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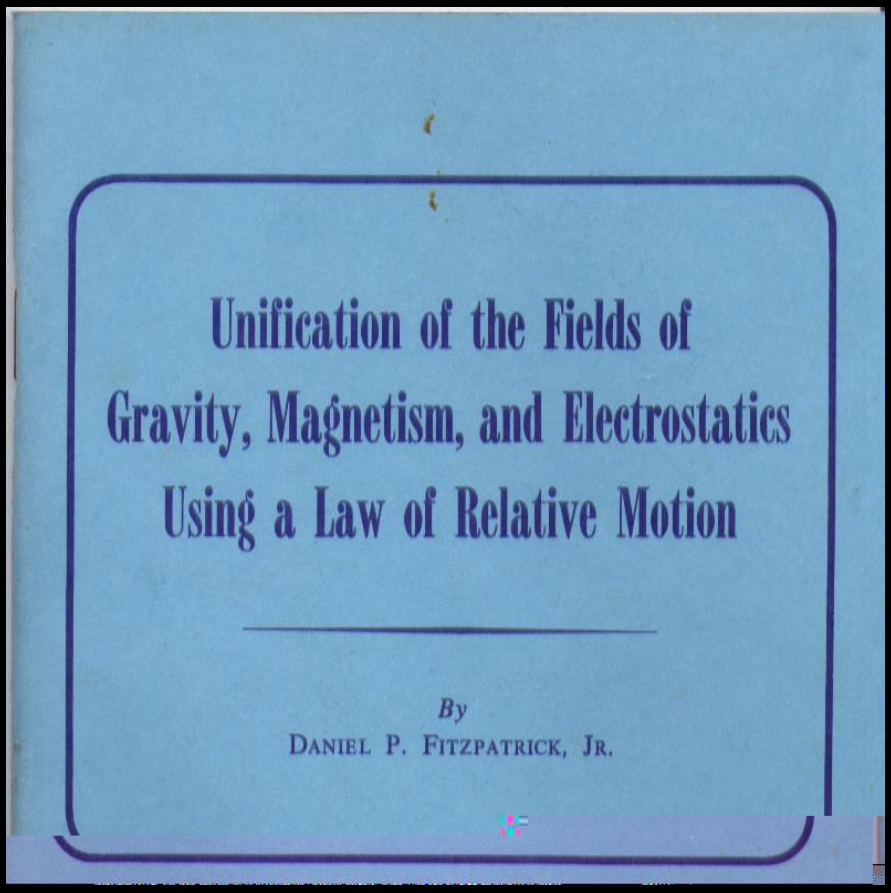


Unification of the Fields of
Gravity, Magnetism, and Electrostatics
Using a Law of Relative Motion

By
DANIEL P. FITZPATRICK, JR.

4 Decades of writings of Daniel P. Fitzpatrick Jr.

there was a full page about it on page 29 of the June 18, 1967 Sunday, New York Times Book Review section.
This e-book will put you a quantum leap ahead of the pack in understanding science.

I had to apply twice for a copyright for this book in 1966 because the Library of Congress would not accept the notary's seal. . Today notarization is no longer needed and they have added a dreadful long copyright form but their new short copyright form is simple to fill out and they will even allow you to xerox it. . They have upped the price from $20 to $30 now but they will take your personal check. . What you gain by doing all this is that you are then granted the extra right - over your automatic copyright - to collect court costs and attorney's fees for copyright infringement and sometimes this makes all the difference.

Now the words, in this following book, have as much or even more meaning than in 1966 when they were first written.

Only three fundamental fields (three fundamental forces) were know when this "Unification of the Fields of Gravity, Magnetism and Electrostatics Using a Law of Relative Motion" was written in 1966.

It's four fields now but the proof of Murray Gell Mann's theoretical quarks and the strong force did not arrive until 1974.

I've written many more books and things over the years: *Over 4 Decades of Daniel P. Fitzpatrick's Books, Papers and Thoughts* D.P.Fitzpatrick Jr.

Introductory Chapter 1.

The search for a common law

Man has invented numerous, wonderful and astonishing instruments, but yet his answers to gravity, electricity, magnetism, and indeed, to the entire universe itself, are only half truths, which he expects to see changed as time goes by.

Many people argue that the human mind can never hope to understand the universe. . One man, Albert Einstein, stood alone and criticized this type of thinking. .

Einstein claimed that we would some day find a common law that would enable us to understand not only gravity, magnetism and electricity, but the universe as well. . Paradoxically the very theory that Einstein gave us so that we may understand the universe, is itself, according to many people, incomprehensible.

I have tried to write this book in such a way that it will appeal, not only to the person with a good scientific background, but to those as well who might have a more casual interest in our universe.

With the later group in mind, I believe it appropriate to present a brief historical background of scientific progress in regard to our field of inquiry.

Chapter 2.

A Brief Historical Background

OUR STORY begins on the night of January 7, 1610. . Galileo had constructed a remarkable new device called a telescope, and on this fateful night he observed the planet Jupiter. . If we follow along and observe the planet Jupiter with a sixty power telescope, we will see exactly the same sight today that Galileo saw on that night three hundred and fifty-six years ago.

The planet Jupiter will appear about as large as the head of a pin, but then as our eye becomes accustomed to the darkness, we notice, close to the planet, four faint pin pricks of light all in an unmistakably straight line. . If we look again on another night we will see the same specks of light near the planet still in the same line, but now they will be situated in different positions on that line. . Galileo made these same observations and was able to inform the world that there were four satellites revolving around Jupiter in much the same manner as our moon revolves around the earth. .

Galileo then, not being content with merely discovering these satellites, made a suggestion whereby the observation of these satellites could be put to a practical use. . We will now look at this proposal of Galileo in the light of knowledge as it existed in the seventeenth century.

Magellan's ship, the Victoria had sailed around the world and returned to Spain in the year 1522, thus convincing the most skeptical of that era that the earth was round. . The people of that age knew, as we do today, that as the earth rotates during the course of a night, it makes all the stars seem to rise in the

east and set in the west much the same way as our sun. . The only star that does not move is the *North Star*. . The reason it does not move is because it is at the pivot point of all this movement.

The map makers and ship navigators in the seventeenth century knew that if a person was at the North Pole he would see the North Star as being directly over his head, or exactly 90 degrees to the horizon. . Now as the person sailed to the south, this star would appear to dip one degree for each sixty nautical miles south that the ship sailed. . This knowledge gave map makers and ship captains remarkably accurate information as to the north and south distances on the earth's surface. . All that one would have to do is measure the angle from the North Star to the horizon and he would immediately know how far south he was from the North Pole. . In other words he could determine his exact latitude.

The measure of east to west distances was not as simple. . In fact in those days it was almost impossible to know where anything was on the surface of the earth in terms of the lines of longitude that we find on our modern globes. . The only way that accurate east to west distances could be obtained would be by people at various places on the earth all measuring the angle from the horizon to a celestial object at the exact time everyone else was measuring it. . The problem was not one of measurement, but it was one of knowing at precisely what instant the other persons were doing their measuring.

Now Galileo's suggestion was this: . Why not use the satellites of Jupiter as a common clock that many people at many different places on the earth could see. . Now everyone could know, by observing the satellites of Jupiter, when to do their measuring.

A man by the name of Römer, realizing how important the satellites of Jupiter could be when utilized as a common clock, began keeping a log on the time it took each of these satellites to go around the planet. . With his telescope and clock, weather permitting, Römer would jot down the exact time each of Jupiter's moons would go behind the planet. . After systematically doing this for several years, Römer found he had an accumulative error of sixteen and

one half minutes that would appear and disappear every six and a half months. . This he linked with the fact that it takes the earth six and a half months to approach Jupiter, and an equal length time to recede. . He then realized that it was taking light sixteen and a half minutes to cover this additional distance between the earth and Jupiter. . Römer then merely divided the distance by the time and thus became the first man to calculate the speed of light. . The speed of light is 186,272 miles per second and this velocity becomes our key to unlocking the secrets of the universe.

Going back to the year 1883 we note that Albert Michelson and Edward Morely had built an intricate mechanism that would be sensitive and accurate enough to detect the difference between the speed of the earth in its orbit and the speed of light. . This experiment became famous the world over because it indicated that the speed of light remained at a constant 186,272 miles per second regardless whether the speed of the earth was added to it or not.

These results jolted the framework of geometric reasoning. . The experiment was repeated many times again, but still the answer was the same. . Here was something that could not possibly be explained by any known law. . Everyone knows that if two cars are coming toward each other and if each car is going thirty miles an hour, then they will approach each other at a total speed of sixty miles an hour. . This Michelson-Morely experiment clearly shows us this is not the case at a speed of 186,272 miles per second.

Chapter 3.

Relativity is Born

Two physicists offered an answer to the dilemma. . Lorentz and Fitzgerald assumed that a moving object must contract just enough

while it is moving, to keep the speed of light constant. . Albert Einstein then showed us that if we corrected the laws that Newton gave us by a factor of $(V/C)^2$ where V is the velocity of the object and C is the velocity of light, then Einstein's Theory of Relativity would give us the same results we had using Newton's laws; furthermore it would give us these new results that we recently had arrived at with the Michelson-Morely Experiment. . Thus, Einstein's Theory of Relativity came about.

