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Flu Dynamics in the Noösphere



- Ørsted's Scientific Method
- The Riemannian Space of the Nucleus

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EDITORIAL

Global Warming Is Dead; Develop Earth and Mars!

The purpose of the global warming hoax is now, and always was, genocide for the Third World, and suicide for industrialized economies, which are brainwashed into killing themselves on behalf of Mother Nature. *Cui bono?* The same financial oligarchy, in the person of the royal wretch Prince Philip and his Nazi cohort Prince Bernhard, who created the environmentalist movement as a way of taming their subjects into submission—and ignorance. When you stamp out the idea that man has unlimited creativity, which can find solutions to any problem, then you create virtual slaves.

The vehicle for launching this genocide campaign was the most evil woman of the 20th Century, Dame Margaret Mead. Mead, an icon of the rock-drug-sex counterculture, organized the 1975 conference of scientists on “The Endangered Atmosphere” to use the global warming issue as a weapon against population growth.¹ The explicit idea was to scare people into consuming less, and emitting less, and to use the force of global atmospheric laws to cut living standards, thus raising the death rates.

Many “scientists” were willing and eager to go along with this hoax. Paul Ehrlich of failed “Population Bomb” fame, and his many disciples, including prominently the Obama Administration’s Malthusian fanatic science advisor John Holdren, led the onslaught.

In the 35 years since the Mead conference, “global warming,” with its bloated billions of research dollars, has converted many into true believers, who now hold the top positions in U.S. scientific organizations and publi-

cations, from where they proliferate the hoax. In fact, it seems that to lead a scientific organization in the United States, one has to be anti-human. How else to explain that genocidal maniacs (defined as those who wish to reduce the human population by the billions) like Holdren and Mead, to name just two, became presidents of the American Association for the Advancement of Science?

In line with today’s corrupt view of science, where truth is of no consequence, such science leaders puff themselves up as a “consensus” against which no dissenting voice can be raised, and before which nations must bow. Now this game is over.

Malthus Up Front

Before Copenhagen, the global warming organizational edifice had shied away from making the population argument up front. But at Copenhagen, Malthus had a front seat. The United Nations organizations, and NGOs like Optimum Population Trust, lobbied to stop so-called global warming, by eliminating people; the fewer the population, the less the global warming, they said.

This Malthusian boldness made it easier for developing sector nations to see what they were being pushed into. For these nations still understand that for their population to prosper, they need the most advanced science and technology, which they correctly perceive as the motor that drove the industrial development of the West.

They also correctly perceive that the refusal of the modern-day colonialists to permit unfettered science and technology in developing nations has kept billions of people literally in the dark, while their nations have been looted for raw materials and cheap labor, and animal preserves are created for the entertainment of the oligarchy.

1. “Where the Global Warming Hoax Was Born,” www.21stcenturysciencetech.com/Articles%202007/GWHoaxBorn.pdf

The Remedy

The Four Powers Agreement proposed by economist Lyndon LaRouche began to take palpable shape this Fall, as Russia and China consolidated the kind of infrastructure development deals—credit-based agreements for building nuclear and rail—that LaRouche advocated as a way out of the ongoing financial collapse.²

As the nascent Four Powers alliance of Russia, China, and India—and not yet the United States—continues to flex its muscle and pursue joint development projects, we have an opportunity to bury the imperialist enemy and its Malthusianism, the idea that man is just another animal, whose numbers must be culled to protect the environment from despoilation.

We need to promote the Four Powers concept as the most effective way to

2. See www.larouchepac.com/node/12093 and <http://www.larouchepac.com/lpactv?nid=12904>

Beware of Studies Warning of Cancer Risks from CT Scans!

The latest hoax designed to deprive you of advanced medical care is the claim that Computerized Tomography (CT) scans cause cancer. CT scans are a noninvasive, X-ray diagnostic technique that provides a quick cross-sectional image of a tumor location, or an internal injury, bone fracture, and so on. About 72 million CT scans were performed in 2007.

The first thing to know about the phony claim that CT scans cause cancer is that it is based on the erroneous linear no-threshold model (LNT) of radiation. This model ignores the well-documented beneficial effects of low-dose radiation, below a certain threshold, and claims that all radiation is damaging and causes cancer. The known damaging effects of high radiation doses are linearly extrapolated to calculate the percentage of such hypothetical damage for any lower radiation dose.

According to the LNT, if a certain level of radiation exposure produces 1 cancer in a population of 100 people, one-tenth that amount of radiation will produce 1 cancer in a population of 1,000, and so on. By the same logic, if swallowing 100 glasses of wa-



Michelle Rasmussen/EIRNS

A LaRouche movement organizer at the Copenhagen Summit, Dec. 9, 2009.

ter could drown you, then there is 1 chance in 100 of drowning by drinking 1 glass of water. Using this method to calculate radiation-caused cancer estimates, the studies in question take the amount of radiation in a CT scan, and then statistically estimate how many cancers might be caused among all those who receive CT scans. This is not an observed effect, just a statistical one.

The LNT assumes that every particle of ionizing radiation, such as an X-ray, can damage DNA in cells, producing mutations that lead to cancer. However, this ignores that fact that low-dose radiation stimulates the body's defenses, selectively removing precancerous cells and stimulating immunity against cancer cells. To put this in perspective, note that there are 10-million times more mutations caused by the body's natural metabolism than those caused by natural or other radiation.

—Marjorie Mazel Hecht

For further reading

http://www.21stcenturysciencetech.com/Articles_2009/Summer-2009/Fear_radiation.pdf

"CT Scans May Reduce Rather Than Increase the Risk of Cancer," *Journal of American Physicians and Surgeons*, Spring 2008.

ture development and scientific progress that the world needs—including nuclear, fusion, the World Land-Bridge, and a mission to return to the Moon and move on to Mars and the rest of the Universe.

—Marjorie Mazel Hecht

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

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

- **Orbital Cycles, Not CO2, Determine Earth's Climate** by Rogelio A. Maduro
- **The Coming (or Present) Ice Age** by Laurence Hecht
- **An Oceanographer Looks at the Non-Science of Global Warming** by Robert E. Stevenson, Ph.D.
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Ocean Acidification: Green Brains On Acid

To the Editor:

I was wondering if you know anything about ocean acidity. I saw it mentioned by the Livermore scientist interviewed ["Interview: Richard F. Post: A Fusion Pioneer Talks About Fusion And How to Get There," *21st Century*, Summer 2009, and saw a Hollywood-style video on it, but it didn't have any scientific evidence.

The movie: "Acid Test," stated that it took millions of years for acid levels to rise to what they were, due to CO₂, during the Jurassic period, and that now they are increasing at that rate over decades, devastating shellfish. Weakening the shells of these animals will kill them and destroy the entire food chain, it said.

Their solution is solar, thermal, and wind. Silly.

Kelly Costello
Washington, D.C.

Gregory Murphy Replies

As the Earth enters into a period of global cooling, the eco-fascists have adopted ocean acidification as the next scare to achieve their goal of population reduction.

When water absorbs carbon dioxide, it produces carbonic acid (H₂CO₂), the mild acid that gives the taste to club soda and carbonated beverages. Ocean water is not acidic, but the opposite, alkaline, with a pH measure from 7.90 to 8.20. A pH of 7 is considered neutral, and below 7 is acidic. When the oceans absorb more CO₂, they do not become "acidic," but less alkaline.

However, scaring people about the oceans turning to

acid, allows the green fascists to continue their genocidal assault on scientific progress and at the same time, keep up the pressure to force nations to cut carbon emissions. The cutting of carbon emissions on the scale demanded by the Intergovernmental Panel on Climate Change will lead to the death of 4.5 billion people, mostly children.

The phrase "ocean acidification" first appeared in 2003, in a paper published in the journal *Nature*, titled, "Oceanography: Anthropogenic Carbon and Ocean pH," written by Ken Caldeira of the Carnegie Institute for Global Ecology in Stanford, California.

A Model-Only Scare

The anecdotal evidence that CO₂ will cause the oceans to become corrosive is based on a faulty experiment conducted at the Carnegie Institute for Global Ecology. This 2003 experiment took a highly concentrated CO₂ gel, which contained a 760 parts per million (ppm) concentration of CO₂—about double present atmosphere levels—and dropped it into a very large fish tank. That concentration was intended to represent the doubling of present atmospheric CO₂ concentrations. The highly concentrated gel formed carbonic acid in the fish tank, dissolving the fish and the shellfish creatures in the tank, much the same way a piece of meat will dissolve in a glass of Coca Cola.

Based on this one experiment, all of the alarmist stories about melting shell fish and an ocean "dead zone" have been spun out. But, there is a big differ-

ence between a 760 ppm gel dropped into a large fish tank in one shot, and a 760 ppm CO₂ atmospheric concentration that slowly enters the oceans' highly buffered system over several centuries.

In the real world, carbon dioxide emissions only increase linearly at a average rate of 1.5 to 2 parts per million a year. Thus, even to get to the level of carbon emissions that the alarmists say will cause the oceans to become corrosive (if we assume they are right), will take 192.5 years. Don't you think that in that time frame, with man's capacity of creativity and ability to discover, that we could find a solution—even if ocean acidification were to become a real problem.

A Non-Problem

But ocean acidification is a non-problem and really only an attack on scientific progress and human development. As Swedish materials scientist Fred Goldberg reported at the 2008 Heartland International Conference on Climate Change: If all of the fossil fuels on the Earth were burned all at once in an orgy of consumption, it would not produce enough carbon dioxide emissions to lower the oceans' pH by one step. That is, from say 8 on the pH scale to 7.

It should also be noted that the human contribution to carbon dioxide emissions is less than 4 percent of the total of the current atmospheric carbon dioxide concentration of 385 ppm. So human carbon emissions can not be the main cause of change in ocean pH, as claimed in the



creative commons

Ocean acidification is a fish story. Here, a white shark at Isla Guadalupe, Mexico.



creative commons

Ocean pH varies widely. This school of goldband fusilier was photographed in Papua, New Guinea.

Natural Resources Defense Council film "Acid Test."

Ocean surface layer pH does change and cycle naturally. First, let's get some things straight. Ocean pH is measured mainly around land masses and mainly at the surface layer, which does not represent the pH of the whole ocean, which varies with depth. Ocean pH cycles around land masses because of the upwelling of nutrients from the bottom of the ocean and the overturning of the ocean surface layer. Variation is also a seasonal result of different ocean oscillations, including the Pacific Decadal Oscillation.

Ocean pH varies from about 7.90 to 8.20 at different geographical locations. But along coasts there are much larger variations: from 7.3 inside deep estuaries, to 8.6 in productive coastal plankton blooms, and to 9.5 in tidal pools. The pH is lowest (most "acidic") in the most productive ocean regions, where upwellings of water from the deep ocean occur.

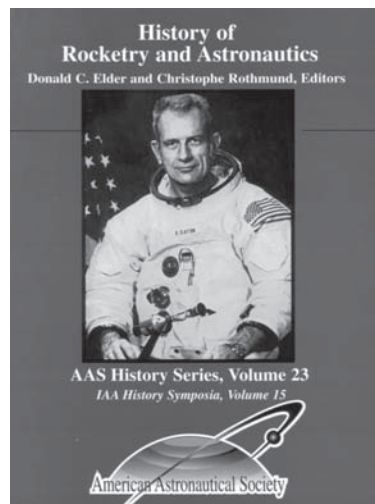
The Real Effects of CO₂

Craig Idso, director of the Center for the Study of CO₂, has recently published a book, *CO₂, Global Warming, and Coral Reefs*, cataloging some of the recent research on the effects that an increased

CO₂ will have on the oceans and marine life. He shows that increased CO₂ concentrations in the ocean will be a great benefit to the marine plants, for increasing sea surface temperature could increase the rates of photosynthesis up to 92 percent.

This is a far cry from the doomsday scenarios of the eco-fascists. Idso also points out that if absorption of carbon dioxide into the oceans were to continue to increase, it would be offset by the continuing process of the weathering of terrestrial carbonates, which increase delivery of calcium ions to the oceans and raise the pH level. To quote the Australian geologist Ian Plimer, "There is no chance that the oceans will turn into acid, as long as the Earth has rocks."

In the conclusion of his book, Idso writes, "Clearly, climate alarmist claims of impending marine species extinctions due to increases in both temperature and atmospheric CO₂ concentrations are not only not supported by real-world evidence; they are actually refuted by it." Idso further states, "We've got to realize that rising atmospheric CO₂ concentrations are not the bane of the biosphere, but a boon to the planet's many life forms."



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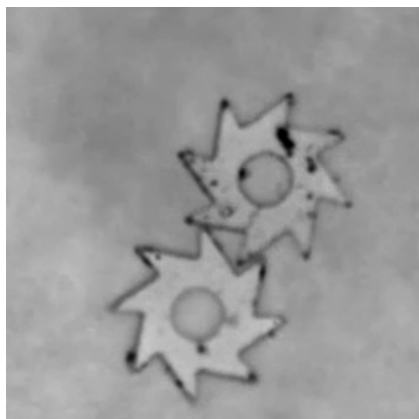
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Westinghouse Electric Corp.

The foundation for the Sanmen nuclear plant Unit 2 (top), and the containment vessel bottom head for Unit 1.



Argonne National Laboratory

Bacteria working to turn microgears. Click for a video. <http://www.flickr.com/photos/argonne/4185312325/>

CHINA POURS CONCRETE FOR SECOND WESTINGHOUSE NUKE PLANT

Concrete was poured in December for the foundation structure of the Unit 2 nuclear plant at the Sanmen nuclear site in China, a 1,000-megawatt pressurized water reactor plant designed by Westinghouse. Unit 1 at the site awaits placement of the huge 700-ton Containment Vessel Bottom Head, which was assembled at an on-site facility and will be put in place by crane. Westinghouse senior vice president Ric Pèrez stated, "We remain committed to safely bringing the first AP1000 plant online in 2013, on time and within budget."

The contract for the two Sanmen plants and two others to be built at Haiyang, China, was signed in 2007, and discussions are ongoing for more AP1000 plants to be built in China's interior. The consortium team for the Sanmen plant includes the Sanmen Nuclear Power Company of China and the National Nuclear Corporation. Westinghouse also has contracts to build six AP1000 reactors in the United States.

NORMAN BORLAUG, FATHER OF 'GREEN REVOLUTION,' DIES AT 95

Norman Borlaug, the man who fed the world, died at age 95 on September 12, 2009. He leaves an unmatched legacy of using scientific advances to develop high-yield crops to provide for growing world populations. His work, initially in Mexico, then India and Pakistan in the 1960s, and later in Asia and Africa, doubled and tripled grain yields, saving millions of lives from starvation, in what became known as the "Green Revolution." Borlaug's success proved that the Malthusians (most notably Paul "Population Bomb" Ehrlich), were dead wrong, and that with determination, education, and advanced science and technology, man could provide for increasing population—and the environment. In his later years, Borlaug chastised his environmentalist critics, saying, "If they lived just one month amid the misery of the developing world, as I have for 50 years, they'd be crying out for tractors and fertilizer and irrigation canals and be outraged that fashionable elitists back home were trying to deny them these things."

Borlaug's children issued a statement after his death which serves as a challenge to scientists and others: "We would like his life to be a model for making a difference in the lives of others and to bring about efforts to end human misery for all mankind."

For more about this remarkable man, see a short documentary: "A lifetime fighting hunger" www.youtube.com/watch?v=m2TmEdiXTvc&NR=1 and the trailer to a full length documentary on Borlaug's life, released in 2009, "Freedom from Famine," www.youtube.com/watch?v=LRPibWf3wN8. See also a book review of the authorized Borlaug biography *The Man Who Fed the World*, www.21stcenturysciencetech.com/Subscriptions/Spring%202008%20ONLINE/Borlaug.pdf

ARGONNE SCIENTISTS HARNESS BACTERIA TO TURN MICROGEARS

Scientists at the Argonne National Laboratory and Northwestern University, have discovered that common bacteria can turn microgears when suspended in a solution. The researchers observed that although the bacteria appear to swim around the solution randomly, they occasionally collide with the gear spokes, turning it in a definite direction. A few hundred bacteria work together to turn the gears. The Argonne work lays the basis for future biomechanical systems driven by microorganisms.

Igor Aronson, the principal investigator in the work, said: "Our discovery demonstrates how microscopic swimming agents, such as bacteria or man-made nanorobots, in combination with hard materials can constitute a smart material which can dynamically alter its microstructures, repair damage, or power microdevices." The speed of the gears can be controlled by manipulating the amount of oxygen in the suspended liquid. The bacteria slow down when less oxygen is available.

EVIDENCE OF LIQUID WATER FOUND ON SATURN'S MOON ENCELADUS

The Ion and Neutral Mass Spectrometer on NASA's Cassini mission collected data on five fly-bys of Saturn's moon Enceladus from plumes of gas and other particles

escaping from cracks in the surface near the moon's south pole. A team of researchers then analyzed these data from and compared it to known compounds, identifying several. One of them, radiogenic argon, is a product of decaying potassium, which indicates interactions between water and rock underneath the moon's icy shell. They also found ammonia, which scientists think works like antifreeze, to lower the temperature at which liquid will freeze. Water made up more than 90 percent of the vapor, followed by carbon dioxide at 5 percent. Methane and many more complex organic molecules were also seen. Two of the team from the University of Texas at San Antonio, Joseph Westlake, a physics Ph.D. student and his advisor, Adjunct Professor J. Hunter Waite, published their analysis of the data in the Aug. 25 issue of *Nature*.

VISTA TELESCOPE'S SPECTACULAR IMAGE OF THE FLAME NEBULA

The new telescope VISTA (the Visible and Infrared Survey Telescope for Astronomy) released its first images from the European Southern Observatory's Paranal Observatory in northern Chile. VISTA is a survey telescope working at infrared wavelengths and is the world's largest telescope dedicated to mapping the sky. Its large mirror (4.1 meters), wide field of view, and very sensitive detectors are able to reveal completely new views.

DEUTERON THEORY OF COLD FUSION PROPOSED AT ICCF-15 ROME CONFERENCE

Radiochemist and materials expert Dr. Edmund Storms reported to 21st Century his new theory of cold fusion, which he presented at the international conference on condensed matter and nuclear science in Rome, Oct. 5-9. Storms believes that clusters of deuterons (the nuclei of the naturally occurring isotope of hydrogen) are able to penetrate the nucleus of palladium, transmuting it into a heavier element and releasing energy in the form of heat. The deuteron clusters, perhaps similar to Rydberg clusters, are charge-free configurations that are not repelled by the positive charge of the palladium nucleus. Storms's research shows that the reaction occurs not within the palladium crystal lattice, but in nanoparticles of palladium mixed with other elements that form at the surface of the palladium cathode.

There is no unstable intermediate nucleus, and thus no radioactivity, released in the reaction. The absorption of deuterons produces an element of higher atomic number and mass, each deuteron releasing about 12 MeV of energy because of the mass defect.

According to Storms, who has been pursuing cold fusion since his retirement from Los Alamos National Laboratory in the early 1990s, his theory can explain all the known phenomena reported in cold fusion experiments to date. He believes it may also be the explanation for nuclear transmutation in biological systems, first documented by Louis Kervran and subsequently pursued by researchers in Japan and Russia. Recently the Japanese have detected biological transmutation using nuclear magnetic resonance (NMR) techniques that are more reliable than chemical analysis, Storms says. Russian researchers have shown transmutation by bacteria capable of reproducing in 100 percent heavy water, which has deuterium in place of the hydrogen.

LASER PROCESSES PROMISE BETTER ARTIFICIAL JOINTS

Researchers at Purdue University's Center for Laser-Based Manufacturing are developing laser technologies that create longer-lasting artificial joints and arterial stents, which can be manufactured 10 times faster and less expensively than present processes. One technique works by depositing layers of a powdered mixture of metal and ceramic materials, melting the powder with a laser and then immediately solidifying each layer to form parts. This enables parts to be formed one layer at a time, making it ideal for coating titanium implants with ceramic materials that mimic the characteristics of natural bone. The laser deposition technique also makes it possible to design each implant specifically for each patient.



European Southern Observatory

VISTA's large mirror, wide field of view, and sensitive detectors revealed this image of the Flame Nebula in Orion in December. For more information, see www.eso.org/public/news/eso0949/



Andrew Hancock/Purdue News Service

Engineering doctoral student Shaoyi Wen (left) and technician Andrew Hecht review data for the "laser deposition" system. The technology is expected to help meet the increasing need for artificial hips and knees, as the population ages.

