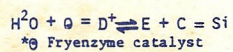
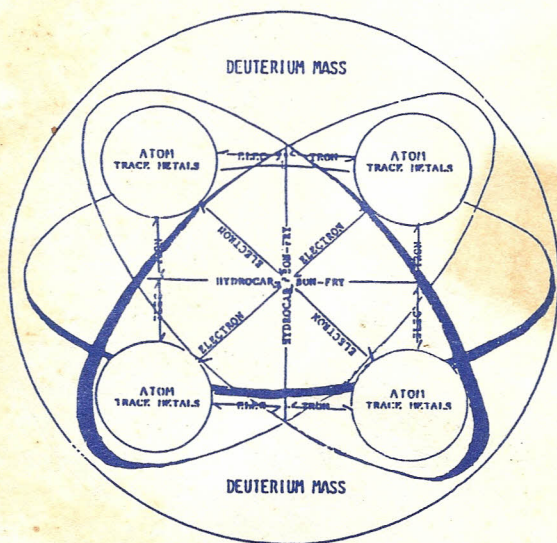


DECARBOXYLATION METAL DEGRADATION THROUGH CO-FUSION

FRYENZYM INDUCED CO-FUSION OF DEUTERIUM



By: John C. Wagner

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First Edition, 1977

By John C. Wagner

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INTRODUCTION

Believing in the continuity of nature and knowledge, thus noting appropriately that natural chemistrys depend on interrelations between members of a *distribution* of atomic weights, that they furthermore are accompanied in nature by the existence of a gravitational and electromagnetic field, and that no quantum theory that cannot be completely justified with both classical mechanics and general relativity, can have both light and gravity, in addition to charge, believing and noting all of this, one is led to realize that there are gravitational-electromagnetic properties of the elements that science currently overlooks.

Wagner's Catalytic Spin Theory

In the past, many great men of science have promulgated theories of the nature of the universe. Sir Isaac Newton, Einstein, DeSitter and Lemaitre.

Newton suggested in the Principia that the earth was originally in a fluid state. Einstein reasoned that the Universe was spherical, characterized by a radius of curvature R . This radius was constant, independent of time, so that his universe was static. Its volume is finite and has a definite value given by $2\pi R^3$ (not $\frac{4}{3}\pi R^3$ as in Euclidean geometry, because of the different geometry of relativity). The greater the mass density, the greater the curvature of

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space. The presence of matter forces the light rays to be curved. Since light rays travel along curved paths, they must come back eventually to their point of origin. Einstein therefore believed in a closed universe.

DeSitter thought that *time* progresses at different rates at different distances from the observer. He felt, therefore, that time is "curved".

The Belgian priest astronomer Lemaitre decided that the present universe, whether expanding or contracting, may represent a transition phase in a continuous evolution, from an initial state similar to the Einstein universe (in the distant past) to an ultimate state similar to the DeSitter universe (in the indefinite future).

Wagner's theory tells us that the Universe, the Cosmic Plan, is toward Unity or O movement. The ancient Egyptian regarded O as a Divine number representing Purity, Stillness, and absolute Awareness. The Wagner theory states that the Universe is progressing towards a state of Perfect Ordering. Relativity tells us that matter is energy congealed in space-time. The Wagner No Motion Theory tells us a simpler, more far reaching fact: MOTION (HEAT, ENTROPY) = MATTER IN TIME. NO MOTION = SPACE ONLY IN ZERO TIME.

At the heart of the Wagner No Motion Theory has been the observation that all bodies have a rotational spin, from the micro to the macro. It is no coincidence that the planets rotate in orbits and upon their own axis, and that protons, neutron, and electrons, and the smallest subatomic particles, gluons, as well as molecules also spin. Light has rotation, as the polarimeter shows when light is shined

through an organic protein. Lately physicists have shown that light itself has spin.

It is altogether probable that interactions between light and organic growth really results from spin-spin interactions, some of which annihilate mass, others of which reorganize mass.

All chemical reactions, then, are really minute perturbations of these laws operating overall to produce no motion from motion in time.

What has come of this theory for chemistry and physics is a completely new understanding of the elements and the Natural Universe. Wagner's theory has unified electromagnetism, nuclear forces, and gravitation. What it has done is to more exactly articulate the mechanics of these laws. Scientists will see that this theory does not violate existing principles but instead unifies them into a much more coherent whole.

From this theory Wagner was able to create a new atomic chart of the elements. This chart was not based completely on a more theoretical knowledge but was gathered from experimental evidence gathered in the course of using his catalytic formulas in the breakdown of heavy metals and destruction of dangerous pathogenic bacteria and viruses.

It was found in the course of catalytically treating industrial wastes with high heavy metal concentrations that some heavy metals were considerably reduced (in mass) and that at the same time other heavy metals increased in mass. These results were verified by outside testing

laboratories. Wagner believes that what was happening was that the catalyst was altering the atomic spin of these heavy metals and in so doing changing their atomic structure or more simply destroying one heavy metal and creating another. A transmutation if you will.

Space and matter and light rays consist of spiral fields. The vibration or spin of atoms and their constituent parts on the planet earth are constant, but these same atoms traveling at the speed of light vibrate much slower.

Nature knows how to make favorable decisions on macro and micro levels of existence which will preserve it eternally from human ignorance of the most clever kind.

Neither Newtons nor Einsteins formulations offer a reliable explanation of gravitation. (Experiments have proved that the force of the gravitational attraction between two particles of matter, or two planetary bodies is inversely proportional to the square of the distance between them).

Throughout the whole of nature we are confronted by an array of vibrating systems from atoms to entire galaxies which quiver at certain frequencies. This phenomenon of quivering matter appears also to be present in radiation or light which also vibrates to certain frequencies. The quivering of atoms go on at several thresholds which have been related to their spin. The binding energy which holds the atoms together as molecules and cells appears to be related to the electromagnetic fields comprised of electrons. The spin of the electrons causes an atom to become a miniature magnet that attracts one atom to another depending on its nuclear configurations. The binding energy which holds the

inner part of the nucleus of the atoms together, appears to be about 100 times stronger than the electromagnetic field which attracts the atoms to one another. The strongest force in nature also vibrates and spins like a top around the configurations of protons and neutrons in the nuclear core of an atom and also generates its own quivering magnetic lines of force. The nuclear spin makes the atom one of the smallest but stongest magnets in the universe and we know this rotating force is called nuclear energy. It is possible to tune in to the frequencies in the hearts of atoms and discover the periodic pulse beat of the inner core. The measurement of time's periodic occurrence by the nuclear spins of an atom is only relative to the atom's position on planet earth.