The postulates of Einstein's Theory of Relativity that we will concern ourselves with here are listed below:

1. The velocity of light in a vacuum is constant and independent of the velocity of the source and the velocity of the observer.

2. An object must contract in size (relative to an observer) in the direction it moves relative to the observer. . This contraction is too small to detect at any mechanical speeds that we are familiar with here on earth, but this contraction starts to become very great as the object approaches the speed of light. .

3.The mass of an object (relative to an observer) increases as the object moves relative to the observer. . This increase in mass is also very slight at speeds we witness here on earth, but this increase in mass becomes extremely large as the object nears the speed of light.

4.A clock that is moving relative to an observer will keep time slower than the observer's clock. . The amount of slowing down will be negligible at any speeds we can obtain here, but this slowing down of the clock becomes appreciable when the clock moves at a speed near the speed of light.

5. Gravity is a form of acceleration and gravity is equivalent to acceleration

Now it seems that the writer has the double problem of not only making our universe understood to the reader but making Einstein's Theory of Relativity understood as well. . It is hoped that the

following pages will show that we live in a relativistic universe; it is hoped also that one will gain a better understanding of both the universe and Einstein's Theory of Relativity, because to know one is to know the other.

Einstein, who was thoroughly trained in the use of mathematics, utilized this field to the fullest extent in giving us the Theory of Relativity. . He came extraordinarily close to achieving his goal in untying the gordian knot which confines the mysteries of the universe. . However the scope of mathematics that aided Einstein so much, now failed him when he was almost in view of the solution. . Every lengthy calculation had become an avenue that was ended by a zero or an infinity sign. . Einstein was resolved to proceed farther, but his method of conveyance, the realm of mathematics, had been utilized to its fullest extent and could transport him no further. . He was so near to the answer yet that answer could not be obtained.

The answer is to be found not by the method of mathematical calculations, but by discarding old traditional and archaic inferences and replacing these with scientific analysis and logic.

Chapter 4.

Antiquated Reasoning

As one of the first humans looked about on our earth, he had a certain awareness of a limited area in which he traveled and hunted. . He visualized himself as at the center of a well know territory surrounded by a larger expanse of a region in which he had never roamed, but which he nevertheless knew existed by means of communications with his fellow beings. . Even though over a million years have passed between this first member of the human species and ourselves, this sense of being at the heart of our orb

still exists in us. . Man , while endeavoring to understand the universe around him, has repeatedly made himself the center of the cosmos and thereby thwarted his efforts at obtaining his long sought after goal.

What was true of the ancients, in trying to understand the motion of the sun and planets by considering the earth at rest, is still true today in the space age when man tries to unravel the enigma of space and time. . The delusions that hinder us in our perception of the true nature of the fields of gravity, magnetism and electrostatics are the following two:

1. The first delusion, is that we, like our prehistoric friend see man as the focal point between the microcosm and the macrocosm. . We are inadvertently saying this: a thing smaller than man has a certain order and has a certain set of rules; anything larger than man belongs to an entirely different order and has contrasting laws. . This poses a question. . Does it seem logical to assume that this infinite universe, composed of an unceasing sequence of orbiting bodies building together to form larger revolving units, would pick man, a mere speck in this universe, as the center of coordinates to differentiate between a microcosm and a macrocosm? . It is very unlikely. . This assumption, that he is the midpoint of things, is the very thing that obstructs man in achieving the solution he so diligently seeks.

2. The second delusion that obscures the explanation of our environment is that we constantly seek a place in the universe that remains at rest. . We then try to express all motion in terms of items moving in respect to us or another object that we allege is remaining stationary. . The reason for this is that most of man's experience with movement here on earth is in solving problems involving a certain motion in regard to an immobile earth. . Our prehistoric friend found out that describing motion in respect to a quiescent earth worked just fine, and this method of description suited his descendents fairly well for over a million years. . Because of the simplicity of this method of portraying movement, the majority of the occupants of this planet earth see no reason for not continuing this arrangement for another million years. . This is

not such an easy thing to do because Galileo and Einstein have both shown us that this method is not suitable in all cases, and that other people who may be journeying through space on another planet, revolving around another sun, may want to describe motion using their sun or their planet as a place of reference. . We can understand that they are going to express all motion that they observe in the heavens in respect to their sun or their planet being at rest. . We understand their situation only too well and we say to them, so that mistakes will be avoided, as we exchange information, that they should express all movement of celestial bodies that they observe by adding the phrase "Relative to Planet X". . We will then tell them that after our celestial observations that we will add the phrase "Relative to the earth"

The above presentation, a limited analogy of a portion of Einstein's Theory of Relativity, helps one realize that man does not have a monopoly on the point of view as to who is at rest and who is moving.

Chapter 5.

A Common Link

Einstein once said, while working on his Unified Field Theory, that trying to find the answer to the universe was like trying to understand how a dinosaur looked when all we had uncovered so far was one of its bones.

Einstein was of the belief that a common link was to be found connecting the fields of gravitation, magnetism and the electron charge . . He felt that this had to be so because of some basic

similarities, one of them being in each of the three fields the intensity varied as the square of the distance.

The following pages will present a new interrelationship of gravity, magnetism and the plus and minus charges inside the atom, namely that there is one common law that covers all these three types of fields. . It will be discovered that we had quite a few more of the dinosaur's bones all the time but we failed to recognize them as such. . It seems absurd to think that we could ever find a link between the force of gravity, the electrostatic charge and the magnetic line of force. . Not only do we have three different fields to deal with, but we are also working with quite a difference in the material makeup of the realm in which these fields exist. . One is a realm of conductors and insulators. One is a world of iron compounds and another is gravity that acts upon all objects no matter what their makeup is.

Such a link is before us but we have not seen it because we have been used to dealing with plus and minus charges in the field of electrostatics and magnetic lines of force in magnets. . We also have been observing gravity in a very similar light.

The universal link that we are trying to find to unify these three fields will have to be something that these three fields have in common. . What can this possibly be? . Our first look at the magnet, the electron and the earth seems to indicate to us that these are three separate entities each having its distinct and unconnectd field. . We are not dismayed by this observation and we keep persevering in the search for a similarity between these fields, and after a long and arduous pursuit we finally find a similitude that seems to point the way to a solution.

We have found that there is only one thing that these three fields have in common, and that is, in each of these fields there are components moving through space relative to their surroundings.

Therefore if we are ever going to find some bond between gravity, the magnet and the attraction of the electron to the nucleus of the atom, then we must find this link in the region of components

moving through space relative to other objects. . Our answer must then be found in the realm of relative motion,

We are going to have to divorce from our minds the conception of positive and negative charges and also magnetic lines of force because each of these is only attuned to a separate field and is not in harmony with any general law covering all three fields.

Since we have decided that we must do away with lines of force and plus and minus charges, let us do so now. . In the balance of our proceedings we shall only use the magnetic lines of force and the electrostatic charges to check our results.

We shall see in the following pages why the magnet, electron and gravity behave the way they do. . This we shall refer to hereafter as the "Law of Relative Motion". . This law pertains to bodies in orbit around other bodies. . We will see just how one orbiting object affects another.

Let us be concerned now with the explanation of the fields of gravity, magnetism and electrostatics using the "Law of Relative Motion". . Orbiting bodies will attract or repel each other because the speed of light, or rather the speed of action at a distance, between these orbiting bodies will remain constant. . The "Law of Relative Motion" will show the amount and direction of this attraction or repulsion.

The "Law of Relative Motion" that will pertain to all types of particles no matter what they are composed of is this:

The "Law of Relative Motion" that will pertain to all types of particles no matter what they are composed of is basically Ampere's 1825 Law:

Two bodies on orbits will have an attraction that will vary proportionally with the cosine of the angle of the planes of their orbits, and they will have a torque that will tend to make the orbits parallel and become oriented in such a way that both objects in both orbits are traveling in the same direction. . The attraction and torque thus produced will be proportional to the relative mass and velocity of the bodies.

Perhaps this can be stated in a simpler fashion:

Objects traveling on parallel paths in the same direction tend to attract.

Objects traveling on parallel paths but moving in opposite directions tend to repel.

If the paths of these objects are not parallel then a torque will exist which will tend to make these paths parallel in a direction in which both objects are traveling the same way

Chapter 6.

Magnetism and the law of Relative Motion

We shall consider magnetism and find out if our Law of Relative Motion gives us in reality, the same answers as our observations of magnetism. . We know that electrons will repel each other, but by examining Figure 1. we arrive at a situation when they will attract each other. . In this figure we see wire A B and wire A' B' parallel to it. . The arrows indicate the direction that the electrons are flowing through the wires. . Actually these electrons will be going in

various ziz-zag paths but experimentation has shown us that the net effect is the same as if they are traveling straight along the wire. . So we will consider that they do just that.

