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TITLE:

KUSHI

Biological Transmutation

K18-KUS KUSHI, MICHIO --- BIOLOGICAL TRANSMUTATIONS -- This is the Taoist approach to transmutations with "low energies": classification of elements by yin/yang, m.p./b.p., density, color, &c.. Manufacture of Fe, Co & Ni from C & O.. Na + O = K, etc.. The Fugate of Carbon & Oxygen.. transmutations in air & water, bacteria & seeds.. Original lab notes with equipment diagrams! Bibliography, Resumees.. PRICE: $ 8.

MICHIO KUSHI
62 BUCKMINSTER ROAD
BROOKLINE MASSACHUSETTS 02146

[redacted]

October 12, 1980

Dear Mr.

I apologize for having delayed in answering your letter of August 20, 1980.

The transmutation of the atom can be achieved if elements are changed into the state of plasma, and if these elements are well understood, their antagonistic/complemenatary relations to other elements, according to the principles of yin and yang.

The atomic number, mass, density, and gravity, physical reaction to temperature such as melting and boiling points, chemical reactions to other elements, reactions to specific environmental factors, such as to ultraviolet infrared wavelengths applied to the elements, as well as spectroscopic color analysis - all of these characteristics of the atom can contribute to classify the atom into the yin group or yang group.

After George Ohsawa and myself succeeded in producing potassium out of sodium and oxygen, using a vacuum tube and two elements being used as antagonistic/complementary poles, with a minor current of electricity, we presented the experiment to several chemical corporation. At that time, Pfizer International became most actively interested. We had conferences on several occasions, however, soon after, we decided not to become involved with these corporations, as a result of the consideration of the vast effects this would have on the industry.

Thereafter, we continued in our own experiments, a succeeded also to produce iron out of carbon and oxygen. Other series of experiments also proved that precious metals such as platinum and gold can be produced.

In the meantime, experiments were confirming biological transmutation in plants and microorganisms.

I feel that the time is approaching to develop more these small scale experiments towards experiments which aim at finding the methods of mass production. During the 1980s, this will be one of my research subjects. At that time, I shall be able to consider how to present to the world the transmutation of the atom using the principles of yin and yang, for the future world industry.

Very sincerely yours,

Michio Kushi

MK:akr

1. the transmutation from Na (Sodium) to K (Potassium):

The applied formula: $^{23}_{11}Na + {}^{16}_{8}O - {}^{39}_{19}K$

George Ohsawa and Masashiro Torii, professor of the Musashino Institute of Technology, with several scientists, have achieved the transmutation of the atom from Na to K by the following method, first achieved on June 21, 1964.

In this experiment, one electric discharge vacuum tube with two poles was used. The length of the vacuum tube is 20 cm and the diameter 2 cm. Electric poles of several different metals were tested. The power of electricity used in this experiment was 60 watts.

First 2.3 mg of Na was inserted and sealled in the vacuum tube, and electricity was started running through the tube. About 30 minutes later. 1.6 mg of O was introduced, and a second later, Na changed into K.

This result was examined carefully by authoritative testing agencies and the same experiments were performed repeatedly, yielding the same successful result.

2. The Production of Fe (Iron) from C (Carbon) and O (OXygen)

The applied formula: $2\,{}^{12}_{6}C + 2\,{}^{16}_{8}O \rightarrow (2\,{}^{28}_{14}Si) + {}^{56}_{28}Ni \rightarrow {}^{56}_{26}Fe$

George Oshawa and his associates in Japan succeeded in their experiments with several methods to produce Fe from C and O. Later French scientists tested similar methods and confirmed the success of the transmutation. After creating the method to achieve the most efficient possible transmutation, they filed patents accordingly. The following examples show only a few methods to accomplish the transmutation from C and O to Fe:

Method 1: Transmutation in Air (A)

Two graphite crucibles (appx. 2.5" x 5" to 6 " cover each other top and bottom. The upper crucible has a 10mm hole, surrounded by a ceramic ring. The ceramic ring acts as an insulator. Into this hole, a carbon rod (0.25" diameter) until it reaches to the carbon powder (2 to 3 grams) placed at the inside bottom of the lower crucible, is inserted. The lower crucible has one or two small holes at the lower part of its side wall for the air circulation. An iron base placed under the lower crucible acts as one electric pole. The carbon rod acts as another electric pole. as the carbon rod approaches the carbon powder, the electric arc arises. Continuing the operation for 20 to 30 min. the carbon powder changes to Fe.

In this experiment, the applied electricity is about 35 to 50 volts, and 8 to 18 amps, either A.C. or D.C.

Method 2: Transmutation in Water.

Using two carbon rods (0.25" diameter), create an electric arc between them, by striking them on one another in water. This operation is performed for 1 to 5 seconds. Then, brown-black metallic powder falls down to the bottom of the water, which contains Fe.

The applied electricity is the same as in Method 1.

Method 3: Transmutation in Air: (B)

Carbon powder is placed on a copper plate, approximately 12" long, 6" wide, and 0.5" thick. This plate works as an electrical ground. A carbon rod (identical to the carbon rods used in methods 1 and 2) as another electrical pole, strikes repeatedly the carbon powder on the plate, producing an electric arc. The carbon powder changes into Fe.

The applied electricity is the same as in the former methods.

During the process of the above transmutation, Ni (Nickel) is temperorarily produced. But it disappears very soon, for it is an isotope with a radio-active nature. The life of an Ni isotope is considered approximately 1/1000th of a second.

In these experiments, the degree of transmutation from C and O to Fe is approximately 5% to 20% immediately, with a larger percent of transmutation occuring gradually in the air, which has the effect of cooling the metallic powder to below room temperature.

The Fe which is produced by this transmutation is stainless. It does not rust easily. It has also much less reaction to heat than ordinary iron, due to its composition of 2 Si (silicon) as the formula indicates. This iron was named G.O.S. (George Ohsawa Steel), given the initials of George Ohsawa by the scientists who worked with this transmutation.

All results of the transmutation for Fe have been carefully examined and analysed by several methods as (1) magnetic inspection, (2) spectroscopic analysis, (3) chemical analysis,)4) examination by reagent, etc. confirmed by authoritative testing agencies.

(3) Biological Transmutation of the Atom:

George Ohsawa has guided Sanchide Komaki who is the professor of biology, Mukogawa University, Kyoto Japan, and has accomplsihed several methods of the transmutation of the atom through biological cells, using bacteria or microorganisms. Among these transmutations, some applications are creating amazing results which shall become great benefits for mankind. Similar experiments have been made in France by Louis Kervran and other scientists, which are also producing notable results. Some examples simply outlined are as follows:

* Ff m. w/ CO_2

G.O. of Sanchide Komaki, prof biol.,
Mukogawa U., Kyoto Jap.

A. The experiments with bacteria and microbes:

The ferment of beer, black mold, or a similar microbe, which has been cultivated without K (Potassium), grows and increase, first slowly but later rapidly, producing K within itself, by the transmutation from other elements. With a method applying this principle, K. grows, increasingup to 100 times in quantity after only 3 days; 10.000 times after only 6 days; 10^{20} times after only 30 days, and so on. This is the method to produce and supply the total quantity of K which the entire world needs for agricultural and industrial uses.

Similar productivity was achieved when "S. Cerevisae dried microbe" was cultivated at the non-K land. According to the figuring based upon the realistic and scientific cultivation, a land space of about 2.000 acres, having the proper storage and facilities , can produce 200.000 tons of K, and 20,000,000 tons of high quality of protein every year. The above amount of K becomes 240,000 tons of potassium fertilizer (K^2O). and the amount of protein is equivalent to 50,000,000 tons of beef. These amounts will supply an ample quantity of protein and potassium as the essential food supply for the entire society of mankind. (The detailed information concerning the above methods will be soon introduced in the academic report of the Biochemical Society, Paris, France.)

B. The experiments with vegetable seeds:

Vegetable seeds as buckwheat, soy beans, peas, and others, which have been cultivated in twice distilled, purified water, began to grow gradually but in perfect condition, with all elements with the seeds increased one hundred to several hundred times in 30 days.

This demonstrates that all biological life is transmuting within itself elements suitable for its specific needs. These biological transmutations are going on within the plants at atmospheric pressure, temperature, and with normal solar energy.

5. Conclusion:

The above report gives only a simple glance at the problem relating to the transmutation of the atom. The purpose of this report is to give a basic understanding of the facts and possibilities of atomic transmutation with low temperature, low pressure, and low energy. In accordance with the analysis report from Japan, it is confirmed that more than 35 elements such as Si, Al, Ca, Mg, No, Ni, Na, K, Pt, Hg, Au, and so forth, can be produced from the light elements (atomic numbers 1 through 8). The efficiency of production is depending on further technological and engineering studies.

The Japanese scientists working on atomic transmutation are as follows:

George Ohsawa	Philosopher, writer, honorary professor of Nippon University, honorary citizen of Paris, founder and president of Institut des Hautes Etudes Dialectiques et Scientifiques, Tokyo.
Masashiro Torii	Doctor in Chemistry. Professor of Musashino Institute of Technology, Tokyo.
Shizuko Washio	Doctor in biology. Professor of Atomi Institute Tokyo.
Sanehide Komaki	Doctor in agriculture. Professor of Mukogawa University, Kyoto.
Chikao Narita	Doctor in Medicine. President of Tokyo Shibaura Hospital, Tokyo
Yuzura Sasaki	Research member of Institut des Hautes Etudes Dialectiques at Scientifiques, Tokyo
Noboru Yamamoto	Research member of Institut des Hautes Etudes Dialectiques et Scientifiques, Tokyo.

At the present time, five universities and two other chemists are also cooperating in the study and experiments.

In France, about 30 members have organized a research group for the transmutation of the atom, including scientists, scholars, businessmen, and students.

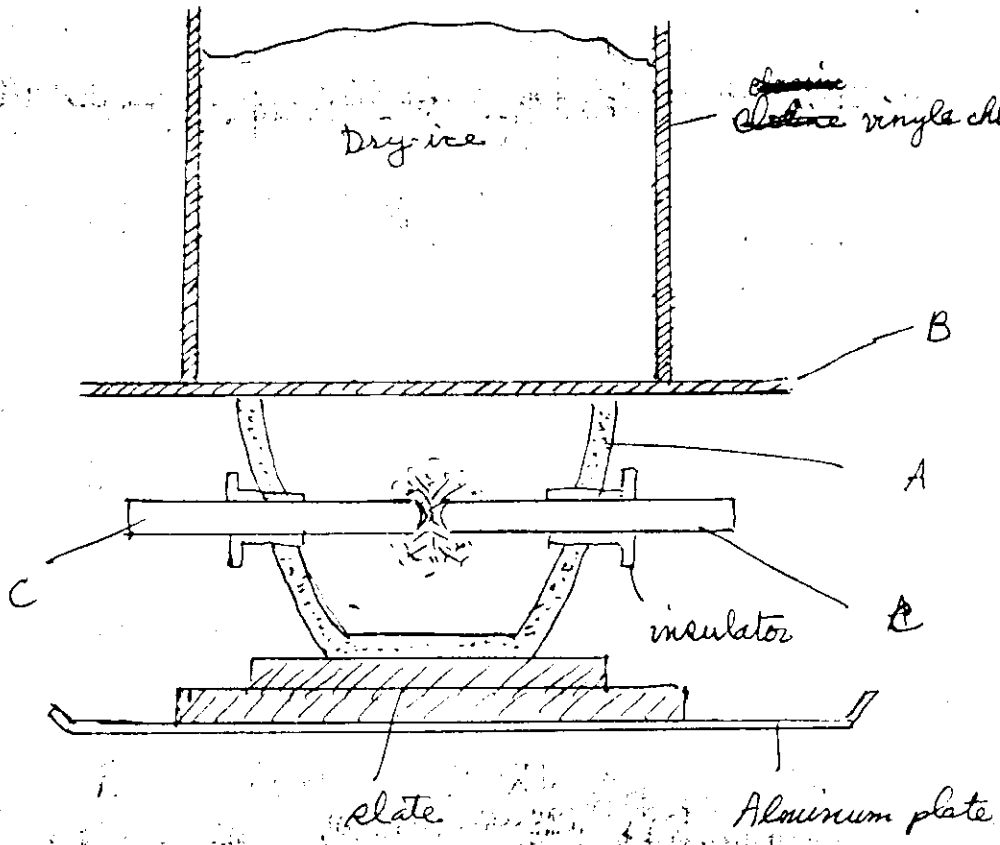
In the United States, Michio Kushi and East West Institute, 101 Walden Street, Cambridge, Massachusetts, are representing information concerning the transmutation of the atom.

March 1965

An experiment Transmuting ~~making~~ Fe from carbon + oxygen

C No. 65002 Feb. 5 '65

An Experiment
without using metals



Exp. 1. A ~~red~~ ~~carbide~~ porcelain carbon crucible, B – slate
C – pure carbon bar 30–50V 18–22 Am. 17 min.
Slate contains Fe, Better not to use this method.

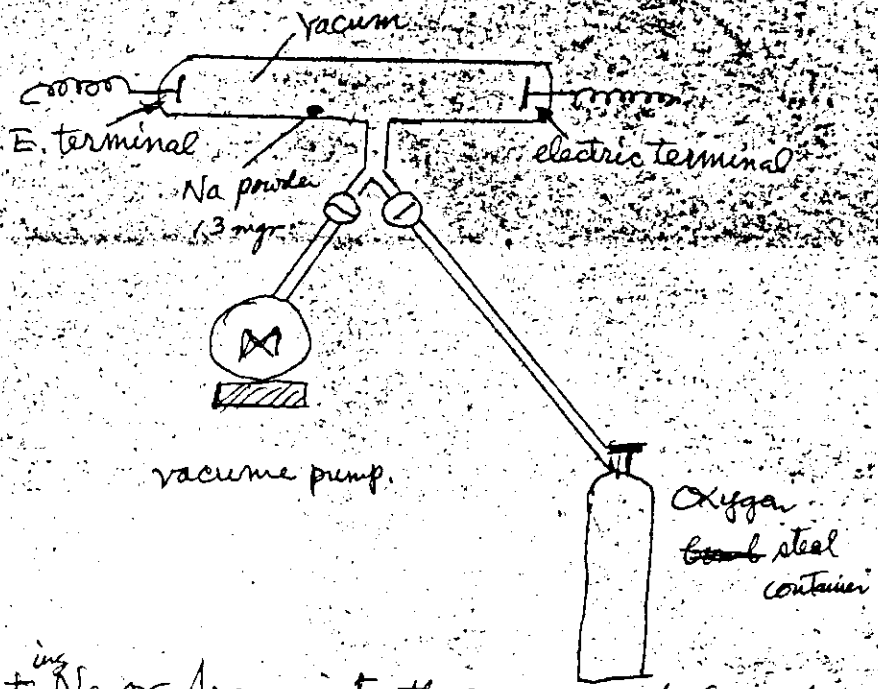
Exp. 2. A – plant pot B asbesto screen
C – pure carbon 40V 21 Am. 15 min.
Makes good arc.

Exp. 3. A – plaster crucible B – asbesto screen
C – pure carbon 40V 26 Am. 15 min.

Problems Fe in the ~~crucible~~ porcelain, slate, plaster, & dryice

An Experiment of transmutation Na to K from

1.3 mgr. Na + 0.8 mgr. O = 2.1 mgr. K



★ ☐ Put Ne or Argon into the vacume tube, increase conductivity and get faster result.

★ ☐ Heat up Na from outside, ionize Na faster.

★ ☐ Size of vacume tube 15~20 m.m dia. × 20 Cm length

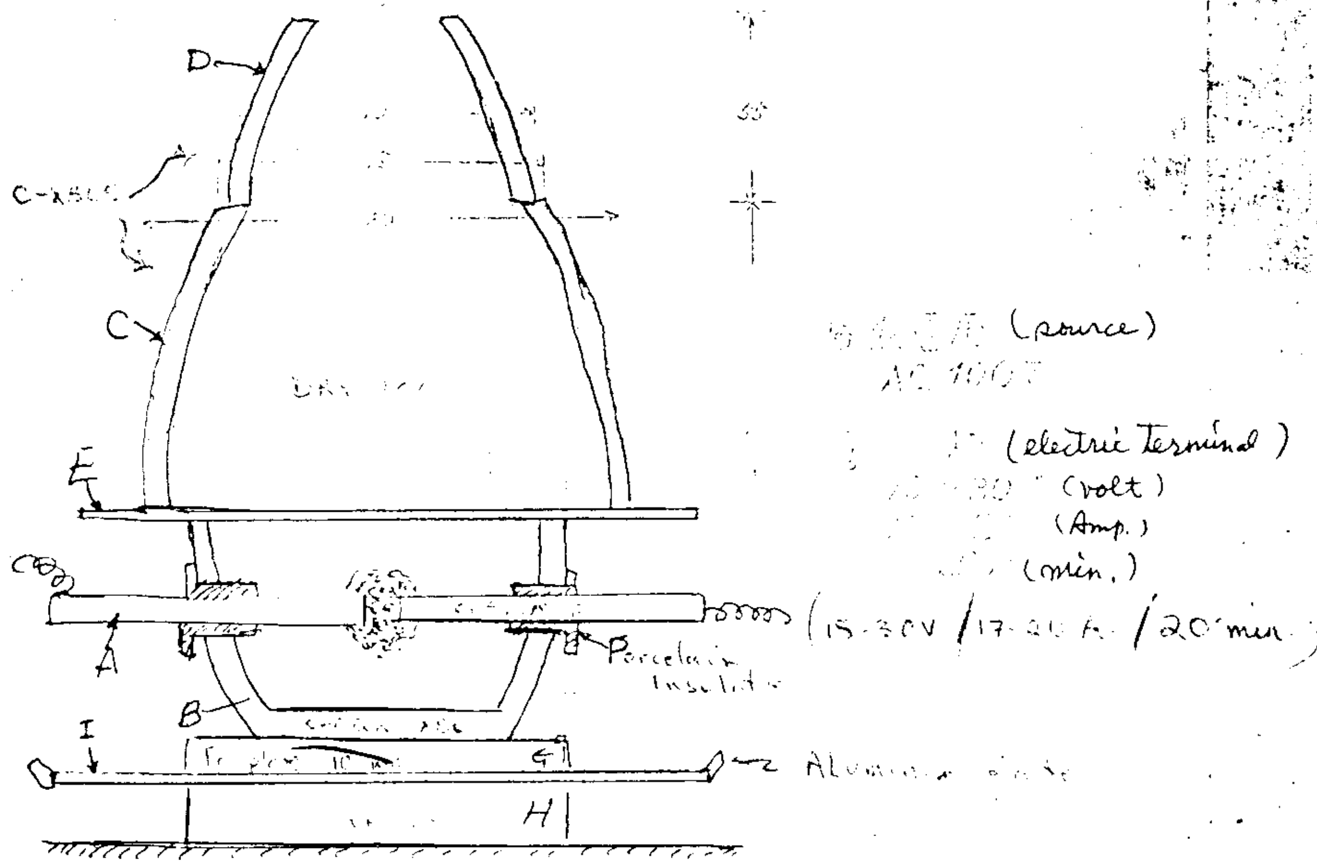
☐ Can use third electric terminal to help heat up.

☐ Make electric coil around vacume tube is O.K. (Heating)

No date but should be around the beginning of 1964.