SIMULATED HYDROGEN (ZORONGEN GAS TECHNOLOGY)

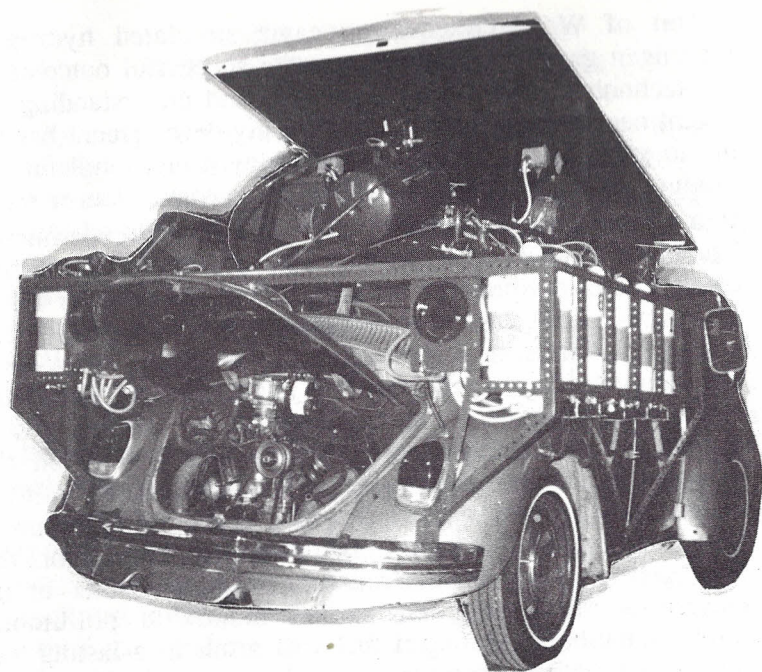
As early as 1820 man has been searching for a way to manufacture hydrogen from water through electrolysis, or other methods that would be safe, requiring no storage and could be used as it is manufactured. Multimillions of dollars have gone for scientific research to find a way of developing a free fuel electrolysis system, out of the past several working concepts have been developed resulting in unfeasible storage facilities and dangerous separation of the hydrogen and oxygen gases that are not cost effective. Through years of research and development I have successfully developed an electrolyte that does indeed manufacture and produce free fuel. This was achieved by recognizing that the only safe way to utilize an electrolysis converter was to separate only the hydrogen blend from the water, by utilizing my new electrolyte, zorongen gas differs from pure hydrogen in as much that it does not explode upon ignition, but burns as does natural gas resulting in a safe blend into air, I have designed my zorongen fuel cell to use zorongen electrolyte only, for the complexity involved in the splitting of water through the zorongen electrolyte concept that produces the zorongen gas are multiple, the written formulation of my new electrolyte can be found within my writings.

The technology that I invented and successfully developed is based on a new electrolyte that manufactures a unique new gas known as zorongen that is 94.3% hydrogen, 1.2% oxygen, 4.5% nitrogen. This blend is produced by a new electrolysis technology this was achieved by recognizing that the only way to utilize an electrolyzer was to develop an electrolyte to separate only the hydrogen blend from the water, this new zorongen electrolyte formula that produces the zorongen gas is the discovery that will lead the way to a clean environment throughout the world, in the past my scientific developments have led me to believe that any free energy produced by man would have to be based on a catalytic formula for mixing through a mechanical device causing an occurrence within the atmosphere that would result in the production of the zorongen gas reaction, (a catalytic co-operation of the elements) and that a hydrogen blend can be extracted from water and can produce large amounts of energy with no radioactive waste with no threat of melt-down or no tox.

Out of Wagner's equation came simulated hydrogen, (zorongen gas technology) due to the successful outcome of the technology that I have developed and understanding the urgent need for a clean environment, my development has led me to produce the zorongen technology a clean full reactor producing the new element (H_2NO_2) the conversion of water into electricity based on my cold fusion energy experiments. The experiments have shown that a minute amount of the new catalyst injected into water can indeed place the water into a different atmosphere, once this atmosphere has been converted the water is bombarded with electrons thus separating the hydrogen from the oxygen of the water, the hydrogen being the lighter element would surface and is burned off as zorongen gas. The catalytic effect on the oxygen would cause the oxygen to be encapsulated into the water molecules. The zorongen gas is the only fuel sources that can be recycled back into the engines carburetor, the zorongen gas exhaust recirculation system results in no emissions eliminating all carbon monoxide pollutants, implementation of zorongen fuel will result in a lasting and universal benefit for mankind.

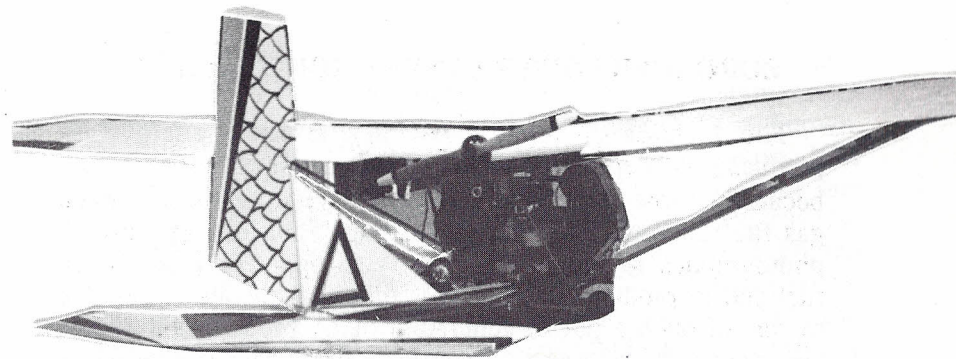
The zorongen gas is a formulation of gases that can only be manufactured through the zorongen fuel cell by the use of the zorongen electrolyte, zorongen gas blend can not be manufactured or blended in any other way. The zorongen gas unlike hydrogen will not explode at high temperatures but will burn when ignited.

I know that the zorongen electrolyte formula that produces the gas blend is the new discovery that will lead the way to a clean environment throughout the world for it is the forever fuel and is an achievement on the order of the Apollo technology and represents a whole family of changes on our daily life and in a remarkably short time zorongen will go from a radical concept to gather international importance for the world, for my new zorongen gas technology can produce new development of materials and engines unlike anything ever used before. And the new zorongen gas will become the fuel of the future and is the candidate for all technology that requires an on-board fuel source.



ZORONGEN GAS POWERED VOLKSWAGON

In Jan. 1990 I developed an all zorongen gas 1971 Volkswagon to introduce my new zorongen gas cell. 12 of the fuel cells were attached to the car and put on display to promote the invention of the new zorongen gas technology, the Volkswagon was designed to burn on all zorongen gas or mixed with regular gas and propane gas. The car was equipped with a solar cell so the car can produce its own energy, the solar panel produces energy to the cars battery and the battery feeds voltage to the fuel cell where the zorongen gas is produced and then used to fuel the engine. The zorongen gas reduces carbon deposits and engine wear increases mileage and improves engine performance, the zorongen fuel cells contain seven quarts of water mixed with four ounces of my new electrolyte which release 94.3 percent hydrogen, 1.2 percent oxygen and 4.5 percent nitrogen.



ZORONGEN GAS POWERED AIRCRAFT

In June 1991, I developed an ultralight aircraft with a zorongen gas-powered engine that I made the "Chickenhawk" I made my first pre-flight at Brown Field on Otay Mesa near the mexican border, and is the San Diego Chapter of the Experimental Aircraft Association. The "Chickenhawk" failed to take off at Brown Field due to a minor technical problem, a broken gas valve delayed what would have been the first flight by a plane fueled not by oil, but by water, regular tap water, twenty-four quarts of it.

The point of the flight was basically to show that the gas was coming from water I proved the point even if the plane never got off the ground. Although my single-engine plane never got aloft, its water powered engine worked as planned, demonstrating my contention that engines can be run cleaner and cheaper by fueling them with water gas instead of the traditional gasoline. The "Chickenhawk" was equipped with six fuel "cells" each resembling a giant jug and containing four quarts of water and a small amount of my "zorongen electrolyte formula" the reaction between the water and the formula, which acts as a catalyst, produces the hydrogen-based "zorongen gas" the gas collects in tanks and is fed to a converted carburetor, where it is burned. The rest of the process is the same as in a traditional gasoline-burning engine, if there's nothing we can do about toxic waste problems at least we can produce a new concept that will not create toxic waste, "that being the new zorongen gas technology".

