

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

① 24

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

| | | |
|------------------|-----------------------|-------------------------------|
| 1. REPORT NUMBER | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER |
|------------------|-----------------------|-------------------------------|

⑨

| | |
|-------------------------|------------------------------------|
| 4. TITLE (and Subtitle) | 5. TYPE OF REPORT & PERIOD COVERED |
|-------------------------|------------------------------------|

Writing the Observer Back Into the Equation

Technical Address

| |
|----------------------------------|
| 6. PERFORMING ORG. REPORT NUMBER |
|----------------------------------|

| | |
|--------------|--------------------------------|
| 7. AUTHOR(s) | 8. CONTRACT OR GRANT NUMBER(s) |
|--------------|--------------------------------|

⑩ Thomas E. Bearden

| | |
|---|---|
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS |
|---|---|

System Development Corporation
4810 Bradford Blvd
Huntsville, Alabama 35805

n/a

⑫ 90p.

| | | |
|---|-----------------|---------------------|
| 11. CONTROLLING OFFICE NAME AND ADDRESS | 12. REPORT DATE | 13. NUMBER OF PAGES |
|---|-----------------|---------------------|

n/a

⑪ 5

Mar 1976

vii + 79

| | |
|---|--------------------------------------|
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) | 15. SECURITY CLASS. (of this report) |
|---|--------------------------------------|

n/a

Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
n/a

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release. Distribution unlimited.

DDP
Approved
REC-3
NEED
GTC

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

© T. E. Bearden 1976. Reproduced by permission of the copyright holder.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

action, acupuncture, anenergy, antigravity, archetype, axioms of logic, behavior, biofields, biological system, collective unconscious, complementarity, consciousness, conservation of energy, death, de Broglie waves, dowsing, duality, ego, Einstein's spherical model of the cosmos, formon, free energy devices, Heisenberg uncertainty principle,

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This address was given by the author at the Princeton Center for Alternative Futures on March 5, 1976 to a group of scientists, parapsychologists, and academicians. Preliminary introductory remarks by Hazel Henderson and Ira Einhorn, and a discussion after the address, are included.

The speaker advances a fourth law of logic which contains the negation of each of Aristotle's three laws of logic. Thus the four-law system is closed.

ADA 027867

405 247

7/B

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

Block 19. (continued) Hieronymus device, holographic reality, identity of opposites, inception, infinity, intersecting frames, life, linked brains, Mach's principle, many-worlds interpretation of quantum mechanics, mass, materialization, metaphysics, mind, mind/body problem, Moray device, nothing, orthogonal frames, orthorotation, particle, perception, perceptron, probability, psychic, psychotronics, psi, quantum, quark, quiton, relativity, reality, spacetime curvature, spirit, time, tobiscope, tulpa, two-slit experiment, unified field theory, universe closure, wave, wavicle, zero.

Block 20. (Continued). It contains and resolves all present paradoxes since a paradox by definition is a violation of one or more of the first three laws, and hence is a statement of, or included in, the fourth law. The four-law logic encloses everything which can be thought -- physics and metaphysics -- in one consistent logical system. By the author's perceptron approach to perception, the fourth law (identity of opposites on their common boundary) can at last be comprehended. The fourth law resolves, e.g., the two-slit experiment, the Hieronymus device's operation, the mind/body problem, the nature of mind, the nature of nothing, and the difficulties in the logical basis of probability.

Using the fourth law and the author's perceptron approach to perception, a fundamental particle becomes an Einsteinian closure of the universe, in the manner of Einstein's spherical model of the cosmos. The simultaneous existence of both macroscopic and microscopic universes is due to multiple closure of the same universe at different rates (differing by a factor of 10^{42}). The polarity of a charged particle is due to the direction of closure taken by the fast closure universe cusp. The world thus becomes a single giant hologram, and reality becomes holographic, rather than Cartesian. Mass is a time differentiator, and in its differentiating of L^3T Minkowskian spacetime, the time dimension is lost. Thus physical detection systems do not detect time directly, and the time dimension cannot be "seen" by a mass detection (sensory) system. The mind is objective, since mental phenomena occupy or share or exhibit the time dimension, which is accepted as an objective dimension in physics. The mind itself is not perceived or observed, however, since a mass perception system (the physical sensory system) loses the time dimension, the only objective dimension shared in common by mind and matter prior to perception/detection/observation. Thus the act of physical sensory detection -- perception itself -- is responsible for Descartes' sharp separation of mind and body.

Based on a time-clustered set of orthogonal 4-spaces selected from Everett's many-worlds interpretation of quantum mechanics, a model of both mind and matter can be constructed. A mind becomes a complete 3-dimensional physical world, three or more orthogonal spatial turns (rotations) away from the ordinary 3-dimensional world, in an n-dimensional space clustered about a single time dimension. DeBroglie waves and photons are fitted into this model, and the nature of a quark is postulated to explain why it has not been detected separately in experiments. From the model, constructs that model life, death, a biological system, psi, consciousness, inception, telepathy, psychokinesis, UFO's, God, and the collective unconscious can be taken. Materialization, dematerialization, and mind linkage also exist, as does a specific mechanism for tulpas -- materialized thought forms.

Einstein's postulates of special relativity are derived. A new defining equation for mass is given. The two-slit experiment and the Hieronymus device are shown to involve the fourth law of logic, as does the Heisenberg uncertainty

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

Block 20 (Continued). principle. Psi or psychic effects can be recorded and processed by ordinary electromagnetic apparatuses with little change. A new definition of nothing is advanced. Multiple presences and singular absence are identical (indistinguishable) to a monocular perception/detection process. Feynman's criterion for a unified field theory -- that it must explain why 10^{42} occurs in both the ratio of an electron radius to the Einstein closed universe's radius, and the ratio of the electrical force and the gravitational force between two electrons--- is met by dual universe closure at rates differing by 10^{42} . The dual closure universe model also is consistent with Santilli's proof that the classical assumption that electric field and gravitational field are different things is false, and that they are either totally or partially the same thing. In dual closure, an electrical field is essentially a gravitational field compressed by a factor of 10^{42} , but in a separate closure cusp than the gravitational field.

| | |
|-----------------------------|-----------------------|
| ADDITIONAL INFO | |
| NTIS | |
| DDC | |
| UNCLASSIFIED | |
| JUSTIFIED | |
| <i>Added on file</i> | |
| BY <i>AK for processing</i> | |
| DISTRIBUTION | AVAILABILITY NOTES |
| Dist. | AVAIL. AND/OR SPECIAL |
| <i>A</i> | |

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

T.E. Bearden
System Development Corporation
4810 Bradford Blvd
Huntsville, Alabama 35805

August 1, 1976

Ms. Alice Healy
Defense Documentation Center
ATTN: DDCTSR-I
Cameron Station
Alexandria, VA 22314

Dear Ms. Healy:

Enclosed are two papers which I would like to have placed in the DDC system, per our previous conversation. Completed DD Form 1473's are also enclosed. The material is copyrighted by me, but naturally this letter constitutes authority for you to put it in DDC.

Your assistance is deeply appreciated. These two papers represent something of absolutely fundamental importance, I believe, and their content should be available to all DOD users who are interested in parapsychology and psychotronics.

Sincerely,

Thomas E. Bearden

Thomas E. Bearden
LTC, U.S. Army (Retired)
Research Scientist

2 incl

"Writing the Observer back Into the Equation" (2 copies)

"An Approach to Understanding Psychotronics" (2 copies)

ADA 027867

1/10 - 1/10

WRITING THE OBSERVER BACK INTO THE EQUATION

March 5, 1976

© T.E. Bearden 1976

ABSTRACT

This address was given by the author at the Princeton Center for Alternative Futures on March 5, 1976 to a group of scientists, parapsychologists, and academicians. Preliminary introductory remarks by Hazel Henderson and Ira Einhorn, and a discussion after the address, are included.

The speaker advances a fourth law of logic which contains the negation of each of Aristotle's three laws of logic. Thus the four-law system is closed. It contains and resolves all present paradoxes since a paradox by definition is a violation of one or more of the first three laws, and hence is a statement of, or included in, the fourth law. The four-law logic encloses everything which can be thought - physics and metaphysics - in one logical system. By the author's perceptron approach to perception, the fourth law (identity of opposites on their common boundary) can at last be comprehended. The fourth law resolves, e.g., the two-slit experiment, the Hieronymus device, the mind/body problem, the nature of mind, the nature of nothing, and the difficulties in the logical basis of probability.

Using the fourth law and the author's perceptron approach to perception, a fundamental particle becomes an Einsteinian closure of the universe, in the manner of Einstein's spherical model of the cosmos. The simultaneous existence of both macroscopic and microscopic universes is due to multiple closure of the same universe at different rates (differing by a factor of 10^{44}). The polarity of charge is due to the direction of closure taken by the fast closure universe cusp (i.e., in constituting a fundamental charged particle). The world thus becomes a single giant hologram, and reality becomes holographic, rather than Cartesian. Mass is a time differentiator, and in differentiating L^3T Minkowskian spacetime, the time dimension is lost. Thus physical detection systems do not detect time directly. The mind is objective, since mental phenomena occupy or share or exhibit the time dimension, which is accepted as an objective dimension in physics. The mind itself is not perceived or observed, however, since a mass perception system (the physical sensory system) loses the time dimension, the only objective dimension shared in common by mind and matter prior to perception/detection/observation. Thus the act of physical sensory detection -- perception itself -- is responsible for Descartes' sharp separation of mind and body.

Based on a time-clustered set of orthogonal 4-spaces selected from Everett's many-worlds interpretation of quantum mechanics, a model of both mind and matter can be constructed. A mind becomes a complete 3-Dimensional physical world three or more orthogonal spatial turns away from the ordinary 3-dimensional world, in an n-dimensional space clustered about a single time dimension. De Broglie waves and photons are fitted into this model, and the nature of a quark is postulated. From the model, constructs that model life, death, a biological system, psi, consciousness, inception, telepathy, psychokinesis, UFO's, God, and the collective unconscious can be taken. Materialization, dematerialization, and mind linkage also exist, as does a specific mechanism for tulpas -- materialized thought forms.

Einstein's postulates of special relativity are derived. A new defining equation for mass is given. The two-slit experiment and the Hieronymus device are shown to involve the fourth law of logic, as does the Heisenberg uncertainty principle. Psi or psychic effects can be recorded and processed by ordinary electromagnetic

apparatuses with little change. A new definition of nothing is advanced. Multiple presences and singular absence are identical (indistinguishable) to a monocular perception/detection process. Feynman's criterion for a unified field theory -- that it must explain why 10^{42} occurs in both the ratio of an electron radius to the Einstein closed universe radius, and the ratio of the electrical force and the gravitational force between two electrons -- is met by dual universe closure at rates differing by 10^{42} . The dual closure universe model also is consistent with Santilli's proof that the classical assumption that electric field and gravitational field are different things is false, and that they are either totally or partially the same thing. In dual closure, an electrical field is essentially a gravitational field compressed by a factor of 10^{42} .

PROLOGUE

This paper contains an edited and slightly expanded version of an informal address given at the Princeton Center for Alternative Futures, Princeton, New Jersey on March 5, 1976.

Attendees at the gathering included several prominent physicists, parapsychologists, parapsychologists, and persons of note from other disciplines. A partial listing of attendees is as follows:

Hosts

Hazel Henderson
Carter Henderson

Attendees

Dr. Heinz Pagels
Dr. E.H. Walker
Dr. A.C. Hilgartner, M.D.
Dr. Andrija Puharich, M.D.
Dr. Charles Muses
Dr. Marvin Feldman
Ira Einhorn
Chris Bird
Moray King
Joyce Petschek

Hazel and Carter Henderson, Directors of the Princeton Center for Alternative Futures, served as most outstanding and congenial hosts for an informal weekend of mutual discussion and interaction.

I wish to express my most sincere and deep appreciation to our hosts, and to all the distinguished attendees, for the opportunity to present some rather far-out and perhaps even far-fetched ideas and concepts, but most of all for the stimulating interactions which occurred on that memorable weekend.

From all of you, I received far more than it was in my own poor power to give.

Tom Bearden

WRITING THE OBSERVER BACK INTO THE EQUATION

Hazel Henderson

This weekend party was put together by Ira and I, and we've brought some people together here who we think might share our interest in the whole problem of -- perhaps we might call it writing the observer back into the equation. I find that my interest in this whole question stems from the problem that I deal with in science policy-making in Washington, and that problem is the notion that science is completely objective and value-free. Somehow that notion seems to leave the human being out of it, and science policy becomes the sort of system that way that I can't deal with.

Ira has been sending us material written by Tom Bearden, whom we are going to introduce in a moment. Tom, I think, has some very interesting new concepts that might get at this problem, and also some of the basic problems we're having with some of the logic we use.

Without further ado, I'm going to introduce Ira, and have him start the discussion and then introduce Tom, who's going to bounce some of these concepts off all you brilliant people from different disciplines -- mostly the hard sciences, although there are a few social scientists here. I hope we can get an interdisciplinary discussion going around some of Tom's concepts, which I think are very exciting.

So, Ira, why don't you pick up here?

Ira Einhorn

I just want to first say a few words. A lot of you in this room are the recipients of information that I send out on a weekly basis. What I find myself sitting in the midst of right now are piles and piles of information going out all over the world, information that no one has any way of valuing now, but in three or four years I'm sure

that it is going to be extremely valuable. I'm now distributing to about fifteen countries through the auspices of my friend Ed Mahler and the (Company) .

Mixed in with the other information that I get is some special material that only goes to a limited audience. Tom, when I was first introduced to him by my friend Jim Beal -- who at that time was working for NASA -- was introduced the way that a lot of other people are, as someone who was very isolated. He was working on things that very few people around him could in any way respond to. One of the functions I perform is to try to get this information out to people who can respond to it, and give the person who is very isolated some feedback. Because anyone who works alone for a long time, and doesn't get any feedback, really gets out on a limb. Particularly if his ideas are new, and especially if the ideas are in areas like physics and consciousness. These are two words which -- even though Hazel is talking about writing the observer back into the equation -- have not been coupled together in any way until very recently.

Tom has two types of work. One type consists of the papers that he does, and I distribute these papers to a number of people in this room. The other type of work that he does are freestreams.

Now the freestreaming started after Tom and I had our first interaction, which I found to be very interesting. Tom sits at a typewriter, and information comes out. He brings this information out in a very clear or released state, or state of ki, or state of wu wei -- there are many ways of describing this particular state of consciousness. What I found to be particularly interesting is that often information would come out for me, for Andrija Puharich, or for Jack Sarfatti, so that Tom to a certain extent was seemingly part of a group mind linkage. These papers are called "Freestreams" and I hope that in about six or eight months, with the help of some of the people in this room, we are going to have those edited and published. They are

separate from the more conventional papers that Tom has been circulating.

I'm extremely excited about Tom's ideas and I've spent an enormous amount of time promoting them, mainly -- and I say this for the benefit of everyone in the more conventional areas of physics -- because I think there is a crisis in physics, as there is a crisis in economics, and in almost every other discipline I'm looking at. Not because I think that Tom's ideas are right per se. I've written letters to major physicists saying this, that "You are in a predicament right now; why not look at some unusual ideas, not because these ideas are quote right unquote, but because they may give you the clue to the next step we have to take." And I feel very strongly about Tom's ideas in this light, because I think he is moving into areas that within the next ten years will become the most important that we can look at in the physical sciences.

Tom and I have become close as a result of this process. I found the beginning of this process very interesting because I've worked with a lot of people who have brought down information, and -- I think Tom's going to say a little bit about this, before he gets into the ideas -- I know the problem he experienced in dealing with the reception of information in an unconventional way.

Every time I would get one of these freestreams in the mail, my response was to read it and get chills, because of the nature of the information, and my next response after that was to pick up the phone and call Tom. Having had six or seven years working with Andrija Puharich, I know how difficult it is. We are all, I think, in a very strange space right now, where we seem to be bombarded with ideas that are coming from places that we don't understand -- I don't want to name those places, I don't want to talk about them, I don't want to prejudice people!

It's a very difficult situation. I read, I guess, four or five hundred pages of this material every week, and I decide among 250 people who are on my mailing list who should get what. So I process an enormous amount of material and, as Chris Bird and

I have been discussing, it is really beginning to pay off. For example, we've just had a book that will be published in Russia, that was originally published in France. We've had trouble getting it published in this country, but we know that as soon as it's published in Russian, it will quickly be translated into English. Tom Bearden, in this particular case, has been asked to do the afterword, and it's interesting that someone who was a Lieutenant Colonel in the U.S. Army will be doing an afterword to a book that is published by the State in Russia. That is the kind of thing we're running into more and more.

So there is this growing network of people. I'm to the point now where I think that within six months I can say goodbye to the network. I think the work will have advanced to the stage where it will be published in more conventional forums, and that means that my work will be over, and I can move on to something else. I'm really beginning to get that feeling. I'm in the process now of doing an article for a magazine which I hope will announce some of this, and then I'm sure people are going to be picking up on it all over the place. It's basically physics and consciousness -- as Hazel said so well, reading the observer back into the equation, because I think that's the problem. Because it gets us into the questions of purpose, and attention, and values, and these are problems that I don't think anyone can neglect.

And so here is Tom Bearden.

Tom Bearden

Thank you very much.

The first thing I want to say is that I appreciate all of you coming here tonight. It makes me feel exceedingly flattered, and also exceedingly apprehensive, because some of the best physicists and parapsychicists in the world are sitting in this room.