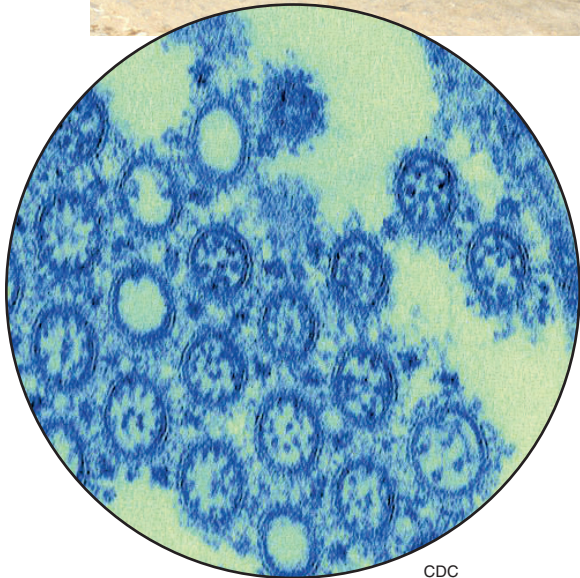
FLU DYNAMICS IN THE NOÖSPHERE

Economic Collapse Breeds Pandemics

by Christine Craig



WHO



CDC

Globalization and its destruction of the physical economy have created perfect conditions for pandemics to kill millions. Above an urban slum dwelling in India. At left is a transmission electron micrograph of the current H1N1 virus virions in a tissue sample.

To stop oncoming pandemics we must reverse the policies responsible for the current economic collapse.

Whether today's swine flu becomes apocalyptic in outcome is not so much a matter of how a virus works, but of the economic conditions that enable it to thrive. The poverty, hunger, disease, and wars raging in the wake of globalization and the collapse of physical economies worldwide create perfect conditions for a new and terrible flu pandemic. How successful this pandemic will be in killing millions depends on whether we reverse the policies sending civilization into a Dark Age, and mobilize our scientific and public health resources to use the anti-flu tools we have, and to develop new ones.

We can get a glimmer of the tragedy ahead by looking at history. World War I was the first pandemic war; it was a war of catastrophic proportions and import, and it hosted a pestilence of kindred nature. The Great War spawned the Great Pandemic.

More than 50,000 American troops died in combat in World War I, while more than 60,000 died of disease, primarily influenza and its complications. Almost 100 percent of those flu deaths were young and healthy adult males, who had been screened several times to be the best stock in the country.

The flu worked with the flower of youth on the battlefield. There were no old people or babies to kill in the filthy, rat-infested trenches, packed with one live soldier per 4 inches of trench length (the estimate for 1915 Western Front). The U.S. Army mobilized more than 4 million soldiers and transported 2 million of them across the Atlantic by boat to crush the "Hun," only to be immobilized on the Western Front by an unseen enemy travelling among them. Medical officers at the time estimated that almost 9 million soldier-days were lost to the influenza—and the United States only engaged in the fighting for six months before peace was declared on Nov. 11, 1918!¹

1. Carol R. Byerly, *Fever of War*, New York University Press, New York (2005). This book is one of the few that address the interaction between the Great War and the Great Influenza Pandemic of 1918.

This is an aspect of the natural history of the influenza A virus that you don't read about in the virology and medical journals, or even, I suspect, in epidemiology books and journals, although epidemiologists, more than most groups, should understand the import to disease spread of the policies and practices of war.

How It Began

One of the first recorded cases in 1918 of an outbreak of a highly infectious form of influenza came in the Spring of 1918, from an Army camp in Kansas. When the U.S. Army got to the front lines in France, a highly infectious form of influenza began spreading among the soldiers there as well. Then came word of a much more virulent form spreading in southern France and Spain.

By August of 1918, the influenza spreading widely in Europe was not only highly infectious, but it had turned uniformly deadly as well. Almost simultaneously, it manifested itself in many parts of the globe.

The influenza outbreak was seen at the time by military doctors as a phenomenon of the military mobilization. There were warnings and fears that it would get out into the civilian population, but the war effort took precedence. Now, almost 100 years later, although the mention of the 1918 flu causes fear, few people make the connection between the pestilence and the war.

But the 1918 flu was not forgotten. In January 1976, when the H1N1 swine flu showed up at Fort Dix, an army camp in New Jersey, it initiated an immune reaction in the Federal bureaucracy that continued to rage until the next Winter, and resulted in the mass production of a swine flu vaccine which was given to 40 million people, many months after it was clear that there was no swine flu spreading among humans anywhere in the world. The damage to the prestige of the Federal health authorities still persists today.

It was the specter of the 1918 virus's ravages, coupled with lack of knowledge about what drives pandemics, plus bureaucratic inertia, which led to the debacle. One Army recruit died of the flu after a 5-mile forced march while ill. Several others became acutely ill and were hospitalized. Probably hundreds were infected by the virus, but the flu never got out of that camp.

What was the difference between this incident and the first spread of the Spanish flu in the Kansas Army camp, full of recruits in the Spring of 1918? Some say it was a difference in the innate qualities of the viruses. But what would have happened if Fort Dix had been processing hundreds of recruits daily, pack-



Fresh young troops, the flower of youth, en route from New Zealand to the killing fields of World War I in Europe.



Today's public admonishments about the swine flu, as World War I's slogan, "coughs and sneezes spread diseases," ignore the conditions of poverty, crowding, and war that proliferate the spread of killer disease.

ing them like sardines, and sending them off to a war fought by tens of millions in close-quarter combat? Would that virus have gained the tools necessary to have equalled or

bested its ancestor, the 1918 Spanish Flu?²

Why did the 1918 flu kill so many young and healthy people? Was it because it held that potential uniquely within its genes? Or was it also because it was given such unique opportunities to do so, with (1) the economic and social devastation of four years of the most horrific and widespread war up to that time; (2) incessant close packing of millions of young men during the war mobilization and warfare; (3) all the sick soldiers crowded together on troop ships and headed home with their diseases to re-infect their countries all over again after Armistice was declared.

Virologists Taubenberger et al. marveled at the dynamics of the 1918 Spanish flu spread:

But 3 extensive pandemic waves of influenza within 1 year, occurring in rapid succession, with only the briefest

2. Justin Lessler, et al., 2007. "Transmissibility of swine flu at Fort Dix, 1976," *J. R. Soc. Interface*, Vol. 4, No. 15, pp. 755-762.



Photo by Harris & Ewing, courtesy of the Library of Congress

A flu ward at Walter Reed Hospital in Washington, D.C., during the Influenza Pandemic of 1918-1919, where beds are lined up, separated by sheets, on a porch.

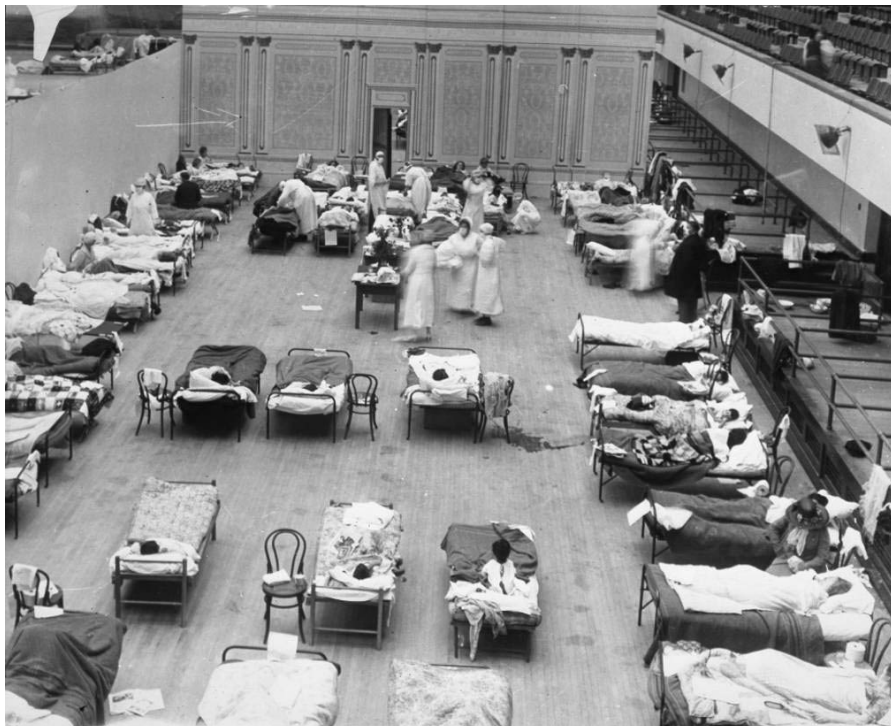


Photo by Edward A. "Doc" Rogers; from the Joseph R. Knowland collection, Oakland Public Library

The 1918 flu swept the country from coast to coast. Here an emergency hospital set up in the Oakland Municipal Auditorium in California, with volunteer nurses from the American Red Cross.

of quiescent intervals between them, was unprecedented. The occurrence, and to some extent the severity, of recurrent annual outbreaks, are driven by viral antigenic drift, with an antigenic variant virus emerging to become dominant approximately every 2 to 3 years. Without such drift, circulating human influenza viruses would presumably disappear once herd immunity had reached a critical threshold at which further virus spread was sufficiently limited. The timing and spacing of influenza epidemics in interpan- demic years have been subjects of speculation for decades. Factors believed to be respon- sible include partial herd immunity limiting virus spread in all but the most favorable circumstances, which include lower environmental tempera- tures and human nasal tempera- tures (beneficial to thermolabile viruses such as influenza), optimal humidity, increased crowding indoors, and imperfect ventilation due to closed windows and suboptimal airflow.

However, such factors cannot explain the 3 pandemic waves of 1918-1919, which occurred in the spring-summer, summer-fall, and winter (of the Northern Hemisphere), respec- tively. The first 2 waves occurred at a time of year normally unfavorable to influenza virus spread. The second wave caused simultaneous outbreaks in the Northern and Southern Hemi- spheres from September to November. Furthermore, the interwave periods were so brief as to be almost undetectable in some locales. Reconciling epidemiologically the steep drop in cases in the first and second waves with the sharp rises in cases of the second and third waves is difficult.

Assuming even transient postinfection immunity, how could susceptible persons be too few to

sustain transmission at 1 point, and yet enough to start a new explosive pandemic wave a few weeks later? Could the virus have mutated profoundly and almost simultaneously around the world, in the short periods between the successive waves? Acquiring viral drift sufficient to produce new influenza strains capable of escaping population immunity is believed to take years of global circulation, not weeks of local circulation. And having occurred, such mutated viruses normally take months to spread around the world.³

Obviously Taubenberger et al., although part of the Biosphere and Noösphere, know little about the interconnections between life, the Biosphere, and the Noösphere. Although these authors raised some pertinent questions, they were apparently not aware of the work of the great Russian biogeochemist Vladimir Vernadsky.

Vernadsky and the Noösphere

In 1918, Vernadsky was a mature scientist observing and pondering such ideas. He experienced not only the devastation of the Great War and the Great Influenza, but the many years of violence, unrest, famine, disease, and social upheaval of the Bolshevik Revolution as well.

In 1945, at the end of World War II, Vernadsky expressed his thoughts in his essay, "Some Words About the Noösphere":⁴

In the thick of life today, intense and complex as it is, a person practically forgets that he, and all of mankind, from which he is inseparable, are inseparably connected with the Biosphere—with that specific part of the planet, where they live. It is customary to talk about man as an individual who moves freely about our planet, and freely constructs his own history. Hitherto, neither historians, scientists in the humanities, nor, to a certain extent, even biologists, have consciously taken into account the laws of the nature of the Biosphere the envelope of Earth, which is the only place where life can exist. Man is elementally indivisible from the Biosphere. And this inseparability is only now beginning to become precisely clear to us. In reality, no living organism exists in a free state on Earth. All of these organisms are inseparably and



Vladimir I. Vernadsky (1863-1945) located man within the Biosphere, inseparable from its laws. Here, Vernadsky on a geological expedition.

continuously connected—first and foremost by feeding and breathing—with their material-energetic environment.

Let's look further at these inseparable connections.

Influenza A is the classic zoonosis. It doesn't need humans. It can survive and thrive quite well within its primary natural host and reservoir—aquatic birds. Within its natural habitat, the bird gut, it is spread by the fecal/oral route. Ducks and geese defecate the virus into the waters of lakes and ponds and other wetlands, where their neighbors, who feed on animals and plants of the same waters, pick up the virus and start the cycle over again. At certain times of the year, some lakes and ponds are bursting with flu viruses of many subtypes. All known flu subtypes can be isolated from bird habitats (though not all can be found at any one habitat). Young waterfowl are invariably infected before they migrate. Few, if any, waterfowl show any symptoms of illness. The host and disease seem

totally adapted to each other.⁵

But viruses are by nature opportunists, and the flu virus, by nature, is one of the more opportunistic of viruses. If a flu virus lodges in a human passing through its domain, and finds the human terrain conducive to replication and spread, it will readily add that human being to its list of travelling companions, along with dogs, horses, pigs, seals, whales, ferrets, and chickens, just to name a few.

The possibilities for such encounters are endless: duck hunters gathered in a duck blind on a duck-filled lake; soldiers tramping through a wetland; farmers growing ducks or geese for eggs and food; farmers using duck feces to fertilize fish ponds; children plucking goose feathers from geese just shot by hunters.

Similarly, pigs and chickens living openly on farms, as was the case in the United States at the beginning of the 20th Century, could be easily infected by sharing ponds with domestic or wild waterfowl.

It has always been popular to attribute all new flu outbreaks ultimately to some mixing bowl in Asia, because Asia was the hypothetical origin of the 1957, 1968, and 1977 pandemics. The first solid information about the 1918 virus, however, came from an outbreak at Camp Funston, Kansas, in March of 1918. Could the proximate progenitor of the 1918 pandemic virus have been a locally grown virus?

3. Jeffery K. Taubenberger and David M. Morens, 2006. "1918 Influenza: The Mother of All Pandemics," *Emerging Infectious Diseases*, Vol. 12, No. 1, pp. 15-22.

4. V.I. Vernadsky, 2005. "Some Words About the Noösphere," *21st Century* (Spring), pp. 16-21.

5. Robert G. Webster, et al., 1992. "Evolution and Ecology of Influenza A Viruses," *Microbiol. Rev.*, pp. 152-179.

According to the Kansas State Historical Society, in 1885 there were 3 million pigs in Kansas—two for every human being in the state. Many farms of that era contained ponds or reservoirs on the premises, accessible in many cases by pigs and domestic fowl, which could have hosted local species of waterfowl as well as the multitude of migrating ducks and geese in Spring and Fall. At the beginning of the Fall migration, at least 20 percent of ducks are still shedding influenza virus, and could easily infect the pond water of farms along the migration route. In fact, in lakes and ponds where such ducks spend their summers, live virus can be isolated from unconcentrated water.

Pigs have been shown over the years to be able both to give their flus to humans and to get them from humans. They have surface receptors on the cells of their upper respiratory tract, which recognize and bind both avian- and human-adapted flu viruses. It is not much of a stretch to imagine among the 4 million soldiers recruited and drafted, that many were rural farm boys who were in close contact with pigs, just days before reaching their training camps. We know that something like this must have happened at Fort Dix in 1976.

A Convergence of the Right Circumstances

We don't know how long influenza A has been with humans in a consistent and global way, nor do we know how many times bird flu has independently jumped to humans in our long history, either directly, or indirectly, through the mediation of another species like the pig or chicken. Probably this has happened countless times locally, without fixing itself among humans. But, once in a while, when the right circumstances have converged at the right place and time, the flu has made the transition on a more permanent and widespread basis. It seems that 1918 was such a time.

Fortunately, the state of the medical and biological sciences had advanced enough by 1918 to recognize the nature of the disease, as well as understand some of the measures which should be taken to blunt its assault. Unfortunately, the Spanish Flu was spawned during one of the most savage wars in recorded history, where its primary victims—the young—were gathered in unprecedented numbers under the worst possible sanitary, nutritional, and crowding conditions.

The migrations of the soldiers from countless countries, by ship, train, or on foot, carried the virus to all parts of the globe, where it tore through the civilian population with similar force and speed. Recent tallies of the carnage caused by the Spanish Flu virus estimate that perhaps 30 percent of humanity was infected, and more than 50 million people may have died from it. The death toll from the influenza dwarfed the official death toll from World War I—8.5 million.

Modern genetic analysis of samples of the Spanish Flu taken



Army Corps of Engineers

Aquatic birds are a primary reservoir for viruses to spread to other animals and human beings. These waterfowl inhabit a wetland in Kansas.

from flu victims in 1918 by Taubenberger et al.⁶ have given strong evidence that the 1918 Spanish Flu was a fully avian-type flu in terms of amino acids coded for by the genes. It has recently been hypothesized that it jumped directly into humans from birds. Humans then spread the disease, not only throughout humanity, but into pigs as well, where it has become enscathed as the classic H1N1 swine flu.

More recently, Webster et al., following on years of phylogenetic analysis of flu family trees, countered that the progenitor viruses to the 1918 flu had been co-circulating for years in human and probably swine populations, and that several reassortment events were necessary to finally produce the killer of Fall 1918.⁷

There is obviously not enough evidence to prove either claim, although the Webster et al. hypothesis is a better fit with the historical evidence. However, trying to build a theory of the evolution of the 1918 virus from a few “fossils” and a lot of speculation has some resemblance to building a theory of man's evolution based on a study of the “fossils” known as Piltown Man.

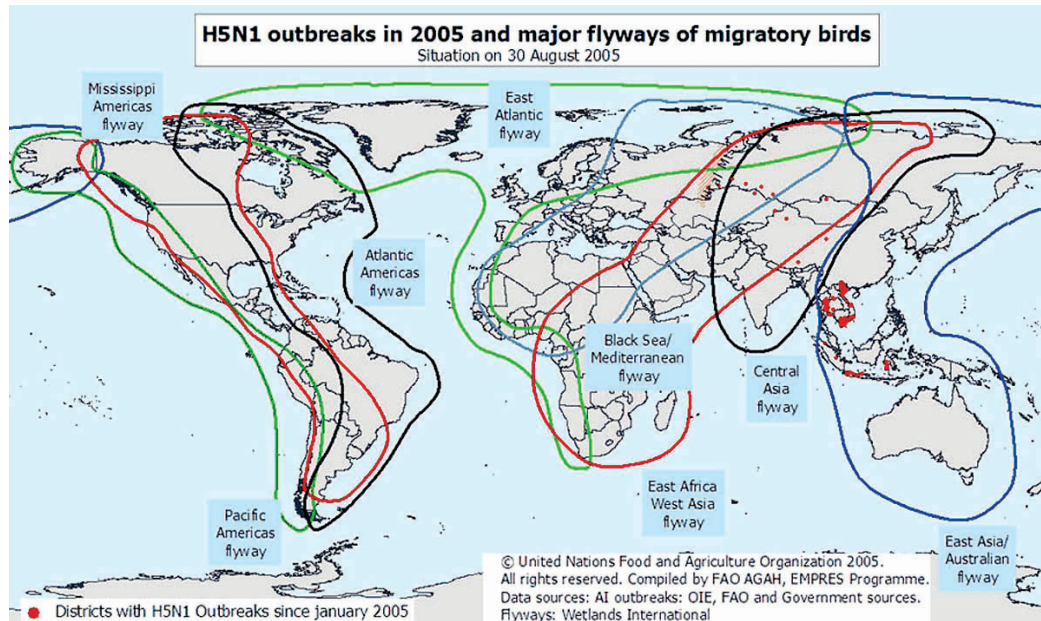
In any case, the 1918 flu started out as a mild but very contagious disease, and within six months had become a monster. Somewhere on the Western Front a change occurred in the virus that sealed the fate of humanity. Thinking back on the hypothesis of an Asian origin for all pandemic flu, I was intrigued to read in a soldier's account of the 1918 influenza in Europe, that among the ambulance drivers used to ferry the sick and wounded back to hospitals were many whom he called

6. Jeffery K. Taubenberger and David M. Morens, 2006. “1918 Influenza: The Mother of All Pandemics,” *Emerging Infectious Diseases*, Vol. 12, No. 1, pp. 15-22.

7. Gavin J.D. Smith et al., 2009. “Dating the emergence of pandemic influenza viruses,” *PNAS*, Vol. 106, No. 28, pp. 11709-11712.

**Figure 1
GLOBAL
WATERFOWL
FLYWAYS AND
H5N1**

Waterfowl are efficient conveyors of viruses around the world.



Source: FAO

“chinks.” I had never really thought about the colonial nature of World War I until I read that.

It turns out that many thousands of Vietnamese and North Africans served on the Western Front in support and fighting positions for France. Apparently, many thousands of Chinese were contracted out to the British by China, and colonial Africans participated as well, in support work, such as digging the endless trenches.

Here we have a potent situation of East meets West on the battlefields of France. Could some unique reassortments or recombinations have taken place in France between Asian and North American flu strains that Summer in 1918? Ambulance drivers would certainly get more than their fair share of exposure to the flu viruses going around. And while we are speculating about origins, we can hardly forget that the main residents of the trenches were the rats. There were many millions of rats living in the trenches with the humans. The rats fed on anything they could sink a tooth into, including rotting casualties of war. They grew as large as cats. And then there were the lice and fleas.