No.65001 An experiment of Transmutation of Fe ~~from~~ from with Carbon plus Oxygen

Feb. 5 '65



A. pure carbon rod.

B. carbon crucible #1/2

C. carbon crucible #2

D. carbon crucible #1

E. iron plate, alminum plate, steel plate. There are 25 Holes (which are 4 m/m φ)

F. Porcelain insulator

G. Iron plate (10m/m thickness)

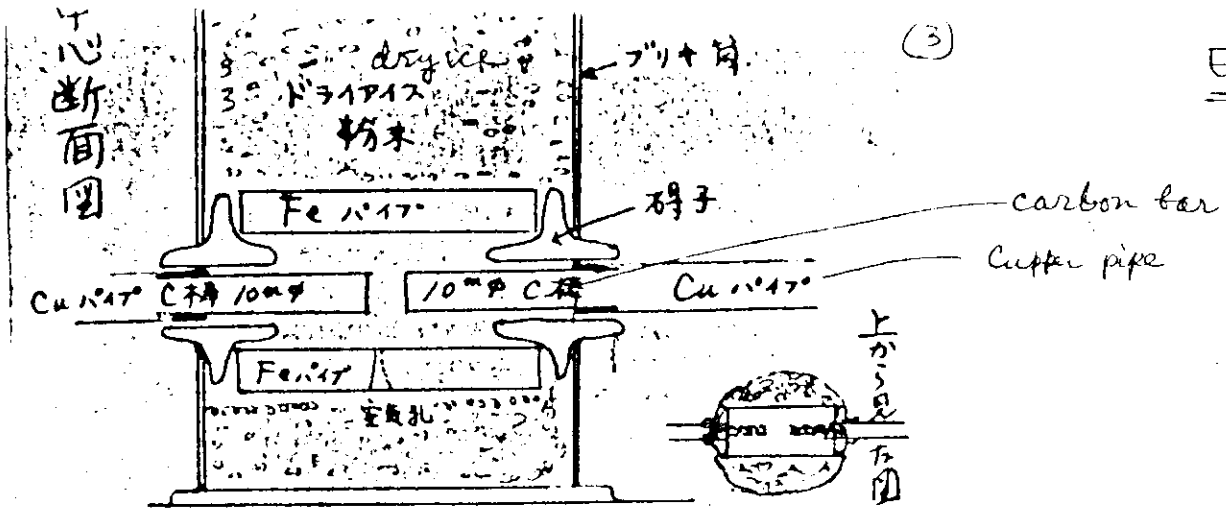
H. bricks

I. Alminum plate

dryice

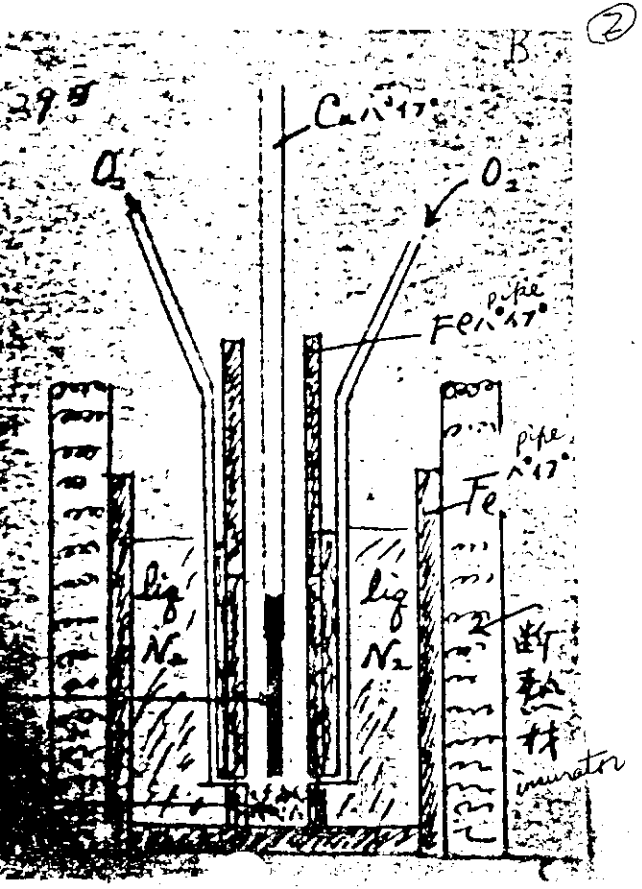
Experiments transmuting making Fe from carbon plus oxygen

(3)

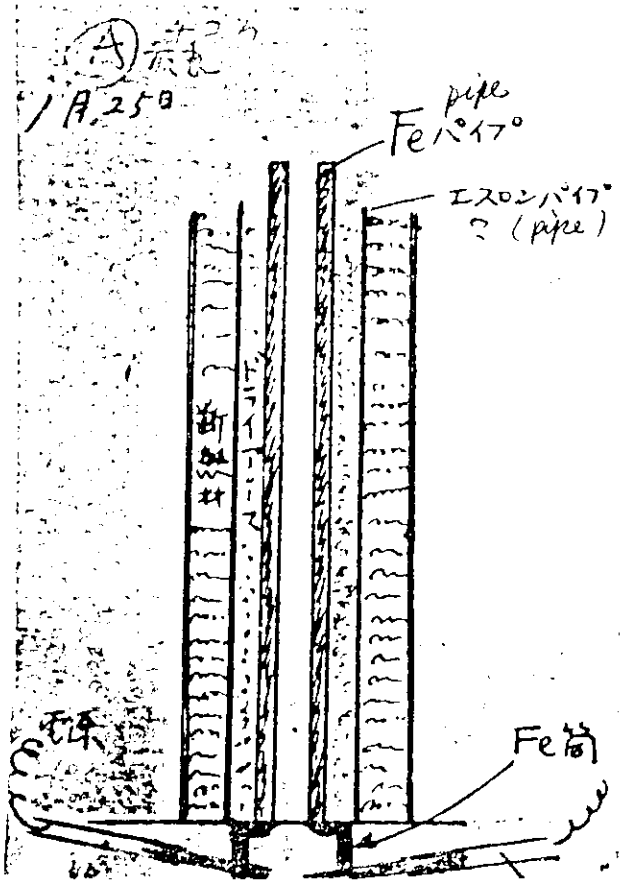


(c) 2月10日, 5日の実験図

(2)



(1)



Experiment

1. Build an instrument as shown in picture. Crash dry ice and put into the crucible. Make electric spark between two carbon rods.
2. Source electricity AC 100 V ~ 120 V
   terminal 15-30 volt 17-20 Amp. 20 min
3. Add dry-ice time to time, for cooling. Keep temp of inside crucib -20°C during arc.
4. accumulate pieces dropped in the crucible, on the con plate etc, after electric
5. Do manetic test for above particles.

Problems.

1. Fe from carbon bars. It is impossible to get 100% pure carbon bar,
2. Fe from carbon crucible
3. Fe from iron plate, aluminum plate, copper plate
4. Fe from dry-ice. Dry-ice
5. Fe from insulators (porcelain).

(1)

RESUME

NAME: Michio Kushi

DATE OF BIRTH: May 17, 1926

PLACE OF BIRTH: Kokawa, Wakayama-ken, Japan

FATHER: Keizo Kushi; Last occupation: Professor at Akita University

MOTHER: Teru Kushi; Last occupation: Council member of Tokyo Probate Court

EDUCATION:
Akita High School, graduated 1943;
Yamagata University, Department of Literature, graduated 1945;
Tokyo University, Department of Political Science, Faculty of Law, graduated 1948;
Tokyo University, Faculty of Law, completed Graduate Course after the visit to U.S.A.; 1950;

RESEARCH WORK:
Columbia University Graduate Course, Faculty of Political Science, 1950-51
Visited England, France, and Belgium for Research 1952-53;
Completed Graduate Course Research for Faculty of Law, 1953;

EXPERIENCE:
Served for United States Government State Department and Pentagon as temporary interpretor for Japanese language during study period in Columbia University
Organized and established or participated in the establishment of several Japanese gift stores (Azuma, Inc., Ginza, Inc., Kabuki, Inc., Takashimaya, Inc., Nippon Service, Inc., and Genpei Restaurant, Inc.) and enterprises in New York - 1954-64;
Acted as the agent and representative in New York for Japanese Manufacturing Companies (Renown Shoji, Company, Ltd.; Toko Nylon Company, Ltd.) 1954-64;

EDUCATIONAL ACTIVITIES:
Lectured in New York on Oriental Philosophy, Culture and Way of Life, 1954-64, weekly;

1965 - Moved to Boston and established an educational organization for Oriental Philosophy, Culture, Oriental Medicine, and the Macrobiotic Way of Life. Presentations were made in Harvard University, Cambridge, Wellsley, Brookline, and Boston, Massachusetts, and other areas;

BUSINESS ACTIVITY:
Organized and established in Boston and Los Angeles the following enterprises:

1. Erewhon, Inc. - 1966
2. Sanae Restaurant, Inc. - 1968
3. The Order of the Universe Magazine - 1967
4. The East West Journal - 1971

EDUCATIONAL DEVELOPMENT:
1973: Founded and became president of the East West Foundation, a non-profit educational organization for the teaching and spreading of all aspects of Macrobiotic Way of Life, Oriental Philosophy, Culture, Oriental Medicine, and various traditional arts;

EDUCATIONAL DEVELOPMENT

1975 - The first annual Amherst College Summer Residential Program, sponsored by the East West Foundation, and held every year thereafter;
1978, September - Opening of the Kushi Institute, for the purpose of developing and training students to become teachers;
1977-79: Appearances on the Harvard School of Public Health television, for area medical schools and universities;

SPECIAL PROJECTS:

1974 - Ashburnham Land Project, Massachusetts;
1977 - Establishment of the International Medical-Scientific Advisory Board of the East West Foundation, to be continued every year thereafter;
1978 - First European Congress of Macrobiotics, held in London England, to be held in varying locations every year thereafter;
1979 - First North American Congress of Macrobiotics, held in Boston, Massachusetts, to be held every year thereafter;

1977, December - First Cancer Conference, held in Pine Manor Junior College, Chestnut Hill, Massachusetts, to be held every year thereafter;
1978, August - Second Cancer Conference, Amherst, MA;
1979, August - Third Cancer Conference, Boston, MA;

1979 - Establishment of Erewhon Miso Company, North Carolina.

KUSHI INTERNATIONAL SEMINARS:

May and June, 1974	The Far East, Japan, and Taiwan
June, 1975	London, England; Paris, France
August, 1975	Amherst College Summer Residential Program
October, 1975	Amsterdam, Holland; Lisbon, Portugal; Rome and Milan, Italy, Ghent, Belgium; Paris, France
March, 1976	Miami, Florida; Caracas, Venezuela
April-May, 1976	Bologna, Italy; Paris, France; Ghent, Belgium; Barcelona, Spain; Madrid, Spain; Lisbon, Portugal
July, 1976	London, England; Paris and Entrevaux, France; Amsterdam, Holland;
August, 1976	Amherst College Summer Residential Program
October, 1976	Barcelona, Spain; Lisbon, Portugal; Rome, Italy; Ghent, Belgium; London, England
November, 1976	Vancouver, British Columbia: World Symposium on Humanity
February, 1977	Costa Rica; Rio de Janeiro, Brazil; Sao Paulo, Brazil; Miami, Florida; Caracas, Venezuela

MICHIO KUSHI, Resume, cont'd -

KUSHI INTERNATIONAL SEMINARS

April, 1977	Establishment of the International Medical-Scientific Advisory Board of the East West Foundation
June, 1977	Gstaad, Switzerland; South of France; Lisbon, Portugal; Amsterdam, Holland
August, 1977	Amherst College Summer Residential Program
September, 1977	Washington, D.C. - White House - Seminar on Food Policy Recommendations for the United States
November, 1977	Paris, France; Amsterdam, Holland; London, England
December, 1977	First Cancer Conference, Pine Manor Junior College, MA
February, 1978	New York, United Nations Lecture:"One Peaceful World Through Macrobiotics"
July, 1978	Gstaad, Switzerland; Woumen, Belgium; Bologna, Italy; Lisbon, Portugal; London, England
August, 1978	Amherst Summer Residential Program, Amherst College and Cancer Conference
November, 1978	European Tour with Gloria Swanson and William Dufty: Barcelona, Spain; Paris, France; Veurne and Ghent, Belgium - Macrobiotic and Natural Food Fair; London, England: First European Congress of Macrobiotics; Dublin, Ireland
February, 1979	New York, United Nations Seminar and Public Lectures
March, 1979	Munich, Germany; Antwerp and Ghent, Belgium; Amsterdam, Holland; London, England
April, 1979	Toronto, Ontario - World Symposium on Humanity and Public Lectures
May, 1979	Visit to Japan, with Gloria Swanson and William Dufty
July, 1979	Lausanne, Switzerland: International Macrobiotic Summer-camp; Barcelona, Spain; Porto and Lisbon, Portugal
August, 1979	Massachusetts: Amherst College Summer Residential Program, Amherst, MA; Third Annual Cancer Conference and First North American Congress of Macrobiotics, Boston, MA
October, 1979	Antwerp, Belgium: Second European Congress of Macrobiotics; Ghent, Belgium: Macrobiotic and Natural Food Fair; London, England; Florence, Italy; Paris, France

FORTHCOMING:

1980: Visit to Central and South America; Australia; and South Africa;
Future Plans:
Central American Congress of Macrobiotics
South American Congress of Macrobiotics
Far Eastern Congress of Macrobiotics
World Congress of Macrobiotics

- In addition, throughout this time, Michio Kushi has been visiting and giving seminars in many cities in the United States, including Los Angeles, San Francisco, New York, Miami, Philadelphia, Washington, D.C., Tucson, Dallas, Boulder, Minneapolis, Ann Arbor, Seattle, Detroit, Key West, Baltimore, Atlanta, Chicago, and other major cities, as well as several areas in Canada, including Vancouver, Toronto and Montreal;

- Since 1950 up to the present time, Mr. Kushi has been consulting many thousands of people on the way of life to reconstruct their health, freedom and happiness, towards the development of humanity.

PUBLICATIONS BY MICHIO KUSHI

(5.)

The Teachings of Michio Kushi, Volumes 1,2, and 3; Published by the East West Foundation; 1970 through 1977;

The Book of Macrobiotics: The Universal Way of Health and Happiness, 1977, published by Japan Publications, Inc.;

The Macrobiotic Way of Natural Healing, with Robert S. Mendelsohn, M.D.: 1978 originally published by the East West Foundation;

The Book of Do-In: Exercises for Physical and Spiritual Development, 1978; published by Japan Publications, Inc.;

Visions of a New World, Volume 1: The Era of Humanity, 1979, publised by the East West Journal;

Oriental Diagnosis, 1978, published by Red Moon Publications, London England;

How to See Your Health: The Book of Diagnosis, 1980, Kodansha International, U.S.A./Ltd.;

A Dietary Approach to Cancer, 1977, Published by the East West Foundation;

Nutritional Approach to Cancer - Conference Report - I, II, and III, 1977-79, published by the East West Foundation;

Food Policy Recommendations for the United States, 1977, Published by the East West Foundation;

Macrobiotics: Experience the Miracle of Life; 1978, published by the East West Foundation;

Macrobiotic Case Histories: 1974 to Present time, published by the East West Foundation;

Order of the Universe Magazine, since 1967, originally published by the East West Foundation, presently published by the Order of the Universe Publications;

Seminar Reports, Reports of lectures and seminars by Michio Kushi, since 1973, published by the East West Foundation;

Natural Agriculture and the Cause and Cure of Disease, 1973, published by Tao Books and Publications;

Acupuncture and Ancient and Future Worlds, published by the East West Foundation, 1975;

Food For Spiritual Development, 1968, published by Order of the Universe magazine.

- In addition, several books have been printed in other languages, and many additional books have been written from lectures and seminars of Michio Kushi given in European countries, Japan, and South America.

- The Book of Macrobiotics is now being published in Braille, by the Iowa Commission for the Blind.

EAST-WEST J. p 15

Feb '75

EXPLORING THE MYTH OF IMMUTABLE ELEMENTS

By Bruce Gardiner

The movement of life procedes from the constant changing of one element into another. This is transmutation. To the educated, scientific mind, transmutation is a startling impossibility, but for a "simple" mind, it is almost self-evident truth.

Some 2500 years ago, Buddha proclaimed that "even the tiniest aggregates (of matter) are without essence." We might translate his pronouncement into modern jargon by saying that atoms have no permanent identity, and that they may change or trasmutate themselves. In the 20th century French scientist Louis Kervan has corroborated this view in his *magnum opus, Biological Transmutation* (translated by Michel Abehsera, Swan House Publishing Company, 1972). Before these two men there have been countless alchemists, both oriental and Occidental who have held that metals could be transmuted. The search for the philospher's stone, by which gold could be made from lead, is one example. Unfortunately the timeless science of alchemy has been laughed away by its adolescent son, chemistry.

Dr. Kervran is a scientist of tireless curiosity. Throughout his life time he has compiled literally hundreds of examples of phenomena explainable only by the transmutation of one element into another. For example he observed that workers in the Sahara desert ingested more sodium than they excreted, and oddly enough their level of potassium excretion increased simutaneously. After much puzzling, the only answer was transmutation of sodium into potassium.

In the presence of high desert temperatures and hard labor, this transmutation is catalyzed by aldesterone, the adrenal hormone which regulates the balance of salts within the bloodstream.

After years of study Kervran summarized his conclusions....

This research has permitted me to verify:

1) that the vital phenomenon is not of a chemical order; it goes deeply into the atom, starting with the nucleus. Organic Chemistry is on the final stage of molecular arrangement.

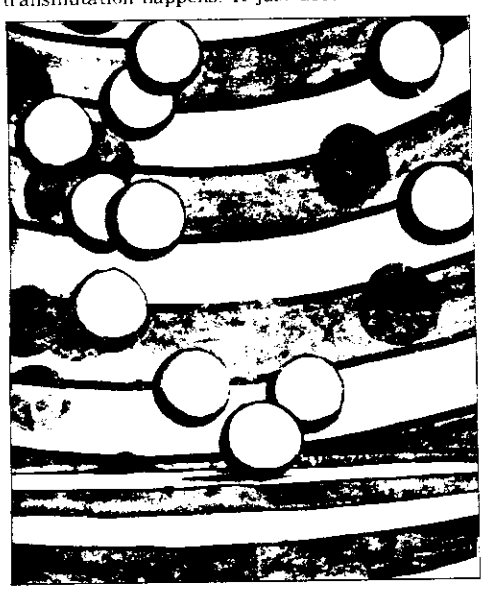
2) that the nucleus of the atom in light elements is quite different from what nuclear physics regards as the average type, the latter having value only for the heavy elements.

3) that Nature moves particles from one nucleus to another - particles such as hydrogen and oxygen and, in some cases, the nuclei of carbon and lithium. There is thus transmutation.

4) that biological transmutation is a phenomenon completely different from the atomic fissions or fusions of physics and it reveals a property of matter not yet recognized.

These conclusions fly right in the face of the acepted theories of quantum mechanics and nuclear physics. The latter science of "probability" hpyothesizes that the atom is a "constant" building block of the universe, created at the dawn of the material universe. Atoms change into other atoms only during fusion or fission. Fission is the natural process of nuclear decay in unstable radioactive elements; this radioactive energy has been tapped in nuclear reactors and atomic bombs. Fusion has not been demonstrated in the laboratory, for this process only occurs at extremely high temperatures and pressures. The change from hydrogen into helium in the sun is an example of fusion.During this reaction, a portion of the matter involved is changed into energy, which is emitted as heat and light.

Nuclear physics teaches that transmutation is impossible. As, two atoms approach their + charged nuclei they are supposed to repel one another, unless there is extremely high temperature and pressure to force them together. That sounds reasonable enough were it not for the countless anomalies that abound in nature. Dr. Kervran has unearthed many of these in the course of his work. He offered no explanation of how transmutation happens. It just does.



The Kitchen Laboratory

In my own kitchen, we have made *iron* from pure *carbon*, using only a transformer, a copper dish, graphite rod, carbon powder, and house electric current.

The schematic diagram shows the arrangement of the materials. To perform the experiment, pass 20V through the wires that connect to the copper dish and the graphite. Use the graphite rod to spark the dish that contains the carbon. After ten to twenty minutes, some of the carbon dust will respond to the magnet, indicating the presence of iron. You can easily confirm the results through laboratory analysis.

The transmutation reaction here is

$$2({}_{6}C^{12} + {}_{8}O^{16}) = {}_{28}{}^{56}\left\{\begin{matrix}{}_{26}Fe^{56}\\ {}_{27}Co^{59}\\ {}_{28}Ni^{58}\end{matrix}\right.$$

The Ego and Science

The myth of immutable elements arises from an egocentric attitude. One mistakes his small body-self, revealed to him by the senses, for his real Self. To realize one's true Self, on the other hand, frees one from the shackles of senses and provides the mystic's experience of cosmic consciousness.

As long as a man harbours egocentricity, his whole view of life will be tainted with the ego's subjectivity, so that he projects ego or permanent selfhood into all he perceives. The theory that an atom of a given element does not and cannot change is just one example of egoistic science.Others are the binding force of the atom, the idea that all matter contains the pulling power we call gravity, that the planets were formed from the sun. In each case the egocentric perceiver looks toward the center of the phenomea for causes , but never sees the original cause.

Fortunately, the course of science and civilization mediates against ego-oriented hypothesis.Newtonian mechanics became outmoded and Einstein's theory of Relativity took its place, as science began to deal with high velocity phenomena. Neils Bohr's rigidified model of the atom has been slowly broken down to the probabiltiy theories of quantum mechanics. In the same way the "stagnant" theory of the atom will soon enough give way to the "changing" theory. Which means that soon enough the scientific community will echo the ancient teaching that "everything changes", expressed by Buddha and countless forgotten sages before him.

PERIODIC CHART OF THE ELEMENTS

IA	IIA	IIIB	IVB	VB	VIB	VIIB	VIIIB			IB	IIB	IIIA	IVA	VA	VIA	VIIA	Noble Gases
1 H 1.00797																	2 He 4.0026
3 Li 6.939	4 Be 9.0122											5 B 10.811	6 C 12.01115	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.183
11 Na 22.9898	12 Mg 24.312											13 Al 26.9815	14 Si 28.086	15 P 30.9738	16 S 32.064	17 Cl 35.453	18 Ar 39.948
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.9216	34 Se 78.96	35 Br 79.909	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc (99)	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.9044	54 Xe 131.30
55 Cs 132.905	56 Ba 137.34	57 *La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.980	84 Po (210)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	89 †Ac (227)															

*Lanthanum Series	58 Ce 140.12	59 Pr 140.907	60 Nd 144.24	61 Pm (145)	62 Sm 150.35	63 Eu 151.96	64 Gd 157.25	65 Tb 158.924	66 Dy 162.50	67 Ho 164.930	68 Er 167.26	69 Tm 168.934	70 Yb 173.04	71 Lu 174.97
†Actinium Series	90 Th 232.038	91 Pa (231)	92 U 238.03	93 Np (237)	94 Pu (242)	95 Am (243)	96 Cm (247)	97 Bk (249)	98 Cf (251)	99 Es (254)	100 Fm (253)	101 Md (256)	102 No (253)	103 Lw (257)

The Industry of Love

The following article debuts our new column on alternative science. It is based on three lectures given by Michio Kushi at the Noh Center in Boston during January. In this month's column, Mr. Kushi discusses alchemy. Next month we will print the continuation of his article as he examines alternative energy sources.

by Michio Kushi

THE SIZE OF SPACE

The December 30 issue of *Time Magazine* featured an article in its "Science" section about a new theory of the universe. Two American astronomers, Sandage and Gunn, had calculated the density of matter in outer space and decided that the universe will continue to expand without end. The article concluded with these words: "Gunn finds the implications of an open universe thoroughly mind-boggling and paradoxical. Even though the density of its mass is small," he explains, "the total amount of mass is infinite because space is infinitely big." Sandage agrees. "This expansion is such a strange conclusion," he says. "One's first assumption is that it cannot really be true, and yet it is a premier fact."

What do you think of that? The two astronomers say space is infinite.

Will the expansion of the universe continue endlessly as they maintain or will it perhaps be balanced by a phase of contraction, as some previous theories claimed?