I want to first say a few words about the things I try to do, and eliminate any idea that there is some mystic power involved or something like that. I worked very hard for quite a few years in Aikido: in fact, I am a third degree black belt and I still teach regular classes in the art. Aikido is a very unusual discipline of self-defense. In Aikido, there is no time to think when violently attacked by a skilled attacker. The unconscious portion of the body must learn to react immediately. If one works hard enough at that -- and most people do not, because it takes about six times a week practice to do what I am now talking about -- then one gets into a very unusual type of sensory perception. For example, during that period of intense practice, my body senses reached out about 35 or 40 feet from my body, and if you scratched your head, I could feel it at that distance. I do not have that kind of alertness now because I've gotten a bit older, and a broken back has taken a bit of the steam out, and I do not work nearly that hard anymore. Particularly, I do not do any falls myself. But I did become a student of perception during this time, because to attain that kind of perception it was not possible to do it with the conscious mind. What we normally do not realize is that the unconscious mind is perfectly capable of thinking, about anything you normally think about, and about many things you do not think about. And it can think much faster than the conscious mind, and it can react much faster. Really good self-defense depends upon that factor. Until reactions are totally automatic, one has no real defense against a skilled attacker.

Before meeting Ira, I had been having intuitive flashes and I had been pondering

various matters for a long period of time. After meeting Ira, for some reason I sat down one day and I decided to try on the typewriter the same type of system of uncensored, released perception that I used in Aikido. All in the world I'm talking about is the same state you get into when you just stare off into outer space and simply lose yourself in a muse or brown study, so to speak. There are no good words to describe it. What you really do is release the tight structuring of the conscious mind, just let go, and allow the unconscious to work on the problem. It is not a weird state at all; everybody does it. We call it, quote, creative thinking, unquote when it's done that way, coming up from within with new ideas, etc. To my surprise, the process seemed to work immediately, perhaps because of my long training in Aikido.

Now the process has a direct indicator -- it's nice to have a metering device to tell when one is doing this type of thing right, or if one is only thinking or imagining things. When you are at the typewriter, if you think with your conscious mind, you impress memory. There is a memory register which holds memory, and you impress that thing if you think, so you can remember what you thought. Actually there are two of these memory registers -- one holds the perceived thought for about 15 seconds, while the other holds it for a moderate period of from several minutes to several hours. This impressing of the memory registers is an unconscious habit you have created and used all your life; that is the way your mind works. If you do this uncensored and unstructured perception process I'm talking about, you do not activate the second memory register, and so you can tell exactly if you are doing it, because a thought comes through, and it fades immediately, almost as soon as it goes through. How fast do you forget a dream when you wake in the morning, a normal dream? Within about 15 seconds, according to laboratory data. So in the process I'm talking about, long term memory is not hit, and one loses the entire thing in about 15 seconds.

The other characteristic of this type of musing is that several different channels

usually get going at once, with enormous amounts of information going through, but I can only track and type part of one of these, and all the rest are lost.

And other than that, there is nothing weird or mysterious about it. Specifically, it is not mediumistic at all. I am not a medium. I do not do this in any sort of trance. It is not psychic, whatever that means. It is not possession, or any other kind of weird state you might name. It is just a perfectly ordinary, relaxed, loose state. I call that state released because we do not have a good English name for it. And I call the uncensored, raw information and material that emerges a freestream.

I wanted to set the stage, because I want to make it very clear that I am not a medium and I do not have mediumistic messages for anyone.

I do, however, deliberately go much deeper into the unconscious than most persons habitually do, and I allow that deep unconscious to use the typewriter directly, while my conscious mind remains passively alert in a noninterfering manner.

The other thing I want to make very clear is that I am not a physicist. I have a master of science degree in nuclear engineering, and I am not even a practicing nuclear engineer. I am in fact an air defense wargames analyst, a tactician, and an air defense strategist. That is my specialty. With that setting, I wanted to set forth my limitations in very precise order. When listening to the things I say, one must be aware of those limitations. And it also gives me a beautiful excuse for the type of language I use -- some of the more involved language of physics I cannot use, because I am not familiar with it. And for some of the things I am trying to say, there are no words. So I will have to create a word, and then clarify what I mean when I say it.

With those disclaimers, I would now like to turn your attention to some very deep questions, without getting too far afield philosophically, because we want to deal with them, not just discuss them all night.

First, I noticed some things. One thing I noticed is that the schism that DesCartes

set up between mental phenomena and physical phenomena is totally incorrect. Let me try to immediately convince you of that with some arm-waving. Physical phenomena contain or occupy the time dimension; that is certainly an objective dimension, because you don't have any objective physics left if you don't have time. So whatever this physical world of physical phenomena is, it must contain or have or occupy time. Now that same objective time dimension is also shared and occupied simultaneously by the mind. I.e., mental phenomena are happening at the same time as physical phenomena. But if the mind has or contains or occupies one single objective dimension, then the mind must be accepted as objective. That means that DesCartes was wrong, and in fact I ought to be able to find, if I am clever enough, a scheme whereby the observer -- which name is itself just a clever disguise for mind, you see -- can be included in the same equations that one tries to use to describe what it is that he is observing. So at this point it becomes a challenge, not really to one's cleverness, but to how vigorously one turns over all the conceptual rocks and looks for something frantically wriggling underneath one of them. That is the approach -- to simply stumble along and kick over all the sacrosanct concepts until we find something.

Let us start with logic.

First, one does not have a thought per se, one really has a "perceived thought." There is a perception operation involved when one thinks. There is no independent existence to physical phenomena either; there is a perception operation involved when one perceives or observes physical phenomena. So if I take a process viewpoint, I can consider this perception operation as a process having input and output, and I shall speak of it in that kind of terminology. If it is a process, I notice also that it is finite. I normally do not see infinite things. E.g., I normally do not count all the numbers in an infinite series from zero to the end, and reach infinity. I normally see only finite things. So perception is a finite process. That means it takes a finite

piece of time for it to occur. So at this point we have a finite time criterion that we can insist be imposed upon either a perceived thought or a perceived physical phenomenon. And with that, I insist that we impose that criterion back upon logic itself.

The three axioms, or main laws, of logic date from Aristotle. I write them in this form: (WRITE)

| | | |
|-----|------------------|-----------------------------------|
| | $A \equiv A$ | law of identity (which it is not) |
| | $A \neq \bar{A}$ | law of contradiction, |
| and | $A \vee \bar{A}$ | law of the excluded middle, |

and with that, Aristotlean logic ceases.

These three laws are increasingly called axioms, and all the rest of the underived "laws" or fundamental assumptions are considered to be postulates. There is really no difference between postulate and axiom -- they are both stated, rather than being derived -- except that an axiom is considered to be the most fundamental statement and the most general, and thus the three absolute foundations of logic are also taken as the axioms for everything. Any other general, underived fundamental statements which set up the requirements and contents of a specific branch of logic or a specific logical science are called postulates. So in relativistic physics, e.g., one expects to find Einstein's postulates rather than Einstein's axioms. Nonetheless, all our science and all our mathematics and indeed all our logic is founded upon Aristotle's three axioms of logical thought. So if we make any change to those three laws of logic, then we change the entire present paradigm of logical thought, including all logic, science, and mathematics.

If we now have problems in describing everything logically from those three laws -- i.e., if we find some things or phenomena in the world that will not fit our present 3-law logic system -- then perhaps one approach might be to build a new logic. And indeed hosts of formidable paradoxes that defy 3-law solution seem to exist in both

physics and metaphysics. Many logicians, foundations scientists, and philosophers have tackled these paradoxes and unresolved logical difficulties, but to date no one has succeeded in building a really successful new logic that unites physics and metaphysics and solves the paradoxes.

But that is the approach we are going to take: We are going to try to find a new logic. So I want to challenge this Aristotelean system of three axioms, and I want to use as my basis for challenge all the arm-waving I did about perception being a process, whether it's mental perception or physical detection.

We will insist that either mental perception or physical detection requires a finite amount of time in which to occur. We will, therefore, from the process output viewpoint, insist that there is no such thing as A per se, but that rather there is a perceived A where A is the output of the perception process. I will insist that there is no such thing as not-A, but that rather there is a perceived not-A where not-A is the output of the perception process. Further, I'm going to use a symbol to represent this: a little square box like this. (DRAW)



The little square box is an abbreviation for the fact that perception has occurred, and anything I write inside the box represents the output of that perception operation. So a little box around x (DRAW)



means that x has been outputted by the perception process.

I can speak of the little box either as mental perception and describe thought, or I can speak of it as physical detection and describe an instrumentation system that does detection and measurement. Now all we do is simply start writing little boxes around the objects that are to represent perception or detection outputs. Also, since

each little box requires a finite time to occur, I must be very careful to keep up with the individual little pieces of time, Δt 's. Since I get somewhat tired of writing little Δt 's, I will just write the number of each one and the Δt will be understood.

So applying this to the first law, we have (WRITE)

$$\boxed{A}_1 \equiv \boxed{A}_2$$

and we see immediately that that thing is in fact the law of linear repetition. Do it as many more times as you wish -- three, four, five, six -- and you keep getting A as the perception output. Note also that this law requires a mind and a memory operation. I.e., it requires the comparison of A_1 with A_2 in another time, Δt_3 , where it is ascertained that A_1 and A_2 have no difference. The identity sign in the logic statement implicitly assumes the operation (WRITE)

$$\boxed{\boxed{A}_1 \wedge \boxed{\neg A}_2}_3 \rightarrow \boxed{0}_3$$

We will see that this actually invokes a new law of logic, which is where the observer and memory have been hidden all along. But we will come to that shortly.

So the first law actually is the law of linear repetition, because what I am calling identity here is between two different time intervals. The first little delta t is different from the second little delta t, etc. The first law says that, when I go fishing in time slice one, I catch a yellow fish, and when I go fishing in time slice two, I catch a yellow fish. But the fact of identity or sameness has to be derived from a separate operation not explicitly stated in the first law, but assumed in it implicitly.

Now without getting into all the hangups the philosopher tends to get into, I'm going to make a very simple statement: There is no knowledge without memory. Knowledge is totally a memory process, as in fact is having a "measurement" or

comparison existing in your knowledge. Knowledge, you see, is involved in the concept of the observer, so we must get at the concept of knowledge as well. But we are just going to hit it and go; we are not going to get bogged down in that boundless gulf in hierarchies of complicated linguistics. Knowledge depends totally on a memory process being invoked. If you want to prove something, you have to go back and check it, and that is a memory operation -- seeing what happened when you did it the first time. As we saw from the first law, this memory operation has usually been unconsciously and implicitly assumed. But we must pay careful attention to what actually happens in the mental perception process, and so we must not assume that memory and knowledge are automatically invoked.

Now take the second law and apply the same little boxes, and we have (DRAW)

$$\boxed{A}_1 \neq \boxed{\bar{A}}_2$$

and it says I went fishing in time slice one and I caught a yellow fish, and I went fishing in time two and caught a blue fish. That is no problem; it is perfectly possible, because there are all kinds of fish out there where I'm fishing. So this law is simply the law of nonlinear repetition. However, notice again that the fact that A_1 actually differs from \bar{A}_2 requires another operation to establish that fact, and it requires a memory operation as well. Here the nonidentity symbol contains the implied assumption that that operation has occurred -- i.e., that (WRITE)

$$\boxed{\boxed{A}_1 \wedge \boxed{-\bar{A}}_2} \xrightarrow{3} \boxed{B}_3 \quad \text{where } B_3 \neq 0$$

Then we go to the third law and apply the little boxes, and we have (WRITE)

$$\boxed{A}_1 \vee \boxed{A}_2$$

and it says, I go fishing in time one and I catch a yellow fish, or I go fishing in time two and I catch a blue fish. Again, I don't have too much of a hangup with this, except that now I notice a most remarkable thing: this law says I can only catch one fish at a time! And in fact, if I look back now to the first two laws, I see that, yes, that is true, for that is all I've been doing, catching one fish at a time. The identity or nonidentity symbol in each case concealed an implied additional memory operation.

For the first law, I catch a yellow fish in time one and I catch a yellow fish in time two, which I can only tell was a yellow fish by comparing it in time three to what was the yellow fish in time one. For the second law, I catch a yellow fish in time one and I catch a blue fish in time two, which I can tell was not a yellow fish only by comparing it in time three to what was a yellow fish in time one.

So the third law of logic is actually the law of monocularity: only one thing at a time is perceived or detected or measured or changed. And that is the basis for our observed world of discrete change: only discrete changes can be detected in mental perception because that is the absolute nature of the thought perception process itself, according to Aristotle's third law of logical thought.

So now we are ready to challenge this 3-law system of logic and change it. We do this by a gedanken experiment. First, suppose that in time three I am able to gather up what was A in time one, and what was not-A in time two, and shove them both through the detection process simultaneously. As we saw, that is in fact precisely the thing that was assumed in the first and second laws when one wrote the identity sign and the nonidentity sign respectively.

Applying the third law, I can see just one single thing, so I can label the output in time three as B, where (WRITE)

$$\boxed{A}_1 \wedge \boxed{\bar{A}}_2 \boxed{}_3 \rightarrow \boxed{B}_3$$

But notice that, although what was A_1 and not- A_2 are both in the output, neither is there exclusively, and the third law requires then that all distinction between A_1 and not- A_2 has been lost in time three. I.e., only one-thing can be outputted in time three, and therefore A_1 and not- A_2 have been merged into a single one-thing, with all distinction between them being lost. Thus there is a one-thing output instead of a two-thing output.

But the loss of all distinction between two entities is the precise definition of identity. To distinguish is to differentiate, and if one does not even separate, there is no differentiation or distinguishing.

So the way to write this is to write a totally new law of logic, and to write it in this fashion: (WRITE)

$$\boxed{A}_1 \equiv \boxed{\bar{A}}_2 \Big|_3$$

Or better yet, now just understand the little boxes and the little Δ 's, and write (WRITE)

$$A_1 \equiv A_2 \Big|_3$$

What this new law says is that, in time three, what was A in time one is no longer separated or distinguished from what was not- A in time two, insofar as this monocular operation that I have imposed in time three is concerned. It also explicitly states the time three memory operation implied by the identity symbol, hence we now have the observer's mind and memory properly accounted for. So here we are really dealing with the observer and what he perceives. This I claim is a fourth law of logic. Specifically, it is the law of the boundary. In fact, I claim that this law is what makes or defines a boundary. It ends the exclusive output of one thing A , begins the output of another thing not- A , but insists that both A and not- A are simultaneously and nonexclusively present. And that in fact is exactly what a boundary is and does.

At this point you might wonder if I can give you some examples. I most certainly hope to -- examples which at present are recognized as unsolved problems in foundations of physics and foundations of mathematics.

E.g., after considerable struggle, the foundations of mathematics fellows gave up on the following fundamental problem: They first tried to define a line as a length, or as the presence of length. Then they tried to define a point, an entity they kept having to deal with, as nonlength or as the absence of length. Then they asked the question, how can a line be composed of points? I.e., how can length be composed of nonlength? How can the presence of length be composed of the absence of length? How can apples be composed of oranges? By the first three laws of logic, lines cannot be composed of points, if points and lines are defined in terms of length and nonlength. However, someone forgot to tell lines and points that, and lines were perfectly happy to be composed of points. One could clearly see that, since any number of points could continue to be found in a line. Although in actuality each point so found in a line was found or perceived in a separate piece of time from the piece of time in which the line was found, but no one took cognizance of that fact. Eventually, all the logicians and persons working in foundations of mathematics simply gave up trying to solve this problem. None of them could find the answer. And the reason they could not find it was because their logic system of three axioms did not contain the answer in it. This new logic system, with the fourth law added, does have the answer contained in it. So let me show you where it is.

To determine something, perceive something, you have to invoke some kind of operation -- punch a hole in a plane, cut a line, whatever. To have a thing called a line, or called a length, such an operation -- e.g., cutting a plane -- must be invoked. To distinguish a point in the line, you have to invoke another operation yet again. And what we have said with the fourth law is that, if you have or invoke an operation

in one time that gives a point as its output, and you have a slightly different operation which, when imposed in another time gives a line as its output, then there is a third operation -- which may be thought of as ^{outputting} the boundary between a conceptual point and a conceptual line -- and this third operation cannot tell the difference between a very small line segment and a point, between length and nonlength, between presence of length and absence of length. So to this boundary operation, lines can be made of points -- lengths can be composed of nonlengths -- because to it, line and point are indistinguishable, and become synonymous.

For a more physical example:

Take the surface of a cube in deep space. Call the cube thing, a three-dimensional concept. Call the empty space around the cube nothing, meaning a three-dimensional nothing or absence of thing. If one is standing inside the cube and looks at the boundary surface of the cube, one cannot find a single piece of that boundary surface that does not belong totally to the cube. So one can very reasonably proclaim that by the first three laws of logic each piece of the boundary belongs totally to the cube, to thing. But by the same token, if in a different operation one is standing outside the cube, one cannot find a single piece of that boundary surface that does not belong entirely to the space surrounding the cube. So in this case, one can claim by the first three laws of logic that the boundary surface belongs totally to nothing. Then in a third operation one can state that, by the first law of logic, each and every piece of the boundary surface is identical to itself, and of course one has just identified what was thing with what was nothing. Specifically, what was thing in perception time one and what was nothing in perception time two have been identified, by all distinction and separation between them being removed, in time three. And all that one has really done is apply the fourth law of logic.