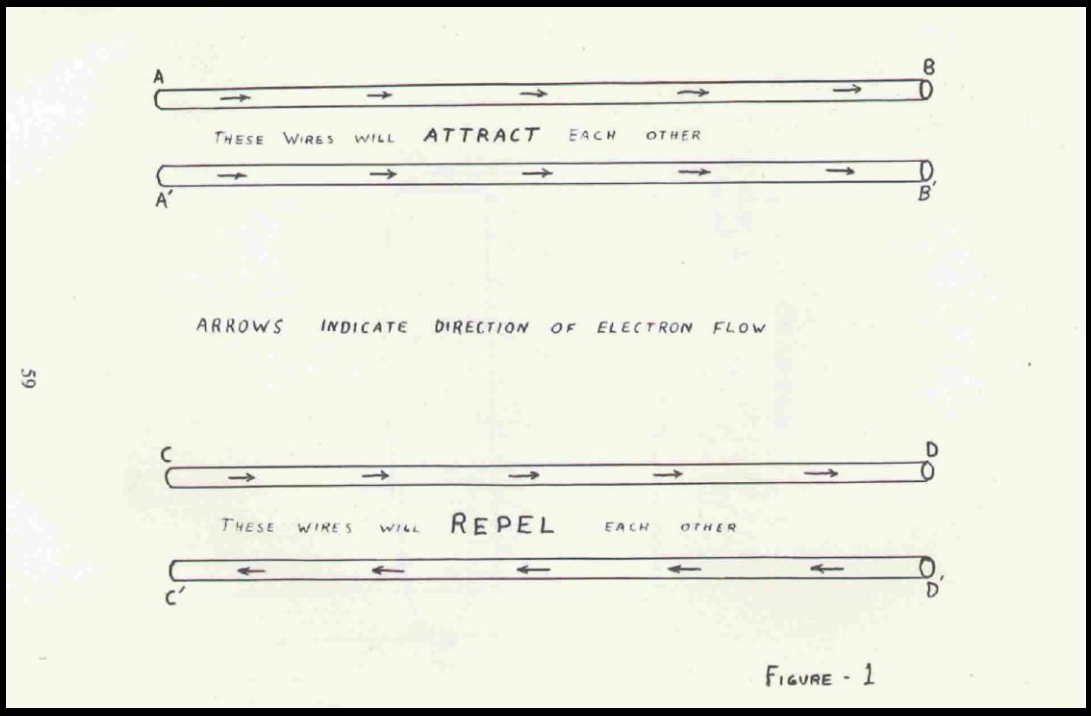


FIGURE - 1

In reality when we have two wires such as these and the wires are carrying currents in the same direction, the wires will attract. . So this seems to agree with our Law of Relative Motion that says objects traveling on parallel paths in the same direction will attract. . Now consider wires C D and C' D'; the arrows again indicate the direction the electrons are flowing. . In these wires the electrons are traveling in opposite directions. . The "Law of Relative Motion" says that when things move on parallel paths in opposite directions they will repel. . Such is the case here which means that this law still holds true.

The way in which we obtained our "Law of Relative Motion" is found by observing these same wires. . If the wire A B was not parallel to wire A' B' but was inclined at an angle to it, we would not have as strong an attraction. . Ampere's 1825 law and our "Law of Relative Motion" tell us that this attraction varies with the cosine of the angle of the two wires. . As the angle becomes 90 degrees the cosine is zero and no attraction takes place. . As the angle is

increased beyond 90 degrees the cosine is negative and the wires will repel. . We also have a torque which will tend to make the wires parallel and become oriented in such a way that the electrons in both of the wires are going in the same direction. . The reason for this attraction and repulsion is that the speed of light, or rather the speed of action at a distance, is trying to remain a constant regardless of the speed of the electrons. . We will investigate this constancy of the speed of light in future pages; at this point we shall proceed to see if our "Law of Relative Motion" continues to predict the behavior of other wires with electrons flowing through them.

A look at figure 2. shows a current flowing through coil A B which will be a fixed coil. . The electrons are traveling in the direction of the arrows. . We are going to pass a current through a much smaller coil A' B', the arrows showing us that the electrons are traveling in the same direction as coil A B. . We shall make this small coil parallel to the big one, but we will place this little coil on gimbals so that it may tilt in any direction. . We now find that coil A' B' will not stay parallel to the large coil but it tilts in the direction shown. . We are told that this tilt is because of collection of magnetic lines of force at the poles, but since we are trying to do away with the lines of force, as a tool, let us see if our Law of Relative Motion will retain its usefulness in this situation. . As we look at both A and A' the electrons in both orbital type paths are traveling on parallel paths in the same direction. . At B and B' the electrons are also moving in the same direction and on parallel paths. .

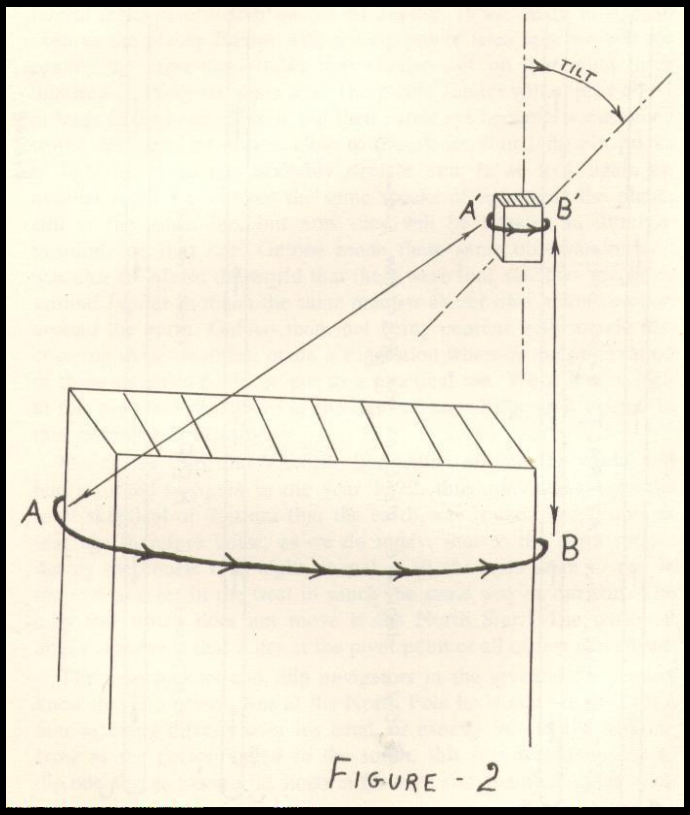


FIGURE - 2

These points will also tend to attract but points B B' are closer together than points A A'. . Therefore since this attraction varies in intensity inversely proportional to the square of the distance, we can expect the pull at B B' to be greater than the pull at A A', and the little coil at A'B' should tilt. . If we were to move coil A' B' at different positions around the large coil, the small coil would tilt in respect to the varying distances of A A' to B B'. . We now can see the reason iron filings sprinkled around such a coil as A B, will give an illusion of magnetic lines of force. . We must consider each speck of iron as coil A' B' and being acted upon by both points A and B of the large coil. . In actual practice we will get this tilting in any size magnet because magnets are composed of small spinning electrons that when locked on certain orbitals in iron are in effect extremely tiny magnets. .

If we were to place the large coil A B on gimbals also, it would swing along with the small coil, A' B' to such a position that both of the coils would now be parallel. . What we have accomplished here now is that we have successfully used our "Law of Relative

Motion" to eliminate magnetic lines of force when wires are wound on coils. . In the following section we shall test our new law using two more electrical devices: the electric motor and the generator.

We want to keep firmly in mind during the remainder of these proceedings that the electron has no such thing as a negative charge. . Remember, we're going to try and eliminate that from our mind. . We want to view the electron as nothing more than a high speed object that will obey the rules of our Law of Relative Motion.

Chapter 7.

the Electric Motor and Generator explained by the Law of Relative Motion

Now we shall take a look at a generator and a motor, or at least a simple circuit of the same. . Here is where we utilize the fact that the object's mass is going to be determined by the speed through its relative surroundings. . In general relativity we found that relative mass is increased as an object's speed is increased, but what is its speed increased in relation to? . Einstein has also told us that no point in the universe can be said to be standing still. . So we can only assume that if an object goes faster in regard to us, then it might not be going faster in regard to another person, who let us say, might be going on a similar path as the object and close to the same speed as the object. . It is necessary to realize at this point that mass is going to be determined by the relative speed of an object through its surroundings.

In Figure 3. (below) we have a basic motor circuit. . We have a conductor in which electrons are flowing in the direction indicated by the arrow. . Do not confuse the electron flow with the current flow that some of the texts use that is opposite to electron flow. . We see two magnets on either side of this conductor, the arrows going around them indicating the direction electrons woud have to go

if they were electromagnets. . An electron is moving in its orbit from A' to X'. . This is the part of its orbit that is parallel to the direction of electron flow through the conductor.