The universe is supposed to have begun to expand after a "big bang" when all the matter now in the universe exploded from a tremendously concentrated mass. No one, so far, has explained the origin of that mass. The big bang is like the mythical turtle on which the world was said to rest—just there as something to start from for lack of anything better.

How can one find his way through the labyrinth of science? Seeing the false leads scattered through the article in *Time* resembles the copying game printed in Sunday newspapers: "Find the 50 things wrong with this picture." Can we cut through all those details with a basic clue to rescue us from our confusion in the face of experts?

Modern civilization is built on science. Our ecological and economic problems are inseparable from that foundation, and there is no way to flee those problems. To solve the current crises, we have to create a truly natural technology which can properly meet the needs that science has served at such a terrible cost to the human and natural environment. The obvious clue, the secret everyone knows, crops up in the last sentence of the *Time* article: "One's first assumption is that it cannot really be true...." The compass to freedom is our intuition, our innate sense of natural balance, our common sense, "one's first assumption."

The technology responsible for the current ecological crisis is the product of specialists, that is people who have become professionals by concentrating on the part and ignoring the whole. A fully natural technology will be free of expertise, with the long years of artificial schooling and the vast investment of money which a complex technocracy requires. It must be simple and available to all. The basis for creating one peaceful world is just common sense.

Now, is space infinite? Can something physical really be infinite, that is to say endless, an absolute? Physical space with the matter it enfolds is the relative, not the absolute world, because all our observations of the physical world are relative. Space and time exist *within* the absolute. The only absolute, infinite and endless, is change. No matter how large or how small a portion of the universe is selected, the one characteristic always present is change. The slower our speed, the more space and time enter into consideration. At infinite speed, in the absolute realm, space disappears and so does time. The material world with which science deals is a relative eddy, a small island within the ocean of infinity.

THE SPIRAL IN THE VOID

The form of creation is mirrored wherever we look in the natural world—the whorls in our own fingertips, the spiral mounting of branches on a tree, the cyclone vortex of cloud patterns photographed by weather satellites, and the whirling arms of our galaxy. The spiral of creation looks something like this: (See Fig. 1)

The world which a materialistic science can deal with first appears in the transition from wave energy to sub-atomic particles. It is a minute point within that panoramic wholeness which opens to our view when we use our premier intuition.

Taking the relative for the absolute—as the astronomers do in calling space infinite—is the basic error of materialism. But our common sense insists that every short-term profit is balanced by a long-term loss, for the principle of balance (which traditional Chinese philosophy called yin and yang) orders the entire relative world. Yin produces yang and yang leads to yin, perpetually creating the balance of the whole.

NATURAL EDUCATION AT LAST

We must educate ourselves in a quite different sequence from that which we followed at school while learning to become future experts. Our reeducation contains two degrees—learning and application, or receiving and giving—with four stages following the mastery of each degree in two areas, the mental and the physical.

I:

A) Psychological freedom, or self-mastery

B) Physical freedom or health and longevity

II:

C) Freeing others, by teaching or personal example

D) Natural technology, or alchemy

In order to master D, we must pass through A, B, and C. The first class (A) is the most difficult. It is the goal of traditional and modern paths toward detachment, whether in a secular context such as EST, or a religious context, such as the study of spiritual techniques. Many of us are now keenly interested in stage A because modern education blocked our childlike intuition and stifled our basic sanity. We must laboriously de-brainwash ourselves from the artificial concepts we have been stuffed with since infancy.

We still struggle with A, the elementary school of life, because we failed to grow up, and we failed to

grow up any sooner because we didn't have to. We were thoroughly spoiled by a civilization of short-term prosperity that managed to shield us from reality.

Bred in the escapist habits which are produced by that kind of education, we would like to flee from the material world into spirituality as an escape from mundane matters. If we had been born in poverty, we would be much less likely to act so superior about our particular trip.

The spiritual world and the material world are two poles of a continuous spectrum: dream and reality, the yin circumference and the yang center of creation. The goal of enlightenment is not to isolate ourselves from the material world in a general retreat backward along the spiral of evolution. The goal of enlightenment is to live as a free being in the world of ordinary, daily reality. As we outgrow our escapist habits, we begin to study B, a concern of many young people now involved in the natural food movement, macrobiotics, organic farming, etc.

Our ecological and economic crisis is the price for having flouted the common sense of humanity. Until quite recent times, people took only of the earth's excess. For example, the abundant growth of trees was used to make charcoal for heating. Humanity lived off our planet's natural growth as interest, without ever touching our capital. Modern civilization, however, depends on living off our capital. Our prosperity is a false prosperity which can be buoyed up only so long by artificial expedients before collapsing. The present crisis really started 200 years ago with the industrial revolution, when (for a number of reasons which we can pursue in another lecture series on history) people began ignoring the lessons of inevitable balance that must be mastered on level A. Something went wrong with our intuitive judgment. The current spiritual quest is an effort to recover that basic judgment of a free human being at one with the larger environment.

The earth is our mother, our only material origin. If we consume that, from which it has sprung.

In high school we were taught that the three fundamental particles in an atom are the electron, the proton, and the neutron. The electron was pictured as a minute speck circling around the central clump of larger particles, the protons and the neutrons, in the nucleus. The electric charge on each electron is minus 1 and the electric charge on each proton is plus 1. Since the proton is at the center (yang), we would expect its charge to be positive, and the electron at the periphery would naturally have a negative (yin) charge. But what is the neutron, with no charge?

Nothing can exist in this relative world which is neither plus (yang) nor minus (yin), permanently at the balance point. Furthermore, the distance of the electron from the nucleus is supposed to be constant. Nothing is constant in the relative world. Everything moves through change. No one has ever seen or photographed the constant circle which is supposed to represent an atom with its outer electrons and central nucleus. The

You can't capture a ghost. The basic reality is motion, change, continuous development.

Words as labels have blinded us. We say X moves. What is X? Try to photograph it. What actually moves? Moving moves.

Change changes. Once we have realized that it is impossible to destroy or arrest change, we can create a true science. The fatal flaw in the science we learned at school is the absence of a large perspective.

THE ELEMENTS

The periodic table of the elements hangs on the wall of every chemistry classroom. Let us see if we can shake the dust off chemistry by seeing that blockish chart in terms of our dynamic spiral.

The first large pattern that emerges is the existence of seven rows across. Seven is the sacred number of orbits in a complete spiral (seven days to a week, the seven heavens) seven crops up everywhere

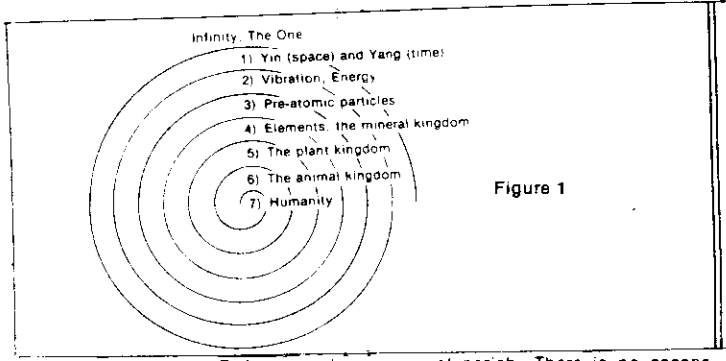


Figure 1

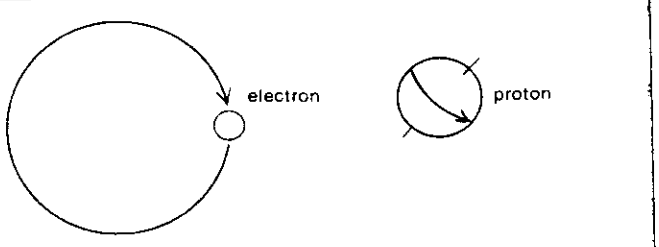


Figure 2

throughout the consciousness of the race, but modern science is barred from realizing the continuity of the physical and the spiritual world. These seven rows with Hydrogen (H) and Helium (He)—the two lightest elements—in the top row and the massive radioactive elements—Uranium (U), Plutonium (Pu), etc.—in the bottom row are the reflection in the world of chemistry of our seven orbital spiral of creation, circling in toward the dense center. (See Fig. 4 on next page)

Why are the elements in the bottom row radioactive? These elements at the center of the spiral are under tremendous evolutionary pressure. The spiral reverses its direction at the extreme point of materialization and tends outward again. The massive radioactive elements start to break down and emit particles on their way back to the sixth orbit. Thus Uranium decays to become Lead (Pb).

The elements at the middle of the fourth orbit, balanced halfway down the spiral—Iron (Fe, number 26), Cobalt (Co, number 27), and Nickel (Ni, number 28)—are magnetic. Why does a magnet, iron for example, attract other metals? Nature is a process seeking its balance point. We say that the element iron possesses the quality of magnetic attraction, but actually magnetism is the tendency of all the other metals moving toward balance at the midpoint of the spiral. The specific qualities of iron are due to that tendency. Matter is the manifestation of energy.

The tendency of the elements to move towards balance is not only evolutionary (through time), but phys-

We graduate from B, however, by moving from the passive degree to the active degree by assisting others to reclaim natural health. When Jesus returned from the desert he went about healing the sick; he could not stay meditating on a mountain top.

The teaching of Jesus, like that of Buddha, at C, was directed to helping others realize their own absolute freedom. "Take up thy bed and walk." Their activity, because it was grounded in wholeness rather than the limited and ephemeral, continues to live even now. The mastery of D, is our task today.

The reliance of modern society on the way in which physical needs are supplied by science is not something God-given. Modern industrial civilization was developed by people like us: it can be changed radically by human beings. We are free to change our industrial civilization at its very root in modern science.

STUDYING NATURAL TECHNOLOGY

Creating a natural technology depends on solving two problems: (1) the manufacture of materials and (2) the utilization of energy. Modern science answers the first problem by mining ores and refining them into metals. Couldn't we, however, create metals directly from the elements in the atmosphere and the ocean instead of depending on the extraction of already existing materials in the earth? What if we used the energy that comes to us from wind and water, the sun and even outer space, instead of relying on the depletion of fuel deposits in the form of coal and oil?

we must perish. There is no escape from our lack of judgment. We have created the current crisis and now we must resolve it. It is we who must face the problem because it is we who will be destroyed if we continue to evade the basic order of balance, justice, and proportion in all things. This is why we must now learn true science, if our spirituality is to be anything but one more attempt at escape from this world in which we find ourselves.

TRUE SCIENCE

Let's return to high school science and review the four states of matter:

plasma
gas
liquid
solid

Plasma is on the borderline between the world of matter and the world of energy. The flame from a match, for example, is in the plasma state, where the atoms are moving so fast that they break down into sub-atomic particles (orbit 3 of our spiral diagram). Basic examples of gas, liquid, and solid are air, water, and earth.

Obviously, the level of energy, or temperature, from plasma to solid is lower and lower. Thus a solid, such as ice or metal, is the frozen, least pliable state. Energy (vibration, or spirit) is just the diffuse (yin) form of matter, and matter is nothing but a condensed (yang) manifestation of spirit, vibration, or energy. In order to understand the world of matter wholistically, we must see it in the context of spirit

concept is pure fantasy, a hypothetical ideal. There are no such perfect circles in nature.

The electron actually spirals in toward the center, contracting its supposedly constant distance from the nucleus, to become what's called a proton. Since the proton is much larger than an electron, how does it acquire its additional weight? The proton's greater mass is created by the change of energy into matter. That gain corresponds to the difference in energy between the swiftly revolving electron and the proton rotating about its own axis. (See Fig. 2)

As the proton turns back to spiral out again on its way to become an electron, just at the extreme turning point where yang (centripetal force) changes to yin (centrifugal force), the neutron appears. (Similarly, the positron is an electron turning back from extreme yin toward yang.) The full cycle looks like this: (See Fig. 3, p. 24)

These so-called particles are not stable entities. The fallacy of conceptual thinking pervades materialistic science. It is the disease of naming. I, you, and John Smith are supposed to be I, you, and John Smith—once and for all, but how many different people we have been in our growth from childhood to old age! We are nothing but change.

The world is a verb, not a noun. The nucleus of an atom is the *massing* of low energy levels at the central area of the atom. The electron is not a shiny pellet we would see if our microscopes were only powerful enough. It is a cloud, and a very diffuse (yin) cloud. Don't be fooled by the naming game of dualistic thought.

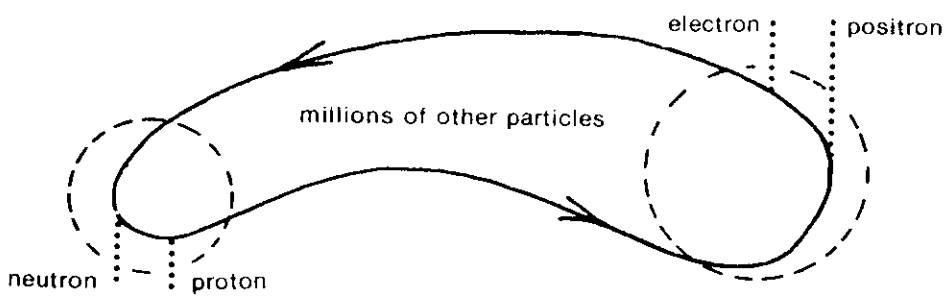


Figure 3

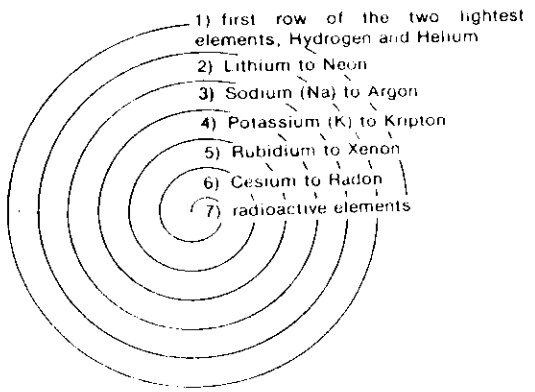


Figure 4

ical (across space) as the above diagram of the distribution of elements around the earth makes obvious (See Figure 5 on p. 25)

YIN AND YANG

Four basic tests to judge the relative yinness or yangness of an element are (a) weight, (b) reaction to heat, (c) chemical behavior, and (d) color. The denser of two elements is the more yang, other things being equal. An element resistant to heat—that is, with a high boiling point—is more yang than an element less resistant to heat (yang). So oxygen, which is already liquid at -219.4 degrees C, is very yin and Carbon, which melts only at 3,500 degrees C, is extremely yang. Even if we didn't know the melting point of Carbon, but knew that Oxygen was yin (which it obviously is from its abundance in the atmosphere above the earth), we would know that Carbon is yang from its ease of combination with Oxygen. Opposites attract; the more easily elements combine, the greater their polarity. The final criterion of color (d) can be verified by seeing the most vivid line in an element's spectrum. The colors from yin (high frequency) to yang (low frequency) are violet, blue, green, yellow, orange, red, purple.

ALCHEMY

Alchemy is the wholistic science of matter, which preceded modern chemistry. It was known throughout the ancient world, in both the Occident and the Orient. In Northern China, a tomb was recently unearthed which archeologists dated around 1,000 B.C. Next to the person buried there, a metallic box was found. Analysis showed it to be an alloy of nickel with 70% aluminum. Aluminum does not occur in nature: its extraction from bauxite ore has only been possible in modern times after the development of high temperature technology, yet 3,000 years ago aluminum was produced by alchemy.

Alchemy is the method of creating elements by transmutation. Transmutation involves changing the number of protons and neutrons in the nucleus of an atom so that one element, Sodium (Na) for example, becomes another element, for example Potassium.

Transmutation is a far more radical change than mere chemical combination. It's the difference between getting married and having a casual affair; you really have to change. There's no other way to create a new being.

An example of chemical combination is the reaction of Hydrogen and Oxygen to form water, H_2O. The Hydrogen and Oxygen atoms combine at their surfaces where the electrons are. Each Hydrogen atom, however, remains in its nucleus a Hydrogen atom, with one proton, and each Oxygen atom also keeps its characteristic nucleus of 8 protons and 8 electrons.

Transmutation creates a Potassium atom (with 19 protons and 20 neutrons) from a Sodium atom (with only 11 protons and 12 neutrons) by changing the nucleus, the very core of the atom.

According to modern science, the core of an atom is very stable, almost indestructable. Modern science does admit the possibility of transmutation, but only under very unusual—and expensive—conditions. A cyclotron shoots atomic particles at enormous velocity toward the target nucleus of an atom; a few protons and neutrons are knocked out of the target atom which thus becomes a lighter, different element. Obviously that extreme, violent method is not the secret of transmutation employed in alchemy, nor can it serve as the basis for a natural technology.

The elements evolved naturally, and are continuously changing from yin to yang and back again. Helium, for example (with 2 protons and 2 neutrons), develops from the nuclear

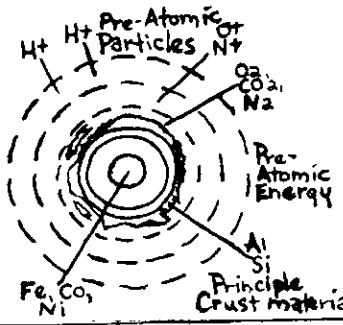


Figure 5

addition of 2 deuterium atoms (with 1 proton and 1 neutron each). Lithium, the next element (with 3 protons and 4 neutrons), evolves from the nuclear addition of 1 Helium atom with 1 Tritium atom (having 1 proton and 2 neutrons).

$$^{1}H_{2} + {}^{1}H_{2} = {}^{2}He_{4}$$

$$^{2}He_{4} + {}^{1}H_{3} = {}^{3}Li_{7}$$

Some elements are quite abundant and others are very rare. Modern science has no satisfactory explanation for this basic fact, yet the reason for it is quite obvious when we see how all the elements were created by natural alchemy. With a little arithmetic you can see why Carbon, for example, is so common, but Lithium is relatively rare, depending on the number of possible combinations between atoms and isotopes necessary to create them.

Since we know that Oxygen is very yin and Carbon is very Yang, we can see why their nuclear combination produces an element as stable and hard as Silicon.

$$^{8}O_{16} + {}^{6}C_{12} = {}^{14}Si_{28}$$

It's easy to experiment with transmutation in the plant kingdom. Simply sprout seeds in nearly distilled water with a glass cover to keep out elements other than those contained in air and water. If you take some of the seeds to a laboratory for analysis and then compare a lab analysis of the elements contained in the sprouts, you will discover an amazing difference in the number of elements present. The transmutation of those elements from air and from water has taken place under normal temperature and pressure.

Nuclear fusion occurs readily throughout nature, because, as we saw, the nucleus is not a closed system of stable particles, but is an open field of energy in continual change.

Transmutation in the animal kingdom was documented by Louis Kervan in his studies of French workmen stationed in the Sahara. He noted their intake of food in terms of chemical elements and compared it with their natural excretions. They gave off more Potassium and less Sodium than they had taken in. He concluded that Sodium was being transmuted to Potassium by nuclear fusion with the Oxygen breathed in, according to the formula

$$^{11}Na_{23} + {}^{8}O_{16} = {}^{19}K_{39}$$

This process is essential to our metabolism, and the balance of Sodium with Potassium plays a key role in the transmission of impulses along our nervous system. The trouble with demonstrating transmutation in the vegetable or animal kingdom is that scientists may immediately object that too many unknown variables are present for the evidence to be convincing.

Therefore we must neatly demonstrate transmutation in the mineral kingdom under laboratory conditions. My teacher, Georges Ohsawa, transmuted Sodium to Potassium with the following simple apparatus (Fig. 6).

In a vacuum tube with a positive and negative electrode at either end, he put 2.3 milligrams of Sodium. He passed an electric current between the two electrodes, heating the Potassium from solid to liquid to gaseous to plasma state. He then introduced 1.6 milligrams of Oxygen through the valve. The product remaining in the tube, as verified by spectroscopic examination, was 3.9 milligrams of Potassium.

Using similar methods, we can easily create iron, the basis of heavy industry, and gold, the standard of monetary systems. The alchemical revolution means the end of materialism.

[continued on page 26]

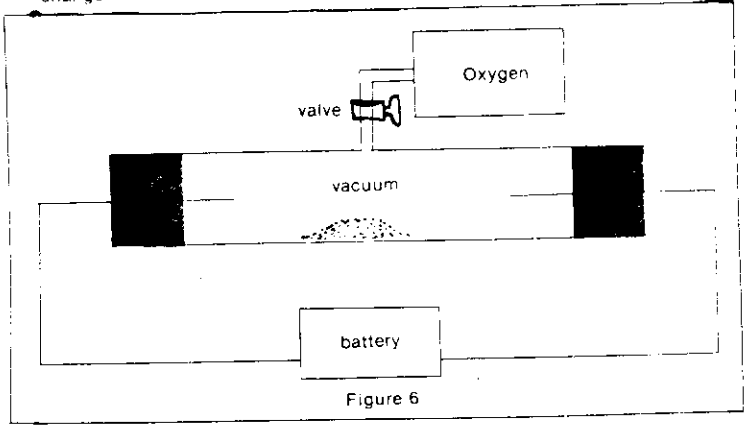


Figure 6

[continued from page 25]

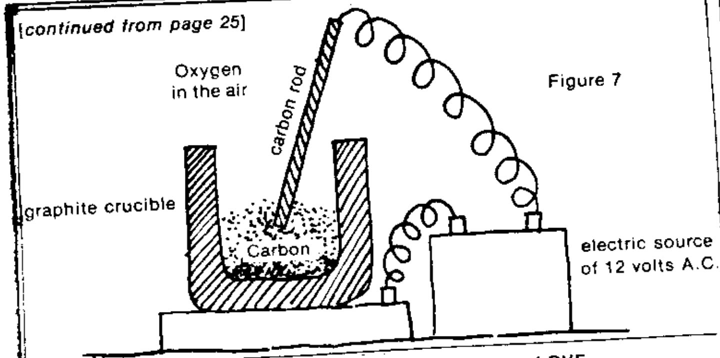


Figure 7

REVOLUTION

No one is in favor of materialism, but it remains a perennial problem. Dualistic religions try to negate the material world, yet the mass of society remains attached to materialism—for it has no real choice. Just in order to survive, we must spend most of our time and energy on material concerns. That dilemma is due to the sheer cost of basic materials and energy as produced by modern science. The material world is valued highly because it costs a lot to keep going.