As another example, the logicians all gave up on the simple problem posed by

the statement, "It is true that this statement is false." Most of them took the view that the statement has no meaning. Now of course it has meaning! It makes perfectly good sense from a structural English standpoint. One has a little trouble getting his head ahold of its meaning, though, as the Cajun says! But it is a perfectly legitimate English statement, and it is simply a fourth-law boundary statement. Two opposites identified together at the same time. I.e., what are opposite in times one and two are not necessarily opposite in time three. So the sentence is just one statement that obeys the fourth law of logic.

But does such a thing have any meaning in physics? Of course. E.g., is an electron two dimensional or three dimensional? I.e., is it a wave or a corpuscle? Now I can arm-wave all night, and say that "I can slap it with one particular kind of bat, and it will be two-dimensional; it will be a wave. Or I can slap it with a different kind of bat and it will be happy to be three-dimensional, a thing, an object, a corpuscle." But what is it before one slaps it with one of those exclusive batting operations? It is both of them at once, but neither one exclusively. It is described by the fourth law of logic. But it is unobserved and unobservable in that dual-state condition, because observation or perception is monocular and can only output or detect monocular, singular things.

Now I point out that one of the dreams of many logicians has been to form a metalogic that closes logic into a closed system that encompasses everything in the universe. Many have tried to achieve this, and all of them have failed. But now let us do a little 'sposing here, like a Cajun sort of. The first three laws of logic are known to form an open system. So let us think very crudely. If each of those laws is regarded as a sort of operational critter -- and I claim that there is one or more implied operations with each of them -- then they are sorta like little vectorial things. And you are never going to have a closed vectorial system unless, for each and every vectorial,

you have its opposite vectorial in there with it. Unless you have the negative of every positive, you are not going to have a closed system. So if you want to have a metalogic that forms a closed system with the first three laws, and gathers in all the areas not included by the first three laws, obviously you have to have the negative of each of the first three laws in there. But this fourth law of logic is the negative of each of the other three laws! Does it negate the first one, A is identical to A? Surely. A is identical to not-A. Does it negate the second law, A cannot be identical to not-A? Surely. For it states that A can be (and is!) identical to not-A. Does it negate the third law, A or not-A? Yes, because you have both of them, A and not-A, in there simultaneously. So the fourth law contains and is the negation of each of the other three laws. And that makes it a magic fourth law indeed, because it closes logic into a fully closed system, and it contains all things which negate or contradict either or all of the first three laws! I.e., an application of that law should be capable of resolving any and all of our presently known paradoxes, because each such paradox is simply a contradiction or negation of one or more of the first three laws, and hence is contained in or resolved by the fourth law.

It also explains the particle/wave controversy, which is only avoided by the principle of complementarity. Before a monocular perception operation, the two -- corpuscle and wave -- are not exclusively separated, and there is no distinction or distinguishing between the two. If you reach in and pull one out, that represents a determination, a separation, a differentiation. So when you do that, you have one or the other, because you no longer apply the fourth law, you apply the other three. But before you make that monocular separation, you have both entities, identified and unseparated, and that is the fourth law of logic.

But it is even more fundamental than that in physics. You use it every day and don't realize it.

For example, in probability.

One doesn't have much physics left without probability.

But what after all is probability? The foundations of mathematics fellows have never succeeded in answering that question either, to their satisfaction -- they are in fact still squabbling over its answer. If you read the definitions presently advanced, you will find they essentially say, "Probability is probability, every fool knows that!"

Let me use a very simple example to get at the answer to that question. Let us use the face of a die turned up. Now one can only think by operationalism. To operate and output something is to automatically put it in the past. It's happened, it's gone, the moment you do it. To perceive an object is to put it in the past. To determine it is to put it in the past. To observe it is to put it in the past. There is no observed, perceived, detected, measured, or determined present. That is, there is no separated, exclusive, determined present such as is specified by the first three laws of logic -- the fourth law is the present, by the way -- but in observational physics which deals with determined, observed past phenomena, there exists no present. The future has not yet been observed, so it also is the unobserved. Only the past therefore is the observed. How then can one ever hope to model the unobserved present or the unobserved future? It is the same question as, "How can lines be composed of points?"

If I look at this little problem I'm discussing -- the observed die with one face up -- that is in the past. When I see it, it is in the past. When I think it, it is in the past. So if all I can observe, think, or perceive is the die in the past, how can I ever model it in the future?

It's very simple!

If I drive any problem set to its absolute boundary limit, it turns into its own opposite by the fourth law of logic, by the law of the boundary. So how do I do that with

this problem of the die?

The problem set is specified by the condition "the perceived die with one face up"; that is the most recent past. Now simply find all the most immediate pasts you can get to meet the condition specified, and gather them all up together, and they then must turn into and comprise precisely the opposite, the most immediate future. In this problem set, I can find and collect six such pasts, each consisting of the perceived die with one face up. So by the fourth law of logic those six "faces up" collected together as an ensemble represent the future and in fact are identical to the future. The "present," which is simply the boundary between the most immediate past and the most immediate future, was specified by applying the fourth law of logic in the first place: identity of most immediate past and most immediate future, being binocular, is unperceived, but it is the present nonetheless. So that is what probability is -- an application of the fourth law of logic, so that the most immediate future can be represented in terms of the most immediate past -- and you have been using that ever since you have been doing mathematics and physics. Without the fourth law of logic, there exists no rigorous logical basis for probability! So apparently the fourth law is a very useful law indeed; we have just failed to realize that we have been applying it all along.

The fourth law is also particularly appealing because I can write such a crazy thing as (WRITE)

$$0 \equiv \infty$$

and really blow everyone's mind, for any fool knows that is not true -- but then try finding "zero point energy" -- it's infinite!

Try it, e.g., in the Einstein spherical model of the cosmos. In that model, start from any point in the universe, in Einstein's closed universe model, and go to the end of the universe in any direction, and you are at the same point you left from.

Einstein said that if you looked across the cosmos in a straight line in any direction, you are looking at the back of your own head. So the most internal point in that model of the universe is also the most external point. Each point in the universe has got the whole universe outside itself, and it has also got the whole universe inside itself as well! And that blows the heck out of one's mind if it contains only the first three laws of logic! It causes no embarrassment whatsoever if one's logic contains the fourth law.

Or take a hologram -- the physicist works with those every day! Look at the information in it. In a hypothetically perfect hologram, whatever you have in the whole thing, you have in any part you wish to cut out and examine. And you don't have any more and you don't have any less! Try it again -- because you can't believe that, like the Cajun says -- cut it again and the whole thing is still in there, in each piece. In no way can it be in there by the first three laws of logic. Because now the whole is not equal to the sum of the parts; rather, the whole is each part. And two or more parts put together still only give the same as was contained in each part separately.

Okay. Now, using this kind of approach, it would be nice if one could find something that would turn physics head-to-tail, close it back upon itself, and gather in that observer, in one great all-encompassing model of reality. And we are going to do that. We are going to get the observer, his mind, his soul, god, life, the whole works in there. This is supposed to be, now, for if this new four-law system of logic encloses everything, it must do all those things. Otherwise it's not closed around everything; it's open somewhere, and something, some of the beasts, got out. But we are going to close the gate and get all those beasties in there.

To do that, I have to have another weird concept. I must realize that there is no such thing as detection of something external. It doesn't exist. A detector detects only an internal change to itself. E.g., consider a triode. It only detects a change on its own internal grid; it knows nothing at all about what happens in that external

circuit. If its grid gets a change on it, then the triode is very happy to detect that. So all detection systems detect a change in their own internality. They have nothing whatsoever to say about an external universe or an external change or an external reality. All that sort of interpretation is pure assumption. And here I quote Henry Margenau, editor of Foundations of Physics, and Robert Bruce Lindsay, member of the editorial board of the same journal. Margenau and Lindsay, in their book, Foundations of Physics, state that "Physics has nothing to say about a possible real world lying behind experience." So when we rigorously examine the idea of an external reality, ^{not} the idea will simply stand up, and foundations physicists are well aware of that.

So I can look at a perceiving system, a detecting system, observing system, instrumentation system, measuring system, -- whatever I wish to call the fundamental perception system -- and I can very crudely say, okay! It has one part in it that changes, and it has another part that does not change, or at least it doesn't change very much, and I can call that a detecting system. Specifically, it is a macroscopic detecting system if it has one part which does not appreciably change, when detection occurs.

So now let us invoke a process I started doing long before I realized it had a name -- it's called the "method of elementary abstraction," and what one does is, one regards a concept as a kind of ore, then takes a pick to it and picks it apart and examines all the other concepts it contains. One throws out everything then, all the picked out parts, except the single most fundamental idea or characteristic that the ore holds. That remaining idea is then the pure gold, and the rest of that stuff was the dross.

So let us challenge this idea of a "detecting system" with the elementary abstraction approach, and let us throw out everything in there except the most fundamental thing it contains. To do that, let's start physically shrinking this

"macroscopic detection system" and get it as small as possible.

Now if I get it so small that, for any part of it to change, the entire thing has to change, then I cannot get it any smaller, because all I have left is just the single part that changes, and that part must still change in any detection, else no detection would occur.

So I'm going to stop right there, at that point, and I am going to name that beast, because it looks very unusual. That is really a wiggly fish. I'm going to call that a perceptron. And I'm also going to claim that we have just defined a "fundamental particle," such as an electron, a proton, etc. It cannot get any smaller, because any change to it is a change to the whole thing, by definition. That is what one really means when one speaks of a "fundamental particle." You can't change one side of it without the other side also being involved. If the fundamental 3-D particle had any 3-D subparts, I could think of one of them as changing and the other or others not changing, and so the particle would not be "fundamental." I can think of it as having subparts of a different dimensionality -- such as 2-D waves -- but that is another matter which we will not cover here.

And since I have thrown away the chief macroscopic characteristic -- i.e., that the detecting system had one part which did not change -- then the system is no longer macroscopic, but I now call it microscopic.

Now with the perceptron, one has something magical. Because for the perceptron, to detect is to change, and to change is to detect. Change and detection become synonymous. I.e., external change and internal detection become synonymous. And thus I have just invoked the fourth law of logic: the perceptron is the boundary between the observer and the observed, the subjective and the objective, the internal and the external. The opposites have been identified in each of those pairs of concepts. That is the use of the fourth law of logic, and that ought to allow me to close all these

things such as physics, metaphysics, matter, fields, etc. into one overall system, because the perceptron model is a boundary statement. It states its own opposite. Everything one can think of as "external" is a set of internal changes. Anything one thinks of as a set of internal changes also comprises detection of external phenomena. In fact, the perceptron itself is nothing but a set of changes -- and these internal changes also define what is referred to as the observed or detected external world. The perceptron concept defines the fundamental microscopic observer or microscopic detection system.

Now wouldn't it be nice if one could write a transfer function for the perceptron? Because what does the perceptron perceive? I.e., what is its output? That is what one calls physical phenomena -- when all the outputs are collected, clickety, clickety, clickety, click! I.e., when they are collected in a memory system, which is the requirement that establishes the macroscopic detection system. I.e., the memory requirement can only be met by some part of the overall detection system that does not necessarily change from detection to detection. Thus the very concepts of observer and observed phenomena and physical reality and the separate existence of an external reality require a macroscopic detection system having one part which does not change in the detection process and hence can be used as a memory or storage facility. It is also not accidental that causality -- which at its essence is merely time-ordering of detections -- must disappear at the quantum level, which is where one tries to describe the microscopic detection system or perceptron. Causality -- time-ordering -- is totally a memory process, and the perceptron -- i.e. the quantum detection system -- has no memory. It also follows that the statistical model of quantum mechanics is itself a macroscopic concept -- for again one does not have statistics without memory. The microscopic world, if one insists on using that term at all, consists entirely of the fourth law and is totally holographic. It is unperceivable

in the ordinary macroscopic sense.

But this sort of quandary presents no particular problem from the viewpoint of the fourth law of logic and the perceptron concept. But in conventional terminology, the problem can be summarized as follows: When I collect all the output clicks of the perceptron, that ensemble is what I call "physical phenomena." But then what in the world went into the perceptron process as input? Because the word output is merely a statement that perception has occurred, while the word input is merely a statement that perception has not occurred. But if the perception process has never occurred for the input side, then the input is by definition unperceived, or unperceivable. So how can one determine what the input is, when no determination is possible?

It is very simple! If I can collect all the clicks, they are going to turn into the unclicks, the opposite, by the fourth law of logic. So that "totality of perceived or perceivable realities" will automatically constitute and model unperceived and unperceivable reality.

You see, there is no longer any problem with modeling the unperceived! All one has to do is correctly model the entire perceived, and one is there. At the boundary, it turns into its own opposite, and the perceived and unperceived are identical.

And it turns out that one can do that -- because one can write a transfer function for the operation of the perceptron, i.e., for the operation of perception itself. But let me be a little more precise.

Here is one statement of the minimum amount of change or detection that can occur.
(WRITE)

$$\Delta A = h/4\pi$$

The world, you see, is dimensionally built out of something called action, whose dimensions are ML^2/T . It is not built out of mass, or energy, or time, or length; it is built out of action. Only one never measures action itself; all one measures is

a derivative of action. The time rate of change of action is energy, e.g., and the length rate of change of action is momentum. It is action which is processed and changes, but it is a derivative of action which is detected or measured.

So now let us accent something well known in physics: Only changes are perceived. In our perceptron model, that is not at all surprising, for the perceptron simply consists of its own outputs, its own changes. And so only another change can be added to its internal constitution, hence outputted, or detected.

But suppose you had a little black box which contained a perceptron, but you did not know that. Suppose I informed you that the gadget in the box never sees an entity, a characteristic, or whatever; instead, it only sees changes in an entity, a characteristic, etc. Then if I asked you what kind of gadget you would call that, you would quickly reply that that gadget was simply a differentiator.

Then I would say, "That's fine! That means, then, that to perceive is to differentiate, because I've got the basic perceiver in the box." And you would say, "Of course! Differentiation after all is just separation, and that's what the perceptron is doing, it separates that which it outputs, by the third law of logic." And I would say, "Yes, that makes good sense!"

But mathematically the perceptron output is in fact a time derivative. Now why is it a time derivative?

The perceptron is a fundamental particle, a mass. Now what is the single most fundamental conceptual nugget in the idea of mass? Simply L^3 . The mass must occupy space, so it must be three-dimensional. If something does not occupy three spatial dimensions, it is not mass.

By the fourth law of logic, a thing can only do that which it is, and it can only be that which it does. So a thing can only measure or detect that which it is or has. That which has or is length -- such as a ruler or a string -- can be used to measure,

detect, or compare length. Area, e.g., may be inferred or computed, but only length is measured or detected by the ruler.

A mass is thus a special kind of ruler, whether viewed as a measuring system, a detecting system, or a perceptron. So a mass can only detect that which it is or has -- three spatial dimensions.

But if one believes in the Minkowskian geometry of special relativity, the world is built out of L^3T . It is not built out of just L^3 . However, try as I can, I cannot look at or detect time. I look here, there, everywhere -- I see three L's, but I'll be a sonofagun if I can see that fourth dimension, time. The reason I do not see it is quite simple. My mass system -- each particle of this thing that makes up my entire physical body system -- is a time differentiator, and it invokes the operation of time differentiation on Minkowskian 4-space input and it throws away the T in the process, outputting L^3 . So I go around perceiving or detecting or observing in three spatial dimensions because the gadgetry I'm looking or perceiving with is a time differentiating system. So I lose any direct perception of time.

But what else did I lose when I lost time? I lost the only dimension, time, that my mind occupies in common with the physical universe! So I lost any direct perception of my mind also. I look around for my mind, and I can't find it. I look here, there, everywhere, but I can't see it. No wonder! In looking, I threw away where it was; I threw away the plate it was sitting on.

I did not say that accidentally, because we are going to get it back before we are finished.

Okay. This perceptron idea then ought to have some practical application.

I must realize, however, that to perceive is to differentiate; perception is a differentiating operation. Specifically, to differentiate is to separate, and what I really separate is an action quantum. What I really do is go around separating

them (to try), then putting them back together again. How, after

all, does one write the equation for quantized change? In terms of $\Delta E \Delta t$. Or $\Delta p \Delta L$. One writes the product of two associated little delta quantities. And that describes an action-separating or action-fissioning process. And then we meet canonical variables, and what we are really talking about is how we separate or split that action quantum into two pieces. But we can only measure, detect, observe, or perceive one piece because perception and detection are monocular. I.e., in a differentiating process, one must differentiate with respect to one of the variables, and that splits that particular variable out of the action atom and loses it, leaving the other variable. So that is why two variables are canonically tied together. If I separate an action quantum into ΔE and Δt , for example, and I have a monocular perception process -- only one thing at a time is perceived or outputted -- and if I output the ΔE , that is all I see. I lost all the Δt , because the perceptron can only output one thing at a time, by the third law of logic. So where did the lost variable go? It got out of the perception box, so to speak.

If I perceive, measure, or detect the Δt , I lost all the ΔE . If I get part of the ΔE and part of the Δt in one conglomerate output, then I lose part of both ΔE and Δt . Whatever I lose is what I do not perceive. Therefore it is what I am uncertain of. And that of course leads to the Heisenberg uncertainty principle -- that is all the principle says!

Now take the uncertainty principle, and put it into plain English, and you have "It is absolutely certain that everything is uncertain." That itself is just a boundary statement, a statement of the fourth law of logic, and of the monocularity of the perception process. That is what it is. That is why it has such boundary power and bounds all observed phenomena. It provides the absolute limit, or boundary, for everything observed or perceived, for perception itself.