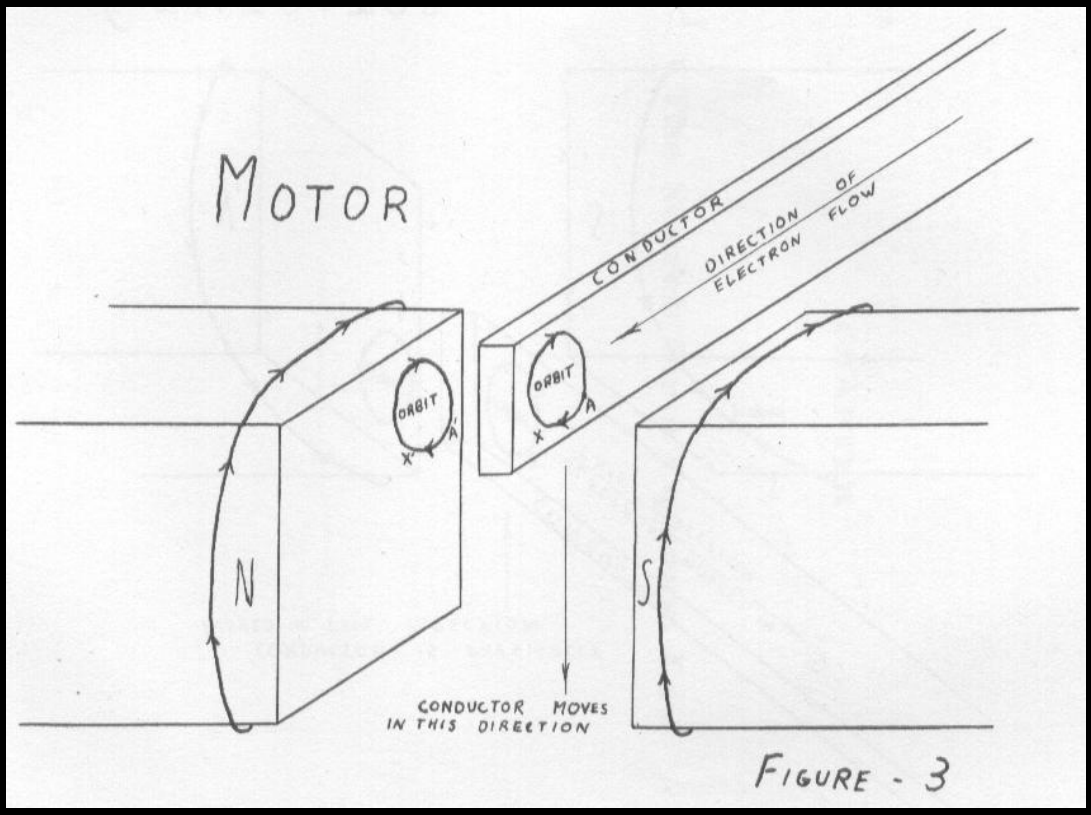


FIGURE - 3

An electron in the conductor (above figure 3.) will have a parallel path to the orbit of the electron in the magnet because these orbits will tend to make themselves parallel. . Now as the electron in the conductor moves along path A X it will be going faster along path A X than a similar electron travels from A' to X' because of the added speed of the electron itself (electron flow) going through the conductor. . Now all of the electrons in the large magnets are lined up in the same planes and are, in fact, the cause of the magnet. . These electrons are, in a sense, saying to the electrons that are inside the conductor: "This is your orbit. You are at rest in this orbit along with the rest of us and from our point of view we are all stationary and it is the rest of the universe that is moving." . Since Galileo and Einstein both said that all motion is relative and that there is no fixed point in the universe that is standing still, then we must admit that if the electron in the conductor sees his

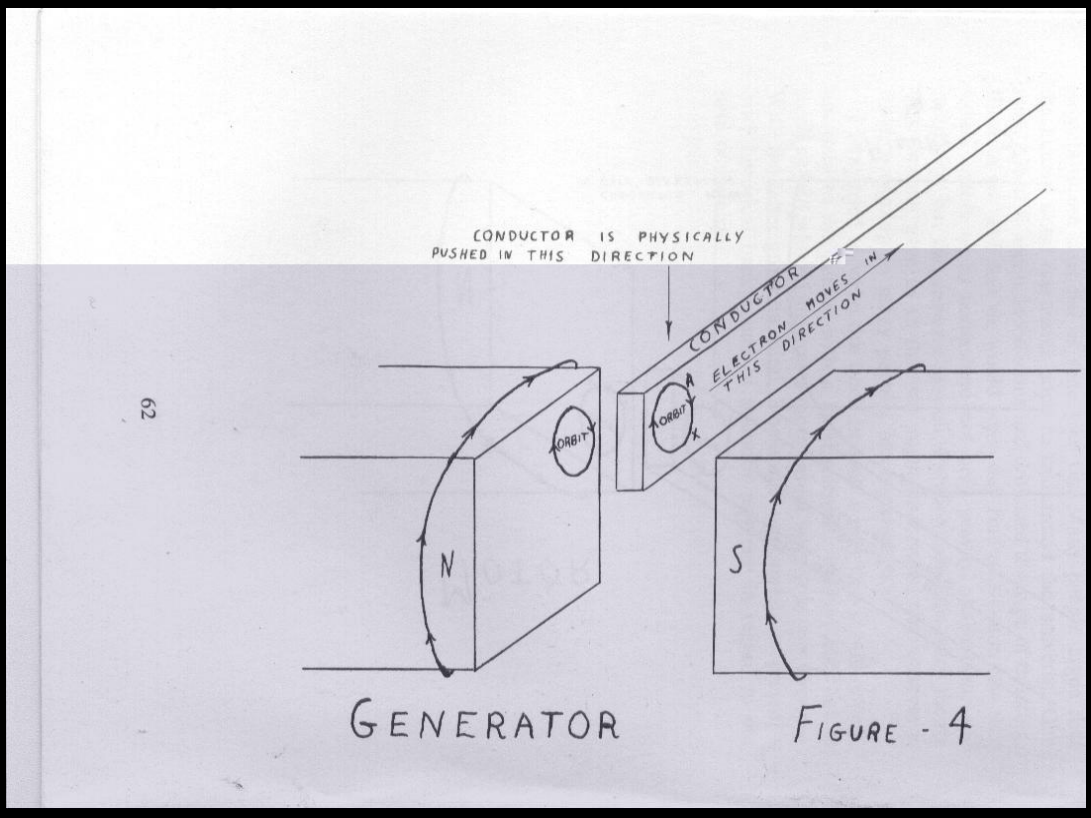
neighbors on both sides of him, revolving at the same speed on parallel orbits then he might obtain this point of view, which we as outside observers would consider faulty. . Anyway this electron is not going to listen to our point of view and it is going to follow a geodesic. . A geodesic is the path of least resistance, and in this particular case, the geodesic will result from our point of view, as to what standing still means, against what standing still means to the electron. . Let us return to consider the electron in the conductor. . It is now being moved along path A X faster than it would have traveled if it had not been pushed through the conductor as well. . The neighboring electrons in the magnets are going to exert a drag on the electron in the conductor at this point and the result will be the same as if the orbiting electron was a rapidly spinning wheel and we had grabbed it all at once at point X. . What would we expect to happen if someone gave us a spinning wheel and we grabbed it by the rim? . It would pivot around the spot where we had grabbed it. . The same thing happens here and our conductor is forced downward. . We could use other points on the orbit, for instance, a point directly opposite from A X and say that in order for the electron to stay with his neighbors it would have to be accelerated instead of held back. . The result in either case, however, would be the same.

The physicist would say at this point why doesn't the author simply explain that since the electron is in the same plane as shown because of magnetic influence then it will only be necessary to give the relativity formula showing the relative mass of the electron, m, with the rest mass of the electron m_o. . The formula is: $m = m_o /(1 - V^2/C^2)^{1/2}$. This would show that a much greater force will be needed to move the electron through path A X because we are trying to move it at a higher speed now that is approaching the speed of light, and this means that considerably more force is needed to do this. . The electron in the conductor will be trying to spin and also orbit around a nucleus that is in the conductor, but yet stay at rest compared to the electrons in the magnets. . With either view the conductor still moves down, and we have explained why it moves down without using any magnetic lines of force, which incidentally everyone always agreed never existed in the first place.

. I think that even Michael faraday who gave us these lines of force over a hundred years ago would have been one of the first to eliminate them if he could have found a better method of explaining magnetic phenomena.

It is hoped that even the physicist has gained something from the way we associated the relativity formula and the way in which different points of view of whatever is at rest will give us our geodesic, or path of least resistance, in which an object moves.

In Figure 4. (below) we are going to move the conductor physically downward this time.



The above figure 4. will be in effect a small electric generator. . As we move the conductor downward, the electron in its orbit is covering the A X section of its orbit but it has its own orbital speed plus the speed that we are moving the entire conductor. . Here we have a similar situation as existed in figure 3. . It would be as if the magnets alongside the conductor would apply the brakes to the electron every time it came to this section of its orbit. .

Since we are physically holding the conductor and forcing it downward then the conductor cannot move in any direction except this. . Something has to give, however, and we force the electron to move through the conductor this time. . As the brakes are being applied to this electron, that is spinning and revolving at a speed already close to that of the speed of light, then the orbit will tend to pivot at point X and the whole orbit will be displaced in the direction shown. . Experimentation again shows us that this is the direction electrons will flow in a wire when a wire is pushed between magnets in this manner.

Chapter 8.

Gravity and the Law of Relative Motion

We have shown that magnetic phenomena can be expressed in terms of relative motion. . Now we are ready to take a look at this thing called gravity. . We are going to analyze it in the same light as we did with the magnet and electric current.

At the risk of repetition we again go to our great instructors Galileo and Albert Einstein who taught us that all motion is relative. . If this is so then why can't we think of ourselves and the earth in the same sense as electrons traveling in the same direction on parallel paths? . We, this includes people , cars, chairs, tables, stones and anything else not fastened down, are certainly going

through space with the earth. . Consequently we must be traveling on a parallel path with the earth.

