl is to the typical populist among goldfish, who mistakes his bowl for the extent of his functional universe.

Today, the planetary society is poised at the brink of a threatened "New Dark Age."⁷ Unless that "New Dark Age" is prevented by choice of effective action now, this world will be plunged, very soon, into a general catastrophe, worse in intensity than that which struck Europe during the famous "New Dark Age," which depopulated Europe during the middle of the 14th century. We have been brought to the brink of such a threatened disaster, through the influence of those mostly hidden axiomatic assumptions which have lately shaped the decisions of policy-makers, and which have fostered tolerance for such foolish, official decisions, among most of the citizenry. Without examining, and inoculating our nation's policy-shaping processes against those axiomatic assumptions which have so guided us, decision by decision, to today's brink of disaster, we shall not be able to choose the decisions upon which survival depends. The relevant issues are the identifiable, axiomatic presumptions of "Newtonian social theory."

Since modern popular opinion is chiefly, directly or indirectly, a product of the "trickle-down" effects of classroom and textbook, it is the content of those textbooks and classroom dogmas, which is best searched for clues to the pathologies which have invaded the popular consensus.

Granted, some among the various symptoms of that pathology's impact upon modern university teaching in these fields, can be detected and exposed, as symptoms, without resort to those advanced topics in mathematics which lie within Tennenbaum's specialist's competence. However, one could never understand how the overall corruption of modern education "works," without reference to the seminal issues of mathematical physics.

These are the same issues expressed as the central feature of the savage, and fraudulent attacks upon Leibniz by the avowedly Newtonian agent of Venice, Leonhard Euler, and the perfervidly Newtonian asset of the same Venice-directed salon as Euler, the Aristotelian Immanuel Kant. Those frauds by Euler and Kant typify the same issues upon which Bernhard Riemann's epoch-making habilitation dissertation is focussed: Those are the issues at the center of the great fight within 19th century mathematics and mathematical physics, with Gaspard Monge, Legendre, Gauss, Weber, Riemann, Weierstrass, and Cantor, on one side, and Laplace, Grassmann, Kelvin, Clausius, Helmholtz, Maxwell, Kronecker, and Rayleigh, on the other.

Lyndon H. LaRouche, Jr., is a member of the scientific advisory board of 21st Century.

5. See Lyndon H. LaRouche, Jr., "Riemann Refutes Euler," *21st Century Science & Technology*, Winter 1995-1996. See also, Lyndon H. LaRouche, Jr., "Non-Newtonian Mathematics for Economists," *Executive Intelligence Review*, Aug. 11, 1995. On the formal proof against Euler, see the treatment of Nicholas of Cusa's conclusive proof, that π is a transcendental value, in Lyndon H. LaRouche, Jr., "On the Subject of Metaphor," *Fidelio*, Fall 1992.

6. Compare this with the present writer's thesis, on the subject of the pre-

sent crisis as "end of an epoch," as presented in the second part of his presidential campaign paper of Oct. 11, 1995, *The Blunder in U.S. National Security Policy*, and his Dec. 2, Eltville, Germany, address on the subject of "The End of An Epoch," published in the Jan. 1, 1996, edition of *EIR*.

7. See *Executive Intelligence Review*, Jan. 1, 1996, *passim* on the diagnosis of the present condition of the global IMF monetary-financial system, as "terminal."

PAOLO SARPI AND THE

Why Classroom Makes



Philip Ulanowsky

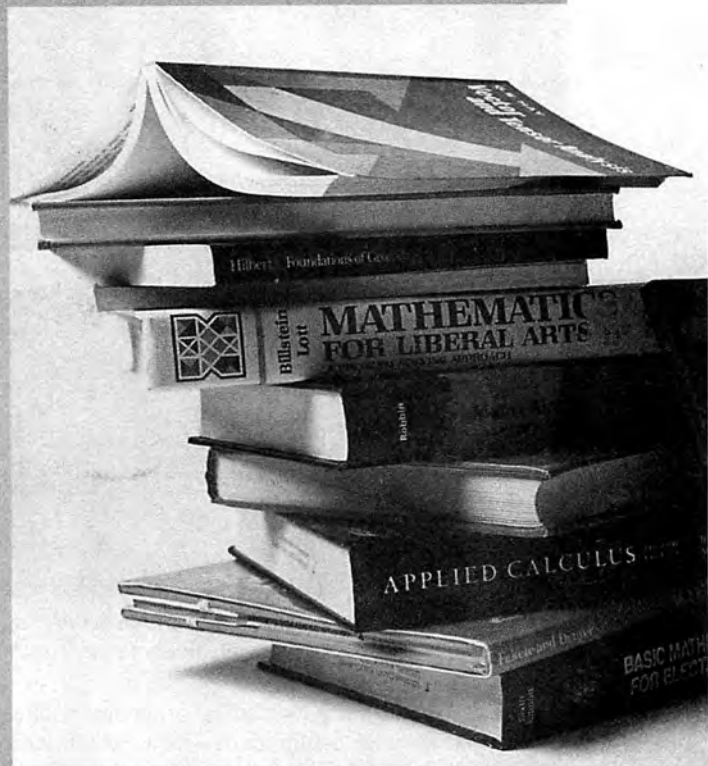
by Jonathan Tennenbaum, Ph.D.

There is an ancient Chinese saying, “Yu ren de li,” which could be translated as “The Fisherman’s Advantage.” The story behind it goes like this: Once a clam, lying on the sandy shore of the ocean, opened up its shell in order to bathe in the bright sun. Just at that moment a snipe—a bird with a long beak, as we often find in such places—came by and saw the clam open up. The bird immediately tried to peck at the clam’s soft flesh. But the clam quickly closed its shell, so that the bird’s beak was tightly caught. The bird tried to get free, but could not, and finally it said to the clam: “If you don’t open up, you will never get back to the water, and in two days you will dry up and die.” The clam replied: “Well, if I don’t let you free, you won’t be able to eat anything, and you will soon starve.” The clam and the bird kept arguing back and forth like that, until finally a fisherman, passing by, captured them both and ate them for dinner.

This little proverb, and thousands like it, remind us of something which Erasmus of Rotterdam pointed out 500 years ago: The greater part of human wisdom—at this stage of development, anyway—consists in understanding the causes of stupidity. Looking into the abyss of the greatest financial, economic, and social crisis in world history, the time is ripe to pose the question, to ourselves and others: Why have we been such fools? Why have we allowed this to happen to us, and to our children? And, looking back over the last 550 years, we should ask the broader question: What kinds of fools are we, when, after all this time, and given all the magnificent accomplishments of Renaissance science and culture, we have not succeeded in getting rid of the ancient, oligarchical parasite, which has now taken over the entire world financial system and is plunging us toward a near apocalypse of chaos and war?

FRAUD OF THE ENLIGHTENMENT

'Standard Mathematics' People Stupid



The 'lazy reason' of mathematics fools us into thinking that our structure of assumptions constitutes reality.

In answering that question, economist Lyndon LaRouche has pointed his finger at something which most people, certainly, would never imagine could be such a big problem: mathematics—more precisely, “standard classroom mathematics,” of the sort commonly taught in secondary schools and universities.¹ This includes the things commonly called high school and college algebra, analytical geometry, and calculus, things that are considered the basis for the teaching of physics and the other so-called exact sciences. LaRouche says we should look there, if we want to discover, in concentrated form, the conceptual origins of the mass stupidity afflicting our world civilization today.

I should add, to avoid a possible misunderstanding: The problem we are talking about, runs far deeper than the decline of education, which has occurred in the Western countries in the recent decades. The Soviet Union, for example, was even

more deeply afflicted with this problem than many Western countries, in spite of the fact that Soviet scientific education was maintained at a higher overall level in terms of technical proficiency. The malady LaRouche points to goes back at least 400 years, to the days of the Venetian mathematician and political mastermind Paolo Sarpi. It has grown generally worse over the last 200 years, following the successful efforts, by Leonhard Euler and others, to suppress Wilhelm Gottfried Leibniz’s influence on scientific education.

So, what is this terrible problem with ordinary classroom mathematics? In order to make the issue as clear as possible, I want to preface my discussion of mathematics by the following observation:

Considering human mental activity, it is possible to distinguish between two very different modes of thinking. In the first mode, which is by far the most common, our judgments con-



The Bodleian Library



Paolo Sarpi (1551-1623), the Venetian mastermind of cultural warfare, who was Galileo's chief patron and collaborator. Sarpi and Galileo popularized a formal, algebraic approach to knowledge, in opposition to Kepler's method of creative reason.

cerning the world are governed by a certain, relatively fixed set of basic ideas or assumptions—ideas which we consider self-evident, and which we use as a kind of measuring-rod for what we judge to be the "reality" or "truth" of any other thoughts or propositions.

I will call this first mode *lazy reason*, using an expression of Leibniz. The obvious difficulty with this first mode of thinking is, that our judgments will only be as good as the set of ideas that we use as our criterion or measuring-rod: any error or fallacy in those ideas will tend to have wide-ranging, devastating effects on the validity of our judgments. In other words, we really only judge "consistency" in this mode, and not truth. We do not have any way, in this mode, to judge whether or not the basic assumptions of our thinking correspond to reality or not; we cannot measure the measuring-rod! We might easily find ourselves in the predicament of a pure mathematician, who is able to imagine all kinds of possible universes, and to reason brilliantly about them, but finds himself unable to judge which of them he is actually living in.

The second mode of thinking, which I shall call *Socratic reason*, is unfortunately a rather rare occurrence in our times. It is characterized by an attitude that Nicholas of Cusa called "Docta Ignorantia" or "Learned Ignorance," which is to consider that our thinking, and especially those basic ideas which seem the most "obvious" and self-evident to us, *always* contain something incomplete, imaginary, or even absurd—and that to successively discover and remedy such imperfections of

reason, is the essence of truth insofar as it is knowable to us, and the source of increase in the power of Man to command the forces of Nature. To perfect human reason in a sustained manner, is the whole business of physical economy. The ability to discover and to successively overcome the imperfections of reason is a function of our—Man's—self-conscious *participation* in the further development of the Universe. In that way, we make the relationship between our own thinking processes, and the organization of the Universe as a whole, into an object of conscious reflection.

If we compare "lazy reason" to measurement with a fixed measuring-rod, then from that standpoint the most striking characteristic of Socratic reason is that it seems to constantly change its measuring-rod. Actually, Socratic reason is associated with a completely different conception of *measure*. Socratic reason, identified in this way, is not at all so simple and straightforward as "lazy reason." Most of us, having, let us say, at least a strong habit of "lazy reason," tend to feel uncomfortable even at the thought of this second mode; it seems so paradoxical, "unsafe," "messy," and certain to cause trouble. This is why the term "lazy reason" is very appropriate. The common characteristic of "lazy reason" is to try to find a region, a comfortable little niche, where the real universe will not disturb the "private," personal universe existing in our imagination. Let me give you some examples.

Take first a very common type of person all of us know. This person loves to complain about the terrible situation in the

DISCORSI
E
DIMOSTRAZIONI
MATEMATICHE,
intorno à due nuove scienze

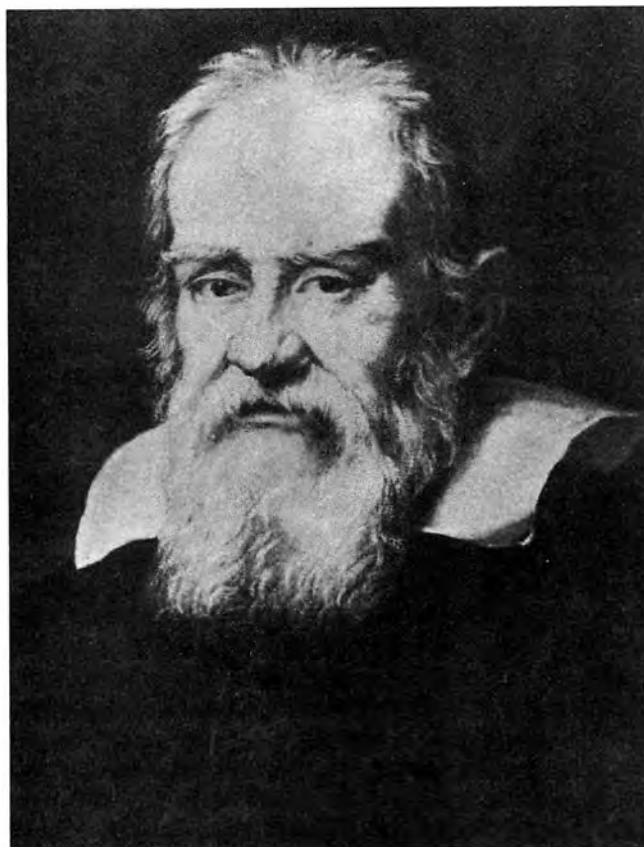
Attenenti alla
MECANICA & i MOVIMENTI LOCALI;

del Signor
GALILEO GALILEI LINCEO,
Filosofo e Matematico primario del Serenissimo
Grand Duca di Toscana.

Con una Appendice del centro di gravità d'alcuni Solidi.



IN LEIDA,
Appresso gli Elsevirii. M. D. C. XXXVIII.



Galileo Galilei (1564-1642), promoted by Sarpi as a demigod of science, put forward a view of the world in which the natural state of material bodies is uniform motion in an infinite straight line; no areas of ambiguity—creative mentation—are allowed.

world, in his country, and so forth; but when it is suggested that he try to do something to *change* it, he immediately shakes his head and says, "I am too small, nothing I can do could make a difference." If we challenge such a person, and ask him how he *knows* what he just said, he usually has great difficulty giving a coherent answer. In nearly every case, that person has never seriously tried to *discover* what he could do. Instead, he has adopted as a supposedly self-evident "Law of the Universe," the absurd assumption, that his own actions cannot possibly have any significant effect on the future course of history.

There is another typical case, which seems to be the opposite, but is fundamentally the same problem: the politician or political activist who says, "Don't bother me with history. I am a practical man." Or the physicist, who specializes in some exotic sort of elementary particle, declaring, "It doesn't matter to me whether or not this particle exists; I am only interested in its properties."

Now, I suggest to you, that it is the habit of "lazy reason" which makes us into fools, or at least potential fools. It is exactly those cozy, comfortable areas, where "lazy reason" likes to vacation under the shade of supposedly self-evident assumptions, which constitute the most dangerous blind spots in our thinking. Whoever has knowledge of those blind spots, can manipulate people easily. Here is where the Venetian masters of intelligence, and their modern students, practice their special form of "magic." As every magician knows: The illusion is nowhere, but in the minds of the deceived.

Space and Time

This brings me to my main topic, "standard classroom mathematics," which could be called the School of Lazy Reason par Excellence. Some people, I am sure, will object strongly to what I am going to say, claiming that algebra, calculus, and so forth are just useful technical tools, and attacking them would be like attacking hammers, nails, and screwdrivers, just because somebody might misuse them. Furthermore, these people will slyly point out, that even people whom LaRouche and this speaker highly praise, such as Leibniz, for example, are known to use algebra, the calculus, and so forth—in fact, Leibniz invented the calculus.

To that I would reply that there does not exist an isolated, purely neutral, purely technical subject-matter for the human mind. The human mind actually is incapable—fortunately!—of receiving "pure information," in the way a computer does. Whether we are aware of it or not, everything we learn, in school or elsewhere, is connected with a *way of thinking about the world*. And it is a fact, which can be easily verified, that Leibniz's conception of mathematics is completely different from, and sharply opposed to, that which is conveyed in 99.99 percent of "standard classroom mathematics" teaching anywhere in the world today. I hope to make this more clear as I proceed.

Now, according to the available evidence, the original architect of today's "standard classroom mathematics," in terms of its *conceptual content*, was a Venetian monk named Paolo



NEWTON'S PRINCIPIA.
THE
MATHEMATICAL PRINCIPLES
OF
NATURAL PHILOSOPHY,

BY SIR ISAAC NEWTON;

TRANSLATED INTO ENGLISH BY ANDREW MOTTE.

TO WHICH IS ADDED

NEWTON'S SYSTEM OF THE WORLD;

With a Portrait taken from the Bust in the Royal Observatory at Greenwich.

FIRST AMERICAN EDITION, CAREFULLY REVISED AND CORRECTED,

WITH A LIFE OF THE AUTHOR, BY N. V. CHITTENDEN, M. A., &c.

NEW-YORK:
PUBLISHED BY DANIEL ADEE, 107 FULTON-STREET.
1848.

Isaac Newton (1642-1727) imposed on science a world of little hard balls bumping into each other in absolute time and space and knowable only via sense perceptions—quite a hypothesis for someone who claimed not to make any. This romanticized portrait of Newton adorned the first American edition of his Principia, published in 1848.

Sarpi, who lived from 1551 to 1623. Sarpi was a kind of universal scholar, as well as being one of the chief masterminds of Venice's political intelligence operations. As one of a small handful of persons, he had full access to the secret archives of the Council of Ten, the highest ruling organ of Venice, and he could use the entire foreign intelligence apparatus for his operations. Sarpi is honored as one of the founding fathers of the *Giovani* faction ("The Young Ones") of Venice, the faction that organized the shift of the center of oligarchical operations from the militarily vulnerable Venice up to England and Holland. According to the analysis of our colleagues, Sarpi was a key figure in manipulating both Protestants and Catholics into the conflicts which led to the Thirty Years' War.

It appears that Sarpi was personally selected and trained for his leading role, from an early age. While quite young, he astonished people with his knowledge of mathematics, history, and oriental languages, and his extraordinary memory. He graduated later as doctor of theology from the Venetian-controlled University of Padua, the famous training-ground of Aristotelian method, which attracted the children of the elites from throughout Europe.

Paolo Sarpi's most well-known influence on the development of science—although not the only one—is connected with the fact that Sarpi was the main sponsor and closest collaborator of the famous Galileo Galilei, often hailed as the forerunner of

Newton and the founder of the experimental method of modern science. Whatever Galileo's own abilities may have been, I think it is fair to say, that Sarpi was largely responsible for the conceptual content and main thrust of Galileo's work, and for building up Galileo's reputation all over Europe, against Kepler—just as the Venetian-controlled salons throughout Europe later continued Sarpi's policy, by building up Newton as a kind of demi-God. Galileo himself called Sarpi his "father and teacher," and said that Sarpi had the greatest knowledge of mathematics of anyone in Europe at that time.

Actually, I have found no indication that Sarpi made any significant original contribution to mathematics per se. What Sarpi did do, with the help of Galileo and others, was to launch a kind of "methodological Trojan horse," designed to destroy the scientific and technological revolution of the Renaissance, from the inside. And a certain type of mathematical thinking was crucial to this.

According to various accounts, Sarpi devoted much energy, even as a young man, to studying the work of a French mathematician named François Viète or Vieta (1540-1603). Viète is known today as one of the pioneers of so-called analytical geometry, one of the first to apply *algebra* in a systematic way to the solution of geometrical problems. It appears that Viète also developed a conception of a purely formal, "abstract" algebra—in which the letters or symbols used to form equations

can represent figures, shapes, objects, or any arbitrary things, and not only numbers or lengths. Now, why was Paolo Sarpi, mastermind of Venetian intelligence, interested in that?

The Worldview of 'Standard Mathematics'

In order to make a good guess about that, I think the best approach is to jump a bit ahead and look at the kind of mathematical worldview which was actually popularized by the work of Galileo and Newton. I invite those of you who have been subjected to "standard classroom mathematics"—I suppose that is nearly everybody—to judge, whether or not the following is an accurate characterization of the *way of thinking about the world*, underlying what you were taught.

First, there is the idea, that the world is divided into two completely separate domains: on the one side there is a "subjective" domain of thoughts, feelings, and so forth "inside" us; and on the other, there is a so-called "objective" domain of things outside us—a domain which is supposed to exist independently of our mental activity. The connection between the two is provided by sense perception. From the standpoint of the "objective" world, apparently, we ourselves are just tiny, basically insignificant objects included in the vast immensity of this "objective domain." *Truth* is supposed to consist in a kind of *agreement* between certain combinations of thoughts and ideas which we form "inside" us, and the objective world "as it really is"—the "real facts" as they are called, as if stored in some hidden register.

The main general feature of the "objective" domain is called *space*. Space is thought to be the all-encompassing object which contains all other objects in the objective domain. The essential property of space is the apparently unlimited possibility of perfectly continuous extension or motion in any combination of three independent directions: up and down, left and right, backward and forward. So we have an idea of "pure," homogeneous, empty three-dimensional space, in which various sorts of objects are moving around—people, dogs and cats, atoms and molecules, trees and houses, Earth, planets and stars, and so forth.

Furthermore, in this way of thinking, space is fixed and unchangeable, and *completely independent* of the objects and events occurring within it. Space just "is," it doesn't do anything, doesn't react to anything, and doesn't have to pay rent, gas, or electricity. It is in an eternal state of "Nirvana." This notion of "pure," empty space is typical of the peculiar, strangely *oriental* quality of the "pure mathematical" concepts that Newton insisted upon in his famous *Principia Mathematica Philosophiae Naturalis* (Mathematical Principles of Natural Philosophy) of 1687, and in his later work *Opticks*.² (We shall later see the devastating criticisms which Leibniz raised against them. But, let me go on a bit.)

Space, we are taught, is completely homogeneous and infinitely divisible. The minimum parts or atoms of space are called points, which have no extension or features of any

kind, except to "be somewhere" in space. Otherwise any two points are *absolutely identical*. The extension of a point gives us a line. Lines are infinitely thin and totally smooth. We can divide a line into as many parts as we wish, without encountering any features which could distinguish one part of a line from another.

The "pure mathematical" concept of the *point* is a kind of model for a more general notion of *elementary discreteness*—the idea, that each object in space has its own, separate existence. In this mode of thinking, it seems obvious to us that the only natural cause of things happening in the Universe, is that the various objects are acting on each other, by bumping into each other or some other kind of influence. So, action always has the form of some object acting upon one or more other objects. This, of course, tends to lead to Newton's famous hypothesis that matter consists of absolutely hard little balls floating around in empty space.

If you think about it, however, the competing theory of a perfectly elastic ether, completely filling space everywhere, involves a very similar quality of ideas. The common feature of this sort of thinking is what we might call the doctrine of *percussive, kinematic causality*: the idea that events in the Universe occur as the result of endless chains of "cause and effect," like a row of dominoes, in which each falling domino causes the next one to fall. From this standpoint, it appears self-evident to us that cause proceeds uniquely from the past to the present.

Now, besides space and the discrete objects in it, we have *time* and *motion*. The basic notions of these things, as conveyed in mathematics and physics classrooms, are still essentially in accordance

with the original specification that Newton made in a famous *scholium* (commentary) in his *Principia*. According to Newton, we are to consider as fundamental only what he calls "absolute, true, mathematical time, which flows uniformly in and of itself, by its nature without relation to anything exterior, and is called duration." In other words, a time "purified," so to speak, of all change—a rather strange sort of conception, if you think about it.

Closely connected with this is the seemingly self-evident idea of *perfectly smooth, continuous motion*. So we have, for example, Galileo's notion that the "natural" form of motion of material bodies—when they are not rudely disturbed by other bodies—is uniform motion in a perfect, infinitely long, straight line. Newton generalized this to a picture, in which the natural, straight-line motion of a body—apart from occasional, direct collisions with other bodies—is continuously deflected by the "forces" associated with other bodies acting at a distance. But the key to this notion of continuous motion is that there are no distinguishable, individual events. We could call this "blurred change," *change without events*, or in other words "linearity in the small."

Now the stage is set to introduce the grand *organum* of for-

"That which does not follow from the phenomena, should be called a hypothesis, and hypotheses—whether metaphysical, physical, whether they involve hidden properties or are mechanical—have no place in experimental physics. In this physics propositions are derived from the phenomena and generalized by induction." —Isaac Newton

mal mathematical analysis, which makes up much of the subject matter of “standard classroom mathematics.” Indeed, by imposing “pure space” and similar sorts of notions, we have already reduced the image of reality to a kind of pure algebraic form. So we are taught to begin by setting up the famous “Cartesian coordinate system” of x, y, z axes, to represent points by coordinates, and to represent lines and various curves by equations involving those coordinates, and so forth.

Most of you have more or less suffered through this sort of process, and I don’t need to remind you of it too much here. But I want to point out something rather curious, which we find in Sarpi himself and in his followers along the line of Galileo-Descartes-Newton-Euler: It is a seeming obsession, going into fanaticism, with the idea of creating a *perfect mathematical world* in which, so to speak, there is no “dirt” left in the Universe, no trace of the areas of ambiguity (singularities) inseparably connected with creative, Socratic thinking. Reality must be like a Venetian masked ball of interchangeable, faceless figures dancing on an absolutely clean floor. We see exactly the same thing in the work of John von Neumann on mathematical logic, game theory, and economics, and in radical positivism generally. Instead of being a mere tool, a “useful fiction” as Leibniz called it, algebra is transformed into a form of cult worship.

‘Hypotheses Non Fingo’

Now, it is on the basis of the concepts just sketched, that Newton, in his famous *Mathematical Principles of Natural Philosophy*, proclaimed a kind of universal, objective method to discover the laws of the Universe. Newton wrote:

A rational mechanics is the science of the motion, that is caused by any given forces, and the science of the forces, which are required to produce any given motion, a science, which is precisely developed and proven. . . . And therefore I present this work of mine as the mathematical principles of natural philosophy, in which everything seems to depend upon the following, namely to determine the forces from the motions, and from those forces then to derive all the other phenomena. . . .

That which does not follow from the phenomena, should be called a hypothesis, and hypotheses—whether metaphysical, physical, whether they involve hidden properties or are mechanical—have no place in experimental physics. In this physics propositions are derived from the phenomena and generalized by induction.

Here we have the famous “Hypotheses non fingo” (I do not make hypotheses) of Newton. Think about this for a moment. There is something very strange going on here. Newton claims, that he has derived, deduced, his physics *from the phenomena only*. But remember what we have just gone through: the notion of empty, purely homogeneous, infinitely divisible space,

elementary discreteness, simple continuity, kinematic causality, and so forth. *What are all these, if they are not hypotheses?* And yet, here is Newton saying, “I don’t make hypotheses”; everything is “derived” from the observed phenomena!

Here we have the traces of a magician’s sleight of hand: As long as we accept Newton’s mathematics as self-evident, we imagine his results are rigorously, “objectively” derived. But once we free ourselves from the illusion of the “self-evidence” of his mathematics, we see that, in fact, it is something *imagined*. We realize that we were fooled into a Buddhist-like trance, into virtual reality.

It was Gottfried Leibniz, echoing the future words of Bernhard Riemann 150 years later, who blew the whistle on the fraud of Newton’s *Mathematical Principles*. In his famous correspondence with Newton’s friend, Samuel Clarke, Leibniz wrote:³

“In order to go from mathematics to physics, another principle is necessary . . . namely the principle of sufficient reason: that nothing happens, for which there does not exist a reason, why it happens one way, and not another.” —Gottfried Leibniz

The great foundation of mathematics is the principle of contradiction or identity, which is the theorem, that one and the same statement cannot be simultaneously true and false. . . . But in order to go from mathematics to physics, another principle is

necessary . . . namely the principle of sufficient reason: that nothing happens, for which there does not exist a reason, why it happens one way, and not another.

I have repeatedly emphasized, that I consider space, just like time, as something purely relative . . . space is nothing but an ordering of existence of things, insofar as they are considered as simultaneous. . . . [The notions of absolute, empty space] are the fantasies of philosophers, who are stuck in incomplete concepts and who make an absolute reality out of space. The simple mathematician, who is satisfied with a mere play of imagination, might create such concepts, but they are destroyed by higher reasons.

What is Leibniz trying to tell us? The actual Universe is *activity, change*; it is *universal history*, it is the universal ordering of *singularities*—individual, unrepeatable events of transformation of the Universe. Activity, change is *everywhere dense*; the notion that there are some “smooth” areas or gaps where no events take place, is nothing but the result of our own naive imagination, of “lazy reason.”

Let us go now a step further to get a deeper understanding of what is going on here, where we can see the hand of Paolo Sarpi at work. I do not have Sarpi’s famous *Arte de ben pensari* (Art of Good Thinking) at hand to do this, but rather something which, according to the accounts of the Venetian commentators themselves, is essentially the same: *An Essay Concerning Human Understanding*, written by Newton’s supporter John Locke in 1690.⁴ The famous German historian Leopold von Ranke reports that Locke took crucial parts of his work directly from Sarpi’s *Arte*, which Locke examined while on a trip to Venice.

Locke writes:

The souls of the newly born are empty tablets, only afterwards filled in by observation and reasoning. . . .

When does a man begin to have any Ideas? I think the true Answer is, When he first has any Sensation. For since there appear not to be any Ideas in the Mind, before the Senses have conveyed any in. . . . T'is about these Impressions made on our Senses by outward Objects, that the Mind seems first to employ itself in such Operations which we call, perception, remembering, consideration, reasoning, etc. In time, the Mind comes to reflect on its own operations, about the Ideas got by the senses, and thereby stores itself with a new set of Ideas, which I call Ideas of reflection.

The simple Ideas, the Materials of all our Knowledge, are suggested and furnished to the Mind only by those two Ways above-mentioned, . . . When the Understanding is once stored with these simple Ideas, it has the Power to repeat, compare, and unite them, even to an almost infinite Variety, and can make at Pleasure new complex Ideas. But it is not in the Power of the most exalted Wit or enlarged Understanding, by any Quickness or Variety of Thoughts, *to invent or frame one new simple idea in the mind*, not taken in by the Ways before mentioned. . . . [emphasis added]

Now it should be very clear what is the "One behind the Many" of the whole Sarpi-Galileo-Newton-Locke operation (or, it would nearly be more accurate to say, the "Zero behind the Many"). For, Locke is saying, very clearly and forcefully, that human creative mentation does not exist, that there is no such thing as a valid creative discovery. That is the inner essence of the whole operation. Locke claims there is no such thing as the *generation of an idea*. All the human mind can do, he claims, is to carry out algebra-like operations with the so-called simple ideas, ideas which have the quality of Newton's little "hard balls" of naive imagination. A kind of cartoon of "lazy reason."