Okay. I can see, then, L^3 and I go around thinking of a Cartesian frame, thinking of three-dimensional spatial objects because I time-differentiated

four-dimensional spacetime objects. I slice the 4-space world in two, into a 3-space slice, every time I perceive, every time my clicker goes "Click!", every time an output comes out of the perceptron gadget. That is what the perceptron does.

But now, if I really believe the fourth law of logic, then I believe that I can take two opposites -- any two opposites -- and I can turn one into the other. And heretofore, it has been rather commonly accepted that mind and matter are totally separated opposites. And that is not exclusively true. I can identify the two. And therefore I ought to be able to represent the mind as precisely and as exactly as anything else in physics. The only thing is, I must close all the physics -- I must get it all, to reach the boundary where physics and metaphysics are synonymous. So one way to approach the problem is to "gather in whole worlds" -- i.e., to look at ways to gather in or close the entire cosmos.

So let us go back again to the Einstein spherical model of the closed cosmos. When I close the universe of three dimensional space, I get everything closed in there -- all the matter, the space, the observers, the minds, the beings, the memories, the entire ensemble. I thought first in terms of a point -- well, I actually get the closure in the smallest operational entity, the perceptron itself. So I actually get the closure in a fundamental particle, because that is the smallest 3-D piece, and that is what the perceptron is. And the perceptron is where external and internal become synonymous, which is another way of referring to closure. So a particle is an Einsteinian closure of space such that the whole universe is closed in there inside it. Name any wiggle in the outside one normally thinks of. Is it in there? Yes, it is lumped in there, because we closed all of it in. Yes, the inside is the outside and the outside is the inside as well. And inside and outside exhibit complementarity to a monocular perception process, by the third law of logic. Monocular perception can see the inside or it can see the outside, but not both simultaneously. Can this closure

detect the external? Yes, because that is only to detect the internal, it is already in there. It just sorts out or separates one thing at a time; it is all in there. The separation is, or creates, the external. The external, the separation, is indeed real; but in one sense it is also a created illusion of the perception process itself. So the external physical world is a monocular differentiation series, while ultimate reality is an undifferentiated multiocular total-presence-of-all-at-once, hence total absence of any specific, exclusive one-thing.

Does Mach's principle apply then? Does the external determine the internal, the distant determine the local? Yes, it does. I may not be clever enough to find out exactly how, but it does. The external is the internal, the distant is the local. And since by the fourth law a thing does that which it is, or causes what it is, or is what it causes, then the external causes the internal and vice versa; the distant causes the local and vice versa; and Mach's principle rigorously applies.

The only thing being detected is internal changes. And action quanta are separated one at a time and differentiated or fissioned, so that a single piece of time Δt is formed by the splitting, giving a discrete but not necessarily quantized structure of time, since the magnitude of the Δt that is split out may vary.

So now we have presented a challenge. The challenge is to find how to represent the mind in terms of the physical universe, because it has got to be just as physical as the room and chair you are sitting in, and as your own foot. If it isn't that physical, one has not found the mind. And if it isn't that exact, one hasn't found it either.

But I just mention that to tantalize you a bit. Before we get into that, let us first do some other things; let us summarize what we have done so far. Every fundamental particle of mass is a perceptron. Every fundamental particle has got the entire external universe closed inside it. The whole universe is thus a giant hologram.

You see, one can have three-dimensional holograms and four-dimensional holograms just as one can have a two-dimensional hologram. So the entire world is built as a single giant hologram.

Now has any physicist every played with a concept that will fit that? Of course! I did not know that when I started my own perceptron theory, but it was simply fantastic to run across it. The physicist's name was Everett, and the work to which I am referring is called the many-worlds interpretation of quantum mechanics. Everett was originally a student of Dr. John Wheeler at Princeton University, and for his PhD thesis he submitted the many-worlds interpretation of quantum physics.

Everett noticed that the conventional interpretation of relativity, and in fact for all of physics, had a terrible limitation. It was interpreted for only one single observer at a time. In special relativity, e.g., one may compute how an event appears to one observer in the S frame, and then run over to the S-prime frame and see how it looks to one observer over there, but we only consider one observer at a time. Now it is a simple matter for me to convince myself that you and I both exist at the same time, regardless of how you may be moving. But if we do, then I assure you that physics is quite different indeed from what you studied in your university physics book! So if you believe as simple a thing as the fact that we all exist simultaneously, then you must learn a new approach for physics, for the one you learned is incomplete and vastly limited.

Everett considered the problem of multiple simultaneous observers, and he worked out in detail what this did to physics. And with that he provided a totally new interpretation of physics, and a startling new vision of greatly expanded physical reality. And it is weird, too! Because now one has multiple orthogonal worlds everywhere, of every type and description, no matter how wild or farfetched a world one envisions or conjures up. Every possibility is concretely real and exists, no

matter how strange. But regardless of how odd the many-worlds interpretation is, it is totally consistent with the entire experimental basis of physics. That doesn't prove it in the conventional sense of course, but it says that not a single thing known out there disproves or contradicts it.

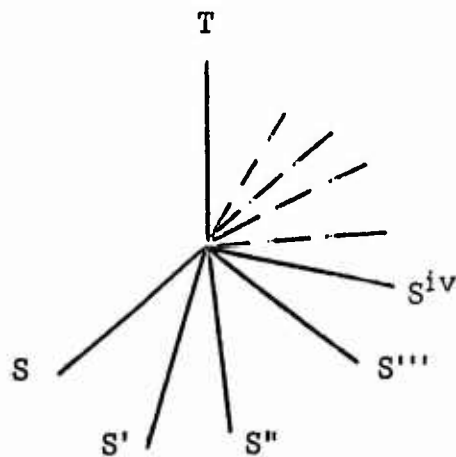
And I noticed something rather remarkable about Everett's multiple worlds. Something that no one else seems to have noticed, or if he did, he was not foolhardy enough to advertise the fact!

Of course I could first point out that considering multiple simultaneous observers considered multiocular perception. Hence multiple worlds, which are in fact multiocular perception, are indicated. Orthogonality is also indicated, since orthogonality is the basis for spatial separateness. Everett's many-worlds interpretation is thus a result of his application of the fourth law of logic: multiocular perception constituting that application.

So everything I had been doing in perceptron theory could be fitted neatly onto Everett's theoretical framework, providing a theoretical structure for the concepts.

But the most fantastic thing by far was that my required physical model for the mind emerged from the union.

If I choose a very particular set of Everett's orthogonal worlds (DRAW)



and here, since I cannot draw four dimensions, I will use one line to represent a 3-dimensional space -- this line down here (POINT) is one 3-D spatial frame. Call that one S. This next little line here (POINT), which is also a 3-D spatial frame, is a whole orthogonal turn away from the first, in an infinite-dimensional space. Call it S'. The next 3-D space is another orthogonal turn and labelled S''. We have S''', S^{iv}, etc. in similar manner. So we have an infinite number of orthogonal 3-D spatial frames represented on this drawing.

Now all these spatial frames are also specifically selected so that they all share in common the same time dimension, which we will draw with a single line and label T (POINT).

Not very much to look at.

But for instance: The intersection of two spatial objects which are orthogonal to each other is one less than the dimensionality of the lowest dimensioned one. E.g., the intersection of two orthogonal lines -- one-dimensional objects -- is one less than one, or zero-dimensional, and that is a point. I.e., that determines a point. If one has a one-dimensional line orthogonal to a two-dimensional plane, then the plane is two-dimensional, the line is one-dimensional, and, so taking one less than one, that's a zero-dimensional intersection, or again a point.

And so the spatial intersection of two 3-D spaces one orthogonal turn apart is two-dimensional.

So if I have a 3-D electron in the S frame, it is a 2-D photon in the S' frame.

By the way, it is well known that velocity is just a measure of curvature of space. It is usually thought of as a measure of curvature in the direction of the time axis; however, it can also be a measure of the curvature in a fourth orthogonal length direction in infinite dimensional space. You get the same projection effect as in the

first case, and one can show that mathematically. And all that c , the speed of light in vacuum, is, is a right angle turn. Or in other words, an orthogonal turn. So if one is in the S frame, any 3-D object in the S' frame is moving at the speed c in the S frame. And it is two-dimensional in the S frame. That's exactly what we call a photon. The reason it moves at the speed c is that all c is is the orthogonal turn in the first place. Velocity is merely the measure of spatial curvature; specifically, of the amount of spatial rotation in the direction of another orthogonal spatial axis.

Between S' and S'' -- i.e., between c and c^2 , the velocity of an entity in that region is simply c^2/v in the S frame, and in the S frame that is what one calls a DeBroglie wave. Yes, a DeBroglie wave is a real, solid, concrete particle! Just like an electron. But between one and two orthogonal turns away from the observer's frame.

When turned totally to the S'' frame, an electron becomes just a length, a one-dimensional entity, to the S frame. One dimension is lost each time an orthogonal turn is made in a departing manner. If it is turned an additional orthogonal turn past S'' , then it is in the S''' frame, and it has a point intersection with the S frame. It is zero-dimensional to the S observer spatially, but it still contains the same T dimension.

Now notice that the S observer's mass will time differentiate when it perceives, so it will extract and lose the T dimension. So that observer's perception process will tell him that anything in S''' or higher is totally separate from him.

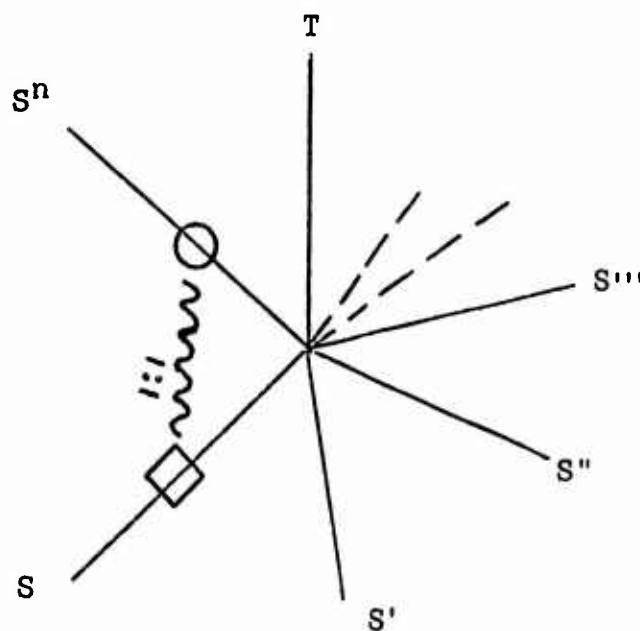
But now I claim that all those frames --- S''' and higher --- precisely meet the definition of what we all have been referring to as minds. What one calls "mental phenomena" are nothing in the world but perfectly real and ordinary objects moving in those higher frames. A very startling concept indeed, but one that is very physical and very exact. And we previously pointed out that that was one fundamental

requirement that must be met in modelling the mind, according to the fourth law of logic.

Now there are an infinite number of those higher orthoworlds. And it can be shown mathematically that, when something moves in one of them, it crosstalks into the other frames a tiny bit -- an incredibly tiny bit, it is true, but a finite amount nonetheless. A little vector is induced in each of the others by an object moving in one frame.

Thus Dr. E.P. Wigner's explicit assumption that consciousness reacts on the rest of the universe has a solid basis in this physical model of the mind. Wigner has already shown that argument against this assumption can be reduced to the weak objection that it is unpleasant to imagine consciousness having a large effect on physical reality; i.e., on the S frame, and he has proposed a kind of solipsism that would overcome even this objection. In this physical model using a time-clustered series of orthogonal worlds, Wigner's arguments have a solid basis.

Now if I take a set of phenomena in one of those higher orthoworlds (DRAW)



and if I take a set of phenomena, of what I call matter, here in the laboratory S frame, and then if I get a nice one-to-one, two-way correlation crosstalk between those two sets of phenomena, then the set in the S frame is a body, the set in the higher frame is a mind, the two-way correspondence correlation is life or spirit, and we now have a model of a living biological system. And from the standpoint of the S observer, the life portion represents the input from that higher mindframe.

To be precise, I call the crosstalk from one frame to another, in that fashion, inception.

Incept is a word that has fallen into some disuse, but it is a beautiful and appropriate word. It simply means initiate. So to incept matter is to induce or initiate change to it. In a living system, that is what we call behavior -- the inception of preferential change onto an otherwise nonpreferential or inert mass system.

In fact, the old English use of the word "spirit" used to be in the sense of "that which quickens or initiates, or incepts, behavior or movement in matter." We still speak of a "spirited horse," e.g., as one which is energetic and moves around a lot. Spirit originally meant that which quickens matter, and it meant nothing else! It meant the same as chi, ki, prana, ectoplasm, bioplasmic energy, and all those other terms variously applied to the incepted energy today. The Christians of old used to know about that, and they called it spirit, until they got wrapped around the axle about some other things and forgot that the word spirit meant an energetic type of thing that could be used to move matter.

So this (POINT) is life, inception. To live is to incept. To incept is to live. To produce input changes into an otherwise inert and ordinary physical system at a tiny, tiny level -- changes which are sheer magic if you insist on isolating the physical matter and using only the first three laws of logic. Because from the ordinary 3-law, single 3-D frame, Cartesian approach, one does not know where the life inception comes

front. It rains from the sky, but one cannot find that life input in the microscope. The physics of inert matter in one 3-D frame is totally unable to account for life inception, because life inception comes from a hyperworld outside that 3-D spatial frame.

Now why are human minds all separated? That problem is simple. If one takes an infinite number of things, i.e., an infinite number of mindworlds, and selects a finite number of them at random, the probability is one that no two of them will be the same. But then how does one explain telepathy? Again that is fairly straightforward. E.g., if I take one mindworld, and establish a correlation between it and another mindworld, that is telepathy. If I establish a perfect and total one-to-one correspondence between the two mindworlds, then what I really have done is to rotate one world around to the other, and those two mind sets link together in one common worldframe and accordingly become one mind. One set of orthoworld phenomena. And they can still be tied to, or correlated to, two different physical things in the S frame, although those two things will now exhibit correlation.

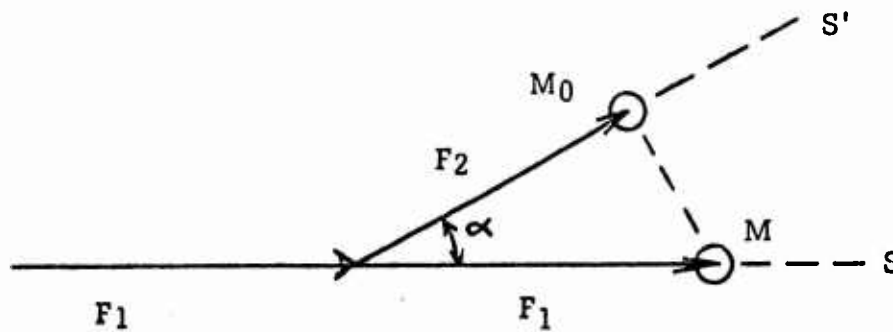
Can I give you an example of that? Yes indeed! It's in your own head. The two cerebral brain halves are in fact separate brains. If the corpus callosum nerve cable that connects them is severed -- and that has been done in persons with certain forms of epilepsy and in others when tumors in that area were removed -- the two brains are separated and two separate human personalities emerge in one body. If one has a severe psychosis, so that interference with the correspondence of various parts of the two brains is introduced, again personalities can be separated in their functioning, even without severing the corpus callosum, and one has multiple personalities. A psychiatrist friend of mine mentioned one patient who has thirteen different personalities in her body, all independent of each other, and all requiring psychiatric treatment! All of them are insane!

So this selected, time-clustered many-worlds model is startling and it is

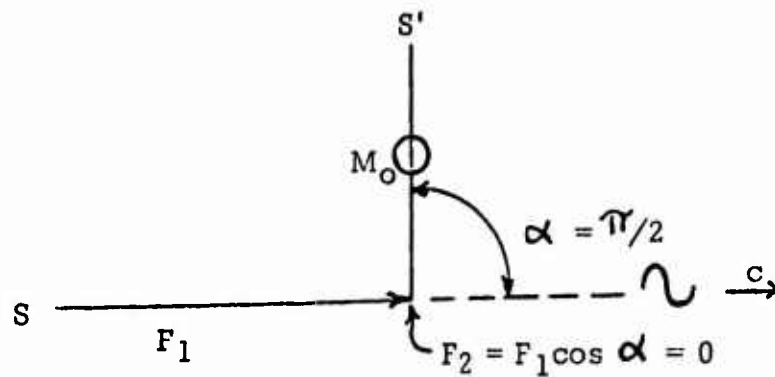
a bold proposal intended to unite physics and metaphysics. But it meets several exacting requirements. The mind has got to be as objective as a chair; if one does not have that kind of model, it is not correct, from the fourth law of logic. And one has to get the whole physics thing in there that one uses to model the chair, or one does not move to the boundary where the physical models the nonphysical. So one has to get a whole physical world collected if one is to model the nonphysical mind, again by the fourth law of logic. Then if one wants to model multiple minds, one obviously has to collect multiple worlds, by the same reasoning. And this model meets all those criteria. And it meets the test of including all the strange parapsychical mind effects being noted by our parapsychologists. Telepathy is here. Psychokinesis is here. What I'm calling inception, if you don't like that term, can be called "minute psychokinesis," for that is what it is. One can usually move four or five electrons in his brain by inception; that induces an input signal into the complex physical servomechanism that is the body, and then ordinary physics can be used to describe how the servomechanism moves from there. But the input signal, which comes from another worldframe, is pure magic as far as the conventional inert physics of one worldframe is concerned. Yet it is that tiny inception that constitutes our lives and gives us free will, conscious behavior, memory, knowledge, and all the rest of those intangibles which we associate with mankind and which we prize above all else.