We also must be going in the same direction with it.

What does our Law of Relative Motion tell us about objects that are traveling on parallel paths and going in the same direction?

Our law says these objects will attract.

Is this what happens between us and the earth?

It certainly seems so.

Some readers have probably proffered the question to which we now turn our attention. . If gravity is the attraction obtained by our moving on a parallel path and in the same direction as the earth why then is the earth also attracted to the sun when we are definitely not going on a parallel path with it?

The answer is this:

We are traveling on a parallel path with the sun when someone takes the entire solar system into view.

If we could imagine an enormous giant looking at us and using our Law of Relative Motion, he would say that not only does the earth attract the people on it because they are moving on parallel paths and in the same direction, but since the planets are all moving together in the solar system and that system itself is moving through space, then all the units of that system will be attracted together. . This giant will also look at our galaxy and say the reason that the various solar systems in it seem to be attracted to the other solar systems that may exist is because our solar system must be moving through space in unison with the stars and other solar systems as seen from yet a larger system.

At this point it might be well to revise certain fundamental points. . The reason that the earth is attracted to the sun is because the earth and the sun are traveling on parallel paths, as everything in the solar system moves together through space. . From the sun's point of view, since we are not traveling exactly in the same direction as the sun and since we said we would only have gravitational attraction when we are traveling along with something, therefore, the earth, by using our"Law of Relative Motion" should expect to be repelled from the sun somewhat because our speed would be a bit higher than the sun's speed.

We must remember that our new law does completely away with gravitational attraction unless the objects are traveling together.

Compared to the sun, the earth is going at a terrific rate of speed. . The "Law of Relative Motion" would say that both the earth and sun should repel each other,

Our friend, the giant, would expect to see the distances between the earth and sun contract because our solar system and all the units in it, which of course would include the earth and sun, would be traveling through the universe together.

What actually happens is that the earth moves on a geodesic, which is the happy medium of both the giant's view and the sun's view.

Einstein said the orbits of bodies were geodesics; now we can actually visualize them using our "Law of Relative Motion".

Chapter 9.

Electrons and the Law of Relative Motion

We notice, as we look at Saturn with its rings, that a distinct tendency exists in our universe to make orbiting satellites stay in one particular plane. . This is not only noticeable with the planet Saturn with its rings, but with Jupiter and its moons as well. . The same effect is apparent in our solar system as a whole.

Mercury, Venus, Earth, Mars, Saturn, Uranus, Neptune and Pluto are all in the same plane orbiting our sun.

Our galaxy and even other galaxies as far as we can see, seem to exhibit this same tendency that the objects they are composed of all stay in the same plane.

This, indeed, is one of the postulates of the Law of Relative Motion which tells us that all orbiting objects will stay in the same plane.

Some of us may ask at this point the following question:

If orbiting bodies seem to group in the same plane throughout the universe and if the "Law of Relative Motion" does not distinguish between pieces of matter and sub-atomic particles, why aren't all atoms and molecules made up of groups of electrons all orbiting in the same plane?

The answer to this question is that the electrons do orbit in the same plane to some extent and we would see more of this tendency if there were less molecules and electrons per unit area, that is if the density of the molecules and electrons in matter was less than it is at present. . The high speed electron along with his densely populated neighbors, continue to create new geodesics in which all electrons in turn must move.

Light and heat upset this further.

All the electrons in matter are kept in constant agitation regardless of whether they are orbiting around a nucleus or not.

Even if the electrons are free electrons consisting of a static charge on the plate of a capacitor or a rubber or amber object,

these electrons seemingly free to stop, with nothing to rotate around, still cannot halt their incessant speed.

It is this constant speed that all of these electrons are constantly being kept in and the inactivity of the nucleus compared to this speed that gives the illusion of positive and negative charges.

As we observe several molecules we must keep in mind that the electrons around the molecules are moving in a myriad of directions and precessing as they go. . It is no wonder then that the two molecules will tend to repel each other. . Each time one of the outer orbiting electrons finds a new geodesic which is caused by a neighboring electron revolving around its atom, then this revolving electron will tend to move the entire molecule, that it is revolving around, to a different spot.

The electrons then that revolve around the molecules are centering devices that constantly shift the entire molecule each time it nears a geodesic caused by a neighboring electron. . The result is that molecules will be spread out uniformly throughout matter.

An analogy can be made to that resembling a multitude of spiders placed on a large flat surface: . Each spider will move in any direction as long as he feels another spider or the tentacles of another spider, otherwise he stops. . We can eventually expect to end up with a uniform distribution of spiders over our flat surface. . The same thing is true with the distribution of molecules in matter. . This is also true with the distribution of all objects throughout our entire universe, whether they be large or small.

The distribution factors of light and heat and other electrons do not, however, keep all of the electrons from forming planes. . there are some electrons that do not succthrough throughumb to the above disturbing factors and continue to spin and revolve in the same plane as their orbiting neighbors.

If another nearby molecule has electrons that are also spinning and revolving predominantly in one or several planes, then there will exist ways in which these molecules can link together.

These electrons that thwart all the disturbances and remain in predominant planes are bonding agents that hold matter together, and by their various assortment of planes in different angles, are one of the things that give us the various types of assortment of properties that we observe in matter.

Chapter 10.

Alternating Current
Radio Waves & Light Waves

There are two types of electricity, one that has a steady flow in one direction, and is called direct current. . This is the type we referred to earlier in the book. . Now we are going to observe alternating current.

This type of electricity is commercially more readily used because it can be transformed from one voltage to another through a device known as a transformer. . Alternating currents along with this transformer action is what we will consider next.

As we look at two things namely the transformer and alternating current and as we observe them in the light of our "Law of Relative Motion", we will obtain the answer that men over the centuries have asked.

What is light?

We will not only have the answer to this but we will also see why light seems to be both a wave and a particle.

We will also see why energy of both radio and light waves, as well as X rays is increased as the frequency of the wave is increased.

As you look at Figure 5. you will see two greatly magnified views of two conductors.

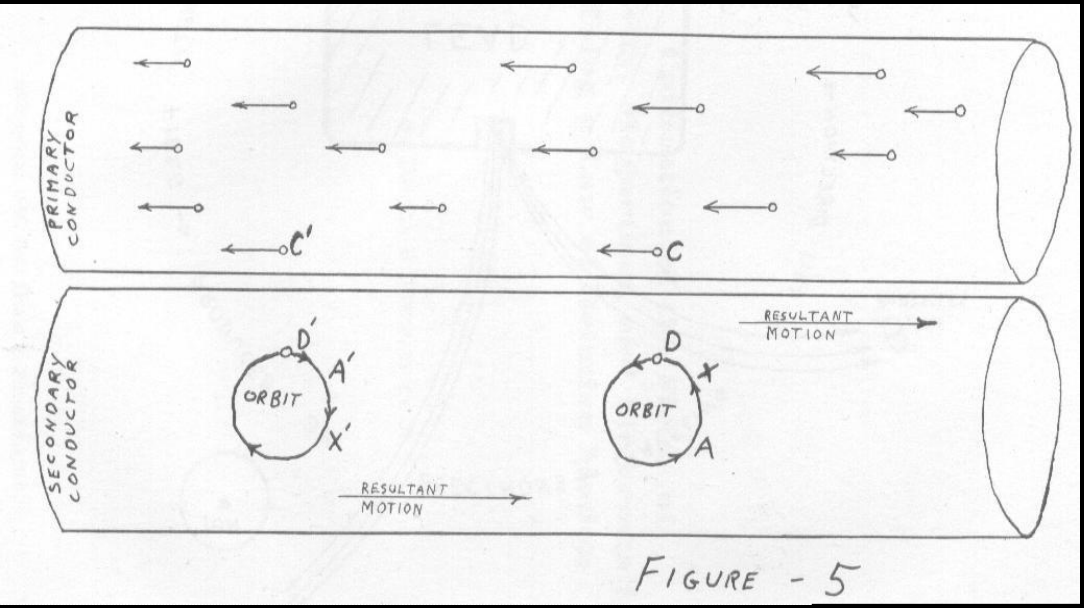


FIGURE - 5

Ordinarily at frequencies such as commercial power frequencies of sixty cycles per second, these wires will be wound around a soft iron core and at frequencies of hundreds of thousands of cycles per second and millions of cycles per second a ferrite core can be used to obtain a maximum transfer of power from the primary (top conductor in our Figure 5.) to the secondary (bottom conductor in the same figure).

Since we will not be concerned with the efficiency of the device, we will eliminate the core. . Now we are going to suddenly start electrons flowing through the top conductor.

We are going to observe what happens in the bottom conductor at the precise instant that the electrons start to flow in the top conductor.

In the bottom conductor, since there has been no influence of any electron motion in the top conductor until just this instant, the orbits and spins of the electrons in the bottom conductor will be in various haphazard positions.

We are going to concern ourselves with two of these electrons; one of them is orbiting and perhaps spinning clockwise with A' X' as a section of its orbit and perhaps a section of its spin surface as well.

Another electron is orbiting with A X as a section of its orbit and spin.

At the instant electrons start flowing in the top conductor the electron at C will attract the electron in the bottom conductor when it is moving through point D, because our Law of Relative Motion says that objects moving on parallel paths in the same direction will attract.