Well, is it true, what Locke says? Is it true that the human mind cannot generate fundamentally new ideas? Let us look at an example that Lyndon LaRouche has been using recently: How Eratosthenes measured the curvature of the Earth, more than 20 centuries before anyone actually saw that curvature with his own eyes.⁵ Where did Eratosthenes get his hypothesis, his initial idea to do the measurement? A hypothesis *contrary* to what his own sense perception seemed to tell him! In fact, Eratosthenes (and his predecessors, who anticipated the same hypothesis) violated the commonplace "algebra" of thinking; he exploded the seemingly self-evident simple idea of a flat Earth. This, LaRouche emphasizes, is the form of every fundamental discovery, of which there have been many, in the history of science. By its very nature, I should add, a discovery of this sort can only be communicated by metaphor. Whatever "fits" into the literal, algebraic language of the existing system, is consistent with its so-called simple assumptions, and therefore is not a discovery at all.

But perhaps the most illuminating demonstration of the fallacy of Locke and Sarpi, is contained in the creative process of



Gottfried Leibniz (1646-1716), in the tradition of the Renaissance, opposed the acausal Newtonian universe and fought for the principle of Socratic reason, where the actual Universe is one of change, a universal ordering of singularities.

composition of classical poetry and music. Once we have acquired and nurtured that great gift of culture, we can experience this process (or re-experience it in the form of inspired performance) whenever we want. Among other things we can observe, that the process of composition typically begins with a "something" which initially has no notes or words or even what most people would consider a specific thought; yet it is very specific, it is a specific quality of tension, an impulse to create, a metaphor searching for its metaphor; it is the very beginning of *remembering* something which you are going to experience for the first time in the future! Was the composition there all along? Yes and no. *You* changed! How do you distinguish between the creative tension of a *valid* conception, in the process of coming into being (or being recreated in performance), and a mere chimera, a wishful self-delusion, an empty effect? All of these sorts of issues are immediate, empirical realities of the process of composition or performance. Yet, none of this exists for John Locke. Locke does not understand that ideas are transfinite.

That is the key to beginning to discover the *real* calculus of Leibniz, as opposed to the castrated formal parody taught even in the better classrooms of today. One must understand what Leibniz meant when he said, concerning Descartes, exactly what we have concluded about Locke:

[Descartes] is very far from having penetrated into the analysis and art of discovery, and I could not help laughing, when I saw that he thinks algebra is the first and most sublime of the sciences, that truth is nothing but a relationship of equality and inequality.

The Chronic Failure of 'Standard Classroom Mathematics'

Now, after we have revealed the fraud of Newton's *Hypotheses non fingo*, and the algebraic fantasies of Sarpi, Locke, and others, someone is surely going to say: "Well, that may all be true. But, after all, Newton's physics *worked*, didn't it? Wasn't it a practical success?"

But, I say to you, no, the impression that Newton's physics was successful is an illusion, a myth, which was created to impress naive students and others who are taught to think about science in a superficial, purely formalistic way—as if science were a schoolboy game of "getting the right answer" to please the teacher.

For example, contrary to popular illusions, Newton *did not, and could not* derive the orbits of the planets from his theory. All he did was to develop a kind of algebraic inversion of Kepler's original discoveries, in order to derive a form of physics acceptable to the assumption of "kinematic causality." In this way, Newton arrives at a mathematical procedure for extrapolating the motion of planets *when their positions are already given*—a procedure, however, which leads into the nightmarish mathematical difficulties commonly referred to as the "three body problem." The only "right answer" of significance which Newton gets—while ignoring the difficulty posed by the three-body problem—is what Kepler had already provided: the motion of each planet in an (approximately) elliptical orbit with focus at the Sun.

It is not true that Newton successfully "corrected" Kepler, by applying the idea of universal gravitation to conclude that the motion of each planet is "perturbed" by the influence of the other planets. The concept of universal gravitation was clearly stated by Kepler long before Newton, and the issue of so-called perturbations of the planetary orbits was in fact the central subject of Kepler's famous 1619 book, *Harmonices Mundi* (The Harmonies of the World). However, Kepler's method rejects the Galileo-Newton concept of kinematic causality, the idea that planetary motions are governed by pairwise interactions between the planets. For Kepler, gravitation is a mere *effect*, a mere phenomenon, not a cause. Cause does not proceed mechanically, from the past into the present. Cause is to be found in the "isochronic" ordering of Platonic ideas.

This is exactly what we demonstrated earlier in refuting Sarpi and John Locke. But, as we have witnessed ourselves,

present-day physics professors are often so brainwashed in "standard classroom mathematics," that they are virtually incapable of understanding anything about Kepler's method. They can't understand that Kepler's reference to musical composition, in his analysis of the solar system, is absolutely rigorous and *necessary*. The image that Kepler concerned himself with extravagant fantasies or irrational, mystical speculation is complete nonsense. When we break through all the mythology and brainwashing, and actually begin to understand Kepler, then we see that with his playful, humorous approach he was at the same time an awesomely rigorous scientific thinker. The unfortunate Newton, however, was living in a fantasy world of virtual reality.

Now, if we look at the history, we find that the actual progress of physical science was constantly at war with the methods promoted by Sarpi, Newton, et al. Every significant

further discovery was made *against* Newton's mathematical method. The great revolution begun by Roemer, Huygens, Bernoulli, Leibniz, and others, centered around the propagation of light, which led into the revolution of electricity—Benjamin Franklin's *schoene Goetterfunken* (beautiful Godly sparks)—already joyously announced the demise of Newton's sterile, boring form of classroom physics.

How, then, was the illusion created, that Newton's mathematical physics laid the basis for the whole subsequent development? A very simple technique was used, similar to the "crisis management" of those who are trying to save the totally bankrupt financial system today. Looking at the history, on the one side, you have breathtaking, revolutionary discoveries, coming one after the other, each made by methods directly opposed to the whole framework of Newtonian mathematics.

But after each such major revolution, you find teams of skillful mathematicians, deployed to modify the existing formal schema in order to take account of the empirical results of the new discovery, while completely eradicating the idea of the discovery. As Newton tried to bury Kepler, so Maxwell worked to bury the revolutionary work of Ampère, Gauss, Weber, and Riemann; so also Niels Bohr and others worked to bury the revolutionary discovery of Max Planck.

This is how we got our standard textbook science, whose essential conceptual feature is to deny singularities, to deny the existence of Socratic reason. This is just like our mass media, which, each time another gigantic piece of the financial system collapses, keep repeating: nothing happened, nothing happened!

It remained for Bernhard Riemann, in a sense, to deliver the last, devastating blow to Newton's "standard classroom mathematics," and lead the way back to the domain of Socratic reason. LaRouche has developed this very beautifully in recent ar-



Chris Lewis

Tennenbaum: "The laws of the Universe are destroying Sarpi's life work right now."

ticles, so I will only remind you of that with a short quote from Riemann's famous habilitation dissertation of 1854:⁶

It is known, that geometry presupposes both the conception of space, and the first principles for construction in space, as something given. . . . The relation of these presuppositions remains in darkness; one has insight neither, if and how far their connection is necessary, nor, a priori, if they are possible. From Euclid to Legendre, to name the most famous of recent workers in geometry, this darkness has been lifted neither by the mathematicians, nor by the philosophers who have concerned themselves with it. . . . A necessary consequence of [my work in this paper] is that the principles of geometry cannot be derived from general notions of magnitude, but rather that the properties, by which space is distinguished from other thinkable three-fold extended magnitudes, can be gathered only from experience. . . . [and, Riemann concludes] this leads us to the domain of another science, into the realm of physics, which the nature of today's occasion [that is, mathematics] does not permit us to enter.

So, physics is in the domain of creative reason. Physics rules mathematics, not the other way around. It is physics which unfolds a succession of mathematical "geometries," as *useful fictions*. But however indispensable, mathematics as such, as the form of "lazy reason," cannot know reality. And, as Riemann emphasizes in his posthumous writings, the "experience" from which our knowledge of the Universe is derived, is not simple sense perception.⁷ It is the higher form of experience, which Locke does not know, which Sarpi wanted to stamp out of existence: the illumination of the human race's shared *experience* of its own process of creative discovery in increasing our mastery of the Universe—what Riemann once referred to as "the poetry of hypothesis."

Why is the Sarpi-Galileo-Newton "standard mathematics" still dominating the thinking of students and scientists even though it has been nothing but a dead corpse for a very long time? The answer is, the corrupting power of the oligarchy. That leads me to my final point.

The End of the Enlightenment

Let's go back to the Venice of Paolo Sarpi, a Venice which is in all-out war against the emergence of the sovereign nation-state, as launched by the Renaissance. How would the Venetians of Sarpi's sort, think?

The Renaissance is a great revival of confidence in the perfectibility of the individual human mind, in its creative powers to act in "imago viva dei" (the living image of God). The nation-state of the Renaissance is based on a new phenomenon: an educated citizenry, educated to think and to participate in a broad way in scientific and cultural progress. This is far too powerful an idea to be destroyed from the outside. You must destroy it from the *inside*, by corrupting the citizens. And the most effective way to do that is to start by corrupting the *thinking* process of scientists, the institutions of scientific progress.

The key to destroying the creative powers of the mind, in the millennia-long tradition of the oligarchy, has always been Aristotelianism. But you cannot use Aristotle openly, dogmatically. You have to sneak him in through the back door, as an anti-

authoritarian, as a radical democrat. A new, "lean and mean" Aristotle, as leader and priest of a new "Liberation Movement" called the Enlightenment—supposed liberation from "religious dogma," from "Absolutism," from "old-fashioned moral values" and so on, all the way to Newt Gingrich's liberation from the "oppression" of the U.S. Constitution. Teach people to hate the notion of the "common good," which can only be defined from the standpoint of Socratic reason. Degrade society into an algebra of soulless particles, each impelled by Lockean impulses of self-evident pleasure and pain.

Essentially, you corrupt scientists and citizens by glorifying their weakness, by teaching them to take the easy way, to trust in "lazy reason." Let people be ruled by their own foolishness. Let them think their weakness is their strength! Teach people to repeat "hypotheses non fingo," to believe that sense perception is the origin of knowledge. Build up a myth of Galileo as a martyr against the so-called Tyranny of Reason, and use Venice's Aristotelian assets in the Church to play both sides at once. Make a revolutionary slogan out of Galileo's insistence: "Don't tell me how the Universe is organized! I saw it with my own eyes, through my telescope." Let this rallying cry be echoed, by the foolish citizens of dying nations, who say, "Don't tell me what is going on in the world, I watch television every night!" Enforce that corruption, by silencing anyone who dares to raise his voice against the magical delusion of "objective science."

But, that is all over with now. As the financial empire of the oligarchy comes tumbling down, the Enlightenment is now suffering the fate of every evil thing.

We come to the close. The laws of the Universe are destroying Sarpi's life work right now. That is the reality which, thanks to LaRouche's discoveries in the science of *physical economy*, we are able to understand more profoundly, more efficiently than ever before. And so we are here today, to proclaim a new renaissance, to bring back Socratic reason, and to declare:

The triumph of an evil idea is its downfall. But the Good lives on forever!

Jonathan Tennenbaum directs the Fusion Energy Foundation in Europe. This article is adapted from his speech to the Schiller Institute conference in December 1995 in Eltville, Germany.

Notes

1. See the accompanying article by LaRouche, "How Hobbes's Mathematics Misshaped Modern History," p. 21.
2. *Sir Isaac Newton's Mathematical Principles of Natural Philosophy and His System of the World*, the Andrew Motte translation revised by Florian Cajori (Berkeley: University of California Press, 1946), and his *Opticks* (New York: Dover Publications, 1952).
3. The Leibniz-Clarke correspondence appears as "The Controversy between Leibniz and Clarke, 1715-16," in Gottfried Wilhelm Leibniz, *Philosophical Papers and Letters*, Vol. 2, edited by Leroy E. Loenker. Second edition (Boston: Kluwer Academic Publishers, 1969), pp. 675-721.
4. Locke's *An Essay Concerning Human Understanding*, in *The Great Books Series* (Chicago: University of Chicago Press), Vol. 35, p. 85.
5. See "How Eratosthenes Measured the Unseen," Figure 2 in Lyndon H. LaRouche, "Kenneth Arrow Runs Out of Ideas, But Not Words," *21st Century*, Fall 1995, p. 42.
6. Lyndon H. LaRouche, "Riemann Refutes Euler," *21st Century*, Winter 1995-1996, pp. 36-49, and Bernhard Riemann, "On the Hypotheses Which Lie at the Foundations of Geometry," in *A Source Book in Mathematics*, edited by David E. Smith (New York: Dover Publications, 1959), pp. 411-425.
7. Bernhard Riemann, "Philosophical Fragments," *21st Century*, Winter 1995-1996, pp. 50-62.

BEN FRANKLIN

Booksellers & Record Shop



- Kepler**, by Max Caspar. Definitive biography long out of print. Dover, \$11.95
- Beginner's Guide To The Sun**, by Peter Taylor and Nancy Hendrickson. Excellent introduction to solar & solar wind research. Kalmbach, \$19.95
- Tirion's Bright Star Atlas 2000**. Willmann-Bell, \$9.95
- Cloak of Green**, by Elaine Dewar. Links between the Greens, government, and big business. Lorimer, \$22.95
- Battling Wall Street—The Kennedy Presidency**, by Donald Gibson. A book every anti-Green should read. Environmentalism in context. Sheridan Sq. paperback, \$16.95
- Walking on the Edge—How I Infiltrated Earth First!** by Barry Clausen. Exposes FBI collusion with EF! crimes. Merril Press, \$15.95
- Saviors of the Earth?—The Politics and Religion of the Environmental Movement**, by Michael S. Coffman. Northfield, \$12.99
- 3-D Geometric Origami—Modular Polyhedra**, by Rona Gurkewitz and Bennett Arnstein. Dover, \$6.95

Ben Franklin Booksellers
 107 South King Street
 Leesburg, Virginia 22075
 Phone (703) 777-3661
 Toll free (800) 453-4108
 Fax (703) 777-8287

Type of credit card (circle one):
 MasterCard Visa Discover AmEx

Credit card # _____
 Exp. date _____

Name _____
 Address _____

City _____
 State _____ Zip _____

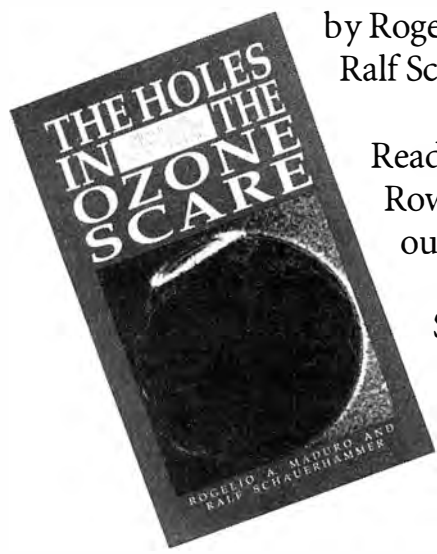
Home phone _____
 Business phone _____

For shipping, add \$3.50 for first book and \$.50 for each additional book. For Canada add \$7 and \$1.30.

Total book price \$ _____
 Plus shipping \$ _____
 V.a. residents add 4.5% sales tax \$ _____
 Total enclosed \$ _____

THE HOLES IN THE OZONE SCARE

THE SCIENTIFIC EVIDENCE THAT THE SKY ISN'T FALLING



by Rogelio A. Maduro and Ralf Schauerhammer

Read the book that ozone depletion theorist Sherwood Rowland called "the leading source of opposition to our work."

Send checks or money orders (U.S. currency only) \$15 plus \$3 shipping and handling to:

21st CENTURY
 P.O. Box 16285
 Washington, D.C., 20041



The Ozone Story

36 Pythia Drops the Ball

by Lyndon H. LaRouche, Jr.

Prince Philip's revival of the pagan worship of Gaia begets acceptance of hoaxes and hoaxsters in place of science.

39 The Club of Rome's Myth-making

40 New Scientific Evidence Proves Ozone Depletion Theory False

by Rogelio A. Maduro

New scientific evidence continues to demonstrate that the ozone depletion models—and the resulting ban on CFCs—are based on a Big Lie.

41 The Crista-Spas Project

48 The Ozone Depletion Theory

51 Why the U.S. Should Withdraw from the Montreal Protocol

by Hugh W. Ellsaesser, Ph.D.

There is too little knowledge and too much misrepresentation of ozone depletion.

54 Montreal Protocol Enforcers in Flight Forward

by Marjorie Mazel Hecht

The Montreal Protocol may still be alive, but it is not well.

56 The Nobel Fraud

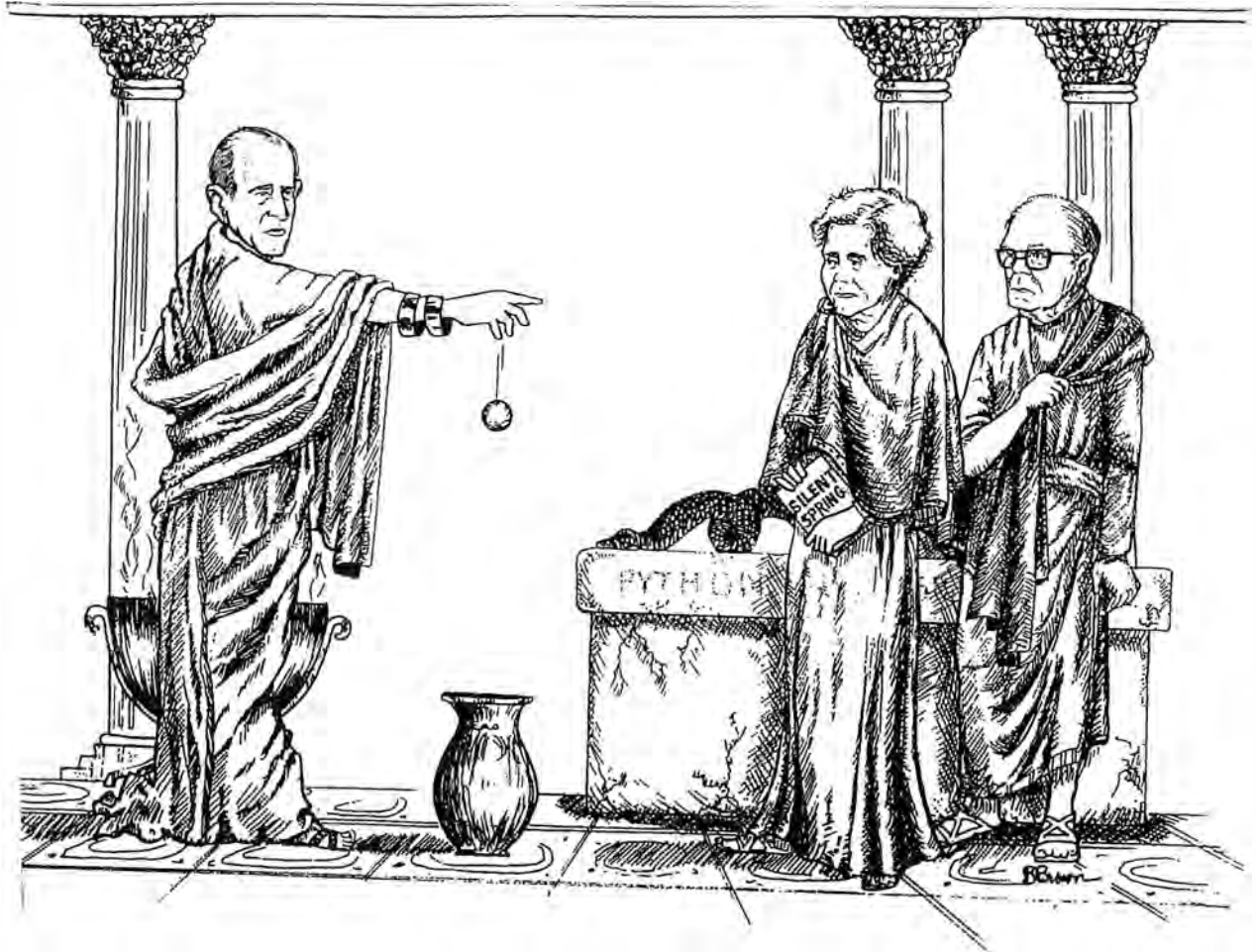
by Rogelio A. Maduro and Torbjoern Jerlerup

This year's Nobel Prize in Chemistry was intended to squelch opposition to the ozone depletion theory.

58 Alfred Nobel's Honor Upheld in Stockholm

59 French Scientist: This Nobel Prize Is a 'Scandal'

Pythia Drops the Ball



by Lyndon H. LaRouche, Jr.

Prince Philip's revival of the pagan worship of Gaia begets acceptance of hoaxes and hoaxsters in place of science.

Sometimes, we cannot fully understand the popular lunacies of the present, without digging into certain superstitions which have been handed down over even thousands of years. Through the middle of the 1960s, the prevailing, rational beliefs of the majority among U.S. citizens, were based upon the traditions of our nation's 1763-1814 struggle for independence from Britain, traditions typified by President John F. Kennedy's crash program for a manned landing on the Moon. How could such a sane people abruptly turn to such anti-scientific lunacies as Rachel Carson's *Silent Spring*, or the pranks of such as the Nobel Prize-winning F. Sherwood Rowland and the "global warming" enthusiasts?

To understand that stunning turnaround of the past 30 years, one might pay closer attention to the revealing arguments of His Royal Highness Prince Philip, the co-founder and chief guru of the World Wildlife Fund. Prince Philip argues that that mother organization for the international ecology movement, which he and the Netherlands' ex-Nazi-SS member Prince Bernhard co-founded in 1961, is based upon an effort to revive the religion of the pagan Earth-mother Goddess whose Greek names were Cybele and Gaia (var., *Gaea*). To understand the superstition of Rachel Carson's and Rowland's devotees, we must probe those misty niches of European culture, where the pagan religious tradition of the Gaia myth has lurked during these relevant thousands of years.

Think back to the First Century A.D., under the Roman Empire. The First Century's famous Plutarch, the author of the parallel biographical sketches of Greek and Roman celebrities, was, by profession, a pagan priest of the cult of Apollo at Delphi, otherwise known more precisely as the cult of Gaia, Python-Dionysos, and Apollo. Ozone hoaxster F. Sherwood Rowland is unlikely to achieve the durable celebrity of a Plutarch, but the influence of such modern sleight-of-hand specialists can be understood best, if we view these charlatans as in the sophist tradition of the ancient priests of Apollo.

Is H.R.H. Prince Philip the apostle of an effort to eradicate Christianity, Judaism, and Islam, by means of reviving ancient paganist religious superstitions? The evidence is clear, and overwhelming; there is no doubt that that is exactly what he, the husband of the head of the Church of England, is doing. Many of the Prince's devotees, including that macho himself, insist that that is exactly what is afoot. On background, read James Lovelock's *Gaia: A New Look at Life on Earth* (New York: Oxford University Press, 1979); compare this with the Prince's pleas for revival of paganism, since the time of his intervention into the 1986 Assisi conference.

Turn to the latest effort to eradicate Christianity and Judaism by the Prince and his devotees: as reported in the weekly *Executive Intelligence Review* for Jan. 26, 1996. A committee of British public figures, led by Baroness Warnock—perhaps, more appropriately named "Warlock," resolved that apes should be given the same political rights as human beings. According to the published report [the London *Sunday Telegraph*, Dec. 24, 1995], the committee resolved, with but one (Catholic) vote in dissent, that man must share-out with the apes the right to "life, liberty, and freedom from torture." In this disgusting action, Warnock and her committee asserted no principle which Prince Philip has not promulgated, repeatedly, publicly, for years.

That pagan prince and his Worldwide Fund for Nature (formerly, the World Wildlife Fund) are appealing to the lunatic monster which lurks in unsanitary corners of all too many, plainly suggestible, modern minds.

The Dirty Nooks in Modern Minds

In light of the fact, that European history and civilization began in ancient Greece, the fight of the followers of Thales, Solon, Aeschylus, Socrates, and Plato, against the cult of Apollo, is the principal place of reference for picking up the threads of modern culture.

According to the relevant scholarly sources, the celebrated Apollo cult at Delphi was a syncretic concoction based upon a more ancient cult of the whorish, and ostensibly incestuous, Earth-mother *Gaia*, and her serpentine consort-son *Python*, for which a variety of snake was later named. According to the myth, the two machoes, Apollo and Python, had it out one day, in the course of which Apollo chopped Python into segments. Thereupon, Apollo was seized by a fit of remorseful weeping, making prayerful apologies to the ostensibly be-reaved Gaia. Apollo tenderly interred the remains of the all-broken-up Python in a spot thereafter known as the grave-site of Python-Dionysos, where an empty-headed prophetess, known as *Pythia*, sat, babbling her symbolic prophecies, or, picking the ancient equivalent of bingo-balls out of an urn.

That area became known as the site of the Delphi cult of



Illustration by P. Emerson

Rachel Carson's legacy: Her 1962 book, Silent Spring, led to an increase in irrational fears of pesticides, accompanied by an increase in disease and death caused by the ban on DDT.

Apollo, and served as the principal center of international financial usury for ancient oligarchical Greece. The banks which dominated the location featured a big sow, so to speak: the principal treasury for the Delphi cult-center as a whole, which presaged Venice's *fondo* of St. Mark's. That big sow was attended by the smaller banks, which each represented one of the satrapal Greek city-states over which the cult of Apollo reigned, the suckling piglets, so to speak.

As a Wall Street gambler of today might make a furtive visit to his favorite tea-leaf-reading salon, in ancient Greece, for the then-current, base price, a supplicant visiting Delphi could be passed through an extensive ritual of purification. Then, purified of the taint of his excess cash, the supplicant would have his question addressed publicly, by Pythia's plucking out a marble, taken at random, from the relevant urn.

For that time's equivalent of the Rolls-Royce price, the prophetess would respond to the formally stated question, not by mere plucking-out of a token, but by babbling some piece of virtual gibberish. In that temple, in the first row of the benches located on the side of the Python-Dionysos grave opposite the oracular Pythias, as Plutarch in his time, sat the relevant local spin-doctors, the famous priests of Apollo. At the close of the ceremony, *for a price*, a priest of Apollo would conjure up an interpretation of the mumbo-jumbo phrases just earlier uttered by the oracle.

Plutarch's case illustrates the point, that that Delphi cult of Apollo continued to be the most influential loan-shark organization of the Mediterranean, deep into the time of imperial Rome. Indeed, the surviving evidence is, that it was that cult of Apollo which had sponsored the rise of Rome to power among the Latins, and aided it in crushing the Etruscans and subjugating the Italians. That cult was the leading agency perpetuating the cult of the gods of Olympus, whose influence introduced



Tom Szmeczo

Dr. F. Sherwood Rowland is a prominent signer of *The Morelia Declaration*, a document published as a one-third page ad in *The New York Times*, Oct. 10, 1991. The Declaration ends with a call for "liberation movements among species" so that "one day we can attain genuine equality among all living things."

that same cult, with Latin names, as the core pantheon of ancient Rome. Similarly, it was the agency behind the oligarchical model of law of evil Lycurgus' Sparta, and the agency which sponsored the Athens school of Rhetoric and its agent, Aristotle, in the time of the Peripatetics.

It was chiefly through the Latin branch of the Apollo cult's influence, that the paradigm associated with the myths of Gaia-Python-Dionysos-Apollo was transmitted to reside among the uncleaned pores of the modern European mind.

The ancient Greek mind, the stage upon which the indicated conflict between Solon and Lycurgus played out, is, respectively, the image of man in Homer, versus the irrationalist theogony of Hesiod. In the heritage of Hesiod's superstitions, two images of god and man are blended as one. One image is that of the evil Earth-mother-whore goddess and her consort: Shakti and Siva, Ishtar (or Athtar, or Astarte) and Baal, Cybele and Dionysos, Gaia and Python, Isis and Osiris. The second image, is that of the gods of Olympus. The common feature of such a blending of theogonies, is the image of relationship between man and the universe characteristic of the oligarchical society in which a ruling set of families rules, as if they were gods, over a mass of more than 95 percent of the human species. That is the tradition of Aristotle's teacher, Isocrates of Athens; that is the tradition of ancient Babylon and Tyre, of the Roman and Byzantine empires, of European feudalism, of Venetian financier aristocracy, and of Venice's London, financier-aristocracy clone.

That is the tradition which the British Royal Family represents, and upon which Prince Philip and his accomplices have projected their "post-industrial," utopian design for a post-nation-state "globalist society." That is the utopian image proposed by Britain's Lord William Rees-Mogg, one of the more prominent international sponsors of the "Third Wave" lunacy of Alvin Toffler and House Speaker Newt Gingrich. Quite literally, Rees-Mogg demands a "Third Wave" utopia, in which

THE MORELIA DECLARATION

A unique exchange has taken place. For the first time environmentalists, scientists, representatives from the native tribes of North and South America, political activists and writers from 20 countries have spent a week in Mexico discussing the state of the world as we approach the end of the millennium. Independently, but without exception, each participant expressed concern that life on our planet is in grave danger.

The participants at this conference wish to stress that environmental destruction cannot be confined within the boundaries of any nation state. We urge our fellow writers, environmentalists, scientists, members of indigenous minorities, and all concerned people to join us in demanding the creation of an International Court of the Environment at which environmentally criminal activity can be brought to the attention of the entire world.

If the latter half of the 20th century has been marked by human liberation movements, the final decade of the second millennium will be characterized by liberation movements among species, so that one day we can attain genuine equality among all living things.

Homero Arldjis (Mexico)	Lester Brown (United States)
<u>F. Sherwood Rowland (United States)</u>	Octavio Paz (Mexico)
Peter Matthlessen (United States)	Petra Kelly (Germany)
Vladimir Chernousenko (Soviet Union)	Miroslav Holub (Czechoslovakia)
Gita Mehta (India)	Alvaro Umaña (Costa Rica)
Evaristo Nugkuag (Peru)	W. S. Merwin (United States)
Kjell Espmark (Sweden)	Adam Markham (Great Britain)
Thomas Lovejoy (United States)	Vassily Aksyonov (Soviet Union)
Augusto Roa Bastos (Paraguay)	Arturo Gómez-Pompa (Mexico)
Margarita Marino de Botero (Colombia)	Kirkpatrick Sale (United States)
J. M. G. ...	Durning (United States)
	... (Sweden)

less than 5 percent of the population controls the world through "information," while 95 percent are kept illiterate as a matter of policy, reduced to the status of serfs, or worse.