But wouldn't it be nice if one had a magic process so that one frame could be flipped into another? Wouldn't it be nice to build a machine that could do that, i.e., that could turn from one frame or world to another at will? Because one could then build a vehicle that could travel at any speed desired, and one could go anywhere in the universe one desired, or even into other universes if one desired. One could go in here and out there is this one world, with no travel in between.

The most primitive thing one can do is get behind an object and shove it from the rear and try to accelerate it to the speed c that way. Because as one shoves the object, in a line in the observer's frame, then as the velocity of the object increases, that is spatial rotation, and the objects frame is rotating away from the observer's frame and the applied force. And so the part of the force that is actually being applied to the object is the projection of the force into the object's frame. That projection is shrinking and the applied force is therefore steadily shrinking, as the angle of rotation increases. (DRAW)



Call that angle of rotation between the two inertial frames angle alpha. Now just as alpha gets to 90 degrees, the projection of the force into the object's inertial frame goes to zero, and we have the situation we will now draw here. (DRAW)



One calls the apparent resistance of the object being accelerated, the inertial mass of the object. Mass is just the measure of how much it seems to resist further push, i.e., how hard it is to push it faster. For the faster one tries to push the object, the more it seems to resist, and hence the more its mass seems to increase. What really happens is that its 3-D spatial frame rotates away from the frame containing the line of force, and less of the force is actually being projected into the object's frame and onto it to affect it. And so at 90° rotation, the force has zero projection onto the object, and one can no longer affect its velocity, which is c because of the orthogonal turn. Therefore the object has infinite inertial mass in the S frame; i.e., infinite resistance to further acceleration. But by the fourth law of logic, that must also correspond to zero mass, and so it does. The object is now two-dimensional in S because it lost one dimension with respect to the S frame when it turned orthogonally. Since mass is a three-dimensional concept, to the S observer the orthogonal S' object has zero mass. So the photon exhibits infinite inertial mass with respect to any acceleration force, and therefore the speed of light is the same to every observer. It also exhibits zero mass since it is not three-dimensional. So that is the fourth law of logic. Zero mass is infinite mass. The two are identical on the boundary. There is no conflict in the statement for a specific problem. It does not hold anywhere but on the boundary. But on the boundary it is correct. Zero mass there is infinite mass. All that infinite mass means is that, push as hard as you wish, you cannot affect its velocity. All that zero mass means is that, push as hard as you wish, you cannot affect its velocity, because there is nothing to push against to affect!

But now I point out that every time a mass system emits a photon, one has 3-D mass turning into 2-D waves. And every time a mass system absorbs a photon, one has 2-D waves turning into 3-D mass. In L^3T spacetime, you see, a wave is

simply a differentiation with respect to length, and a mass or L^3 is simply a time differentiation. And from special relativity we know that length and time are the same, the only difference between them being the parameter c . One orthogonal rotation, because that is what c really is. So all that adds up and it makes perfectly good sense. But also, photon emission and photon absorption are energy conservative. No energy is lost in the process, and it does not take any energy to accomplish it. What it does require is very precise time synchronization. You do not have to get behind an object and use the whole world's fuel supply to push it, to try to get it to the speed of light; what you have to do is gently thump it just right, and bang! It will flip itself one orthogonal turn without using any energy. And then if you are clever enough, you can get over in the system with it, and kick it again, and it will flip again, and you can get into any space you want, you can go at any speed you want to, you can violate the speed of light and the limited laws of physics in one frame, and you can go in here on earth and out there by the star Sirius without any travel in between. Granted, of course, that you have a developed science to do all that!

But if you don't have a dream, if you don't even have a concept, if you don't have a fishing line to throw in the ocean, then you are never going to catch that fish that allows you to violate all those ordinary restrictions that we normally cannot overcome. So instead of spending our time going around saying, "We can't, we can't, we can't; nobody can do this!" look for a way that you can do it! If you have the fourth law of logic, quit dwelling on zero and look at infinity. Quit saying "no, you can't," and "it doesn't exist, " because doesn't exist and exist are the same thing on the boundary! All limitations can be overcome, and all things are possible!

There are also a couple of new sciences that are being born right now, and that deal with things very similar to what I'm talking about. One is Thom's theory of catastrophes, and the other is Robinson's nonstandard analysis. With some difficulty,

I managed to obtain and view a film made by Dr. Robinson before he died. I did not follow all the advanced mathematics, but at one place -- when he finished -- he showed that it came out with a boundary statement, with the identity of opposites. It is in there. And it is in Thom's catastrophe theory, if you look deeply enough.

The selected orthoworld model I have advanced is a schema. We cannot dignify it by calling it a theory -- one after all must have thousands of equations in there to call it a theory! -- it is a schema. But in this schema, logic fits -- a new logic, a metalogic. In this schema one has included the observer, his life, and his mind, and they are included in an absolutely precise, physics manner. We have not used a lot of mystical mumbo-jumbo or a lot of fancy words which actually have little or no intellectual content. Instead, the schema has exactly the same kind of content one has in physics. So one can now build precise mathematical, physical models of the mind, of physical phenomena, psychokinesis, ESP, and going faster than light, and going in here and out there -- teleportation. One can build a model of almost pure witchcraft -- pure magic -- from the standpoint of a single, limited, Cartesian world model.

And these types of unusual phenomena are happening every day. They are being observed by physicists such as David Bohm, and other legitimate, widely-recognized scientists -- not a bunch of crazy kooks! One simply cannot maintain the view that everyone in parapsychology is in a vast conspiracy against the establishment -- that is just not true.

But what has been desperately needed is a new approach. We have needed a model that fits the data, and now we need to look into the ramifications of this model that seems to fit it all, and see what it prescribes or predicts as new aspects of reality.

The perceptron idea is very crude. Actually everything I do is crude. But it seems to fit or solve everything I can ask. E.g., it generates a new definition of

mass itself, a new definition of a photon -- and by the way, derivations of the first two postulates of Einstein. Let us derive those while we are passing, for they turn out to be quite simple.

The second postulate of relativity is, "The speed of light is the same for every observer." Of course! Perception is a finite process. Every perceptron has the same rate of operation, So all one has to do is go out in the external universe and find the fastest thing that moves, and that has to be it, by process of elimination. And that thing has to be 2-dimensional. So there emerges only one alternative: c , the speed of light in vacuum, is the speed that represents an orthogonal rotation, the speed of operation of the perceptron itself. So that is why the speed of light is the same to every observer. The second postulate says, from the perceptron viewpoint, that the speed of operation of every perceptron is the same. And that follows from the simple process of abstracting the idea of the perceptron to represent the fundamental, basic perceiving device in the first place.

Light, a photon, is orthorotated. It is merely a particle that rotated 90° with respect to one's 3-D spatial frame. And 90° orthorotation is simply the speed c . So every observer, i.e. every particle, ought to see every photon as a 2-D object travelling at the speed c , and he does.

And in fact every photon must see every particle in the S frame as a 2-D object travelling at the speed of light in the S' frame also.

Now how about the first postulate? That takes a little more trouble. We have to first introduce the concepts of a dimensional molecule and its absolute value.

Now we can regard the dimensions of a perceived quantity as having been created or outputted by the perceptron. When we express a set of these outputted dimensions as an ordinary fractional expression, we will call that expression a dimensional molecule. E.g., the dimensions of energy are (WRITE)

$$E = ML^2/T^2$$

and both E and the right side of the equation we will consider to be dimensional molecules of energy, each composed of MLL/TT (WRITE)

$$MLL/TT$$

But perceptron operation is the most fundamental operation. Further, perception is purely differentiation or separation. Since the two fundamental kinds of separation are ΔT and ΔL , then we will regard all other dimensional units as "molecules" somehow composed of ΔL and ΔT only. That is, we are in fact assuming a basic quantum of spacetime $\Delta L \Delta T$ as the basic quantum, and we are assuming that perceptron operation simply splits or fissions this basic quantum of spacetime into ΔL and ΔT in each operation.

If two quantities have the same units, then the absolute value of their dimensional molecules must be equal. That is, we will define the use of "absolute value of a dimensional molecule" in that manner. E.g., since kinetic energy and any other kind of energy have the same dimensions, then we can say that (WRITE)

$$|K.E.| = |E|$$

the absolute value of kinetic energy and any other type of energy is the same.

Now from experiment, it is known that matter and energy are intertransposable. Specifically, we know this from photon emission and photon absorption. So we can write this as (WRITE)

$$|M| = |MV^2|$$

the absolute value of mass is equal to the absolute value of kinetic energy. Now dividing out the M, we have (WRITE)

$$|1| = |V^2|$$

And, taking the indicated square root, we have

$$1 = |v|$$

the absolute value of velocity equals one. Therefore velocity is dimensionless in the perceptron output sense. That means it does not affect the perceptron's output or represent perceptron output. That is, velocity is a constant from the standpoint of the perceptron's differentiating operation, so a constant velocity input to it does not result in any relative change in its output relationships. Operationally speaking, this is the same as a statement that the derivative of a function and the derivative of that same function plus a constant are equal, i.e. that (WRITE)

$$D [f(x)] = D [f(x) + C]$$

So the laws of physics -- i.e., the relationships between repeated operations of one perceptron -- are the same for all observers -- i.e., for all perceptron masses -- moving at constant velocities relative to each other. And that is Einstein's first postulate.

It is also intuitively pleasing because, since velocity merely is a measure of rotation, a rotated perceptron should continue its normal functioning, with respect to its own frame, as a nonrotated perceptron does in the laboratory observer's frame. And that of course is the case.

Mass, by the way, is defined by perceptron theory as (WRITE)

$$M \equiv \left| \dot{n}_1 + \dot{n}_0 \right| \text{ operations per second}$$

where each operation processes one action atom or quantum of magnitude $h/4\pi$, and where \dot{n}_1 represents the rate of separation of whole quanta -- i.e., of fusion of subquantum fragments into action quanta -- and \dot{n}_0 represents the rate of fissioning of action quanta into subquantum fragments.

Again, this is intuitively pleasing, because energy is the time rate of change

of action, and so since the absolute value of energy and mass are the same, then mass must in some manner be a time rate of change of action also. And indeed perceptron theory derives it in that expression. We then find that mass is (WRITE)

$$1 \text{ kilogram} = 17.053 \times 10^{50} \text{ perceptron operations per second.}$$

where each perceptron operation processes an action quantum, either by fission or by fusion, of magnitude $h/4\pi$.

One must free up some of the restrictions in our heads -- such as the idea that action can only be positive, that it's an "absolute value" sort of thing. Allow it to be negative also sometimes. Now take a localized region of space and impose a single channel idea: everything which goes in must also go out. And realize that all velocities, all lines in the laboratory spatial frame, are real objects in one of the other many-world spatial frames. They are not just one-dimensional objects in the laboratory frame; that is simply their intersection with the laboratory frame. In their own spaces they are perfectly ordinary 3-D objects. And when those objects move, a line goes all the way through the localized region of space we have chosen in our laboratory spatial frame. The line goes in this side and comes out the other side.

And Feynman did not consider that when, in his three volumes of the Feynman Lectures on Physics, he included the same old tired refutation of the geometrical approach to gravitation. Someone noticed in about 1740 that geometrically one can generate the inverse square law of gravitation by thinking of two objects existing in an isotropic flux of little corpuscular balls. Feynman reiterated the objection that, if one chose a planet in orbit around a sun, it hits more flux particles on the front than it does on the rear, hence it would slow down and decay in its orbit.

But in our model, the little flux corpuscles are indeed magical orthorotated balls, for to the laboratory frame they exist as lines, and consequently can go right

through an object and on out the other side. So in the orbital case, one has as many line-particles going in one side of the object as another and the objection does not hold.

So from perceptron theory one can derive the universal law of gravitation, and in fact one can also derive all of Newton's laws of motion, relativistic form. I have already made those derivations in a published paper, "Quton/Perceptron Physics," which is available through the Defense Documentation Center.

So to summarize, here is what can be derived from the schema approach I am advocating: One can derive Newton's laws of motion, relativistic form. Newton's law of universal gravitation. The first two postulates of Einstein's special relativity. The equivalence principle, necessary for general relativity, follows from the fact that a single generating mechanism for force itself emerges.

And in addition, one can get the mind in there, being in there, thought and mental phenomena in there, life and the living observer in there, physical phenomena in there, and parapsychical phenomena in there. So we have got the observer in there -- mass, mind, matter, thought, field, force, and time. And that constitutes for the first time a complete physics of the observer and the observed, and writes the observer back into the equation.

We are all alive; we are not robots. Any complete science must contain that fact.

And also one has God in there, if one chooses to look. Simply take it all -- Everett's entire universal wave function -- all the worlds, spaces and times, beings, observers, lives, etc -- and that is the All, the Godness itself. The set of all sets. The frame and framer of all frames. The format of all formats. And it is exact. It is physical. And it fits the fourth law of logic, because by means of that law a thing is that which it does, and it does that which it is. Therefore Godness is simply all

doings, all phenomena, all phenomena proscriptions. And it is all precisely modelled.

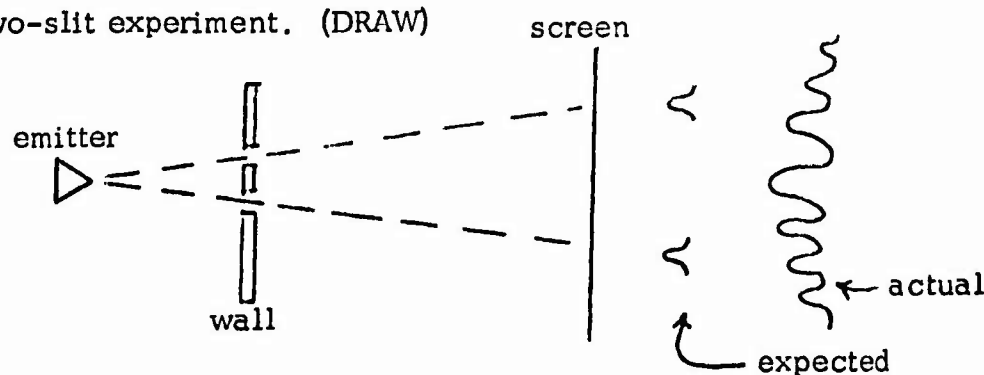
In the orthogonal worlds approach of Everett, all possibilities are real and exist. Didn't you really suspect that an unlimited Creator must have it all in there already anyway, including even the most remote and fantastic possibilities? If something were left out, how could the All be unlimited or all?

The many-worlds interpretation of physics is indeed weird, but it provides a schema which is known to be consistent with the entire experimental basis of physics. And in addition it contains a schema which I claim gets all that other stuff in there if I choose the right set of selected orthogonal worlds.

My entire message is: Let's get a new approach, let's get a new science paradigm. Let us not quit talking about dirty old metaphysics, but let us make it scientific. Let us not go back to when Copernicus had to renunciate his theories, let us not return to dogma. Let us stay scientific and objective. But let us believe that what can be worked out in many-worlds schemas and models has direct application to our everyday lives.

And when we have the fitted models worked out in detail, then let's do some engineering. Let's build some gadgets to do some of the marvelous things predicted by our fitted models.

A few of these new miracle-gadgets are built already. To try to prove that, I am going to draw two such gadgets -- one you are familiar with, and one you are probably not too familiar with. The first concerns a fundamental experiment in physics. The two-slit experiment. (DRAW)



Electrons are being emitted here (POINT). A screen is over here (POINT). In this region (POINT), there are two little slits, just big enough to allow the electron wavelength to go through. Now if I believe that the emitted electron is a little baseball, it will go through one of the slits and not the other, and it will hit here on the screen (POINT) or there (POINT). Once in a while, one will bounce off the edge of the slit a little bit, so one will get a bit of scattering at this point here (POINT) and also here (POINT). Every electron which misses a slit hits the wall and gets absorbed, and doesn't go through. So this pattern on the screen is what I get, right?

No.

What I actually get is the standard diffraction pattern like this (DRAW). If the electron were in fact a wave front and passed through both holes at the same time, that pattern is precisely what I would get. However, if I check each electron hitting the screen, it still only hits in one place. It says "Oh, no! I'm still a little baseball!" But over by the baffle plate containing the two slits, it said "Oh, no! I'm not a little baseball! I'm a wave!"

It's two-handed, gentlemen. The fourth law of logic says that it is both simultaneously, without any distinction or separation into two. It comes to one place and the experiment says, "Hey, you! You have to act like a wave, like a two-dimensional object!"

"Ho-kay!"

Then it gets over to the other place and the experiment says, "Hey, you! You have to act like a three-dimensional object, like a little baseball!"

"Ho-kay!"

Now that is a real device; don't laugh at it, it works. And that experiment is one of the fundamental bases of physics. But this is a device. One can build devices that process entities which are in two-nonexclusive-states-at-once.