ZORONGEN POWER GENERATION IN AUG. 1991

The technology lends itself to the solar energy gas producing concept based on photovoltaics /H₂O/ zorongen gas, because of low amperance required to produce the zorongen gas the following concept is possible: "solar energy through photovoltaics to produce electricity to operate the zorongen fuel cell to produce zorongen gas that will operate the engine to run an on-site power generation plant, producing low cost electricity". With respect to hydrogen, it has been suggested by numerous investigators for use in energy applications and may have potential for use in the future as an energy medium. It is clean burning and can serve many applications now being satisfied by petroleum fuels or natural gas however, unlike petroleum and natural gas, which can be extracted from nature's storage and pools and caverns using a tiny fraction of the energy they deliver, at this time production of hydrogen from water requires dedicated plants that consume several times the energy represented by the resulting hydrogen product. In this sense, hydrogen is similar to electricity: large quantities of a relatively low-value energy source (for example, coal or the sun's rays) must be consumed to produce a lesser amount of a more valuable energy product (electricity or hydrogen). In each case, the provide the valuable energy end-product, with respect to zorongen, I have investigated documentation old and of newly developed technology that is available at the present time. I find no technology available that will produce only hydrogen from a reactor that has been developed commercially, cost effective or safe. Whereas, I have developed a unique energy product that will produce a hydrogen blend gas that will meet the world's energy demand at a cost more economical than other fuels sources, and is environmentally safe.

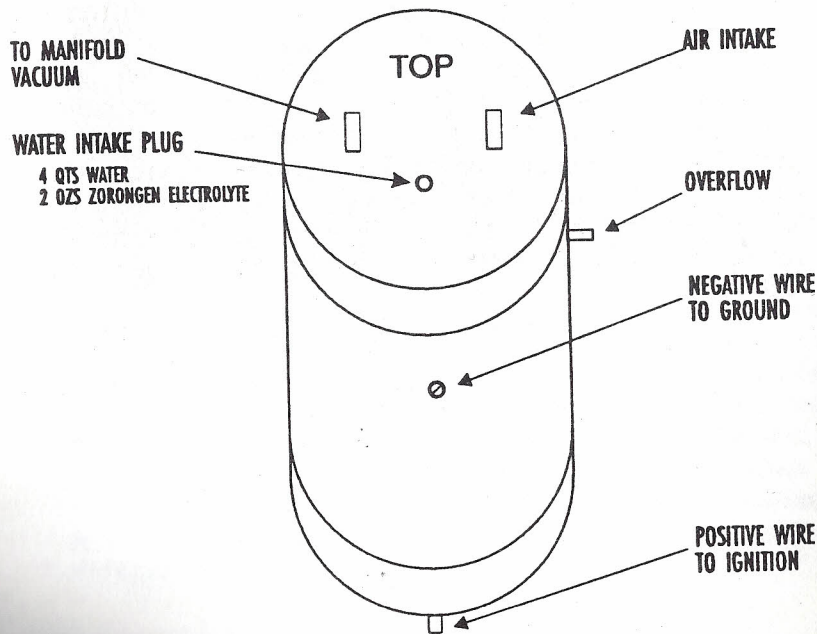
My zorongen gas technology is revolutionary in as much as it produces 94.5% zorongen gas at room temperature, at 1,5 amp. 12 volts and develops 94.3% hydrogen. As is known, hydrogen makes up 90% of the atoms in the universe. It is abundant in interstellar space with an average of about one hydrogen atom per cubic centimeter. However, on earth, the gas constitutes about 0.29% of the atmosphere, it is known that 66.6% hydrogen and 33.4% oxygen can be produced by passing an electric current through water, and separates the hydrogen from the oxygen in the water molecule in a process called electrolysis using hydrochloric acid electrolyte, where as zorongen can be produced with no carbon electrolyte and will produce 94.3% hydrogen using my new zorongen electrolyte with no hydrochloric acid. Air is a mixture of gases, it is approximately 70% nitrogen and 20% oxygen. Each of the atmospheric gases liquifies at different temperatures. Nitrogen liquifies at a higher temperature then oxygen. For example, air coming into contact with uninsulated zorongen fuel lines will liquify nitrogen before the oxygen. Oxygen is separated out of the water and used in pure form in engine combustion. Suitable devices that accomplish this have been designed and tested in vehicles, aircraft, generations. Out of my flowing equation came the revolutionary new simulated hydrogen zorongen gas technology.

**WAGNER MANUFACTURING
COMPANY**

14372 OLDE HWY 80 #A
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**TECHNICAL TALK
ZORONGEN GAS CELL
NEW ELEMENT H_2NO_2**

FUEL FROM WATER



ANSWERS TO THE MOST COMMONLY ASKED
QUESTIONS ABOUT ZORONGEN GAS FUEL

**STATIONARY APPLICATIONS
TOMORROW'S TECHNOLOGY TODAY
THE ZORONGEN GAS AGE
ON - SITE POWER GENERATION**

The Energy Carrier

ZORONGEN fuel has been studied and applied in virtually every way which conventional fuels are used, in domestic non-commercial use.

- Cooking.
- Water and space heating.
- Cooling and refrigeration.
- Lighting.
- Farm Implements.
- Transport.
- Generating electricity.

"In all these applications, it is superior to conventional fuels and other synthetic alternatives".

With the demand for energy increasing worldwide four times faster than the population new energy sources have to be found. The problem with wind, solar, water, and nuclear power is in *transporting* the energy from where it is generated to where it is needed. ZORONGEN can serve as this link between the new sources of energy and the end uses. With engine-driven generators or fuel cells the energy consumed in generating ZORONGEN can be converted to electrical power for use, on-site, in homes, businesses and factories.

ZORONGEN versus Natural Gas

Some advantages of ZORONGEN as compared to natural gas (methane) are:

- A minimum of 4% ZORONGEN in air is needed for combustion. For natural gas it is 5%. An explosion of 4% ZORONGEN has only *one-fourth* the energy of a 5% natural gas and air mixture. This means that if an explosion with leaking ZORONGEN gas occurs, it would be less damaging than a similar explosion with natural gas.
- Leaking ZORONGEN rises faster and dissipates more readily. The high density of propane makes it a particularly hazardous gas, in this respect.

ZORONGEN gas in itself, is an achievement on the order of Apollo Technologies, and represents a whole family of changes on our daily lives. The tie that binds the technologies together is the ZORONGEN Gas Cell that manufactures 94.3% hydrogen, 1.2% oxygen, 1.2% oxygen, and 4.5% nitrogen (NEW ELEMENT, H_2NO_2).

In general, Zorongen is not particularly hazardous compared to other flammable substances. It does have some unique properties that require special safety considerations. Its high rate of diffusivity enables it to penetrate some materials, such as cast iron.

Heat energy

On a weight basis Zorongen has three times the energy content of hydrocarbon fuels. On a volume basis it has about one-third less. This means that a given volume of Zorongen will not give off as much energy as other gases, such as methane.

Explosion Energy

A concentration of Zorongen of 18% or more in air can cause *detonation* (an explosion). Only 6% is needed for methane and propane. The amount of pressure that exploding Zorongen will exert on an enclosed container depends on the detonation velocity and the density of the unburnt mixture. Since Zorongen burns quickly, it has the *highest* explosion potential of any gas, *on a mass basis*. On a volume basis, it has the *lowest* explosion hazard. For an equivalent storage of energy, Zorongen has a similar explosion potential as methane or propane.