The same ancient cult of Apollo is also the mind-map of the syphilitic forerunner of Adolf Hitler, Friedrich Nietzsche, and of the Nazi philosopher Martin Heidegger.

The Practical Significance of Myth

In assessing the anti-scientific hoaxes of Rachel Carson, F. Sherwood Rowland, and their like, it is most useful to recall the principle of scientific method taught to us by Gottfried Leibniz, to seek to understand the practical implications of processes in terms of those characteristics of action by which one type of process is distinguished most essentially from another. From this standpoint, once we understand the characteristic features of the way in which Rachel Carson, et al. perpetrated the anti-DDT hoax, and Rowland et al. perpetrated the popularized "ozone hole" hoax, we do not need to take the same laborious route to prove the fraudulent character of kindred claims by them or their co-thinkers.

Once we learn to identify the distinguishing characteristics—the axiomatics, if you prefer—of a certain way of thinking, we can foresee the significant, combined effect of each of those propositions which are generated by that same axiomatic way of thinking. Once we can show, that the characteristic feature of the mind of a Carson, Rowland, et al., is exactly the *Gaia* type which Prince Philip has insisted is his adopted way of thinking, we are enabled to reach accurate general conclusions respecting the kind of oligarchical, bucolic utopianism which is implicitly demanded by the hoaxes of Carson, Rowland, et al.

The Hesiodic world-outlook is characteristic of an oligarchical form of society, a society in which a self-apotheosized, ruling assembly of families imposes its capricious impulses upon a subjugated 95 percent, or more, of a population which has

been chiefly degraded to the relatively bestial status of serfs, slaves, or worse. This is the decadent, characteristically degenerating form of culture which the Roman Emperor Diocletian bequeathed, as his code of "zero technological growth," to reign thereafter, over both Byzantine culture and the law of European feudalism and financier-aristocracy generally.

"It is only because European civilization has permitted itself to be corrupted entropically by the kind of oligarchical mind which the British Empire and Prince Philip's co-thinkers typify, that the culture of this planet is faced with the early prospect of the deepest and longest new dark age in human existence to date."

The contrary model of society, that sought by Solon, Aeschylus, and Plato, and realized by the 15th century creation of the modern nation-state republic, is based upon a notion found in *Genesis* 1:26-28. Each human individual is born in the living image of God the Creator, and that not by virtue of bodily form, but rather those creative powers of reason whose expression is typified by valid fundamental discovery of superior principle respecting man's increasing power for do-

minion over the universe. The function of the modern nation-state is not to make one man or woman more equal than another in his or her bestiality, but in respect of each individual's educable capacity for increasing mankind's power of dominion over the universe through artistic, scientific, and technological progress.

As the Fall of Rome and of Byzantium illustrate the rule, the way of the Hesiodic mind is the death of nations and cultures unfit to survive, death through the characteristic entropy of any culture which thinks in the same characteristic manner as the admirers of Rachel Carson and F. Sherwood Rowland. The rise of European civilization to domination over this planet's affairs, shows that any culture based on the principle of universal classical education for artistic, scientific, and technological progress, is characteristically anti-entropic, superior to every culture of an opposite view. It is only because European civilization has permitted itself to be corrupted entropically by the kind of oligarchical mind which the British Empire and Prince Philip's co-thinkers typify, that the culture of this planet is faced with the early prospect of the deepest and longest new dark age in human existence to date.

It is, as the Duke of Edinburgh, that prince of perversity, has stated the matter accurately, the tradition of the pagan worship of the evil, entropic *Gaia* which causes foolish people to accept the hoaxes of pranksters such as Rachel Carson and F. Sherwood Rowland today.

Lyndon H. LaRouche, Jr. is a member of 21st Century's scientific advisory board.

The Club of Rome's Myth-making

A background paper by Ann Corrigan for the Club of Rome's Goals for Mankind project makes the following proposal, which, she correctly states, is "in consonance with the Club of Rome's goals" and "would follow naturally from the previous reports":¹

A system of goals that prescribes a world order that will satisfy the basic needs of all humanity and humanity's less material desires, and that is accepted by the people of the world, is clearly desired. The goals presented by the *Reshaping the International Order* and *Goals for Mankind* reports are thus an important contribution to the design of viable world futures. Both reports, however, present their goals in abstract, skeletal forms. . . . [G]lobal goals presented in such a format will not be successful in reaching a large portion of the world, and, even more importantly, in becoming a part of the common person's accepted world views.

The classical means by which a shift in commonly held world views is accomplished, consists of one of the many forms of myths. Whatever form they take, myths reach down to all levels of the human mind. They engage the entire soul and stimulate the mind and body to action. It is proposed, therefore, that the Club of Rome seek to embody the goals presented in its latest reports, but more es-

pecially in the *Goals* study, through the creation of myths and the dissemination of these myths to the peoples of the world. . . .

It is this author's belief that the Western, developed countries are among the best initial candidates for the mythmaking project. . . . The countries of this area will be required to make some significant, and sometimes drastic, shifts of perception in order for the "new international order" to be fulfilled. Thus it is very important for these societies to make a change in their value systems. . . .

The mythmaking project in the U.S. could employ a science fiction writer such as [psycho-sick science fiction writer] Ursula LeGuin, a popular essayist such as Alvin Toffler, and/or a television/film writer or producer. Use of a popularly based medium could be very successful in terms of the number of persons reached and the impact that would be made on individuals.

Notes

1. Ann Corrigan, "Science and Myth: Two Proposals to the Club of Rome," in *Goals in a Global Community—The Original Background Papers for Goals for Mankind, A Report to the Club of Rome*, edited by Ervin Laszlo and Judah Bierman, Vol. 1, *Studies on the Conceptual Foundations* (New York: Pergamon Press, 1977). These excerpts come from pages 303 and 306-7.

New scientific evidence continues to demonstrate that the ozone depletion models—and the resulting ban on CFCs—are based on a Big Lie.

by Rogelio A. Maduro

New Scientific Evidence Proves Ozone Depletion Theory False

New satellite ozone data and other atmospheric studies based on actual measurements confirm that the ozone layer is not a homogeneous, flat structure and that atmospheric dynamics, not chemistry, is the driving factor that determines the thickness of the ozone layer. The scientific research reported here strips any shred of credibility from the claims of the ozone depletion theorists, leaving the Montreal Protocol backed only by the Malthusian ideology of its founders.

The dramatic new satellite ozone data, featured on the cover, are from the Crista-Spas ensemble of instruments, designed by scientists at the University of Wuppertal in Germany, which was deployed by the Space Shuttle in November 1994. The Crista team announced its first results at a press conference in Bonn on Nov. 6, 1995, but the results of the mission were barely covered in the European press, and not covered at all in the United States.

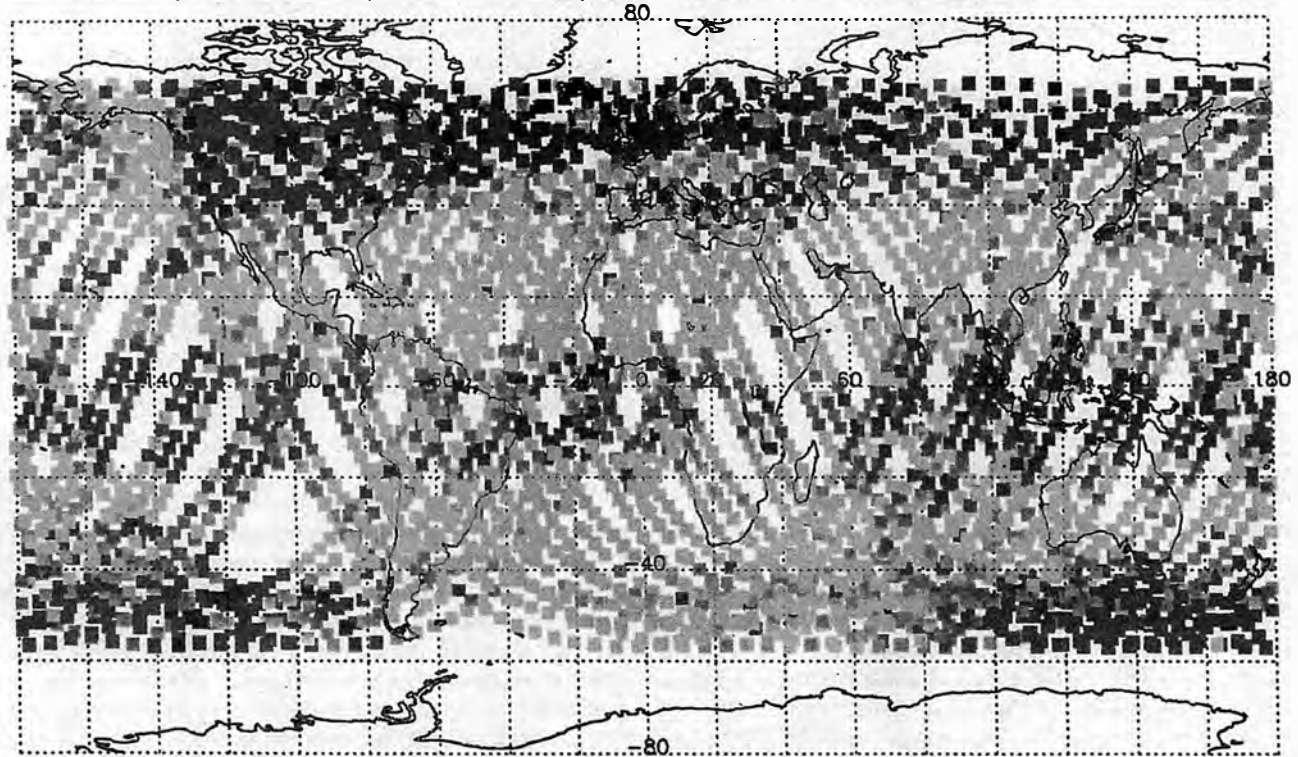
Crista-Spas is a group of instruments (Crista), deployed on a space platform (Spas), that measures atmospheric gases in such detail that it can create three-dimensional images of the distribution of the gases in the stratosphere (see box, p. 43). As the German scientists told the press, these 3-D images show that the models behind the ozone depletion scare are completely, and axiomatically, wrong. In the words of Germany's *Die Welt* newspaper Nov. 7, the evidence presented

at this press conference means that "all ozone computer models produced so far have, in effect, turned into waste paper [*Makulatur*]."

The Crista-Spas is one of those unique experiments that gives scientists a look at the real processes that shape the atmosphere. Like the early weather satellites that showed us the first top-down, global views of hurricanes and storm systems, Crista-Spas has now provided us with the first set of three-dimensional images of atmospheric gases. Crista-Spas is able to monitor 15 atmospheric gases in great depth and detail. It is a joint project of the University of Wuppertal and the German Space Agency (DARA) together with NASA.

The 3-D images demonstrate that the ozone is organized in complex dynamic vortical and filamentary structures that are constantly changing, in patterns as complex as those of weather systems near the surface. In contrast, the computer models used by the promoters of the ozone depletion and global warming scares assume that the ozone layer is homogeneous, and use linear equations to model the stratosphere. Any attempt to model complex nonlinear processes (such as those demonstrated to occur in the ozone layer) with zonal averaging and linear equations, will invariably give wrong results, regardless of how big a supercomputer is used. *The methodology is axiomatically wrong.* Yet, this erroneous methodology is what the promoters of the ozone depletion scare have been us-

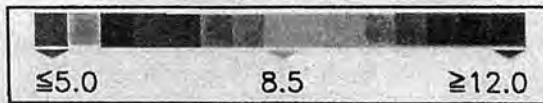
30.00 km; SL5 SCS6 SR6; 780 - 788 cm⁻¹; DAY 313 07:06:00 - DAY 314 06:54:00



Preliminary

CRISTA

Volume mixing ratio [ppm]



O₃

block:0.47

Crista Project, University of Wuppertal

A map of ozone measurements taken at 30 km by Crista. Crista's three-dimensional imagery shows that the ozone "layer" is not homogeneous, but is a patchwork, characterized by small-scale and large-scale dynamical structures.

ing to forecast ozone depletion rates and to make policy (See box, p. 48).

The Crista researchers emphasized this point in their Nov. 6 press statement:

One can only understand these occurrences if one examines them in their totality and mutual interdependence. One finds no solution to the ozone problem if one examines only the photochemical side, but neglects the energetics and dynamics.

Instead of a uniform distribution of ozone along a [band of constant] latitude, as the current models predict, Crista showed a patchwork of large and small scale structures in the ozone distribution. . . . The first results show that photochemical models alone do not adequately describe the condition of the atmosphere. Dynamic processes and transports must be considered, for which temperatures, waves, and turbulences show themselves responsible.

Dr. Ulrich Grossman, one of the leaders of the Crista project at the University of Wuppertal, summarized some of these results in an interview:¹

The main point is that the instrument measures with an extremely high spatial resolution in a very short time. So we get a very dense measurement net over the globe within the constraints of the Shuttle orbit. What we see in nearly all emissions and also in ozone density is that there are large fluctuations from point to point and that the ozone distribution in a horizontal map looks like a weather map.

When the modelers "talk about zonally averaged values, it is useless," Grossman said. The ozone layer "is very, very structured. All these structures are moving around, like what you see in the weather map. . . . You have to take all these structures into account if you want to make a real, reliable forecast for ozone over the next . . . 20 or 40 years."

"Because all the processes involving all these gases in the atmosphere generally are nonlinear, when you take averages, you make mistakes. Once you are down to precision on the order of [hundredths], the errors which you would make by using average values are much bigger than that." Grossman does not believe that even a "mathematical program with the biggest computers" would be able to do this properly.

Models Versus Reality

The shortcomings of the existing ozone models is a central issue. The Nov. 6 Wuppertal press release states:

A further scientific goal [of the mission] is the examination of the validity of the so-called atmosphere models. Until now computer simulation models were used for the prediction of certain changes in the atmosphere, as for instance the ozone hole or greenhouse effect, as the only expression of these phenomena. The high quotient of error (1 to 2 errors in 1,000 program steps with a total of 1 million steps) places our "knowledge" of the protective layer of the Earth in question. Crista delivers for the first time scientifically grounded information.

Crista measured ozone distribution from 15 to 95 kilometers in altitude. The expected values are based on the so-called Keating model, compiled from earlier experimental results. The Keating model shows no variations in the ozone density along a line of constant latitude, so that the ozone distribution is assumed to be a clear band structure, with densities greatest at the equator and diminishing toward the poles.

During the Nov. 6 press conference, Crista researcher Dr. Martin Riese summarized the more significant results of the mission, especially the dynamical structures. One of his most interesting observations is that the so-called ozone hole over Antarctica is the result of *dynamic* processes in the atmosphere, not of man-made chemicals. According to Riese:

The corresponding ozone distribution measured by Crista presents a completely different picture [from the Keating model]. Although the ozone density diminishes from the equator toward the poles, the band structure of the Keating model is no longer visible. This is especially true for the high northerly and southerly latitudes. A large number of larger (10,000 km) and smaller (1,000 km) structures appear. In addition, there are in part considerable fluctuations of the ozone layer from one measurement point to the next. In total, the ozone distribution resembles a patchwork.

The large structure is an area with relatively low ozone concentrations at the high northerly latitudes. The polar vortex, which is building up, is visible here, in which a sideways movement of the air masses is visible. This sideways motion causes ozone-poor air from greater heights to be transported to an altitude of 30 km.

A structure of medium size is found northwest of Tierra del Fuego [at the tip of South America]. There is an area of extremely low ozone concentration in the region of the outwardly directed south polar vortex. This does not concern the so-called ozone hole, which also occurs in the south polar vortex, but at lower altitudes. The ozone hole is a consequence of the peculiar meteorological conditions in the southern winter, which lead to a very stable polar vortex and thereby permit a complete destruction of the ozone between 12 and 22 km in the southern spring. In contrast, the low ozone densities at 30 km are mainly a consequence of the transporting away of ozone.

Crista is designed, in particular, to detect the small-scale

structures. The many small structures found in the ozone distribution retrospectively confirm the development of the Crista experiments. The fluctuations that occur from one point of measurement to the next play a great role in the calculation of photochemically influenced production and loss of trace gases. Further small-scale structures of interest are the so-called filaments. These are thin stream-threads which are predicted by the theory and which play a role in observations of the stability of the polar vortex. From understanding the filaments, the question of whether or not there can be an ozone hole at the North Pole assumes greater meaning. In the case at hand, northwest from the ozone hole there appears a filament, which in the future, on the basis of other trace gas measurements taken by Crista, will be more precisely examined.

The Crista-Spas experiments have been in the making for more than 10 years, and over this period, the University of Wuppertal has also launched rockets and balloons with different types of infrared spectrometers. According to Dr. Grossman, it took this long to complete the Crista experiment largely because funding for this kind of research is limited.

Grossman stressed the difference between the models and their associated theories, and the results from the Wuppertal series of experiments. "In every rocket experiment," he said, "you see a very structured profile. You see variation from one day to the other, from kilometer to kilometer. . . . The results never, never looked like a model prediction." Their earlier results were always so different from the model predictions, he said, that they realized that "it can't be that we accidentally always launch on the spot on the Earth and at the time where there is a disturbance in the atmosphere, and otherwise it is quiet." The Wuppertal researchers concluded from their rocket and balloon experiments that the structures they were finding must be constantly occurring, and that "the only way to look into this was to build a satellite" for this purpose.

The project was eventually funded by the German Space Agency. The satellite was built by industry while Grossman and his students at the university built the instruments, except for the cryostat (see box, p. 43). NASA has been very helpful to them, Grossman said, by providing the Space Shuttle to carry Crista-Spas aloft.

Dynamics, Not Chemistry

The primary role of dynamical processes in determining the thickness of the ozone layer has also been established in other extensive field work. On Dec. 1, *Geophysical Research Letters*, a journal of the American Geophysical Union, published a scientific paper by scientists from Norwegian and Russian institutes demonstrating that the thickness of the ozone layer over Russia is determined by meteorology, not chemistry.² The scientists, Kjell Henriksen from the University of Tromsø in Norway and Valentin Roldugin from the Polar Geophysical Institute in Russia, analyzed one year of daily samples from six Soviet Middle Asian ozone measuring stations at two different altitudes. They discovered that *changes in the ozone layer were directly caused by the horizontal and vertical movement of air masses* (that is, wind dynamics). A close analysis of the data also demonstrated that *chemistry played no role in the*

Continued on page 44

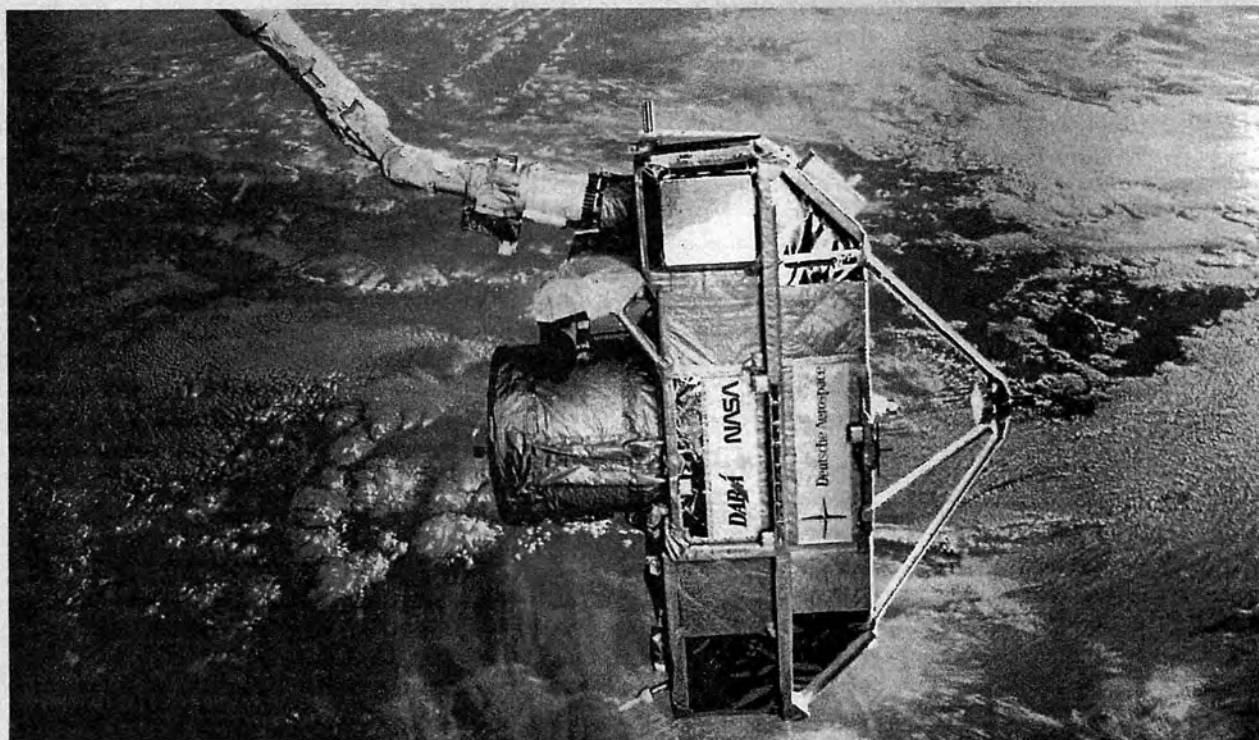
The Crista-Spas Project

Crista, Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere, is a group of infrared instruments sensing the middle atmosphere (10 km to 100 km) from an Earth orbit. Spas is the acronym for Shuttle Pallet Satellite, the spacecraft carrying Crista. It is launched into Earth orbit by the Space Shuttle and deployed in free flight for several days, at a distance between 20 and 120 km from the Shuttle.

Crista's measurements achieve an unprecedented spatial resolution; vertical resolution is 1.5 km, and horizontal resolution is 500 km by 650 km. The instrument is designed to measure small- and medium-scale dynamical structures in

tics to cryogenic temperatures. Satellite measurements show that many parameters of the middle atmosphere exhibit large-scale variations (over several thousand km). These disturbances are quite frequent and often of considerable magnitude.

Small-scale structures of the order of a few hundred to a few thousand kilometers were previously determined under favorable conditions by rocket, balloon, and ground-based measurements. These can also be quite pronounced, but these measurements yielded local snapshots only. Hence, little was known about the frequency of occurrence of small- and medium-scale structures.



The Crista group of instruments on the Spas platform as it was being deployed by the Space Shuttle in November 1994.

the middle atmosphere. Such structures, which until now have been inaccessible to satellite measurements, have strong influences on the photochemistry and energy budget of the atmosphere.

The Crista experiment uses minor constituents in the atmosphere as tracers for atmospheric dynamics (waves, turbulence, and so on). The emissions of these trace gases in the middle- and far-infrared are determined by means of the limb-scanning technique, and yields the spatial distribution of these gases.

High spatial resolution is obtained (a) by high measurement speed and (b) by using three telescopes that measure simultaneously in three different view directions. High measuring speed is obtained by cooling all parts of the op-

Crista is the first attempt to determine the global distribution and the frequency of occurrence of such structures. During the relatively short flight time of a Space Shuttle mission, Crista recorded as much data as a typical satellite instrument does in half a year—more than 50,000 images in eight days.

Crista was also able to determine the large-scale structures in the atmosphere present during its deployment. Dynamical structures on all scales have strong influence, especially on the photochemistry of the middle atmosphere. For that reason, the Crista mission is complemented by an experiment on Spas that can measure radicals in the middle atmosphere, Mahrsi (Middle Atmosphere High Resolution Spectrograph Investigation).

Continued from page 42

thickness of the ozone layer over these stations.

The authors discuss the implications of their work in detail:

Intensive investigations on irregular variations of the total ozone during the last years point out many phenomena as possible sources. Influences related to homogeneous and heterogeneous chemistry, volcanic activity, solar proton events, and other forms of solar activity are documented. . . . The main cause, however, may be influences from meteorological conditions, and these relations have got much less attention. The role of horizontal advection and vertical motion as a significant source for ozone column variations has been studied more than 40 years. . . . Recently *Rabbe and Larsen*³ have indicated dynamic processes in the atmosphere as a main reason of ozone variations and ozone "miniholes." They show that ascending motion of the air is accompanied by dilution of the ozone layer, and vice versa, descending motion of the air causes enhanced density of the ozone layer. The causes of ascending and descending motions are often winds blowing across mountain ranges. Such vertical air movements will cause adiabatic expansion and compression with cooling and warming in time scales down to a few hours. Chemical processes can also contribute to ozone variations, but here the time scales are days. On the other hand, ozone variations with periods in the order of 10 days, and seasonal variations as well can also be explained by dynamic meteorological reasoning.

After a detailed analysis of the Russian data, Henriksen and

Roldugin conclude with a sharp reminder to the promoters of the ozone depletion fraud that they cannot arbitrarily exclude factors other than chemistry from their models:

The question of so-called "ozone depletion" has to be investigated from the point of view of long-term variation of general circulation in the atmosphere. Models of "the depletion," as summarized in [the World Meteorological Organization's] *WMO Report*, must realize that the meteorological conditions have significant effects on the ozone layer, being the main cause of seasonal as well as most of the shorter and apparently arbitrary density and thermal variations.

No Ozone Depletion over Norway

Other scientific papers have confirmed that the ozone depletion theory is wrong. The Norwegian science magazine *From the World of Physics*, for example, published a thorough review of ozone science by Thormod Henriksen from the Institute of Physics at the University of Oslo, which presents evidence that the ozone layer was thinner in the 1940s than today!⁴

Norway has several of the ozone measuring stations that have been operating continuously for the longest periods of time, and these are managed by some of the most qualified scientists in the field. Thus, Norway has some of the best, consistent data for a historical analysis of ozone trends. Henriksen describes the history of ozone research in Norway, and analyzes the ozone data starting in the 1940s. Figure 1 compares measurements done at the Dombaas research center in two periods: 1940-1946 and 1978-1994. As can be seen, the ozone layer went through a thinning process in the 1940s sim-

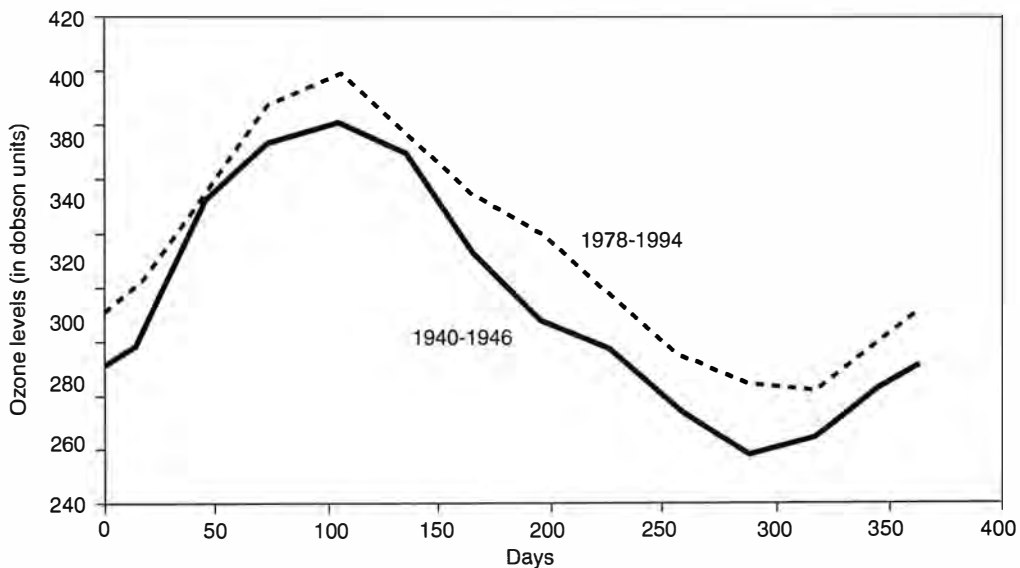


Figure 1

SEASONAL VARIATIONS IN THE OZONE LAYER OVER NORWAY (1940-1946 and 1978-1994)

Measurements of ozone levels over southern Norway show that a thinning process occurred very similarly in 1940-1946 and 1978-1994—except that the measured ozone levels were lower in the 1940s than now.

Source: Adapted from Thormod Henriksen, "Ozone Layer and Ultraviolet Radiation," 1994

ilar to that occurring now, with the exception, as noted by Henriksen, that "the ozone layer over southern Norway was *thinner* in the period between 1940 to 1946 than it is today."

Henriksen also points out that the levels of ultraviolet (UV) radiation have hardly changed:

[In] the last 50 years the ozone layer has not changed to such a degree that biological effects are to be expected. In other words, there have hardly been any changes in the levels of UV-radiation, and therefore it is a dead-end to connect the recent years' development of the ozone layer with the increase of skin cancer.

Henriksen concludes:

We can safely state that the picture of a depletion of the ozone layer is far more complicated than the picture that the media often gives. Those who expect a depletion timed with the release of CFC gases, will look in vain in their measurement results. It looks like the amount of ozone did increase in the 1950s and 1960s and reached a maximum in the 1970s. Since then, the amount of ozone has been decreasing. We believe that the low values in 1992 and 1993 are due to the volcano Mt. Pinatubo. . . .