Suppose we could create steel—say for a penny a pound, instead of the present dollar a pound—by transmutation of Oxygen and Carbon, both of which are abundantly available, instead of mining and refining iron ore. If we could create gold for a penny an ounce, what would happen to the present economic system? Fort Knox would be revealed as the illusion it really is.

Iron and steel (an alloy of Carbon and Iron) can be created by nuclear fusion of two Oxygen atoms (each with 8 protons and 8 neutrons) and two Carbon atoms (each with 6 protons and 6 neutrons), thus:

$$2\ {}^{6}C_{12} + 2\ {}^{8}O_{16} = X$$

Element X breaks down partly to Nickel (with 28 protons and 31 neutrons) and mainly to Iron (with 26 protons and 29 neutrons). You can do this yourself with the equipment pictured above. (See Fig. 7)

Steel produced by alchemy is much harder and far more rust resistant than industrial Steel. In India there is an ancient pillar of such Steel, near Delhi; modern science cannot explain why it is completely rust proof or how it could have been made.

Medieval alchemists were able to create Gold from Mercury, its neighbor in the periodic table. The intuitive powers of such men who could sense that similarity of Gold and Mercury puts us to shame. We must go beyond them to produce Gold on a large scale, once we have mastered its production in small quantities as they did.

Gold is created by the nuclear fusion of seven Oxygen atoms with seven Carbon atoms using a different amount of heat and electricity than employed in the creation of Iron. You can make it in your kitchen.

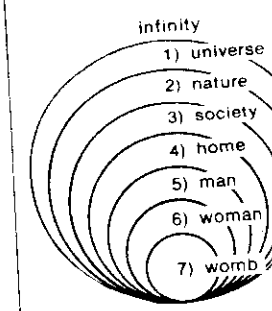
Our natural technology must be something anyone can do with the simplest equipment. When that is realized, the material world will be seen at its true worth, and we will be free to place value where it belongs—on life itself.

LOVE

Alchemy is the technology of love. Instead of the violent methods and extremely high temperatures employed by modern industry with its consequent pollution, it uses only the universal principles of attraction, or yin and yang, to create combinations based on natural harmony. Love has no waste.

The same principles we have been discussing in terms of the mineral kingdom weave through the plant and animal kingdoms. The whole universe is involved in the conception of a child through a woman and a man. The mother's womb is at the center of a spiral orbiting through the woman's body, the man's body enfolding her, the couple's home, the society in which they live, the natural world, and the entire universe.

Figure 8



Each orbit flows toward the orbit beneath it in a striving toward manifestation. The child is the receptacle not only of his mother's nourishing blood, but also of infinity. At birth it begins the return to its source by expanding its sphere of interests—from the immediate realm of mechanical response, to sensory preferences, to emotional attachments, to intelligent inventiveness, to social consciousness, to philosophical concerns, to ultimate reconciliation. That seven leveled process of growth in our scope of judgment takes place through a sequence of greater and greater giving.

Superficially it appears that two people living together take from each other, but if their relationship is love—rather than a business arrangement for mutual profit—they are constantly giving to each other from their hearts with no thought of return. They empty themselves to return to their true nature, which is the void, the infinite motion of nothingness.

4 (C+O) ⟶ Cd (112)

5 (C+O) ⟶ Ce (140)

6 (C+O) ⟶ Er (168)

7 (C+O) ⟶ Pt (196)

In the Orient, the number seven is very active (yang), the last number before the return to infinity, which is signified by the number eight. In the same way, the seventh octave is the end of the spiral of elements. Platinum stands as the last transmutation of carbon and oxygen. After that the elements become increasingly yin.

Platinum → Gold → Mercury → Radioacitve

△ ⟶ ▽

Beyond the first three, more and more of the elements are radioactive and unstable.

We might call radioactive decay, death. The "matter" of the element is returned to a simpler state as a lighter element. As this happens, the element's yin components are discharged as invisible preatomic particles and energy. But death is part of the cycle of life, for particles will reassemble and transmute the heavy elements again. Is this not like biological life?

The grand cycle of the birth and death of the elements, we call the Fugate of Carbon and Oxygen. It begins with a prelude: the first eight elements which suggest the major notes of the fugue; then there are seven movements during which are built the variations on the original theme. More and more intricate the melodies become as the elements grow larger and heavier. In any closed system of the atoms the "surroundings" are the Conductor whose intensity is deepended through seven movements until finally there is a long coda, as the elements dissolve into the "silence" of infinity. Yang changes to yin. As the fugue of the world of matter is ending, those who listen may hear the eternal rythm infinite motion, which is called the order of the universe.

Questions for future study:

1. Why is the center of the earth thought to be composed of iron?

2. If radioactive metals are considered to be the end of the spiral of materialization, why is it that they are not found at the core of the earth?

3. According to scientific observations uranium deteriorates into lead over long periods of time. Under what circumstances is this true? Are there times when lead would progressively transmute itself into uranium? When?

4. Why is iron magnetic?

5. Radio-astronomers have observed that the elements that are radioactive in the earth's crust (uranium and radium, for example) are not present in the crust of Mars. Why is this?

Answering these questions may seem to be an unnecessary, abstract application of the unifying principle. However, the answer to any one, clearly stated in terms of yin and yang, may be the key to unlock your understanding of man and his future material and spiritual destiny.

Carefully consider one of these questions, or think up another one. Whenever you have a moment, puzzle over the answer, and your brain cells will become more yang and more receptive to mental vibrations (yin). After a while the answer will come like a bolt of lightning.

Natural Transmutation of the Elements

wgt.	composition		wgt.	composition		wgt.	composition	
1	P	hydrogen	37	$2C + {}^{13}C$		73	(3B) + 2C) + 0	
2	P + n		38	2 C + C		74	(2B + 3C) + 0	
3	${}^{1}H + {}^{1}H$		39	(B + C) + 0		75	(B + 4C) + 0	
4	$2{}^{3}H$	helium	40	(2C) + 0		76	(5C) + 0	
5	$He + H^{1}$	lithium	41	(B + C) + ${}^{18}0$		77	(3B + C) + 20	
6	${}^{4}He + {}^{3}H$		42	(2C) + ${}^{18}0$		78	(2B + 2C) + 20	
7	${}^{4}He + {}^{1}H + {}^{2}H$	berilium	43	(C + ^{18}C) + 0		79	(B + 3C) + 20	
8	${}^{4}He + {}^{2}H + {}^{2}H$		44	(2 ^{18}C) + 0		80	(4C) + 20	
9	${}^{7}Li + {}^{2}H$		45	(3B + C)		81	(3B) + 30	
10	${}^{4}He + {}^{6}Li$		46	(2B + 2C)		82	(2B + C) + 30	
11	${}^{4}He + {}^{7}Li$		47	(B + 3C)		83	(B + 2C) + 30	
12	$3{}^{4}He$	carbon	48	(4C)		84	(3C) + 30	krypton
13	$3{}^{4}He + {}^{1}H$	nitrogen	49	(3B) + 0		85	(3B + 3C) + 0	
14	${}^{12}C + {}^{2}H$	nitrogen	50	(2B + C) + 0		86	(2B + 4C) + 0	
15	${}^{13}C + {}^{2}H$		51	(b + 2C) + 0		87	(B + 5C) + 0	
16	4^{4} He	oxygen	52	(3C) +)		88	(6C) + 0	
17	$4{}^{4}He + {}^{1}H$		53	(2C + ^{13}C) + 0		89	(3B + 2C) + 20	
18	$4{}^{4}He + {}^{2}H$		54	(2B) + 20		90	(2B + 3C) + 20	
19	${}^{7}Li + {}^{13}C$		55	(b + C) + 20		91	(B + 4C) + 20	
20	$5{}^{4}He$		56	(2C) + 20	iron	92	(5C) + 20	
21	$5{}^{4}He + {}^{1}H$		57	(C + ^{13}C) + 20		93	(3B + C) + 30	
22	5 He + H		58	(2B + 3C)		94	(2B + 2C) + 30	
23	B + C		59	(B + 4C)		95	(B + 3C) + 30	
24	2C	magnesium	60	(5c)		96	(4C) + 30	
25	${}^{12}C + {}^{13}C$		61	(3B + C) + 0		97	(3B) + 40	
26	$2{}^{13}C$		62	(2B + 2C) +)		98	(2B + C) + 40	
27	B + 0		63	(B + 3C) + 0		99	(B + 2C) + 40	
28	C + 0	silicon	64	(4C) + 0		100	(3C) + 40	
29	${}^{13}C + 0$		65	(3B) + 20		101	(3B + 3C) + 20	
30	${}^{13}C + {}^{17}0$		66	(2B + C) + 20		102	(2B + 4C) + 20	
31	^{9} Be + B		67	(B + 2C) + 20		103	(B + 5C) + 20	
32	20		68	(3C) + 20		104	(6C) + 20	
33	$0 + {}^{17}0$		69	(3B + 3C)		105	(3B + 2C) + 30	
34	$0 + {}^{18}0$		70	(2B + 4C)		106	(2B + 3C) + 30	
35	B + 2C		71	(B + 5C)		107	(B + 4C) + 30	
36	3C		72	(6C)		108	(5C) + 30	

wgt.	composition		wgt.	composition		wgt.	composition	
109	(3B + C) + 40		147	(B + 6C) + 40		185	(3B+6C) + 50	
110	(2B + 2C) + 40		148	(7C) + 40		186	(2B + 7C) + 50	
111	(B + 3C) + 40		149	(3B + 3C) + 50		187	(B + 8C) + 50	
112	(4C) + 40	cadium	150	(2B + 4C) + 50		188	(9C) + 50	
113	(3B + 4C) + 20		151	(B + 5C) + 50		189	(3B + 5C) + 60	
114	(2B + 5C) + 20		152	(6C) + 50		190	(2B + 6C) + 60	
115	(b + 6C) + 20		153	(3B + 2C) + 60		191	(B + 7C) + 60	
116	(7C) + 20		154	(2B + 3C) + 60		192	(8C) + 60	
117	(3B + 3C) + 30		155	(B + 4C) + 60		193	(3B + 4C) + 70	
118	(2B + 4C) + 30		156	(5C) + 60		194	(2B + 5C) + 70	
119	(B + 5C) + 30		157	(3B + 5C) + 40		195	(B + 6C) + 70	
120	(6C) + 30		158	(2B + 6C) + 40		196	(7C) + 70	△ platinum
121	(3B + 2C) + 40		159	(B + 7C) + 40		197	(3B + 7C) + 50	gold
122	(2B + 3C) + 40		160	(8C) + 40		198	(2B + 8C) + 50	
123	(B + 4C) + 40		161	(3B + 4C) + 50		199	(B + 9C) + 50	
124	(5C) + 40		162	(2B + 5C) + 50		200	(10C) + 50	mercury
125	(3B + C) + 50		163	(B + 6C) + 50		201	(3B + 6C) + 60	
126	(2B + 2C)+ 50		164	(7C) + 50		202	(2B + 7C) + 60	▽
127	(B + 3C) + 50		165	(3B + 3C) + 60		203	(B + 8C) + 60	radio-actives
128	(4C) + 50		166	(2B + 4C) + 60		204	(9C) + 60	
129	(3B + 4C) + 30		167	(B + 5C) + 60		205	(3B + 5C) + 70	
130	(2B + 4C) + 30		168	(6C) $ 60	thulium	206	(2B + 6C) + 70	
131	(B + 6C) + 30		169	(3B + 6C) + 40		207	(B+ 7C) + 70	
132	(7C) + 30		170	(2B + 7C) + 40		208	(8C) + 70	
133	(3B + 3C) + 40		171	(B + 8C) + 40		209	(3B + 4C) + 80	
134	(2B + 4C) + 40		172	(9C) + 40		210		
135	(B + 5C) + 40		173	(3B + 5C) + 50		211		
136	(6C) + 40		174	(2B + 6C) + 50		212		
137	(3B + 2C) + 50		175	(B + 7C) + 50		213		
138	(2B + 2C) + 50		176	(8C) + 50		214		
139	(B + 4C) + 50		177	(3B + 4C) + 60		215		
140	(5C) + 50	cerium	178	(2B + 5C) + 60		216		
141	(3B + 5C) + 30		179	(B + 6C) + 60		217		
142	(2B + 6C) + 30		180	(7C) + 60		218		
143	(B + 7C) + 30		181	(3B + 7C) + 40		219		
144	(8C) + 30		182	(2B + 8C) + 40		220		
145	(3B + 4C) + 40		183	(B + 9C) + 40				
146	(2B + 5C) + 40		184	(10C) + 40				

Seven Principles of the Order of the Universe

1. All things are differentiated apparatus of One Infinity.
2. Everything changes.
3. All antagonisms are complementary.
4. There is nothing identical.
5. What has a front has a back.
6. The bigger the front, the bigger the back.
7. What has a beginning has an end.

Twelve Theorems of the Unifying Principle

1. One Infinity differentiates itself into Yin and Yang which are the poles that come into operation when the infinite centrifugality arrives at the geometric point of bifurcation.
2. Yin and Yang result continuously from the infinite centrifugality.
3. Yin is centrifugal, Yang is centripetal. Yin and Yang together produce energy and all phenomena.
4. Yin attracts Yang. Yang attracts Yin.
5. Yin repels Yin. Yang repels Yang.
6. The force of attraction and repulsion is proportional to the difference of the Yin and Yang components. Yin and Yang combined in varying proportions produce energy and all phenomena.
7. All phenomena are ephemeral, constantly changing their constitution of Yin and Yang components.
8. Nothing is solely Yin or solely Yang. Everything involves polarity.
9. There is nothing neuter. Either Yin or Yang is in excess in every occurrence.
10. Large Yin attracts small Yin. Large Yang attracts small Yang.
11. At the extremes, Yin produces Yang, and Yang produces Yin.
12. All physical forms and objects are Yang at the center and Yin at the surface.

Classification of Yin (▽) and Yang (△)

	Yin	*Yang*
Tendency	Expansion	Contraction
Position	Outward	Inward
Structure	Space	Time
Direction	Ascent	Descent
Color	Purple	Red
Temperature	Cold	Hot
Weight	Light	Heavy
Catalyst	Water	Fire
Atomic	Electron	Proton
Elements	K, O, P, Ca, N...	H, As, Cl, Na, C...
Light	Dark	Bright
Construction	Surface	Inside
Vibration	Short Wave	Long Wave
Work	Psychological	Physical
Attitude	Gentle, Negative	Active, Positive
Biological	Vegetable	Animal
Agricultural	Salad	Cereal
Sex	Female	Male
Nerves	Orthosympathetic	Parasympathetic
Birth	Cold Season	Hot Season
Taste	Hot (curry), Sour, Sweet	Salty, Bitter
Vitamins	C	K, D
Country of Origin	Tropical	Cold
Seasonal Influence	Summer	Winter

Kushi Institute
STUDY GUIDE

SPECIAL ISSUE

on

Atomic Transmutations

lectures with Michio Kushi

Number 10

NO LONGER AVAILABLE

The contents of this, the tenth issue of the Kushi Institute Study Guide, were taken from the transcriptions of a lecture on transmutation given by Michio Kushi at the Kushi Institute on June 24, 1980. Any errors in content or editing are the responbility of the editor. Comments, suggestions or criticisms should be addressed to the editor, care of the Kushi Institute.

The purpose of this publication is to provide stimulating material that will broaden and deepen our understanding of the natural order of life. Our hope is to awaken the memory of our relationship with the infinite universe.

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DAILY DEDICATION FOR ONE PEACEFUL WORLD

When we eat, let us reflect that we have come from food which has come from nature by the order of the infinite universe, and let us be grateful for all that we have been given.

When we meet people, let us see them as brother and sister and remember that we have all come from the infinite universe, and let us be grateful for all that we have been given.

When we meet people, let us see them as brother and sister and remember that we have all come from the infinite universe through our parents and ancestors, and let us pray as One with all of humanity for universal love and peace on earth.

When we see the sun and moon, the sky and stars, mountains and rivers, seas and forests, fields and valleys, birds and animals, and all the wonders of nature, let us remember that we have come with them all from the infinite universe. Let us be thankful for our environment on earth, and live in harmony with all that surrounds us.

When we see farms and villages, towns and cities, arts and cultures, societies and civilizations, and all the works of man, let us recall that our creativity has come from the infinite universe and has passed from generation to generation and spread over the entire earth. Let us be grateful for our birth on this planet with intelligence and wisdom, and let us vow with all to realize endlessly our eternal dream of One Peaceful World through health, freedom, love and justice.

ONE PEACEFUL WORLD PRAYER

Having come from, being within, and going towards infinity,

May our endless dream be eternally realized upon this earth,

May our unconditional dedication perpetually serve for the creation of love and peace.

May our heartfelt thankfulness be devoted universally upon everyone, everything and every being.

----Michio Kushi

A PEACEFUL REVOLUTION

This year as many of you know, our macrobiotic approach to healing sickness, using only very natural home cooking and very simple remedies such as ginger compress or certain condiments, has begun to spread very rapidly throughout the country and the entire world. Already, following several well-publicized case histories of cancer patients who began macrobiotics, several major hospitals have approached us to initiate some kinds of macrobiotic activities in their facilities; and many other similar developments are going on.

Very, very soon, we will discover that we have totally changed the institution of modern medicine itself - not by attacking and saying, "You are wrong," but by their own initiative, wanting to incorporate and adopt our methods and whole approach.

However, although this is of course very wonderful, there are also other peaceful revolutions that we may need to make in the near future in addition to the revolution in medicine and food. For example, the whole area of people's spiritual view is in a state of chaos, with many different religions all saying different things; and the real meaning and understanding behind all of their traditions have been lost. We may also use our macrobiotic view to unify and synthesize these things.

Another example, which may become very critical in the near future is science, which I would like to study with you tonight. Especially, let us study the background and findings so far in the field of atomic transmutations.

CLASSIFICATION OF ELEMENTS BY YIN AND YANG

Let's see how our understanding of yin and yang applies to the world of elements. Yang temperature is what - more high temperature or more low temperature? High temperature (hot) is more yang; low temperature (cold) is more yin. Yang size is what? It is smaller and more compact; larger is more yin size. Heavier is more yang; lighter is more yin. In terms of density, yang is more dense, more hard or solid; less dense is yin. Red color is more yang; purple or violet is more yin; various colors are there in between - red, orange, yellow, green, blue, violet. Beyond red is infra-red, which we don't see anymore as actual color; beyond violet is ultra-violet.

	YANG	YIN
TEMPERATURE	Hotter	Colder
SIZE	Smaller	Larger
WEIGHT	Heavier	Lighter
DENSITY	More Dense	Less Dense
COLOR	I-Red, Red, Orange, Yellow, Green,	Blue, Violet, U-Violet

Now by applying this kind of understanding, let's see among elements which are more yang and which are more yin; please refer to the alphabetical table of elements. (Next page).

ATOMIC WEIGHT

An atom's orbiting electrons do not influence weight much, as they are so small. Atomic weight is essentially the weight of the nucleus. A large atomic weight means this atom is heavier, a more yang element.

ATOMIC WEIGHTS

Based on the assigned relative atomic mass of $^{12}C = 12$

The following values apply to elements as they exist in materials of terrestrial origin and to certain artificial elements. When used with the footnotes, they are reliable to ± 1 in the last digit or ± 3 in the last digit in the case of type.