Cost analysis

Hydrochloric water electrolysis - verses - Zorongen water electrolysis

The Zorongen gas processes for producing hydrogen from water electrolysis is approximately

input * 3 amp.h = \$0.016
output * 238 amp.h = \$3.00

The hydrochloric acid water hydrogen gas electrolysis production is approximately

input * amp.hrs = \$1.00
output * amp.hrs = \$0.80

Electrical Specifications

Electrical input	Gas output	Model Physical Specifications
1.5 amps, 12 volts.hr	15,000 BTU.hr	Model-4 4-quart water container
1.5 amps, 24 volts.hr	30,000 BTU.hr	
1.5 amps, 48 volts.hr	60,000 BTU.hr	Model-6 6-quart water container
1.5 amps, 96 volts.hr	120,000 BTU.hr	
1.5 amps, 212 volts.hr	240,000 BTU.hr	Model-8 8-quart water container

Flammability Limits and Optimum Mix

The limits of flammability of Zorongen in air are from 4% to 75%. This means that a minimum of 4% and no more than 75% Zorongen mixed (by volume) in air are necessary to support combustion. The range of flammability for Zorongen is wider than methane, propane, or other hydrocarbon fuels. *"In most accidental situations, the lower flammability limit is of particular importance. This is due to the fact that in realistic accident sequences, ignition sources with sufficient energy are nearly always present, once leaking fuels and combustibles have reached flammability concentrations in air."*

The minimum limit of flammability for Zorongen is *higher* than for either propane or gasoline (2%).

Related to the above safety considerations, is the fact that Zorongen requires three times higher concentration in air (29.3%) for maximum combustion energy than methane (9.48%).

Ignition Temperature

The temperature needed to start the combustion of Zorongen in air is slightly greater for methane and *double* that for gasoline. This means that Zorongen is usually not ignited, at atmospheric pressure, by ignition sources such as a lit cigarette, but only by a open flame.

Ignition Energy

The minimum amount of *energy* (not temperature) necessary to start the combustion of Zorongen is about *one-tenth* the minimum for any hydrocarbon fuel. Most ignition sources, such as electrostatic sparks, exceed this energy level. Electrostatic sparks from the human body ("carpet shock") have about three times the amount the amount of energy needed to set off a Zorongen explosion.

Flame Luminosity and Temperature

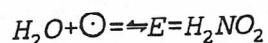
Zorongen gas is colorless, odorless and nontoxic. It produces a barely visible blue flame with very little radiant energy compared to hydrocarbon fuels. It is possible to come into contact with a Zorongen flame, accidentally, because of its near invisibility

Flame Speed

The flame speed of any combustible gas is the sum of its burning velocity and the speed with which the flame displaces the unburnt gas mixture. The flame speed for Zorongen is *ten times* that for hydrocarbon fuels. Therefore, automatic check valve: designed for methane must be able to respond quickly enough to prevent Zorongen fuel-air mixtures from burning back into a fuel line.

TRANSMUTATION WAGNER'S FORMULA: ZORONGEN GAS

NEW ELEMENT



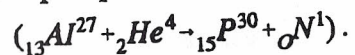
THE TRANSMUTATION OF ELEMENTS

INTRODUCTION

The development of artificial radioactivity has made possible the conversion of one element into another by means of nuclear changes within the atom. The bombardment of nuclei with certain high energy particles such as protons (${}_1H^1$), deuterons (${}_1H^2$), alpha particles (${}_2H^4$), beta particles (E^-), and neutrons (${}_0H^1$) may result in the capture of the particle by a nucleus, followed by elimination of a particle from the nucleus different from that captured. The result is the formation of unstable radioactive isotopes of the element, or transmutation into a new element.

NUCLEAR REACTIONS

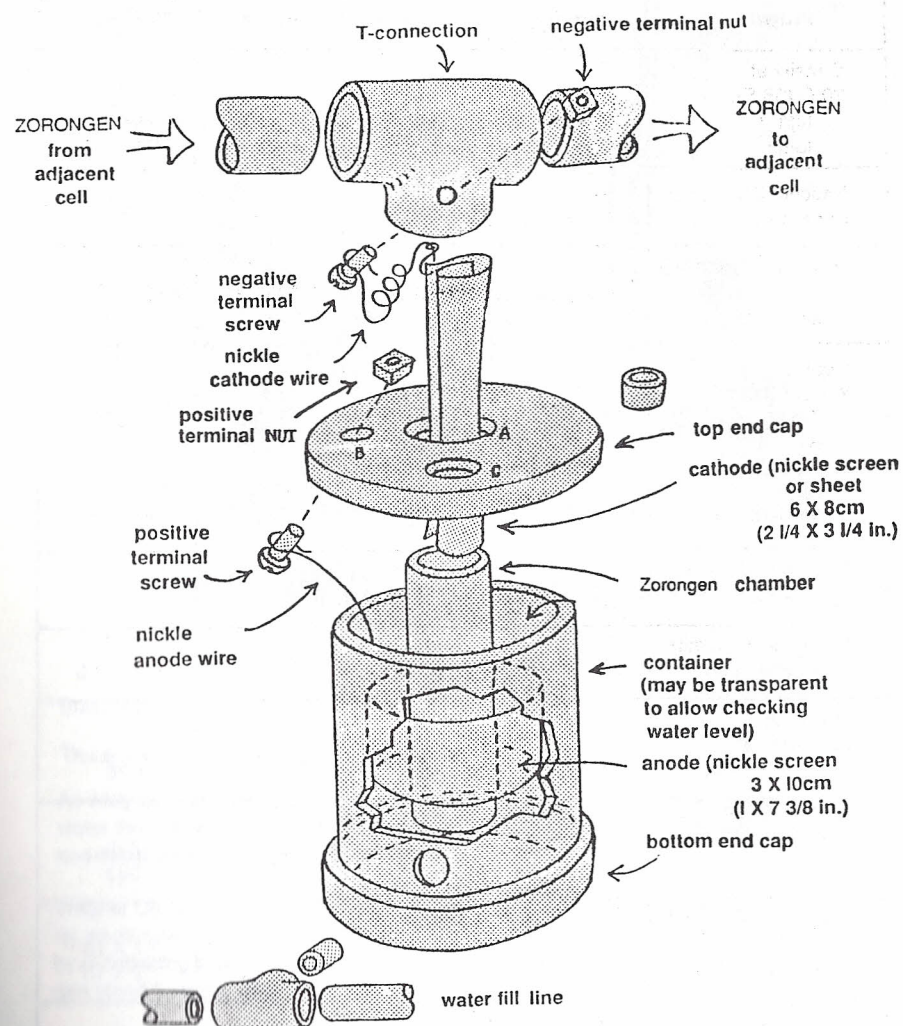
Transmutation of element and the artificial preparation of unstable radioactive isotopes involve nuclear changes within the atom. For example, when aluminum is bombarded with alpha particles, the product are radioactive phosphorus and neutron