More Evidence of No Depletion

Another way of taking on the unreliability of the ozone depletion theory is to examine the fudge factor in how the scare story data are presented. Harvard Astrophysicist Sallie Baliunas put the data in perspective in a paper presented at a congressional hearing on ozone, Sept. 20, 1995.⁵ Baliunas focussed on the unreliability of the estimates of ozone depletion, which have claimed as much as 0.3 percent depletion per year. The natural variability of the ozone layer, she said, is orders of magnitude greater than the alleged man-made "depletion." "Over Washington, D.C.," she noted, "ozone varies annually by 25

percent, some 80 times greater than the stated anthropogenic decline." Furthermore, any estimate of "ozone depletion," she said, has to factor the natural variability of the Sun's ultraviolet output (which is what creates the ozone layer in the first place), and the shift in wind patterns and meteorological conditions, particularly in the upper atmosphere. In addition, as noted by Henriksen, volcanic eruptions have a major impact

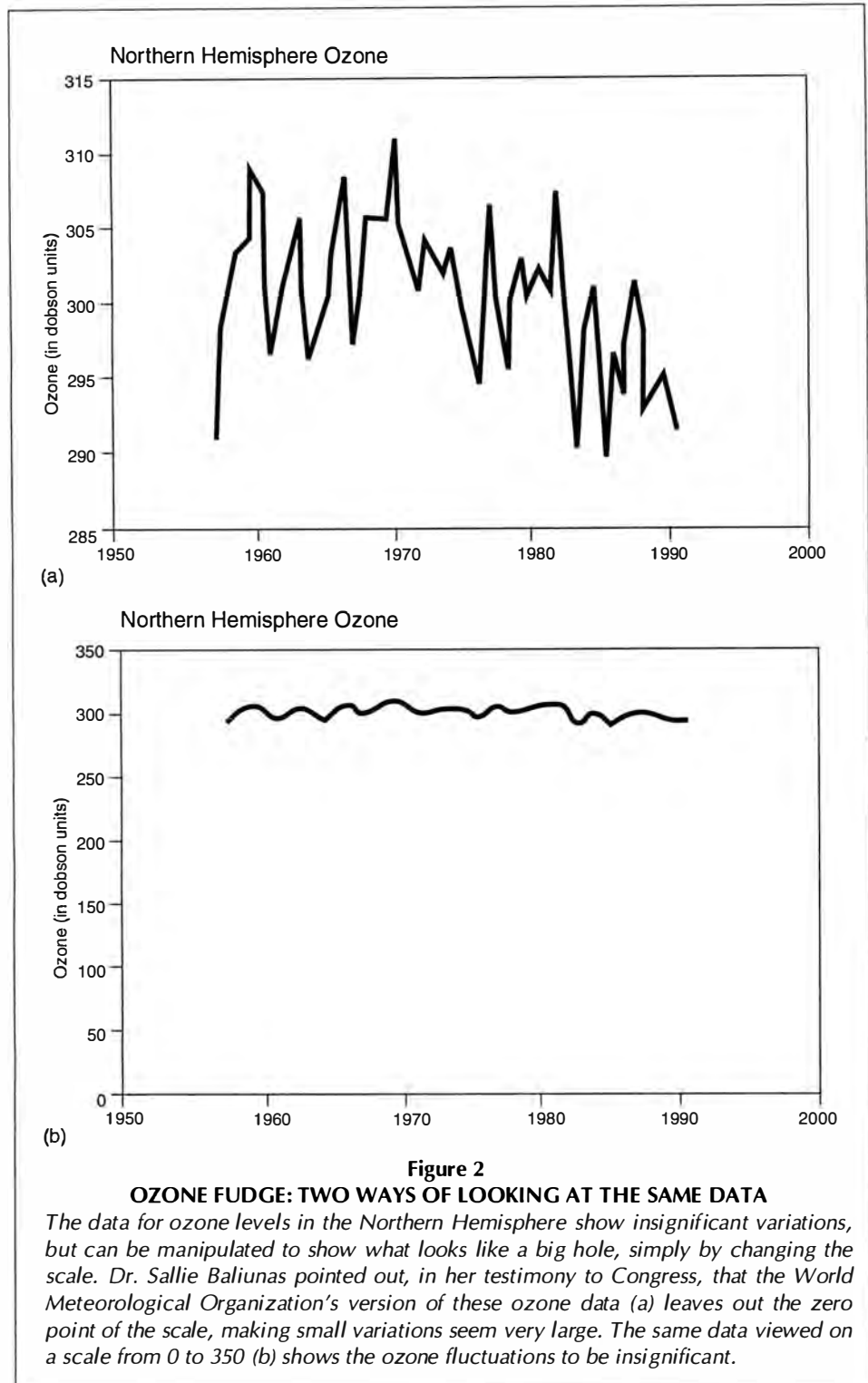


Figure 2
OZONE FUDGE: TWO WAYS OF LOOKING AT THE SAME DATA

The data for ozone levels in the Northern Hemisphere show insignificant variations, but can be manipulated to show what looks like a big hole, simply by changing the scale. Dr. Sallie Baliunas pointed out, in her testimony to Congress, that the World Meteorological Organization's version of these ozone data (a) leaves out the zero point of the scale, making small variations seem very large. The same data viewed on a scale from 0 to 350 (b) shows the ozone fluctuations to be insignificant.

on the ozone layer.

Baliunas also examined the statistical fudge methods used by the ozone depletion theorists to embellish their theory. The 1994 World Meteorological Organization's (WMO) report on ozone depletion, for example, estimates the depletion starting from two points, 1970 and 1978-1979. The choice for the second set of data is clear; that's when satellites started measurements.

The choice for the first starting point, supposedly arbitrary, is actually designed to skew the ozone record. As Figure 2 shows, the thickness of the ozone layer goes up and down considerably from year to year. The 1957 readings, however, show that the thickness of the ozone layer is about the same as it is today; thus, there has been no *long-term* depletion of the ozone layer. By ignoring ozone readings before 1970, the WMO begins its analysis with "a year of *maximum* ozone abundance for the entire 34-year record. . . ." As Baliunas comments:

Choosing 1970 or 1978-1979 as the starting point creates the maximum possible downward trends in ozone since then. The selections of the starting points, for example, 1976 or 1957, would indicate no significant downward trend since then. The fact that the inferred trend depends entirely on the selection of the endpoints means that the trend has not been reliably determined.

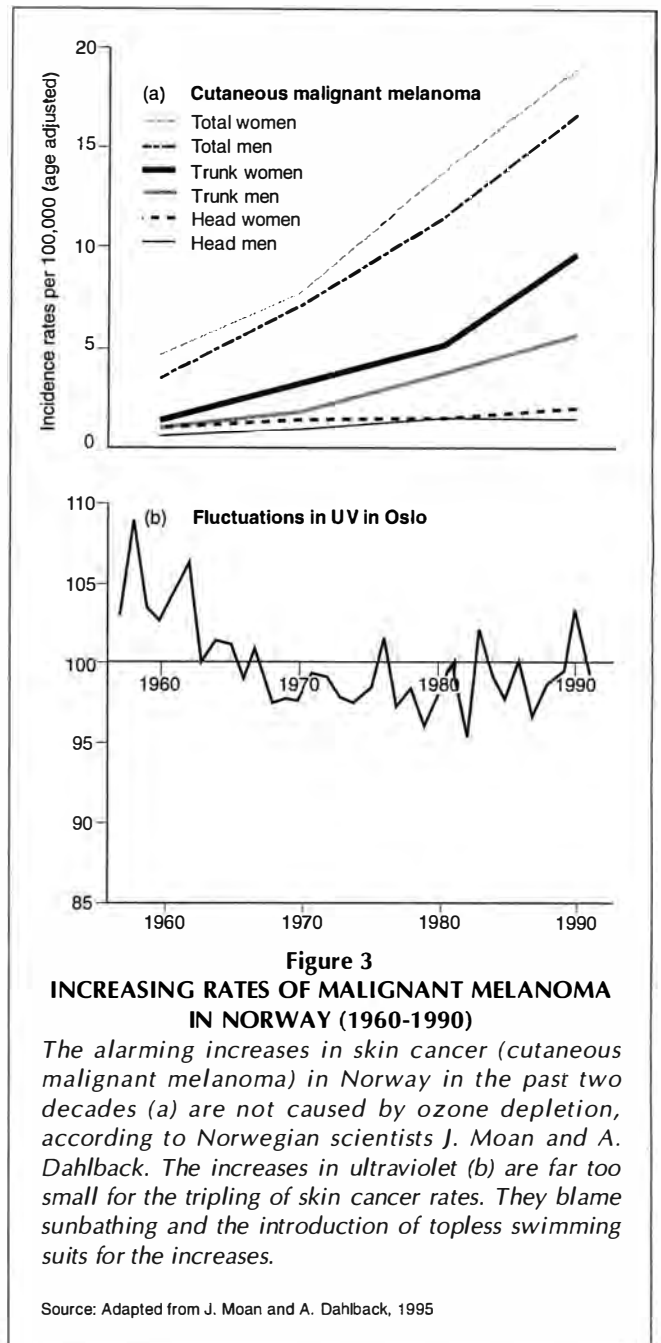
Another graphic distortion in the WMO report is to magnify ozone depletion by plotting very small changes out of context. One WMO figure, highlighted by Baliunas, omits the zero-point of the scale, so the amount of depletion looks extremely large from one data point to the next. When the WMO figure is compared with a normal presentation of the same data (Figure 2), as Baliunas notes, "the fluctuations in ozone are seen to be insignificant."

The Skin Cancer Scare

How has such a technical matter as stratospheric chemistry come to dominate headlines around the world and mobilize politicians to impose a ban that will cost their nations over \$5 trillion over the next few years? The answer is fear of increased numbers of deaths from skin cancer as more ultraviolet radiation hits the Earth, supposedly the result of ozone depletion. If it were not for the mass hysteria that has been created over the alleged dangers of an increase in skin cancer rates, there would be no ban on CFCs today, and newspapers would not even bother to cover the issue.

For example, during the same four- to six-week period that the so-called ozone hole appears over Antarctica, a nitrogen oxide (NO_x) hole also develops over the same area. Both the so-called ozone hole and nitrogen oxide hole are created in Antarctica by the same natural phenomena, but mentioning this and other unusual phenomena over Antarctica would raise too many questions in people's minds about the extraordinary chemistry that takes place at the end of the polar winter in Antarctica, and would lead people to question the ozone scare. So, the NO_x hole is never mentioned.

Let's look at the UV/cancer theory. First, the scare stories about UV and ozone depletion are based on increases in UV that are minuscule, compared with the natural variations in



UV-B that are determined by one's altitude and distance from the Equator. Second, there is no evidence that levels of UV-B have increased at the surface of the Earth, despite the claims of worldwide ozone depletion. And third, biological research now indicates that it is not UV-B that causes the malignant types of skin cancer, but UV-A, which is not screened out by the ozone layer.

The ozone depletion theory predicts that there will be a 10 to 20 percent increase in the level of UV-B radiation at the surface as a result of ozone depletion. This might seem like a large increase, unless one knows something about the geometry of the Sun and the Earth. UV-B varies by 5,000 percent from the Equator to the Poles. It also varies with altitude. This

is the result of simple geometry: There is more sunlight exposure at the Equator and the atmosphere is thinner in the mountains, so more UV-B gets through.

In midlatitudes such as that of the United States, a 1 percent increase in UV-B is the equivalent of moving 6 miles south (closer to the Equator). Thus, the alleged increase in UV radiation, according to the theory, would be the equivalent of what a person would receive if he were to move 60 to 120 miles south—the equivalent of moving from New York City to Philadelphia.

Actual instrumental measurements of ultraviolet radiation at the surface show that there has been no increase in UV levels, despite widespread claims of ozone depletion in northern latitudes. Just as with the ozone layer, the levels of UV radiation go through tremendous seasonal fluctuations. The amount of incoming UV radiation is modulated by several factors, including the angle of the Sun at that particular time of the year (lowest in winter), incoming solar radiation, sun spots, thickness of the ozone layer, meteorological conditions (cloud cover, and so on) and pollution. Accurately determining the amount of UV radiation requires long-term readings over an extensive network. Curiously enough, while tens of billions of dollars have been spent on "ozone research" almost no money has been spent on UV readings at the surface.

The most extensive study to date of UV-B radiation at the surface is that conducted by Joseph Scotto and his collaborators at the National Cancer Institute. The study, published in the Feb. 12, 1988, issue of *Science*,⁶ presented evidence that the amount of UV-B reaching ground level stations across the United States had *not increased*, but in fact, had *decreased* between 1974 and 1985. Instead of rejoicing at the results, the promoters of the ozone depletion scare saw to it that the network of observing stations was shut down, by cutting its funding (less than \$500,000 out of more than \$1.75 billion in research funds to study "climate change").

One of the recent attempts to contradict the Scotto study was an article by J.B. Kerr and C.T. McElroy, published in *Science* magazine in 1993, claiming an upward trend in UV radiation over Toronto.⁷ The results were front-page news internationally, but when it was soon demonstrated by other scientists that the so-called trend was based on faulty statistical manipulation,⁸ this reverse got little publicity. The entire "rise" in UV-B was based on readings taken during the last three days of five years of measurements! A correct statistical analysis showed that the trend in UV was zero (that is to say, the amount of UV had neither increased nor decreased over the five-year period).

Interestingly enough, the Canadian study had been rejected for publication by *Nature*. At the time the Canadian paper was submitted to *Science*, F. Sherwood Rowland was the president of the Ameri-

can Association for the Advancement of Science, publisher of *Science*. According to knowledgeable sources, Rowland rammed through the publication of the paper despite its obvious errors.

Taking Another Look at UV-B and Cancer

In July 1993, Dr. Richard Setlow of Brookhaven National Laboratory published the results of an experiment indicating that malignant melanoma skin cancers are caused not by UV-B, the part of the UV spectrum filtered out by the ozone layer, but by UV-A, a part of the spectrum that is not affected by the thickness of the ozone layer.⁹ In other words, this research indicates that the thickness of the ozone layer is irrelevant to the rates of malignant melanoma, which is the fundamental threat allegedly posed by ozone depletion.

But what about the dramatic increases in reported cases of skin cancer? The increases are real, but they cannot be blamed on ozone depletion. This is the determination of the world's foremost photobiologists working on the effects of sunlight on the body, who gathered for an international conference on "Ozone, Sun, Cancer" in Paris in May 1994.¹⁰ These experts concluded that present rates of skin cancer are caused by a variety of factors, but "the main determinant is individual behavior"—in other words, overexposure to the sun, the use of tanning parlors, and, perhaps, the use of sunscreen lotions.

Many scientists pointed out that the range of ultraviolet radiation that causes malignant melanoma is UV-A, thus confirming the research by Dr. Richard Setlow of Brookhaven National Laboratory. Previously, it had been considered that UV-A was the "safe" range of ultraviolet light, while UV-B, which is partially filtered by the ozone layer, was the "unsafe" portion of the spectrum.



Marjorie Mazel Hecht

Dr. Sallie Baliunas (left) and Dr. Richard Setlow during the congressional hearings on ozone Sept. 20, held by Rep. Dana Rohrabacher (R-Calif.), chairman of the House Committee on Science's subcommittee on energy and environment.

Norwegian scientists J. Moan and A. Dahlback state the point strongly:¹¹ "Increasing rates of CMM [cutaneous malignant melanoma] are not caused by an ongoing ozone depletion." The scientists further note:

In some studies a tendency of ozone depletion (= 0.03% per year in summer and = 0.27% per year in winter) has been reported also for northern latitudes (55°N). Could this be the reason for the alarming increase in the incidence rates of skin cancer observed over several decades in several countries? Obviously not, since the increasing trend in UV found from 1968 to 1990 is too small (only a few percent) to account for the tripling of the CMM incidence rates found for the same period. [See Figure 3.] Thus, the increasing rates of skin cancer seem to be due to changing habits of solar exposure. A strong indication for this is that the increasing trend of CMM in Norway is lowest for CMM arising on the face and largest for CMM arising on the female breasts. This is likely due to the introduction of the topless swimming suit in the years after 1970.

Moan and Dahlback also address the beneficial aspects of UV radiation. In fact, there is a body of evidence indicating that both sunlight and UV-B provide health benefits. As Moan and Dahlback point out, when UV-B strikes the skin, it turns cholesterol molecules into the hormone cholecalciferol, vitamin D, which plays a crucial role in the body's calcium and potassium chemistry. Therefore, they write:

Since vitamin D seems to have a protective effect against the development of several forms of cancer, including breast cancer, prostate cancer, gastrointestinal cancer and CMM, an ozone depletion may also have a beneficial effect, notably for persons that get small exposures to solar radiation. In fact, the increase in mortality rates of colon cancer from south to north in USA has been attributed to the protective role of Sun-induced vitamin D. Similar south-north gradients exist also for breast and ovary cancer, notably for postmenopausal women. An improvement of the vitamin D status may also be preventive with respect to osteomalacia in elderly people.

The Norwegian scientists also have an uncharacteristically harsh criticism of those who have promoted other UV-ozone scares, such as Prof. J.C. Van der Leun, a Dutch dermatologist, who has warned of epidemics of cataracts, immune suppression, and photoaging of the skin. Moan and Dahlbeck state that "even though it is well documented that UV radiation can cause such effects, little epidemiological data seem to be available for an evaluation of their significance in relation to ozone depletion."

A Policy of Genocide

The latest atmospheric data, presented here, confirm that the ozone depletion theory is a scientific fraud. In fact, the Montreal Protocol banning CFCs was signed in 1987, despite the fact that there was no scientific evidence to support

Continued on page 50

The Ozone Depletion Theory

The theory that man-made CFCs would deplete the ozone layer is only one of many theories claiming that ozone depletion would lead to doomsday. The theory originated in March 1971, when James McDonald, an atmospheric physicist from the University of Arizona, testified at congressional hearings on the Super-Sonic Transport (SST) program. At the time there was a major fight to kill the SST program, but all of the arguments of the opponents had failed.

McDonald presented his theory that water vapor emissions from the SST were going to wipe out the ozone layer, allowing a large amount of ultraviolet radiation to penetrate to the surface of the Earth, which would allegedly cause a massive increase in skin cancer incidence. The news media seized upon the skin cancer story and made it the issue of the day. Funding for the SST was killed, and the ozone depletion theory was born. McDonald had previously testified in Congress as an ardent proponent of the theory that UFOs—unidentified flying objects—regularly visited the Earth, causing major electrical blackouts in the process of recharging their alien spacecraft.

Once the skin cancer scare had been established as an issue that would get the news media's attention, ozone depletion theories began to proliferate. Some maintained that the ozone layer was going to be wiped out by nitrogen oxides (rather than water vapor) from SST exhausts, by nitrogen oxides from atmospheric nuclear tests, by nitrous oxide from nitrogen fertilizer, by methane from cows and rice paddies, by chlorine from the Space Shuttle exhaust, by acid rain, and by emissions from pesticides, fumigants, and so on.

Enter Rowland and Molina

The theory claiming that CFCs would deplete the ozone layer was theory number 7, invented by F. Sherwood Rowland and Mario Molina in December 1973. Rowland was then head of the chemistry department at the University of California at Irvine and Molina was his assistant. At the time, the first five ozone depletion theories—SST-water, SST-nitrogen oxides, atmospheric nuclear tests, fertilizers, and methane gases from cows—had faded into the background. The theory then in vogue (#6) was that chlorine from the Space Shuttle exhaust would cause ozone holes over Florida and deplete the ozone layer worldwide. Rowland and Molina, however, found a much better source of chlorine in the stratosphere than the Space Shuttle—CFCs.

The Rowland and Molina theory says that CFCs are so inert that there are no sinks (nothing to capture or destroy them) in the troposphere (the portion of the atmosphere below the stratosphere). Therefore, CFCs have very long lifetimes in the atmosphere.

According to the theory, the most common CFCs, CFC-11 and CFC-12, both very long lived, remain in the atmosphere about 50 and 120 years, respectively. After 5 years of cruising in the troposphere, the CFCs are transported into the stratosphere. There, ultraviolet rays break them up into "free" chlorine atoms (those that can combine with other elements) and other molecules. This chlorine atom then supposedly breaks down ozone molecules. The theory claims that this is a catalytic reaction, thus one single hyperactive chlorine atom may allegedly destroy hundreds of thousands of ozone molecules. This reaction only stops when the chlorine atoms bind with other atoms or molecules known as "reservoir compounds."

Not the Real Story

Fortunately, Rowland and Molina's version of atmospheric chemistry is not the real story. The hypothetical threat to the ozone is based on a set of flawed axioms and assumptions fed into computer models that spew out doomsday predictions. The required sequence of chemical reactions has never been observed even in the laboratory. It is all supposition. For example, this theory neither predicted, nor can it explain, the existence of the ozone hole over Antarctica (another new theory had to be manufactured to try to explain that).

If any of the axioms and assumptions underlying the ozone depletion theory are proven wrong, the whole edifice falls. The ozone depletion theory assumes, for example, that there are: no natural sources of chlorine; no sinks for CFCs other than the stratosphere; no influence from solar phenomena, including solar proton events; no long-term influence from atmospheric dynamics; no influence from atmospheric electricity and electrochemical reactions in the stratosphere; no influence from geomagnetic fields; and, that an increase in UV-B causes an increase in malignant melanoma skin cancers.

In fact, the theory is wrong on every one of these assumptions. The promoters of the fraud protect themselves by adding the caveat "significant" to these assertions (for example, that there are no "significant" natural sources of chlorine), but in practice they dismiss all factors other than those they choose.

Wrong Axioms, Wrong Methodology

More important than these errors is the fact that the

methodology used to arrive at this set of beliefs is wrong. What has happened in the ozone depletion theory is perhaps the best example of the New Age transformation of science into a "virtual reality" game in which computer models have replaced reality. Scientific truth, real world observations, nature, the biosphere, are all swept aside by the irrational belief that whatever image or numbers appear on the computer



Laurence Hecht

Sherwood Rowland (left) at a 1993 NATO Advanced Workshop on ozone depletion, where he got into difficulty answering a question on why there are no measured increases in UV if there is ozone depletion. Rowland put the blame on the measuring devices, but Dan Berger (right), inventor of the devices, said that was not the case.

screen is reality. The scientific hypothesis has been replaced by "mathematical models," or, more precisely, the theory of "systems analysis."*

These models are made up of collections of mathematical and chemical formulas that purport to represent the behavior of the atmosphere and its components. The models are "validated" by a hand-picked group of "experts" that compare the results of one model versus another.

Dissenting voices are summarily excluded from these deliberations or the complaints are simply ignored. This is called the "assessment process." Then, when all the models are compared, a "consensus" is formed and an edict is issued: Mankind faces doom because some model says this or that action will cause some damaging effects a half-century to a century down the line. These edicts are then promoted in the news media, and opposing views or evidence are seldom, if ever, mentioned.

Notes

*For a detailed refutation of "systems analysis" theory, see "Kenneth Arrow Runs Out of Ideas, But Not Words," an exposé of *Science* magazine's promotion of environmentalist mumbo-jumbo as peer-reviewed objective science, by Lyndon H. LaRouche, Jr., in *21st Century*, Fall 1995.

Continued from page 48

such a ban, and that the people who organized the treaty knew that there was no such evidence. Richard Elliot Benedick, the U.S. State Department official responsible for negotiating the Montreal Protocol, says so plainly in his book *Ozone Diplomacy*:¹²

The Montreal Protocol on Substances that Deplete the Ozone Layer mandated significant reductions in the use of several extremely useful chemicals. . . . By their action, the signatory countries sounded the death knell for an important part of the international chemical industry, with implications for billions of dollars of investments and hundreds of jobs in related sectors. The protocol did not simply prescribe limits on these chemicals based on "best available technology," which had been a traditional way of reconciling environmental goals with economic interests. Rather, the negotiators established target dates for replacing products that had become synonymous with modern standards of living, even though the requisite technologies did not yet exist.

At the time of the negotiations and signing, no measurable evidence of damage existed. Thus, unlike environmental agreements of the past, the treaty was not a response to harmful developments or events, but rather a preventive action on a global scale.

What Benedick knew, but did not say, is that the ban on CFCs would directly and indirectly cause millions of deaths per year, and that he supports this mass murder.

Seven years after the Montreal Protocol banning CFCs, the "evidence of damage" still does not exist, and the Montreal Protocol has served as the shining example for new international environmental treaties. The Climate Treaty, the Biodiversity Treaty, and others, have been signed despite the lack of scientific evidence, the argument being that the delegates are just following the example of the Montreal Protocol.

The ban on the production of CFCs took effect on Jan. 1, 1996, in the United States. This event, which most people may not even notice until their car air conditioners break down, is earth-shaking. The production of one of the most useful chemicals invented by man—literally, the life-blood of the world's food refrigeration system—is ending.

By preserving the food supply and keeping it wholesome, refrigeration is one of the major factors in the dramatic increase in human life expectancy in the past half-century. By removing these inexpensive, benign, and efficient coolants, the Montreal Protocol measures put at risk the poorest populations in the world, those for whom the more expensive refrigerant replacements will make the cost of refrigeration prohibitive. The entire worldwide food chain depends on CFCs. CFCs are used in refrigeration systems at the time crops are harvested and during transportation, storage, and distribution. This refrigeration "cold chain" depends on a steady supply of CFCs and HCFCs.¹³

There are no drop-in substitutes for CFCs and HCFCs for most refrigerators, freezers, and refrigerated transports, which means that as supplies disappear, existing equipment shuts down or is scrapped. Most nations of the world cannot afford to replace this equipment. As a result of the ban on CFCs, the

cold chain is already collapsing in the poorer areas of the world, particularly Africa and Eastern Europe.

Public health also suffers from this cold chain collapse, because most vaccines and many medicines need to be refrigerated. In addition, a ban on the agricultural pesticide and fumigant methyl bromide, for which there is no available chemical substitute, means that many countries will lose the ability to export their crops, and that dangerous pests will spread to other areas of the world to destroy crops and attack people. Methyl bromide is crucial to preserve food in storage, particularly grains. More than one third of the world's grain supply will be lost if methyl bromide is banned.

In 1992, international refrigeration experts estimated that the ban on CFCs was going to kill between 20 to 40 million people every year by the end of the decade, through hunger, starvation, and foodborne diseases. This is now an underestimate, given the addition of methyl bromide to the list of chemicals to be banned, and given the emergence of new and old diseases.

Can the Montreal Protocol and this nation's ozone policy be reversed? Sherwood Rowland and his colleagues often assert that there are "no credible" scientists or science opposing their theories. Their Big Lie stands exposed.

Rogelio A. Maduro is the co-author of The Holes in the Ozone Scare: The Scientific Evidence That the Sky Isn't Falling, and an associate editor of 21st Century.

Notes

1. Interview with Ulrich Grossman, head of the Crista Project at the University of Wuppertal, Nov. 15, 1995.
2. Kjell Henriksen and Valentin Roldugin, 1995. *Geophysical Research Letters*, Dec. 1, pp. 3219-3222.
3. A. Rabbe and S.H.H. Larsen, 1992. "Ozone Variations in the Northern Hemisphere Due to Dynamic Processes in the Atmosphere," *Journal of Atmospheric and Terrestrial Physics*, Vol. 54, pp. 1107-1112; and A. Rabbe and S.H.H. Larsen, 1992. "Ozone 'Minihole' over Northern Scandinavia," *Journal of Atmospheric and Terrestrial Physics*, Vol. 54, pp. 1447-1451.
4. Thormod Henriksen, 1994. "Ozone Layer and Ultraviolet Radiation," *From the World of Physics*, Vol. 4, pp. 108-114.
5. Sallie Baliunas, 1995. "Ozone Variations and Accelerated Phaseout of CFCs," Testimony presented at hearings of the House Science Committee's Subcommittee on Energy and Environment, Sept. 20.
6. Joseph Scotto, Gerald Cotton, Frederick Urback, et al., 1988. "Biologically Effective Ultraviolet Radiation: Surface Measurements in the United States, 1974 to 1985," *Science*, Vol. 239 (Feb. 12), pp. 762-764.
7. J.B. Kerr, and C.T. McElroy, 1993. "Evidence for Large Upward Trends of Ultraviolet-B Radiation Linked to Ozone Depletion," *Science*, Vol. 262 (Nov. 12), p. 1032.
8. P.J. Michaels, S.F. Singer, P.C. Knappenberger, 1994. "Analyzing Ultraviolet-B Radiation, Is There a Trend?" *Science*, Vol. 264, p. 1341.
9. R. Setlow, et al. 1993. "Wavelengths Effective in Induction of Malignant Melanoma," *Proceedings of the National Academy of Sciences*, Vol. 90 (July), pp. 6666-6667.
10. The most important papers presented at the conference were published in book form: *Ozone, Sun, Cancer*, edited by L. Dubertret, R. Santus, and P. Morliere (Paris: Les Editions Inserm, 1995).
11. J. Moan and A. Dahlback, 1995. "Ultraviolet Radiation and Skin Cancer: Cutaneous Malignant Melanoma," in *Ozone, Sun, Cancer*; see note 10.
12. Richard Elliot Benedick, 1991. *Ozone Diplomacy, New Directions in Safeguarding the Planet* (Cambridge, Mass.: Harvard University Press), pp. 1-2.
13. D.W. Kaminski, 1988. "Refrigeration and Worldwide Food Economy," presentation at the International Refrigeration Conference of the International Refrigeration Institute in Paris; cited at length in *The Holes in the Ozone Scare*, p. 187. Prof. Kaminski's work was done at the Institute of Agricultural and Foodstuff Economy, Warsaw.

Even Robert Watson, head of the Ozone Trends Panel that was instrumental in setting up the ozone depletion issue, admitted to journalist Alston Chase in 1989 that "probably more people would die from food poisoning as a consequence of inadequate refrigeration than would die from ozone depletion."

Why the U.S. Should Withdraw From the Montreal Protocol

There is too little knowledge and too much misrepresentation of ozone depletion.

by Hugh W. Ellsaesser, Ph.D.

The United States should delay implementation of the provisions of the Montreal Protocol and should initiate action to withdraw from the treaty. There are two primary reasons for this recommendation:

(1) We are still lacking in our understanding of the factors controlling stratospheric ozone.

(2) There has been a profound misrepresentation of the health and biological effects of UV (ultraviolet light) from the Sun.

It had been known since the SST CIAP Program (Climatic Impact Assessment Program of the Super Sonic Transport, 1972-1975) that chlorine in the stratosphere could catalytically destroy ozone. However, at that time there was no known significant source of chlorine going into the stratosphere other than the small amount expected from space launches. This was changed dramatically when F. Sherwood Rowland and Mario Molina discovered in 1974 that the ultimate fate of CFCs (chlorofluorocarbons such as freons) was photo-decomposition by the more energetic solar ultraviolet which penetrates the atmosphere only down to about 20 km altitude. This decomposition releases the chlorine from these compounds and allows it to move about in the stratosphere and to chemically destroy stratospheric ozone catalytically, that is, without being consumed itself.