Boy, that blew their minds in physics. They didn't believe it at first, so they set up a photon gun and hit each and every electron with a photon as it left the emitter and started over toward the two-slit region. That is, they determined precisely when a little electron was on the way. What they were telling the electron was, "Hey, you! I know you're there now, in that one place I just hit, just like a little baseball." And the electron said, "Ho-kay! Since you want me to be a little baseball, then I'll be one for you." And this time the electrons only went through one slit or the other, and gave the expected pattern. And when the experiment was repeated and only a fraction of the electrons were hit with photons, then a mixture of the two patterns emerged.

And to quote Richard Feynman, Nobel prize winner in physics, no physicist in the world understands this experiment! It is simple to mathematically describe the results, but no one could understand why things happened as they did. Well, the reason they don't understand it is that the results are not contained within the first three laws of logic. Specifically, the third law is violated if one insists on thinking in terms of the present. That requires two simultaneous states, and that automatically means it is not determined or perceived. Thus in physics terms that becomes probabilistic and undetermined, and that is automatically a wave concept. I.e., waves are not stuck in one place and determined, so they exist in the present and not the past. On the other hand, when a selection or determination is made on the electron, that is a differentiating or separating perception operation, hence in the past. And that is automatically a 3-D corpuscle concept. So when the electron has not been separated into single state but remains in dual-state, it acts as a wave. In that case it passes through both slits at once. But when it has been forced into a selection or separating perception, that makes it single state, and in that case it passes through only one slit or the other. When the electron strikes the screen, regardless of whether

it is in dual-state or single-state, the screen forces a selection upon it, and so the electron becomes single-state and thus hits in only one spot on the screen at once.

And that is the explanation of the two-slit experiment, that no one understands. The reason it cannot be understood is that the answer is not present in the first three laws of logic. It requires the addition of the fourth law to complete the explanation of the experiment.

So things, nothings if you will, can be processed in the two-states-identified-as-one-so-none-observed state. They can be amplified, recorded, put on tape, etc. You can put life itself on tape! On ordinary electromagnetic recording tape. And you can then pickup that recorded life essence and beam it through a television camera. It can modulate the microwave carrier, be stripped off and processed by the home television receiver, and reradiated out into a million living rooms at once.

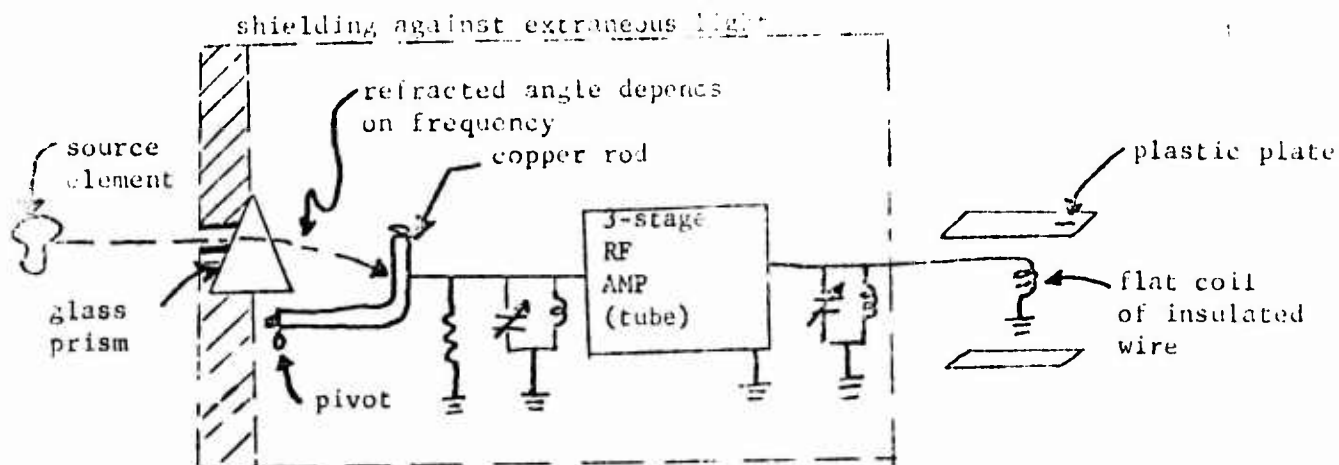
It's been done! Psychokinesis has been projected over the TV channel. Uri Geller looked into a TV camera and said "Bend!" and willed metal to bend, and metal bent and snapped in many places all over England. And he did the same thing again here in the U.S. He did the same thing to psychokinetically repair nonworking clocks and watches. And the same phenomena were induced in multiple psi-positives when a tape of Uri doing that was later rebroadcast.

Okay. The two-slit apparatus is a real physics instrument that all the physicists are familiar with, and it processes an object that is existing in two states simultaneously. It has one selector region that will only process waves -- because the slit dimensions are down toward the correct DeBroglie wavelength to do that -- so the two-state entity is happy to act like a wave there. And it has another selector region that is as broad as a barn and allows the entity to be processed as a particle, so the dual-state entity will act like a particle there.

The second device is one that most of you are probably not familiar with, but I

will show you the scheme.

This is the way it looks, like this (DRAW).



This is the Hieronymus device, patented by Thomas G. Hieronymus in 1947. It has an optical front end, a prism which passes waves -- particles don't go through, they just bounce off -- so a wave entering the front end will go through the prism and be refracted at an angle which depends upon the frequency of the wave. Now inside the surrounding box which acts as a light shield is a small tuner, a little copper rod attached to a rotatable wheel so that the rod may be moved through the various refractive angles from the prism. The prism is mounted on the box with a thin slit in the wall, so that only a small and narrow "field of view" exists external to the box. The tuner rod is wired to the input of a three-stage RF amplifier where each stage is separately shielded against light -- which is very interesting, because of a similar requirement in the two-slit experimental apparatus if the electron was to act as a wave.

With the two-slit apparatus, we found that if one invokes the proper operation, one can select or separate whichever of the simultaneous unseparated dimensionalities of the electron he wishes. The end result follows the principle of complementarity -- it is either one or the other once selected -- but what the principle of complementarity

does not say is that, before the selecting or separating operation is invoked, the electron exists in both states, 2-D wave and 3-D corpuscle, simultaneously. So it can waltz through both kinds of gates -- one which admits two-dimensional aspects only, and one which admits three-dimensional aspects only. But since it is not a single-exclusive-thing, it is a no-single-thing or a nothing, A nonthing. Simply a "piece of nothing," or what I call a quiton.

And the Hieronymus device is also a special type of processor of dual-state entities, of pieces of nothing, pieces of vacuum, pieces of space. It is tuneable to a certain frequency by shifting the position of the rotatable copper rod. The rod is wired to the input of the 3-stage RF amplifier tuned to, say, 455 kilohertz. The output of the RF amplifier comes out of the box and ends in a flat coil of wire between two parallel plastic plates.

Coming into the box through the slit in the prism, one can have single state entities and dual-state entities. Now we don't have a good name for a dual-state entity. There used to tentatively be a word called the wavicle used by some physicists to describe it. Today one talks about "wave packets." But what after all is a wave packet? It is a three-dimensional bunch of two-dimensional waves! So that is where the physicists have hidden the idea of the dual state wavicle today.

Only single-state waves and dual-state entities or wavicles can pass through the prism and be refracted at an angle dependent upon the frequency. If one then tunes the rod into the correct angle of refraction, the refracted wavicles hit it, as do the single-state waves if their frequency should happen to coincide with the frequency of the wavicles. Now the single-state wave dies when it hits the copper rod -- it may chip a single electron or two off a copper crystalline grain, but that is lost in the thermal noise anyway, below the detection threshold of the RF amplifier. The

wavicle, however, simply says "Oh! Now you want me to act like a corpuscular electron, and go through those wires and conduction paths. That's all right, that is my right hand side." So the wavicles will go through and be amplified, just exactly like ordinary electrons would do. But now it is not electron energy, it is a dual-state analog of energy -- let us call it anenergy, for analog of energy -- (Hieronymus called it eloptic energy, since it could act as electron flow or as optical waves, but was neither exclusively). The amplified anenergy will come out in the coil of wire and it will generate another analogous kind of field. It is not an electrical field and it is not a magnetic field, and so you will not measure it on your normal laboratory instruments. One must make some very peculiar little changes to certain laboratory instruments to get anything to measure the anenergy. The simplest way to detect the anenergy fields is to use the human sensory system, because the human body knew about RF energy, frequency modulation, and also this anenergy long before we had modern electrical and magnetic instruments. One example of the use of anenergy is acupuncture. A very ancient system dealing with the fact that a peculiar type of energy-like stuff flows in the body.

The anenergy is dual-state, and to ordinary instruments which deal with or respond to only single-state energy, the anenergy registers as zero. Note that it is zero single-state energy, but that allows for any amount of dual-state anenergy. The human sensory system can sense it and the human body conducts it through channels and functional plexuses, just as it does electricity.

Now if one reacts in horror, believes that this sort of thing is witchcraft, and firmly believes that he cannot sense the anenergy fields, then he cannot. One can turn the entire anenergy detection system in his body off with his conscious mind and with his unconscious mind. Click! Bang! The negative psi effect is a well-documented effect in the field of parapsychology. There are goats as well as sheep. There are

some persons, e.g., who do worse on psi tests than chance would possibly allow. They are the goats. They exhibit the negative psi effect, for unconsciously they are deliberately and strongly wanting to show you that psi does not work, but in so doing they try so hard that unconsciously they use and exhibit one aspect of the very effect their unconscious is trying to deny.

At any rate, the human sensory system can get a tickle or a tingle from the anenergy field generated by the flat coil of wire in the Hieronymus machine's output. What type of tingle you get depends upon your own type of body sensory tuning. It may feel as if your fingers on the plastic plate are resting on a vibrating plate. It may feel as if you have your fingers in thick syrup. Or it may feel greasy in a peculiar way. Very funny little sensations which vary from individual to individual. And the negative person does not get a tingle at all. So if one is too negative, he will not get a sensation from the output.

However, the experiment can be done in a controlled fashion. One can call in one's friends, have the entire apparatus under a black cloth, with an element sample in the field of view of the prism -- each element, by the way, gives off an individual frequency of anenergy, and that means there is a different refractive angle for each element. You can ask your friends to touch the plate, and to tell you when they get a funny sensation in their fingertips. And don't say anything else. Then tune the little rotatable rod. A few of your friends will not get any sensation, no matter how long you tune the rod. But others will say, "Yes! Right there! I got a peculiar feeling!" "Felt like water!" "Felt like the plate was wet." The next one may say, "It felt like the plate was syrupy." But the thing is that the sensation will occur when the tuner rod is at the same angle, for a particular element. Thus the experiment is repeatable.

The Hieronymus machine has been built by many persons, and it works for those who are not negative. It provides a practical example of a device that processes entities that exist in the dual-state, or that obey the fourth law of logic. And one can do some magical things with these dual-state nonthings, these nothings, if one starts building gadgets to use them.

Okay.

I must now say a word about something else.

What is nothing?

The absence of thing. That is what nothing means. There have been volumes written on the problem of nothing, and no one has solved it satisfactorily yet. So let us solve that one too, while we are at it!

No-thing means the absence of thing. Specifically, to a monocular gadget which can only see or output or handle one-thing-at-a-time, it means the absence of that specific type of output. I.e., the absence of the one-and-only-one condition. So translated into perceptron terms, "nothing" means the absence of the just-one-thing-exclusively condition. And that is all it means. So what fits that definition?

That requirement? This does. (WRITE)

$$0 \equiv \sum_{i=2}^n a_i \Big|_{n+1}, \quad 2 \leq n \leq \infty$$

Multiple presence is the same as "absence of singularity" to a monocular process. So total absence and total presence are perceptually the same. A monocular process cannot tell any single thing is present if two or more are shoved through simultaneously. So perception cannot tell if wavicles are waves or particles, and they disappear like magic from the selective, deterministic mechanism and simply become unperceived, or nothing, or vacuum. But they are real, and they exist. They exist, you see, in the

unperceivable present, the unselected or undetermined multiple state. They are in fact nothing but the probability states the physicist uses in physics, and propagates forward in time in an absolutely causal manner until observational selection of one state occurs, to create the most immediate past, which is all that observational physics normally deals with. But in the many-worlds interpretation, all possibilities are concretely real and exist.

So zero is infinity. Total presence is total absence. When you reach the zero point in vacuum, you must expect to find everything in it. By Einstein's spherical model of the cosmos, e.g. By the fourth law of logic. It is no wonder that one has so much energy in zero point energy; it is all in there, one has the entire universe's energy in there. It is no wonder that in a particle -- which is just an actual closure of the external universe in an Einstein closure -- one has so many wiggles. All the wiggles of the universe are in there.

So nothing is very rich indeed. You can reach into nothing, into pure vacuum, and you can pull out pieces of the whole world as long as you pull them out in pairs. It is all in there. So there ought to be some great things that one can get out of nothing. And we ought to think about that for a while. Instead of eliminating all the infinities in our equations, we should perhaps start thinking of what they mean and what we can do with them. What we can get out of them. How we can use them.

And another thing. There is no limitation placed on closing the universe. Suppose one closes it very gradually. That closure will be what I call the quote macroscopic world unquote. It is a geometrical closure, or gravitational closure. That closure has a great radius. But the universe can also be closed extremely rapidly and powerfully, and that type of closure is what a fundamental particle represents.

Many physicists have done a great deal of work on unified field theories. Feynman made one interesting statement: He said that anyone who wished to create a

successful unified field theory must first explain one very curious coincidence. This coincidence can be illustrated by two separated electrons. For the two electrons, the gravitational force between them is about 10^{42} times as small as the electrical force. And the radius of the closed universe model is also about 10^{42} times the classical radius of the electron. Feynman considers this coincidence so curious that it must not be coincidental at all.

But there is nothing that strange about it from our viewpoint of multiple universe closure! By the fourth law of logic, a thing is that which it does, and it does that which it is. So the very weak gravitational field simply represents -- and exists from -- a very weak closure of the universe, and the very strong electrical field simply represents -- and exists from -- a very strong closure of the same universe. The strong closure must have a very small radius, and the weak closure must have a very large radius. And these two radiuses must be inversely proportional to the closure strengths, or the field strengths. Hence the same parameter, 10^{42} , must appear in both ratios. So Feynman's criterion is fully met in our closure model when we consider dual closure. And the dual closure model also generates a new explanation of what charge really is. A positive charge is simply a strong universe closure in one direction, and a negative charge is simply a strong universe closure in the opposite direction. Significantly, many physicists are toying with antimatter models. In our model, an antimatter world simply represents a weak closure of the universe in the opposite sense from our normal weak gravitational closure.

Further, the dual closure model explains the holography of the universe. The external universe is inside each and every fundamental particle in itself. Only because of this is it possible for two observers (two perceptrons) to contain or observe or detect or perceive the same external phenomenon in the first place.

So what we are saying is that in one sense an electrical field is nothing but a highly compressed gravitation field, orthorotated into another frame. And if I could release the gravitational field that is compressed into an ordinary flashlight battery, I could get all the anti-gravity I wanted!

But is there anything else in physics that says that this is anything except wild speculation? Yes indeed there is! A physicist by the name of Santilli -- whose mathematics I can't even follow -- succeeded in proving about a year or two ago that the classic assumption in physics that the gravitational field and the electrical field are exclusive is false. And that left two alternatives, what Santilli calls the weak assumption and the strong assumption. The strong assumption is that they are totally the same thing, and the weak assumption is that they are partially the same thing. I submit that they meet both conditions at once by the fourth law of logic. They are totally the same generically, but the rate of closure or compression differs, and they are in different orthoframes. And so I submit that the dual-closure universe model is the way to go to find the long-sought unified field theory, in a holographic universe, because it is simply the only present model which fits the criteria.

And with that, we have completed our model. We have got it all in there, the mind, the matter, the fields, the being, the life, the behavior, the metaphysics, the physics, everything. And that was what we originally said that the fourth law required.

So that is how we must write the observer back into the equation.

And with that thought I leave you, for that is all I have to say.

QUESTIONS AND DISCUSSION

Hazel Henderson

What should we do now? Continue or have a cup of coffee or what?

Carter Henderson:

No I think we should stick with it now, if everyone feels like it.

Tom Bearden:

First the psychiatrist. Yes, I am insane! (laughter)

Hazel Henderson:

Okay, who wants to jump in?

Chris Bird

When you were describing that Hieronymus machine, what is the sensor and what is it sensing? And why, for one person, e.g., does it feel liquid, and another person feels friction? And can't we eliminate the amplifier, or whatever is in the black box, anyway? Since, so far as I understand, it has been eliminated?

Tom Bearden

Campbell did it, to build what is called the second type of Hieronymus device.

Chris Bird

Yes, some people don't need the machine or the wiring.

Tom Bearden

Yes, that is correct. Okay, that's a formidable question to try to answer, and I can only give you a very crude answer, and it comes out like this. You have a physical form in the ordinary universe you think of. You have mental forms in these other worlds, which are just as concrete and real as these physical forms, but they are orthorotated.

Now mind is not just the conscious mind; your conscious mind is a very

small part of your unconscious mind. I can walk around in my unconscious, and it is much vaster than my conscious mind. The unconscious, by the way, is digital at the deepest level, it is not continuum. The seemingly continuous signal data that you have is actually in vast groupings of digital data. In other words, a nerve ending fires or it doesn't, and that is digital data. The nerve endings also process the dual-state anenergy. Nerves do not transmit just electricity; electricity is not the last type of energy that is available. There is yet another kind, in each of these orthoframes, and you can call it ki, chi, prana, whatever you wish -- wavicles is probably a better term for the physicist, because it doesn't sound mysterious that way. It is dual-state, though, it is not single state; and so it is zero to an exclusive-state-only device, which is what the perceptron is. So you think nothing is there, and that is what is there -- nothing; two-or-more-simultaneously.