Name	Symbol	At. No.	At. wt.	M.P. °C	B.P. °C
Actinium	Ac	89	(227)	1050	3200 ± 300
Aluminum	Al	13	26.98154[a]	660.37	2467
Antimony	Sb	51	121.75	630.74	1750
Argon	Ar	18	39.948[b,c]	−189.2	−185.7
Arsenic	As	33	74.92216[a]	817	613
Astatine	At	85	(210)	302	337
Barium	Ba	56	137.34	725	1640
Berkelium	Bk	97	(247)		
Beryllium	Be	4	9.01218[a]	1278 ± 5	2970
Bismuth	Bi	83	208.9806[a]	271.3	1561 ± 5[d,e]
Boron	B	5	10.811[b,c,d]	2300	2550
Bromine	Br	35	79.904[b]	−7.2	58.78
Cadmium	Cd	48	112.40	320.9	765
Calcium	Ca	20	40.08	839 ± 2	1484
Californium	Cf	98	(251)		
Carbon	C	6	12.011[b,c,d]	3550	4827
Cerium	Ce	58	140.12	795 ± 3	3257
Cesium	Cs	55	132.9055[a]	28.40 ± 0.02	678.4
Chlorine	Cl	17	35.453[b]	−100.98	−34.6
Chromium	Cr	24	51.996[c]	1857 ± 20	2672
Cobalt	Co	27	58.9332[a]	1495	2870
Copper	Cu	29	63.546[c,e]	1083.4 ± 0.2	2567
Curium	Cm	96	(247)	1340 ± 40	
Dysprosium	Dy	66	162.50	1409	2335
Einsteinium	Es	99	(254)		
Erbium	Er	68	167.26	1522	2510
Europium	Eu	63	151.96	822 ± 5	1597
Fermium	Fm	100	(257)		
Fluorine	F	9	18.9984[a]	−219.62	−188.14
Francium	Fr	87	(223)	(27)	(677)
Gadolinium	Gd	64	157.25	1311 ± 1	3233
Gallium	Ga	31	69.72	29.78	2403
Germanium	Ge	32	72.59	937.4	2830
Gold	Au	79	196.9665[a]	1064.43	2807
Hafnium	Hf	72	178.49	2227 ± 20	4602
Helium	He	2	4.002602[b,c]	−272.2[b,c,m]	−268.934
Holmium	Ho	67	164.9303[a]	1470	2720
Hydrogen	H	1	1.00794[b,c]	−259.34	−252.87
Indium	In	49	114.82	156.61	2080
Iodine	I	53	126.9045[a]	113.5	184.35
Iridium	Ir	77	192.22	2410	4130
Iron	Fe	26	55.847	1535	2750
Krypton	Kr	36	83.80	−156.6	−152.30 ± 0.10
Lanthanum	La	57	138.9055[g]	920 ± 5	3454
Lawrencium	Lr	103	(257)		
Lead	Pb	82	207.2[g]	327.502	1740
Lithium	Li	3	6.941[b,c,d,g]	180.54	1347
Lutetium	Lu	71	174.97	1656 ± 5	3315
Magnesium	Mg	12	24.305	648.8 ± 0.5	1090
Manganese	Mn	25	54.9380[a]	1244 ± 3	1962
Mendelevium	Md	101	(256)		
Mercury	Hg	80	200.59	−38.87	356.58
Molybdenum	Mo	42	95.94	2617	4612
Neodymium	Nd	60	144.24	1010	3068
Neon	Ne	10	20.179[b]	−248.67	−246.048
Neptunium	Np	93	237.0482	640 ± 1	3902
Nickel	Ni	28	58.71	1453	2732
Niobium (Columbium)	Nb	41	92.9064[a]	2468 ± 10	4742
Nitrogen	N	7	14.0067[b,c,d]	−209.86	−195.8
Nobelium	No	102	(254)		
Osmium	Os	76	190.2	3045 ± 30	5027 ± 100
Oxygen	O	8	15.9994[b,c,d,g]	−218.4	−182.962
Palladium	Pd	46	106.4	1552	3140
Phosphorus	P	15	30.9738[a]	44.1 (white)	280 (white)
Platinum	Pt	78	195.09	1772	3827 ± 100
Plutonium	Pu	94	(244)	64	3232
Polonium	Po	84	(209)	254	962
Potassium	K	19	39.102	63.65	774
Praseodymium	Pr	59	140.9077[a]	931 ± 4	3212
Promethium	Pm	61	(145)	~1080	2460
Protactinium	Pa	91	231.0359[c]	~1600	
Radium	Ra	88	226.0254[c,d,g]	700	1140
Radon	Rn	86	(222)	−71	−61.8
Rhenium	Re	75	186.2	3180 ± 20	5627
Rhodium	Rh	45	102.9055[a]	1966 ± 3	3727 ± 100
Rubidium	Rb	37	85.4678[c]	38.89	688
Ruthenium	Ru	44	101.07	2310	3900
Samarium	Sm	62	150.4	1072	1778
Scandium	Sc	21	44.9559[a]	1539	2832
Selenium	Se	34	78.96	217	684.9 ± 1.0
Silicon	Si	14	28.086[c,d]	1410	2355
Silver	Ag	47	107.868	960.93	2212
Sodium	Na	11	22.9898[a]	97.85 ± 0.03	882.9
Strontium	Sr	38	87.62[c]	769	1384
Sulfur	S	16	32.06	115.3	444.674
Tantalum	Ta	73	180.9479[c]	2996	5425 ± 100
Technetium	Tc	43	98.9062	2172	4877
Tellurium	Te	52	127.60	449.5 ± 0.3	989.8 ± 3.8
Terbium	Tb	65	158.9254[a]	1360 ± 4	3041
Thallium	Tl	81	204.37	303.5	1457 ± 10
Thorium	Th	90	232.0381[c,g]	1750	4790
Thulium	Tm	69	168.9342[a]	1545	1950
Tin	Sn	50	118.69	231.9681	2270
Titanium	Ti	22	47.90	1668 ± 10	3287
Tungsten	W	74	183.85	3410 ± 20	5660
Uranium	U	92	238.029[c,g]	1132.3 ± 0.8	3818
Vanadium	V	23	50.9414[c]	1890 ± 10	3380
Wolfram (see Tungsten)					
Xenon	Xe	54	131.30	−111.9	−107.1 ± 3
Ytterbium	Yb	70	173.04	824 ± 5	1193
Yttrium	Y	39	88.9059[a]	1523 ± 8	3337
Zinc	Zn	30	65.37	419.58	907
Zirconium	Zr	40	91.22	1852 ± 2	4377

[a] Monoisotopic element.

[b] Element with one predominant isotope (about 99 to 100% abundance).

[c] Element for which the atomic weight is based on calibrated measurements.

[d] Element for which variation in isotopic abundance in terrestrial samples limits the precision of the atomic weight given.

[e] Element for which users are cautioned against the possibility of large variations in atomic weight due to inadvertent or undisclosed artificial isotope separation in commercially available materials.

[f] Most commonly available long-lived isotope.

[g] In some geological specimens this element has a highly anomalous isotopic composition, corresponding to an atomic weight significantly different from that given.

Taken from Robert C. Weast, PH.D. CRC Handbook of Chemistry and Physics (52nd Edition 1971-1972). Chemical Rubber Co. 18901 Cranwood Parkway, Cleveland, Ohio 44128.

MASS OR DENSITY

Again, higher density means a more yang element.

MELTING POINT/BOILING POINT

These indicate borderlines of transformation. Below the melting point an element is in what form? Solid, or gross matter. Above the melting point and up to the boiling point is what form? Liquid. Beyond boiling point this becomes gas. Further beyond this becomes plasma, the intermediate stage between matter and energy. Further beyond, this plasma becomes what? Here matter dissolves into vibrations, waves, or you may say spirit. So, matter has four stages, plus vibrations.

The upward limit of temperature is very huge - we don't know this limit; but we do know the low temperature limit. That we call Absolute Zero, -273° Centigrade, or 273° below the freezing point of water. We cannot make anything colder than that here on this earth. On some other planet or in some other place in the universe we may be able to go much lower, but as far as the earth is concerned, that is the absolute limit.

Compared with water, which has a melting point of 0° C. and a boiling point of 100° C., some elements have a very low melting point, these elements are more yin. Others have a very high melting point, these are more yang elements.

Let's take some examples: right here room temperature is about 32° C.; in this temperature, water is between melting and boiling, in a liquid state. At the same time, some elements, such as iron or copper, are already frozen at this temperature; they appear solid, which means frozen. You may say, for iron, copper and other similar elements, ice formation is already taking

THE EDGE OF THE UNIVERSE
VOL 3/# 1C

MAKING IRON:

Equipment

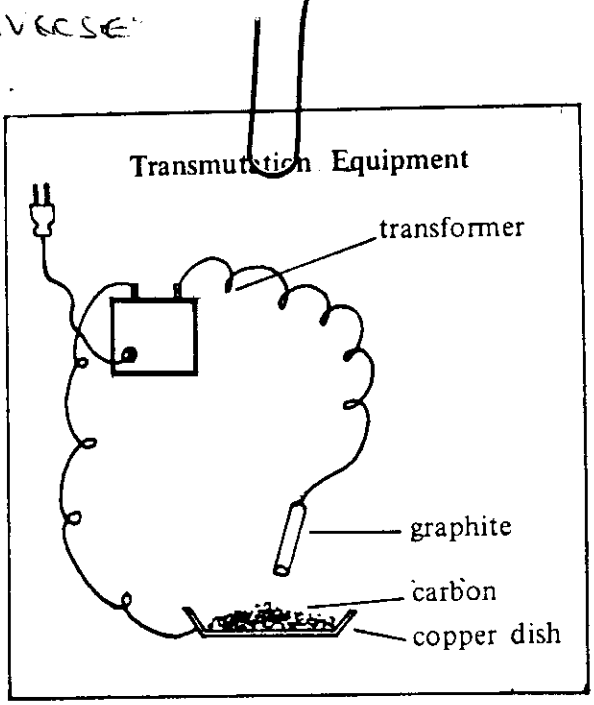
transformer
2 two foot lengths of well-insulated wire
2 alligator clips
1 square of copper (approximately 3" x 3"), with the edges bent up to form a dish.
1 three inch graphite rod
2 - 3 oz. pure carbon (obtained from a chemical supply house.

Attach the wires to the positive and negative terminals of the transformer. Secure an alligator clip at the end of each wire. Attach one to the copper dish and the other to the graphite rod. Sprinkle powdered carbon in the copper dish, so that it makes a thin, even layer. Turn on the electric current and touch the graphite to the carbon. This produces an arc from the graphite to the carbon. As it sparks, pull the rod away. The copper dish will become very hot. Repeatedly touch and withdraw the graphite for about fifteen minutes.

Let the dish cool down and then pour the carbon powder onto a piece of paper. Put a magnet underneath the paper and draw it along the pile of carbon. You should notice tiny flecks of "carbon" that are attracted to the magnet. These contain very small amounts of iron in addition to other heavier elements. Can you predict what other elements are present? Send your results to a laboratory for chemical analysis if you wish to confirm the results.

This is fusion at low energy, temperature and pressure. Contrasted with present scientific understanding of nuclear physics, it seems miraculous, but it is only a simple technological application of yin and yang.

In nature the attraction of yin and yang is greatest between carbon and oxygen, and iron is produced by the following reaction:



$$2\,{}^{12}_{6}C + 2\,{}^{16}_{8}O \rightarrow {}^{56}_{26}Fe$$

The electrical energy released in sparks activates the carbon atoms on the dish and the random oxygen molecules (O_2) that are in the surrounding air. As they begin to cool rapidly and contract, they fuse together and form iron. Yang energy produces yin, expansion, excitation; then yin, cool temperature, causes yangization, condensation and fusion.

Since such fusion reactions can occur at low energies and temperatures, they are common in nature, particularly in plants and animals. In fact, without the theory of low-energy transmutation it is impossible to explain the origin of the first cellular life. According to theory, cells are produced by the division of prior cells. Where did the first cells come from? Some speculate that bacterial or viral spores may have been transported between solar systems. This avoids the basic question: how did living matter organize itself from the world of elements?

To understand the law of transmutation, we are studying yin and yang. Within this study we can grasp the unity of life which is overlooked by scientific sensory judgment. Thus we can not only see the relative and stagnated world of matter, but also glimpse its mutability. For this the Chinese Taoists spent the last years of their lives studying alchemy.

THE FUGATE OF CARBON AND OXYGEN

How did the elements that form the Universe arise?

There are essentially two theories of creation considered by analytic cosmologists. One is that matter is constantly being produced in interstellar space. The second is the Big Bang theory which suggests a giant ball of matter that exploded at the beginning of the universe. This second theory is most widely held.

The Big Bang does not explain the origin of matter, not does it try. Physics and astronomy are applicable only within the world that can be measured with sensory instruments, but to understand creation, we must pierce through the judgment of the senses to a world of ultra-sense beyond the speed of light. In this dimension, vibrations are moving at speeds approaching the infinite. However using scientific instruments, it is impossible to detect these manifestations of electro-magnetic energy. Thus, all attempts at understanding the universe have lead only to mechanical models, and cosmogony has been left as the pursuit of religion or occult sciences.

The problem lies in the fact that modern man has lost his intuitive vision of change within the universe. To ancient man this vision was common; it was neither occult nor scientific, but merely his everyday perception of dualistic monism comparatively speaking, modern man's outlook is stagnant, rigid, and conceptually abstract. The Big Bang hypothesis states that all the elements have existed in their present form since the origin of the universe. With the exception of radioactive decay, elements do not transmute themselves into other elements. Do you believe this is so? Is this in accordance with the principles of the law of change?

Far Eastern thought would lead one to a far different conclusion. Buddha said that "all aggregates (of matter) are devoid of essense." The principle teaching of Buddhism, Taoism, Shinto or Vedanta is that everything is changing; there is no constancy in this universe. It seems logical that elements must transmute their form from one to another.

How can we apply this intuitive wisdom of the unifying principle to detect the patterning within the creation of the chemical elements?

First there are yin and yang elements. This may be confirmed by spectroscopic analysis (see "The Spirallic Chart of the Elements," Volume III, Number 6). These combine, most obviously, in chemical compounds, and the strength of bonding shows the strength of attraction between the yin and yang elements involved in the reaction.

Eg. $2H_2 + O_2 \longrightarrow 2H_2O$

yang *yin*

To begin this reaction, an electrical spark or a flame is necessary to activate the outside electrons. When they are excited, the hydrogen and oxygen merge or bond together.

The reaction that produces water shows a relatively weak attraction of yin and yang. In nature, much stronger attraction exists. Under the proper circumstances actual fusion of two atoms may occur. This we call *transmutation*. Scientists have detected this process in the sun where hydrogen is changed into helium. However, the gases in the sun are under extreme temperature and pressure. Transmutation has also been accomplished with particle accelerators, in which high-speed nuclear particles are bombard stationery target atoms. This is the method by which heavy unstable elements, such as neptunium or plutonium, were made. However, transmutation also occurs in nature and in living organisms without such extreme energy. (See Biological Transmutation, written by Louis Kervran, summarized by Georges Ohsawa, and published by the George Ohsawa Macrobiotic Foundation).

At the end of this article is a chart that shows how the elements have transmuted from the highest, hydrogen, to the heaviest radioactive elements. The chart is based upon our understanding of the attraction of yin and yang elements. Hydrogen, the center of the pre-atomic spiral, is yang. It gathers particles to itself, forming the first octave of creation. Just as a spark is necessary to produce water from the constituent elements, so also are certain conditions necessary, to induce transmutation within the first eight elements. You may figure out the conditions, if you study the melting and boiling points of the first eight elements.

Within the first octave, the greatest attraction is between carbon and oxygen, which represent yang and yin respectively. It is the interaction of these two that form the other elements. (You will notice that carbon is often replaced by boron. In terms of yin and yang, these are like brothers in that they react in similar ways in forming new elements.)

The movement of yin and yang continues for seven octaves:

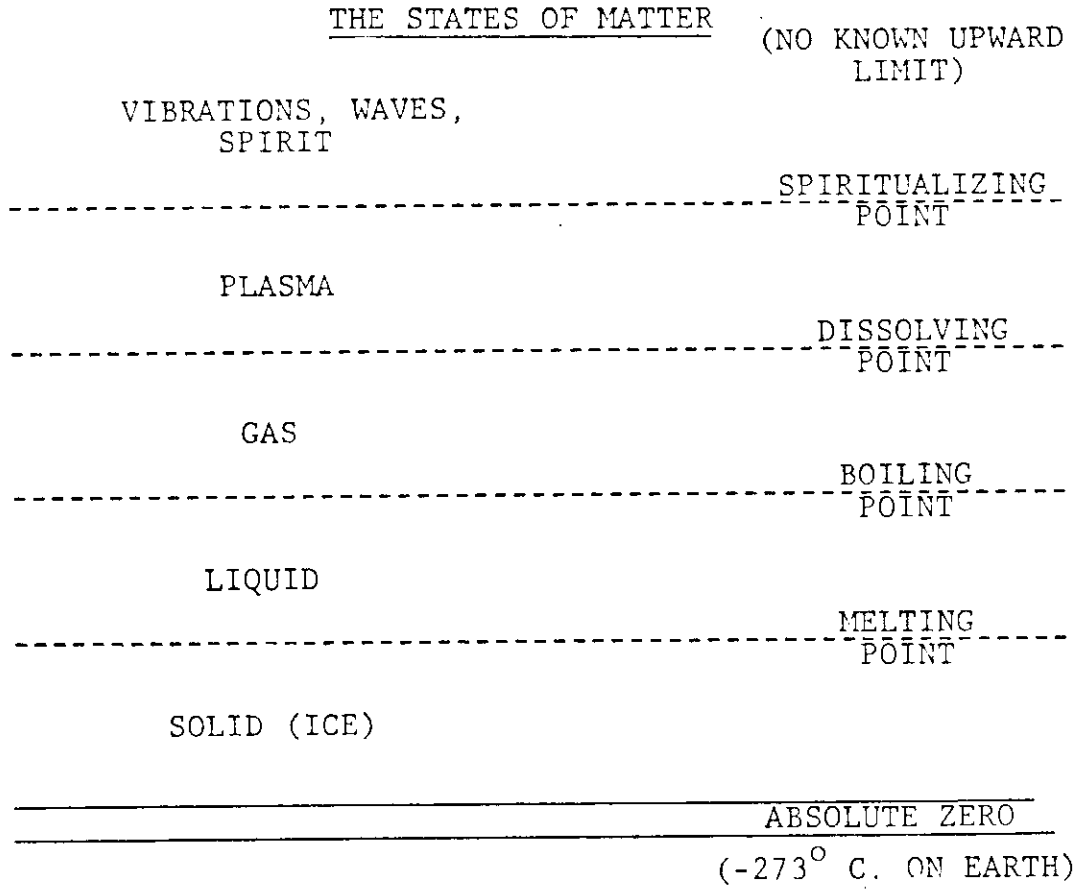
1 (C+O) $\longrightarrow$ Si (atomic weight 28)

2 (C+O) $\longrightarrow$ Fe (56)

3 (C+O) $\longrightarrow$ Kr (84)

place at room temperature. It naturally takes a very high temperature to change these into liquid form. Other elements, such as oxygen, nitrogen and hydrogen are already far above their boiling point, existing here in gas form. These gases become liquid only at very cold temperatures, fairly near to absolute zero.

So within our surroundings, although we may not notice it, all states of matter are occurring at once - some elements are in a frozen or "ice" state, some are in a semi-frozen state (like mercury), some are in liquid state, some are in gas or plasmic state, some are already in a vibrational or wave state. Our present material civilization is very limited in its view, only dealing with frozen and liquid states - not gas, plasma or vibrations.



SIZE

Which is the smallest atom? Hydrogen, so in terms of size, hydrogen is very yang. As we go higher in atomic number, the atoms get larger and larger, going from yang to yin.

WEIGHT

As far as weight is concerned, the opposite happens; the atoms get heavier and heavier, going from yin to yang. So, both yin and yang factors are there, balancing each other. Of course, this balance is not exact but is different for each element.

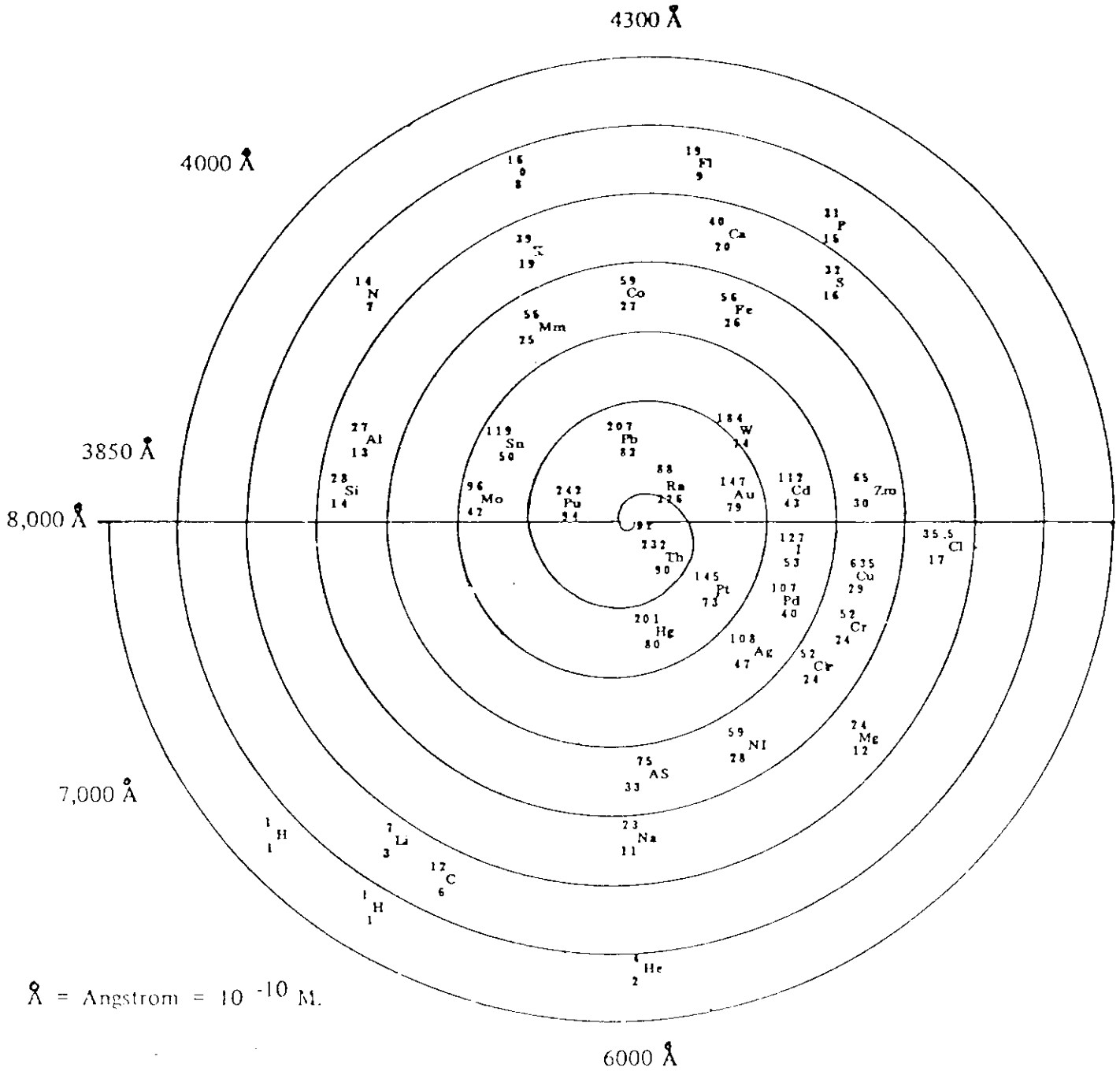
COLOR

Suppose we burn an element, and put a prism in front of it to see what colors are most strongly emitted. This is called spectroscopic examination; by examining the color spectrum of each element, we can make a more exact classification of yin and yang elements. (Please see the accompanying chart on the next page.)