* $\odot$ WAGNER'S CATALYST

WAGNER MANUFACTURING COMPANY

ZORONGEN GAS CELL



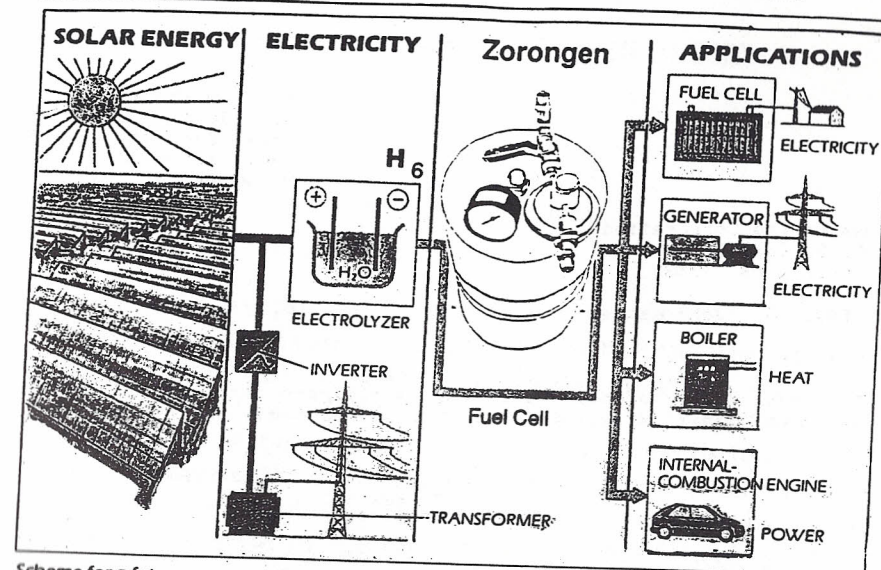
Cell Assembly

14372 OLDE HWY 80 #A
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(619) 443-2016

EXHIBIT 140
Safety Related Properties of ZORONGEN

Property	Zorongen	Methane	Propane	Gasoline
Density at 20 C (68 F), 1 atm kg/l lb/ft ³	0.000083 0.00519	0.00078 0.0484	0.00187 0.1166	0.72 44.83
Specific Gravity (Air = 1.0)	0.0696	0.641	1.56	3.90
Diffusion Coefficient m/s ft/s	0.0061 0.0200	0.0016 0.0052	0.0012 0.0039	0.008 0.0026
Heat Energy Weight Basis Wh/kg BTU/lb Volume Basis Wh/l BTU/ft ³	34,722 53,776 2.89 278.9	13,333 20,650 10.36 1,000	12,778 19,789 23.89 2,306	12,361 19,144 8,889 85,819
Explosion Energy kg TNT/kg Fuel	24	11	10	10
Flammability Limits % volume in air	4 - 75	5 - 16	2 - 1	1.4 - 7.6
Optimum Air/fuel Mix % volume in air	29.3	9.48	4.03	1.76
Autoignition Temp. C F	580 1,076	540 1,004	487 908	295 563
Ignition Energy in Air Wh BTU	6×10^{-9} 2×10^{-8}	8×10^{-8} 3×10^{-7}	7×10^{-8} 3×10^{-7}	7×10^{-8} 2×10^{-7}
Flame Temp. in Air C F	2,045 3,713	1,875 3,343	2,100 3,812	2,197 3,987
Flame Speed m/s ft/s	0.7 0.9	0.3 1.0	0.3 1.0	0.3 1.0

NEW ZORONGEN FUEL CELL



Scheme for a future energy economy uses electricity from solar panels to electrolyze water into Zorongen for storage and pipeline transmission, and then for a diverse range of applications.



WAGNER CO.

Environmentalist:

Thank you for your interest in the Wagner electrolyser fuel cell.

As early as 1820 man has been searching for a way to manufacture hydrogen from water through electrolysis, or other methods that would be safe, requiring no storage and could be used as it is manufactured.

Wagner Co. through years of research and development has successfully developed an electrolyte that does indeed manufacture and produce free fuel. This was achieved by recognizing that the only safe way to utilize the fuel was to separate only the hydrogen blend from the water.

The ZORONGEN Electrolyte formula that produces gas is the new discovery that will lead the way to a clean environment throughout the world.

(NOTE: THE ONLY FUNCTION OF THE WAGNER FUEL CELL IS TO MANUFACTURE ZORONGEN GAS)

QUANTUM GEOMETRODYNAMICS
THEORETICAL CATALYTIC SPIN THEORY

BY

John C. Wagner

Because my physical research activity, chemical investigation of inorganic catalyst, has had as its goal the development of an exact formula, general theory of catalyst I have had to assess critically the limits which occur theological perimeters explaining catalyst process. My assessment reveals that limitations of currently accepted approaches are so severe that an entirely new theological foundation would have to be formulated. The result of my efforts in this task of theological and theoretical reconstruction was finding that quantum mechanics alone cannot furnish an adequate foundation as can quantum geometrodynamics a theoretical system in which quantum mechanics and general relativity are brought to terms with one another. Though many of my contemporaries will agree that the theory of quantum geometrodynamics is not yet definitely proven and that even if it were it would be inappropriate for the description of our ordinary catalyst phenomena. My experimental results lead me to believe that such applications are far less inappropriate than currently accepted quantum mechanics models which fail to prove any explanation whatsoever for the result I am now obtaining routinely.

The measure of theory is its ability to generate physical results. I have presented a short summary of my accomplishments and as one can see my efforts toward development of a quantitative inclusive technological framework for the mechanism of inorganic catalyst has lead to a system of theoretical postulation relation and protective postulates and prejudiced hypothesis which is not being regarded with experimental confirmation.

Micro-Methods, Inc.
6500 Sunplex Drive
Ocean Springs, MS 39564
(601) 875-6420
November 14, 1988

Wagnerite Corporation
P. O. Box 812
Biloxi, MS 39533

ATTN: Dr. John Wagner

Dear Dr. Wagner:

The results of the analyses of the sample received 10-31-88, description as shown, lab file #22-WC-11-88, are as follows:

ZORO GAS - WATER SPLITTING CORPORATION
P. O. BOX 812
BILOXI, MISSISSIPPI

Hydrogen Vol%	94.3
Oxygen Vol%	1.2
Nitrogen Vol%	4.5

If we can be of further assistance, please contact the office.

Sincerely,



Thomas J. Wilson

TJW/dw

METHODOLOGY

Gas Chromatograph

Quantum geometrodynamics represents the most systematic attempt in physics to correlate quantum mechanics, which describes the behaviour of atoms and their constituents at ordinary temperatures and energies, with general relativity, which describes the space-time behaviour of matter at extreme velocities and energies. As early as 1967, Roger Penrose, expressing an opinion even then shared by many, stated that "...there is a deep connection between quantum theory and general relativity, so that it may actually be a mistake to attempt to build up the subjects separately" (15). The passage of time, and the devoted work of a number of distinguished physicists (16-19), has shown already that Penrose was correct in expressing his concern.

The telling effect of geometrodynamics on current thought in physics was obvious to all scientists who attended the May 1981 symposium held in honor of P.A.M. Dirac at Loyola University, New Orleans (20). Physicists are notoriously cautious, but where Dirac is concerned, they have all learned to listen. With respect to attendees presenting papers and discussions on geometrodynamics, Dirac's presence was significant. Since 1937, when Dirac

first enunciated his "Big Numbers Hypothesis", which focuses attention on the fact that certain very large numbers appear consistently in the equations of physics, physicists have been perplexed with the possibility that local processes might depend in some way upon all processes in the universe. Since Dirac's own mathematics in this regard lead to diverging series and infinities, physicists have generally avoided pursuing the implications inherent in the hypothesis. Those who have forged ahead anyway, led by John Q. Wheeler, their generally acknowledged chief, are the physicists to whom we owe a debt of gratitude, for these are the developers of quantum geometrodynamics. Competing theories, because they confine allowable mathematical formalization to local, renormalizable, 4-space field constructions, do not succeed as well as geometrodynamics in correlating gravity and electromagnetism. By rejecting the unproven assumptions that the equations of a unified field theory must be renormalizable, that the only possible kind of gravitation is of the weak Newtonian kind, that the only space manifold is a 4-space, quantum geometrodynamics has achieved a self-consistent mathematical formalization which competing theories have been unable to duplicate. These mathematics predict the self-organizing tendency of matter as a consequence of a "superspace" in which the non-linear master field is gravitation. Perhaps vindicating Dirac, this superspace is interconnected with itself instantaneously at all points in the universe. It shows the possibility that among the finite number of possible field concentrations, there can occur strong, short range gravitation, thus the strong nuclear force, and weak long range gravitation, thus the weak nuclear force and the electromagnetic forces.