What happens when a flu with novel antigenicity gains the ability to effectively infect human tissues, especially the tissues of the lower respiratory tract? We can read the horrific medical accounts from 1918 to find out.⁸ And we can look at the much more recent medical history of the H5N1 avian flu virus, which periodically sweeps through Asian poultry farms, concomitantly causing occasional human disease—a virus causing human symptoms almost identical to those of the Spanish Flu, but with a kill rate of about 50 percent rather than the 2-5 percent of the version of the Spanish Flu which swept the world in 1918.

8. <http://web.uct.ac.za/depts/mmi/jmoodie/influen2.html#Pandemic%20influenza>

The difference between the H1N1 Spanish Flu pandemic strain, and the H5N1 avian flu pandemic strain, is that the H1N1 pandemic strain somewhere, somehow, gained the genetic tools to spread easily among human beings—something the H5N1 strain has not yet attained. Then, apparently, the H1N1 flu gained the ability to strongly infect the lower respiratory tract, specifically the lungs. The H5N1, however, remains a bird flu pandemic, and more specifically, a poultry pandemic, where it is a very efficient spreader and killer.⁹

The Sepsis Danger

Sepsis is the medical term given to a systemic inflammatory response by the innate immune system of the body to a microbial infection, whether bacterial, viral, or other. Sepsis can lead to rapid multi-organ failure and death in severe cases, and often the patient requires a ventilator for breathing assistance. Lungs, kidneys, brains, and livers all can be severely damaged through actions by cells and chemicals of the innate immune system. It is not so much the virus directly causing fatal harm to the tissues, as it is the immune system’s exuberant response in trying to eliminate the virus from the tissues, which causes the damage. It has been suggested that sepsis, in the form of cytokine storm, was the mechanism of many of the excess deaths in the 1918 virus—specifically among those who succumbed quickly to primary viral pneumonia. These included many of the young

9. The descriptions of the symptoms of many early victims of the main wave of the Spanish Flu in 1918 are eerily similar to descriptions of symptoms in chickens infected with the highly pathogenic H5N1 bird flu when it first appeared in Hong Kong’s live markets in 1997:

“One moment, birds happily pecked their grain, he recalls, the next, they fell sideways in slow motion, gasping for breath with blood slowly oozing from their guts. On necropsy, pathologists found that the virus had reduced the bird’s internal organs to a bloody pulp. We were looking at a chicken Ebola, Shortridge recalls. I had never seen anything like it.”

In Michael Greger, “Bird Flu: A Virus of Our Own Hatching.”

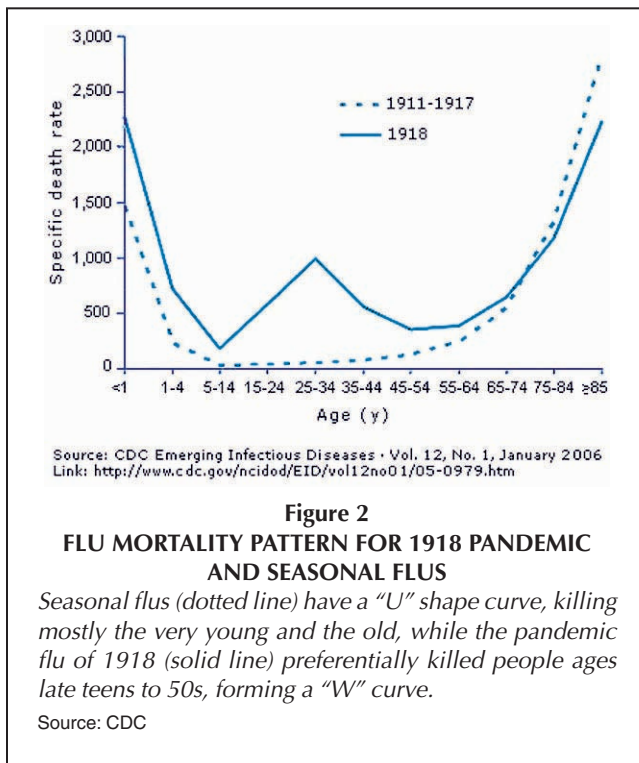


Figure 2
FLU MORTALITY PATTERN FOR 1918 PANDEMIC AND SEASONAL FLU

Seasonal flu (dotted line) have a “U” shape curve, killing mostly the very young and the old, while the pandemic flu of 1918 (solid line) preferentially killed people ages late teens to 50s, forming a “W” curve.

Source: CDC

and previously healthy adults who proved so susceptible to the virus. This same mechanism seems to play a role in the high fatality rate in chickens and human beings infected with the H5N1 highly pathogenic bird flu.

It is this sepsis, causing fulminant and fatal primary pneumonia in the young and healthy, that strikes fear into the heart of flu-watchers every time a flu acts a little differently. The seasonal flu is “comfortable.” It kills only the old, the extremely young, and those whose underlying diseases make them vulnerable.

Almost 90 percent of seasonal flu deaths at the beginning of the 21st Century have been in the very old and frail. Similarly, at the beginning of the 20th Century, the infants and elderly shared equally in flu deaths, giving a “U” shape to flu mortality charts.

But in the 1918 Spanish Flu, a terrible thing happened. The chart changed into a “W,” with a death spike peaking around the age of 25. The very young and the very old still died in similar numbers, but the young adults, who barely registered on the chart during the seasonal flu, died in very large numbers, accounting for most of the excess deaths over those for seasonal flu. Because similar, but much smaller spikes of fatal infection in young people showed up in the other main flu

pandemics of the 20th Century—1957 and 1968—the ideas of the 1918 Spanish Flu, of flu pandemics in general, and of excess mortality in the young and healthy, have fused into one idea in the population.

What is worse, that idea takes us back to the fearful times we have barely emerged from even now—a time when mankind lay helpless before the onslaught of infectious disease, where smallpox, polio, tuberculosis, bubonic plague, cholera, typhoid, typhus, yellow fever, puerperal fever, and malaria stalked young people in the United States just as most of them still do in many underdeveloped countries. Barely under the surface of rational Western man hunkers an inchoate horror in the face of microbial disease, born of millennia of ignorance and helplessness to stop the periodic dying, and more dying, particularly among the cherished young, whose lives were cut short in their prime productive years.

The Fear Today

Looking out at the new AH1N1 swine flu through the lens of this shared psychology, the 2009 swine flu seems very fearsome. It touches that sense of horror just below the surface, as it strikes in school classrooms and sickens the young people preferentially, killing a few. It travels the airlines and spreads almost visibly (given the plethora of internet maps and charts tracking the disease) from country to country, preferentially seeking out the young people to infect. It is clearly not the 1918 Spanish Flu yet, but is it the precursor to a flu of that viciousness and virulence—a flu that could pop up at any time in its killer mode and mow down the youth like before?

Are we still helpless primitives in the maw of the marauding

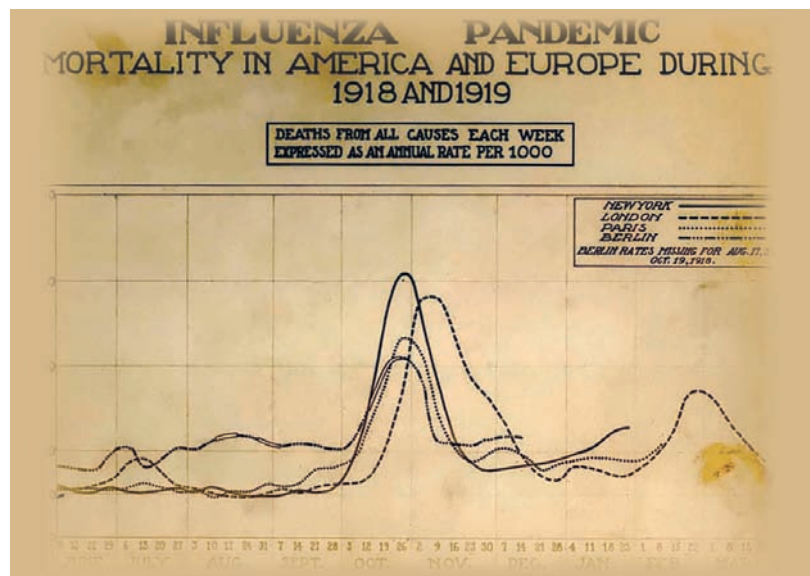


Figure 3
FLU MORTALITY IN 1918 PANDEMIC

The 1918 flu pandemic killed more than 1 million people in the United States, and about 50 million worldwide. This illustration charts the deaths in major cities, 1918-1919.

Figure 4
HOW THE FLU VIRUS INVADES THE CELL

1. The flu virus uses special molecules (the glycoproteins hemagglutinin and neuraminidase) projecting from its surface envelope which have been derived from host cell material, to bind to complementary receptor molecules on the host cell membrane.

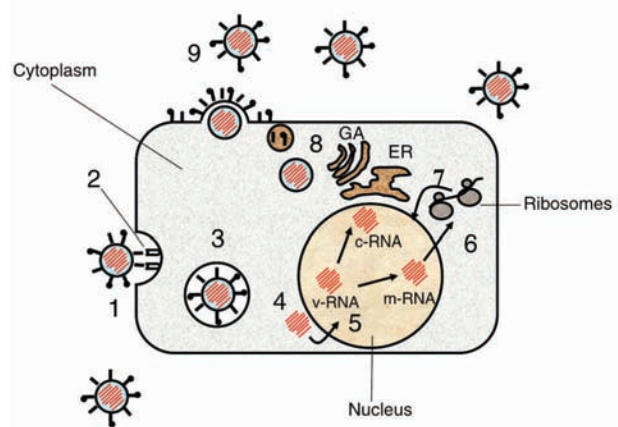
2. This handshake of recognition at the cell membrane sets into motion a process called endocytosis, the same which cells use to bring external substances into the cell for nutritional or other purposes. The cell membrane surrounds the virion and fuses around it.

3. Now the virus is within the cell, in a spherical vesicle surrounded by a membrane. But it does not yet have access to the rest of the cell.

4. Next, the aqueous environment within the vesicle acidifies, which sets into motion a cascade of events, resulting in the release (decoating) of the virus RNA strands and related proteins into the cytoplasm of the cell. The virus now has free access to hijack the cellular machinery required for its replication and the eventual release of its progeny from the cell.

5. The viral RNA (v-RNA) is transported into the nucleus, along with the four viral proteins essential for processing of the viral RNA. Here are found the host cell chromosomes and the required apparatus for DNA and RNA synthesis and processing. Using its own nuclear enzymes and those of the host cell, the viral RNA is transcribed into messenger RNA (m-RNA, the code for protein translation) and complementary RNA (c-RNA). The c-RNA will eventually produce all the copies of the eight viral RNA strands necessary for the hundreds of infectious progeny which a single infected cell can produce.

6. Meanwhile, in the cell cytoplasm (the aqueous milieu outside the nucleus), the cell's protein-manufacturing equipment, its ribosomes, have been conscripted to pro-



Christine Craig

duce the protein products necessary for the assembly of new virions.

7. The protein products destined for packaging within the viral envelope are now transported into the nucleus, where they are assembled in the proper proportions and configuration with a complete set of eight v-RNA strands. Then they are exported into the cytoplasm and migrate toward the inside of the outer cell membrane.

8. While this is occurring, two viral components take a different route. Hemagglutinin and neuraminidase, the two glycoproteins which will eventually stud the outside of the viral envelope, are transported to the outer cell membrane via the endoplasmic reticulum (ER) to the Golgi apparatus (GA) route.

9. The viral glycoproteins are duly incorporated into the cell membrane, whereupon the virions exit the cell in a reverse of the process by which they entered—exocytosis.

—Christine Craig

pestilence? Not unless we choose to be.

The 1918 Spanish flu was a terrible pandemic, brought on by the economic, environmental, and cultural devastation of a worldwide war of imperial powers. But even before the war broke out, the seasonal flu was a terrible killer. Before the United States went to war in 1918, its average death rate for influenza/pneumonia over the preceding three years was around 650,000, compared with 1,000,000 for the 1918 pandemic year. That is, 650,000 deaths in, say, 1915 (with a population of 100 million) compared with a mere 35,000 deaths for seasonal flu in recent years in the United States (with a population of 350 million). That is, .65 percent versus .01 percent deaths per total population.

Obviously, something has changed. We don't die of the flu as we used to. And we don't get pandemics as we used to. The 1957 and 1968 pandemics were pale imitations of the Mother of All Pandemics. And the seasonal flus of recent eras were pale imitations of the seasonal flus in the years before 1918.

Of course, flu commentators, including some who should know better, say that a 1918-like pandemic is a once-in-a-

century phenomenon, while the other pandemics of the 20th Century are once-in-30-years phenomena. They can't be citing statistics, because there are too few instances to make statistics useful. They must be consulting the Delphic Oracle. In any case, such predictions put flu snugly in the category of unstoppable acts of nature.

While Vladimir Vernadsky is clear about the inescapable connections between man and the Biosphere, he is also clear that the Noösphere, the phase-space of man's reason and its products, is a powerful and growing force, able to change the aspect of the Biosphere in remarkably short time periods, compared with even life's powers of change:

Mankind taken as a whole is becoming a mighty geological force. There arises the problem of the reconstruction of the Biosphere in the interests of freely thinking humanity as a single totality. This new state of the Biosphere, which we approach without our noticing, is the Noösphere. The Noösphere is a new geological phenomenon on our planet. In it, for the first time, man

becomes a large-scale geological force. He can, and must, rebuild the province of his life by his work and thought, rebuild it radically in comparison with the past. Wider and wider creative possibilities open before him. It may be that the generation of our grandchildren will approach their blossoming.¹⁰

How Viruses Work

A virus can be likened to an idea. The British zoologist Sir Peter Medawar once commented that a virus was “simply a piece bad news wrapped up in protein.” Someone throws a stone through your living room window. It has a note attached. You can’t help yourself; you open it up, and it reads: “If you are reading this, you will be dead in 24 hours. Have a nice day.”

Like an idea, if a virus lodges in fertile ground, much work can be produced out of something too small to even detect with the senses. If it lodges in sterile ground, no work can be accomplished, although the idea can be passively transmitted to another without the middleman being affected by the idea. That would be the case if a message were sent by semaphore or telegraph: “Enemy aircraft 10 minutes away.” The person receiving and retransmitting the code might not understand the code, and so could be caught unaware by the attack, whereas the person to whom the message was sent might understand and take defensive action.

Think of the influenza virus as an idea in the realm of life. When implanted in a receptive organism, it can cause the organism to perform work and produce things it otherwise would not be able to produce. It can cause the organism to amplify the successful viral idea manifold, then spread it to everyone it meets. As is common with ideas, in the process of reproduction and reassembly of the viral idea within the host, the product is constantly changing slightly. And as with many ideas, the products of the viral idea within the organism can be very harmful or fatal at times.

So, we have three interwoven qualities of this viral idea: *infectivity*: the ability to implant itself and perform work once within a receptive host; *contagion*: the ability to transmit the idea from one host to another. And to these we must add a quality which we will call *virulence* or *pathogenicity*: the ability to produce morbidity and mortality in the host organism while performing work.

Viruses are very simple ideas, for the most part. They cannot build the factory necessary to carry out the processes they need.



CDC

The gold standard public health response to killer viral diseases is vaccination, priming the human or animal host with disease antigens to promote an adaptive immune system response. Here are smallpox vaccinations, which in the past decades have resulted in stopping smallpox worldwide.



WHO

They rely on the infrastructure already present in the host cells. They simply alter the line of products that the cell produces, using their own code to hijack the assembly line.

The influenza A virus, for instance, contains 8 separate strands of RNA (ribonucleic acid) coding for 11 genetic products necessary for the efficient production and release of many new viral particles by the infected host cell. These products, when transcribed and translated by the cell, are able to direct the machinery of the animal cell to produce many copies of the viral genes and proteins, which are assembled, then packaged in the host membrane as the viral particles move out of the cell.

While in the cell, the original viral RNA strands are copied many times for repackaging in the new viral particles. This process is extremely prone to errors, leading to mutations in each generation.

Furthermore, if more than one flu virus type is within the body in the same tissues, the RNA segments will be assembled without regard to which flu virus the genes came from. This is termed *reassortment*, and is a primary way that flus with new qualities of infectivity, virulence, and contagion are generated. That is how one gets RNA segments from bird viruses, swine

10. V.I. Vernadsky, 2005. “Some Words About the Noösphere,” *21st Century* (Spring), pp. 16-21.

viruses, and human viruses into one new virus.

A third and very potent form of genetic change can occur among the viral RNA strands as well. Two homologous RNA strands with differing information can undergo recombination, whereby they effectively switch homologous sections of the RNA strand. Non-homologous switching could also occur, but would be much less likely to lead to a viable viral particle. But that is all right. In such a large factory, with so much product, a few of these new ideas will be viable ones, leading to potent new flu types to plague humanity.

The host response to a flu attack is to mount an immune counter-offensive to drive out the invader. If the host recognizes the flu type, it sends out cells that produce antibodies to antigens remembered from the previous attack. The flu attack is driven off rapidly with little host damage.

However, if it is a sufficiently new virus antigenically, the body sends out raw and untrained but enthusiastic recruits called the innate immune system. These agents attack the virally infected tissues much like the troops fighting in World War I. But this battlefield is not the farmers' fields and lush vineyards of France; this devastated battlefield is your lungs. After the initial bloody battle has already severely damaged your lungs, the adaptive immune system kicks in, producing specific antibodies to the viral invader. If you survive, the next time you meet the same flu, the adaptive immune system will drive the invader off with little damage.

The Public Health Response: Vaccination

The gold-standard public health response to viral diseases which pose a widespread threat to humans and domestic animals is vaccination, to prime the host body with disease antigens so that the adaptive immune system can kick in at the least sign of the flu virus. Vaccines have proven themselves extremely valuable for two centuries in saving the lives of young people from virulent contagious viruses such as smallpox, and more recently, polio, measles, chickenpox, and the like, which act as if they were unstoppable acts of nature. For smallpox, vaccination combined with other public health measures like surveillance and quarantine, drove the virus to extinction in the world-at-large (it still exists in a few laboratories). With a concerted effort, polio might also be eliminated by such means.

But Influenza A is a different story. Influenza A is not a disease of humans only. It is, as mentioned above, a zoonosis originating in birds. It has also shown itself to be shared easily among man and the domestic pig, and there could be other vectors as well. Further, it changes antigenically each season as new mutations or reassortments find more fertile ground for infection. Such diseases cannot be stamped out by vaccination, at least in the form we now know it.

For influenza, vaccination only blunts the effect of the virus on the population. Seasonal flu kills around 35,000 people (90 percent of them old people) every year in the United States, despite a vaccination rate in old people of more than 60 percent. Until the 2008-2009 flu season, national flu policy did not encourage vaccination among children (ages 5-18) unless there were underlying health problems. During the 2007-2008 flu season, fewer than 25 percent of young people were vaccinated.

From a rational public health standpoint, it might be better if the young were required to be mass vaccinated, despite the fact that few die from seasonal flu. Recent research has given evidence that the death rate of the very elderly is not strongly affected by their vaccination against the seasonal flu, because they often mount such a feeble immune response to flu vaccine challenge.¹¹ Society might be better served by requiring vaccination among the main spreaders of the flu—children in school and daycare—even though they are the least likely to die from it. We can see by the behavior of the novel H1N1 flu now in circulation, that with an antigenically new flu type, the group with the most cases also becomes the group with the greatest morbidity and mortality, especially because many of the young these days may never have had exposure to any flu virus in their young lives.

Because vaccination as now practiced only blunts the seasonal flu attack, antiviral drugs such as oseltamivir, zanamivir, amantadine, and rimantadine have been developed to prevent or treat the flu among those still susceptible each season. These drugs can either prevent the disease process, or decrease symptoms and viral shedding, depending on how they are prescribed. Until the 2008-2009 flu season, recent recommendations from the Centers for Disease Control advised using only the neuraminidase inhibitors, oseltamivir and zanamivir for seasonal flu, because of widespread resistance of the H3N2 seasonal flu to the older drugs amantadine and rimantadine. However, this season, resistance to oseltamivir in the prevailing H1N1 seasonal flu strain reached 98 percent, leading to recommendations for use of zanamivir alone, or in combination with rimantadine for confirmed cases of seasonal H1N1.

A handful of known cases of the new H1N1 swine flu of 2009 has now been shown to be resistant to oseltamivir as well (the strain was already resistant to amantadine and rimantadine). If the resistance factor spreads as rapidly in the 2009 H1N1 pandemic strain as it did in the seasonal H1N1 strain, by Fall, only one antiviral option might remain: zanamivir.

New Treatments Needed

Some flu experts have questioned why, with all the pandemic planning and funds poured into flu research since the H5N1 avian flu reappeared in 2003, little has been done to identify and mobilize for use, treatments aimed at quelling the sepsis (including the so-called cytokine storm) which leads to so many flu deaths, especially among the young and healthy. Not only is sepsis a prominent feature of fatal flu, it is a major cause of deaths from infections such as MRSA (methicillin resistant staphylococcus aureus) and other hospital-acquired diseases. In many of these cases, the basic innate immune mechanism is the same.