Of course, to make this more exact, you can also include information such as melting point/boiling point and so forth, and adjust everything slightly to make it still more accurate. But the general idea is here.

This chart is arranged in a seven-orbit spiral; towards the center, atomic weight becomes heavier and heavier, and atomic number goes higher and higher. Furthermore, the elements in the lower half of each orbit have generally longer spectroscopic wavelengths (measured in Angstrom units) - more yang colors - the elements in the upper half have shorter wavelengths - more yin.

Spectroscopic Classification of the [illegible]ments in a Logarythmic Spiral



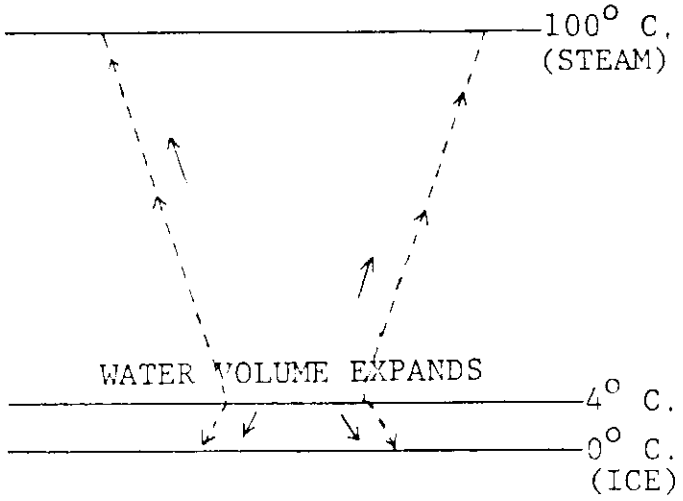
Å = Angstrom = 10^{-10} M.

You can discover some very interesting things from this chart. For example: find oxygen and carbon; oxygen is in a more yin category, carbon is more yang. (Also compare their melting and boiling points.) Yang carbon and yin oxygen are something like male and female; they have nearly opposite tendencies, and can therefore combine very easily. Hydrogen and oxygen are very far from each other in this chart, they can also combine very easily, as in H_2O (water). This is one reason water can naturally occur in abundance.

This chart can solve all chemical mysteries, such as why some elements can easily combine and others can't. Suppose, we want to combine two elements, X and Y, and we see they are both more yang. Then we could introduce some yin condition, by changing temperature and making them more expansive, or by introducing some other more yin element as a catalyst or using some other technical adjustments. Carbohydrates, for example, are composed largely of H,C and O. Can you see how this occurs, according to their yin and yang natures?

THE MYSTERY OF WATER

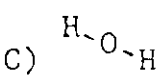
Let's use this understanding to solve some scientific mysteries. Water (H_2O) has a very strange property. If we take some water and apply heat, as the water heats up towards boiling, its volume expands. However, if we apply cold, at a certain point the volume also expands. The borderline is about 4^{o} C. - below this, water expands and above this water expands. Why? These are simply facts which science knows, but nobody has any good explanation for why. So we must use our magic spectacles - yin and yang.

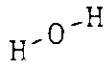


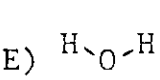
We know hydrogen is more yang and oxygen is more yin. A water molecule has two hydrogen and one oxygen atom, but what does the structure look like? Here are six possibilities; please study them and decide for yourself which one you think is the right structure.

A) 

B) H-O-H

C) 

D) 

E) 

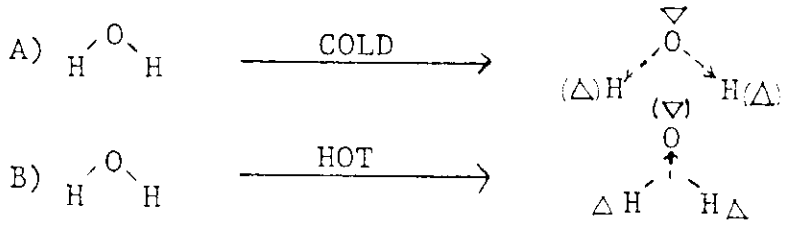
F)

This is such a simple question, a child of seven or eight years should be able to figure out the answer very quickly. Yet it took scientists 60 years to figure out the structure of water! The result of 60 years and 1000's of scientists work is the version marked in the diagram, (F). This is the structure of water.

Since they don't know yin and yang, they can't explain why this is so. However, we can see that hydrogen is more yang so it naturally goes down; yin oxygen goes up. The two hydrogen atoms can't come too close, though, because they repel each other, so this structure results.

Now if we apply heat, what happens? Which atoms can attract this high temperature? Oxygen. Hydrogen does not react so fast,

as it is already more yang; but the oxygen atom quickly absorbs the heat and becomes more yang. What happens to this structure then? The attraction begins to deteriorate as the oxygen atom begins to repel the hydrogen atoms; the molecule becomes larger and the water's total volume expands. Now, if we apply cold, the yin oxygen does not react so quickly; but the hydrogen atoms becomes more yin quickly. Again, the molecule's attraction deteriorates, and the water begins to expand.



You can see this mechanism very easily, right? In this way, using yin and yang, we can solve many technical and scientific riddles; let's see some other examples.

THE DELUSIONS OF SCIENCE

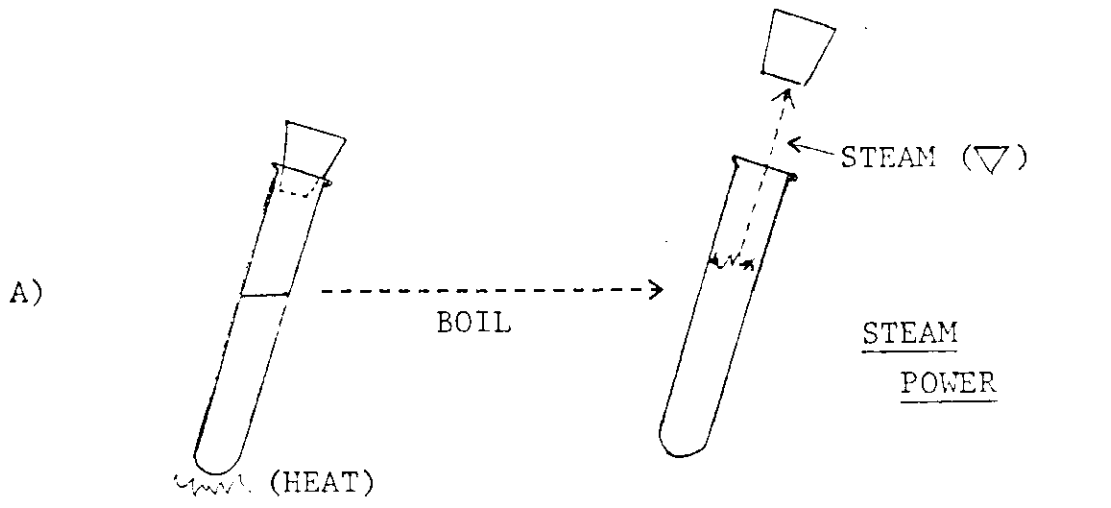
Does anybody know who discovered the steam engine? James Watt. One day he was sitting in the kitchen and was watching a kettle of water begin to boil; he saw the lid moving up and down, and started to think, "If we use this steam as an applied force, we can generate tremendous power." This thinking led to the invention of the steam engine and all its contributions to industry.

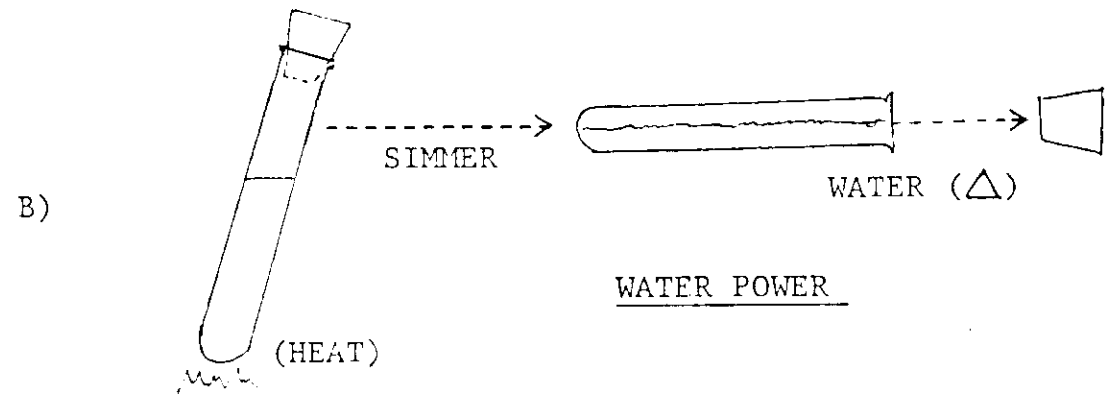
However, if James Watt had known yin and yang, he could have made a far greater contribution to industry. Which is more yang, water or steam? The water in his tea kettle was more yang, particularly at the bottom of the kettle. He was only using his senses, so he observed the steam's action, and he simply imitated that. If he had used our magic spectacles, he would have paid attention to this more yang part.

This steam is already more diffused, more inefficient; the water part has much greater power - that part we should use. You can try this at home.

Go to the drugstore and buy a test tube. Fill it part way with water and put a cork on it. Then heat it with a candle or gas burner. After several minutes, when it begins to boil, the steam will blow the cork off. This confirms James Watts principle of steam power.

Now refill and recork the tube and apply heat again. This time, though, when the water is just at simmering stage, before it begins to boil, turn the tube onto its side. The more yang water will blow off the cork.





thing like the basic octave of the musical scale. As you can see, some are more yin and some are more yang. Among them, helium, lithium, beryllium, and boron are not found so much on the earth's surface; but hydrogen, oxygen, carbon, and nitrogen are found in abundance. Within these four, hydrogen and carbon form a more yang group; nitrogen and oxygen form a more yin group. As you can imagine, these four can very easily combine chemically.

When hydrogen, carbon and oxygen combine chemically, what is result? Carbohydrate. When these three combine chemically with nitrogen, what results? Protein. Vitamins and enzymes belong to which group? Also protein. Now, how did all these different elements arise? By your common sense, you can see that nature's more than one hundred different elements could not have suddenly appeared, one by one - one day oxygen, one day nitrogen, one day platinum, etc. No, they must be linked together by some continual process.

This is like an evolutionary continuum. When we see a fish and a human being, they appear very different; but we know that a connection is there, they are both part of one evolutionary chain. In the same way, one process must be linking between hydrogen and iron, between nitrogen and gold, or silicon and sodium. That evolution of elements, science has not yet explained, because they believe one element cannot change into another within natural conditions.

In scientific terms, this changing process is totally different from chemical combination - as in carbohydrates - when two or more atoms mix together but each retains its own nature as hydrogen, carbon, etc. - or from transformation of state, such as solid to liquid to gas, etc. In this evolutionary process, two elements overlap, merge their electrons into a single set of orbits and become a totally different element. This is called

transmutation. According to modern physics, transmutation can only occur in conditions of very high temperature, very high pressure and intensive energy, such as the conditions created artificially in a cyclotron or atomic reactor. But common sense tells us this must have been going on naturally when this earth or this solar system were being created. Let's look at these first basic elements, and trace their evolution.

Hydrogen is the number one basic element; one proton plus one electron. This is the original form energy takes when it evolves from a more vibrational state towards more condensed energetic "particles" (which in reality are simply very compact "clouds" or spirals of energy.) Hydrogen's atomic number (number of electrons or peripheral "particles") is 1; it's atomic weight (generally corresponding to the number of "particles" in the nucleus or central region, including protons and neutrons) is also 1; one proton.

Then hydrogen$^{1}_{1}$ combines with "heavy" hydrogen, an isotope which contains two neutrons as well as one proton, or H^{1}_{3}, to create helium; $H^{1}_{1} + H^{1}_{3} = He^{2}_{4}$.

Then how does lithium arise? One helium plus one heavy hydrogen; $He^{2}_{4} + H^{1}_{3} = Li^{3}_{7}$. Then lithium combines with one semi-heavy hydrogen (having one neutron) to make beryllium; $Li^{3}_{7} + H^{1}_{2} = Be^{4}_{9}$. Then further processes go: $He^{2}_{4} + Li^{3}_{7} = B^{5}_{11}$, or boron, or alternatively, $Be^{4}_{9} + H^{1}_{2} = B^{5}_{11}$. Then carbon; $B^{5}_{11} + H^{1}_{1} = C^{6}_{12}$; then nitrogen; $C^{6}_{12} + H^{1}_{2} = N^{7}_{14}$. Oxygen; $N^{7}_{14} + H^{1}_{2} = O^{8}_{16}$, or $C^{6}_{12} + He^{2}_{4} = O^{8}_{16}$.

As you can see, as the elements get heavier and more complex there are several possible roots or originating processes possible; each of these different ways creates a slightly different quality of oxygen, or boron, etc. Then this type of evolution continues

You can see that the steam engine is absolutely a waste of energy. It requires much more heating time, more fuel, and gives off less power than our method. If you design a method of applying the power of the more yang part of water, you can create a much more efficient, stronger machine. The person who knows yin and yang can always invent more efficient technologies.

Nearly all of modern science's theories and inventions are tremendously inefficient, because they are created out of mechanical thinking and do not understand yin and yang. Sometimes, these inventions can be disastrous.

For example, Newton was sitting under a tree, according to the famous story. (The story doesn't say with whom he was sitting, perhaps his girlfriend.) When he saw an apple fall, he thought, aha, maybe the earth is pulling on that apple. This was the beginning of the theory of gravity.

But this idea ran directly counter to religion, which believed God created the earth. If Newton had stood far away, he might have thought, no, maybe the heavens are pushing the apple down. Heaven's force is actually pushing apples and other objects to the earths's surface, and is also pushing the earth itself, as well as all other planets, around the sun in spirals. "God created the earth" means: from the periphery, or from infinity, heaven's force created all material phenomena by pushing in.

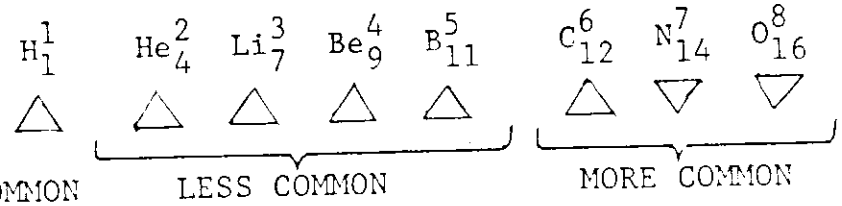
But Newton didn't think that way. He thought that everything has a center, like the earth, and this center is pulling everything else towards it. This idea corresponds to materialism, the idea of pulling many material objects into one's own orbit and accumulating them. Newton's theory of gravity provided scientific support for various forms of behavior, such as egoism and individualism, as well as materialism; and further such social ideas

as independent national sovereignty. This superstitious view also separated people from their intuitive awareness of God, or infinity, as our universal source of life, energy and matter; so church and science split apart. Ideologically speaking, Newton's way of thinking as he observed that falling apple became crime number one - selfishness, or arrogance, or you may say ignorance of infinity or God.

If you carefully examine all our modern scientific "laws," discoveries, technologies, and so forth, one by one, you find something very interesting. Most of them - not all, but most - are wrong. Most are superstitious, baseless assumptions, and will all naturally be changed or discarded, ten, fifty, or one hundred years from now.

For example, medicine. Suppose in 1980, perhaps one or two thousand new medicines are invented. In five years, already 95% of them will be gone - they will be found dangerous or ineffective and will be replaced by new medicines and thrown out. Then in several years, those replacements too will be thrown out. This all wastes such tremendous amounts of energy, power, money, time and ideas; and it is not helping humanity at all. But by using our magic spectacles, our understanding of the spiral of yin and yang, we can create a scientific revolution of common sense. This as you know, is already going on in medicine; now, let us further study the transmutation of elements.

EVOLUTION OF THE ELEMENTS



These first eight elements are nature's basic elements, some-

PERIODIC TABLE OF THE ELEMENTS

1 H 1.008																	2 He 4.003
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.011	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.90	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.71	29 Cu 63.55	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc 98.91	44 Ru 101.07	45 Rh 102.91	46 Pd 106.4	47 Ag 107.87	48 Cd 112.40	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.90	54 Xe 131.30
55 Cs 132.91	56 Ba 137.34	57 La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.22	78 Pt 195.09	79 Au 196.97	80 Hg 200.59	81 Tl 204.37	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra 226.03	89 Ac (227)	104 (Rf) (261)	105 (Ha) (262)	106												

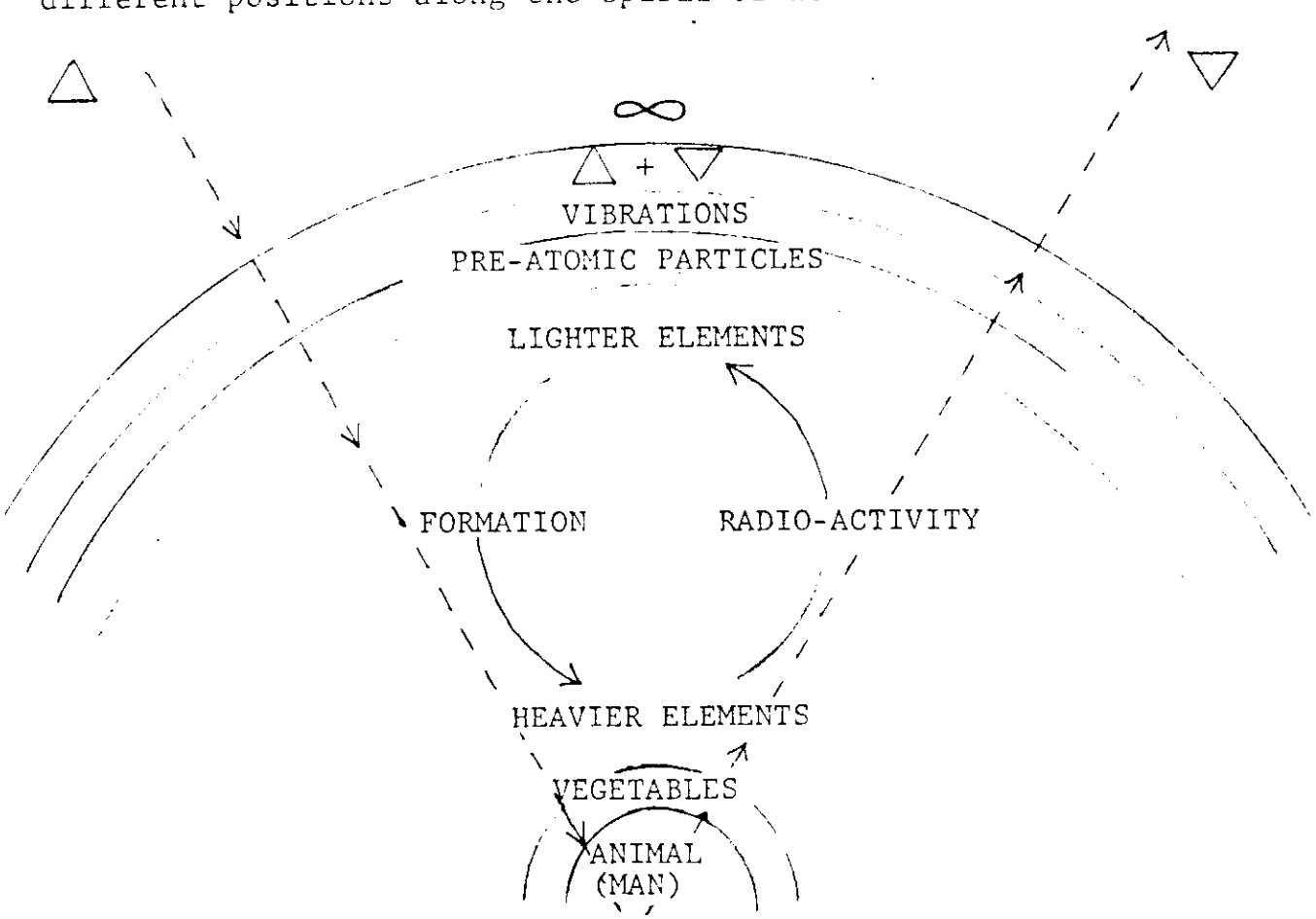
Lanthanides	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.4	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97
Actinides	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np 237.05	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (249)	98 Cf (249)	99 Es (254)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (260)

(available radioactive isotope of longest half-life)

This is taken from a book by Andrew Streitwieser Jr., and Clayton H. Heathcock. Introduction to Organic Chemistry. Macmillan Publishing Co., Inc - 866 Third Ave., New York, NY 10022, 1976.

after these initial eight, in "higher octaves" so to speak, until we arrive at very heavy elements like lead, gold and so forth.

Meanwhile as we go towards the more central part of this spiral, we can imagine that the reverse should also be taking place: yang always changes back into yin, right? So as we reach the very heavy elements with atomic weights like 200, 230 and so on, such as radium and uranium, what kind of character arises? Radioactivity: heavier elements changing back into lighter elements. So although present day physics has a very rigid, fixed view, saying that elements cannot change into other elements without very violent circumstances, we can see that all elements are constantly changing back and forth, not only in different chemical combinations and different states of matter, but also in different positions along the spiral of atomic evolution.