Model calculations through 1990 concluded that continuing release of these compounds at then current rates would lead at equilibrium—the middle of the 21st century—to a column-integrated ozone decline of perhaps 5 percent, with most of the ozone destruction occurring near 40 km. Meanwhile, the Antarctic Ozone Hole was discovered in 1985 and the Montreal Protocol was adopted in 1987. The chief negotiator of this treaty, Richard Benedick, later wrote about it:¹



Stuart Lewis

Hugh Ellsaesser at a 1992 public forum on the ozone story in Washington, D.C.

Perhaps the most extraordinary aspect of the treaty was its imposition . . . against unproved future dangers . . . dangers that rested on scientific theories, rather than on firm data. At the time of the negotiations and signing, no measurable evidence of [ozone] damage existed.

The ozone hole was found to be due to a very rapid and nearly complete springtime destruction of ozone in the 12- to 22-km layer within the Antarctic winter polar vortex. The hole, of course, was not predicted and could not be explained without adding to the theory (1) particles of ice and/or nitric acid, (2) temperatures low enough to freeze these out of their nor-

Ozone model predictions

- AER
- Cambridge
- ◇ GSFC-PSC
- ▲ GSFC
- Italy
- ▼ MPIC
- MRI
- ◆ NCAR
- △ Oslo

Observed ozone levels

- TOMS
- △ SBUV
- DOBSON

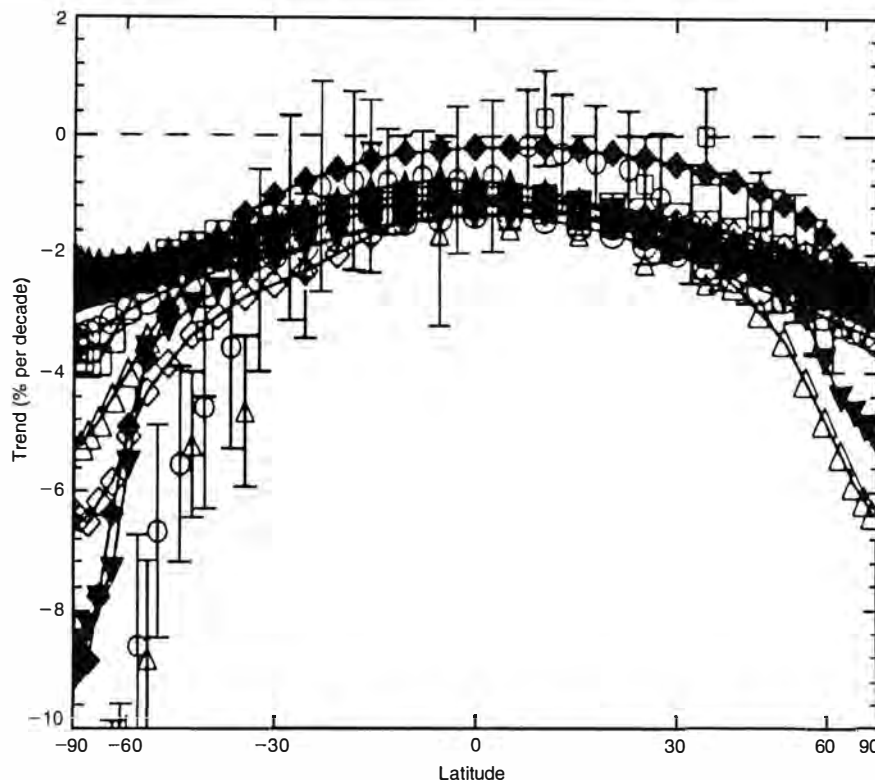


FIGURE 1

MODEL-CALCULATED CHANGES IN OZONE COLUMN DEPTH COMPARED WITH OBSERVATIONS (1980-1990)

Data from several ozone models overpredict ozone loss in the tropics, where the ozone amount is controlled primarily by chemistry, and underpredict ozone loss at higher latitudes, where the ozone amount is controlled primarily by transport. The levels of ozone actually observed by the TOMS satellite, the SBUV satellite, and the ground-based stations are shown by symbols within error bars.

Source: World Meteorological Organization, "Scientific Assessment of Ozone Depletion," 1994, Report No. 37.

mal vapor states, and (3) new reactions converting nitrogen to inactive or reservoir species and converting reservoir species of chlorine to active species.

An Ozone Trends Panel was formed, and after an 18-month review, its leader, Dr. Robert Watson (then of NASA, currently in the White House Office of Science and Technology Policy), issued an executive summary by press release March 15, 1988, claiming a 1969-1986 ozone loss of 1.7 to 3.0 percent from 30° to 64° north. Watson added:

[Our ozone] models do not predict that ozone decreased the way it did over the Northern Hemisphere during the past 17 years. Our models are not doing a good job, so we would have to say that they are underestimating decreases in the future.

The Ozone Trends Panel also made the completely unanticipated finding that the bulk of this ozone column decrease had occurred below 25 km; it did confirm a loss in ozone near 40 km, but only about half that predicted by the models.

Four years later, a flagrant case of influencing public policy by press release occurred when Dr. James Anderson, Chief Scientist of the NASA expedition, announced by press release on

Feb. 3, 1992, that the NASA ER-2 plane had detected over eastern Canada and northern New England the highest concentrations of chlorine monoxide it had ever encountered, even in flights into the Antarctic ozone hole, and suggested that an Arctic Ozone Hole could be imminent.

This promptly got the attention of William Reilly of the Environmental Protection Agency and of Al Gore in the Senate. Within 2 days, the U.S. Senate voted 96 to 0 to advance the ban on CFCs from the year 2000 to 1995. President Bush took this action for the United States on February 11, only 8 days after James Anderson's press release. On April 30, 1992, NASA held another press conference to announce that the observed high levels of chlorine oxide apparently were prevented from doing their worst by unusually warm winter air. This, however, did not prevent the Montreal Protocol Meeting in Copenhagen in November 1992 from adopting the 5-year acceleration of the phaseout of CFCs, and so on, as an official part of the treaty.

Unexplained Realities

The modelers still cannot explain the loss of ozone in the lower stratosphere below 25 km without large increases in sulfate particles, as occurred in 1992 and 1993 following the

eruption of volcano Pinatubo. As Dr. James Anderson told the *New York Times Magazine*, March 13, 1994:

The thinning of the ozone layer over other parts of the earth is accelerating, and we don't understand why, and we don't know how fast. We don't know what factors control the movement of ozone in the stratosphere. We don't know what part of the thinning is due to the natural dynamics of the atmosphere and what part is due to the destruction of ozone by man-made chemicals. We don't know much of anything. . . . We've confused computer models of the atmosphere with the real thing. We're making huge extrapolations based on nothing but models, and models are often wrong.

With the losses of ozone near 40 km and below 25 km noted above, there have been no losses of ozone in the middle stratosphere and essentially no losses in the ozone column over the equator when the depth of the column is controlled most completely by chemistry alone. This leads me to the conclusion that the disappearance of ozone from the lower stratosphere, with no loss in the more chemically active middle stratosphere, is caused by changes in the circulation of air from the troposphere to the stratosphere. The most recent atmospheric warming, beginning circa 1976, has been somewhat greater in the tropics than at other latitudes. This would be expected to lead to an acceleration of the so-called Hadley circulation, which drives tropical tropospheric air through the tropical tropopause into the lower stratosphere.

Because of the stability of the stratosphere—that is, increase of temperature with altitude—air in the stratosphere can rise no faster than radiative heating allows its temperature to adjust to that of the levels through which it is rising. If the upward motion is accelerated beyond this rate, the air will move horizontally, rather than vertically, because of its greater density.

Thus, any speedup in the Hadley circulation will lead to a greater proportion of the entering tropospheric air moving horizontally toward the poles rather than rising high into the stratosphere, forcing air at other latitudes to descend, that is, cause stratospheric overturning. This enhanced horizontal motion from the tropics to the poles will sweep ozone out of the lower stratosphere and into the troposphere. Such an acceleration of the Hadley circulation would thus explain the observed, but so far unexplained, increase in tropospheric ozone, as well as the decrease in ozone in the lower stratosphere accompanied by no change in ozone in the more chemically active middle stratosphere or in the total column over the Equator.

Health Effects

As for health effects, by current World Meteorological Organization estimates, a 1 percent decrease in the depth of the ozone column is equivalent to a 2.3 percent increase in normal skin cancer incidence. This, in turn, from U.S. cancer incidence statistics, is equivalent to moving 14 miles closer to the Equator. In addition, at the present time, there are 20 to 25 million sufferers from osteomalacia in the United States, including 25 to 50 percent of the women beyond menopause. Among these, there are more than twice as many bone frac-

“It should be noted that the ‘intolerable’ 5 percent decrease in ozone predicted to result from continued release of CFCs actually occurred in 1993 and is still with us. Have you noticed any of the intolerable effects this was supposed to produce?”

tures per year (typically of the femur or spine) as there are new cases of skin cancer per year.

Theoretically, additional ultraviolet would alleviate this condition in the growing and future generations, just as, theoretically, it would lead to additional cases of skin cancer. Considering the number of people affected and the relative severity of the health effects, increased ultraviolet appears to offer a *net health benefit*, particularly, since our bodies are much better able to warn us of too much ultraviolet than too little. At least one study by the Dutch has shown that susceptible women living on their tropical island of Curaçao suffer less from osteomalacia than does a comparable group living in the Netherlands.

It should also be noted that the “intolerable” 5 percent decrease in ozone predicted to result from continued release of CFCs actually occurred in 1993—and is still with us. Have you noticed any of the intolerable effects this was supposed to produce?

Hugh W. Ellsaesser retired from the U.S. Air Force after 20 years as an Air Weather Officer and from the Lawrence Livermore National Laboratory after 23 years of atmospheric and climate research.

Notes

1. Richard Elliot Benedick, 1991. *Ozone Diplomacy: New Directions in Safeguarding the Planet* (Cambridge, Mass.: Harvard University Press), pp. 1-2.



See the ozone documentary that lets scientists—not propagandists—tell you the facts about ozone depletion.

A 50-minute video produced by Belgian television BRTN
Distributed in the United States by
21st CENTURY

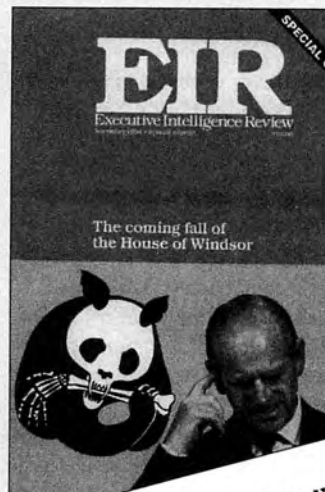
Available now on VHS \$20 plus \$3 shipping

Send check or money order (U.S. currency only) to:

21st CENTURY
P.O. Box 16285 Washington, D.C. 20041

Montreal Protocol Enforcers In Flight Forward

by Marjorie Mazel Hecht



Hugh Ellsesser: Statement on the Montreal Protocol

27 November 1995.
I strongly recommend that the U.S. delay action on implementation of the Montreal Protocol and begin action to withdraw from the treaty. The two major reasons for recommending this action are:

1. Health effects of increased ultraviolet have been exaggerated.
2. The major loss of ozone has been at levels below 22 km and chlorine are currently unable to explain such loss at the rates of 0.5% per year as in Area 5.

HEALTH EFFECTS

By contrast WHO estimates a 1% decrease in the depth of the ozone column is equivalent to a 2.3% increase in actual UV-B coming to the earth's surface. From U.S. winter business aviation, it is estimated to average 14 miles closer to the ground. In addition, at the present time there are 20-22 million sorties from continental to the U.S. including 25-30% of the winter beyond intercontinent. Among these there are over twice as many home Airbus per year (typical of the Airbus or space) as there are new cases of skin cancer per year.

Thereafter, additional ultraviolet would alleviate this condition in the growing and future generations just as, therefore, it would lead to additional cases of skin cancer. Considering the number of people affected and the relative severity of the disease, increased ultraviolet appears to offer a real health benefit, particularly, since our bodies are much better able to react to what is called than they are in spite of the thin atmosphere.

OZONE LOSS IN THE LOWER STRATOSPHERE

The major loss of ozone in the past 15 years has been at levels below 22 km in the lower atmosphere. Atmospheric chemists are currently unable to explain this without the presence of volcanic aerosol, i.e., the presence of unusual amounts of sulfuric and nitric acid.

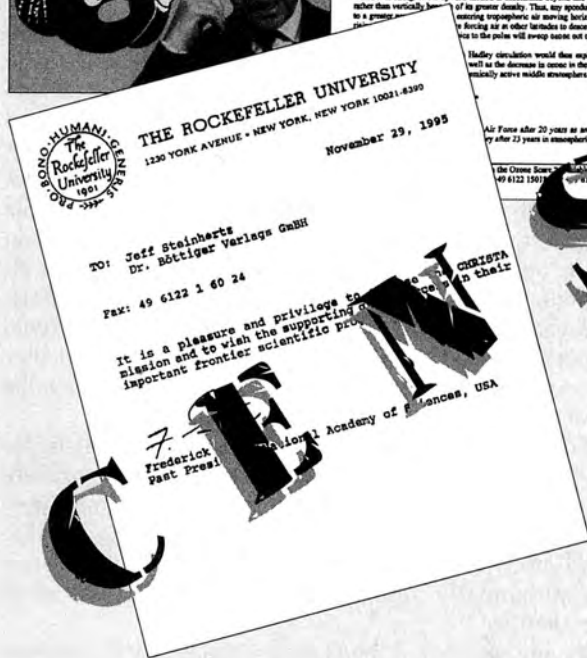
I believe it is far more likely that the disappearance of ozone from the lower atmosphere, with an loss in the more chemically active middle atmosphere, is due to changes in the circulation of air from the troposphere to the stratosphere. The most recent atmospheric reanalysis, beginning since 1978, has been somewhat greater in the tropics than at other latitudes. This would be expected to lead to an acceleration in the so-called Hadley circulation which drives tropical tropospheric air through the tropical tropopause into the lower stratosphere.

Because of the stability of the stratosphere, increase of temperature with height, air in the atmosphere can rise to lower than adiabatic values in response to adjust to that of the level through which it is rising. If the upward motion is accelerated beyond this rate, the air will move horizontally rather than vertically. If of greater density, this air moving in the Hadley circulation will lead to entering tropospheric air moving horizontally toward the poles rather than rising as at other latitudes to descend, i.e., atmospheric overrunning. This rise in the poles will sweep ozone out of the lower atmosphere and into the

Hadley circulation would thus explain the observed, but unexplained, well as the decrease in ozone in the lower atmosphere accompanied by locally active middle atmosphere.

Air Force after 20 years as an Air Weather Officer and then for 27 years in atmospheric and climate research.

The Ozone Book is published by Dr. Böttiger Verlag GmbH, 49122 Iserlohn, Germany.



The Montreal Protocol may still be alive, but it is not well. This fact became evident at the Vienna meeting of the Protocol signers in December 1995, which brought together delegates from 150 nations and nongovernmental organizations, along with industry representatives and United Nations staff, under the aegis of the U.N. Environment Programme (UNEP).

Publicly, the Malthusians running this seventh meeting of the Montreal Protocol declared a victory over the opposition, effusively praised themselves for their good work, and puffed their "consensus." Privately, however, U.N. spokesmen worried that their "most successful international environment treaty," which has forced a ban on CFCs, was in danger of falling apart because of wide-ranging opposition. Through the usual backroom methods of political arm-twisting and promises of funding for developing sector nations (which some might term bribery), however, the Protocol has not fallen apart—yet.

The most shocking demonstration of how worried these Malthusians are about preserving their consensus of big lies occurred Dec. 5. While Greenpeace demonstrators made attendees walk through an "ozone hole" banner at the front entrance of the meeting and freely leafletted delegates inside, a duly reg-

istered representative of this publication was grabbed by armed U.N. guards and prevented from distributing materials critical of the ozone hoax and its House of Windsor controllers.

While armed guards took Geoffrey Steinherz, a press representative for *21st Century* and *Executive Intelligence Review* (EIR) to a back room to interrogate him, other armed guards fanned out through the meeting room to snatch away any visible copies of the materials he was circulating. Many delegates who watched the blue helmets in action were stunned at the armed censorship operation. Although the radical antipopulation views of Elizabeth Dowdeswell, the New Ager who heads the UNEP, are well known, her deployment of armed guards to remove opposing materials from the meeting was seen as a politically extreme overreaction.

A U.N. spokesman later stated that the presence of these materials inside the Montreal Protocol meeting was "a major security breach," according to a report from an Austrian member of the press corps.

What UNEP Didn't Want the Delegates to Read

Among the banned materials that Steinherz had circulated were copies of the book *The Holes in the Ozone Scare: The*



Scientific Truth That the Sky Isn't Falling published by 21st Century Science Associates; the EIR report "The Coming Fall of the House of Windsor," which documents the top-down oligarchical control of environmentalists and their hoaxes; a statement from atmospheric scientist Dr. Hugh Ellsaesser, urging delegates to pull out of the Montreal Protocol; a preview of the results of a University of Wuppertal atmospheric project called Crista, whose spectrometer mapping of the ozone layer makes previous ozone models "rubbish," according to the researchers involved; a statement from Dr. Frederick Seitz, former president of the U.S. National Academy of Sciences, supporting the Crista project; and a leaflet summarizing the Malthusian aims behind the CFC ban and the death toll it will cause.

The banned leaflet addressed the delegates bluntly with the issue that motivates the ozone hoax: "The question now is whether the delegates to this conference will have enough morality to overturn the greatest instrument of genocide since that Austrian hippie, Adolf Hitler, was unleashed upon the world."

Despite the self-congratulatory bravado of the ozone depletion hoaxsters, who presented leading ozone depletion theorists with special achievement awards at the meeting, it is the

◀What the U.N. Environment Programme didn't want the Montreal Protocol delegates to see.

population question that most worries them about the fragility of the treaty. It is clear that many nations, especially in the developing sector, are not going to starve and kill their populations by eliminating inexpensive refrigerants or a vital insecticide for the sake of a big lie about ozone depletion, no matter what kind of "consensus" is formally adopted.

It will cost India, for example, \$2 billion to phase out CFCs, money the country does not have. Indian companies now export up to 60 percent of their refrigeration products to countries in west and southeast Asia and Africa, and the industry would lose an estimated \$250 million a year in foreign exchange under the CFC phaseout.

The Issues at the Vienna Meeting

This meeting of the Montreal Protocol signatories addressed the phaseout of hydrochlorofluorocarbons (HCFCs), which are the current replacement substances for CFCs, and the phaseout of methyl bromide, a widely used fumigant and insecticide.

India, on behalf of the Group of 77 Nonaligned nations, led the battle against the ozone depletion hard-liners from the West, demanding delays in further phaseouts until the necessary research was done to demonstrate the behavior of methyl bromide in the atmosphere. There was also a delegation of 10 U.S. farmers at the Vienna meeting, to make the case that methyl bromide should not be banned because the science did not support a ban, and to let the international delegates know that its ban would shut down a large section of U.S. agricultural exports. These farmers also wanted to make sure that the U.S. delegates didn't "sell out U.S. farmers."

But little of this battle made it into the press accounts of the Vienna meeting, except for the wailings of Greenpeace and other green groups that the sky was falling because their program for banning everything was not fully adopted.

The UNEP and the United States claimed victory. A U.S. State Department press release Dec. 8 crowed: "In Vienna today, the United States successfully negotiated significant new measures to help protect the Earth's ozone layer. Through the leadership of the U.S. delegation, the parties to the Montreal Protocol on Substances that Deplete the Ozone Layer agreed to controls on methyl bromide and hydrochlorofluorocarbons (HCFCs)."

A State Department official commented that they were "really pleased with the way things evolved" and that they could have gotten "a lot less." It is true that given the demands of the Group of 77, the United States could have come out with a lot less. But the measures agreed upon at the Vienna meeting are in reality a disaster for all concerned—both industrial and developing sector nations. The Montreal Protocol is built on a big lie, and until the various parties challenge this central lie—and challenge its Malthusian enforcers—all the nations involved will continue to lose.

Specifically, it was agreed at the meeting to advance the freeze on the use of HCFCs in developed countries from 2030 to 2020. For developing countries it was agreed that HCFCs would be phased out in 2040.

There was more contention over methyl bromide. It was

Continued on page 57

The Nobel Fraud

by Rogelio A. Maduro and
Torbjørn Jerlerup



AP Photo/Eric Roxfelt

In October 1995, the “inventors” of the ozone depletion theory, F. Sherwood Rowland, Paul Crutzen and Mario Molina, received the Nobel Prize for Chemistry. The prize was awarded not on the basis of scientific merit, but as a political statement of support for the promoters of the ozone depletion scare: “The three researchers have contributed to our salvation from a global environmental problem that could have catastrophic consequences,” states the Nobel citation. In other words, it is not the science, but the political agenda that matters. In this case, the political agenda will dramatically reduce the world’s population in the name of preventing a mythical catastrophe.

This Nobel motive is not at all hidden. Henning Rodhe, a member of the Swedish Academy of Sciences, told the Associated Press concerning this award that “the timing is good in view of the Vienna meeting [of the Montreal Protocol signatories]. “I personally hope that the Nobel prize will put some pressure on the participants,” Rodhe said.

Rodhe made it clear that one of the principal reasons for awarding this prize was to stifle the opposition to the ozone depletion fraud in the scientific community. “The Nobel prize will put a rest to this debate on whether the ozone hole really is a result of CFCs,” he told the wire service.

Rodhe is a close personal friend and collaborator of Crutzen, and has been preparing the way for the Nobel award for the past two years, appearing on Swedish national radio to speak against the book *The Holes in the Ozone Scare*, and against scientists who have publicly opposed the ozone catastrophe scenario.

Who Are The Prize Winners?

F. Sherwood Rowland is a professor of chemistry at the University of California at Irvine; Mario Molina, his former graduate student, is now a professor at the Massachusetts Institute of Technology; and Paul Crutzen is a professor at the Max Planck Institute for Chemistry in Mainz.

Industrialist Alfred Nobel specified in his will that the Prize be given to individuals whose acts have benefitted mankind. And what have these Nobel laureates done for mankind? Their writings and actions answer for them. Sherwood Rowland has spoken out internationally on behalf of the *equality of all species*. He was a leading signer of the so-called Morelia Declaration, a manifesto produced at the end of a one-week conference in Mexico, and published as a one-third page paid advertisement in *The New York Times*, Oct. 10, 1991.

◀ *F. Sherwood Rowland (left) receives the Nobel Prize for Chemistry from King Carl XVI Gustaf in Stockholm Dec. 10.*

Not unlike the terrorist Unabomber's manifesto against civilization, published last year in *The Washington Post*, the Morelia Declaration calls for the creation of an International Court of the Environment to prosecute those involved in "environmentally criminal activity" anywhere in the world. It concludes by stating that "if the latter half of the 20th century has been marked by human liberation movements, the final decade of the second millen[n]ium will be characterized by liberation movements among species, so that one day we can attain genuine equality among all living things."

Rowland is also on record stating that there are too many people in the world and the world's population has to be reduced. His promotion of the ban on CFCs, therefore, which will lead to the deaths of 20 to 40 million people worldwide every year, fits well with his expressed philosophy.

Paul Crutzen is active in the same circles as Rowland. Crutzen has been a "long-time . . . collaborator" of the International Institute for Applied Systems Analysis (IIASA) in Vienna, according to the Winter 1995 issue of IIASA's newsletter. A key center for both ecofascism and East-West espionage and back-channel operations, IIASA was founded by Soviet science operative Dzhermen Gvishiani (a founder of the Club of Rome), McGeorge Bundy of the Council on Foreign Relations, and Club of Rome Malthusians Aurelio

Peccei and Alexander King. IIASA's direct ties to the KGB became a subject of public dispute when the Reagan administration cut U.S. funding for the Institute because of its espionage activities.

IIASA worked closely with the Club of Rome, providing a "scientific" cover to justify the arguments put forward in the Club of Rome's *Limits to Growth* book and elsewhere: that there are too many people in the world, and that such overpopulation will lead to the destruction of the biosphere—unless draconian policies to reduce consumption and population are enforced.

The IIASA winter newsletter boasts that "during the 1980s, Crutzen frequently came to IIASA, where he collaborated intensively with an international and interdisciplinary group of research scholars on a project called "Sustainable Development of the Biosphere." Crutzen, according to the newsletter, showed how human activities, such as fossil-fuel combustion, agriculture, and industrial production threaten the biosphere. This "is the same work for which Crutzen has now won the Nobel Prize," the newsletter states.

"Paul Crutzen's work with IIASA continues," the article notes. "Today, he plays an important role as a member of IIASA's Steering Committee on Global Environmental Change." Crutzen has succeeded in turning science into politics by motivating "unprecedented global policy measures [to ban CFCs]," the newsletter states. "That is what makes this

Continued on page 59

Montreal Protocol

Continued from page 55

agreed that developed countries would phase out methyl bromide by 2010, reducing its use 25 percent by 2001 and 50 percent by 2005. The U.S. farmers considered this a "victory," because the EPA had instructed the U.S. delegates to push for a total phaseout no later than 2001, and now they have some breathing space.

For the developing countries, it was agreed to freeze the use of methyl bromide in 2002 at the average levels of use from 1995-1998. No phaseout was agreed on. In addition, it was agreed that next year's meeting will consider exemptions for critical agricultural use of methyl bromide, while the 1997 meeting will consider a phaseout schedule for the developing countries.

Victory?

When asked by this reporter why the United States considered these agreements such a big victory, a State Department official said that, previously, developing countries had demanded a 10-year grace period before a freeze on a substance, but the Vienna meeting had produced agreement for a freeze in only 8 years—by 2002! The same official noted that there was tremendous "dissent and contention" over methyl bromide, but pooh-poohed this. These countries claim that "people will starve" if methyl bromide is banned, he contended, but most of its use is for cut flowers, tobacco, and wood products.

Similarly, this official made light of the reported opposition



UNEP

UNEP head Elizabeth Dowdeswell: Her Montreal Protocol hasn't fallen apart yet.

from Russia to the ban on CFCs, which took place Jan. 1, 1996. (According to Russia's Interfax News Agency, Russia wants a four-year delay in the implementation of the ban, because it will cause severe dislocations in Russia, given the current economic crisis and lack of funds. Further, the Environment Ministry has reportedly written a paper questioning whether there is even a link between industrial emissions and ozone depletion.)

No matter how loudly the Montreal Protocol enforcers applaud themselves, however, or how many Nobel prizes they accumulate, the truth remains that the ozone hoax is caught between the continued publication of scientific evidence that exposes their fraud and the unwillingness of populations and governments to pay for this hoax with their own dead bodies.

Alfred Nobel's Honor Upheld in Stockholm



AP Photo/Martina Huber

The ozone depletion trio: (from left) Rowland, Molina, and Crutzen at their Stockholm press conference.

The Swedish chapter of the Schiller Institute upheld the honor of Alfred Nobel by reminding the Nobel laureates in chemistry of their betrayal of Nobel's principles at the award ceremonies Dec. 8, 1995. The signs of demonstrators greeting the Nobel laureates read: "The Nobel committees are desecrating the grave of Alfred Nobel" and "Alfred Nobel says: dissolve the Nobel committees."

A leaflet titled "Deadly Waste" was distributed at the ceremony and at a press conference for the laureates: "Will the Nobel Prize winners in chemistry of this year go down in history as the Lysenkos of the 1990s, and will the Nobel Prize be reduced to the status of an award from Lumumba University in the old Soviet Union?" the leaflet asked.

The press conference was marked by the chemistry laureates' arrogance. An American journalist who asked about the environmental "backlash," was told that the backlash "is not powerful enough," and is not "of our concern." Other questions on the science opposing their views elicited the response from Rowland that "no scientific opposition exists" to the depletion theory!

'Consensus Is Not Science'

The most interesting interchange occurred when a journalist for *Executive Intelligence Review* asked whether the Nobel Prize winners believed that science should be determined by "consensus," whether the ozone theory "has to be right just because an apparent majority applauds it," noting that this was exactly the approach undertaken to

promote Nazi race "science." When Rowland supported the consensus view, the Nobel laureate in Physics, Frederick Reines, who was also at the podium, countered Rowland, saying that you have to look at all "that is constant throughout all changes; this is science. Search for the eternal variety, the beauty of the world. Consensus is not science."

Rowland also faced criticism the next week at his speech before a panel at the annual meeting of the American Geophysical Union, Dec. 11-16, in San Francisco. Rowland concluded his ozone depletion talk by graciously telling the 300 or so in the audience: "Even though the [Nobel Prize] money is going into my bank account and not yours, everyone here should take credit in the work done and be proud of what we have accomplished."

This magazine's correspondent pointedly asked Rowland: "Should we each take pride and credit, as well, in the fact that millions of people will be killed because of your politically motivated, computer-generated scare stories?" The only reply Rowland mustered was to note that there was a mistake in the chemical formula on page 138 of *The Holes in the Ozone Scare*.

Rowland continued to rail against the ozone book in answer to subsequent questions, telling the audience that "if any of you wants to have an out-of-body experience, you just have to read this," and announcing that the book and its author are "the leading source of opposition to our work." At this point, the moderator closed the panel.

Continued from page 57

year's Nobel Prize in Chemistry so special."

A Desecration of Nobel's Aim

Awarding the Nobel Prize to such Malthusians is a desecration of the heritage of Alfred Nobel. Nobel stipulated in his will that the prizes should be awarded to "those who, during the preceding year, shall have conferred the greatest benefit of mankind" in physics, chemistry, medicine, and literature and "the best work for fraternity among nations." Unfortunately, after his death, the Swedish nobility took over the awarding of the Nobel Prizes. During his lifetime, Alfred Nobel had despised the European nobility, referred to the "Swedish nobility sickness," and termed the Swedish nobles "left-over insignias from demolished mental asylums."

These very same "left-overs," however, took their revenge by seizing control of the funds and the prize committees, and changing the requirements for the prizes. First, they removed the criterion that prizes should be awarded "to those who, dur-

ing the preceding year, shall have conferred the greatest benefit on mankind." Nobel had stipulated this because he had had to fight hard, from time to time, to raise funds to develop some of his 400 patented inventions, and he knew the need to financially support promising new ideas.