The electron at C will also repel an electron in the bottom conductor when it is moving in an opposite direction. . This will be a point directly across the orbit from D. . We must remember, however, that since these forces strengthen as the objects get closer together; the stronger force will be obtained when the electron is at D, because C and D are the closest points these electrons come to each other.

This attraction will pull the whole orbit/spin of the electron in the bottom conductor in the direction shown.

Every time the electron A X as it spins & revolves in its orbit, we will have the same effect that we had in our generator, namely that the electron or a portion of the electron's real speed through path A X will be faster than before because of the addition of the speed of the entire orbit in the same direction that the electron travels through points A X.

At this point its mass increases or the brakes are applied, whichever way you prefer to look at it; with the resultant motion of the electron through the conductor as shown.

Our other spinning/orbiting electron does essentially the same thing.

The electron C' in the top conductor will repel the electron in the bottom conductor when it is at D' because our new law tells us that particles moving in opposite directions will repel. . We notice the same resistance offered at A' X' along with less resistance or drag offered when the electron is directly opposite in its orbit from section A' X'. . The resultant motion of the orbit is shown.

Since all of the electrons in the conductor can be considered to be rotating/revolving clockwise or counter clockwise to a certain extent, then we will have a current flow through the bottom conductor that will be opposite to the current which is flowing in the top conductor.

This current flow in the bottom conductor will be very brief, however, because as soon as both the orbits of the electrons in the bottom conductor in Figure 5 reach the walls of the conductor, then the whole process has to stop even though current continues to flow in the top conductor.

If we now reverse the flow of current in the top conductor, we would get another brief flow of current in the opposite direction in the bottom conductor.

Also we see this current will be flowing on the walls of the conductor. . This very thing has been noticed, especially in the higher frequency end of the radio spectrum and has been called "Skin Effect". . Coils used at these frequencies are even silver plated to provide a lower resistance to the electrons that travel jammed against the conductor's walls at these higher frequencies.

In *Figure 4.*. where we had produced an electron flow by moving a conductor, or wire, across the face of a magnet, we find that the voltage (speed/pressure of electron travel through the wire) is

directly proportional to the speed that we move the conductor past the magnet.

In fact it is thought that the voltage produced in this way is even more than proportional to the speed of the moving conductor and it may lie on a relativity curve with the voltage becoming infinite as the speed of the conductor across the face of the magnet reaches the speed of light.

Because we cannot move a conductor at any speed that even approaches this, we cannot check this for certain

The orbiting electrons in the bottom conductor in *Figure 5.* produce a higher voltage the faster they are attracted or repelled to the conductor walls and as the case might be, if they could be instantaneously attracted or repelled to the conductor walls, the voltage produced in the bottom conductor might be infinite.

We notice that the faster we change the direction of the electron flow or current in the top conductor, the more abrupt the orbits of the electelecronsrons in the bottom conductor are pushed or pulled against the conductor walls. . This causes a higher instantaneous voltage to be induced in the secondary or bottom conductor. . We notice as we go on increasing the frequency of the change in direction of the current in the top conductor from sixty changes per second that the power company supplies us with, to a frequency change of several thousand times a second, we find thet we can move the bottom conductor quite a distance from the top conductor and still acquire a voltage transfer through the conductors.

What is now happening is that the top conductor is becoming a transmitting antenna and the bottom antenna is becoming a receiving antenna for receiving radio waves.

We are now going into the radio frequency spectrum.

As we go higher in frequency we find that we can even move our two conductors even further apart, but at frequencies of one hundred million cycles per second we have produced a dilemma for ourselves. . We find that even though the speed of the electrons in our bottom or receiving conductor is increasing, the total number of the electrons (amperage) is decreasing furthermore these electrons, that are not moving as fast as our high voltage electrons, are causing a drag to our high speed/voltage electrons. . Special coaxial cables help us conduct these voltages here, and with the aid of these special cables we try and increase our frequency to several thousand, million cycles per second. . Here even our cables fail us and we have to revert to a rectangular metal tube called a wave guide in order to prevent the few high speed, or high voltage electrons from being dragged down in speed by their slower neighbors.

Above these frequencies nature has bested man. She has endowed us with an instrument that can detect the electrons, that although they may be few in number, such as either one or several electrons that shift orbits in an atom.

When the retina of the eye detects this voltage it does so in a very similar manner to the way in which a voltage was produced in the bottom conductor in *Figure 5.*

The electron that has just shifted orbits being the same as the top conductor and the retina of our eye being the bottom conductor. . The sensitive current that our eye would detect in this manner is what physicists have labeled the photon, not understanding what a light wave really was. . Now we see why light was thought to be both a wave and a particle. . It is really neither.

Chapter 11.

The Real Key
Constancy of Action

The first thought that comes to our mind now with this new understanding of light is to re-examine the results of the Michaelson-Morley Experiment inorder to find out more about our universe. . We will do just this and we will find that the world owes even a greater debt than we had realized to Lorentz, Fitzgerald and Einstein.

The answer that things contract in the direction of their movement, and that light has a velocity that is independent of the velocity of the source and the velocity of the observer, gives us a key that enables us to unlock the mystery of space and time.

Keeping in mind Einstein's rule that the velocity of light has to remain constant regardless of how fast the body emitting or receiving the light is moving, we now see the constancy of the speed of light is the very thing that explains why things on parallel paths, going in the same direction, attract and things going in opposite directions repel.

We found that light, radio waves and alternating current are caused by the same basic action between moving electrons. . The only difference between light, radio waves and alternating current is the frequency at which this change takes place. . Since all of these actions must occur at the speed of light, we can now say that not only is the speed of light a constant but the speed of all of this type of attraction and repulsion must remain a constant.

The speed of this sort of attraction and repulsion is a speed that is independent of the speed of the source and the speed of the observer.

This constancy of not only the speed of light, but rather the constancy of all action at a distance is the key that we have been looking for.

Chapter 11.

The Real Key
Constancy of Action

This constancy of not only the speed of light, but rather the constancy of all action at a distance is the key that we have been looking for.

Let's take another look at Figure 1. and the wires C D and C' D'.

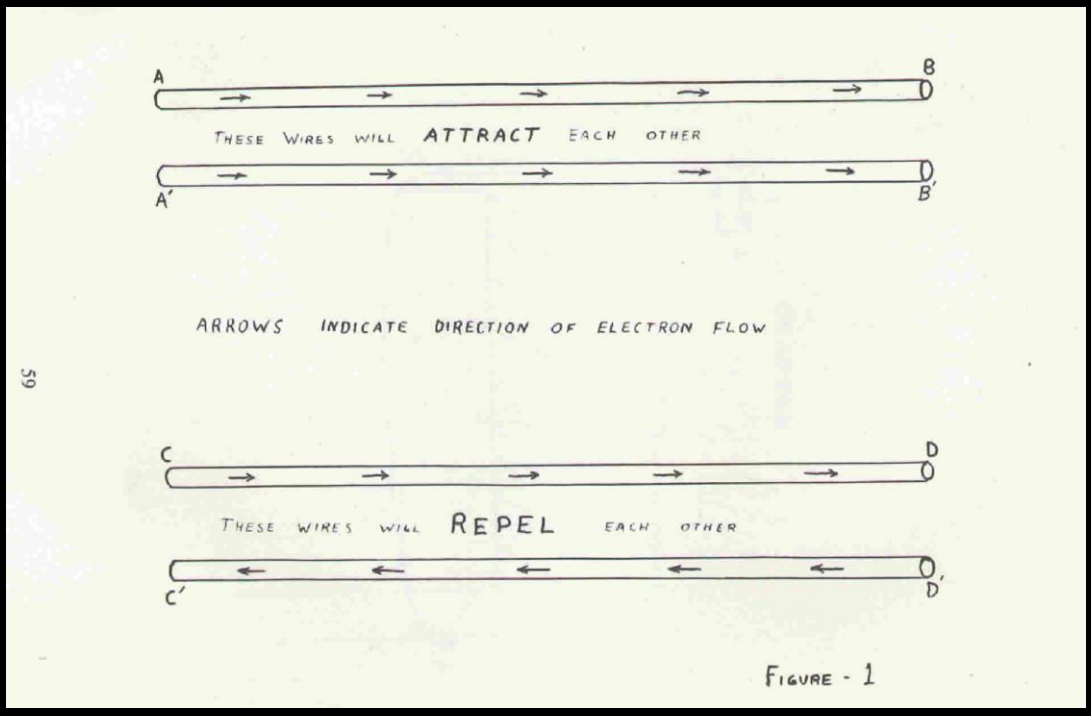


FIGURE - 1

We are going to make the assumption that since we are not going to change the size of the electrons flowing through the wires and since the electrons traveling towards the right in wire C D will be approaching the electrons in wire C' D' almost at the speed of light, then how can we reconcile the fact that the speed of light, or more correctly, the speed of action at a distance between the electrons in wire C D and C' D' will have to be the same as that between the electrons of wires A B and A' B' when those electrons are going in the same direction, as compared to those electrons in the opposite directions in the bottom two wires?