My work in inorganic catalysis began some years before

geometrostatics became explicit in theoretical physics; I developed geometrodynamic principles related to those of current geometrostatics on the basis of experimental results which I could not explain satisfactorily with quantum mechanical theory. Such results include gravimetric, electromagnetic, and thermodynamic data wholly inexplicable in terms of Hartree-Fock SCF (self consistent field) theory (21), which theory is at the state of the art in straight quantum mechanical analysis of catalytic effects, but completely consistent with geometrodynamic principles which predict that (1) matter is entirely made up of curved space that is permeated with what Wheeler calls "worm-holes" (22), (2) quantum forces are disguised curvature effects (23), (3) protons can be pictured as tiny singularities in a strong microscopic gravitational field, (4) geometry fluctuates violently at small distances, (5) matter is constantly trapping and releasing photons, (6) for events near a singularity energy needn't be conserved, (7) entropy increase in spontaneous processes is pushed by thermal radiation emitted by singularities, and (8) celestial and microscopic processes are in immediate tachyonic contact by means of static, rather than oscillating fields.

At the base of my theoretical structure is the proposition that atoms and their constituents are geometrodynamic entities. With respect to thermodynamics, I have never been able to accept, even when reflecting on ordinary inorganic reaction processes, that catalysts concerned give up no energy to the reactants they somehow cause to react at a fraction of the normally non-catalyzed temperature. Nor have I ever been able to support the idea that all elements other than carbon, hydrogen, and nitrogen are in any sense "inorganic"; the ubiquity with which they appear in all living systems as obligate enzymatic co-factors making them

just as alive as the high MW enzymes they are invariably found to be catalytically driving. I am not surprised that evidence of proton decay seems to be accumulating in various laboratories, or that Stephen Hawking (24) has recently discovered that the spectrum with which singularities emit radiation is primarily thermal. I find a chemist's recent observation that ordinary clays give off light while dehydrating extremely significant, where the editor of the magazine publishing this observation felt three lines sufficient to report on it.

The net product of my theoretical and experimental work has been the creation of inorganic formulations which provide much more energy than one would expect them to.

Accessing the source of this energy required coupling large ensembles of the right elements by means of their angular rotation, or spin. This is the only way to couple to the geometrodynamic domain of the atom, as far as I can tell. I find it no coincidence that according to the third law of thermodynamics matter refuses to give up its spin even in the limit of absolute thermodynamic zero temperature.

Theory predicted to me, and experiment verified, that paracrystalline aqueous colloidal organization would be the ideal physical state of matter within which to achieve the kind of spin resonant coupling by means of which thermal radiation of individual atoms might be collected in order to do chemical work. Such a physical state offers both organization (negentropy) and mobility, and it is no wonder that it is the preferred state for biological tissues, which are invariably assisted in their metabolic processes by trace quantities of inorganic elements.

The challenge to formulating the right colloidal system was water structure. Once I found out how to modify the spin of hydrogen at room temperature, I could proceed with determining other aspects of the system. I have both indirect and direct evidence (change in heat capacity at constant pressure equivalent to value known for spin transition) for this modification of the spin angular wave function of the hydrogen. Other chemists have been able to change the spin of hydrogen (from ortho to para), but only at cryogenic temperature.

When stable organic compounds, pollutants or otherwise, are emulsified within such an energetic colloid, they slowly dissociate. It doesn't matter if they have a boiling point of 318C; they are degraded, in a gentle reaction at room temperature, and at the end of reaction the reactant mass has lost a significant fraction of its non-volatile weight.

As will be appreciated, there are many uses for thermal energy, once you can collect it. Thus far I have learned how to harness our geometrodynamically generated thermal energy in the form of chemical potential. I am currently involved in efforts to harness it electromagnetically. I have obtained quasi-superconductive effects (electron-photon interaction) at room temperature; these effects do not resemble solid state (band theory explainable) effects. I have one experimental colloid the water vapor from which emits light at room temperature when excited by a 10 volt applied field. I have an aqueous non-metallic electrolyte whose conductivity decreases with temperature (like a metallic conductor), and another aqueous gel which is semi-transparent to visible light yet is an extraordinary insulator. Yet another aqueous system of my formulation

QUANTUM GEOMETRODYNAMICS
THEORETICAL CATALYTIC SPIN THEORY
DEVELOPMENT ARE THE PHYSICAL RESULTS
OF THE ZORONGEN GAS CELL.

BY

JOHN C. WAGNER

WAGNERS' EQUATION:

MOTION (HEAT, ENTROPY) = MATTER IN TIME

NO MOTION = SPACE ONLY IN ZERO TIME

(consisting of 99.5% water and .5% by weight inorganic reagent) displays thermodynamic anisotropy as a function of *height* in the reaction vessel upon uniformly applied thermal and/or electrical stress. Another aqueous inorganic colloid (also mostly water) concentrates electrostatic fields to a high degree. Last but not least, we have a gel which expands in volume 10 fold or so as it dehydrates, leaving behind a crystalline mass whose shape is that of a magnetic toroid.

I am hoping to continue my research for its potential value to alternate energy applications. Also, as should be clear, there are biomedical applications in which I look forward to engaging myself. I believe I have a valuable hypothesis for the mechanism by means of which water transports electrons in cellular metabolic systems, and another with respect to the neurobiochemical effects of heavy metal accumulations and what can be done to reduce them.

To the critical scientific reader, who may justifiably balk at the simultaneous mention of quantum geometrodynamics and its application to the physical chemistry of inorganic catalysis, I can offer no other defense than the consistent regularity with which my experimental results have agreed with my predictive hypotheses.

CONJUNCTION

The Superconducting State.

Further Evidence that Gravitational (Mass Dependent) Processes Function in Nature as Fundamental Physical Chemical Determinants.

Vanishing Electrical Resistivity, Isotope Effect, and Meissner Effect Not Correlatable under BSC Quantum Theoretical Model.

Quantum Geometrodynamics Development of the Simplistic Gravitational Postulate;

Idealization of Atoms and Lattices as Geons (Gravitational-Electromagnetic Entity);

Superconduction, Isotope Effect and Meissner Effect as Consequences of Overdeterminant Geonic Co-Variations.

Spin Redefined in Terms of Connectivity Geometry in Multiply Connected Space;

The Magnetic Field Redefined as Stretched Space.

The Modified Meissner Effect in Alloy Superconductors: Explanation in Terms of Interexisting Heterogeneous Spatial Connectivity Topologies.

The superconducting state was first observed by Kamerlingh Onnes, a Dutch physicist, in 1908. Onnes was working with liquid helium and developed techniques for

producing temperatures very close to the absolute zero. He observed that when mercury was cooled to 4k or so, both the temperature dependent and temperature independent components of its electrical resistivity vanished abruptly. Since this first observation of the superconducting state, scientists have plunged into an intensive research programme, the hoped for result of which would be an inclusive theoretical understanding of the superconducting state. The superconducting state challenges our understanding because of the characteristics of the superconducting state, namely, the disappearance of electrical resistivity, the exclusion of magnetic induction within the superconductor (Meissner Effect), the variation of critical temperature for different elements and alloys in different magnetic fields, the effect on critical temperature and current of imperfections in substances, and more. None of the characteristics are predicted by Maxwell's equations of electrodynamics, and quantum theory explains only the possibility of the characteristics, but not their interrelation.