In fact, the recent outbreaks of community-acquired MRSA in the United States seemed to be concentrated in the same young and healthy population as the H1N1 swine flu. Even though MRSA is a bacterial invader, and influenza is a viral invader, the innate immune response of the host to the invader has many similarities. If drugs were found and developed which

11. Lone Simonsen, et al., 2007. "Mortality benefits of influenza vaccination in elderly people: An ongoing controversy," *The Lancet Infectious Diseases*, Vol. 7, No. 10, pp. 658-666.



Millions of people now live in urban slums, like this favela (shanty town) in Rio de Janeiro—or worse. The poverty, lack of basic water and sanitation infrastructure, and crowded conditions, exacerbated by the current economic breakdown, are perfect breeding grounds for the spread of diseases.

could modulate the overexuberant parts of the innate response to infection, without significantly weakening the overall immune response to the disease, many sepsis deaths could be avoided every year.

Such a group of drugs would be especially welcome at the beginning of a novel pandemic flu, before closely matched vaccines could be manufactured and distributed. Those showing signs of sepsis, or those in the most vulnerable groups for that particular flu, could be given such drugs to minimize the impact of the flu infection on their bodies.

This is not just a pipe dream, although few such drugs are now in the pharmaceutical pipeline. The eminent flu expert Dr. Yoshihiro Kawaoka, of the University of Wisconsin, has been pursuing such drugs with many collaborators, both in Japan and the United States. Several such drugs have been found that show promise in animals infected with the flu.¹² Dr. Robert Webster, another eminent flu expert, has also been working on this angle.¹³

Dr. David Fedson, a prominent flu researcher, now retired from the vaccine manufacturer Sanofi Pasteur, suggested as early as 2006 that the same statins prescribed to millions of middle-age and elderly people with high cholesterol could provide protection from the fatal sepsis common in infection with the H5N1 flu.¹⁴ Studies of hospital cases of pneumonia have shown that statins can reduce hospital deaths from pneumonia

12. David Marsolais, et al., 2009. "A critical role for the sphingosine analog AAL-R in dampening the cytokine response during influenza virus infection," *PNAS*, Vol. 106, No. 5, pp. 1560-1565 (Feb. 3).

13. Jerry R. Aldridge, Jr., et al., 2009. "TNF/iNOS-producing dendritic cells are the necessary evil of lethal influenza virus infection." *PNAS*, Vol. 106, No. 13, pp. 5306-5311 (March 31).

14. David S. Fedson, 2006. "Pandemic Influenza: A Potential Role for Statins in Treatment and Prophylaxis." (June 6)

by half. Fedson has recently written several papers promoting such agents as a first line of defense against a pandemic flu—before vaccines and antivirals become available for the masses.¹⁵

Many of these agents would be drugs already readily available in all countries, including the developing countries (which would be the last to secure sufficient vaccines and antivirals in a pandemic). Such drugs could be much cheaper than the vaccines and antivirals hoarded by the rich industrial nations; and they would be available even at the very beginning of the pandemic, for the first casualties, even in flus resistant to antivirals. As Fedson et al. stated in a 2007 paper on treatment alternatives for a pandemic flu:¹⁶

If, however, statins are shown to be of benefit, the public health argument for their use in a pandemic would be hugely compelling. Currently, a five-day course of

treatment with a neuraminidase inhibitor costs \$60 to \$90 in the US, and the global availability of these agents is limited. By contrast, generic statins are available worldwide and are inexpensive. In the US, a five-day course of treatment would cost approximately \$1.75, whereas in a developing country such as India, it would probably cost less than \$1.00. Moreover, unlike vaccines and antivirals, statins would be available in almost all countries on the first day of the pandemic.

Fedson has proposed an international effort to find many such drugs among the vast library of known drugs, herbs, or other substances. These candidates would be tested and developed for the purpose of standing as a first line of defense against our dreaded nemesis, pandemic flu—not to prevent it, but to turn a dragon of mythical proportions into an everyday pussycat.

Man's Relationship to the Biosphere

While these lines of inquiry are laudable and necessary, it may be that we already have a well-characterized and safe first line of defense against the flu at our fingertips. We just are not using it wittingly to our benefit. And this points up the noöspheric aspect of the flu idea. Man is not just a passive factory for the flu; like all life, man has tools at his disposal to fight the flu—physiological and behavioral tools to keep the flu at bay. But man has other tools not available to mere life: tools crafted through reason, or the lack thereof.

15. David S. Fedson, 2009. "Meeting the Challenge of Influenza Pandemic Preparedness in Developing Countries," *Emerging Infectious Diseases*, Vol. 15, No. 3, pp. 365-371.

16. David S. Fedson and Peter Dunnill, 2007. "New Approaches to Confronting an Imminent Influenza Pandemic," *The Permanente Journal*, Vol. 11, No. 3, pp. 63-69.



CDC

Dr. Terrence Tumpey, a microbiologist at the Centers for Disease Control and Prevention, holding a reconstructed 1918 pandemic flu virus, inside a specimen vial containing an orange-colored culture medium. The virus was re-created in order to examine what made it so virulent.

Our modern civilization has, in a geological and evolutionary blink-of-the-eye, set man up in a new relationship with the Biosphere. With this new relationship have come inevitable unintended consequences—details still to be worked out by man's reason. The creation of cities with large populations of humans in close proximity is one great change, a change made possible by advances in agriculture over millennia, creating enough food for more people to exist, and for many to turn to other productive and creative labor.

However, the creation of cities and towns has had the unintended consequence of providing many diseases, such as tuberculosis, smallpox, cholera, and influenza, with more opportunities for sustained spread. Furthermore, within the cities and towns much of the population has often been made more susceptible to disease by their separation from the fruits of agriculture, and from nature in general. Within cities, the need for water and sanitary infrastructure becomes crucial, but the maturation of that technology has long lagged the development of cities. Even today, in the huge human agglomerations within the developing world euphemistically called cities, a crush of millions of the poor subsist with no such infrastructure.

Cities and towns are the first to suffer famine and then pestilence when war or nature disrupts the life-sustaining agricultural output upon which the whole edifice of civilization depends. One only needs to look back to the plague which struck Athens while it was under siege during the second year of the Peloponnesian War to realize the importance of proper food, water, and sanitation infrastructure for a civilization to survive.

Even during times of peace and plenty, the labor required of many in the cities and towns, especially since the industrial revolution, has necessitated working indoors during the hours of sunlight, leaving a majority of the population, especially school children, deficient in the direct harvest of the Sun's life-giving rays through the transformation of a certain portion of the ultraviolet spectrum's energy into a potent immunomodulating molecule known as Vitamin D. Especially in Fall and Winter, and in the temperate latitudes, there is a pandemic of Vitamin D insufficiency in the developed world.

This lack is especially prevalent among dark-skinned city residents in temperate climates, and among those who wear the most clothes, slather on the most sunscreen, and spend the most time indoors. After the Winter Solstice, the shallow angle of incidence of the Sun's rays through the atmosphere in temperate zones means that the important UV light is used up in chemical reactions with ozone, leaving little at the surface of the Earth's crust for transforming the pre-Vitamin D stored in the skin into the active precursor of the molecule. Then man must either live on the Vitamin D stored during Summer, move south like the birds, or ingest Vitamin D from dietary sources.

Rickets among children has been the noöspheric fossil of gross Vitamin D deficiency in temperate zones of the planet: soft bones, bowed legs—osteomalacia. It was so rampant in the 19th and early 20th centuries, that a public health measure was instituted in the 1930s, fortifying certain foods in the United States with Vitamin D, notably milk. However, the amount of Vitamin D in milk is small, and many of those most in need of the vitamin cannot tolerate ingesting dairy products. Public health measures have made rickets less prevalent (although it is on the upswing again), but they have not banished Vitamin D deficiency in its more subtle forms.¹⁷

There have been many studies in recent years pointing to a link between Vitamin D deficiency and several prevalent diseases associated with modern civilization: colon cancer, diabetes, heart disease, obesity, and multiple sclerosis, just to name a few. There has also been some mention of Vitamin D status and resistance to influenza and other infectious diseases, notably tuberculosis.¹⁸⁻¹⁹

Vitamin D Essential

Back in 1981, a British amateur scientist, R. Edgar Hope-Simpson, pondered the strong positive correlation in temperate latitudes between seasonal influenza and the Fall/Winter sea-

17. [New Roles of Vitamin D](#), 2006

18. John J. Cannell, et al., 2008. "[On the epidemiology of influenza](#)," *Virology Journal*, Vol. 5, No. 29.

19. John J. Cannell, et al., 2006. "[Epidemic influenza and Vitamin D](#)," *Epidemiol. Infect.*

son when the Sun was weakest. He spent the rest of his life unsuccessfully looking for the physical cause of the “seasonal stimulus” for the seasonal flu. It is a remarkable testament to the bankruptcy of much of molecular biology that we still, even today, know so little about such a powerful immunomodulatory molecule as Vitamin D. Because it is so cheap, being free to those who care to sunbathe, science has, until recently, been indifferent to it except where clinical manifestations of its lack are undeniable. Where deficiencies occur, cheap remedies of cod liver oil can solve the problem. In the Winter, brief exposure to UV lamps has been shown to work. There is absolutely no reason for anyone to be short on Vitamin D except:

1. People spend their time indoors working and playing. Many work at night and sleep during the day, as well.
2. Dark-skinned peoples have moved into temperate latitudes, where their highly pigmented skin blocks much of the incident UV light.
3. Women (and often men) in many cultures are encouraged to cover themselves completely while outside.
4. Fear of skin cancer and wrinkles.
5. Old people get less Sun exposure and are less efficient in using the UV light to make Vitamin D.

6. Breast-fed infants get no Vitamin D; their mothers often had little Vitamin D during gestation, and infants are often covered to protect them from the Sun.
7. Nutritionists (and the public), have underestimated the requirements of Vitamin D, and failure to routinely test blood levels has hidden the extent of the silent pandemic of deficiency. Most people think the Vitamin D problem was solved long ago by public health, and is not a problem for them.

Ninety percent of black children in a recent study had insufficient Vitamin D (by public health standards) during the late Winter. More than 50 percent of children in the study had insufficient Vitamin D overall. A high percentage of pregnant women have been shown to have insufficient Vitamin D at temperate latitudes. Dark-skinned pregnant women are at much greater risk.²⁰

Pregnant women were shown to have insufficient Vitamin D even when taking multivitamins. Their neonates, having no source of Vitamin D but their mothers, are even more deficient. Starting out life deficient in Vitamin D can lead to life-long health problems we are only beginning to investigate, including type 1 diabetes, multiple sclerosis, and other autoimmune



Department of Health and Human Services

An American child in 1970 with symptoms of nutritional rickets (bowed legs and enlarged right wrist), in which children's bones are too soft and do not develop properly because of a lack of Vitamin D. Many adults and children today, especially those with darker skin, are deficient in Vitamin D, and Vitamin D supplements are a frontline defense against the pandemic flu.

diseases, plus schizophrenia, obesity, and other ills. Many of these are the special risk factors which are correlated with increased risk of complications or death from seasonal flu.

While all countries with financial means are spending billions to purchase vaccines to protect their populations from a novel influenza, and large amounts are spent each year for seasonal flu, almost nothing has been done to test the theory that increasing Vitamin D blood levels in the population can reduce morbidity, mortality, and spread of the seasonal, or any other flu. This is all the more surprising since a proper blood concentration of Vitamin D, unlike the flu vaccine, has a multitude of other beneficial effects. In many poor countries, especially in temperate climates, Vitamin D deficiency coupled with other nutritional factors might be contributing to the high death rates seen in certain of the young during the present flu pandemic.

At least one country, Canada, has begun studying the effect of Vitamin D status on influenza susceptibility as it collects flu data.²¹ More countries should do the same.

Universal availability of Vitamin D supplements (as in Vitamin D-calcium-fortified orange juice), and education

campaigns connecting Vitamin D sufficiency with immune function may provide tools available to all people to fight the flu, especially as the pandemic vaccine will not be available to all, or even most, people in these countries this Fall.

During the Fall, national, state, and local public health officials will bring people together for mass vaccinations against the novel and seasonal influenza, especially at schools where children congregate. This would be the perfect time to administer Vitamin D to a large group, which could be followed up at a later time. The children and their parents could be educated about the value of Vitamin D and the dangers of its lack.

Although the old are slated to be last in line for the novel flu vaccine, they should be high on the list of those receiving Vitamin D, as they are the most deficient, and the most susceptible to seasonal flu.

The Task Today

As we have seen, influenza is not a simple mathematical expression in one variable. It is an extremely complicated interaction of variables residing in three separate but finely intermeshed

20. Lisa M. Bodnar, et al., 2007. “High Prevalence of Vitamin D Insufficiency in Black and White Pregnant Women Residing in the Northern United States and Their Neonates,” *The Journal of Nutrition*, Vol. 137, No. 2 (Feb.).

21. http://www.privatemdlabs.com/news/Vitamin_D_Deficiency-Diagnosis_and_Treatment_/Canadian-government-using-vitamin-D-testing-to-determine-susceptibility-to-S19286038.php

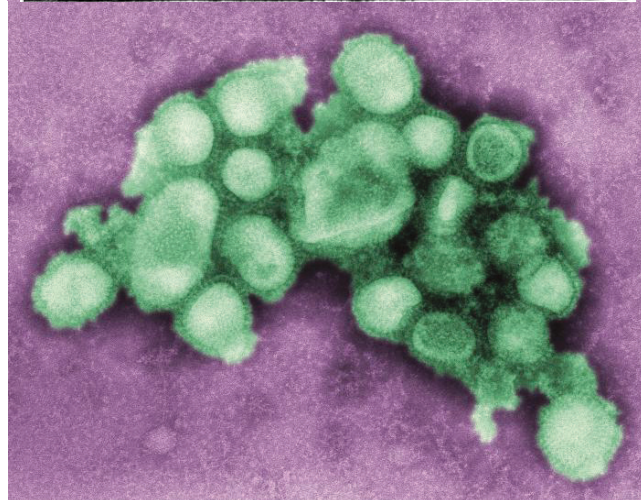
and multiply connected domains of existence, the nonliving, the living, and the Noösphere—a kind of three-body problem. The dynamics of influenza are astoundingly complex, and only an understanding of its dynamics within the Biosphere can give us long-term solutions to its yearly cycle of infection. These solutions must take into account genetic potentialities of both the virus and host, as well as the health and nutritional status of the host.

Furthermore, they must take into account the seasonal and climatic cycles of the planet. Finally, the solutions must take into account the health and nutritional status of the Noösphere itself—the scientific, technological, and cultural level of man within the Biosphere.

This last area is obviously the most important aspect for flu dynamics, because it is through the Noösphere that man gains the power to alter processes within the Biosphere, either for his benefit or his detriment. Without the Noösphere man is as helpless before disease as a beast. Today, 10 years into the 21st Century, we are still relying mainly on a 200-year-old idea—vaccination—to manage the flu.

Without knowledge of the nature of viruses, men like Louis Pasteur experimented to alter the human terrain to make it more resistant to the agents of disease by stimulating the unknown black box of the immune system with viral antigens. This was a very powerful intervention for clinical medicine and public health, and led to huge advances in biological and medical sciences. The modern medical search for antimicrobial drugs is more than a century old, spearheaded by searches for drugs that could treat syphilis and tuberculosis—two bacterial scourges of the 19th Century. We can add a third great idea tied up with these other discoveries of the dawn of microbiology: that

As the ignorance, poverty, rage, and fear expand, the Four Horsemen of the Apocalypse (Albrecht Dürer woodcut, 1498) will commence their ride, mowing down populations in their path like a sharpened scythe through ripe grain.



CDC

of disinfection.

Since those discoveries, although medical and biological fields and subfields have proliferated like viruses, we have not really progressed much beyond these simple ideas, which came only with great difficulty to our ancestors. Although its effects are blunted by medical and other advances, influenza still has the upper hand. And whenever man's cultural and scientific progress halts or regresses, influenza and other infectious diseases roar back with a vengeance.

This is where we stand today. Not only have we not developed new technologies to deal with influenza, but we have spent 40 years dismantling the medical infrastructure that it took a century to develop.

Furthermore, today we are teetering over the abyss of a financial breakdown crisis that will bring on a profound noöspheric contraction of a magnitude not seen since the days of the Black Death in Europe. As the ignorance, poverty, rage, and fear expand, the Four Horsemen of the Apocalypse will commence their ride, mowing down populations in their path like a sharpened scythe through ripe grain. Billions could die of war, starvation, and disease in a Dark Age spanning generations.

To avoid this unthinkable calamity, we must stop the tumble into the abyss by reversing the recent ruinous economic/financial policies now dragging us over the edge. We must rebuild our ruined physical economy, and set our sights on a Noösphere-expanding mission to propel us into the future.

How about building a colony on Mars?²²

22. <http://www.larouchepac.com/webcasts/20090801.html>

A LESSON FOR COPENHAGEN TODAY

Hans Christian Ørsted's Scientific Method

by Tom Gillesberg

Throughout 2009, Denmark has been under a siege of climate hysteria. There has been a great effort to try to delude the public into thinking that Denmark's great mission is to secure a binding global climate agreement during the United Nations Climate Summit, to be held in Copenhagen Dec. 7-18, 2009. If this were to occur, it would force the nations of world to spend much of their economic resources on "renewable energy," and other wasteful actions, because it is claimed that such actions would reduce the human CO₂ destruction of the Earth. The shrill rhetoric is supposed to make people feel that the world would be nearly annihilated, if this were not to succeed.

Fortunately, the growing political revolt in the United States has made it close to impossible to get this policy through. It is not only likely that the climate summit will become a Danish climate flop, but also that, in coming years, people will look back with shame at the absurd rhetoric about human-induced global warming, which is a repeat of the famous Hans Christian Andersen story, "The Emperor's New Clothes." And, in time, people will be embarrassed, and try to forget how much of the world's resources were sacrificed on the altar of climate superstition.

If the great Danish scientist Hans Christian Ørsted (1777-1851)



The city of Copenhagen in an 1895 photo. Today the city has been chosen to host the United Nations Climate Summit, whose delegates are charged with securing binding economic agreements based on superstitions that Ørsted would have derided as nonsense.



Library of Congress

The great Danish scientist Hans Christian Ørsted (1777-1851) in a 19th Century portrait. He is depicted with his experiment on the patterns sound waves produce in a powder on a metal plate.

Instead of today's climate superstition, we must return to the classical humanist scientific method propounded by the great Danish scientist Ørsted and his cothinkers.

were present today, he would be shaking his head at the ongoing pseudo-scientific debate, and the intimidating brainwashing campaign that accompanies it. He would have immediately realized that it is not science that is paramount, but that the whole debate is skewed by a prejudicial assumption that humanity is an evil that must be culled. This is the philosophy of the environmental movement, and its royal backers, Prince Philip and Prince Charles, and this is what has driven them to wish to limit human development through CO₂ allowances and expensive energy, thus undermining the very basis of the existence of present and future humanity.

To counter the media, politicians, and well-paid researchers who persist in their superstitions, and ignore the scientific research showing that it is the Sun which is causing climatic fluctuations on Earth (as documented by the contemporary Danish scientist Henrik Svensmark), Ørsted would have taken out his 1850 book, *The Spirit in Nature*, which he wrote to try to fight the superstition of his day. As he wrote:

No proof is necessary to show that a worldview is a fundamental element of philosophy, but it is no less certain that this must be either fruitless, or in many respects false, if this worldview does not possess, in itself, the most essential truths taught by natural science. Even if the philosophers of the present day are not unacquainted with the results of the natural sciences, they generally pay so little attention to them, that it exercises almost no influence on their inquiries.¹

In Ørsted's time, it was people like the Danish Reverend N.F.S. Grundtvig (1783-1872), who despised science, and in its place created his own mythological universe. Today, the environmentalists and climate fanatics, instead of using modern science and technology to improve the environment and living conditions of the population, prefer to use climate superstition to deceive them. They erroneously claim that human activities destructively interfere with nature's delicate balance, and that man, therefore, is nature's worst enemy. Ørsted would have protested, and emphasized how studies of nature and the Earth show something quite different. He would have insisted that the environmental ideologists' idea that we must have zero growth, and stop human development, is contrary to the very laws of the universe. Everything changes and develops. As he wrote:

The Earth has not always been as it is now; its internal structure testifies to the fact that it has been developing from one condition to another for thousands of years, and

Gillesberg is chairman of The Schiller Institute in Denmark, and Copenhagen mayoral candidate, who led The Friends of the Schiller Institute list in the Nov. 17 municipal elections. This article first appeared in Danish in the Schiller Institute's campaign newspaper, No. 10, Fall, 2009 (www.schillerinstitut.dk/ka10). It was translated by Michelle Rasmussen and Carol Jensen.