In contrast to Nobel's requirements, the prizes are now given a long time after the discovery, as a kind of reward to those who are agreeable to the agenda of the European nobility.

The prize in chemistry this year also violates another of Nobel's main principles: that the prize should promote industrialization and a common good. As Nobel explained it, "I mean general prosperity and not individual riches." Nobel would have abhorred the result of Rowland, Molina, and Crutzen's activities, for which they won the Nobel prize, effectively depriving Asian, African, Ibero-American, and Eastern European nations of food and medicines by collapsing the "cold chain" infrastructure, from refrigerated trucks, to retailers' coolers and freezers, to refrigerators in hospitals and clinics.

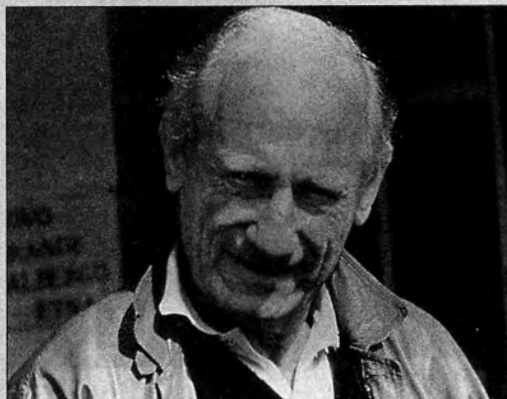
French Scientist: This Nobel Prize Is a 'Scandal'

Haroun Tazieff, one of France's best known scientists, issued the following commentary on this year's Nobel Prize in Chemistry.

The awarding of the Nobel prize has often surprised competent people; this has been true of many Nobel prizes in Literature, Peace, and Economics, fields that do not belong to the exact sciences. But there was never, to my knowledge, such amazement as the stupefaction that has touched the world of chemists. The three awards given for what is known today as the theory of the "ozone hole" are, in fact, a tremendous scientific scandal. The aim is to intimidate honest scientists who have tried to resist the catastrophism and the lies that have reigned for some 20-odd years on the ozone layer and the greenhouse effect.

I am speaking here in my own name, as a volcanologist for half a century; a former director at the French National Center for Scientific Research, and a former Secretary of State for Major Natural and Technological Risks, who led four successive missions to the Erebus Volcano in Antarctica. The arguments of Sherwood Rowland, Mario Molina, and Paul Crutzen are scientifically nonexistent when confronted with the reality of what is observed in Antarctica. The models they have elaborated, especially, have been constantly refuted by satellite and ground-based observations.

As for one of my fields of competence, volcanology, in which I have more than ordinary experience and, in particular, concerning the Erebus volcano, which from a height of 3,000 meters dominates the U.S. station at McMurdo Sound, where measurements have been made of its plume, Rowland et al., as well as their French colleague Gérard Mégie, have deliberately ignored the tremendous quantities of chlorine emitted 365 days a year by this crater, which is in constant activity. Instead they point to the minute quantities of chlorine contained in CFCs to accuse them of a so-called major crime: destroying the ozone layer in the



Volcanologist Tazieff: The aim of this Nobel prize in chemistry is "to intimidate honest scientists who have tried to resist the catastrophism and the lies" about the ozone layer.

stratosphere. Rowland et al. also omit to mention, deliberately, that those variations in the ozone content in Antarctica were discovered, not in 1985, as they would have us believe, but in 1956 by the first scientist to study the upper atmosphere there, Gordon Dobson. They are thus committing the major scientific crime, which is dissimulation of facts and ignoring earlier publications on the same subject.

What is going on in the world today corresponds, with modern propaganda means, to the catastrophist prophecies for the year 1000. For the year 2000, today's technologies are used by the international financiers to terrorize world opinion with lies alleged to be science, promoted by finance-corrupted "scientists." I do not hesitate to compare this big brainwashing enterprise and deliberate lying, to that of the Comintern between 1920 and 1955, which induced tens of millions of left intellectuals to transform themselves into as many militants willfully made stupid.

REMINISCENCES OF A MODEL BUILDER

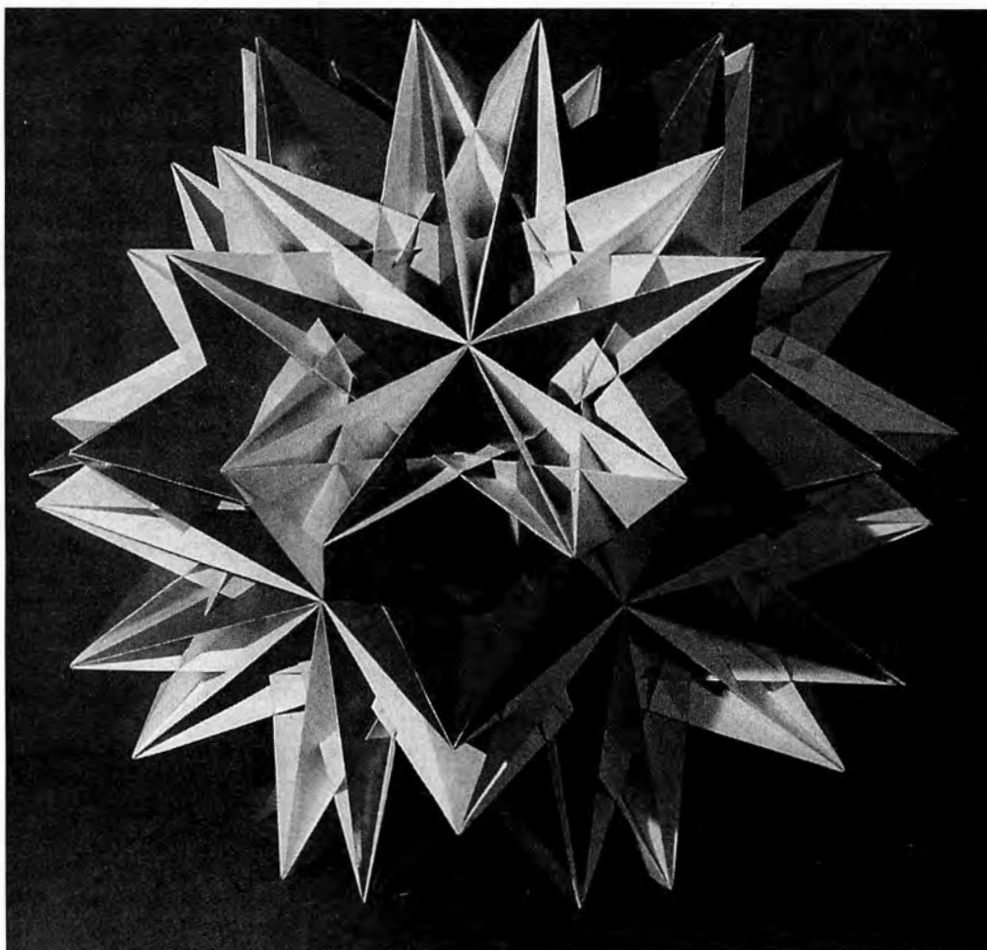
The Story of the Most Complicated Uniform Polyhedron

by George Olshevsky

I was delighted with your Winter 1995-1996 issue, because it featured two topics near and dear to me, namely, evolution and polyhedron models. Although I'm much more involved with the former right now, it is your article on Magnus Wenninger's polyhedron models,¹ and a series of interesting incidents from long ago in my past, that inspired me to write.

Twenty-six years ago (1970), I was a graduate student in computer science at the University of Toronto, developing a program for displaying four-dimensional polytopes via computer-generated motion pictures. One of my advisers was none other than H.S.M. Coxeter. Having made polyhedron models out of the usual materials (cardboard, glue, and paint) as a high-school student, I had been thinking about using some spare time to put together models of all the uniform polyhedra illustrated in Coxeter, Longuet-Higgins, and Miller's original paper.²

Some looked extremely challenging, and I was interested in seeing them "in the flesh." Coxeter, his eyes twinkling, told me that the work had already been done, and he pulled out his review copy of the manuscript of Father Wenninger's first book, *Polyhedron Models*.³ I was totally



Bruce Chilton

Bruce Chilton's model of the retrosub ditrigonal icosidodecahedron, the first accurate model of this uniform polyhedron ever constructed. The model is composed of 3,060 pieces and is about 3 feet across.

amazed that someone had beaten me to the punch, but I remained interested enough to still want to build one or two of the "monsters." Even Wenninger had had trouble with those, said Coxeter, and his book had to be delayed for the

longest time until he finally got them assembled.

In due time, Wenninger's book appeared, and I bought a copy. In 1972, I decided to start working on the absolutely most complicated uniform poly-

hedron of them all (in terms of the number of parts that had to be cut out in its assembly). I followed the instructions in the book, but unfortunately, the polyhedron *refused* to come together. Edges were the wrong lengths, and faces that should have been coplanar did not even come close.

Something had clearly gone awry. So I obtained Wenninger's address from Coxeter and wrote the good father a letter asking what might have gone wrong. He replied quite quickly, and he noted that the printer was partly to blame for the parts not going together properly; some of the templates had to be resized in order to fit the layout, which utterly destroyed their utility. He kindly sent me his original plans for all the "monster" polyhedra. These had been drawn by a mathematician/draftsman friend of his, who had laboriously calculated the coordinates of the various facial intersection points by hand. Among the plans were the drawings for the pieces of the monster I wanted to assemble.

A Second Try

Thus, in 1973, I began my second attempt to assemble the polyhedron. And again, the polyhedron failed to come together. This time the errors were more subtle: no more corresponding edges the wrong length, for example. But faces that should have been coplanar were not. It was doubly irritating, because I had to get a lot farther into the model before the errors became manifest, thereby spending much more time on a cause that turned out to be just as hopeless as before. By then, however, Wenninger and I were corresponding fairly regularly, and he had even visited me at my parents' home in Buffalo, New York.

After explaining that the polyhedron was still not coming together, I learned that the good father had "fudged" that particular polyhedron (but none of the others): He had constructed a model good enough to be photographed for the book, but *not* actually accurate. Indeed, when I checked the photo under a magnifying glass, I could see that certain edges that should have been collinear were not—that some were even wildly off. In other words, that particular polyhedron *had not yet been constructed*.

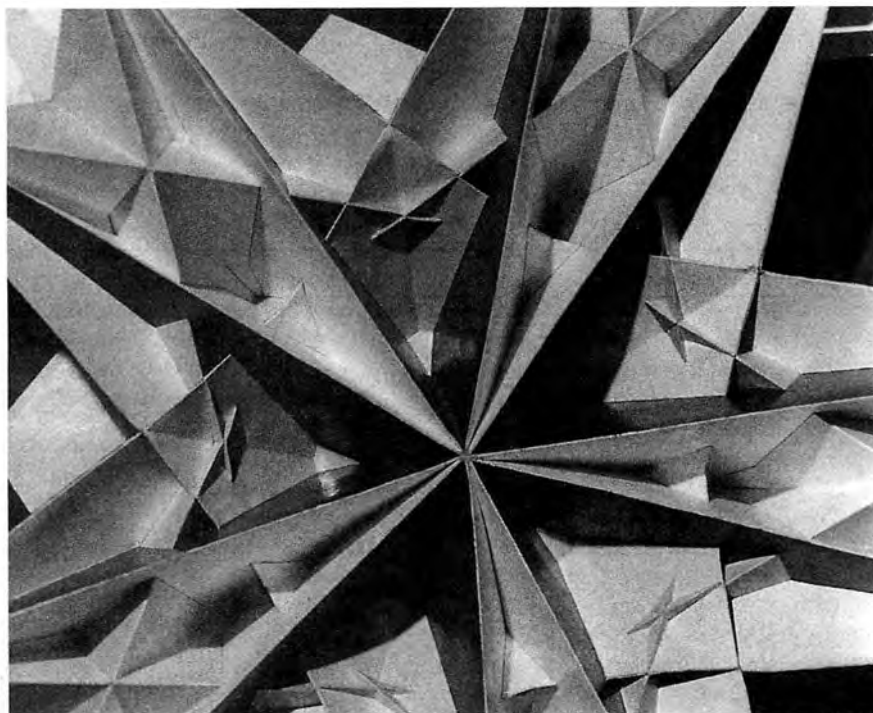
Furthermore, wrote Wenninger, the model he had built no longer existed. It had been hanging, stretched out of

shape by gravity, from the ceiling of his monastery in the Bahamas until the day workmen had to tear the roof off the building. Rain poured in through the hole, thoroughly soaking the cardboard, and the model crashed to the floor, smashing to bits "like a ripe tomato." He doubted whether he would ever have the wherewithal to rebuild it.

By 1974, I was working part-time for the University of Toronto Computer Centre and learning how to program in APL, a highly mathematical language,

the shapes of about half a dozen pieces. And, most peculiarly of all, a very tiny scalene triangle, part of the exterior of the polyhedron, had been entirely omitted from the plans that Wenninger had used (it was there—but the incorrect line moved it to the model's interior when it should have been on the exterior).

I could see at once that the faces that the computer had drawn were correct and would actually go together. More interestingly, I could see that the draw-



Bruce Chilton

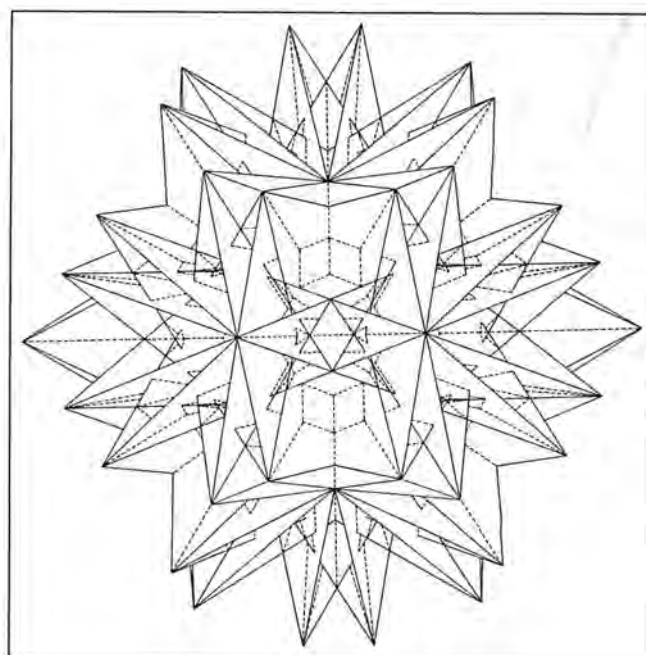
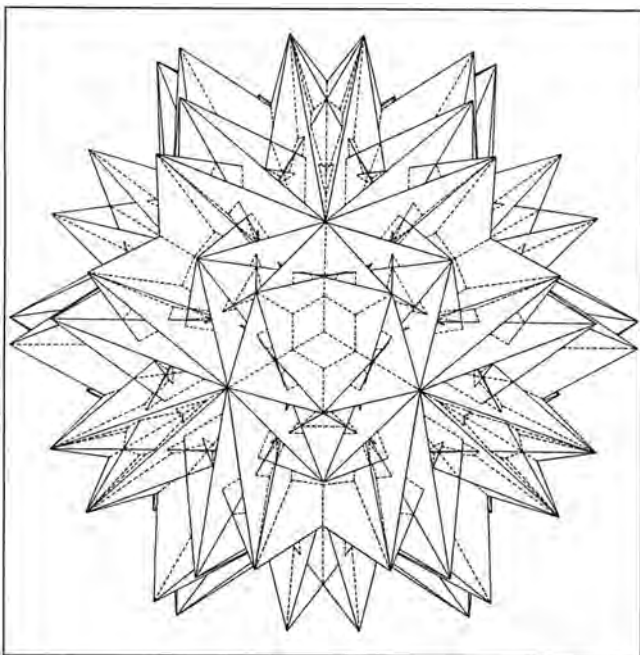
Detail of the interior of one of the 12 "rosettes" of five-fold symmetry that lie on the polyhedron's surface.

which was then a fad of sorts. As an exercise, I used APL's matrix-manipulating capabilities to determine the coordinates of the various intersection points of the faces of the monster polyhedron. Then I input those coordinates to a little plotting program I wrote, which accurately drafted out all the different pieces with a CalComp 30" incremental plotter. That was then a state-of-the-art piece of computer equipment, and it was my bailiwick as the Computer Centre's graphics expert.

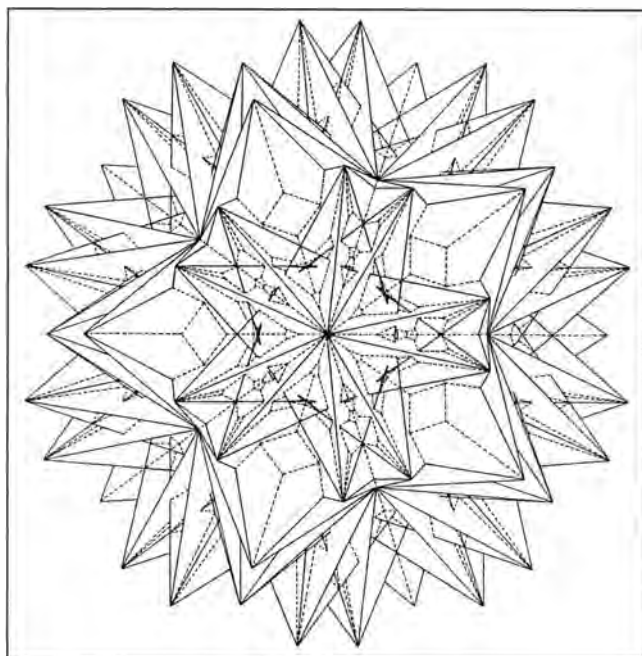
When I compared the computer-generated drawings with the plans Wenninger had sent me, I could see why the latter didn't work. *One line* had been drafted inaccurately, distorting

ing of the polyhedron by Miller that had appeared in the original paper by Coxeter, Longuet-Higgins, and Miller was also *ever so slightly incorrect!* Not only had no accurate model of the polyhedron been constructed, it had not even been accurately illustrated.

Unfortunately, at this juncture my spare time ran out, and I found myself unable to actually cut the requisite 3,060 pieces out and put the model together. So I asked an old friend, Bruce Chilton, whether he would be able to finish the job. Bruce is a long-time friend who had introduced me to the gentle and fascinating joys of polyhedron model-making (and other aspects of "Coxeterian" geometry) when I was still



Drawings by Bruce Chilton



Three views of the retrosnub ditrigonal icosidodecahedron, viewed along its three different axes of symmetry: five-fold, three-fold, and two-fold. There are 60 corners, points, or vertices; 180 edges; and 12 star-shaped (regular pentagrammatic) faces and 100 equilateral-triangular faces.

These faces, almost as large in diameter as the entire model, intersect one another very intricately but quite symmetrically. (The edges of intersection are shown with dashed lines in the drawings.) Forty of the triangles lie in 20 coplanar pairs. Six faces—one star and five triangles—meet at each corner. Although the faces are all regular polygons, they intersect one another to such a degree as to be almost impossible to discern in two-dimensional projections like these. Nevertheless, every peculiarly shaped piece lies on one of the stars or triangles.

in grade school (in the late 1950s). He is a truly formidable draftsman, with great patience and a very steady hand, and his polyhedron models, which decorate his home in Buffalo, are true masterpieces of the art.

Chilton had earned his doctorate in 1962 under Coxeter, and whenever we got together he always had some new and interesting polyhedron models to show me. Photographs of some of his models—three-dimensional shadows of four-dimensional star polytopes—were

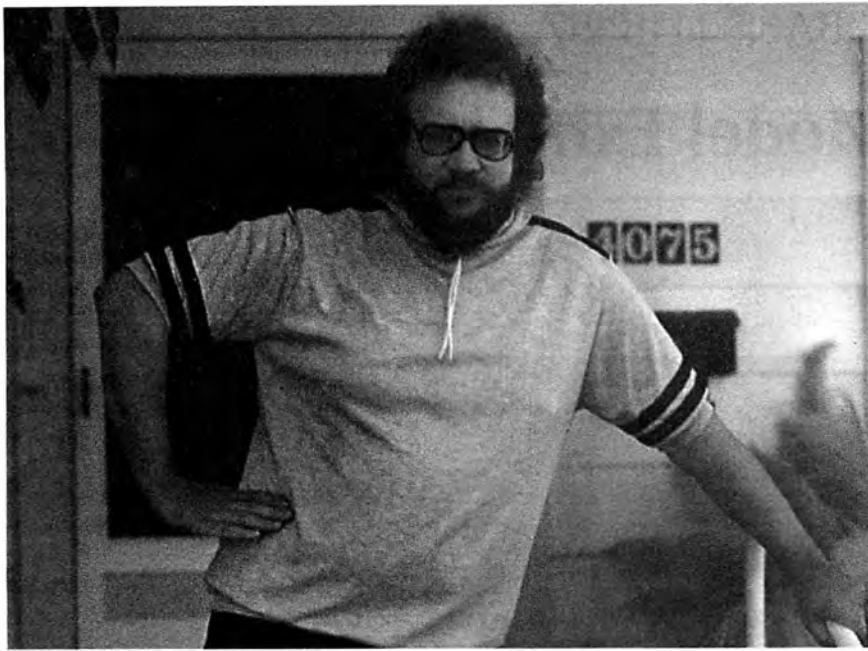
published in an issue of *Leonardo* many years ago. He is now a retired mathematics professor.

Bruce was intrigued that Wenninger had not built the real monster polyhedron, and he plunged into the work. A couple of months later, he called me in Toronto to tell me that the model was done. This was, I believe, sometime in March 1975. A Canadian friend—an erstwhile model-maker himself—and I drove down for the unveiling at Bruce's home, and there it was at last. Although

my drawings were done to an edge length of 20 inches, Bruce had to scale them up by 50 percent in order to handle some of the tiniest pieces, including that little scalene triangle.

'Yog-sothoth'

The whole model was almost a yard in diameter. Bruce and I dubbed it the "yog-sothoth," the name of a monster from the Cthulhu Mythos of H.P. Lovecraft. (We had taken to naming the intricate polyhedra after mythological deities so that we wouldn't have to keep



Joel McVey

Author George Olshevsky, who wrote the computer program that calculated and plotted the shapes of the faces, in a 1984 photo.

calling them by their tongue-twisting Greek names. The yog-sothoth is technically a "retrosnub ditrigonal icosidodecahedron.")

Bruce also produced three drawings of the polyhedron, as viewed along each of its three distinct axes of symmetry, the first accurate drawings of it that had ever been made. (The drawing along the five-fold axis of symmetry corrected the illustration in Coxeter, Longuet-Higgins, and Miller's monograph.)

The model remained in Bruce's home, essentially unknown to all but me and a few close model-making acquaintances, gathering dust for some 10 years. I abandoned mathematics and computers for self-publishing as a career and moved from Toronto to California. My correspondence with Wenninger and Coxeter had for all practical purposes ceased. Then in 1984, out of the blue, I received an invitation to attend a conference titled "Shaping Space" at Smith College in Northampton, Massachusetts. I volunteered to give two talks, one on the three-dimensional sections of the convex regular four-dimensional polytopes, the other on the building of the yog-sothoth.

I flew to Buffalo, whence Bruce and I departed for Smith College in a car full of his models, including the yog-sothoth, for public display. Both Coxeter and Wenninger were in the audi-

ence when I finished my talk and whipped a bedsheet off the yog-sothoth, to a nice round of applause from the attendees.

Since I was then (and still am) a desktop publisher, I entertained hopes of publishing an account of the construction of the first accurate yog-sothoth, including Bruce's true plans for building one, but time has so far not been available, and our booklet, *How To Build a Yog-Sothoth*, so far remains in hyperspace. Bruce's three views of the yog-sothoth appeared in the "Shaping Space" symposium volume. Perhaps sooner than I think, I'll actually get the booklet together. But meanwhile, I'm grateful for the opportunity to compose this account, a tiny contribution to the art of polyhedron model-making.

George Olshevsky is a freelance writer and paleontologist in Buffalo, N.Y., specializing in writing about dinosaurs. He may be reached by e-mail at Dinogeorge@aol.com.

Notes

1. Charles B. Stevens, 1995-1996. "In the Footsteps of Kepler: A Master Polyhedra Builder Demonstrates His Art," *21st Century* (Winter), pp. 66-68.
2. H.S.M. Coxeter, M.S. Longuet-Higgins, and J.C.P. Miller, 1954. "Uniform Polyhedra," *Philosophical Transactions of the Royal Society*, Vol. 246 A, pp. 401-450.
3. Magnus Wenninger, 1983. *Polyhedron Models* (New York: Cambridge University Press).

Second International Airborne Remote Sensing Conference and Exhibition



Hyatt Regency Hotel at
San Francisco Airport
and

NASA Ames Research Center at
Moffett Federal Airfield,
Mountain View, California, USA
24-27 June 1996



Join us in San Francisco at the premier forum designed to help you capitalize on the unique advantages of airborne remote sensing. Technical presentations and displays will highlight current technology and innovations. Exhibits will feature leading-edge airborne remote sensing equipment and services as well as more than 20 platforms equipped with remote sensing and mapping capabilities, including high-altitude aircraft, aerostats, airships, unmanned airborne vehicles (UAV), remotely piloted vehicles (RPV), helicopters, and an extensive representation of light, medium, and large aircraft.

Technical Program

- Airborne Platforms
- Sensors & System Technologies
- Processing & Integration
- Environmental Measurements & Mapping
- Emergency Response
- Resource Exploration, Management, & Mapping
- Infrastructure Mapping & Engineering Applications
- Reconnaissance
- Major Airborne R&D Programs

Preregistration deadline:
24 May 1996



Direct your inquiries to:
ERIM/Conferences
P.O. Box 134001
Ann Arbor, MI 48113-4001, USA
Telephone: 313-994-1200, ext. 3234
Fax: 313-994-5123
wallman@erim.org
<http://www.erim.org/CONF/conf.html>

95-20418 R3

'BEYOND NUMBERS' BANS LEIBNIZ

Geometrical Model Exhibit Misses Point

by Susan and Richard Welsh

"It is, unfortunately, our destiny that, because of a certain aversion toward light, people love to be returned to darkness. We see this today, where the great ease for acquiring learning has brought forth contempt for the doctrines taught, and an abundance of truths of the highest clarity has led to a love for difficult nonsense."

—Gottfried Leibniz,
"Against Barbaric Physics"

The "Beyond Numbers" exhibition at the Maryland Science Center in Baltimore promises all one can wish for in a museum: enriched understanding of the universe, its patterns of shape, motion, and growth—its nature. It is filled with well-made models that show some of the most revolutionary discoveries of human thought. Unfortunately, the promise is betrayed.

Rather than highlighting a universe "beyond numbers," the arrangement of exhibits, together with their accompanying texts, conspire to reinforce precisely those numerical and sterile axioms of mathematics, and of physical science generally, that the exhibition purportedly supersedes. The actual discoveries embodied in the models and other exhibits, are obscured and even falsified; the visitor is led to conclusions quite opposite from those of the scientists who made them, as to both their meaning in science, and the way in which creative discoveries, in general, are made.

"Beyond Numbers" was prepared as a collaboration between the George Washington University mathematics department, which was largely responsible for the concepts, and the Maryland Science Center, which contributed its expertise in exhibition and model-making techniques, and perhaps, its conceptions



Photos by S. Welsh

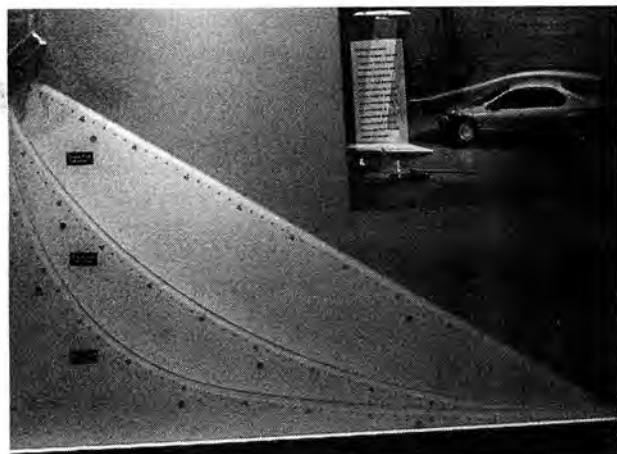
A child investigates knot and link models at the "Beyond Numbers" exhibit.

of what makes good pedagogy for the general public. Two sets of models were produced, a permanent exhibition at the Science Center, and a traveling version, now touring the United States and Canada.

The exhibit's fundamental flaw is that of standard classroom mathematics: the belief that once you have described a process mathematically, and given it a number, you have *explained* it. This is the crippling legacy of Galileo and Isaac Newton. Yet, it is the opposing scientific tradition of Gottfried Leibniz, Christiaan Huygens, the Bernoulli brothers, Carl Gauss, and Bernhard Riemann, that is mainly on display in the exhibition. For it is they, not Galileo and Newton, who actually penetrated to the "patterns" of the universe—although the names of

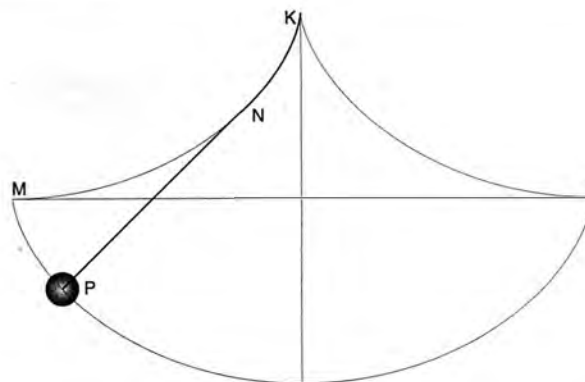
most of these scientists are never mentioned; and where they are, their work is misrepresented.

Most striking, is the absence of any mention of Leibniz's *Least-Action Principle*, although all the most interesting exhibits are profoundly linked by this most powerful concept. The Least-Action Principle asserts that the universe develops in such a way that each successive step is reached through the smallest possible expenditure of effort. In the 17th century, Pierre August Fermat showed that light, on passing through nonhomogeneous media, takes the path of least time between two points. Leibniz formulated this for the movement of bodies and machines. By Riemann's time, in the 19th century, this principle had been extended to virtually every field of physics.