It turns out that all characteristics of superconductivity can be brought under a single inclusive theory, that predicts all behaviours of the superconducting state, by developing a semi quantitative phenomenological model from our as yet simplistic gravitational postulate. This will amount to a relativistic quantum mechanical (spin goemetrodynamic) modification of the current quantum mechanical electron-phonon interaction (Cooper Pair stabilization) theory achieved by many physicists but most succinctly given by Bardeen, Cooper, and Schrieffer¹⁶

The BCS electron-phonon interaction theory postulates that electrical resistivity vanishes when the wavelength of all conduction electrons in a metal matches the wavelength

of phonons in that metal. Phonons are the quantized vibrations of the crystal lattice ions which are known to be the resonant modes of thermal and mechanical (acoustic) conduction of energy through the solid state. When the electron and phonon waves resonate together, Bragg scattering that would normally produce resistance, doesn't occur, and the superconducting state is achieved. Cooper intuited that the phonon-electrons with equal and opposite momenta and opposite spin, resulting in a net stabilization, or lowering of energy, such that the superconducting state becomes the preferred state. Because such an attractive force is ordinarily opposed by a screened coulomb repulsion, produced by phonons (iron cores), Cooper reasoned that the superconducting state was in essence a quantum state on a large (macroscopic) level, in which the separate behaviours of many electrons become locked together via the phonons between them. The quantitative development of the BCS theory proceeds on the basis of the experimentally observed "superconductor gap energy", ϵ , which corresponds to an alteration of the distribution of occupied energy states in the ground state of atoms and crystalline ensembles of them. Whereas in a normal non-superconducting state all available energy wave states below the Fermi level are occupied, in the superconducting state the lowest excited state occupied is separated from the ground state by an amount ϵ . This amounts to a reduction of entropy since fewer states, and thus degrees of freedom, are involved. The equation which results in $\epsilon \cong 4k\theta \exp(-1/NV)$, where θ is the Debye temperature, $k\theta$ is the range of energies of the Cooper pairs, N is the density of electronic states, and V is the net electron-electron interaction energy.

While this theory explains the gap energy, it doesn't

allow us to calculate which elements and alloys should be superconducting and which not, because it doesn't tell us how to calculate V , *ab initio*, for a given substance. The theory cannot at all explain the Meissner effect (perfect diamagnetism within the superconductor), and suggests the isotope effect only generally. The isotope effect refers to the experimentally observed proportionality between T_C , the temperature at which a substance goes superconductive, and the inverse square root of isotopic mass for a series of isotopes of the same element. The only explanation BCS theory can offer for $T_C \propto M^{-1/2}$, is that phonon wavelengths must depend on ion diameter in the lattice, and thus upon atom weight.

Because BCS theory cannot calculate V *ab initio*, neither can it explain or unify under a single principle the variety of T_C 's one gets for different alloys. The isotope effect doesn't hold for atomic weight distributions in alloys, and in alloys, as well, the Meissner effect changes radically. Instead of the perfect diamagnetism observed in pure elements, in alloys we see magnetic hysteresis, higher T_C 's, much less sharp transitions, a series of critical magnetic fields rather than one, and high critical currents. With pure elements (non-alloys) one finds that magnetic induction is excluded from the interior of the superconducting wire up to a certain magnetic field strength, H_C , at which strength the metal transitions to the normal non-superconducting (finite resistivity) state quite abruptly. Pure metals follow the equation $H_C \propto H_0 (1 - T^2/T_C^2)$ quite closely, where H is the field strength required to disrupt superconduction at absolute zero, T is the temperature of observation, and T_C is the critical temperature for the metal in a zero field. The more magnetic field strength applied to the superconductor the lower you have to keep its temperature in order to

preserve the superconducting state.

Because the BCS theory can't explain these characteristics and their interrelation, we are justified in suggesting a theory which might be more inclusive.

The foundation of the theoretical model so far developed in respect to photosynthesis, rests upon a master gravitational field which is non-linear and can organize itself differentially in order to give rise to strong short range forces (nuclear forces), medium strength medium range forces (the electromagnetic force), and weak long range forces (Newtonian gravitation). This matter field is meta-mechanical because it simultaneously provides both the existence of all forces and symmetry relations between forces locally. This is a restatement of the principle of intelligence described earlier, according to which a master field of any kind must not only define forces locally, but define them the same everywhere (globally). In our discussion on photosynthesis and metallo-enzyme complexes, this principle was stated in terms of each of the elements being as they are as a consequence of the purpose served by their interactions in living systems. The principle operates to guarantee to every hydrogen atom, for example, the same number of possible energy states. Nature, it would seem, contains a master field that must establish the presence and behaviour of all matter and energy in space and time by means of static, rather than oscillating interactions. The field would have to be everywhere at once and would thus have to propagate itself at an infinite velocity. Since the only understanding we can have of infinity would be "everywhere at once," it makes no sense to speak of velocity for a field such as this master field. Hence we call it "static." The easiest way to think of such a static master

field is that it is *space itself*, not as we apprehend space in ordinary experience, but as we apprehend space in terms of Einsteinian geometrodynamics. But given that such a gravitational master field operates even in the intelligence of microscopic entities (like heme porphyrins), we have to go a step farther than Einstein's general relativity and postulate the existence of space-time curvature at the microscopic, atomic and subatomic mass level. Einstein's equations suggested that high energy curvature could occur only when very large masses and velocities are present, because his equations did not postulate the kind of master field here postulated. His geometrodynamics worked only with weak Newtonian gravitation (G), which could become strong only at high velocities and accelerations and mass values. As far as Einstein could see, atomic and molecular quantum mechanics required only small relativistic corrections to rest masses and for this reason quantum mechanics was thereafter built up without much reference to relativity. At least there have been only a few exceptions, these being Dirac's electron theory (which predicted the existence of antimatter) and Wheeler's¹⁷ quantum geometrodynamics. Most physicists have avoided the mathematical implications of Dirac's and Wheeler's theories because of their apparent meaninglessness: the equations diverge to infinity. In the case of Wheeler's theory, this meaninglessness may be a definite virtue. Wheeler's mathematics show that an infinite number of coexistent space-time organizations can exist simultaneously; he has thus redefined space as "superspace" because it is a space that tachyonically instantaneously interconnects itself with itself everywhere and everywhen. His equations do not rule out the possibility of, indeed they suggest the possibility of, para-static rotating singularities, the energy of which could correspond to quantum energies. The master field is pre-geometric

because it determines the geometries of all symmetries; matter doesn't exist in it, but trapped photons, and their surfaces, do.

Wheeler's geometrodynamics has been called "new physics." A more appropriate label, in both the writers opinion, and as Wheeler himself sees geometrodynamics, would be "rediscovered physics." We may wish to adopt it because we have seen already, without reference to physics, that matter should really be nothing but self-trapped light, and that relatively few atoms of heavier (more strongly curved space) elements seem to influence chemical behaviour of biochemical systems comprised primarily of large number of lighter elements. Just because one knows of no others who may be currently applying quantum geometrodynamics to physical chemistry, one is not deprived of the urge to develop a new understanding of chemistry based upon geometrodynamical concepts

Let us now visualize a metallic crystal lattice, that of a superconductor, as a spatio-temporal geometrodynamical system, in which ion cores are charge shielded (stabilized) minisingularities, or mass nodes of an overall resonant state. Ion cores, because they are the heaviest components of the lattice, are the entities which curve space the most, and dominate the systems behaviour. At ordinary temperatures all valence (conduction) electrons should be relatively much more mobile than these heavy ion cores, and tend to collide with them, or suffer Bragg scattering, thus giving rise to a finite electrical resistivity. Each electron, in turn, can be visualized as a geometrodynamical entity, since every electron has mass and spin and velocity. As thermal energy is withdrawn from the metal lattice (as it gets colder) the average energy level of electrons, as well as their distribu-

tional randomness, would have to decrease. We would expect that at some low temperature, close to the point where electron motion ceases altogether except for spin, the heavy ion core singularities, which are the primarily static geometrodynamic entities, would resonate with the electron *spin* functions, because these *spin* functions determine the surface gravitational potential of the electron quanta, such that the ion cores, the phonon quanta, and electrons, would resonate on the same wavenumber, and thus become locked together throughout the lattice. This is substantially the Cooper Pair BCS hypothesis, but with a modification. We assign priority to the comparatively higher wavelength *phonons*, thus to the heavy ion cores, in terms of their *gravitational* interaction with the *spin-gravitational* space of the electrons.