A monument memorializing Ørsted and his love of science and truth, created by Jens Adolf Jerichau in the 19th Century. It is in Copenhagen's Ørsted Park.

the attentive inquirer must be aware that it constantly continues to develop itself, and that now, as at any other moment, it is passing from one state to another. We may easily conceive that the same thing is taking place with all the other heavenly bodies, which are, therefore, not only in constant motion, but, at the same time, are in an unceasing state of development. Inaction or rest does not exist in the universe.²

"It is one of the fundamental laws of nature, that everything must be developed over time,"³ concluded Ørsted. That is the most fundamental universal law. Everything in this universe must be in constant flux and development. Instead of trying to subject humans to the limitations that apply to other living creatures on this Earth, we must therefore recognize that man is not just a part of nature, but through his creative reason, is above it.

"In as much as a person thinks, he is free. His freedom grows with his thinking. Without this, he is subject to the laws of unconscious nature."⁴

If we use our reason, we are the unique life form here on

Earth, which has been granted free will. If we deny ourselves reason, we reduce ourselves simply to being animals, and then, as the environmental movement tries to make us believe, we are reduced to blindly subjecting ourselves to nature.

Ørsted's point would later be developed in greater detail by the great Russian scientist Vladimir Vernadsky. The entire universe is developing, but there are three very distinct and different types of developmental dynamics we find coexisting on the Earth: 1) the non-living abiotic lithosphere, which consists of dead stones and matter; 2) the biosphere, which is the result of living biological processes; and finally 3) the noosphere (the sphere of spirit and reason) which is the result of cognitive life in the form of human activity. These three principles and spheres work simultaneously and are interlocked, but are fundamentally different, and have different rank and power in the universe.

Living processes "eat" abiotic non-living material, which is thus incorporated into the biosphere, and the volume of the biosphere, in relation to the lithosphere, grows day by day. Similarly, the lithosphere and the biosphere are subjected to the noosphere, where man is constantly incorporating an increasing proportion of them into his activities. But if man stops using his reason, he loses his free will, and will be subjected to the biosphere and the lithosphere.

Ørsted's Worldview

Like the great astronomer and thinker Johannes Kepler (1571-1630), Ørsted is convinced that we do not live in a universe ruled by anarchy and randomness. On the contrary. The universe is a beautiful process of development, which is guided by a higher idea. Ørsted had therefore called natural laws, "natural thoughts," and in a sharp polemic against people like Reverend Grundtvig, Ørsted said: "natural laws are thoughts of nature... These thoughts of nature are also God's thoughts."⁵

Grundtvig had attacked Ørsted for undermining Christianity through the dissemination of science, for, according to Grundtvig, one could not both study science and believe in God. Ørsted had replied to this with a lecture titled "The Cul-



Ørsted's philosophical opponent, Reverend Grundtvig, in an 1843 portrait by Christian Albrecht Jensen.

tivation of Science Considered as Religious Devotion." The lecture, he said, contained "in brief, the author's thoughts concerning the inner connection between the True, the Beautiful, and the Good, and their common divine source." Ørsted thought that Grundtvig's problem was that he did not understand "how the scientist, when he fully understands his own endeavor, must regard the cultivation of science as religious devotion."

For Ørsted, there is no contradiction between belief in God, who created the universe and its laws of nature, and natural science laying bare natural thoughts, and the deeper reason in that which has been created. The great and beautiful natural thoughts we find through science (the universally valid natural laws) are not inaccessible to us human beings, because our reason is akin to the creative principles behind them:

Were the laws of our reason not found in Nature, we would strive, in vain, to force them therein; were the laws of nature not found in our reason, we would not understand them.⁶

We humans, and only we, are able to find the laws of nature, understand the natural thoughts, and apply them in our service.

Ørsted's Genius

This does not sound like a cold scientist, who objectively considers nature around him, and believes that it is merely a series of random events, without cause and purpose. Ørsted was not like that; on the contrary. The reason that Ørsted could find that which his contemporaries looked for in vain, namely a connection between the diffuse phenomena of electricity and magnetism, was that he knew they were part of an overall harmony, and therefore, there must be a correlation which he could find, if he could understand the idea that lay behind it. Just as Kepler, in his pioneering works, *The New Astronomy* and *The Harmony of the World*, had described how he discovered the harmonic principles underlying the



A depiction of Ørsted and his most famous electromagnetic experiment, from the Deutsche Museum.

planetary orbits in our Solar System, Ørsted believed that discoveries in astronomy are the role model for how we create a deeper understanding of all the other scientific fields. Science, of course, implies the use of our senses, in order to look at the phenomena around us through sensory impressions, and we even build better tools to enhance these senses. But this alone does not give us insight into the coherence of things. It requires something more, namely human genius. We are able to go beyond the sum of sensory impressions, and create a hypothesis about the principle, the thought, or idea, that lies behind the phenomena we observe.

Ørsted understood this early. He began his work, "The First Foundations of Natural Philosophy," published in 1799, while he was a student:

When a collection of knowledge, gained through experience, shall make claim to be science, in the genuine meaning of that word, then these observations have to be connected, according to certain general and necessary laws, which cannot be deduced from experience itself, but must be proven without its help (a priori). If that is not the case with an ordered body of knowledge, then the thinker is not at all satisfied with the result, but it leaves him at a boundary, which he is not certain is the outermost, and it shows him laws, which he dares not



A contemporary view of Denmark's Technical University, the successor of the Polytechnic University which was founded by Ørsted in 1829. Ørsted fought to keep science, not mathematics, primary in the curriculum.

assume to be general and necessary, because he knows that experience can only teach us what is, but not what necessarily must be.

Poetry and Science

As Ørsted himself never tired of pointing out, his first love was not cold mathematics, but warm poetry:

Don't you know that since I was a child, I have been writing poetry, even before I could write prose?... Know that I only left poetry, because it seemed to me, that there were too many lies and affectation in most of it, and that, nevertheless, I have always felt attracted by its harmony.⁷

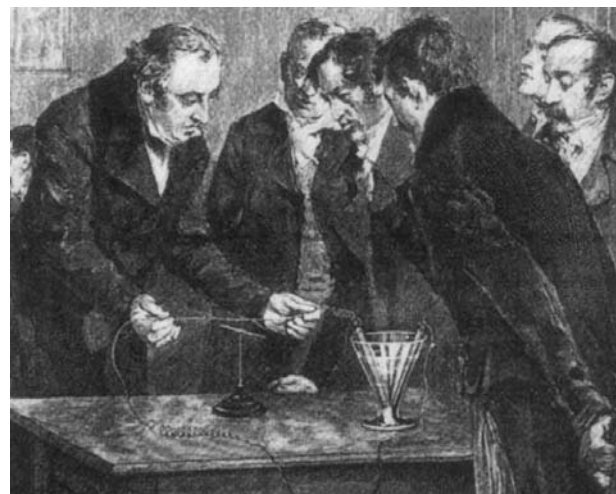
For Ørsted, there is no strict separation between science and art. They are both products of human creativity and reason, each in its own field. And it is through developing ourselves in both areas, that we are able to break the narrow limits of our thinking that have prevented us from capturing the deeper reality behind our sense impressions. Both are products of human reason. Through our capacity for critical self-reflection and a review of our *a priori* axioms and assumptions, we philosophize and reflect about the larger connections and higher harmony. And then, when we seek to create a hypothesis about the invisible underlying coherence that causes our physical observations—the shadows we see on the wall—then it is our imagination, trained through art, which will enable us to do this. For example, Albert Einstein always started playing his violin when he was stuck on a problem, and needed to be inspired to solve it.

Subsequently, we use physical experiments to confirm or refute our theory, where

Its importance is due to the fact that it is not only our reason, which tests the creations of our own reason, but

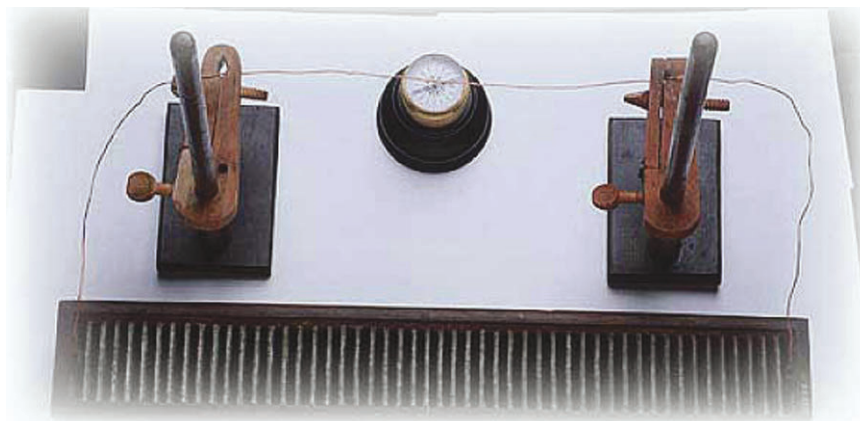


Ørsted's first love was poetry, and Friedrich Schiller (1759-1805) was an influential figure in his philosophy.



Ørsted's discovery of electromagnetism sent a shock wave throughout Europe. Here a French engraving depicting the experiment (right) and (above) a German illustration of the experiment.

Below left: A reconstruction of Ørsted's 1820 experiment demonstrating electromagnetism. A compass placed next to a closed electrical circuit, with the needle parallel to the wire, caused the compass needle to shift, indicating a relationship between electricity and magnetism. Readers can reproduce this effect for themselves.



Many of the most excellent of those who work with natural science, have tried too hard to impress mathematics onto it, or more correctly, the form of Euclidean geometry, whereby it has been regarded as applied mathematics. By doing so, science is robbed of its natural form.

And when a group of mathematicians in 1844 tried to introduce changes in teaching at the Polytechnic University, to be grounded in mathematics instead of physics, Ørsted clearly refused. He declared himself in fundamental dis-

that we are testing how well our reason is in harmony with a creation which we certainly know, for sure, our reason has not produced.⁸

After that, the new knowledge can be turned into new mathematical formulas and principles that we can use in our ongoing activities. But if we try to let mathematics lead us to reality, putting the cart before the horse, then we will get mirages, instead of science, as we see among many contemporary researchers.

That was already a problem in Ørsted's time, and in 1811, he wrote a warning in his *First Introduction to General Natural Science*:

agreement with

those mathematicians who think that physics should only be treated mathematically. In contrast to this, throughout my whole scientific life, and even more so, the further I progressed, I have tried to elevate a treatment emanating from the nature of physics itself, in which mathematics steps backward, as much as possible, in favor of experimental treatment. At the same time, I have constantly declared, that it is exceedingly important for physics, that its truths are also put in a mathematical form, and I encourage those listeners, who would be willing to go further in this direction, to make use of mathematical

teaching for this purpose. In contrast to this, I cannot advise anyone to start with mathematics, in order to become a physicist.

Until his death, Ørsted prevented the Polytechnic University and the Danish scientific community from being taken over by the mathematicians. Ørsted had a dynamic holistic worldview in which all parts of our existence must necessarily be interdependent. There is no false separation between science and art, or knowledge and belief. In 1833, he concluded a letter to Hans Christian Andersen, in connection with his first trip abroad, with these words:

Reason with Reason = The Truth;
Reason within the Will [intention] = The Good;
Reason within the Imagination = The Beautiful.

We see here the dynamic holistic idea that was a hallmark of the Danish Golden Age, in which Ørsted was a great driving force, and which, in reality, was a renaissance, a rebirth of classic Greek art and philosophy. It was living by the Greek idea, that one should be *καλός και αγαθός*, beautiful and good, and seek the truth, the beautiful and the good, which was the source of the explosion of creativity and development during the Golden Age. And this was largely the result of Ørsted and others being inspired by that standpoint through the great influence of Friedrich Schiller's ideas in Denmark.⁹

Reason with Reason

Already as a student, Ørsted published interesting philosophical thoughts, and during his subsequent educational trip throughout Europe, he was able to visit 70 of the great scientists and thinkers of the time. He was immediately attracted by the great incomprehensible phenomena of his time, such as electricity and magnetism, but also all other natural scientific phenomena. From early on, he loved to verify all experiments, and published one of the first chemistry books in German of his time, in order to make the many new speculations and discoveries accessible to a wider audience. The book was soon translated into French.

Ørsted quickly became the focal point in Copenhagen, when it came to reenacting international physics experiments, both for students who needed to have a minimal insight into chemistry and physics, and for other scientifically interested people. He built up an ever more extensive collection of experiments. In 1806, he published a scientific study of the graphics of sound waves (how metal plates, which are set into motion by certain sound waves, create harmonious patterns in powder placed on the plates), which is illustrated in the portrait of Ørsted from 1842. That was the reason he was accepted, in 1808, into the Royal Danish Academy of Sciences, together with scientists and scholars from many fields.

Ørsted quickly became a very active figure in the Academy, and was engaged in ensuring that discoveries and studies were not buried in desk drawers, but were circulating, and published, if possible. He believed that

The announcement of a new thought, is just as much an event as the publication of a new experiment; that [the

experiment] will only gain its importance, which can be very large or very small, by its relation to the world of thoughts.¹⁰

In 1815, he became secretary of the Academy, a post he held until his death in 1851. Ørsted tried to continue his independent scientific research, but more and more of his time was devoted to disseminating natural science to the entire society around him. Then came "The year 1820 [which] was the happiest in Ørsted's scientific life,"¹¹ as he wrote in his autobiography—his seminal discovery of electromagnetism.

Discovery of Electromagnetism

There are those who say that it was pure coincidence that Ørsted discovered electromagnetism, but that is a hoax. Ørsted was constantly on the lookout for such a deeper understanding, and already in 1812, in *Ansicht der Chemischen Naturgesetze*, he had reasoned that electricity and magnetism are "produced by the same forces." Then, in the Spring of 1820, when he was preparing an experiment for his students, he got an idea for a modified experimental arrangement that might demonstrate the connection. Ørsted hypothesized that if a closed electrical circuit would have an effect on a nearby compass needle, it would not make the needle align parallel to the wire, but at an angle. Therefore, before the circuit was closed, he wanted to place the compass needle parallel to the wire, instead of perpendicular, so that any movement away from the parallel would be noticeable. He had no time to verify the result before the lecture, but when they performed the experiment, it showed that the needle did move slightly.

Ørsted did not have the possibility of making a systematic study of the phenomenon before the Summer, when his further studies confirmed the phenomenon, and he mapped it out in detail. Thereafter, as he described it:

He rushed to publish his work. That occurred in the form of a very short Latin prospectus, on two tightly written quartos. . . . He now sent this half-of-a-sheet of paper out by one-day mail to the important scientific places in the world.¹²

Ørsted's discovery immediately sent scientific shock waves across Europe, and, with André-Marie Ampère's continued work based on Ørsted's discovery, a new scientific field was launched. Along with it came an understanding of how phenomena like electricity and magnetism, which are invisible to our senses, are "visible" to our reason, and enable us to better understand and subdue the physical universe.

Understanding electromagnetism had enormous consequences for scientific knowledge, as well as the further development of the human economy and our society. Since Johannes Kepler had identified gravitation as a universally valid physical principle, which is present and acting everywhere, although it is invisible to our senses, the hunt was on for other similar principles, including the two diffuse phenomena of electricity and magnetism. The ability to show that the two phenomena are connected, and operate based on the same underlying laws, was a major step forward in understanding the underlying universal principles, and the beginning of the process of creating a



André-Marie Ampère
(1775-1836)



Carl Friedrich Gauss
(1777-1855)

Ørsted's discovery was furthered by the work of the European leaders in classical science, laying the basis for modern industrial society.



Wilhelm Eduard Weber
(1804-1891)



Bernhard Riemann
(1826-1866)

unified field theory (still the big challenge today), where physically verifiable universally valid physical principles are collected in a single space-time.

One of the thinkers in this direction was Carl Friedrich Gauss, who began his life with great discoveries in geometry and mathematics, and then used his extraordinary genius to shed light on astronomy, geodesy, and Earth magnetism, among other fields. Gauss, like Ørsted, had already at a young age, rejected the traditional Euclidean geometry, and secretly developed his own physical-geometric methods to circumvent the mathematics of his time, which, like the Euclidean system, was based on arbitrary

axioms and postulates. Gauss held his work to give mathematics a new physical scientific fundament hidden from the public, because Europe was increasingly being brought under a political and scientific dictatorship, which did not want any challenges to the generally accepted doctrines. It was therefore Gauss's student, Bernhard Riemann, who publicly challenged and overthrew the arbitrary axioms and postulates within mathematics and physics, which Einstein and Vernadsky later continued working on.

Together with his younger collaborator Wilhelm Weber, Gauss investigated electromagnetism, and the two invented the telegraph in 1833, based on Ørsted's discovery, enormously improving communication possibilities. One could now telegraph messages with the speed of light over long distances.

Subsequently, the spread of electricity meant that town and country were illuminated, and also, with the use of the electric motor, the foundation was laid for modern industrial society, and the opportunity for the prosperity we have today.

The Reason of the Will

For Ørsted, research was always alluring and exciting, but it was not an end in itself. Like the godfather of the American nation, Benjamin Franklin (1706-1790), whom he greatly admired, Ørsted put the general welfare in the seat of honor. Natural science is a means to turn the forces of nature into our tools, and thus be better able to ensure all people a better life. Simultaneously, it can also set us free, by liberating society from

superstition. When Ørsted graduated in 1801, natural science was not something you could study, and therefore, Ørsted spent most of his life, and most of his time, trying to ensure that the gifts of science could reach the whole society. Single-handedly, he built up instrument collections, and was a chemistry and physics teacher for both university students and the general public.

Ørsted used his great fame after 1820, to reach the public in Denmark, and internationally. After a trip to England in 1824, he became the initiator and driving force behind the founding

Ørsted, the Magnetic Association, and H.C. Schumacher

Ørsted did not work alone in his magnetic measuring, but collaborated with the Danish astronomer and geodesist Heinrich Christian Schumacher (1780-1854), among others. In 1808, the 27-year-old Schumacher made a request to the world famous Gauss, to be allowed come to Göttingen to be trained by him. He had already been granted 600 Danish crowns by the Danish king, to study with Gauss for one year. After a long hesitation, Gauss answered that Schumacher was welcome to come and use the astronomical facilities, as long as he did not expect formal instruction from Gauss. This was to be of great importance for the future, because while Schumacher worked with Gauss, they developed a close cooperation and friendship, which continued through the next 42 years, including the exchange of 1,319 letters, one of our primary sources today for an understanding of Gauss's thoughts on many subjects.

Schumacher had to leave Gauss after a year, but he became the director of the Mannheim Astronomical Observatory in 1813-1815, and then was appointed professor of astronomy at the University of Copenhagen. Quite extraordinary, he was given permission to perform this function from Altona, on the extreme southern border of the Danish kingdom, where, with funds provided by the Danish king, he bought a property that served as both his home and a guest house, and where he established an observatory. Schumacher later became a member of the Royal Danish Academy of Sciences, and closely collaborated with Ørsted.

Schumacher had a unique ability to get the Danish king and various finance ministers to allocate money for scientific projects, not only of importance for Denmark, but also for Germany, and the world. In 1821, Schumacher was allocated money from the Danish state treasury for the publication of an astronomical scientific journal *Astronomische Nachrichten* (Astronomical News), which he published from Altona. This quickly became the leading international scientific journal, and a vital pivot for astronomical, magnetic, and other vital basic research. It still exists today, and is the oldest continuously published scientific journal. Schumacher became Ørsted's link to German scientific circles such as Gauss, Bessel, Olbers, and so on, with whom Schumacher, from his advanced position in Altona, was in almost daily contact.

Magnetic Studies

Gauss, as part of his extensive magnetic studies, decided in 1834, that precise international studies of the Earth's



Danish astronomer Heinrich Christian Schumacher (1780-1850) was a close friend of Ørsted, and arranged Ørsted's meeting with Gauss, which launched the Magnetic Association.

magnetic field were necessary, in order to make sound scientific hypotheses about the phenomenon. He designed a magnetic observatory, and a new set of scientific instruments, capable of measuring magnetic changes with "astronomical precision." Then, he had to arrange to have a series of similar observatories built around the world, which would be able to measure changes in Earth's magnetic field, according to a series of clearly defined principles.

As a natural part of that project, Schumacher contacted Ørsted in the spring of 1834, and urged him to come to Göttingen, and to make the preparations to build such an observatory in Copenhagen. Ørsted replied that he would like come to Göttingen for that purpose, but could depart only in July, at which point he would visit Gauss. Schumacher arranged that money was allocated for an extra assistant,

Poulsen, to travel with Ørsted to Göttingen, to learn what would be necessary to construct and operate the observatory. Also, he arranged for the necessary funds to be granted from the Danish treasury to build a fully equipped observatory at the Polytechnic Institute in Copenhagen, complete with the construction of Gauss's newly designed instruments.