UNIVERSAL PROCESS OF ATOMIC EVOLUTION

Now, under what circumstances does this transmutation naturally occur? First we know that the two elements should be complementary; one more yin and one more yang, right? Furthermore, in order to do fusion, this central nucleus part should become more fragile, in a more plasmic state. In this state they are more flexibly adaptable; then if one is yin and the other is yang, fusion can occur. You can picture two big galaxies swerving towards each other; one is spiralling clockwise, the other is spiralling counter-clockwise. They come closer and closer and then - Baaaaaa, fusion!

Same thing like sex, one person's energy spiralling clockwise and one spiralling counterclockwise; then they become closer and closer, and heat up more intensely to something like a very energetic plasmic state and - Baaaaaa, again, fusion! So transmutation of elements is the same process which is creating new human life, new DNA, out of two existing ones.

THE DISCOVERY OF TRANSMUTATION

About 17 years ago, when I was still in New York, I was lecturing every week, and Mr. Ohsawa was coming nearly every year to America to lecture for one week or ten days. One summer, after his lecture we were eating in a macrobiotic restaurant in New York, and some American friends brought a newspaper clipping. It said that Dr. Louis Kervran in France had presented the idea that sodium and potassium were changing into each other under certain natural conditions; this meant, of course, transmutation.

We thought, of course, that is natural; but anyway, for modern science to recognize this is a very big event. That means science has discovered that the material world is not absolute, but ephemeral. In our macrobiotic cosmology, our number one principle is that everything is constantly changing. For modern science which is so rigid, to have discovered this is a really

great event.

Soon afterward, Mr. Ohsawa was lecturing in Paris, talking about health and so forth, and he began to talk about Professor Kervran's discovery and what significance it had in terms of our cosmology of yin and yang. After the lecture many people came up to say hello; finally, an old gentleman, standing behind everyone else, came to shake hands with Mr. Ohsawa, and said, "I am Dr. Kervran."

Mr. Ohsawa was so happy! Then they made an appointment, and two or three days later met to exchange ideas. Prof. Kervran did not have any books at that time and he was facing much criticism and opposition from his colleagues and other scientists; so Mr. Ohsawa encouraged him - "Why don't you write a book?" He was very encouraged and wrote his first book, Transmutations Biologique, or Biological Transmutations.

In this book, he described the circumstances of his discovery. He was working as a doctor for the French government in a construction project in the Sahara desert. In order to control the worker's health, he was every day checking and analyzing what they ate and what they discharged. Then, he discovered something very strange; for some elements, the volume discharged was not equal to what was consumed. Some elements were discharged more than consumed, and some less. Then very wisely, he picked out two major elements for studying this discrepancy; sodium and potassium.

In the macrobiotic view, among all minerals, the sodium/potassium ratio is a key issue. This was discovered about one hundred years ago by George Ohsawa's teacher, Dr. Ishizuka Sagen. He presented these two minerals as a critical complementary and antagonistic functioning force in the body, and maintained that

if Na and K are within a certain general ratio, the body is healthy. If this ratio becomes too far off, sickness arises; he established the ideal Na/K ratio as about 1:5.

Dr. Ishizuka already used the terminology of yin and yang to explain this mechanism, because yin and yang was still at that time a common traditional way of thinking for Oriental people. Mr. Ohsawa then developed this further, and proved it extensively. Since then, I have modified and extended this concept, as you can read in the Book of Macrobiotics. The reason is, we need a more adaptable method we can apply to the whole world. For example, if you go to a very cold region like Alaska or Iceland, this should be more like one versus five; if you go to a very hot, tropical climate, then it should be more like one versus nine or ten. So this ratio is generally one versus five to one versus ten; average is about one versus seven. .This also correlates with our cosmological understanding: heaven's force is presently about seven times greater than earth's force.

At the same time, not only sodium and potassium but various other yin elements and yang are also making balance in our bodies. So I have made it a little more clear; the yin group of elements as a whole, as represented by potassium, and the yang group of elements as a whole, as represented by sodium, are making balance generally according to this flexible ratio, averaging about one versus seven. (This idea is presented in more detail in the Teachings of Michio Kushi, Volume III, in the supplement.)

Anyway, Dr. Kervran discovered that the workers were taking certain volumes of sodium and potassium, but eliminating less sodium and more potassium. After rechecking all his data, he came to a conclusion; sodium must be changing into potassium within the body. Somehow, with very low temperatures, low pressure and low energy supply, transmutation must be taking place. How?

Please check the atomic number and weight of Na and K in the charts; what element is needed for this process? $K^{19}_{39} - Na^{11}_{23} = O^{8}_{16}$. Oxygen, coming from the air we breathe, combining with sodium from salt and certain foods, must be transmuting into potassium. In other words, taking yang (Na) yet creating or discharging yin (K). How was this possible?

1) Everyday they were working hard, so energy level was high.
2) With hard work, body metabolism and breathing were also high.
3) Since they were perspiring, they were taking salt tablets, (sodium).
4) In order to accelerate transmutation, we also need higher temperature - they were working hard under the hot Sahara sun.

Many macrobiotic friends are thinking, well, I can eat plenty and transmute whatever I eat while lying on the couch. It doesn't happen. You need to be active, physically and mentally, for this process to go on smoothly and actively.

Where do you think this transmutation occurs - in the blood, in the lungs, liver, intestines, brains, all over the body? I leave this question for you to figure out.

Then both Mr. Ohsawa and Prof. Kervran wanted to begin testing, to prove this process by experimentation. But neither of them were mechanical technicians; so Mr. Ohsawa began to look for a chemist who could help them. He recalled back to when he was living in Paris, eating brown rice and vegetables (and hard brick-type of bread) and studying at the Sorbonne. At that time he had a good friend who later became a brilliant chemist and was employed by Dupont. His name was Dr. Henoff.

Dr. Henoff was born in Breton, of Celtic descent. Breton as annexed to France many years ago, but many Celtic descendants in Breton still wanted to have independance. While Dr. Henoff was working as a chemist, he also became very involved in this independance movement, even becoming an important leader.

One day, before World War II, there was a big celebration in Paris of the anniversary of the annexation of Breton. It was a very big festive celebration with music and costumes, and many famous people giving speeches, and so forth. Then suddenly the central platform exploded - Baaaagh!

Dr. Henoff and his friends had put a bomb there! He was chief of the invention department where he worked. Soon afterward, he was caught and jailed; but with his friends' help, he escaped from jail and fled to Germany.

Several years later, World War II began. As the Nazis' so called March Army marched on France, Dr. Henoff and his friends organized their own independant troops to march on Paris, to fight for the liberation of Breton. Later, when Naziism was destroyed, Henoff escaped to Ireland and moved to the remote countryside where he changed his name.

When Mr. Ohsawa tried to find him it took about one year; but he finally located him. They flew together to this country and stayed in my home in New York. For six months, Dr. Henoff worked everyday on translating the manuscript of Dr. Kervran's book; and every day, we talked with him about how to make our transmutation experiments.

Then Dr. Henoff and Mr. Ohsawa went back to Japan, and continued trying to figure out how to design the technology; but he still couldn't do it. Meanwhile a young, macrobiotic,

Japanese girl was helping him; and soon, not element's fusion but human fusion came about! (Henoff was about 50 years old.) Then he told Mr. Ohsawa, "OK, time has passed, I cannot discover how to do this experiment, I'd like to marry this girl and take her back to Europe." George Ohsawa scratched his head and said, "OK, fine," and they left.

Then George Ohsawa wrote to me and said, "Now from today I go on number seven diet until I discover solution." I don't know if he really went on number seven or not - but I sent back a letter saying "Bravo!"

Then two weeks later, I got a special delivery letter marked "URGENT!" It said, "I have discovered a way to do it!" Here is the story:

While he was asleep at night, he saw a dream. From the darkness of heaven a big hand stretched out; every time it stretched out, thunder and lightning shot out from it's fingers. While this was happening, on the surface of the earth, various elements began to arise, creating the beginnings of life.

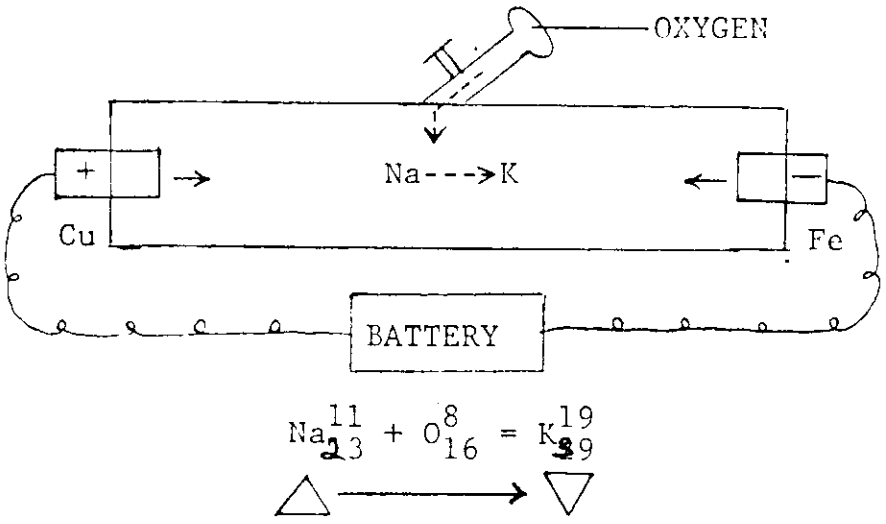
The next morning he called some Japanese scientist friends, who were professors at a university, and asked for their collaboration to make some very simple equipment for an experiment. This is what they made:

You already learned: infinity---yin and yang---vibrations---pre-atomic particles (like protons and electrons)---elements---plants---animals and man. In order to make elements, we must duplicate the first several steps of this process. So practically speaking, for infinity they used vaccuum, a vaccuum tube. Yin and yang were two electrical poles, a plus terminal and a minus terminal. Vibrations: electrical current. Then inside they put

sodium, and attached a valve to let in air (oxygen) at the right time. They set up this equipment, using copper and iron for the yin and yang electrodes, and put a spectroscope prism and screen in front to monitor the experiment. They finished about midnight, and planned to return the next day to see how it would work.

That night, the professor whose laboratory they used became so curious, he could not wait until the next day. So, he went in and began. He applied electricity to the sodium for 20 or 30 minutes, until it became very hot and expanded. Finally, a clear band of orange appeared on the screen. Then he released the valve and let the oxygen enter - the screen went black, and then the next moment a band of pure blue appeared - potassium!

He was shocked! Immediately he called Mr. Ohsawa - "It seems we did it!" So the next morning, Mr. Ohsawa and the other scientists went to the laboratory and repeated the experiment - and again, the orange band disappeared for a moment, then blue appeared. To make sure, they ran complete analysis on this new element, and found it was in fact potassium.



TRANSMUTATION OF SODIUM TO POTASSIUM

THE SOCIAL APPLICATION OF TRANSMUTATION

Now, the theoretical part was proven; but the technological part, that means the way to practically apply this process on a large scale for society, this was not there yet. We needed to figure out how to produce on a massive scale.

Potassium is being used as what? Fertilizer. At that time, one pound of potassium cost about $23.00. Today it may cost about $70.00 or so. It is quite expensive, in other words. Sodium and oxygen are freely available from the ocean and the air, in virtually unlimited supply. I calculated at that time, it would cost us about 3¢ per pound to produce potassium, after the initial cost of setting up the equipment. We could sell it for 20¢ a pound - more than one hundred times less than the current price - and still make a big profit! Then, the potassium industry would quickly collapse.

Then we needed to decide, should we try to industrialize and do this ourselves, or offer it to some government, or to some existing industry. That question George Ohsawa gave me as homework.

Then when he next came to visit (I had moved to the Boston area by this time), we reached the conclusion that our main purpose was to change the world of human spiritual, psychological and physical health. If we got involved with this project it might take us full time work for many years.

So, we decided to offer it to some industry, for some kind of royalty. Mr. Ohsawa said, "Yes, we can ask for one million dollars advance payment, and then some annual percentage as royalty. That will make our macrobiotic movement strong. Suppose, Michio, if we got one million in advance, what would you do with

it?" So I said, "Let's see...maybe I will set up a school, or maybe a foundation." He said, "That's good, but let's buy a newspaper company, like the New York Times. That's very good, OK; but to whom shall we offer the project?"

Again, that was my homework, so I wrote to all the big chemical companies and made appointments, one by one to see them. Most of them, like Monsanto and Union Carbide, could not believe it. Meanwhile, I also wrote a letter to the White House. They wrote back, "We are not interested in securing the rights to this, why don't you go ahead and get patent?"

Then some company, which we will call F, became very interested, and negotiations began. The day before we were to meet with them, Mr. Ohsawa said to me, "This formula is so simple, how will we present it to them? When we explain it, they will know everything. So, let's tell them everything, but then tell them they need all this - plus alpha!" I said, "What is alpha?" And he said, "You know! Yin and yang, but we should call it a special agent to make it as industrial as possible." I was frankly not convinced, but said OK.

The next day, we went to the conference and met with about ten directors, doctors, and the Vice President of F. Mr. Ohsawa asked them, "Do you know what is the most important book in China?" They were a little confused - most important book in China?! Then he told them, "I Ching," and began explaining everything about the experiment, and I explained when they couldn't understand him. I added all details, and then he said, "However, we also need plus alpha as an agent, as catalyst." They all nodded solemnly to each other; I though I would pass out, trying to keep from laughing.

Then Mr. Ohsawa returned to Japan, and I began to work out

all arrangements with them - laboratory facilities, funds, staff, factory etc. George Ohsawa or I would supervise, and so forth. And I notified George that we were ready to begin. But he started then to wonder, should we disclose this or not? Maybe not yet. So he wrote, "Urgent, Michio, let's wait; the time has not yet come." They were very disappointed, but we did not proceed.

Meanwhile, with Prof, Kervran, we started to think, "Let's not be limited to this one experiment, let's do others." We can now change all agricultural orientation, how can we change industry's orientation? What is the key element? Iron, the base of steel, which is the base of industry. Now let's make steel by atomic transmutation.

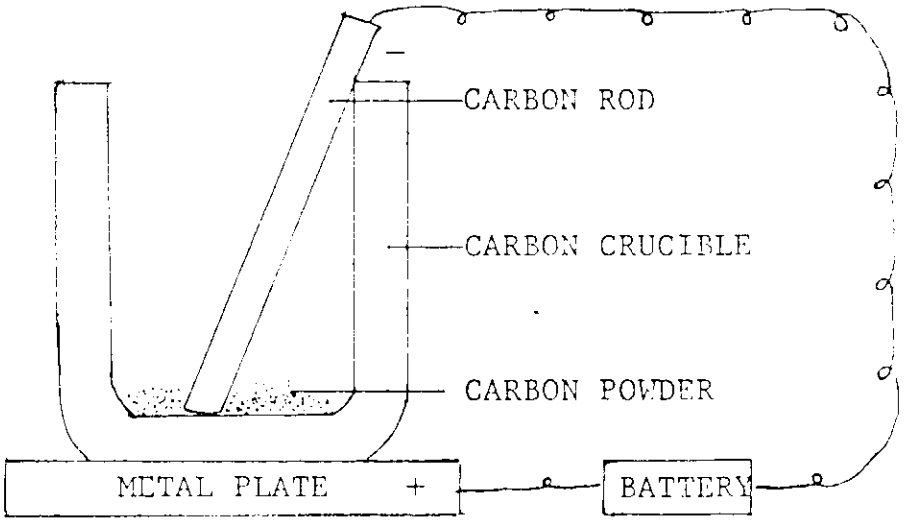
Please check the atomic number and atomic weight of iron: Fe_{56}^{26}. We already know, our first eight elements are the basis of all others; all others can be made by these eight. Among them, carbon and oxygen are most complementary; this is how practically all the heavier elements come out. Of course, other light elements are also combining, but carbon and oxygen is the most basic combination.

Suppose we combine one carbon and one oxygen, what is the result? $C_{12}^{6} + O_{16}^{8} = Si_{28}^{14}$, silicon. Because this bond is so strong, silicon is a very hard, strong element. Then suppose we combine two carbon and two oxygen: $C_{12}^{6} + C_{12}^{6} + O_{16}^{8} + O_{16}^{8} = X_{56}^{28}$. What is this X? Atomic weight 56 is iron, right? Atomic number, i.e., the number of electrons, is 28, that is nickel, right? Cobalt is in between: Fe_{56}^{26}, Co_{59}^{27}, Ni_{59}^{28}. So, generally, 2 C + 2 O is creating this iron-cobalt-nickel group. From X_{56}^{28}, two electrons must fly out, then making iron.

Then we set up another experiment, using only carbon and oxygen; we used a carbon rod as one electrode, with carbon powder,

standing on a metal table as the other electrode, then let electricity pass through and air combine.

We found that iron, cobalt and nickel all came out, furthermore, many other elements also came out! From the air, also nitrogen was combining, hydrogen was combining, and different combinations of oxygen were combining, etc.



$$2\ C_{12}^{6} + 2\ O_{16}^{8} = X_{56}^{28} = Fe_{56}^{26},\ Co_{59}^{27},\ Ni_{59}^{28}$$

So in order to make good steel, we must make very exact conditions, just so much voltage or ampere, and so forth, all technical considerations. But these are minor problems; any of you can experiment a little, and work out solutions.

Then all complicated mining and refining operations would become unnecessary. Again, steel would become very cheap, maybe 1% of the present cost. Also, present day steel rusts very easily; you know big steel ships sitting in the harbor, must be constantly scraped and repainted, meanwhile, all the rust is contaminating the water.

But very strangely, if we make iron this way, bonding two carbon and two oxygen, this is very strong; it does not take any additional oxygen, so it doesn't rust.

They have discovered in India and also in Bonn, iron poles standing 1½ meters out of the ground and 25 meters into the ground. These poles never rust. Local legends say they were built a long time ago; and nobody knows their purpose. So we know that already in ancient times people were practicing the transmutation of steel. Now, we need only work out technical problems for how to make massive application.

Then we have established the way to change agriculture and the way to change industry -- now what is the next area? Economics: the gold standard. How can we make gold?

Again we began experimenting. Already, when we had done the sodium/potassium experiment, there came out a small glittering object. We sent it to the laboratory for analysis, and they said, "This is platinum, no, no, we were wrong. This is gold." In other words, we had accidentally made gold. How?

Please calculate the total of atomic weights from all the pieces of equipment involved: oxygen, copper and iron (for the electrodes), sodium and potassium: O^{8}_{16}, Cu^{29}_{64}, Fe^{26}_{56}, Na^{11}_{23}, K^{19}_{39} = atomic weight 197 - this is very close to gold: Au_{197}. In other words, some minute part of the electrodes must have been melted into plasma, and combined together with oxygen, sodium and potassium, to make gold, because all of these elements have such strong complementary/antagonistic natures.

However, if we can make gold but it is very expensive, it is of no use. To totally change economic conditions, we must find a way to make gold that anyone can use, anywhere. So we need to

calculate the costs of mass production methods, and possibly experiment with several different ways.

In the Orient there are stories of ancient macrobiotic men called Sen Nin; they were living in the mountains and developing their cosmological consciousness and the realization of their health, longevity and physical, mental and spiritual freedom. Perhaps you've seen pictures of wise, old men with large beards and strong eyes - have you see The Empire Strikes Back? Something like Yoda - wise old men with unusual powers.

These legends also say that these men made gold. Their school of instruction had four stages:

1) Self Mastery;
2) Longevity - not only 78 years, but 100, 200, 300 years longevity and health;
3) Education - talking to people, spreading ideas and writings, etc.;
4) Alchemy.

When they discovered the way to make gold, they were then graduates.

Of course, there was no university or actual school for learning these things. The mountain itself was their school; so they lived in the mountains for many years, eating buckwheat, tree bark and wild grasses; meditating, exercising and gradually figuring out and mastering all these levels.

According to legend, they made gold from mercury. Mercury is the next element after gold, with atomic weight 200. How could they know this - that a silver semi-solid/semi-liquid and a soft yellow metal were so close on the periodic table?

Unlike all the methods we had tried so far, this ancient method must have been not adding elements together, but subtract-

ing one heavy hydrogen from mercury: $Hg^{80}_{200} - H^{1}_{3} = Au^{79}_{197}$. The last time Mr. Ohsawa visited America, when he was 78, he said, "Michio, we must discover this deduction method." He died soon after that.

Since then, I have studied these three charts and tried to find this method. Then, when I made the next experimentation, gold came out. All the secrets are in these charts. Now the only remaining problem is how to make mass production. For your homework, as students of macrobiotics, I would like to have you think how to make gold or platinum from the lighter elements. This is a good challenge for thinking in terms of yin and yang.

TRANSMUTATION OF SOCIETY

The Sen Nin, when they mastered such problems, did not attach to these solutions; they didn't tell anyone else, or write it down, but let such things be forgotten again. For them, such things were just training in understanding of the material world, as self-development.

But now, we may need such things as how to make gold, together with potassium and steel, to create a new material revolution, to contribute to the complete change of our whole material civilization. If so, we must do this within the next ten years - then, we may be able to prevent a destructive World War, because war is depending on the present gold standard, present steel industry, present agricultural systems, and so forth. If all that ground collapses, our entire industrial and economic system would collapse. Then there would be no more capitalism, no more communism, and a new type of civilization would have to begin. This will be a very great re-orientation.

Then suppose in the future, as we discover ways to make steel

from the air, from the ocean or the soil, then we can further go, without using air or ocean or soil. The lighter element's origin is what? Energy and vibration; so, using only vibrations and waves, without using hydrogen or carbon or whatever, we can make these materials.

Then, that world would become what we can call a spiritual civilization. At that time, we can say, mankind will really begin to develop - physically, mentally and spiritually - because we would at that time have the capacity to control the material world, freely playing with it by our image or spirit alone.

How many years will these developments take - ten, twenty, thirty years? We don't know, but definitely, the people who can achieve this will be the people who can understand yin and yang, just as the ancient macrobiotic Sen Nin did.