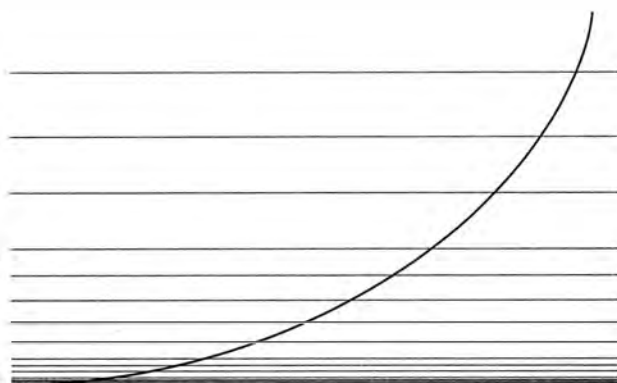
(a)

Discs run down three tracks: one straight and two curved. Visitors to the exhibit can test which path is the fastest. It's the middle curve, which is a cycloid.



(b)

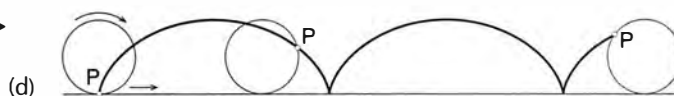
Huygens used the cycloid to make a pendulum clock, because no matter how wide the swing, the time of the swing remained constant.



(c)

How is the cycloid constructed? It is the curve traced out by a point on a circle as the circle rolls along a line.

◀ Bernoulli proved that the cycloid is also the path of a ray of light passing through a medium of constantly increasing density.



(d)

THE BRACHISTOCHRONE

The Brachistochrone

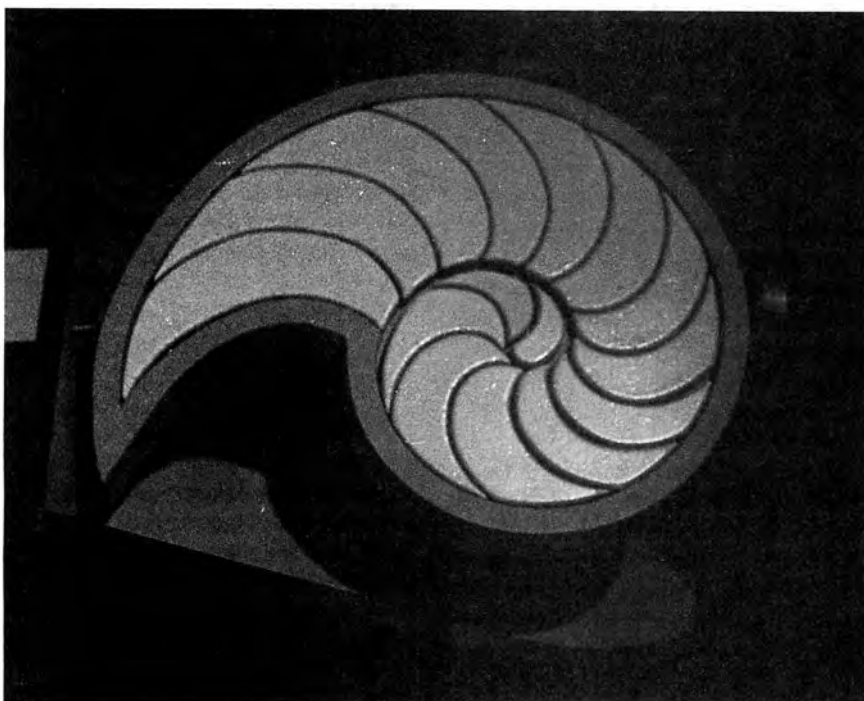
Let us consider one example from the exhibition: the brachistochrone model above.

As the text accompanying the exhibit explains, Johann Bernoulli, in 1696, put forward a challenge to the scientific world, to see who could first solve the following problem: Given two points, A and B in a vertical plane, what is the fastest path for a moving particle to descend, by its own weight, from A to B?

The curve in question would be the *brachistochrone*, from the Greek words for "shortest time."

The answer, which Bernoulli provided the following year, is shown clearly in the model in the Maryland exhibition, where discs run down three tracks: one straight and two curved. The museum visitor, perhaps expecting the shortest distance between two points to be a straight line, discovers that the middle curved track is the fastest. "Cool!" we

heard a group of youngsters exclaim, as they dashed off to push the buttons at the next exhibit, having devoted some 30 seconds of attention to the matter. (Had they stayed to read the text, they would not have learned much more: merely that the contest led to a feud between the Bernoulli brothers, and that the discovery of the brachistochrone created a new branch of mathematics called the calculus of variations—whatever that might be.)



This puzzle, made of wooden segments and about a meter in total length, shows the self-similar spiral growth pattern found in the nautilus shell and many other natural forms. This important reflection of the Golden Section proportion is presented in the exhibition merely in terms of the Fibonacci number series, which is but a pale shadow of the geometric conceptions involved.

The poverty of the approach can be illustrated by quoting a jingle on the Fibonacci numbers distributed to schoolchildren attending the exhibition. It is titled "Fibonacci's Fractal Fugue, or the Ratio's Recursive Round":

"One, one, two, three, five, eight, thirteen, twenty-one, then more.

"Fibonacci: one point six one eight zero three four." (Repeat.)

Step back a minute: Why is the middle track the fastest?

What the text does not say, is that the middle track is a *cycloid*, a curve that has some astonishing properties. Let's look at a few of them, which might usefully have been included in an exhibition such as this.

The cycloid is the curve produced by rolling a circle along a straight line, and mapping the path taken by one point on its circumference. It was Huygens (1629-1695) who discovered that a weight falls along a cycloidal path in the same amount of time, no matter from what point on the cycloid it begins its motion (this curve, he called the *tautochrone*, from the Greek for "same time").

A pendulum swinging along a circular path will not be *isochronic*; that is, the duration of its beats will vary slightly, depending on the amplitude of the swing. If you are trying to make a clock, this is a serious problem! Huygens found that if the pendulum could be forced

into a cycloidal path (see figure), its beats would be perfectly isochronic. He invented a clock using this principle, which was used in navigation, for the determination of longitude at sea.

Bernoulli reported his joy at discovering that his curve and Huygens's were the same: "You will be petrified with astonishment when I say that precisely this *cycloid*, the *tautochrone* of Huygens, is our required *brachistochrone*."

Huygens, Leibniz, and Bernoulli also showed that the path taken by a ray of light through a medium of continuously increasing density takes the form of a cycloid. Indeed, the cycloid has great significance for optics, where it appears as a *caustic*.

The cycloid is a *non-algebraic function*, a curve that cannot be constructed with ruler and compass, or be described by simple algebraic equations. The discovery of such curves, as economist Lyndon LaRouche has emphasized, is one of the most important break-

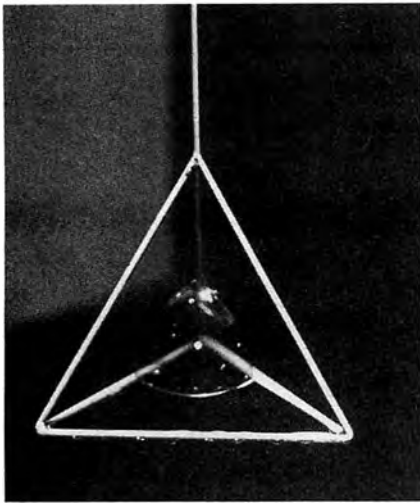
throughs in the history of science. It lifts mathematics out of the domain of mere numbers, and into the domain of physical reality.

This has everything to do with the minimal surfaces shown elsewhere in the exhibition. Yet the lonely brachistochrone model is set apart from them, in a corner of the room devoted to "problem solving." Way on the other side of a hall is a photo of a pendulum clock, but no effort is made to link the two exhibits conceptually. Instead, the pendulum clock accompanies a "hands-on" model of double-jointed pendulums, whose purpose in the exhibition is to underline the chaotic motion of such pendulums, as an introduction to trendy chaos theory.

The brachistochrone problem itself, and the fact that it is solved by a particular curve, is reduced to a mere example of engineering design: what is the best shape for a job (for example, streamlining cars to minimize wind resistance and designing dam cross-sections to minimize stresses). These are useful and important applications, and they are crucial to technological progress; but, they derive from the much more profound reality, that the brachistochrone curve, and curvature in general, define the workings of the universe itself.

LaRouche summed up the importance of the cycloid, in an article in *Fidelio* magazine ("On the Subject of Metaphor," Fall 1992, p. 25): "No student should be graduated from any secondary school, unless he or she has assimilated the treatments of cycloid, tautochrone, and involute-evolute relationships as put forth in Huygens's work on these subjects. Without that, and without the mastery of the tautochronic principle of least action for refraction of light as Leibniz and the Bernoullis set this forth during the 1690s, there could be no competent grounding of the student in the barest prerequisites of as much as uttering the term 'modern physical science.' (How many science and engineering professionals today have met that requirement?)"

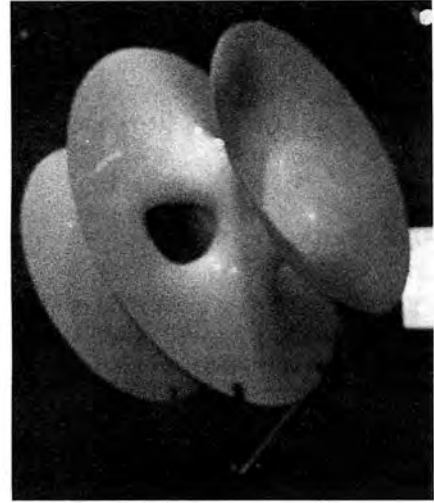
Indeed, LaRouche writes, the work of Leibniz, Huygens, and the Bernoullis shows that the universe of Galileo, Descartes, and Newton—the universe of arithmetic-algebraic functions, derived from pairwise, linear interrelationships—*does not exist*.



(a)



(b)



(c)

MINIMAL SURFACES

Visitors operate a display that dips wire frames into a soap solution, creating a minimal surface. The minimal surfaces are examples of Leibniz's Least-Action Principle, although the text does not say so.

A tetrahedron dipped into soap solution (a) captures a bubble at the center of a minimal surface that links the sides of the wire frame.

A catenoid is formed (b) as one ring sits in the soap solution, and a second ring is raised out of the solution by the operator. The shape is somewhat obscured by the foam that has formed because of heavy use under museum conditions. The catenoid, a surface of negative curvature, is formed by the rotation of a curve called a catenary.

A sculpture of a Costa surface (c). Discovered in the 1980s, the Costa surface is a minimal surface that can be extended forever without intersecting itself, like the catenoid, the helicoid, and the plane.

Biological Applications

Elsewhere in "Beyond Numbers," we are shown natural phenomena that, like the cycloidal brachistochrone, beg for application of the Leibniz Least-Action Principle, particularly the flocking and schooling behavior of birds and fish. A video clip of a flock of birds in flight, and an accompanying computer simulation of this remarkable behavior, greet the visitor almost immediately on entering the hall.

Assuming the viewer can stomach the science-fiction-like "New Age" pseudo-music, and story line of the inter-species love affair between a fish of the water and a bird of the air, what does the visitor then learn? That a computer can "simulate" flocking by three simple, *numerical* criteria, to be sought by each *individual* animal: Avoid objects; stay at the same speed as others in the flock; and move to the center of the flock.

Not once is there mention of the *fluid dynamics* (aero- or hydro-) of locomotion in these media—although it is well known that even such relatively simple flocking behavior as the V-formation of migrating geese minimizes flight effort by all trailing birds, which take advantage of the vortical air patterns created

by the preceding birds. A flock both creates aerodynamic flows, and takes advantage of the flows it creates: a textbook case of least action, related to both the minimal surface exhibit and the brachistochrone. But one would never know it from this exhibit.

Nor is animal behavior in the large the only biological application of mathematics "beyond numbers." In the "knots" section (part of the broader topology exhibit), a short reference tells us that mathematical analysis of knots has been applied to DNA research: It turns out that DNA functioning cannot be understood without consideration of its three-dimensional topological properties. Yet, no mention is made of the revolutionary implications of this concept: that neither heredity, nor cell biochemistry generally, can be properly understood using the notions of linear, one-on-one causality (or the only superficially "complex" extension of that notion, by means of "systems analysis" and its pseudo-novel offspring, "chaos" and "complexity" theory).

The visitor is not even told what DNA is, or that the orthodox notion of its function is as a linear cipher made of beads on a string. Nor is there any suggestion

that once one accepts molecular topology as causally significant, the floodgate is opened to considerations of electromagnetic field phenomena on the *sub-atomic* scale: a very subtle, and very potent, biophysics, far "beyond" the prevalent reductionist axioms of biological causality residing in the molecules-and-larger domain.

Despite all these problems, the exhibition is worth visiting. Many of the exhibits *do* touch on the fundamental properties of the universe. They work well; and if you prepare yourself with study of some of the works listed below, they can be real eye-openers. But, until the issues addressed by LaRouche are understood, there will not be a competent exhibition "Beyond Numbers."

For Further Reading

- Lyndon H. LaRouche, Jr., 1992. "On the Subject of Metaphor," *Fidelio* (Fall).
- Lyndon H. LaRouche, Jr., 1991. *The Science of Christian Economy and Other Prison Writings* (Washington: Schiller Institute).
- Ralf Schauerhammer and Jonathan Tennenbaum. "The Scientific Method of Bernhard Riemann," *21st Century Science & Technology*, Part 1 (Winter 1991) and Part 2 (Spring 1992).
- Steven Vogel, 1994. *Life in Moving Fluids* (Princeton, N.J.: Princeton University Press).
- Carol White, 1991. "Hyperbolic Functions, the Catenary, and the Human Mind," *21st Century Science & Technology* (Spring).

The Solar-Terrestrial Campaign

by David Cherry

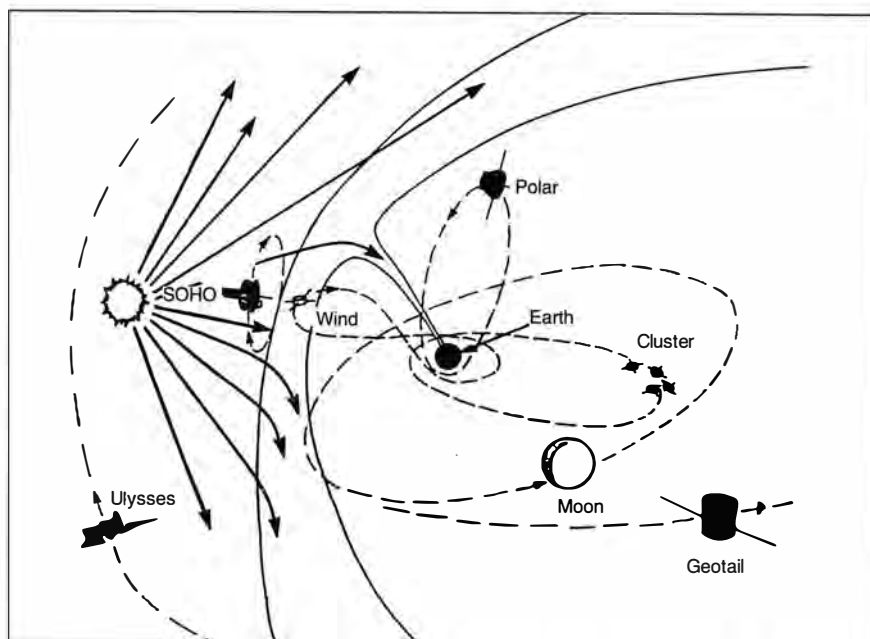
The Sun ejects a gigantic blob of magnetized gas at a speed of well over a million miles per hour. Its mass is that of a million aircraft carriers and it is headed straight for Earth.

Science fiction? No. These coronal mass ejections (CMEs) were first discovered in the early 1970s. Smaller and slower versions occur more frequently and, of course, they don't all head for Earth. But some do come our way, and CMEs occur more often at the height of the 11-year sunspot cycle.

Fortunately, the Earth has its own protective magnetic field, the magnetosphere. This is definitely a help. The day side (sunward side) of the magnetosphere usually extends to about 10 Earth radii. If the blob slams into our magnetic shield, it compresses it—sometimes to less than 7 Earth radii—and transfers energy to it. The collision creates an extraordinary magnetic storm on Earth that damages electronic equipment at a cost of even billions of dollars, interferes with radio transmissions, and produces a beautiful aurora.

This is the dramatic side of solar-terrestrial science in the 1990s. Big geomagnetic storms are not new, of course. The drama for science is our emerging ability to identify the storms' origins on the Sun, and the possibility of even predicting geomagnetic storms days in advance by observing the Sun, and protecting against them. We don't yet know what causes CMEs, but some solar scientists conceive of them as the final stage of a sequence: evolution of the Sun's magnetic field, a resulting energy buildup leading to the formation of instabilities, and energy release in the form of coronal mass ejection.

The 1990s is the decade of simultaneous observation of events or conditions in solar-terrestrial space by multiple instruments, situated at different vantage points. For example, four spacecraft were in place to witness the massive collision of a magnetic cloud (from a



NASA

Man's presence in solar-terrestrial space has become dense enough to improve our conceptual grasp of the solar-terrestrial relationship. The unbroken curves are some of Earth's magnetic field lines.

coronal mass ejection) with Earth's magnetosphere during Oct. 18-20, 1995 (see figure, next page).

Most solar-terrestrial science, however, has no dramatic story to introduce it, and much of it does not even produce any photographic images. Its interest lies, rather, in mapping the unknown and pursuing the unexplained and anomalous, as one would expect.

Now we are in the midst of ISTP, the International Solar-Terrestrial Physics Science Initiative, a collaboration among NASA, the European Space Agency (ESA), and the Japanese Institute of Space and Astronautical Science (ISAS).

ISTP is obtaining simultaneous and closely coordinated measurements from the spacecraft Geotail (ISAS), Wind and Polar (NASA), and SOHO and Cluster (ESA). Geotail explores the night side of Earth's magnetosphere, which is drawn out into a tail by the action of the passing solar wind. Wind is positioned to analyze the solar wind before it is altered by encountering the magneto-

sphere. Polar measures the solar wind over Earth's magnetic poles and observes the energy exchange between the magnetosphere and the ionosphere by imaging the northern aurora. Cluster is a group of four craft that will fly in a tightly controlled, tetrahedral formation, to obtain precise measurements of solar wind variations in space and time. SOHO is described below.

These various observations are also coordinated with others obtained by equatorial satellites and specialized ground-based radar. ISTP began with the launch of Geotail in July 1992 and of Wind in November 1994. SOHO, the Solar and Heliospheric Observatory, was launched in December 1995 and Polar in February of this year. Cluster is soon to be launched.

Our presence so densely in solar-terrestrial space marks a milestone in human expansion beyond Earth's surface. It is less dramatic than the planetary missions, yet essential as infrastructure for the safety of all manned and unmanned

space missions, and an important contribution to life on Earth itself.

Here we report some results from *Ulysses* and *Yohkoh*, launched in 1990 and 1991, respectively, before the 1992 launch of *Geotail*, the first of the ISTP satellites. We also discuss a major anomaly that *SOHO* will investigate.

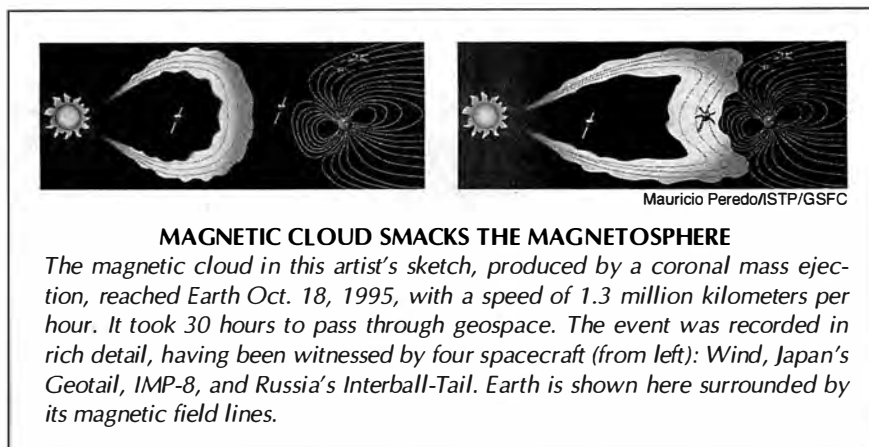
Ulysses

Until *Ulysses*, investigations of the Sun and the solar wind had been confined to a region within 7 degrees of the ecliptic—the plane of Earth's orbit—except for the *Pioneer* and *Voyager* missions to the outer planets. The *Ulysses* mission changed that, by putting the spacecraft—after a swing around Jupiter in February 1992—in an orbit around the Sun that is inclined 80 degrees to the ecliptic. The spacecraft reached 80 degrees south solar latitude in September 1994, and 80 degrees north latitude in July 1995. This scan was near sunspot minimum, the time of the quiet Sun. *Ulysses* will visit these extremes again between late 2000 and late 2001, at sunspot maximum.

According to one theory of the solar wind, its speed should steadily increase toward the poles. Another theory foresaw a maximum speed at midlatitudes. But *Ulysses* found low speed wind (about 400 km/sec) at low latitudes, with a sudden shift to a high speed wind, relatively smooth and free of disturbance, of about 750 km/sec, increasing to 800. Where the transition occurs—anywhere from a latitude of 20 to 45 degrees in each hemisphere—depends on the tilt of the heliomagnetic streamer belt, the equatorial source of low speed wind on the quiet Sun that is obliterated as solar activity goes toward its maximum. So the return to the poles in 2000-2001—when solar activity will be great—should enrich our picture of solar windspeed variations.

Ulysses measurements of mass loss at the poles—specifically of mass flux density—confirms a previously disputed view that the solar wind cannot result from thermal evaporation alone. Apparently an additional driver is necessary. Could it be hydromagnetic waves? Turbulence in the corona? Mini-explosions at the base of the corona? These are the proposals.

An even more unexpected result of *Ulysses* observations is that the densities of the various particles thrown off by the



MAGNETIC CLOUD SMACKS THE MAGNETOSPHERE

The magnetic cloud in this artist's sketch, produced by a coronal mass ejection, reached Earth Oct. 18, 1995, with a speed of 1.3 million kilometers per hour. It took 30 hours to pass through geospace. The event was recorded in rich detail, having been witnessed by four spacecraft (from left): Wind, Japan's Geotail, IMP-8, and Russia's Interball-Tail. Earth is shown here surrounded by its magnetic field lines.

Sun have stable variations with time—that is, they come in waves, and the waves persist into the interplanetary medium.¹

Yohkoh

The *Yohkoh* satellite, originally called *Solar-A*, is a joint project of ISAS and NASA. It is equipped with telescopes for hard and soft X-rays, and spectrometers for X-rays and gamma-rays. These are for the study of the general behavior of the corona and of solar flares. X-ray and gamma-ray instruments are needed because of the extremely high temperatures: The corona is more than 1 million K, and in many flares, plasmas 10 times hotter are shot outward from the chromosphere and the inner corona, where the flares originate. X-rays are produced abundantly at such temperatures.

Yohkoh investigators point out that in the corona, "magnetic pressure dominates the gas pressure, so the X-ray features mimic the structure of the magnetic field. The X-ray loops in the SXT images [Soft X-ray Telescope aboard *Yohkoh*, see back cover] do not represent all of the magnetic field lines or flux tubes in the corona, only those where conditions are right for X-ray production, either hotter or denser than immediate neighbors."²

Observations with the *Yohkoh* SXT led in February 1996 to the discovery that coronal mass ejections that are heading for our magnetosphere can be detected at the time of lift-off as a dimming of the corona. With this discovery, it has become possible to provide 50 to 70 hours of advance warning for the resulting geomagnetic storms. Previously, it had only been possible to see such CMEs as appear in profile above the limb of the Sun, but these are not the ones coming in Earth's direction. And

all CMEs become too diffuse to be imaged after lift-off.

SOHO

The Solar and Heliospheric Observatory (*SOHO*), launched last December, is a joint project of the European Space Agency (ESA) and NASA. It is equipped with 11 instruments to study the Sun, the solar wind, and the solar-terrestrial relationship: telescopes, spectrographs, and particle detectors. There is a strong emphasis on the ultraviolet and extreme ultraviolet spectral ranges.

The observatory is stationed 1.5 million km from Earth, at the L1 libration point, which remains between Earth and the Sun as the Earth orbits. This gives *SOHO* a continuous view of the Sun, without the interruption of night.

One of the many *SOHO* projects is to study the discontinuities in temperature between layers of the solar atmosphere. From the top of the photosphere, up through the chromosphere, to the inner corona, there is an increase in temperature from 4,000 K to 1 or 2 million K, even though the corona is more distant from the center of the Sun by several thousand kilometers. There are also discontinuities within this transition. No one knows what maintains the corona at such temperatures, but the turbulence of the Sun's magnetic fields is a possible source of the energy.

Discoveries about the Sun and the solar wind also increase our understanding of stars in general. The Sun will continue to be the only star that can study at close range for some time to come.

Notes

1. "Those Impossible Waves in the Solar Wind," *21st Century*, Winter 1995-1996, pp. 2-3.
2. L. Acton et al., 1992. "The *Yohkoh* Mission for High-Energy Solar Physics," *Science*, Vol. 258 (Oct 23), p. 619.

Subject Index

Astronomy and Astrophysics

- News Brief. "Nature Turnabout Favors 'Endangered' Mt. Graham Telescopes." Spring, 10.
- News Brief. "Asteroid Site Gives Clues to Dinosaur Extinction." Spring, 11.
- News Brief. "Prototype for New Generation of Large Telescope Mirrors Is Proven." Summer, 5.
- Cherry, David. "Hubble's Quasar Images: A Moment of Truth." Summer, 31.
- Editorial. "Celebrating Kepler and Riemann." Fall, 3.
- News Brief. "Federal Court of Appeals Blocks Mt. Graham Binocular Telescope." Fall, 8.
- Olson, Jim. "Great Heavenly Balls of Ice." Fall, 16.
- Editorial. "The Kepler Year." Winter, 2.
- Editorial. "Those Impossible Waves in the Solar Wind." Winter, 2.
- News Brief. "Act of Congress to End Obstruction of Mt. Graham Telescope." Winter, 9.
- Schauerhammer, Ralf. "Johannes Kepler's *Mysterium Cosmographicum*: A Guide to the Harmony of the Mind and the Universe." Winter, 22.

Biography and Obituary

- Soldano, B.A. ["Linus Pauling (1901-1994): Two Views"] "A Life of Scientific Contribution." Spring, 6.
- Jukes, Thomas H. ["Linus Pauling (1901-1994): Two Views"] "Pauling's Other Side." Spring, 6.
- Huginin, Carol. "It's Time to Bury Darwin and Get On with Real Science." Spring, 32.
- Huginin, Carol. ["The Darwin Debate"] "Bury Darwin: It's Overdue." Winter, 11.
- News Brief. "In Memoriam: Paleontologist C. Bertrand Schultz." Summer, 5.
- Hartmann, Caroline. "A Tragedy of Science: The Life of Max Planck." Summer, 18.
- White, Carol. "From Hot to Cold Fusion: A Look at the Life of Yoshiaki Arata." Summer, 37.

Biotechnology and Food Irradiation

- News Brief. "N.Y. Bill to Repeal State Ban on Irradiated Foods." Spring, 11.
- News Brief. "Food Irradiation: Spices Meet With Consumer Approval." Fall, 8.
- News Brief. "Biotechnology Industry Group Launches Information Campaign." Winter, 9.

Development Policies

- Editorial. "How to Stop Proliferation." Spring, 3.
- News Brief. "Edward Teller Calls for Putting Nuclear Back Into DOE." Spring, 10.
- News Brief. "Nuclear Desalination an Option, Says Jordanian Expert." Spring, 10.
- News Brief. "Indonesia to Build 600-Megawatt Nuclear Plant in Java." Spring, 11.
- Merry, Marcia. "Mideast 'Mega-projects' to Build Infrastructure and Peace." Spring, 12.
- LaRouche, Lyndon H., Jr. "Great Projects Are the

- Path to Global Economic Recovery." Spring, 16.
- Editorial. "Pursuing the Genie of Cold Fusion." Summer, 2.
- LaRouche, Lyndon H., Jr. "Affordable Energy is Not Enough." Summer, 6.

Earth Sciences

- News Brief. "Asteroid Site Gives Clues to Dinosaur Extinction." Spring, 11.
- Ellsaesser, Hugh W. "Atmospheric Scientist 'Shocked' by NASA Ozone Announcement." Spring, 52-53.
- Hecht, Marjorie Mazel. "The Unnatural Case of NASA and Hydrogen Fluoride." Spring, 52.
- Grenier, Emmanuel. "French Volcanologist: Volcanoes Emit Tons of HF." Spring, 53.
- Freeman, Marsha. "Global Climate Change: 'We Are Unable to Answer Even the Most Basic Questions.'" Spring, 54.
- White, Carol. "El Niño, Not Global Warming, Likely Culprit in Weather Anomalies." Spring, 55.
- News Brief. "In Memoriam: Paleontologist C. Bertrand Schultz." Summer, 5.
- Maduro, Rogelio A. "Kobe Earthquake Sounds Alarm: New Infrastructure Can Lessen Future Quake Damage." Summer, 54.
- Maduro, Rogelio A. "Predictions for Los Angeles." Summer, 55.
- Maitra, Ramtanu and Maduro, Rogelio A. "Major Earthquake Expected In The Himalayas." Summer, 57.
- Ellsaesser, Hugh W. "An Open Letter to the IPCC: Climate Reality, Not Politics, Should Determine Policy." Summer, 58.
- Olson, Jim. "Great Heavenly Balls of Ice." Fall, 16.
- News Brief. "German Spectrometer Produces Global Ozone Map in 3-D." Winter, 8.