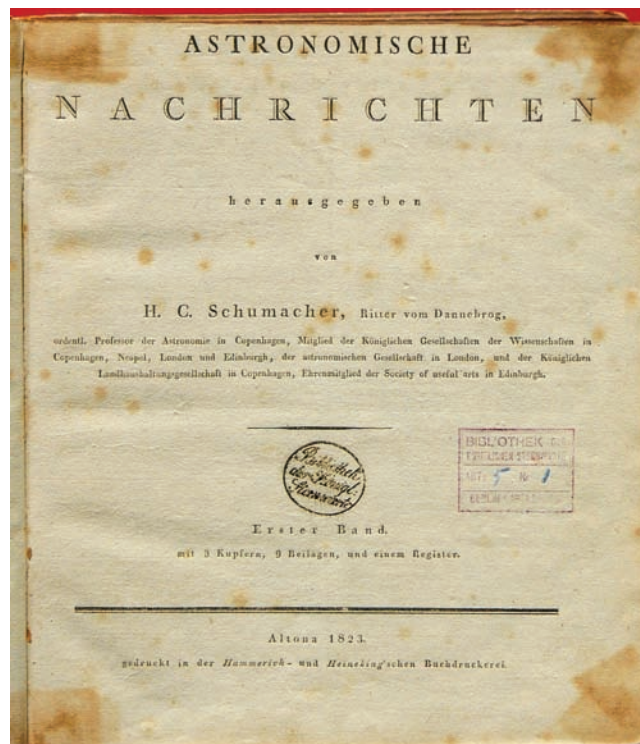
Schumacher was the intermediary in this exchange of correspondence between his two "dear friends," as he called them in private correspondence, and the result was that the plan was successfully put into practice.

While Ørsted visited Gauss, they founded the *Magnetische Verein*, the Magnetic Association, together with five other scientists. Under the direction of Gauss and Weber, the Association organized the construction of similar observatories throughout Europe, and the mapping of the Earth's magnetic field and magnetic fluctuations. This scientific evidence allowed Gauss to write his groundbreaking scientific descriptions of the phenomena of magnetism and Earth magnetism.

Shortly after Ørsted returned from his trip, the magnetic observatory was established, and in November of the same year, the first surprising results were obtained. As part of the project, it was agreed to measure the magnetic field for 24 hours, with 5-minute intervals, on November 5-6. Because of a mistake, only the observatories in Copenhagen and Milan made the measurements, but they showed that there was an amazing coincidence between the fluctuations in the magnetic field at the two locations, despite the great distance. This was later confirmed by extensive studies during the following years, as recorded in the *Magnetische Verein*.



Schumacher's house and observatory in Altona, at the southern border of Denmark, from where he served as a professor of astronomy at the University of Copenhagen.



The title page of the first issue (1823) of Astronomische Nachrichten (Astronomical News), the astronomical journal published by Schumacher with Danish state funds. It is still in publication today.

of The Association for the Dissemination of Natural Sciences, and the founding of the Polytechnic University in 1829, of which he, of course, became the rector. Ørsted's lectures to the students were in Danish, as often as possible, and open to the public. When Ørsted stood at the blackboard, or performed new experiments, which he often did, there was usually a rich mixture of people in the audience from many different backgrounds. This meant that new scientific discoveries could soon be made useful, and transform the society and its activities.

A well known example is the founder of the Carlsberg brewery, J.C. Jacobsen, who was an enthusiastic spectator at these lectures, and used the new knowledge gained to improve and streamline the art of brewing. In an 1844 letter, Ørsted presented his own teaching philosophy:

Associated with the specific scientific treatment I have used in physics, I have tried to make it as accessible to as many readers as the subject would allow; I have made it as popular, and as Danish, as was in my power. Besides, I have endeavored to place the teaching of nature in the context of all of science, yes, even within the entirety of the education of the spirit.

Ørsted strove not only to translate his lectures on scientific discoveries into everyday Danish, to make them available to the public, but throughout his life, he also coined the Danish names of many of the newly found chemical substances and scientific processes, constructing such meaningful words as

oxygen (in Danish "ilt," from "ild" the word for fire), hydrogen (in Danish "brint," from "at brende" which means to burn), and hundreds of others in our scientific and everyday language. That way, the society could avoid using a language of science which was incomprehensible for ordinary people (as Latin was), and instead, integrate scientific language into everyday speech. This was not to lower the scientific level, but to lift ordinary people out of the power of their world of senses, up to the level of science. (It also indeed turns out that even if professional researchers use a myriad special scientific terms, they often do not understand them, before they have translated them into their mother tongue.)

Ørsted was also often involved in the practical application of science as, for example, inventing a method for producing aluminum, a study of the possibility of exploiting deposits of coal on the Danish Baltic Sea island of Bornholm, and the production of the liquor aquavit, together with Brøndum, the famous Danish liquor manufacturer.

Ørsted's International Work

But Ørsted played a major role not only in Denmark. He was a central figure in the international network of researchers and scientists, which, in spite of the Congress of Vienna's attempts to stifle all freedom and development, created the foundation for functioning European nations of the future. Already on his first trip abroad in 1801, he had met leading scientists and intellectuals across Europe, and he continued to have contact with a

vast international network until his death 50 years later. In addition to publishing his own books in both German and French, and sending scientific papers in Latin to leading scientific institutions, Ørsted made sure that prominent scientists, like Alexander von Humboldt, Gauss, and many others, were members of the Royal Danish Academy of Sciences, where he served as secretary. He also arranged financial assistance for research, and gave prizes and monetary rewards for major works, as when Gauss received a big prize in 1822.¹³



Hans Christian Andersen (1805-1875) was inspired by his intellectual father, Ørsted.

In 1834, Ørsted was on an official trip to visit Gauss in Göttingen, arranged by his close friend Heinrich Christian Schumacher.¹⁴ During the visit, Gauss and Ørsted, together with five other scientists, founded the *Magnetische Verein*, the Magnetic Association. It was actually the first international scientific association, and was tasked with mapping the Earth's magnetic field. After the visit, Ørsted built a magnetic observatory at the Polytechnic University in Copenhagen, with a set of new advanced instruments developed by Gauss, which could measure the changes in the magnetic field with "astronomical precision."

The Magnetic Association was also thought to have had a secret mission, which was concealed from its contemporaries: namely, to spread natural sciences and new technologies in society, not only hoping to benefit the general welfare of humanity, but also, over time, to establish intellectual and political freedom in Europe.

The Reason Within the Imagination

When Ørsted collected his main considerations in his book *The Spirit of Nature*, it was not only natural science that had the place of honor, but also philosophy and poetry. Ørsted tries here, as throughout his life, to promote poetry in natural science, and natural science in poetry. Like Schiller, he tries to bring art onto much firmer ground than simply being an expression of arbitrary, indifferent taste. Ørsted was a patron, and an intellectual father, for the great Danish poet Hans Christian Andersen, and he convinced him that it were far better to write stories with scientific, philosophical, and metaphorical insight, than to follow the contemporary popular story trend and write stories based on magic and hocus pocus (like Harry Potter and

similar fantasy today).

Under Ørsted's influence, Andersen's genius flourished, and Ørsted would pronounce the prophetic words that Andersen's novels would make him famous, but his fairy tales would make him immortal.



Adam Oehlenschläger (1779-1850), another Danish poet, was also a lifelong friend of Ørsted.

Throughout his life, Ørsted also had a close relationship and dialogue with the major Danish poet Adam Oehlenschläger, whose sister, Sophie, married Ørsted's brother, Anders Sandøe Ørsted, who was his closest discussion partner and also played a leading role in Danish society in his own right, as a lawyer, and Minister.

In his central position in Danish society, Ørsted, along with other lovers of Schiller, like Finance Minister Count Ernst Schimmelmann, ensured that although Denmark went through many deep crises—for example, the British military attacks on Copenhagen in 1801 and 1807, national bankruptcy in 1813, and the painful loss of Norway at the Congress of Vienna in 1815—there were always resources for an obvious talent to have the opportunity to develop himself, by sending him on a state-financed educational journey throughout Europe. This enabled a young talent to travel to wherever he could get the best education and intellectual nutrition for further development, whether in science, poetry, painting, or



Anders Sandøe Ørsted (1778-1860), Ørsted's brother and closest friend, was a jurist and government minister.

some other field. When such a grand tour were over, the home-comer could illuminate the Danish environment, and reproduce his talent here.

Simultaneously, Ørsted was a central source of inspiration for his time. In most societies, the bright minds and warm hearts get inspiration and spiritual guidance from great philosophical poets. Schiller was such a pure and unspoiled source of inspiration for his time. That can be seen with musicians such as Beethoven and Schubert, but it also applied to the great minds in all other fields, including Ørsted. And for the Danish poets, it also went the other way. Andersen, Oehlenschläger, and others, tapped ideas, inspiration, and courage, from Ørsted. As Hans Christian Andersen beautifully described it in several locations, in much detail, "Ørsted is probably the man whom I have loved the most."¹⁵

Ørsted was always ready to inspire Andersen with new cour-



The famous experiment of Benjamin Franklin, assisted by his son, showed the electrical nature of thunder and lightning. Ørsted proposed it as an exciting subject for a great poet.

age and hope when he had one of his many periods of depression. Ørsted also tried to get contemporary poets to help spread a fascination of natural science, by draping it in poetry. He made the experiment himself, with his poem, “The Airship,” and he thought that Benjamin Franklin must certainly be a good subject for such a poem or drama:

For instance, it is remarkable that the discovery of the electrical nature of thunder and lightning has never inspired a great poet to write an exciting description of it. The discovery was the fruit of scientific thought, but it was proclaimed to the world by an heroic act, for the discoverer conducted the electric fire from a cloud by means which endangered his own life. He was assisted by his youthful son: We can conceive of the inner tension the father must have felt before the experiment, the innocent or heroic participation of the son, and the feeling of triumphant joy when it was concluded. Concerning the son’s participation, the poet is free to choose whether he will suppose the father has not spoken to his son about the danger, or has spoken to him about it, but to test him, has concealed the precautions which he has taken to protect him, while he must necessarily expose himself to danger.¹⁶

Hans Christian Andersen, who shared Ørsted’s enthusiasm for scientific and technological progress, was the poet who most directly accepted Ørsted’s challenge, as can be seen, for example, in his fairy tale “The Drop of Water” and writings like “The Millennium,” “Poetry’s California,” and “The Thorny Road of Honor.”

Like Schiller, Ørsted had a deep trust in the goodness of mankind, that reason would eventually be victorious and give us a better world. In *The Spirit of Nature*, he says directly:

The highest a person can reach in education, is the capability to thoroughly penetrate a limited circle of knowledge with deep insight, and, aided by the spiritual development attained, joined to an eager love of inquiry, to gain a reasonably clear picture of the entirety of existence.¹⁷

And elsewhere he writes that “Insight is the greatest pleasure of our spiritual existence.” Ørsted believed that science gives individuals

impressions of irresistible power, thoughts which appear in undeniable clarity, [and] force him to understand a great deal in a new way. This gives rise to two opposite feelings: either joy, from the new light, or dissatisfaction, from the disruptive

interference with their usual worldview.¹⁸

Therefore, he dreamed about establishing numerous polytechnic schools, so the whole population could get access to science, and not be content with the folk high schools based on Grundtvig’s model, where the rural population should only have the most elementary skills to cope with their daily life, read the Bible, and sing hymns.

Human Creativity

For Ørsted, man and his cognitive ability were something fundamentally good. Consequently, we humans can do stupid, and through our ignorance, evil things, but not in the long run.

The process of thinking, according to its nature, must act according to the eternal laws of nature, so that its unreasonable excesses, contradict its fundamental essence. There is already located an urge there, to weaken the power of evil, within the willing person himself.¹⁹

Of course, Ørsted wanted rapid change, but did not let himself be discouraged by temporary setbacks.

Therefore, we must assume from all that has been said, that the human race develops itself according to the laws of reason, and that the series of changes which take place, despite alternating between progress and decline, lead to actual development, and that the intervention of free will, notwithstanding apparent disturbances, must obey the eternal order of Reason.²⁰

And, “We must . . . remind ourselves, that centuries are short periods in the history of mankind.”²¹

In *The Spirit of Nature*, Ørsted wrote about the unique hu-

EFTER FINANSKRAKKET: MAGNETTOG OVER KATTEGAT



Tom Gillesberg

Kandidat uden for partierne

SCHILLER INSTITUTTETS VENNER
Skt. Knuds Vej 11 kld. tv., 1903 Frederiksberg 35 43 00 33 www.sive.dk

The author, pictured in his 2007 campaign poster for member of parliament from Copenhagen. Gillesberg is well known in Denmark for his campaigns warning of the coming financial collapse, and urging Denmark to support a Maglev train to link Zealand to the Jutland Peninsula. "After the financial crash: maglev across the Kattegat," was his 2007 campaign slogan.

man ability to make hypotheses about the deeper principles that underlie the physical phenomena we can observe, and afterwards to confirm them through scientific experimentation, "You could, with some changes, use an expression of Schiller, and say: What the spirit promises, nature fulfills."²²

We humans are not shabby underlings who must simply let ourselves submit to the world order of our time or nature, he said, but are God's helping hand in the process of continuing creation, and can, through our senses and our genius, both understand and use the laws of nature. And we live in a good and lawful universe, where nature is predetermined to submit, and to listen to us, when we act based on reason. As Schiller put it in his poem "Columbus":

Steer, courageous sailor!
Although the wit may deride thee,
And the skipper at the helm lower his indolent hand—
Ever, ever to the West!
There the coast soon appears,
There it so clearly lies. Your mind sees the land.
Trust in the guiding God and follow the silent ocean!

Were it not yet, it would rise from the streams below.
Genius stands with Nature in everlasting union:
What is promised by one, the other surely fulfills.²³

A New Renaissance

Today, we are faced with a decisive choice. The great climate superstition is just one result of the paradigm shift that occurred in 1968, where the institutions of higher learning were flooded with a new anti-scientific, anti-human worldview. Instead of using our creative reason to come to deeper cognitive insights, and to test our hypotheses through physical experiments, so that we may ensure continued scientific and technological progress, we acquired on some totally new and destructive values. After 40 years, these have led to the collapse of the world economy and financial system, and now threaten the future survival of a large part of mankind.

Inspired by Ørsted, that is the challenge we must accept today. We must have a generation of young enthusiastic defenders of humanity, which commands the greatest human cognitive insight in both natural science, as well as art. We can honor Ørsted's memory, by using his discovery of electromagnetism not only to create a Danish magnetically levitated (maglev) train network, with a top speed of 500 kilometers/hour but also an international maglev network, that stretches all the way from Europe, throughout Asia, to North and South America. And then, of course, we should not just have a satellite named after Ørsted, but also one of the next spaceships that, with Danish participation, will travel to Mars, and beyond, into the great expanses of outer space.

Footnotes

- 1-6. These quotations are from Hans Christian Ørsted, *The Spirit of Nature*, 1856, Third edition (Copenhagen). They were translated into English, using some phrases from the 1852 English translation of L. and J. Horner, *The Soul in Nature*, 1852. (London: Henry G. Bohm).
7. In a letter to theologian and government official A.C. Gierlew, Feb. 13, 1808
8. See Notes 1-6.
9. Friedrich Schiller had a towering influence on Danish intellectual life. As described in this author's article "The Danish Help to Schiller," two leading Danish statesmen, Prince Friedrich Christian of Augustenburg and Ernst von Schimmelmann, financed Schiller throughout six critical years, from 1791-1796.
In appreciation of this generous help, Schiller wrote the "Letters on the Aesthetical Education of Man" to Augustenburg, who lived at the royal palace, Christiansburg, in Copenhagen, at that time. As he received each letter, Augustenburg would carefully study it and then pass it on to Schimmelmann and the other ministers in the government. Thus Schiller's work made a lasting impression on the later educational reforms in which Augustenburg was a leading force.
At this time, Denmark was also still a bilingual nation, so all the works of Schiller directly had a huge and grateful audience.
- 10-12. These quotations are from Ørsted's autobiography, translated into English by Michelle Rasmussen.
13. Gauss won with the paper "Theoria attractionis corporum sphaeroidicorum ellipticorum homogeneorum methodus nova tractata," which presents a general theory of how to map a spherical or elliptical surface onto other surfaces, without distorting its internal properties.
14. See box, p. 33.
15. *Nicolaj Boeigh in Danmark*, Illustreret Kalender for 1887.
- 16-22. These quotations are from Hans Christian Ørsted, *The Spirit of Nature*, 1856, Third edition (Copenhagen). They were translated into English, using some phrases from the 1852 English translation of L. and J. Horner, *The Soul in Nature*, 1852. (London: Henry G. Bohm). Note 20 is taken from the latter, p. 126.
23. The author has adapted here a translation of the poem found at <http://www.schillerinstitute.org>.

Relativistic Considerations in The Moon Model

by Laurence Hecht
September 2, 2009

*The atomic nucleus as
a relativistic space-time
domain.*



Artist's depiction of the Mars Express orbiter approaching Mars. Lyndon LaRouche's proposed 50-year mission to establish a scientific colony on Mars has created an atmosphere of optimism, in which old problems will find solutions.

JPL/NASA



Stuart Lewis/EIRNS

Robert J. Moon (1911-1989), a University of Chicago professor of physics and physical chemistry, proposed a Keplerian model of the atomic nucleus in 1985.

The enthusiastic response to LaRouche's recent call for a 50-year mission to establish a scientific colony on Mars, itself an expression of the bubbling social ferment now nearing its boiling point, prompts this renewed attack upon a scientific problem which it has been my destiny to battle with for over 20 years. It is in the nature of a period such as this, that problems which seemed unapproachable just a short time ago may suddenly appear within one's powers to grasp. I now believe that a solution to some longstanding problems within the core of modern physics, problems which never should have existed, but are the legacy of ugly compromises forced upon earlier generations by the tyranny of empire, is now possible.

It is my hope that with this formulation of the problem related to unsolved questions of the atomic structure and the so-called wave-particle paradox, we may undo that ugly legacy, thus freeing ourselves and giving renewed meaning to the work of those predecessors forced to labor under conditions in which science itself was victim to the British Empire.

I begin with a statement of the problem as seen from my unique standpoint, limiting the case here largely to considerations of the non-living domain. In a subsequent report I will attempt to address the same problem from the standpoint of the relationship among the three domains, as defined by Vernadsky.

For over two decades, I have been in possession of knowledge demonstrating that what is currently taught as dogma regarding the atomic nucleus is systematically flawed. The problem goes beyond that sort of error

which the typical empiricist would attempt to resolve by experimental trial, to deeper methodological issues which touch on the real content of science. Prompted by crucial leads provided me by Manhattan Project veteran and University of Chicago professor of physics and physical chemistry Dr. Robert J. Moon,¹ I undertook a dedicated study of the writings of the founders of experimental and theoretical electrodynamics, André-Marie Ampère and Wilhelm Weber. That study, which was largely carried out between the years 1992 to 1998, demonstrated to me that certain assumptions inherent in modern thinking on these subjects are in error to a childish degree. I summarize the leading features of this still suppressed electrodynamics in three points:

(1) Ampère's demonstration of the physical presence of an angular force, essentially overthrowing the fundamental assumption of potential theory as still taught, and its conclusive

experimental proof by the 10-year collaboration of Carl Friedrich Gauss and Wilhelm Weber;

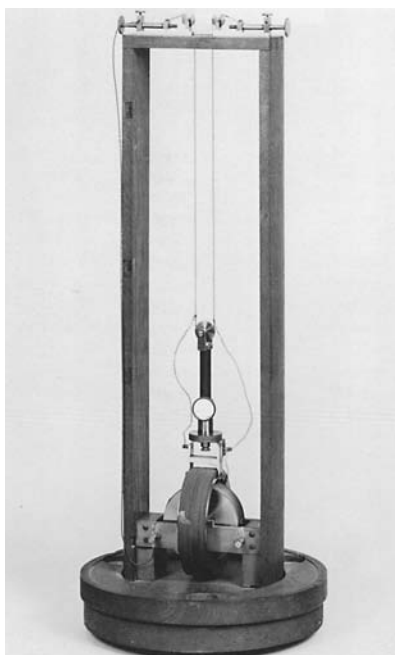
(2) The 1855 Weber-Kohlrausch experiment, establishing the relative velocity at which the force between electrical particles is reduced to zero, and provoking Bernhard Riemann to propose (1858) a similarity in the propagation of light and the electrodynamic potential;

(3) Weber's subsequent deduction (1871) of the bound state of pairs of like-charged particle/waves within the confines of a 10^{-16} to 10^{-13} cm spherical radius, establishing the natural basis for the formation of the atomic nucleus.