Instead of the electrons in wires C D and C' D' contracting when they approach each other, as Einstein tells us, the electrons in the bottom wires take another course that is just as effective, they merely move away from each other at right angles to their forward movement and in this way the speed of light or rather the speed of action at a distance remains a constant and of course the wires containing these move away from each other with their fast moving electrons.

Utilizing this constancy of action at a distance as our key, we are now able to answer very many more questions about our universe. . Later we'll see the cause of the earth's magnetism.

We will see centrifugal force, the gyroscope and pendulum in a different light as well.

We will understand what inertia really amounts to.

We will learn why Einstein pictured our universe as unbounded but yet finite.

The answer to why we see the stars that are farther and farther away receding from us faster and faster will be answered as well.

In later pages we will be able to visualize mass and energy being the same thing thus conforming to Einstein's $E= MC^2$.

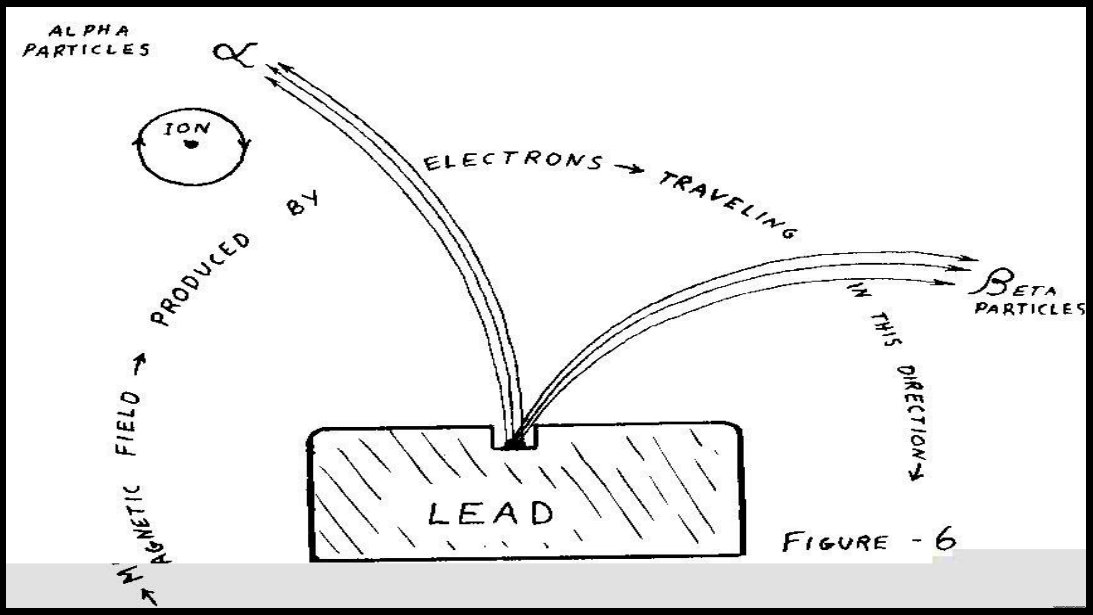
In the next chapter, however, we will show that the faster a particle travels, the greater is the illusion of its negative charge but if this speed is a combination of a forward and rotary speed then we will have the illusion of a positive charge.

Chapter 12.

Why the Ion seems to have a Positive Charge

The explanation that we have given which shows the speed of the electron, compared to the inactivity of the nucleus, gives us the illusion of positive and negative charges, will suffice for most of the world of electrostatics but it is not enough when we are moving free particles through a magnetic field.

Such an example we have below in Figure 6.



Here we have a piece of radium inside of the hollow depression in the lead block as shown. . Around this we have a strong magnetic field.

We then find that the beta particles (high speed electrons) are traveling at speeds from 10% to 99.8% of the speed of light.

These are bent to the right in the above drawing (Figure 6.)

This seems correct because they should try to orbit along with the electrons that are producing the magnetic field.

What about the alpha particles, however?

These are high speed helium nuclei.

They dislodge electrons from the molecules of any gas that they collide with, then becoming ions.

The ions, thus produced, will bend to the left as in the above drawing.

This is opposite to the direction that the beta particles bend. . How can we give an answer to this effect?

The answer is found in examining the ion that is produced when the alpha particle has acquired an electron.

The strong magnetic field will make the electron orbit around the alpha particle in the same plane as the magnetic field produced by the electrons in the electromagnet that we are using to get our magnetic field.

We arrive at our answer when we observe the motor action in *Figure 3.*and the Generator action shown in *Figure 4.*

The same basic action occurs here also because the speed of forward movement is added to the speed of rotation of the electron around the alpha particle and the whole rotating unit is pulled to the left.

Since we have no way of knowing all of the various combinations of orbiting particles that may occur, it seems that the fog tracks that scientists have observed in the cloud chambers will have to be re-evaluated giving a different concept of anti-matter.

We become even more certain of our conclusion that the positive charge is an illusion when we examine the scattering of alpha particles by thin metal foils in the new light of our Law of Relative Motion.

Chapter 13.

The Cause of the Earth's Magnetism

If the earth were magnetized uniformly throughout, it would be necessary for it to have a certain uniform distribution of magnetic flux throughout its entire volume.

We find, however, as we dig into the surface of the earth, these layers are not magnetized (taking an average) to such an intensity. . We know also that the temperature increases the farther a person goes into the depth of the earth.

The Curie point for iron being 860 degrees Centigrade is reached at a depth of sixty miles.

This leads us to believe that there could be no residual magnetism whatsoever below this sixty miles.

All of this seems to indicate that the magnetism of the earth cannot be caused by large magnetic deposits.

Experiments have also been made by measuring the downward variation in deep mines, in the earth, of the magnetic component.

The evidence obtained in this way is found to be more on the side of the scale indicating that the earth's magnetism was caused from above and not from below.

Another factor that interests us at this stage of our inquisitive study of the earth's magnetism is that daily figures from various magnetic observatories around the world are being recorded every three hours and the results sent to a coordinating office at de Bilt, Holland. . The figures that we observe at this coordinating office are being composed of the following parts:

1. A basic steady field that composes 1/4 to 1/3 of the total magnetism of the earth.

2. A field that shifts yearly.

3. Daily increases and decreases.

4. A field that increases and decreases with the lunar month.

The daily variation also seems to pick up in intensity, day after day, finally reaching a peak at the observation station as summer time approaches.

The great German mathematician Gauss, sensed that there was a possibility of two major magnetic fields covering the earth. . Gauss pointed out the way to analyze this situation. . More and accurate recordings since that time have enabled Schuster and others since to find that one fourth to one third of the earth's magnetism is a steady field and the rest seems to shift with the seasons and has greater intensity as daytime comes to the particular station recording the magnetism.

What does all this mean to us?

We can neglect the effect of the earth as a cause of the earth's magnetism and start looking for the answer in the relative movement of the earth in its surroundings.

As we hold a compass in our hands, let us utilize the Galileo-Einstein gift of relativity and imagine that the earth along with us, and of course our compass, is at rest.

The sun, moon and stars can be considered as rotating around us, rising in the east and setting in the west.

We find, if we have a flashlight battery and a loop of wire, that when we connect it to the loop of wire, this has an effect upon our compass when we place our compass inside this loop.

We find that when electrons are moving around the loop (going from - to +) and therefore around the compass in the same direction that the sun and moon and stars seem to go around the earth, then we are reinforcing the direction that the earth's magnetic field would ordinarily move the compass needle.

Here we ask--what is the difference between the electrons going around the loop of wire at a close range and very fast or the sun, moon and stars going around the compass slower but farther away but the mass of these being greater than the electrons?

In other words the spinning electrons in the compass needle will tend to line up the outside of their spinning circumferences in the same plane with the loop of wire with the electrons in it. . This will be in the same plane and in the same direction as the orbit the sun seems to make around the earth.

Our Law of Relative Motion does not distinguish between electrons moving around the compass or the sun moving around the compass as long as the path and direction remains essentially the same.

Since Einstein has shown us that the mass of an object increases as its speed increases then we can consider that the spinning electrons in the compass needle will sense that the slow moving, sun, moon and stars would be rotating around it with a certain amount of mass.

Our electrons in the loop of wire, though being less massive, would be closer, and these electrons would have their relative mass increased (as sensed by the compass) because of the electrons' additional speed through the loop.

The compass does not know the difference between the earth rotating in its surroundings or a loop of wire around the compass with electrons flowing through it.

Now as we go back to our observations from the recordings made at de Bilt. Holland, we can begin to understand what we have: . The basic steady field that composes 1/4 to 1/3 of the earth's magnetism is caused by the earth rotating in respect to the stars.

The other part of the magnetism is caused by the earth rotating in respect to the sun and the moon, the moon having only a small fraction if the variable field. . We can see plainly why different stations would report a difference in magnetism, this being caused

by the earth being inclined at a 23 1/2 degree with respect to its orbit around the sun.

We can see also why the strength increases during the daytime.

Chapter 14.

The Red Shift and The Quasars

In *Figure 1.* we saw the reason that the electrons in wires C D and C' D' repelled was because of the constancy of the speed of light or to put it more correctly the constancy of action at a distance being at the same speed as light and not at an instantaneous velocity.