Definitely, whether by all our efforts together or by only one or two people's huge efforts, we will break through the rigid barriers of modern scientific thinking and technology, and change this vast civilization, and redirect it towards a truly spiritual humanity.

Meanwhile, your homework is, by playing around with plus and minus factors, yin and yang thinking, try to figure out how to make gold or platinum. For now, just the theory is okay; but soon, we may decide to actually do it.

SUPPLEMENT
NOTES ON TRANSMUTATION

(The following passages are excerpted from Mr. Kushi's articles appearing during 1971 in the Teachings of Michio Kushi, Volume III, originally appearing in the Order of the Universe magazine. They have been compiled and reprinted here as supplemental study material for the topic of this issue of the Study Guide.)

ONE VERSUS SEVEN

In the body are a number of minerals which combine to form salts.

YANG MINERALS	+ YIN ELEMENTS	+ COMBINE TO FORM
Na	Cl	Chlorides
K	CO_2	Carbonates
Ca	S	Sulfates
Mg	P	Phosphates
Fe		

These are never found alone, but only as ionized compounds. In fact they may be poisonous to our system as free elements. The most common of these salts is the unrefined sea salt that we use in cooking. When this is roasted, its undesirable chloride elements (yin) are driven off.

Among the yang minerals, there are varying degrees of yin and yang. Na and Mg are yang, while K, Ca, and Fe are more yin. These minerals represent approximately 3.5% of the body and may be divided this way:

Ca-2%; P-1%; S-0.25%; Cl-0.15%; Mg-0.05%; Fe-0.004%;

others-0.0046%.

While the ratio of Na and K in the blood should be maintained at about 1:7, the body as a whole contains 0.15% sodium and 0.35% potassium, the total being 0.50%.

$$\frac{\text{Other minerals}}{\text{Na + K}} = \frac{3.5}{0.5} = \frac{7}{1}$$

Besides the minerals the body is comprised of fats (13%), proteins (16%), or roughly 30% in total. The percentage of carbohydrates is so low because they are quickly and easily burned to produce energy for our activity. Once again we see the ratio of 7:1:

$$\frac{\text{Carbohydrates, Fat, Protein}}{\text{Minerals}} = \frac{29.61}{4.5} = \frac{7}{1}$$

It is more difficult to ascertain the ratio of the solid matter to the liquid, or water, found in the body. Bodies analyzed after death are dehydrated; thus present day scientists are not in total agreement about the figure. Some say as little as 55% is water while others maintain that it is as high as 98%. Our thinking is something like this:

Water within the cells	60%
Water outside the cells	17%
Blood plasma	8%
	85%

Solid matter should constitute the remaining 15%. How do we arrive at this figure? Although the earth is three-fourths ocean and one-fourth land, it is clear that much of the land surface is covered with water, or is at least moist. It is the same in con-

sidering a living body. If we eat regular meals, we produce eight or more liters of digestive juices. The food that we eat also contains water; including tea this might amount to another two or three liters. Therefore, the digestive tract contains something like ten to twelve liters, from which our body fluids and cells are created.

Another way to calculate the body's water content might be based upon the simplest diet consisting almost entirely of brown rice. One hundred grams of rice contains 15 grams of water. Of the remaining 85 grams, 73 grams is carbohydrate. If one's digestion and metabolism is good, he can change almost 60 to 65 grams of this into water:

$$\underset{\text{(Glucose)}}{\text{Simple sugar}} + \text{Oxygen} = \text{Carbon Dioxide} + \text{Water} + \text{Energy}$$

The actual total of water available from brown rice then is about 75 grams (which is 15 plus 60). The rice cooks in 1½ or 2 volumes of water, so the final ratio of water to solid is:

$$\frac{\text{112-150 Grams Water}}{\text{25 Grams Other}} = \text{Nearly 7:1}$$

The same 7:1 ratio is true of our gaseous food, the air. It is difficult to measure the volume of oxygen necessary for the body, for it varies according to our activity. Every cell of our body is a small, primary living creation, and each one needs plenty of oxygen; generally speaking we require about 250 cc per minute. The blood stream which carried oxygenated blood has a capacity of about 1000 cc; thus we can go four minutes without breathing. In a normal, relaxed condition we require, per day:

250cc x 60 Min. x 24 Hours = 358,000 - 440,000cc

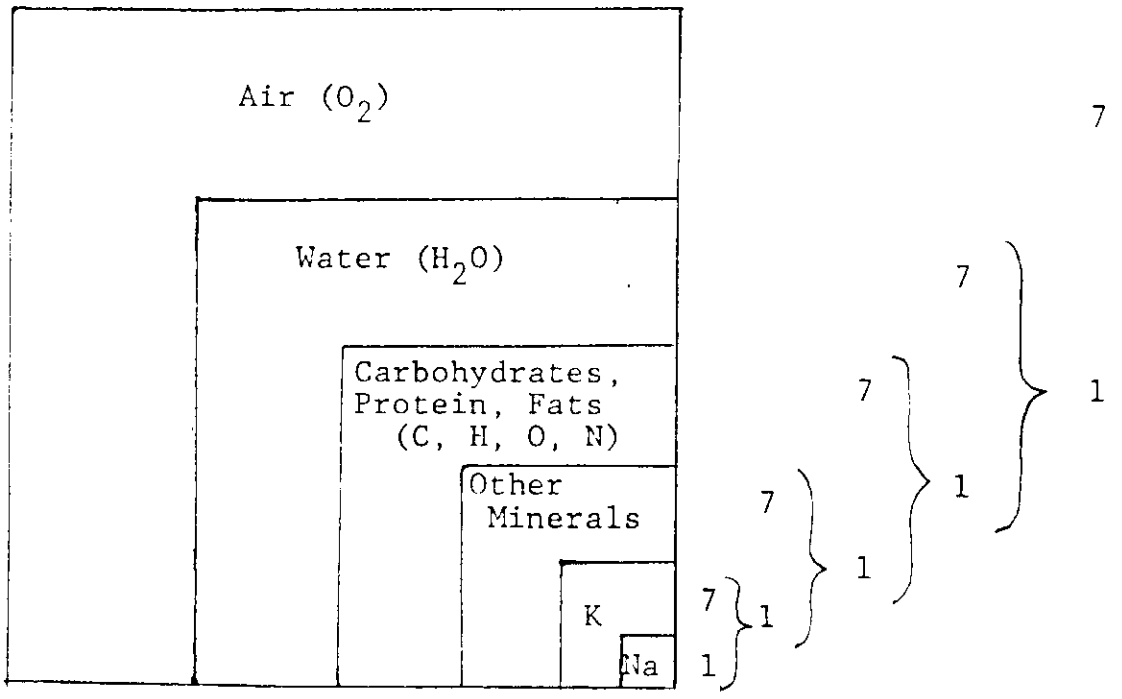
(This may be reduced to 440 litres.) The average body weight is 60 kilograms, or 60 liters.

$$\frac{\text{Oxygen}}{\text{Body Weight}} = 360 - 440 \text{ liters} = 6 \text{ Or } 7\text{-}1/3$$

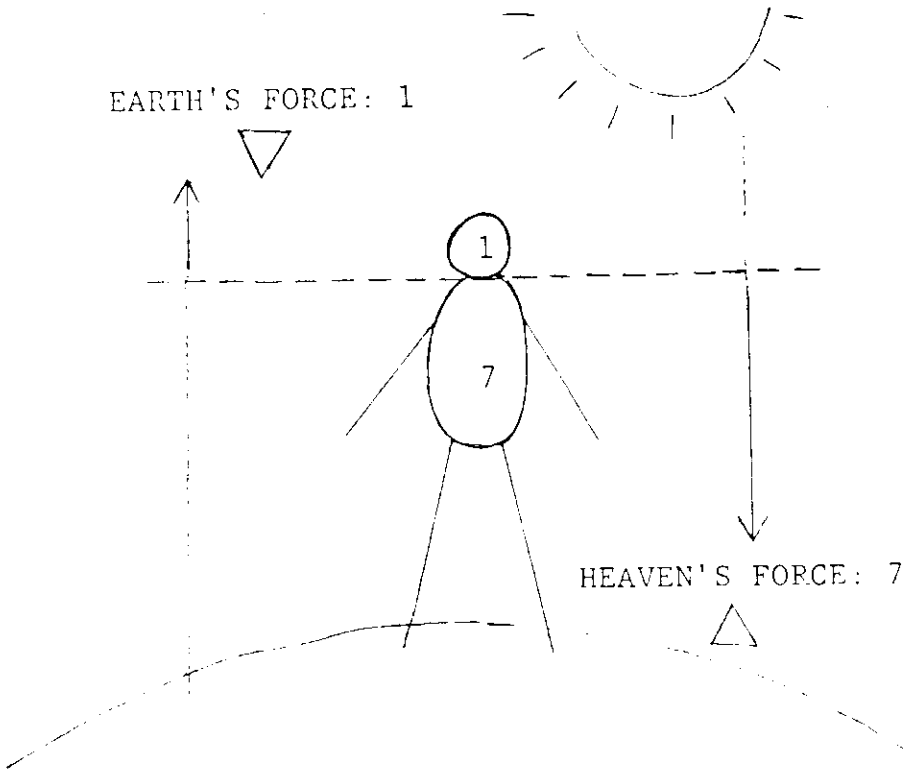
Thus for the person of average activity, the ratio works out to be seven to one:

$$\frac{\text{Food of the Nose}}{\text{Food of the Mouth}} = 7:1$$

This is shown schematically in the figure below.



The origin of "one versus seven" is the force between heaven and earth. (See figure on the next page.)



TRANSMUTATION IN DIET

Using fire is necessary in aiding the transmutation of food into our blood. This process involves, first, ionization by which the speed of electrons is increased and molecules are separated, and second, transmutation or the fusion of atoms. Within the body this transmutation is represented by the change of chlorophyll into hemoglobin, which are, respectively, the essences of the vegetable and animal world. Chlorophyll is green (yin) and hemoglobin, as you know, is red (yang).

Chlorophyll is composed of many atoms: carbon, hydrogen, and oxygen are on the outside and a single atom of magnesium at the center. This molecule has a spirallic motion, but it moves so slowly that science has not been able to detect this structure as yet. Everything in this molecule moves toward the center and is eventually transmutated into magnesium. A molecule of hemoglobin,

on the other hand, has almost exactly the same structure of the peripheral atoms, but at the center is iron. In essence, "animalization" is the change from magnesium to iron.

Interestingly enough, the center of chlorophyll, Mg, is yang, compared to the relatively more yin iron (Fe); nevertheless, chlorophyll as a whole is yin. Similarly, a woman is yin, but her center is actually more yang than man's. Citrus fruit is structured the same way; the pulp is very yin, but the seeds are strong yang. In these examples, there is great yang within, supporting and supported by great yin, and we can say that wherever there is strong yang there is also strong yin.

The change from Mg to Fe requires oxygen, which is yin:

CHLOROPHYLL	HEMOGLOBIN
Atomic Number 12	
Atomic Weight 24	^{Mg} changes into (Fe, Co, Ni) by adding 2 O^{8}_{16}

To make this transmutation into iron, we must use an element strongly antagonistic to oxygen; while magnesium is yang relative to iron, it is insufficiently yang to attract oxygen strongly. Therefore, within the body magnesium is first broken down into two carbon atoms (C^{6}_{12}), which are extremely yang and immediately attract two atoms of oxygen, causing fusion:

$$2\ (C^{6}_{12}) \ +\ 2\ (O^{8}_{16}) \ ---\ (^{28}_{56}Fe,\ Co,\ Ni)$$

Iron, the final product of this transmutation, has an atomic number of 26. The atomic number indicates the number of protons in the nucleus or the number of electrons circulating at the periphery of the atom. The number of electrons is more important in determining the chemical reactivity of any substance. For ex-

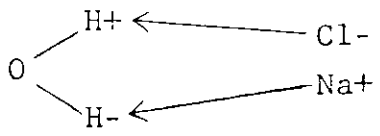
ample, pure sodium is a poison, but if it loses one electron it takes on the ionic form of common table salt, which is not only edible but also necessary for our life. During the transmutation process outlined above, the first product formed is actually nickel, which has the atomic number of 28; nickel rapidly changes into cobalt (27) and finally into iron (26). This change is very rapid, occurring in a fraction of a second. During this change, atomic particles are discharged either as electrons or protons. A single proton is the same thing as a hydrogen ion. (Hydrogen is the simplest of all elements, being composed of only one proton and one electron. When the electron is lost, the resulting proton is the hydrogen ion with a charge of +1. Scientists use the concentration of H+ ions in a solution as a measure of acidity.) To balance the resulting acidity in the body, we should have a bit of salt in our diet, as salt is alkaloid producing. If we take too much salt (yang), we run the risk of creating potassium (K) and the resulting yin condition:

$$Na_{23}^{11} + O_{16}^{8} \text{ ---- } K_{39}^{19}$$

This reaction can actually interfere with the transmutation of iron, especially if we continue eating salt to excess. As a result we feel cold or tired due to poor circulation, and various yin symptoms develop. In trying to counteract this, we mistakenly eat more vegetables or generally overeat, as our desire for physical food greatly increases. It is very easy for a person's salt intake to accidentally become greater and greater, particularly among those who have just begun to change their food habits. By eating primarily grains, seasoned with plenty of salt and tamari, the body begins to contract, but one's mentality simultaneously becomes more yin.

In addition to the right amount of salt, water is also necessary because it accelerates the decomposition fo food. It

serves as a good medium of change because it dissolves many ionic chemical combinations. For example, in NaCl, salt, the loose marriage of sodium and chlorine ions breaks up as the elements arrange themselves at the poles of a water molecule:



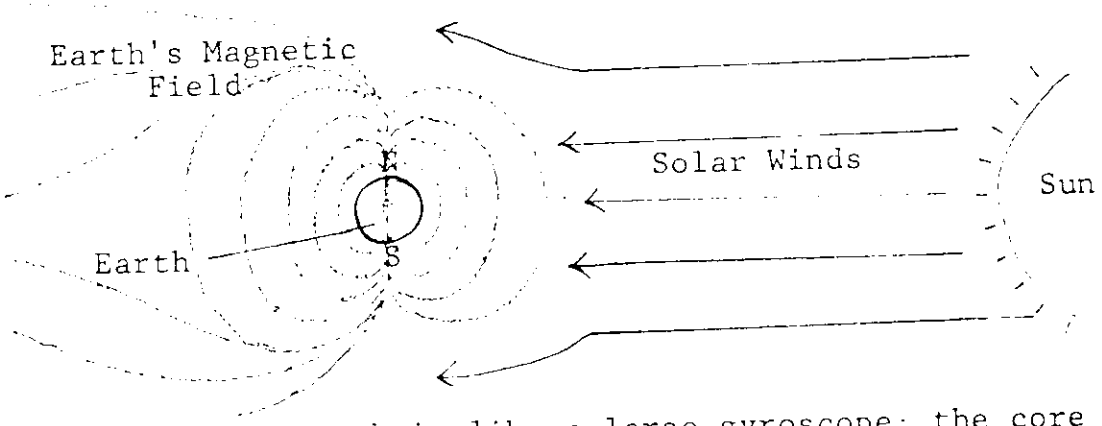
WATER NaCl

In order to assure successful transmutation of magnesium into iron, the magnesium must be yang enough to attract oxygen. To make the original chlorophyll more yang, we use fire when we cook green leafy vegetables. If you eat raw vegetables, you slow down or inhibit the process of transmutation. If we eat raw food, we must employ some yang factor to create balance; food may be salted, or we can get more sunshine and exercise. Animals who eat raw vegetables play around in the sunshine from morning till night. With very few exceptions, they do not sleep during the day; it is this activity that facilitates their transmutation. But modern man is lazy and when he eats raw or otherwise improperly prepared food, he may be unable to create new blood, a state of affairs which leads to malnutrition as well as blood diseases like anemia or leukemia. Thus, cooking is very important, especially for man.

MAGNETISM AND JUDGEMENT

On this earth, iron is one of the few elements that is sensitive to magnetism under normal temperatures (as temperature reaches absolute zero many elements become magnetic.) The invisible world is a magnetic field which constantly changes the infinitesimally small iron molecule on the earth. Between these poles, the

large and small is a current which takes the form of electricity, vibration, or acid/alkaloid. The core of the earth is composed of iron, nickel, and some cobalt, which are the three most magnetic elements. They are in the same family, all having been formed from the transmutation of two carbon and two oxygen atoms. These elements are the cause of the magnetic field, which forms around the periphery of the earth.



As it rotates the earth is like a large gyroscope; the core and the magnetic ocean around it exchange an electric charge. Ultimately speaking, the ocean of the magnet is the Infinite universe.

Within our body is a small quantity of ionized iron, which remains ready to receive magnetic influence. Iron is found mostly in the center of hemoglobin, within our red blood cells. This iron in hemoglobin and Infinity's magnetic ocean charge each other.

Iron is transmuted from two oxygen and two carbon atoms. In the middle of this process is nitrogen:

$$2\ (C^{6}_{12}) \rightarrow \boxed{N^{7}_{14}} \leftarrow 2\ (O^{8}_{16}) = {}^{28}_{56}(Fe, Co, Ni)$$

MAGNETIC ELEMENTS

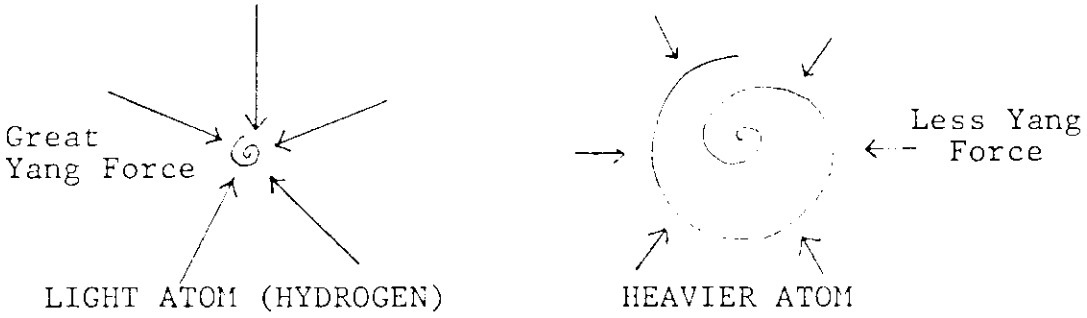
Nitrogen comprises about 70% of the air. The yin and yang elements

of iron are well balanced since both carbon and oxygen have similar weights. Infinity in its entirety is also balanced by the infinitesimally small volume of iron. A charge passes between the two, which we call judgement. This judgement works both ways. Iron in our body is like the needle point of a compass that is pointing north. In the same way the infinitesimal is attracted to the infinite and the infinite to the infinitesimal. When this attraction is in perfect line, we call the resulting condition supreme judgement. At this time our judgement is the judgement of infinity, the judgement of God. This is the real meaning of self-realization. No longer is there yin or yang, because the two are well-balanced. Often the needle does not detect infinity because the iron is ionized too much. The environment of the iron-the other elements in the blood-easily influence the quality of the iron. If iron is not capable of having a magnetic reaction, we may only detect some light, intermediate vibration. At that time, we say we have lost our memory. Now you can see the mechanism of our body and infinity; this is the way that judgement works. "Paradise lost" means loss of the body's magnetic capacity. This Infinite universe, the other pole, has not changed, rather it is we who have become insensitive. If the environment becomes cold, more yin, our food becomes more yang and the iron magnet is more sensitive. On the other hand, warmth makes us more subject to electrifying influences. Electrifying and magnetism are two complementary elements, so that in a cold climate judgement becomes more sharp.

THE SPIRALLIC UNIVERSE

One question occurs to many thinking people when they first study this chart. Why is hydrogen, which is very yang, found in the most peripheral (yin) position? Can you answer this before reading further? (We are referring to the "spectroscopic classification of elements in a logarythmic spiral" chart on pg. 9.)

Hydrogen is very small; this means that the centripetal force, the pressure from the outside is very great. We can observe the same thing in the solar system. Pluto is tiny and very yang in the most peripheral, yin position.



Furthermore, hydrogen is very small because it is at the center of another spiral, the huge spiral of preatomic formation. What are the protons and electrons? Recently, scientists discovered electrons in the nucleus of atoms! This completely upset thirty years of study. According to our thinking, an atom is spirallically formed; and after billions of years, the electrons changes into a proton. The nucleus is the condensation, and accumulation of particles, the very yang conclusion.

Now you can see the symphony of the universe: a prelude, seven movements of a main composition, and a grand finale. The first octave or eight elements (H, He, Li, Be, B, C, O, N) represent the prelude. Then among these eight elements, the greatest antagonism is between carbon and oxygen which together produce silicon. This combination produces seven movements in the world of matter. $(C + O) = Si$, $2(C + O) = Fe$, and so on, until: $7(C + O) = Pt$.

Platinum is the last of the metallic elements. The finale is a dissolution, the diminishing melodies beginning with gold and mercury and culminating in the radioactive elements.

$$Pt^{78}_{196} \text{ —— } Au^{79}_{197} \text{ —— } Hg^{80}_{200}$$

The pre-atomic world is also arranged spirallically; the conclusion of this world becomes the periphery of the next, the atomic world. The spiral of elements is also at the periphery of a huge biological spiral which begins with virus and bacterial life, grows into cells, and proceeds toward the creation of man.

This is the order of the universe, spirals within spirals, manifolds of spirals. The governing principle of all worlds is therefore the same: centripetality and centrifugality, yang and yin.

The biological spiral is itself on the periphery of another, a huge social and historical spiral. If present science discovered this enormous principle, everything could be united; now psychology, biology, religion and technology are separate, with hundreds of laws and theories in each discipline. The unifying principle can bring them together and make them into one, embracing, and understanding the laws of change.