In the period from 1999 to 2006, I was able to apply that understanding of the Ampère-Gauss-Weber electrodynamics to the Keplerian model of the atomic nucleus proposed in 1985 by Dr. Moon.² I arrived at a structure which at once overcame what had been two of the leading objections to the Rutherford-Bohr-Sommerfeld model of the atom, without the need to invoke any new conditions *ad hoc*. The objections of leading chemists, Lewis, Parsons, Langmuir and others, to the Bohr atom were

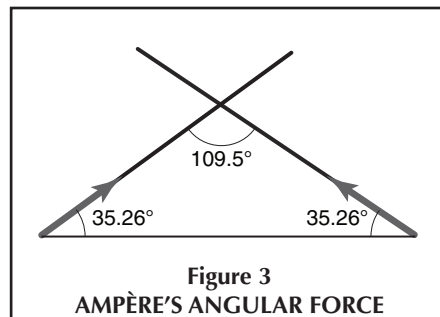
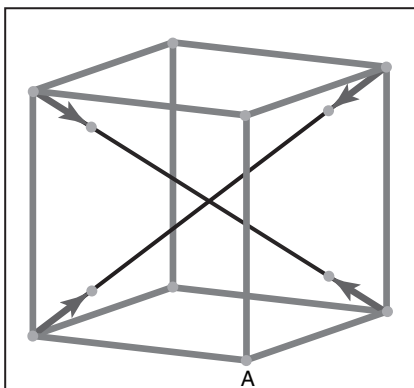
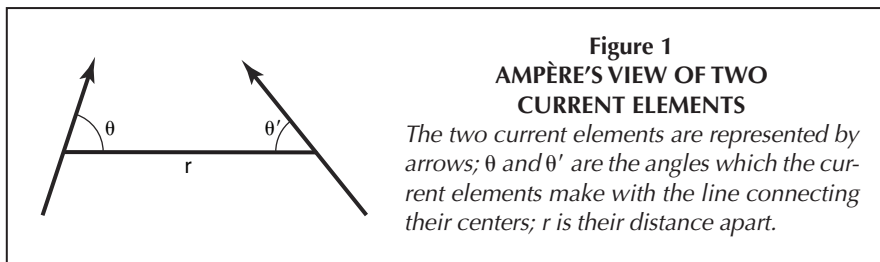
1. The University of Chicago cyclotron, which Moon built in 1936 as a graduate student of William Draper Harkins, its use by Moon in solving the problem of the carbon moderator in the first atomic pile, and his unique role in understanding completely new phenomena in nuclear chemistry arising in the Hanford plutonium reactor, were among his key contributions to the wartime Manhattan Project. The virtual suppression from the historical record of Moon's crucial contribution is not surprising to those who know the inner secret of postwar science, including Moon's pedigree as a student of Rutherford's arch-enemy, W.D. Harkins. See: www.21stcenturysciencetech.com/Articles%202005/moon_F04.pdf

2. "Robert J. Moon on How He Conceived His Nuclear Model," 21st Century Science & Technology, Fall 2004, pp. 9-20 http://www.21stcenturysciencetech.com/Articles%202005/moon_F04.pdf



Historical Collection of Göttingen University
I. Physical Institute

The original bifilar electrodynamicometer used by Gauss and Weber in experiments conducted from 1832-1839. The inner coil is removed and placed at various positions on the laboratory table. Electrification of the two coils causes an electrodynamic potential between them, rotating the coil which hangs from two wires. The angle of deflection is measured by a telescope aimed at the small mirror above the coil.

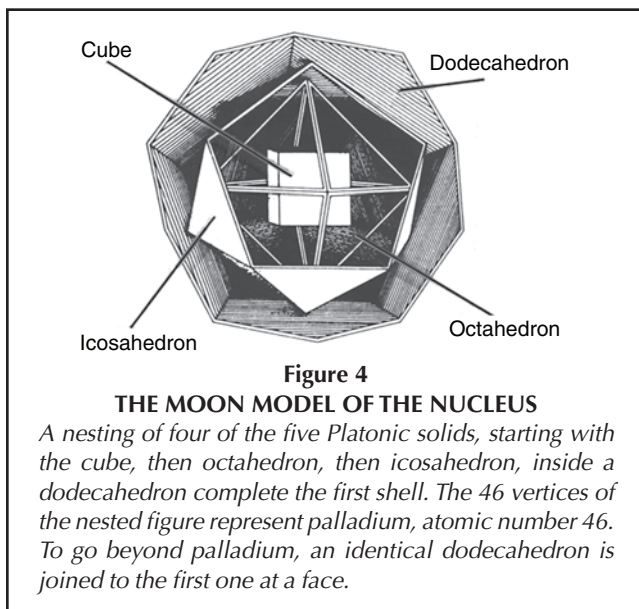




Rudolf Kohlrausch (1809-1858), at right, worked with German physicist Wilhelm Weber (1804-1891) in 1855 to measure the ratio of electrostatic to electromagnetic units.

summarized by Harkins in 1919, the objections being: First, how it is that positive charges could overcome the electrostatic Coulomb repulsion to agglomerate in a central nucleus; second (the widespread objection of chemists of the time) that orbiting electrons are not compatible with the evidence from stereochemistry and crystallography which indicates usually fixed interatomic bond angles, and; third, the exclusive reliance on the data of spectroscopy to the exclusion of other evidence.

The solution was to consider the nuclear protons, which Moon had, in first approximation, placed at the vertices of the nested Platonic solids forming his nuclear shells, rather as Weber-paired particle-waves oriented along the diagonal axes of the solids. The result retained the optimization of charge distribution upon each spherical shell, and among the shells, which had been a key consideration in Moon's structure. By consider-



ing the protons on diagonally opposite vertices as *Weber pairs*, that is the stable bound state of linear oscillation of two like charges which Weber had shown to be a consequence of his Fundamental Electrical Law of 1846,³ the first objection as to Coulomb repulsion was overcome naturally.

Next, by considering the extra-nuclear electrons as corkscrew-like orbits shaped by the field induced by the continuously accelerating and decelerating linear-paired protons, the valid objection of the chemists to the Bohr-Sommerfeld concoction was overcome. The electrons are thus not orbiting about the nucleus at all azimuths, but locked into certain orientations corresponding to the directionality of the diagonals of the Platonic solids. The nuclear orientation thus determines the possibilities for the chemical bonds.

Also within that 1999-2006 effort, I noticed that the Planck action constant could be interpreted as a physical action (that is the

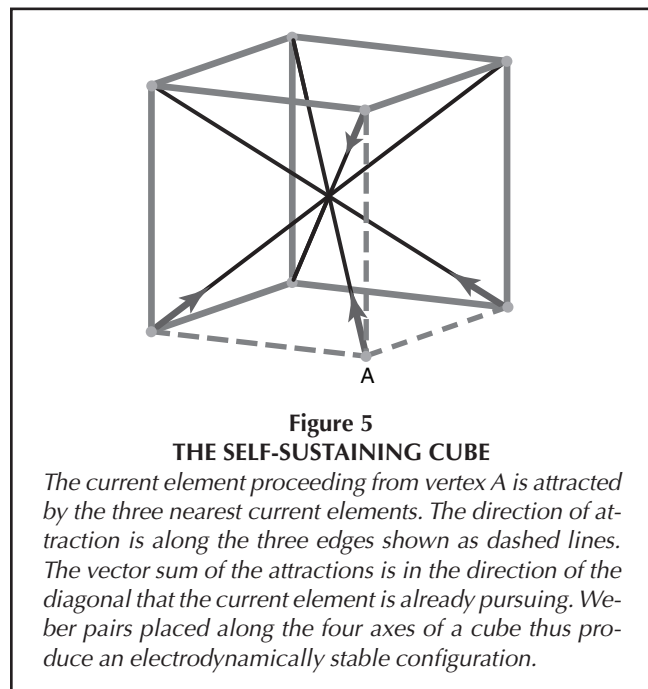
product of a mass \times velocity \times length) in which the mass is the mass of the electron, the velocity that of light, and the length the Weber critical length, ρ .⁴ The Planck action constant, h , is the product of these quantities into $1/\alpha$ (= approximately 137):

$$h = 2\pi \cdot m_e c(\rho/2) \cdot (1/\alpha).$$

3. Wilhelm Weber, "Electrodynamic Measurements, Sixth Memoir, relating specially to the Principle of the Conservation of Energy," *Philosophical Magazine*, Fourth Series, pp. 1-19 (Jan. 1872); 119-149 (Feb. 1872).

4. The distance, ρ , below which the repulsion of like charged particles changes to attraction is:

$\rho = 2e^2/m_e c^2$, where e is the charge of the electron in *e.s.u.*, m is the electron mass, and c the velocity of light in free space.



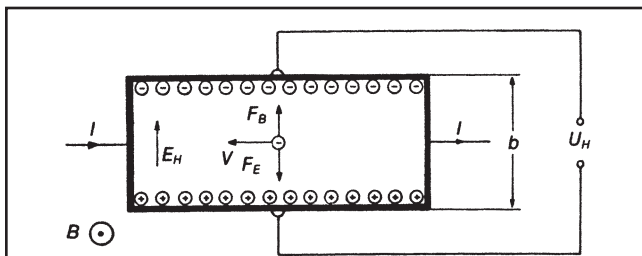


Figure 6

SCHEMATIC REPRESENTATION OF THE HALL EFFECT

Given a conductor through which the current I is flowing, and a magnetic field B perpendicular to the direction of the current and the plane of the current-carrying transistor, the Hall effect describes the deflection of the charged particles sideways, also known as the Lorentz force, F_B . The particles will collect on the edge parallel to the electron velocity (when no magnetic field is present) and move from the opposite edge of the transistor.

This charge separation leads to the buildup of an electrical field E_H (the Hall field). As soon as the resulting force F_E compensates for the Lorentz force, an undeflected current continues to flow. A potential difference U_H is created between these two edges.

This implied that the hypothesized harmonic resonator of Planck might be identical to a collection of 137 Weber-paired electrons. In Weber's conception of the stable bound state of two like charges, the charges oscillate along a straight line of length ρ , accelerating towards the center where they pass through one another, and decelerating out to the maximum distance of separation, ρ . The product $m_e c(\rho/2)$ would represent the physical action of a single pair of electrons (Weber pair) moving in this configuration.⁵

Did the figure 137 have any physical significance? The configuration of 137 electrons was the same that Dr. Moon had deduced from consideration of the paradoxes arising out of the early 1980s von Klitzing experiments showing quantization in the Hall resistance.⁶ Noting first that the presence of an impedance in so-called free space implied the existence of some sort of structure, Moon considered the fact that the ratio of the maximum Hall resistance (25,812 ohms) found in super-cooled thin-layer semiconductors, to the impedance of free space (376 ohms), was almost precisely 137/2.

The impedance of free space is a phenomenon related to the propagation of electromagnetic energy, the Hall resistance occurs in the propagation of electrical currents, and thus the two phenomena would not usually be related. Moon, however, supposed that the electromagnetic propagation in free space occurred in connection with the motion of a grouping of 137 electrons. Going further, he assigned a geometric configuration to that grouping.

Finally, Moon supposed that the configuration of the elec-

5. The same value for the Planck constant would result for a pair of protons, as substituting the value for ρ into $m_p c \rho$ (where m_p is the mass of the proton) would show, thus supporting the universality of the Planck constant.

6. Robert J. Moon, "Why Space Must Be Quantized," *21st Century*, Fall 2004.

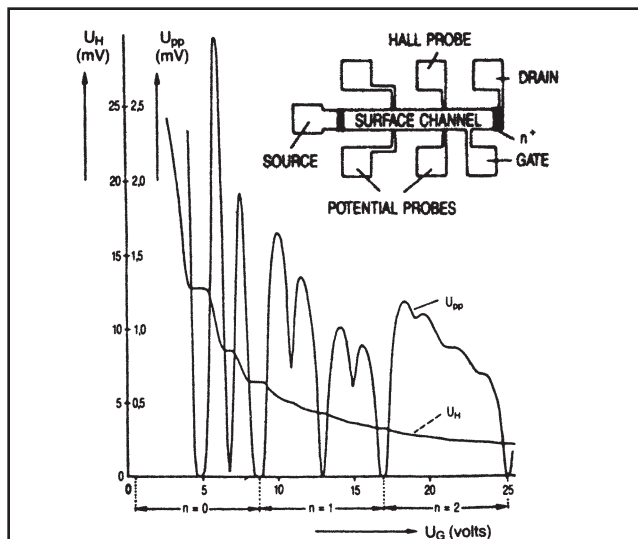


Figure 7

KLITZING'S EXPERIMENTAL CURVE

This is what the grid voltage U_G versus the Hall voltage U_H actually looks like, according to Klitzing's experiment. The plateaus in the Hall voltage can be seen clearly. U_{pp} is the longitudinal voltage, which becomes zero when the plateaus appear. Klitzing first published these results in 1980 in *Physical Review Letters*.

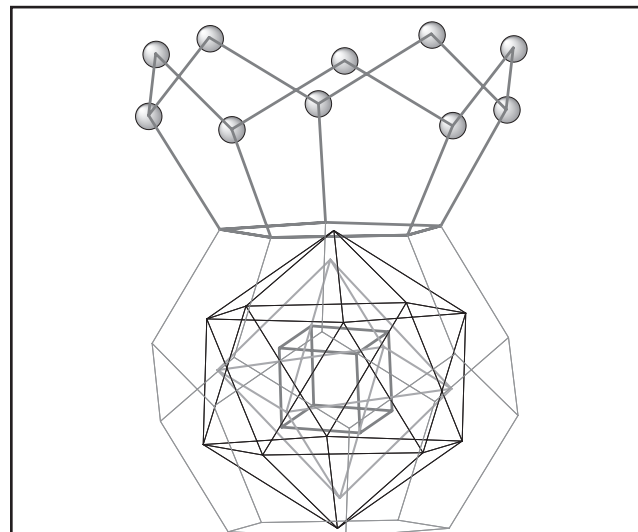


Figure 8

THE MOON MODEL NESTING

In the Moon model of the nucleus, nesting of the cube, octahedron, icosahedron, and dodecahedron (as shown) yield in their vertices places for 46 protons. By building up another nesting of the polyhedra, the two combined dodecahedra have another 46 vertices, making 92—representing the 92 protons of the naturally occurring elements of the periodic table.

In this figure, 10 protons are added to the second dodecahedron, representing the element barium (56).



Stuart Lewis/EIRNS

Charles Stevens (left) and Robert J. Moon in discussion at Moon's 75th birthday party.

trons in free space was related to the configuration of the nucleus. In the Moon model of the nucleus, the vertices provided by a nesting of cube-octahedron-icosahedron-dodecahedron are the resting place of 46 protons. Two dodecahedra then combine to form the structure for the 92 naturally occurring elements of the periodic table. In Moon's conception for the electrons in free space, three of the nested dodecahedra come together, providing 137 positions (138 minus one at the point of joining) for the electrons. Thus, by a leap of genius, an ordering principle was found by which the usual separation between matter and radiation was overcome.⁷

Relativistic Considerations

Now it seems that the empirical notions on which the metrical determinations of space are founded, the notion of a solid body and of a ray of light, cease to be valid for the infinitely small. We are therefore quite at liberty to suppose that the metric relations of space in the infinitely small do not conform to the hypotheses of geometry; and we ought in fact to suppose it, if we can thereby obtain a simpler explanation of phenomena.

—B. Riemann, "On the Hypotheses which Lie at the Foundation of Geometry" (1854)

Wilhelm Weber's 1868-1871 exploration of Riemann's hypothesis concerning the microcosm was first called to the attention of our association by Dr. Robert Moon in a 1974 meeting at his Chicago home with Charles B. Stevens, and again in a

7. According to his autobiographical account, the problem had been one that had occupied Moon since about the age of seven or eight, when he puzzled over the working of a step-down transformer connected to the doorbell in the house of an aunt. After a lifetime of pioneering work in nuclear chemistry, high-energy physics, and the design of electrical devices, Moon was prompted to the solution by attendance at a series of Fusion Energy Foundation seminars led by Lyndon LaRouche over the period 1984-1985, where the fundamental importance of Kepler's discovery to modern science was the central topic. The specific breakthrough occurred one early morning in the spring of 1985 following on a week of study of Kepler's *Mysterium Cosmographicum* in conjunction with some then current papers of LaRouche.

meeting with Lyndon LaRouche shortly thereafter. The subject of the meeting with Stevens being fusion energy, Dr. Moon immediately noted that no important progress could be made without consideration of the paper by Weber, a copy of which in English translation he pulled out from some handy location and began to elaborate upon.⁸ I only began seriously to study the Weber work in 1991, after a period of collaboration with Dr. Moon from 1985 to his death in 1989. The profound nature of the document was immediately evident upon cursory reading, but a deeper appreciation required a study of the prior work of Ampère on electrodynamics, and of Gauss's 1832 work on magnetism, which I had completed by 1996.

I summarized above my attempts over the ensuing 10 years to incorporate that understanding of Weber's contribution into

the Moon model. However, it was only quite recently that I understood the significance of the work as an explicit elaboration of Riemann's revolutionary hypothesis concerning the foundations of geometry.⁹ Weber is describing the change in physical

8. Wilhelm Weber, *Sixth Memoir* (1872), *op. cit.*

9. The relationship between Riemann and Weber is not well known, in good part because of the conscientious suppression of the work of both. The supposed separation between the departments of mathematics and physics, which is the ironic subject of the concluding sentence of Riemann's 1854 "Hypotheses," adds to the obfuscation of the relationship. According to the biographical evidence, Weber, a generation older than Riemann and a generation younger than Gauss, played a role both as a sort of father figure to the younger Rie-



A later model of Weber's electro-dynamometer, which was built by Siemens Bros.

laws within the space which we would recognize today as the atom and nucleus. There are indeed two realms, the domain of the atomic nucleus defined by a spherical radius of approximately 10^{-16} centimeters, and the larger domain of the extra-nuclear nucleons. Developments in physical chemistry which only began to emerge in the two decades following Weber's death in 1891, would have made it possible to carry the exploration Weber initiated into the experimental domain. However, historical considerations alluded to earlier, dictated that that program was never completed. Instead, an abortion known as the Rutherford-Bohr-Sommerfeld atom emerged into the light of day, was fondled and adored, took on new proportions as it grew, and was dressed in fine clothing to be admired and obeyed by subsequent generations of the dutiful. That Emperor, like the others, has no clothes, though a century of steady application of physics has produced enough diarrhea to hide the fact from many.

Weber's explorations of that Riemannian domain may now be considered in light of modern experimental knowledge about the atomic and nuclear domain. We now outline a few of the key points under consideration, leaving a more detailed analysis to subsequent reports.

The Path of the Electron: The stable bound state of a proton pair, as identified by Weber, is a linear oscillator confined within a sphere of radius approximately 10^{-16} cm. The relative velocity of the two protons along that radius rapidly increases from zero at the spherical boundary to $\sqrt{2} \cdot c$ when the particle-wave pair meet and pass through each other at the center. The linear motion of the charges will produce magnetic field lines in a circular configuration, like that found around a current-carrying wire. However, the acceleration of the charges would tend to cause the circles to distort into a corkscrew-like figure.

The net external effect of the field produced by the proton pair would be zero, just as a doubly wound Ampère solenoid produces zero magnetic effect when two oppositely directed currents are passed through it. However, in the very short moments of extremely rapid acceleration and deceleration of the charges, intense localized fields must be produced.

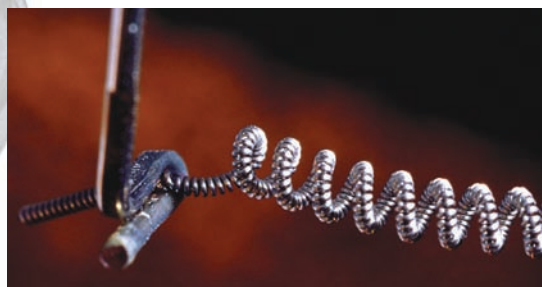
An electron pair, by itself, would be capable of a similar linear oscillation within a larger sphere of radius approximately 10^{-13} cm. However, placed within the field of the proton pair, the two individuals in the electron pair would be caused to spiral around the field lines produced by the more rapidly oscillating proton pair. The general result would be a spiral wound around a spiral.¹⁰ The precise motion of the electron can be cal-

mann, and as mediator between Gauss and his brilliant young student. When Riemann was ailing with tuberculosis, it was Weber who prevailed on university authorities to subsidize a curative trip to Italy. Yet, once the point of the paper is recognized, it is obvious on internal evidence alone, without biographical substantiation, that the *Sixth Memoir* constitutes Weber's tribute to the life of his dearly beloved younger friend.

10. The tungsten filament of an ordinary incandescent light bulb, seen under 25x or higher magnification, provides a convenient model for visualization. The experiment should be carried out soon however, before Al Gore succeeds in



This magnified view of a tungsten filament in an incandescent bulb is an example of a spiral wound around a spiral.



culated theoretically from the equation of motion of the proton pair and the known laws of electromagnetic interaction.

The spatial orientation of the proton pair, which is defined by the vertices of the Platonic solids in the Moon model of the nucleus, will define the orientation around which the doubly spiralling electron will form its trajectory. Except in the case of the single electron of the hydrogen nucleus, there will be no circular or elliptical orbits.

Symmetry Inversion: The field lines which form around a moving positive charge have the reverse polarity of those around a moving negative charge, thus causing a reversal of the rule of handedness to be applied. The corkscrew-like field lines which form around the moving proton will be strongest at the center and weakest at the ends of the line along which the protons oscillate. One might thus expect the first spiral (corkscrew) of the electron to trace a path which is expanded at the outside and pinched toward the center, appearing like two megaphones placed mouthpiece to mouthpiece.