Environmentalism

- Editorial. "21st Century Announces Annual Panda Award." Spring, 2.
- News Brief. "Conservatives, Greens Jointly Attack Advanced Technologies." Spring, 10.
- News Brief. "Nature Turnabout Favors 'Endangered' Mt. Graham Telescopes." Spring, 10.
- News Brief. "N.Y. Bill to Repeal State Ban on Irradiated Foods." Spring, 11.
- News Brief. "To Protect Salmon, Judge Puts Thousands Out of Work in Idaho." Spring, 11.
- Hecht, Marjorie Mazel. "The Unnatural Case of NASA and Hydrogen Fluoride." Spring, 52.
- Ellsaesser, Hugh W. "Atmospheric Scientist 'Shocked' by NASA Ozone Announcement." Spring, 52-53.
- Grenier, Emmanuel. "French Volcanologist: Volcanoes Emit Tons of HF." Spring, 53.
- Freeman, Marsha. "Global Climate Change: 'We Are Unable to Answer Even the Most Basic Questions.'" Spring, 54.
- White, Carol. "El Niño, Not Global Warming, Likely Culprit in Weather Anomalies." Spring, 55.

- Roselle, Mike. "Earth First! Admits It's a Terrorist Cult." [Reprint of "Forest Grump," by Mike Roselle, from *Earth First! Journal*.] Spring, 56.
- News Brief. "Global Warming Challenged by Bull at Berlin IPCC Conference." Summer, 4.
- News Brief. "Global Warming Proponents Launch Breakaway Iceberg Scare." Summer, 4.
- News Brief. "Greenpeace Strikes Out Four Times in French Court." Summer, 4.
- News Brief. "New Legislation Aims to Reverse Damage of Ozone Hoax." Summer, 5.
- News Brief. "State Ozone Bills Play into 'States' Rights' Danger." Summer, 5.
- Hecht, Marjorie Mazel. "'Wise Use' and Environmentalists Both Played by Same Forces." Summer, 8.
- Hecht, Marjorie Mazel. "Thomas Paine on Defending the Country." Summer, 9.
- Hecht, Marjorie Mazel. "What Is Wise Use?" Summer, 9.
- Chaitkin, Anton. "Storm Over Rangelands: Private Rights in Federal Lands." Summer, 10.
- Chaitkin, Anton. "A Warning on the 'Wise Use' Movement." Summer, 10.
- Thompson, Scott. "Rees-Mogg: Black Propagandist For Blood in America's Streets." Summer, 12.
- Bastin, Clinton. "Stop the \$1 Trillion Clean-up Scam: Restart Nuclear Reprocessing!" Summer, 14.
- Ellsaesser, Hugh W. "An Open Letter to the IPCC: Climate Reality, Not Politics, Should Determine Policy." Summer, 58.
- Bennett, R.S. "Solid Gold (X 10) Quail." Summer, 60.
- Editorial. "The Hard Truth." Fall, 2.
- News Brief. "Federal Court of Appeals Blocks Mt. Graham Binocular Telescope." Fall, 8.
- News Brief. "The *Financial Times* of London Promotes Cannibalism." Fall, 9.
- News Brief. "Ozone Bill Still Alive; Constituents Must Do Some Kicking!" Fall, 9.
- News Brief. "Ozone Hole Theorist Watson Gets Some Elementary Education." Fall, 9.
- "Court Affirms Greenpeace Ties to Earth First! Terrorists." Fall, 68.
- Edwards, Dr. J. Gordon. "The Infamous Delaney Clause." Winter, 5.
- News Brief. "House Hearings Challenge Science Mafia on Ozone, Climate." Winter, 8.
- News Brief. "German Spectrometer Produces Global Ozone Map in 3-D." Winter, 8.
- News Brief. "Spread of Uncontrolled Epidemics Threatens World Population." Winter, 8.
- News Brief. "Act of Congress to End Obstruction of Mt. Graham Telescope." Winter, 9.

Fusion—Cold

- News Brief. "Edmund Storms's Review of Cold Fusion Phenomena Available." Spring, 11.
- News Brief. "New Cold Fusion Magazine Announced by Eugene Mallove." Spring, 11.

- Editorial. "Pursuing the Genie of Cold Fusion." Summer, 2.
- White, Carol. "From Hot to Cold Fusion: A Look at the Life of Yoshiaki Arata." Summer, 37.
- White, Carol. "A Career on the Cutting Edge." Summer, 41.
- White, Carol. "The 5th International Cold Fusion Conference: Slow, Steady Progress and Some Fast Talk." Fall, 56.
- White, Carol. "The Entrepreneurs of the 'Other Conference'," Fall, 59.
- White, Carol. "Inventor James Patterson." Fall, 61.

Fusion—Hot

- Stevens, Charles B. "Fusion Report: 'Controlled Fusion, Soon!'" Spring, 58.
- White, Carol. "From Hot to Cold Fusion: A Look at the Life of Yoshiaki Arata." Summer, 37.
- News Brief. "Chinese to Reconstruct Germany's ASDEX Fusion Reactor." Winter, 9.
- Wilsey, Mark. "Tokamak Plasma Advances Made, But Budget Cuts Threaten Program." Winter, 63.

Geometry and Mathematics

- White, Carol. "An Interview With Lyndon H. LaRouche: On Creativity, Technology, and Transforming the World." Spring, 20.
- Editorial. "Celebrating Kepler and Riemann." Fall, 3.
- Robinson, Bob. "Eureka! Rediscovering the Method of Archimedes." Fall, 19.
- Editorial. "The Kepler Year." Winter, 2.
- Editorial. "Those Impossible Waves in the Solar Wind." Winter, 2.
- Schauerhammer, Ralf. "Johannes Kepler's *Mysterium Cosmographicum*: A Guide to the Harmony of the Mind and the Universe." Winter, 22.
- Riemann, Bernhard. "On the Hypotheses Which Lie at the Foundations of Geometry" (excerpts). Winter, 44.
- Anon. "Euler's Lying Attack on Leibniz." Winter, 48.
- Riemann, Bernhard. "Philosophical Fragments" (translation, David Cherry). Winter, 50.
- Stevens, Charles B. "In the Footsteps of Kepler: A Master Polyhedra Builder Demonstrates His Art." Winter, 66.

History of Science and Technology

- Soldano, B.A. ["Linus Pauling (1901-1994): Two Views"] "A Life of Scientific Contribution." Spring, 6.
- Jukes, Thomas H. ["Linus Pauling (1901-1994): Two Views"] "Pauling's Other Side." Spring, 6.
- White, Carol. "An Interview With Lyndon H. LaRouche: On Creativity, Technology, and Transforming the World." Spring, 20.
- Huginin, Carol. "It's Time to Bury Darwin and Get On with Real Science." Spring, 32.
- Huginin, Carol. "The Darwinian Duo: Reductionism And Holism." Spring, 36.
- Huginin, Carol. "What Is the Difference Between Man and Beast?" Spring, 42.
- Editorial. "Pursuing the Genie of Cold Fusion." Summer, 2.
- News Brief. "21st Century's Space Pioneers Book Published in Germany." Summer, 4.
- LaRouche, Lyndon H., Jr. "Affordable Energy Is Not Enough." Summer, 6.
- Hartmann, Caroline. "A Tragedy of Science: The Life of Max Planck." Summer, 18.
- Hartmann, Caroline. "The Max Planck Gesell-

schaft." Summer, 30.

- White, Carol. "From Hot to Cold Fusion: A Look at the Life of Yoshiaki Arata." Summer, 37.
- Editorial. "Celebrating Kepler and Riemann." Fall, 3.
- News Brief. " 'Apollo 13' Movie: Americans Again Look Up to the Stars." Fall, 8.
- Robinson, Bob. "Eureka! Rediscovering the Method of Archimedes." Fall, 19.
- Editorial. "The Kepler Year." Winter, 2.
- Edwards, Dr. J. Gordon. "The Infamous Delaney Clause." Winter, 5.
- Sabath, Karol. ["The Darwin Debate"] "In Defense of Darwin." Winter, 10.
- Huginin, Carol. ["The Darwin Debate"] "Bury Darwin: It's Overdue." Winter, 11.
- Huginin, Carol. "A Species of Ideas." Winter, 19.
- Schauerhammer, Ralf. "Johannes Kepler's *Mysterium Cosmographicum*: A Guide to the Harmony of the Mind and the Universe." Winter, 22.
- Riemann, Bernhard. "On the Hypotheses Which Lie at the Foundations of Geometry" (excerpts). Winter, 44.
- Anon. "Euler's Lying Attack on Leibniz." Winter, 48.
- Riemann, Bernhard. "Philosophical Fragments" (translation, David Cherry). Winter, 50.
- Cherry, David. "Herbart on the Thought Process." Winter, 52.

Medicine

- Freeman, Marsha. "Cancer: A Genetic Disease That Can Now Be Conquered." Spring, 26.
- Lilge, Wolfgang. "Statistical Tricks and 'The Big Lie about AIDS.'" Summer, 45.

Nanotechnology

- Olson, Jim. "The Invisible Revolution: Microelectromechanical Systems." Summer, 51.

Nuclear Energy

- Editorial. "How to Stop Proliferation." Spring, 3.
- News Brief. "Edward Teller Calls for Putting Nuclear Back into DOE." Spring, 10.
- News Brief. "Nuclear Desalination an Option, Says Jordanian Expert." Spring, 10.
- News Brief. "Indonesia to Build 600-Megawatt Nuclear Plant in Java." Spring, 11.
- Cohen, Bernard L. "The Breeder Reactor: Affordable Energy Forever." Spring, 46.
- Cohen, Bernard L. "Fact Vs. Fiction About Plutonium Toxicity." Spring, 48-49.
- Cohen, Bernard L. "Fission and the Breeding Process." Spring, 50.
- Editorial. "Pursuing the Genie of Cold Fusion." Summer, 2.
- LaRouche, Lyndon H., Jr. "Affordable Energy Is Not Enough." Summer, 6.
- Bastin, Clinton. "Stop the \$1 Trillion Clean-up Scam: Restart Nuclear Reprocessing!" Summer, 14.
- Bastin, Clinton. "Getting Rid of Waste by Completing the Fuel Cycle." Summer, 15.
- Bastin, Clinton. "How Reprocessing Works." Summer, 17.
- News Brief. "Blue Ribbon Panel Calls for Burning Surplus Weapons Plutonium." Winter, 9.
- News Brief. "Chinese to Reconstruct Germany's ASDEX Fusion Reactor." Winter, 9.
- News Brief. "Catatonic Society Founded in Japan for Nuclear Cat Lovers." Winter, 9.

Physics

- Wilsey, Mark. "Sonoluminescence: Tapping the Light Fantastic." Summer, 48.
- News Brief. "New Form of Matter Created at Record Low Temperatures." Fall, 9.
- Wilsey, Mark. "Laser Cooling: Atoms Slowed to a Crawl." Fall, 54.

Population

- News Brief. "Spread of Uncontrolled Epidemics Threatens World Population." Winter, 8.

Science Policy

- Editorial. "How to Stop Proliferation." Spring, 3.
- News Brief. "Edward Teller Calls for Putting Nuclear Back into DOE." Spring, 10.
- News Brief. "Nuclear Desalination an Option, Says Jordanian Expert." Spring, 10.
- White, Carol. "An Interview With Lyndon H. LaRouche: On Creativity, Technology, and Transforming the World." Spring, 20.
- Cohen, Bernard L. "The Breeder Reactor: Affordable Energy Forever." Spring, 46.
- Cohen, Bernard L. "Fact Vs. Fiction About Plutonium Toxicity." Spring, 48-49.
- Cohen, Bernard L. "Fission and the Breeding Process." Spring, 50.
- Editorial. "Pursuing the Genie of Cold Fusion." Summer, 2.
- LaRouche, Lyndon H., Jr. "Affordable Energy Is Not Enough." Summer, 6.
- Bastin, Clinton. "Stop the \$1 Trillion Clean-up Scam: Restart Nuclear Reprocessing!" Summer, 14.
- Bastin, Clinton. "Getting Rid of Waste by Completing the Fuel Cycle." Summer, 15.
- Ellsaesser, Hugh W. "An Open Letter to the IPCC: Climate Reality, Not Politics, Should Determine Policy." Summer, 58.
- Edwards, Dr. J. Gordon. "The Infamous Delaney Clause." Winter, 5.
- News Brief. "House Hearings Challenge Science Mafia on Ozone, Climate." Winter, 8.
- News Brief. "Blue Ribbon Panel Calls for Burning Surplus Weapons Plutonium." Winter, 9.

Space Science, Technology, and Exploration

- News Brief. "21st Century's Space Pioneers Book Published in Germany." Summer, 4.
- LaRouche, Lyndon H., Jr. "Affordable Energy Is Not Enough." Summer, 6.
- News Brief. "Shuttle/MIR Link-up Opens New Chapter in Space Operations." Fall, 8.
- News Brief. " 'Apollo 13' Movie: Americans Again Look Up to the Stars." Fall, 8.

Author Index

- Bastin, Clinton. "Stop the \$1 Trillion Clean-up Scam: Restart Nuclear Reprocessing!" Summer, 14.
- Bastin, Clinton. "Getting Rid of Waste by Completing the Fuel Cycle." Summer, 15.
- Bastin, Clinton. "How Reprocessing Works." Summer, 17.
- Bennett, R.S. "Solid Gold (X 10) Quail." Summer, 60.

Chaitkin, Anton. "A Warning on the 'Wise Use' Movement." Summer, 10.

Chaitkin, Anton. "Storm Over Rangelands: Private Rights in Federal Lands." Summer, 10.

Cherry, David. "Hubble's Quasar Images: A Moment of Truth." Summer, 31.

Cherry, David. "Herbert on the Thought Process." Winter, 52.

Cohen, Bernard L. "The Breeder Reactor: Affordable Energy Forever." Spring, 46.

Cohen, Bernard L. "Fact Vs. Fiction About Plutonium Toxicity." Spring, 48-49.

Cohen, Bernard L. "Fission and the Breeding Process." Spring, 50.

Edwards, Dr. J. Gordon. "The Infamous Delaney Clause." Winter, 5.

Ellsaesser, Hugh W. "Atmospheric Scientist 'Shocked' by NASA Ozone Announcement." Spring, 52-53.

Ellsaesser, Hugh W. "An Open Letter to the IPCC: Climate Reality, Not Politics, Should Determine Policy." Summer, 58.

Freeman, Marsha. "Cancer: A Genetic Disease That Can Now Be Conquered." Spring, 26.

Freeman, Marsha. "Global Climate Change: 'We Are Unable to Answer Even the Most Basic Questions.'" Spring, 54.

Grenier, Emmanuel. "French Volcanologist: Volcanoes Emit Tons of HF." Spring, 53.

Hartmann, Caroline. "A Tragedy of Science: The Life of Max Planck." Summer, 18.

Hartmann, Caroline. "The Max Planck Gesellschaft." Summer, 30.

Hecht, Marjorie Mazel. "The Unnatural Case of NASA and Hydrogen Fluoride." Spring, 52.

Hecht, Marjorie Mazel. "'Wise Use' and Environmentalists Both Played by Same Forces." Summer, 8.

Hecht, Marjorie Mazel. "Thomas Paine on Defending the Country." Summer, 9.

Hecht, Marjorie Mazel. "What Is Wise Use?" Summer, 9.

Huginin, Carol. "It's Time to Bury Darwin and Get On with Real Science." Spring, 32.

Huginin, Carol. "The Darwinian Duo: Reductionism And Holism." Spring, 36.

Huginin, Carol. "What Is the Difference Between Man and Beast?" Spring, 42.

Huginin, Carol. ["The Darwin Debate"] "Bury Darwin: It's Overdue." Winter, 11.

Huginin, Carol. "A Species of Ideas." Winter, 19.

Jukes, Thomas H. ["Linus Pauling (1901-1994): Two Views"] "Pauling's Other Side." Spring, 6.

LaRouche, Lyndon H., Jr. "Great Projects Are the Path to Global Economic Recovery." Spring, 16.

LaRouche, Lyndon H., Jr. "On Creativity, Technology, and Transforming the World" (interview, Carol White). Spring, 20.

LaRouche, Lyndon H., Jr. "Affordable Energy Is Not Enough." Summer, 6.

LaRouche, Lyndon H., Jr. "Kenneth Arrow Runs Out of Ideas, But Not Words." Fall, 34.

LaRouche, Lyndon H., Jr. "Riemann Refutes Euler." Winter, 36.

Lille, Wolfgang. "Statistical Tricks and 'The Big Lie about AIDS.'" Summer, 45.

Maduro, Rogelio A. "Kobe Earthquake Sounds Alarm: New Infrastructure Can Lessen Future Quake Damage." Summer, 54.

Maduro, Rogelio A. "Predictions for Los Angeles." Summer, 55.

Maitra, Ramtanu and Maduro, Rogelio A. "Major Earthquake Expected In the Himalayas." Summer, 57.

Merry, Marcia. "Mideast 'Mega-projects' to Build Infrastructure and Peace." Spring, 12.

Olson, Jim. "The Invisible Revolution: Microelectromechanical Systems." Summer, 51.

Olson, Jim. "Great Heavenly Balls of Ice." Fall, 16.

Riemann, Bernhard. "On the Hypotheses Which Lie at the Foundations of Geometry" (excerpts). Winter, 44.

Riemann, Bernhard. "Philosophical Fragments" (translation, David Cherry). Winter, 50.

Robinson, Bob. "Eureka! Rediscovering the Method of Archimedes." Fall, 19.

Sabath, Karol. ["The Darwin Debate"] "In Defense of Darwin." Winter, 10.

Schauerhammer, Ralf. "Johannes Kepler's *Mysterium Cosmographicum*: A Guide to the Harmony of the Mind and the Universe." Winter, 22.

Soldano, B.A. ["Linus Pauling (1901-1994): Two Views"] "A Life of Scientific Contribution." Spring, 6.

Stevens, Charles B. "'Controlled Fusion, Soon!'" Spring, 58.

Stevens, Charles B. "In the Footsteps of Kepler: A Master Polyhedra Builder Demonstrates His Art." Winter, 66.

Thompson, Scott. "Rees-Mogg: Black Propagandist for Blood in America's Streets." Summer, 12.

White, Carol. "An Interview with Lyndon H. LaRouche: On Creativity, Technology, and Transforming the World." Spring, 20.

White, Carol. "El Niño, Not Global Warming, Likely Culprit in Weather Anomalies." Spring, 55.

White, Carol. "From Hot to Cold Fusion: A Look at the Life of Yoshiaka Arata." Summer, 37.

White, Carol. "A Career on the Cutting Edge." Summer, 41.

White, Carol. "The 5th International Cold Fusion Conference: Slow, Steady Progress and Some Fast Talk." Fall, 56.

White, Carol. "The Entrepreneurs of the 'Other Conference.'" Fall, 59.

White, Carol. "Inventor James Patterson." Fall, 61.

Wilsey, Mark. "Sonoluminescence: Tapping the Light Fantastic." Summer, 48.

Wilsey, Mark. "Red Sprites and Blue Jets: Unusual Lightning Flashes In the Upper Atmosphere." Fall, 11.

Wilsey, Mark. "Laser Cooling: Atoms Slowed to a Crawl." Fall, 54.

Wilsey, Mark. "Tokamak Plasma Advances Made, But Budget Cuts Threaten Program." Winter, 63.

Books Reviewed

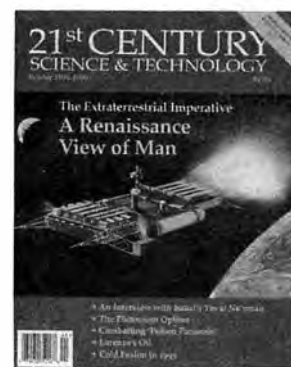
Dewar, Elaine. *Cloak of Green*. (Rogelio A. Maduro) Winter, 69.

Hoffman, Nate. *A Dialogue on Chemically Induced Nuclear Effects: A Guide for the Perplexed about Cold Fusion*. (Dr. Edmund Storms) Winter, 70.

Launius, Roger D. *NASA: A History of the U.S. Civil Space Program*. (Marsha Freeman) Fall, 71.

Neufeld, Michael J. *The Rocket and the Reich: Peenemünde and the Coming of the Ballistic Missile Era*. (Marsha Freeman) Spring, 63.

Preston, Richard. *The Hot Zone: A Terrifying True Story*. (Carol Huginin) Fall, 70.



Did you miss something?

21st CENTURY
SCIENCE & TECHNOLOGY

Back issues of
are available at \$5 each
(\$6 foreign).
U.S. currency only.

To receive the index for
volumes 1-7, send a self-
addressed envelope (9 x 12)
with \$1.01 postage to:

21st CENTURY
SCIENCE & TECHNOLOGY

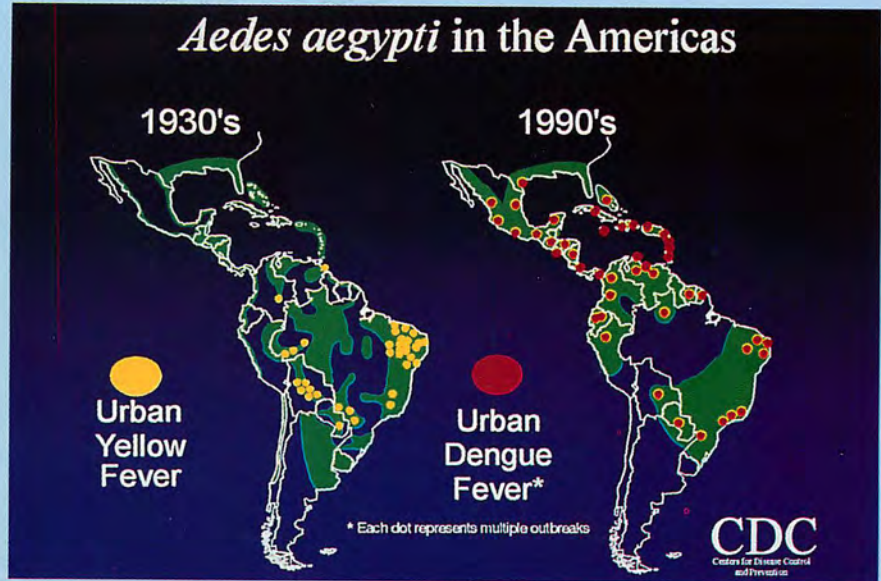
P.O. Box 16285
Washington, D.C. 20041

In This Issue:

BIOLOGICAL HOLOCAUST: THE MAN-MADE RISE OF DEADLY INFECTIOUS DISEASES

From 1980 to 1992, the number of deaths from infectious diseases in the United States alone has increased by 58 percent, and in many parts of the world the increases are even more dramatic. These growing rates of sickness and death are not due to natural causes; the present disaster was a foreseeable consequence of changes in economic policy.

In the Special Report economist Lyndon H. LaRouche, Jr. considers the direction science must take to maximize man's power to decrease sickness rates and improve the conditions of life, while biologist Carol Hugunin reports on the global picture of epidemics.



Centers for Disease Control

The shutdown of mosquito control programs by budget cuts and environmental regulations, plus the increase in breeding areas, have dangerously increased the mosquito population and mosquito-borne diseases. As the maps indicate, conditions today rival those of the Great Depression.



Courtesy of Maryland Science Center

Some of the many examples of minimal surfaces displayed in the "Beyond Numbers" exhibit.

TAKING THE CREATIVE JOY OUT OF GEOMETRY

A wonderful exhibition of geometric models suffers from a fatal flaw: The mathematicians from George Washington University and elsewhere who designed the exhibit, describe the models as though they were derived from abstract mathematical formulas, conveying no notion of the revolutionary scientific discovery that each represents. Susan and Richard Welsh review the Maryland Science Center's "Beyond Numbers" exhibit in the Geometry section.

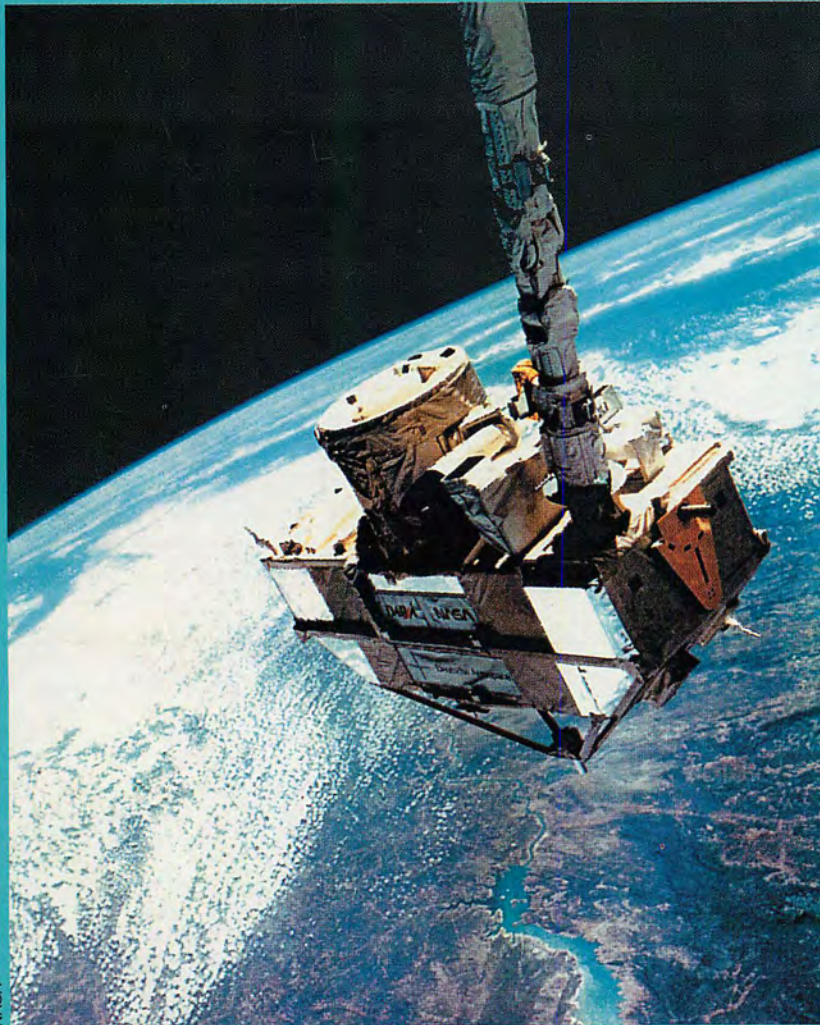


Lockheed

WHAT'S NEW UNDER THE SUN?

The Sun and the solar wind are now under intense scrutiny, thanks to a new generation of space-based instruments in the 1990s. Ulysses was launched for NASA and the European Space Agency in 1990. Then came the 1991 launch of X-ray telescopes aboard Yohkoh, built for Japan's National Astronomical Observatory and NASA. Since then have come Geotail, Wind, the Solar and Heliospheric Observatory, and Polar, with Cluster still in the wings. And from the ground, the Global Oscillation Network now monitors the Sun's oscillations almost without interruption. David Cherry reviews the scope of these missions.

The solar corona seen by the Soft X-ray Telescope aboard Yohkoh. The regions brightest in X-rays are plasma at 3 million degrees Kelvin. Less active, fainter areas are more than 1 million Kelvin. Dark areas are coronal holes, where the magnetic field is thought to be open to interplanetary space.

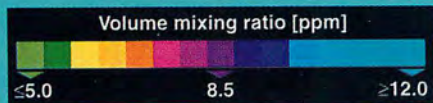


NASA

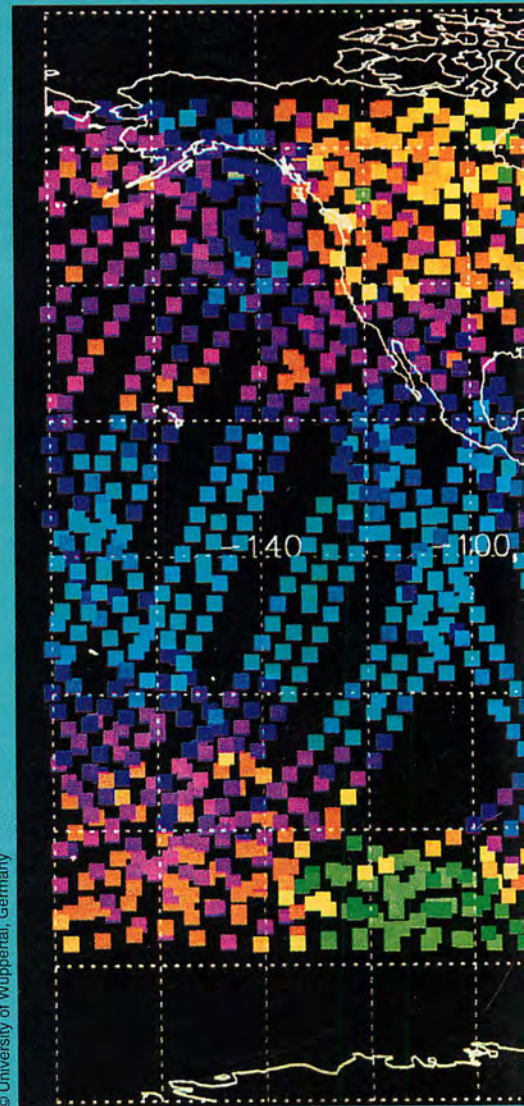
Crista-Spas, the Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere (Crista) housed on the Shuttle Pallet Satellite (Spas), here in a check-out phase on the robotic arm of the Space Shuttle.

FIRST 3-D OZONE MAP SHOWS DYNAMICS OF OZONE LAYER

This spectacular global map of ozone distribution at an altitude of 30 kilometers, produced from the measurements of the Crista instruments, demonstrates that the ozone layer is not the homogeneous layer assumed by the ozone depletion modelers. Instead, the real ozone layer is made up of complex, dynamic, vortical and filamentary structures that are constantly changing. Rogelio Maduro discusses new evidence from Crista and other atmospheric projects that show that ozone variations are caused by atmospheric dynamics, not chemistry.



Shown on the map are measurements of ozone in parts per million, taken by the Crista spectrometer at an altitude of 30 km. The infrared instrument has unprecedented spatial resolution and is designed to measure small- and medium-scale dynamical structures in the middle atmosphere. The criss-crossed pattern in black designates areas not covered by the path of the satellite. Areas with the least ozone measured are green.



© University of Wuppertal, Germany

Note: "In This Issue" appears on the inside back cover.