Here, with the word "gravitation," we move decidedly away from the language of quantum theory, and into the language of general relativity. But by doing so we can better understand both superconductivity, and the kind of inter-elemental co-determination relations in heavy atom co-catalyzed organic metallo-enzyme systems.

The best way to convey the sense of a gravitational interaction between spinning electrons and heavy ion cores (phonons in BCS terminology) is to show just how *all* the characteristics of superconduction are explainable as consequences of geometrodynamic gravitational process. Recall the characteristic behaviours and properties of the superconducting state: (1) disappearance of electrical resistivity, (2) critical temperature (T_c) proportional to inverse square root of isotopic mass (the isotope effect), (3) exclusion of magnetic induction perfect for pure element superconductors (Meissner effect), several critical fields for alloys with

no perfect diamagnetism. The occasion that *just these* effects are observed in superconductivity experiments, serves as evidence enough that the geometrodynamic model is a good one. Let us proceed to examine how and why.

We can start with the isotope effect, according to which the critical temperature of transition into superconduction is higher for lower isotopic masses than for heavier isotopic masses. This inverse dependence on mass is easily understood once a specifically gravitational model of the atom is developed.

The first postulate advanced is that the nucleus of an atom has mass, but that this mass is really a region of intense space curvature, within which electromagnetic radiations (photons spin against themselves to create their own gravitational potential in a defined volume. The writer borrows John A. Wheeler's term "geon"¹⁹ for this region of self-trapped gravitational and electromagnetic potential. In a geon, light rays (photons) passing one another have a mutual attraction that cannot be distinguished in any way from the attractive force created by masses acting gravitationally on one another. This is, of course, a well known consequence of classical general relativity. A geon has mass without mass; "mass" is only the inferred result of our observation of a gravitational potential; what we are really seeing is the result of a region of highly curved space-time viewed from relatively flat space-time. Within the region of high curvature there is really no mass, only violent fluctuation of the fabric of space itself. In a geonic atom, binding energy which holds nuclei together is understood as a stress energy tensor field made of curved empty space whose geometry fluctuates violently.

If electrons, because they have apparent mass, are geonic, then interactions between electron clouds and the nuclei they surround, would be inter-geonic, and gravitation would be the force which generates the electron phonon interaction known to occur in superconduction.

Electromagnetic vibrations of a geon fall into two classes:²⁰ (1) those which are bound in circular null geodesic orbits (photon orbits), and (2) those which can escape to infinity on radial null geodesics. Bound non-valence electrons would fall into the former class; valence and conduction electrons would be in the latter class. Since, however, both nuclei and electrons are made of the same empty space, that space must have a mechanism for altering its own connectivity, such that at any time the nucleus and electron cloud co-establish one another. Because space must be everywhere in balance with itself, regions of high curvature must radiate energy from their surfaces. We can say that for this reason heavier elements have more orbital electrons, at higher ionization potentials the closer we move in towards the nucleus from the atom's surface. The topology of the space in which outer electrons move is thus completely determined by the curvature of the nuclear space. This is a crucial set of concepts that led to the realization that mechanical, electromagnetic or thermodynamic work done on an atom is not really against a coulombic potential, but against variations of the spatial metric which give rise to electric and magnetic lines of force.

The self consistent gravitational electromagnetic co-variations of a geon, or system of geons, led to the "isotope effect," that is, to electron entropy states that increase directly in proportion to nuclear mass increase, for a

given number and distribution of electrons.

The heavier the nuclear mass, for a given electron number, the more energy that must be radiated away from the nuclear geon core into regions of relatively less expanded space. At the surface of the atom, the region between ion cores of a lattice, this geometrodynamics requirement results in an expansion of electron space for heavier nuclear mass and a contraction of electron space for lighter nuclei. Such expansion and contraction of electron space corresponds, respectively, to greater and lesser magnitudes of both thermal energy and entropy. The result with respect to the isotope effect is that conduction electrons in a lattice made of heavier isotopic atoms have more thermal energy and entropy, at a given temperature, than do conduction electrons of the same element with lower isotopic mass. As a consequence, we must cool a lattice of heavier isotopic mass to lower temperature than a lattice of lighter isotopic mass, to obtain equivalent electron spatial energy states, and transition into superconduction, for both. Indeed, in superconductivity experiments on such lattices of heavier versus lighter isotopic masses, it is observed that the T_c of the heavier isotopic mass lattice is lower than the T_c of lighter isotopic mass lattices.

Clearly, on gravitational arguments alone, one can predict the inverse dependence between isotopic mass and critical temperature of superconduction. At the moment, only a brief explanation can be given of why T_c is inversely proportional to the *square root* of the isotopic mass. Inverse dependence on the square root of mass is a consequence of the fact that the nuclear and electron spaces, considered as regions of curved, multiply connected space, must in co-time establish one another. Therefore the effect

tive mass value must be evenly distributed throughout the atomic volume. This distribution is accomplished charge-wise, but not weight-wise. The entropic space in which conduction electrons move must therefore carry some fraction of the effective mass value, but not all the mass value, since what it has must determine, along with what the nucleus carries, the *total* effective mass. It is a case of the mass times itself giving rise to a mass. Thus one expects that nuclear space and atomic surface space should each represent the square root of the total mass, such that when multiplied times one another, the effective total isotopic mass is observed. Since T_C describes the stress energy of the conduction electrons' space, it should be proportional to the inverse of the square root of the effective total isotopic mass. This becomes more clear as the analysis according to geon-geon interactions is developed.

It is often stated in quantum theoretical definitions of conductivity in the solid state, that the conduction electrons don't really belong to the individual atoms, but are shared by all the atoms of the lattice. This is only partially correct; obviously when lattices reach their critical superconducting temperatures, they influence their electrons profoundly. *Every* conduction electron belongs to *every* atom when the electron-phonon interaction occurs. The conduction electrons do *not* have an autonomous existence with respect to the heavy ion cores. It may appear that they do at ordinary temperatures. Proof that this is appearance only is afforded by the existence of the superconducting state, and by the inability of quantum theory to completely explain this state.

It is telling that superconduction involves a transition that occurs as the limit of area temperature is approached.

Niels Bohr²¹ once said that new secrets awaited us in the fact of the zero point energy. He sensed that new physics would have to be developed in order to really understand it. One might have to agree with him, and propose that geometrodynamics is that new physics.

A gravitational resonance between ion cores and conduction electrons is the fundamental physical process by means of which the so called electron-phonon interaction known to quantum theorists causes the superconducting state of matter. Cooling a lattice removes thermal energy from the conduction electrons, until the T_C is reached, and the lattice transitions into a state within which the *spin* properties overdetermine the thermal properties. Thermal energy and entropy are secondary concepts. Space is the primary concept; as thermal energy is withdrawn from the electrons, their space contracts, thus their entropy state function approaches a minimum. Similarly, heating matter expands its space. Neither cooling nor heating affect the motion of "matter" in space, rather the state of empty space itself is what is modified. Except for a very few materials, nature establishes a positive coefficient of linear dimensions with temperature. H_2O is one material that has a discontinuity; it expands on freezing. There are a few others, and these too are significant in the biochemistry of nature. But these exceptions are not really exceptions to anything except an excessively abstract conception of temperature. Temperature is not primary-space is. The concept "allotropic" is used routinely to describe the change that occurs when H_2O structure freezes and expands. The standard argument is that the discontinuity allotropy is due to a more stable crystal geometry as compared to closest packing. The argument is specious. We don't want to admit that nature is *already* a quantum state on a large scale,