But your body is already -- to use the Soviet term -- a psychotronic machine. The mind portion has forms in it at a very deep level that are just as real as that table in their own frame, and these forms can function. You have a great deal of control over these forms -- much more than you realize -- and, if you get everything set just right, you can affect the correlation between your mind^{world} and your body matter world.

Chris Bird

Who are you? You keep saying you -- who are you?

Tom Bearden

Whoever. Any human being does this automatically.

Chris Bird

But who are you? What is "you"? Or "I"?

Tom Bearden

"You" is to have the correlation. Memory is you. Ego is memory. You have

no ego whatsoever unless a memory operation is invoked. Suppose you have a detection of a dog running, and project it on the wall. The picture on the wall has only the information, "Dog runs." To have "I see the dog running," you must add one more operation, "Dog runs," and a feedback or correlation between the two, so that you have "dog runs -- dog runs." You must add the feedback memory operation, and then the enclosed time space gives you "I see the dog running." Remember that the mind shares the time dimension; without the "snipping off" of an interval of time or bounding up an interval of time in your detection process, you cannot have the existence of "personal mind" or ego.

Chris Bird

What's the difference in your seeing the dog running and my seeing the same dog running?

Tom Bearden

It depends totally upon what frame you are in. In a certain frame or certain frames there is a difference, and in another frame there is no difference. In that last frame, you have what Jung called the collective unconscious. E.g., the personal minds do crosstalk at this very deep level. They crosstalk down at the quantum level. Quantum changes crosstalk between frames. Mind changes are totally quantized, exactly like physical changes are. Remember, we are speaking in terms of a physical model of the mind. And minds crosstalk a tiny bit. But it's so weak and so small, that normally it is not noticed at all.

If you take the small crosstalk that is coherent between a particular mind world and a physical body, and include the physical body and the mind world, that constitutes a living being. You then have other bodies in the same physical laboratory frame, each having separate mind worlds, and these ensembles constitute other living beings in the same world. Now there is crosstalk between those

mind worlds, and a certain small portion of that crosstalk is common to all of them. That common crosstalk constitutes what Jung called the collective unconscious. And what he called archetypes are merely the largest of the common signals in everybody, the largest groupings or forms in the collective unconscious, in the collective crosstalk channel. Archetypes then are relatively large things which are repeated many, many times in a holographic system. And one can show that those archetypes can integrate exponentially under certain conditions. So if multiple channels are linked synchronistically, you have a much greater chance of getting strong archetypes built up to a far greater signal level.

You know, it's just like a moving target indicator. If you integrate a coherent signal, over and over again, it increases linearly. Two times is twice as big, three times is three times as big, etc. But if you integrate noise, it is random. So it integrates less than linearly. So in a hypothetically perfect system, if you integrate over and over, you are constantly increasing the signal-to-noise ratio. No matter how weak the coherent signal is, or how far down in the noise it is, if you integrate enough, the signal will grow out of the noise, and above it. So an integrated archetype has a much greater chance of being orthorotated into the laboratory frame than other forms in the separate mind worlds. And time synchronization is the key, since all the worlds share the same time dimension. A thought can become as real as a lamp. In fact, the ancient Tibetians knew this, and they called such objectified thought forms tulpas.

But minds are not normally very stable; they change from one mood to the next in half a second. Things flit in and out, and its content is very unstable and changing from moment to moment. So the mind that triggers a tulpa into objective existence is normally a very erratic and unstable tuner, and so the tulpa tuned in is very unstable. Virgin Mary appearances go away. Angels go away. Devils go

away. Fairies go away. UFO's go away. But I'm saying UFO's can be objective, and they are simply tulpas.

Now is there any part of your question that I haven't touched on?

Chris Bird

Well, you didn't quite address yourself to the sensor.

Tom Bearden

The sensor is the human body itself; the body contains mechanisms which can induce orthorotation.

Chris Bird

Which part of it, do you know? Any part of it?

Tom Bearden

Any part of the body, any electron in it, can do that because the body is holographic. The nervous system of the body does process dual-state energy. And it also involves discharges, in the electromagnetic state, from the nerve endings. Wherever discharges occur -- nerve endings, cold cathode points, spark gaps, glow discharge tubes, glowing filaments, etc -- orthorotation occurs in and along with the discharge function.

By the way, I call those orthoframes biofields, and the first one, the first orthorotated world, intersects with the laboratory frame in what is called the ordinary electromagnetic field. We already know about that one, and we have a nice theory developed for it. We just have not yet worked out all those others. We even deal with the DeBroglie waves lying between the first biofield and the second biofield. But there is an infinite number of those biofields available, not just one and a half, so to speak. And the body already processes those kinds of entities -- dual-state entities, and it really accomplishes orthogonal flipping of those entities. But it is such a minute process that it normally doesn't give enough

electromagnetic field created by the orthorotation of higher biofields to worry about. However, I point out to the parapsychologists, check what the Soviets measured when they did all kinds of laboratory measurements on Kulagina. When she actually got psychokinesis to occur under controlled laboratory conditions, an electrical field formed around the object being moved psychokinetically. Another thing that was measured was that all her body fields -- every sort of field she possessed-- had an excitonic effect. Excitons were formed. All of these fields synchronized and entrained together. The physical vibrations of the body, the electrical firings of the nerve endings, the brain waves as shown on the electroencephalogram, the breathing, the heartbeat -- all of these became synchronized, and then the electrostatic field started forming around the body or object that moved. I point out that the way you get orthorotation is with exact time synchronization, you do not get it with a lot of force or energy. And time synchronization of multiple fields forms excitons, and there is a great deal of pretty sophisticated exciton theory that can probably be applied to this effect in an engineering manner.

So the crude effects of this time synchronization have been measured in the laboratory. Geller and another young fellow, e.g., succeeded in affecting a magnetometer inside a Farraday shield at Stanford Research Institute. To do that, an energy was sent through the shield in a dual state, and then orthorotated at the magnetometer into an electromagnetic field, into the first biofield. Or another way to say this is to say that the anenergy, in a higher mindworld, orthorotates into this world at the magnetometer inside the Farraday shield. There it has become the first biofield by orthorotation. When that is done, the magnetometer will be affected.

There are a few individuals who can do or perform such inception in a much stronger manner than the average person can. You know, people form a distribution pattern. Not everyone is exactly the same. We all form a distribution curve. And

a few people in the upper end of the pattern can generate a lot more power of orthorotation than the ordinary person, and we call these more talented or capable individuals psychics. We call some of them dowsers, some of them psychometrists, some of them telepaths, etc. -- all of these weird names. But they are doing a perfectly natural thing which can be described by physics, if you get the right kind of physics. This is not a bunch of weird mumbo-jumbo, and it is something that we ought to make scientific. But because we do not have a lot of really decent physicists working at this and trying to do theory -- to develop a theory that gives a way to go to do engineering and build some instrumentation systems, we do not have developed instruments to measure these effects yet, but they can be built. A two-slit box, e.g., is such an instrument. Detectors can be built if we can simply get the really good theorists involved and put our minds to it. What we really need are some topnotch theoretical physicists, and it can be done. If we would do the theory and then the engineering, we could build detection gadgets and we wouldn't have to use the body itself as the sensing device. But we are going to have to learn about these new biofields and anenergy, just as we had to learn about electricity -- ohm's law, polarity, ampere's law, storage batteries, and all the rest. We had to do a lot of playing around with electricity in the lab before we found out much about it. Electromagnetic theory and a full-blown electrical engineering degree did not spring up overnight. Mastery of electromagnetism came about by bits and pieces and a great deal of painstaking work by a lot of people, and that is what we have to have in this field. That is the only way we will get there.

So yes, you can build detectors, at least theoretically. Right now, the best detector is a living system, something that is already doing orthorotation of higher biofields into the first biofield, the electromagnetic field. And a lot of very weird stuff you have run into in your life comes from the orthorotation effect. Those silly

people , e.g. , who used to slaughter animals and sacrifice them had a reason , as indeed did those who sacrificed humans . Because the world is a hologram , and a living system is doing holographic inception . So the priest who had trained himself in the focussing of an energy onto an object had himself an amplifier when he had something which had just been alive and was just killed . And some of the persons who once went around killing witches originally had a little more justification for what they were doing that what we have been led to believe . Because a few of those cats could do some unpleasant things , and a few of them today still occasionally can .

A widely observed phenomenon is firewalking , where a man walks on hot coals . There is no way that can be done by ordinary physics ; the fire is just too hot and the walkers stay in contact with the glowing coals too long . The feet should be horribly burned , but they are not .

Okay . There are many cases like that , and some of you in this room are very experienced with those kinds of phenomena .

The point is , there is a totally ^{new} science waiting here , and it is an extension of our present science . This new science can be built , it can be modelled , and that is what we ought to do . Instead of sitting back and repeatedly saying this crazy thing , "I refuse to believe that it exists ." What if we had done that with electricity ? We would still be out there in the thunderstorms with keys and kites , trying to find out if lightning was electricity . That attitude is what we have to change .

Right now the best detector is the human body . Nobody has a really good instrument or meter that will move . A couple of people actually do , of that I have assured myself , but they will not tell you what it is that they use . I have tried to find out . I know that an ordinary coil , e.g. , can be wound in such a fashion that it will enable a meter movement from an energy , but I do not know how to wind it .

I wish I did .

Chris Bird

The human body and the human system are good detectors. They can actually detect much more than instruments. So why do we need the instruments to check this detection system? Why don't we just use the detection system that we call the human system? Or are we at that naive stage where we require an instrument to check ourselves?

I just want to tell everyone present that the finest magnetometer at M.I.T. now detects magnetic fields around the brain, around the heart, etc -- repeating the EKG stuff -- and it goes down to about 10^{-9} or 10^{-10} gauss. But it has been shown that dowsers can go way down to 10^{-14} gauss, and the good ones can do it every time and never make a mistake, in the case of the really good ones. Now how are we going to build an instrument that can get down there, just taking the magnetometer alone?

Tom Bearden

One way the Soviets have approached it is to do something very clever. They realized that the human body does accomplish this orthorotation, although they are not thinking in just those terms, and that the body takes this "other field" -- let's call it that -- and it rotates it into an ordinary electromagnetic field. And so Adamenko built a thing called the tobiscope to detect changes in the electrical resistance in the skin. He found out that at certain points he detected very sharp "peak point" changes, and those points in fact correspond with acupuncture points. He also found a lot more of these acupuncture points that way that were never in the old diagrams. Then he went a little further. If you use these points, you have points in the human body where this orthorotation of fields occurs. Adamenko then found that certain groups of these points formed plexuses, for want of a better word, and these plexuses had very specific reactions to things, or generated very

specific body reactions and emotional reactions when stimulated. Another of the strange things they found was that, when sunspots occurred on the sun, the skin points changed instantaneously, before the speed of light had time to reach the earth from the sunspot and bring the signal. Hieronymus monitored a similar effect when the astronauts orbited the moon, each time the orbiting spaceship passed behind the edge of the moon. There is nothing very weird about that; if you are in a c frame, i.e. in an orthorotated frame chosen in the right manner, the length between the earth and the sun is reduced to zero, simply by the Fitzgerald contraction effect. So if you are operating in that particular orthogonal frame, the length is in fact reduced to zero. And you can go into the orthoframe here, and turn back out of it there, with no travel in between here and there in this frame.

The Soviets measured these point plexuses and the synchronization of man and cosmos very accurately. They are well ahead of us in approaching an operational science involving these types of things. They call this field psychotronics, and they have some excellent physicists working in the field. And they are producing results. Unfortunately they do not publish very many of them. I wish they would. But they are very secretive about the whole affair.

But now we have to consider the observer in this type of experiment. That is what we have to do. Because now we are bringing the observer into the laboratory, and he is becoming part of our instrumentation. We haven't been used to doing that.

I apologize for the length of the response, but I said that was a tough question! There was a lot involved in that question.

Question

This question has to do with the Hieronymus device. After the wave passes through the prism, and enters the RF amplifier, the energy is not of the form of the conventional electromagnetic energy.

Tom Bearden

It is not the wave that enters, now, it is the wavicle. It is in dual-state still when it goes through the amplifier. So as far as ordinary single-state science is concerned, zero goes through the amplifier. In fact I call that a quiton -- I gave dual-state entities that name -- and I call this thing a quiton amplifier.

Question

It is not an electric current, that is full of electron motion, as we know it; it is something else?

Tom Bearden

It is a quiton or quitons. It is a piece of nothing.

Question

Okay. And human detectors can pick it up. So we have an electrical circuit conducting these quitons?

Tom Bearden

You see, nothing is everything, right? So a "piece of nothing" is a "piece of everything." You are used to that concept, except you normally just pull out a one-state piece. All quitons are, are two or more, and those are just pieces of nothing, and since you can't find just one in it, it is zero as far as conventional science and conventional instruments are concerned. So it is zero so far as one is normally concerned. But it is very real.

Question

So we have a circuit that conducts something that we never before thought about it conducting, we only thought this circuit conducted electrons.

Tom Bearden

That is correct. The amplifier works on the right hand, so to speak, while the optical front end works on the left hand. Just like the wavicle in the two-slit

experiment. When it hits the slit region, it is very happy to act as a wave; when it hits the screen, it is very happy to act as a corpuscle, and only hit in one spot. But it went through both slits at the same time.

Question

It's odd that an electrical circuit is used to conduct this nonelectrical energy.

Tom Bearden

Well, it's acting on or in it. You know, when we say conduct etc, you really have a set of interactions going on. Some entities only have a left hand, so to speak, and so they go groping along, interacting with things with their left hand. Some things only have a right hand, and so they go groping along, interacting with things with their right hand. But some things have two hands, both a left and a right, and so they just alternate right along, or "tom walk" through. And the "tom walking" entities are what I am talking about -- a whole new class of entities. They are not electrons and they are not waves. We don't have a word for them. Call them wavicles if you wish. I like to call them quitons, because the term "wavicles" got used and scrubbed out. So I call them "quitons." But there is nothing magic in that name -- name them anything you wish.

Question

Could this in any way be associated with a neutrino?

Tom Bearden

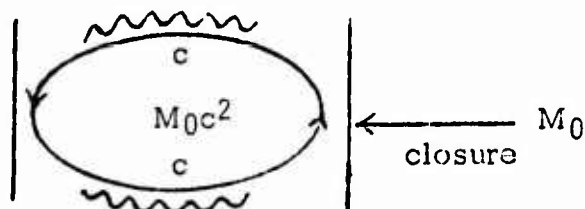
I think so, but I have to admit that, when you start talking about the neutrino, the neutrino sea, etc I am not knowledgeable enough to say yes or no. But, by the way, you can get a crude idea of quarks, e.g., and also a reason why they cannot be found as independent particles in 3-D space.

Question

Quarks?

Tom Bearden

Yes. I should have developed one thing. (DRAW)



If you do one orthogonal turn, that is c . If you then turn on, but back to the space you started from, and close exactly on the tail point where you left, that is another orthoturn, another c . And the two c 's multiply together to give a c^2 turn. Now if you imagine a 2-D wave going around those two orthoturns in the closure to make three-D, and closing exactly in phase with itself, then it will keep going forever in that thing. And that is a locked-in form, a 2-D object that made itself into 3-D by bending back around and closing on its own tail. If you take a 2-D surface and close it all around, what do you have inside it? 3-D. That is the way you do that. So if you do that here with this 2-D wave, that makes a 3-D object, and I call that a formon, a locked-in form. That is what a fundamental particle is. But if you reach into this structure and split it apart, you get the photon, the 2-D object, back out -- in fact you will get two of them -- and you get your c^2 term back out. And that is why $E = m_0 c^2$.

There is a physical reason for that equation! It is not just an equation written on the board! The physical world had to do something that generated that equation in describing it. The equation is hung on there as a description, but you are describing something that actually happens. The equation has physical meaning, if you can find it. It is not just an abstract idea.

But it is not the waves that go through the Hieronymus device. The Hieronymus device is a series selecting device, two filters in series. It will not admit either exclusive state -- wave or particle -- through the combination in series. But the

entity that is both-states-at-once can happily waltz on through. So the Hieronymus device has a stripper as its front end. It strips away this ordinary world from the world of pure magic -- the quiton world -- and processes the quitons. It is a space amplifier. A nothing amplifier.

Question

Is that the energy that is supposed to be absorbed by the Moray device?

Tom Bearden

I haven't been able to find very much information on the Moray device. What I have is simply a copy of the book, The Sea of Energy in Which the Earth Floats. To give you my thoughts on the Moray device and other such devices, I would say this. Conservation of energy has a certain assumption built into it. You are speaking of a single channel system. I.e., it is like a length of pipe with water flowing through it. When you speak of conservation of energy, you are saying that you can measure the input and the output, and that everything that went in or out came out, and nothing else got in in the middle. So you are saying that, other than for the ends you are measuring, it is a closed pipe.