However, a special consideration arises in the space of reversed symmetry found below the Weber critical length. The electron, being repelled the closer it comes to the proton, will tend to be forced outward at the center, precisely where the magnetic field strength, which would tend to draw it in, is greatest. Whether the corkscrews are then pushed to the opposite extreme of being narrower at the ends and more loosely wound at the center, or perhaps the final figure is cylindrical, should be possible to be determined by calculation. Attention should be paid to the possibility of synchrotron radiation deriving from the electron's spiral orbit around the magnetic field line. The continuous change in the field lines and the reversal of charge symmetry produces something not before encountered.

It also seems possible that the solution to this problem, which is intimately connected with that of the true path of the electron, could lead to a new interpretation of the Planck action constant and the fine structure constant. Both these phenomena are connected with the presently still unclear relationship of radiation and matter. Moon's supposition requires a precise value of 137 for the inverse of the fine structure constant. The discrepancy of the measured value by an amount equal to 0.036 might be due to any number of factors, possible within the rela-

replacing these easily available specimens with the more expensive, and often malfunctioning, fluorescent substitutes.

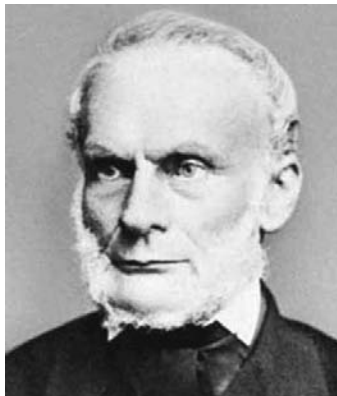
tivistic system under consideration. However, no explanation presently exists for it.

A clearer understanding of the nuclear geometry in its relationship to the electron is essential.

Relative Velocity Greater Than c: Among the most interesting of the conclusions of the Weber-Kohlrausch experiment was that the relative velocity at which the force between two moving charges reduces to zero is equal to $\sqrt{2}$ times the velocity of light, or $\sqrt{2}\cdot c$ in our modern notation.¹¹ The value defines the ratio of the electromagnetic to the electrostatic unit of force, and is incorporated into the system of modern physics. There is thus no contradiction, but rather a complete correspondence, between the results of the Weber-Kohlrausch experiment and all subsequent electrodynamic measurements. The contradiction with the results of Special Relativity, where the relative velocity c forms a maximum limit, is not normally considered, because the Weber formulation of 1871 is unknown or ignored.

It should also be noted that the Weber formulation of a change in force, and of potential, with relative velocity (first proposed by Gauss in 1833) is consistent with Einstein's famous 1905 proposal, that the paradox encountered in experiments measuring the charge-to-mass ratio of moving electrons could be overcome by assuming that the mass increases with relative velocity according to the expression $\sqrt{[1 - (v^2/c^2)]}$. The same expression will be found in Weber's First Memoir of 1846 (in example 2 of §32) for the quantity he defines as *reduced relative velocity* (with the important difference that Weber's symbol c is $\sqrt{2}$ times greater than that employed in modern usage).¹²

The Gauss-Weber formulation is *relativistic* in the precise sense of a velocity-dependent force law. When the Riemannian implications of the 1871 paper are taken into account, the concept is *relativistic* in the broader sense, although not the specific sort of implications that



Rudolf Clausius (1822-1888) suppressed the 1858 work of Bernhard Riemann on the implications of the Weber-Kohlrausch experiment, thus allowing the substitution of Maxwell's empirical fraud.



James Clerk Maxwell (1831-1879) admitted in his Treatise that he was unwilling to "contemplate other geometries than our own," concerning his treatment of the work of Ampère, Gauss, Weber, and Riemann.

are introduced by Einstein's considerations of time. There are several points to keep in mind in attempting a comparison of the two systems. First, in keeping with the program proposed by Gauss in 1832,¹³ Weber retained the constancy of the measures of *mass*, *length*, and *time*, and instead introduced the relativistic consideration by a change in the force or potential with velocity. That difference in the formulations can usually be resolved by algebraic substitution, and may thus appear as merely an artifact of the mode of expression, although more is involved.

Two more fundamental differences, make comparison difficult:

1) Einstein's formulation addresses the shortcoming in the mathematical expression of the Faraday-Maxwell field representation when propagation occurs at the speed of light. Weber's formulations do not address the question of propagation. By proceeding from his ingenious considerations of the relativity of simultaneity, Einstein was able to draw conclusions respecting time beyond anything addressed by Weber.

2) Weber's formulation, by introducing the consideration of a change in curvature in the small (I here employ the term in the most general sense of a change in physical behavior), arrives at a set of possibilities not considered by Einstein. That is, that the laws of electrodynamics would define the binding force of the nucleus and describe nuclear fusion.

Some Implications

The existence of a relative velocity greater than the speed of light by a factor of $\sqrt{2}$ is a crucial anomalous feature of the curvature of space-time (or "state of space" to borrow Vernadsky's term) in the microcosm as deduced by Weber. This is a characteristic of the domain, which is not known to modern physics. Further exploration of the Riemannian space of the nucleus from

a strictly honest standpoint is required. Somewhere in the data available or about to be available lies the solution.

The suppression, by the hand of Clausius, of Bernhard Riemann's 1858 reflections on the implications of the Weber-Kohlrausch experiment, to the effect that the propagation of the electrody-

11. The constant c , as employed by Weber, which had been known as the *Weber constant* throughout most of the 19th Century, was thus equal to $\sqrt{2}$ times the velocity of light.

12. Weber gives there the factor $[1 - (a^2/16)v^2]$ for the square of reduced relative velocity. He later replaced the quantity $4/a$ by the symbol c , giving $\sqrt{(1 - v^2/c^2)}$ for the reduced relative velocity. Keep in mind, however that Weber's c is $\sqrt{2}$ times that employed by Einstein and modern usage.

13. Carl F. Gauss, *The Intensity of the Earth's Magnetic Force Reduced to Absolute Measurement* (1832), English translation at www.21stcenturysciencetech.com/translations/gaussMagnetic.pdf



Philip Ulanowsky/EIRNS

The author teaching a class on the Moon Model in 1992.

dynamic potential is retarded at the same rate as is the propagation of light, is one of those injustices that even now, 150 years after the fact, cries out for redress. Whether understood as such at the moment or not, Clausius's intervention against the publication of Riemann's 1858 work,¹⁴ proved to be the most decisive step in the successful substitution of Maxwell's empiricist fraud for the considerations which had been percolating within the ranks of leading scientists, since the treatment, by collaboration of Ampère and Fresnel, of the phenomena of light and electricity.

There is no deep mystery to Maxwell's fraud. His frank admission, as in the Preface and concluding chapters of his famous *Treatise*, that he is unable to conceive of any means of propagation of the electrical action, other than one *at-a-distance* which he mistakenly, (perhaps even ignorantly, to give him the moral benefit of the doubt) attributes to Ampère, Gauss, Weber, and

Riemann, or through a *medium* (his own conception), is the problem. His stated unwillingness to "contemplate geometries other than our own," seals the case.

To the morally degenerate, results are everything. As in the case of the Wall Street trader, whose apparently wild success up to the moment of his declaration of bankruptcy and jailing, so also for scientific practice. Such frauds against the real intellectual development of the science of electrodynamics as those committed by Hermann Grassmann, Clausius, Maxwell, and Helmholtz, which even now appear to go unpunished, perhaps "too big to fail," are yet heading toward their final come-uppance.

The case against Maxwell's substitution of an apparently algebraically equivalent formalism expressing the propagation of an electromagnetic action is precisely the same as that to be made

against the fraud committed by Sir Isaac Newton (or the collection of actual living entities behind that largely synthetic figure), respecting the discoveries of Kepler and Leibniz. However, the more elaborate development of science in the intervening 150-year period since the crime against Riemann's legacy, as compared to the earlier period from Kepler to Gauss and Riemann, has meant that the damage has been worse.¹⁵

The consideration of further work on the Moon model of the nucleus, and the questions raised by the prospect of space colonization will bring this seemingly arcane issue in the history of science into sharper relief.

15. The rescue of science, by Planck and Einstein, from the worst atrocities of Clausius and Maxwell's frauds, did not entirely resolve the problem. It could only have been by a thorough exposure of the fraud itself that a clearer path out of the morass could have been laid. Such a course was unavailable at the time, as Planck once noted ironically in pointing out that his was the first generation of German physicists to be educated in the "new" (Faraday-Maxwell) electro-dynamics.

14. "A Contribution to Electrodynamics," published posthumously.

Read More about the Moon Model

The Geometric Basis for the Periodicity of the Elements

by Laurence Hecht

21st Century, May-June 1988

www.21stcenturysciencetech.com/Articles%202004/Spring2004/Periodicity.pdf

Advances in Developing the Moon Nuclear Model

by Laurence Hecht

21st Century, Fall 2000

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Who Was Robert J. Moon?

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Searching for Atlantis

by Charles Hughes

“The Search for Atlantis”

History Channel Program, Oct. 7, 2009
(Mystery Quest Series)
DVD number 210470, \$24.95
(Available from the History Channel,
1-800-933-6249)

I viewed this History Channel program on DVD upon the recommendation of William Donato, an explorer skin diver, who told me in a recent phone call about his work with Greg Little’s team of divers. Donato had helped to bring to light some very unusual and probably ancient traces of an unknown civilization on the sunken plateau of the Bahamas plateau. I check in with him from time to time to see what old ruins the divers have turned up in this area, particularly near the Bimini Islands and Andros Island. Donato said that there was some coverage of the divers’ findings in the History Channel production.

The DVD shows underwater movies of probable man-made constructions in two sites, one called the Bimini Road, and the other, a few miles away, called “the rectangles.” Both are near the island of North Bimini.

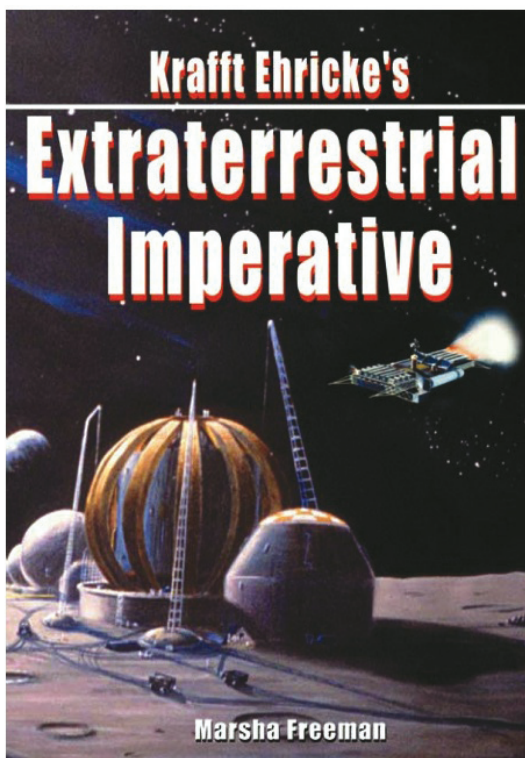
Also shown are important artifacts discovered on the Bimini Road: heavy anchor stones, which are square stone blocks with a hole in the center, presumably for a ship’s anchor cable. Such anchors have been found in the Mediterranean, associated with second millennium B.C. Phoenician ports.

One sequence shows the taking of a sample of limestone from the Bimini Road for a radiocarbon dating test. This test yielded a date of 1400 to 1700 B.C. The rock tested was taken from under a large, square Bimini Road block, and consisted of beach rock, a limey concrete



tion formed in shallow tropic seas, and not like common sedimentary limestone formed millions of years ago. Beach rock can be radiocarbon-dated because it contains the remains of ocean life, rich in calcium carbonate, which form very rapidly in the Bahamas.

The Bimini Road is a long regular series of very large square stones, some weighing tens of tons, extending for about 600 yards, with a sharp “J”-shaped turn at the end. The width is about 50 feet. Because of sea level changes, the construction that is now in 20 feet of water would have been at the water’s edge at about 4000 B.C., or possibly 7000 B.C. The most probable function for the road



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

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

From this new book the reader will gain an insight into one of the most creative minds in the history of space exploration.

Krafft Ehricke's contribution to space exploration encompasses details of new, innovative ideas, but also how to think about the importance and value of space exploration for society.

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Lora Little

Bimini Road stones lying on top of each other.

was a dock, or a breakwater protecting a harbor for trading vessels.

Similar constructions are found in the Mediterranean, and were probably Phoenician or Minoan, from about 2000 B.C. Establishment archaeologists and geologists generally refuse to examine the Bimini Road, saying that it is just a natural formation! Apparently, these academics consider the possible discovery of an unknown sea peoples' civilization in the Bahamas, which is possibly older than Egypt, to be very threatening to their established notions about history.

The other site investigated by Greg Little's team is a few miles away, which Little has named "the rectangles." This site, also on North Bimini, a few miles from the Bimini Road, is considerably deeper, in 100 feet of water. It was located a year or so ago, by a search of the ocean bottom with side-scan sonar. This method of detecting objects underwater bounces sound waves off the bottom of the ocean, returning to a receiver in a boat floating over the area being examined. In this case, the sonar trace revealed objects of square shape, arranged in a grouping resembling buildings that were equally spaced from each other by 10 to 15 feet.

Divers went down to investigate. This was a difficult job, because a diver can only work for 20 minutes at 100 feet, and there was a strong and dangerous current pulling the diver out to very deep water. Piles of large stones were found below, which could not then be proven to consist of square block masonry, because of excessive crusting or coral growth.

The ocean bottom here would have been dry ground in 10,000 B.C., or, if these were man-made building ruins, in the period of the Ice Age. What civilization built these then? Who knows!

In the conversation with Mr. Donato referred to earlier, he surmised that the rectangles were too few to be a city, and that the site was more likely a seaport. The ruins, he thought, would be of storehouses for goods being shipped to and from Europe or Africa to America.

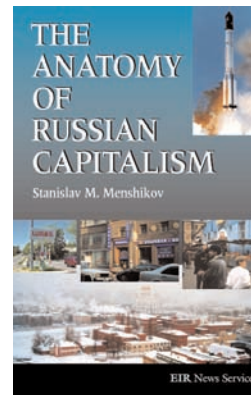
The Bimini Road is a later construction, most likely a Phoenician seaport, or made by descendants of the "rectangle" people, 8,000 years later.

It is a shame that the History Channel calls its program "The Search for Atlantis," and juxtaposes the Bahama finds to the Thera-Santorini volcano disaster, which wiped out the Minoans in 1400 B.C. This disaster is well-documented, and can not be connected to Plato's work in "Critias" and "Timaeus" of the existence of Atlantis, in spite of History Channel's attempt to spin history this way, and suggest that Plato was a liar.

As for the Bahamas, they could have been a far western outpost of Plato's Atlantic civilization, or a sea peoples civilization previously unknown to us. Little was attempting to get a permit to excavate the rectangle and another permit to issue a press release, as of November 2009.

I think some amazing discoveries are about to turn up in the Bahamas, which will give close-minded academics apoplexy. Let's hope so!

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GLOBAL WARMING UPDATE

Compiled by Gregory Murphy

Love Your Carbon Dioxide!

H. Leighton Steward, a retired, oil executive, has recently formed a new advocacy group called CO₂ Is Green, to oppose the genocidal cap and trade climate change legislation that passed the House of Representatives on June 26, and is currently being debated in the Senate.

CO₂ Is Green (CO2isgreen.org) is running television and newspaper ads in Montana targeting Senator Max Baucus (D-Mont.), chairman of the Senate Finance Committee, who is one of the four Senators working on the Senate version of the fascist Waxman-Markey cap and trade bill. In addition to ads aimed at Baucus, the CO₂ Is Green group has taken out television ads in New Mexico, home to Senate Energy and Natural Resources Committee Chairman Jeff Bingaman.

One of the television ads the group is running in Montana and New Mexico says, "There is no scientific evidence that CO₂ is a pollutant. In fact higher CO₂ levels than we have today would help the Earth's ecosystems." The ad urges voters to contact Baucus and Bingaman to voice their opposition to any proposed cap and trade bill.

Steward, the group's founder, said at a recent Rotary Club meeting in Montana, "Higher levels of carbon dioxide would spur more growth of plants and trees." He also noted that past temperature changes had preceded changes in levels of CO₂ and sometimes did not correlate with them at all."

Steward has also set up a sister organization to CO₂ Is Green, called Plants Need CO₂. This is an educational group and operates a website to promote the positive effects of CO₂ on the biosphere, which have been ignored in the current debate over man-made global warming. The website can be found at <http://plantsneedco2.org>. It is mainly based



As this sequence of photos show, the more CO₂ plants eat—absorb from air and water—the bigger and better they grow. Higher-than-normal CO₂ concentrations enhance the efficiency with which plants make use of water, sometimes, according to "Plants Need CO₂," as much as doubling it in response to a doubling of the air's CO₂ content.



Leighton Steward in a television news interview: "Carbon dioxide is good for the environment because it is what plants eat."

on the decades-long work of Sherwood and Craig Idso, demonstrating that higher levels of CO₂ would have great benefits for plants and people—plant growth is increased, plants need less water, and more food can be grown per acre.

Sherwood and Craig Idso operate a website called CO₂Science.org that includes several different experiments conducted in classrooms with elementary school children. The experiments consist of children building three terrariums, which have different levels of CO₂ concentrations: one has current atmospheric concentration, the second

has double the atmospheric concentration, and the third has a reduced concentration. The children monitor the progress of the plants inside each terrarium and then report the results. Their results demonstrate that with higher CO₂ concentrations plants are healthier and more robust.

As Craig Idso points out, after a child has done this type of experiment, he or she can never be persuaded that CO₂ is a pollutant.

Monckton Warns Again: Climate Policy Is Genocide

Lord Christopher Monckton, former science advisor to British Prime Minister Margaret Thatcher, on a Fall speaking tour of Canada and the United States, gave an hour and half speech to the Minnesota Free Market Institute Oct. 14, attacking the global warming fraud. The global warming fraud is genocidal, he said, and based on fraudulent science. He concluded by warning that President Obama is poised to cede the sovereignty of the United States at the December United Nations climate change conference in Copenhagen.

The press and most of the blogs associated with the Tea Party network's have focussed on Monckton's loss-of-sovereignty comments. But they have



James Rea/EIRNS

Christopher Monckton (left) interviewing greens at a climate conference in Berlin in early December: The fight for freedom over fascism will be fought in the United States, Monckton said.

not reported his optimistic urging of the American people to continue to wake up and fight. As he rightly says, the fight for freedom over fascism will be fought in the United States.

Monckton's statements in Minnesota are not new. He warned of the loss of U.S. sovereignty, in an exclusive interview with *Executive Intelligence Review* on the sidelines of the last Heartland Institute Conference on Climate Change in Washington, D.C. The interview was published in the June 12 *EIR*, and is posted on the *21st Century* website.

The saner portion of the blogs associated with the Tea Party network, which have been active in the fight against

Obama's Nazi health-care reform, have reported Monckton's comments of how the global warming fraud is the third genocide being committed by purposefully ignoring the science. The other two genocides that Monckton refers to, are the banning of DDT, which has led to the deaths of 40 million people, and the purposeful mishandling of the AIDS crisis.

A video of Monckton's presentation can be found at <http://mnfreemarket.institute.org/>.

Anti-Gore Film Has World Premiere

The world premiere of the anti-Gore film "Not Evil Just Wrong" took place Oct. 18. The film was streamed live on several websites, followed by a panel discussion streamed from the Heritage Foundation.

The film has some problems. In the first place, the title is too weak, and the directors are not willing to offend. The other main problem, is that it does not mention nuclear power once in the whole 85 minutes.

The film's directors allow the people being interviewed to make the tough statements that the climate change policy is genocide. The interviewees include Lord Nigel Lawson, former Chancellor of the Exchequer during the 1980s, and Patrick Moore, founding member of Greenpeace. Both Lawson and Moore forcefully make the point that cutting carbon emissions would lead to the crash of civilization and the needless

deaths of billions of people. Both Lawson and Moore have been interviewed by *Executive Intelligence Review*, and the interviews are posted on the *21st Century Science & Technology* website.

The premiere's most interesting point came during the panel discussion. Almost all of the questions dealt with how to become more educated on the global warming fraud, in order to talk to friends and neighbors and to fight the genocidal policy. This is highly unusual, and is an outcome of the ongoing mass ferment. One woman, originally from Russia, said that Al Gore should spend more time reading Russian Classical literature, to get a real idea of how cold winter can become. She read an excerpt from Pushkin to illustrate the point.

Is Gore's House Haunted?

An interesting observation can be made by looking at two different polls conducted around Halloween: One that deals with the number of people who believe that human beings cause global warming, and the other with the number of people who believe in haunted houses.



Only 36 percent of those polled in an October 2009 Pew poll believe that humans are causing global warming. Another poll, conducted by Gallup, found that 37 percent of those polled believe in haunted houses.

And so, it's proved: more people believe that houses can be haunted by the dead, than that the living can cause global warming.



Wrong and Evil

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