But now look at an unclosed pipe. Take one that has holes in it everywhere, all along its length, and put it in another big pipe that has tremendous pressure on the water in it. So now you will get leakage into the ordinary pipe, or the inner pipe, that you are measuring. And if all you know about and can measure with your instruments is the input and the output of that pipe, then you are going to measure much more coming out than what you are putting in. And if you don't know anything about the middle, you are likely to exclaim that this is violating the conservation of energy! It is violating single-channel conservation of energy, closed system conservation of energy, because you do not have a closed system. And I just point out that orthorotation uncloses every otherwise closed system. So orthorotational devices certainly ought to be able to easily violate 3-dimensional conservation of

energy, and thus it ought to be perfectly possible to build so-called "free energy" devices.

Now go one step further with the pipe analogy. If I put a little piece in that single-channel pipe, something like an elbow or such, and tune it just right, so that the pipe's fluid starts to resonate, then resonance is induced. Resonance is a wild oscillation and response of the whole system, and it entrains the energy which is going through the pipe into an oscillating energy.

And here are some magic words: Resonance in a single-channel system entrains the single-channel energy. Conservation of energy applies in the conventional sense. Resonance in a multichannel system entrains the energy that is in all the channels. And if you are only measuring the input from the one single channel, then conservation of energy in the conventional sense does not apply, because far more energy can be going out that pipe than is going into it from the front end.

You can resonate superspace, you see! You can resonate zero-point energy! You ought to be able to resonate the connection between the electric field and the gravitational field and get antigravity. You ought to be able to turn the electrical field into a gravitational field and get fantastic antigravity and energy and everything else out of it.

Let me point out a working example. In the original Bohr theory of the hydrogen atom, the orbital electron violates Maxwell's equations. Specifically, the electron is under constant and steady acceleration toward the center, but it does not radiate photons, and that violates Maxwell's equations, which require an accelerated charge to radiate electromagnetic energy. Now the question is, how does it do that? It is fine to describe that, but then one ought to be tremendously interested in finding the reason that it doesn't. But too many

physicists now say, "You are not supposed to ask why!" That attitude means, "I don't know, and furthermore I'm not going to bother to find out!"

Look at it this way. Another peculiar coincidence exists there. For every orbital electron, the DeBroglie waves are integral around its orbital path. Great. That of course was noticed; that is the basis of the Bohr theory, how to set up the orbitals. However, DeBroglie waves are moving faster than the speed of light, faster than c . The speed of time itself is c . Time moves only at the speed of light. DeBroglie waves are outrunning time itself, therefore they are existing in negative time. I.e., when time runs backwards, we can call that "negative time." To a DeBroglie wave -- which is a physical object in the orthoworld model I am using -- time runs backwards. So a DeBroglie wave may be said to carry negative time. And the process of taking a bunch of DeBroglie waves, superimposing them, and changing them into a particle is nothing but time flipping. I.e., turning negative time into positive time. By orthorotation.

The integral number of deBroglie waves around the orbital loop means that a constant velocity electron in that loop is meeting a steady rate of negative time flow, carried by the DeBroglie waves. At the same time, the electron, being constantly accelerated at a constant rate, is trying to lose electromagnetic energy at a steady positive time rate. But at the same time, it is gathering into its own DeBroglie wave superposition structure the negative time at a steady rate from the standing wave DeBroglie waves in its orbital path. So the negative time input from the orbital path and the positive time output from Maxwell's equations simply cancel each other. So Maxwell photons are being born and are dying at the same time. There is nothing wrong with that; that is just the "identity of opposites" again. But it makes the orbital electron appear to violate Maxwell's laws, because positive time photons just don't get born and separated, in this model we are using.

And the old Bohr theory is good enough for this first hack. Before you wonder about the newer approach, which is to consider and represent the probability distributions of the electron rather than orbital paths, remember we have already delved into the business of what probability really is. That is simply modelling the future in terms of the past. That is, it is modelling where the electron may be, assuming that it could ever be anywhere in the first place. But looking at it from the standpoint of the old Bohr theory, there is an exact mechanism that grinds away the photons as fast as they try to be born.

I claim you can lay two operational vectors on that situation. You have a photon continuously being born, and you have the same photon continuously dying. Yes, you can kill photons! You can do that with DeBroglie waves. And you can generate DeBroglie waves with macroscopic devices; they do not have to be microscopic. Every moving object in the universe generates DeBroglie waves. And if you are clever at the way you generate these negative-time carrying DeBroglie waves, and you match a lot of them in phase etc. in a macroscopic system, then you ought to be able to get a lot of negative time. Then you ought to be able to couple that to a resonant system, and get time oscillations, and you ought to be able to rectify time oscillations and get either positive time flux or negative time flux. There is a Soviet physicist named Kozyrev who is doing exactly that sort of thing. And none of our physicists are looking deeply at his material and results. Kozyrev is getting forces generated by time oscillations. Now from relativity, time and length are simply the same thing. But if you can oscillate length, then you ought to be able to oscillate time as well. And Kozyrev is doing it.

Now that was a long-winded answer to your question, but the question entrained all of that, you see.

Andrija Puharich

Tom, I might make a small comment. There have been several questions about the Hieronymus device and what the sensation is under the skin. With all due respect, I don't think you have quite addressed yourself adequately to that, as to why there are different sensations to different people from the same system. Let me just tell you the results of some experimental observations of mine over a period of many years.

Some thirty years ago, I had a famous chemist, Alexander, say to me, that one of the most puzzling things in the world was to go down in the clothing district in New York and watch the millions of dollars of trades that were made each day just by people running their fingers over cloth. They literally will walk up to you and say, "How are you?" and they're feeling your suit to tell its quality. We have no way, he said, of knowing what's going on between those fingers. And I thought that would be a most interesting problem, to try to solve what goes on between these fingers. Why is there so much information there? I had no knowledge then of the sort of thing you've been talking about; I was just thinking of clothing and dollars. So I did a lot of neurophysiological research on that problem, and I'll just briefly give you some conclusions I reached.

If you take a surface that is one side of a series LC resonant circuit -- that's essentially capacity coupling -- and put your finger on it as the other part of the complete loop, then there is obviously an interface between the two. You can do the same thing with any television antenna; stroke your fingers over the surface of the antenna like you would stroke a bow over a string on a violin, and at a certain rate of speed, you will begin to feel a stickiness. And different people have different sensations. And so I hooked some instruments onto the finger and the system. I found out that when you get about six-tenths of a volt negative

surface charge on the skin -- similar to a bias in a diode detector system -- then the RF signal, the sine wave going across that gap, will be half wave rectified. So this is a very important clue. It doesn't directly answer the question, but when positing quitons as dual-state particles -- for rough analogy, say plus and minus simultaneously -- then you would say that the skin is a differentiator pulling out either a plus or a minus stream of charges.

Tom Bearden

The skin would rectify the quitons.

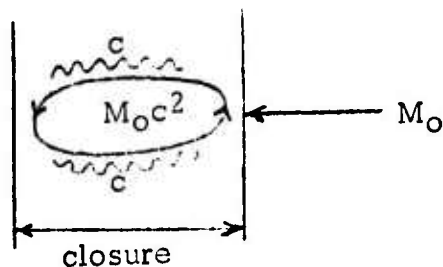
Andrija Puharich

Therefore you would get your pulses with one sign. There are certain conditions. This is not easy to obtain. You must have absolute series LC resonance across the tissue in the whole system. You must have a double sideband system. And in effect when you stroke, you change the dielectric permittivity across the thing because of pressure and plasma effects and so on. So it's not that easy to do, but the net result is that you can actually see on the scope the skin's half wave rectification of that signal. I've never discussed this before, but I've got a lot of data on that, and I thought it might shed some light on the problem here.

My other comment is not experimental but theoretical. You can actually look at the fine structure of the skin. I personally think that the keratin, the protein molecules of which the surface of the skin is made, plays a role here. We have a pretty good idea what keratin looks like structurally. There are certain hydrogen bondings which can be stretched. And this is a well known mechanism. When you stroke your skin over something, it takes a certain amount of pressure, and that creates a stretch, and so there are some well known mechanisms which will account for the half wave rectification in the detection effect, in the keratin of the skin itself.

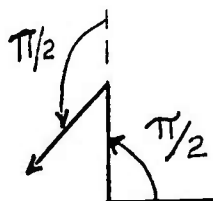
AFTERWORD

I never did answer the question on quarks. Briefly, a particle is a closed two orthobends, like this:

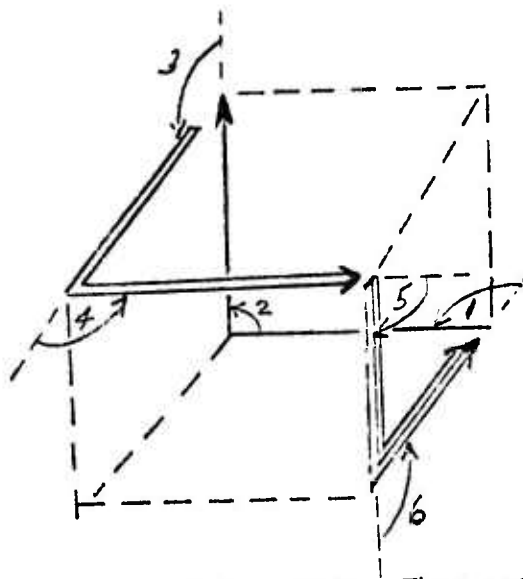


CLOSURE (MASS PARTICLE)

A quark is an unclosed two orthobends, like this:



Three quarks, however, can make a closure, like this:



And that is a fundamental particle. Thus quarks do not independently appear as particles in experiments because they are neither particles nor waves. Their indirect effects, however, should be detectable in a properly designed experiment.

REFERENCES

1. Bearden, Thomas E., Quiton/Perceptron Physics: A Theory of Existence, Perception, and Physical Phenomena, Defense Documentation Center (DDC) System (AD 763210), March 1973.
2. Bearden, Thomas E., Field, Formon, Superspace, and Inceptive Cyborg: A Paraphysical Theory of Noncausal Phenomena, DDC, (AD/A-005-579/8GI), 1974.
3. Bearden, Thomas E., A Conceptual Derivation of Einstein's Postulates of Special Relativity, DDC, 8 October 1975.
4. Bearden, Thomas E., Restatement of the Heisenberg Uncertainty Principle For the Condition of Superposition, DDC, 8 October 1975.
5. Bearden, Thomas E., A Postulated Mechanism That Leads to Materialization and Dematerialization of Matter and to Antigravity, DDC, 8 October 1975.
6. Bearden, Thomas E., The Boundary Identity of Exact Opposites: A Simple Solution to the Age-Old Philosophical Problem of Change, DDC, 8 October 1975.
7. Bearden, Thomas E., The Fourth Law of Logic, 1976 (privately published).
8. Bearden, Thomas E., The Holography of Being, (in publication, private).
9. Bearden, Thomas E., "The One Human Problem, Its Solution, and Its Relation to UFO Phenomena," Pursuit, Journal of the Society for the Investigation of the Unexplained, January 1976.
10. Bertrand Russell, Wisdom of the West, edited by Paul Foulkes, Crescent Books, Inc., New York, Copyrighted 1959 by Rathbone Books Limited, London, England.
11. Hubbard, J., private communication.
12. The Many-Worlds Interpretation of Quantum Mechanics, A Fundamental Exposition by Hugh Everett, III, with papers by J.A. Wheeler, B.S. DeWitt, L.N. Cooper and D. Van Vechten, and N. Graham; eds. Bryce S. Dewitt and Neill Graham, Princeton Series in Physics, Princeton University Press, Princeton, N.J., 1973.
13. Charles W. Misner, Kip S. Thorne, and John Archibald Wheeler, Gravitation, W.H. Freeman and Company, San Francisco, CA, 1973.
14. B.B. Kazhinskiy, Biological Radio Communications, Izdatel'stvo Akademii Nauk Ukrainskey SSR, Kiev, 1962; translation available through the Defense Documentation Center, AD 415676.
15. S.K. Lisitsyn, "New Approach to the Analysis of Electroencephalograms," in Problems of Bionics (Selected Articles), pp. 16-25, DDC, AD 730045.

16. Symposium on Unidentified Flying Objects, Hearings before House Committee on Science and Astronautics, July 29, 1968.
17. Jacques Vallee, Passport to Magonia, Regnery, 1970.
18. Richard Garvin, The Crystal Skull, Pocket Book Edition, March, 1974.
19. Yakov P. Terletskii, Paradoxes in the Theory of Relativity, Plenum, 1968.
20. Milic Capek, The Philosophical Impact of Contemporary Physics, D. Van Nostrand, 1961.
21. David Bohm, The Special Theory of Relativity, W.A. Benjamin, 1965.
22. Edwin F. Taylor and John Archibald Wheeler, Spacetime Physics, W.H. Freeman and Company, 1966.
23. David Michael Jacobs, The UFO Controversy In America, Foreword by J. Allen Hynek, Indiana University Press, 1975.
24. Brad Steiger, Mysteries of Time and Space, special archeological research by Ron Calais, Prentice-Hall, Inc., Copyright 1974 by Brad Steiger.
25. Robert Bruce Lindsay and Henry Margenau, Foundations of Physics, Dover, 1957.
26. R.M. Santilli, "Artions and Gravitation: Some Puzzling Questions," Annals of Physics, Vol. 83, No. 1, March 1974, pp. 108-157.
27. P.A.M. Dirac, "Development of the Physicist's Conception of Nature," Symposium on the Development of the Physicist's Conception of Nature, ed. by Jagdish Merha, D. Reidel Publishing Company, Boston, 1973, pp. 12-14.
28. Hector Hawton, Philosophy For Pleasure, Fawcett World Library, fifth printing, June 1970, pp. 21-24.
29. A. Einstein, "On the Electrodynamics of Moving Bodies," Ann. Physik. 17, 891, 1905.
30. Robert Eisberg and Robert Resnick, Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles, John Wiley & Sons, New York, NY, 1974, pp. 63-68, 146-152
31. Evert W. Beth, The Foundations of Mathematics, Harper Torchbooks, The Science Library, Harper & Row, New York, NY, 1966, pp. 481-518.
32. Donald R. Barr and Peter W. Zehna, Probability, Brooks/Cole Publishing Company, Belmont, CA, 1971, pp. 16-17.
33. N.A. Kozyrev, "Possibility of Experimental Study of the Properties of Time," Pulkovo, O vozmozhnosti eksperimental 'nogo issledovaniya svoystv vremeni, Russian, September 1967, pp. 1-49, JPRS 45238, 2 May 1968.

34. Arthur T. Winfree, "Rotating Chemical Reactions," Scientific American, Vol. 230, No. 6, June 1974, pp. 82-95.
35. Stanley Krippner and James Hickman, "West Meets East: A Parapsychological Detente," Psychic, May/June 1974, pp. 51-55.
36. Richard Feynman, The Character of Physical Law, M.I.T. Press, Cambridge, Mass., March 1967; 2nd printing September 1967, pp. 31-33.
37. Richard P. Feynman, Robert B. Leighton, and Matthew Sands, The Feynman Lectures on Physics, Addison-Wesley Publishing Company, Volumes I, II, and III, passim.
38. Thomas J. Jech, The Axiom of Choice, American Elsevier Publishing Company, New York, NY, 1973, pp. 3-6.
39. E.P. Wigner, "Two Kinds of Reality," in The Monist, Vol. 48, No. 2, April 1964.
40. Bernard d'Espagnat, Conceptual Foundations of Quantum Mechanics, W.A. Benjamin, 1971.
41. "Axiom," Encyclopaedia Britannica, 1968, Volume 2, p. 921.
42. "Laws of Thought," Encyclopaedia Britannica, 1968, Volume 21, p. 1083.
43. "Semantics in Logic," Encyclopaedia Britannica, 1968, Vol. 20, pp. 201-205.
44. "Foundations of Mathematics," Encyclopaedia Britannica, 1968, Vol. 14, pp. 1096-1101.
45. G. Spencer, Laws of Form, Julian Press, New York, 1972.
46. Mario Bunge, Foundations of Physics, Springer Tracts in Natural Philosophy, Vol. 10, Springer-Verlag, New York, 1967, pp. 58-68.
47. Joseph J. Goodavage, "The Incredible Hieronymus Machine - Ultimate Doomsday Weapon or Savior to Mankind?" In Saga, September 1972, p. 92.
48. Louise and Galen Hieronymus, Tracking the Astronauts in Apollo "11", With Data From Apollo "8" Included, 2nd printing, Advanced Sciences Research and Development Corporation, Inc., Fort Lauderdale, Florida, 1969.
49. Langston Day and George De La Warr, New Worlds Beyond the Atom, Vincent Stuart Publishers Ltd., London, 1973 edition.
50. Jule Eisenbud, M.D., The World of Ted Serios, Pocket Books, Simon and Schuster, New York, 1968.
51. Sheila Ostrander and Lynn Shroeder, Psychic Discoveries Behind the Iron Curtain, Prentice-Hall, 1970, passim.

52. Jeffrey Mishlove, The Roots of Consciousness, Random House Inc., New York, N.Y., and The Bookworks, Berkeley, Ca., 1975.
53. Edward W. Russell, Report on Radionics, Neville Spearman, London, 1973.
54. John Taylor, Superminds, Viking, New York, NY, 1975.
55. Dr. Thelma Moss, The Probability of the Impossible, Copyright 1974 by Dr. Thelma Moss, Plume, New York, NY, 1975.
56. Bearden, Thomas E., An Approach to Understanding Psychotronics, privately published, 1976. To be published in the Defense Documentation System.
57. James M. McCampbell, Ufology, Jaymac Company, Belmont, CA, 1973.
58. Jacques Vallee, Passport to Magonia, Henry Regnery, Chicago, Ill, 1969.