Now, if we were to hold the wires together and they could not repel then there would be only one thing that the electrons could do and that would be to contract. . This contraction now is not quite in the same direction as Einstein's contraction. . Our contraction is at right angles to Einstein's contraction, but our contraction along with Einstein's contraction will keep a round object round and it will not become elongated as Einstein had supposed. . The whole essence of the matter is that objects get smaller all around and not just in the direction of their motion as we have been led to believe. . This is what is causing the redshift of our most distant stars.

The reason for this follows. . As the earth rotates and also revolves around the sun, and as the sun along with the planets move in relation to our galaxy, and our galaxy moves in relation to the other galaxies, these movements cannot be quite added and subtracted from each other as they could if space was Euclidean. . Instead we must assume that if we consider the earth at rest, then

we must consider the things that are farther and farther out in space to be moving faster and faster (not away from us but merely in regard to us). . This movement, according to relativity, would make the time of the object moving seem to be a slower time than our time.

If light is being emitted from an object whose clock appears to us to be a slower clock, then we will see the frequency to be a lower frequency than the emitting object sees it.

For instance we would see light that was being emitted from that slower time star not as white light but as light in the red end of the spectrum.

We can even imagine stars or galaxies to have time slowed so much in relation to our time that they would be sending out light that we would be receiving as radio waves, provided that these galaxies were far enough away.

These then are the Quasars.

This also is the final answer to Olbers' Paradox.

It was the German astronomer Heinrich Olbers who proved that if space was Euclidean, and if the number of stars in the sky was infinite then we would be blinded with their light.

Is this not then the answer or a rather good representation of Einstein's relativistic universe that would be unbounded but yet finite?

The only stars that could possibly give us light, radio waves or any other radiation, as far as we are concerned, will be those whose lights we are receiving as low frequency radio waves.

Any stars or any matter farther out in the universe than these can not possibly have any effect upon our gravitational attraction, light or any other action where we must figure motion through our surroundings.

We must, however, take into consideration the mass of the universe, as a whole, up to this limit, when we make our relativistic calculations.

Chapter 15.

The Pendulum, Gyroscope and Vibrating Elements

Since space is relativistic and not Euclidean, then the motions of all the components of our universe, as seen by us on earth, considering the earth at rest, will be seen by us on earth as separate motions.

An analogy may be made to the skin of an onion that is made up of many separate layers, each layer being a distinctly different layer than the one under it. . As each item moves in respect to the earth, this item must contract from our point of view here on earth. . This we were taught by Lorentz, Fitzgerald and Einstein. . Now! . How does this affect the constancy of light, or rather the constancy of action, at a distance between us on earth and these other moving objects?

We already have shown how time, as seen by these moving objects, is not the same as the time we are measuring here on earth.

This we previously saw was the reason for the Red Shift and apparent illusion that far away objects are receding from us. . But what else occurs that contracts relative to the earth, or what happens to our constancy of action at a distance when we see both

an electron moving about an orbit here on earth and an object in space moving in respect of us? . Both of these objects must be experiencing a contraction in respect to us, the observer. . Now, if both of them are experiencing a contraction as seen by us, how can we still have a constancy of action, between the electron that is contracting and the object in space that is also contracting?

We can have only one answer and the answer must be this: The electron that is orbiting must be attracted (viewed by us here on earth) to the object that is moving relative to us here on earth.

The effect of all the electrons in matter, going in all directions, and being attracted (from our point of view) to other objects in the universe is the effect that we call inertia.

The reason will be seen quite a bit clearer as we study the gyroscope and pendulum, , The gyroscope and the pendulum along with vibrating objects offer us a special type of effect called gyroscopic inertia.

As we observe a gyroscope spinning, we see that the portions of the gyroscope that are on the rapidly spinning wheel must be contracted relative to the observer on earth because it is moving in respect to the earth. . The constancy of action at a distance then will tend to make the rim of the wheel attracted to objects in space.

Objects in space that are traveling in the same direction as the rim of the gyroscope will cause a greater attraction to the gyroscopes rim than other objects. . There will be objects in space that will be moving in directions opposite to the direction that the gyroscope's rim is moving and our Law of Relative Motion would show us that these should repel. . This repelling action is caused by the constancy of action at a distance the same as the attraction is increased by the same constant speed of action.

One very important thing happens here, however.

Because we are going to be higher up on the relativity curve when we calculate the attraction (the mass is going to increase at an ever

increasing proportion in regard to the increase in speed of the object), the attraction of portions of the gyroscope's rim as they move on parallel orbits and in the same direction with other objects in the universe is going to be greater than the repelling action which portions of the gyroscope's rim will undergo when it is in parallel with other objects in the universe which are going in an opposite direction to the rim.

In other words, this constancy of action will make the gyroscope's rim attracted to objects that lie in the same plane as the rim of the gyroscope, this attraction increasing as the speed of the gyroscope is increased.

As we tilt the gyroscope, we will notice that we are now making a new plane - in the sky of fixed stars - to which portions of the gyroscope's rim will be attracted.

This new plane will depend on the speed of the gyroscope wheel and the speed by which we tilt the wheel.

The spinning wheel will try to move into this same plane and this is our precession that we observe in the gyroscope and other gyroscopic instruments,

To summarize this: Gyroscopic inertia is caused by the rim of the spinning gyroscope being pulled by every star and planet in our universe.

Chapter 16.

Inertia and Mass

Since this was written in 1966

Since all matter is made up of electrons which are essentially in themselves small gyroscopes, then all of these gyroscopes, all wanting to precess in different directions, give us this quality of matter we call inertia.

If mass is the measurement of the inertia of matter, then if we could make electrons move on lower orbits, (closer to the nucleus) we would have less inertia because each electron now would have less of a gyroscopic effect because of its smaller orbit.

This is exactly what happens when we receive energy in the form of light from an atom.

Niels Bohr has shown us that when light energy is given off by an atom, then the electron responsible for this effect has moved from a higher to a lower orbit.

Now we have a picture of how mass can be turned into energy.

We have a much better idea now of what the formula $E=MC^2$ means. . Another way of stating this fact is that the electrons are giving matter a slight bit of inertia or mass by their revolving around the nucleus.

If such an electron were to lose some of its speed by imparting some of this speed to an electron in our eye (sending out light), then it could not continue on its orbit and it would fall to a smaller orbit, then it would impart less gyroscopic action, hence less inertia, hence less mass to the atom of which it was composed.

Mass and energy then can be seen to be essentially the same thing.

There is much more to be learned about the universe, but if we know that the speed of light, or should we say the speed of action

at a distance, must remain a constant, then we have a key to probe all motion in our world.

Our universe must present quite a different picture to us, as we look out than it would to someone who might be exceedingly larger than us and who could look in on us. . The way such a being would visualize us would be the same way that we observe a piece of matter. . He would see things in a more or less steady state even though certain elements of the system seemed to be rotating and revolving around. . We view a piece of matter in much the same way. . We see a substance in a more or less steady state even though we know it is composed of rotating and revolving electrons.

Physicists will have to take another look at the way in which we measure the mass of the various components of the atom.

Chapter 17.

A Second Look at Einstein's Theory

The Law of Relative Motion will now give us a much clearer picture of Einstein's General Theory of Relativity

If we take a sphere that is made out of any type of material, which is composed of many orbiting electrons and we move this sphere through space at a fixed speed of 10% of the speed of light, then as it approaches another object we find the electrons in our sphere have a tendency to shift the electrons being passed just as the electrons in the primary conductor in *Figure 5* caused the electrons in the secondary conductor to shift. . Since we are going to keep the forward speed of this sphere the same, we would notice

a drag similar to the drag on the armature of a generator. . In fact, we would have made sort of a generator because we would have caused an electric current to flow in the object that the sphere had just passed

Keeping the sphere at a fixed speed of 10% of the speed of light, when this drag is noticed, means that we will have to increase the force we are applying to move the sphere. . As we apply this force, we will say that the mass of our sphere has been increased because it is now taking more force to keep it at the same speed.

Now, our sphere is composed of great quantities of electrons all rotating in various orbits. . As our sphere passes an object and induces an electric current in it, the forward speed of the sphere has not slowed down but the orbiting electrons in the sphere have their speed slowed down because they have just imparted some of their speed into the electrons in the object they have just passed

Now electrons in orbit can be considered sort of a clock; so we can say if they are slowed down then the time of the sphere is going slower also.

As these electrons go slower, then they must drop to a lower orbit.

If many of them do this then they must contract in size.

This is exactly as Einstein's general theory of relativity shows it to be.

As the velocity of light is approached mass increases, time goes slower and the object contracts

In the earlier paragraph as the sphere moved past the object and the drag was felt, we could also maintain that the mass of the sphere had not increased but the sphere had been accelerated.

We can consider that it had been accelerated even though it remained at the same velocity because both Newton and Einstein have shown us that gravity is a form of acceleration.

If the sphere, that we are moving at this fixed rate of speed, passes an object extremely larger than itself, then each electron in our sphere will have to impart some of its speed to a great many electrons in the extremely large object. . This distribution affects each electron in the large object only slightly. . Therefore the mass increase, the contraction, the slowing down in time will be more noticeable in our sphere than in the large object.

The same effect: that of each portion of the small sphere being affected greatly compared to the same size portion of the large object, is the reason the large object will consider itself less affected and more inert. . The larger this object becomes, compared to the other objects in its vicinity, the more inert it will tend to regard itself, and the more it will feel it is at rest compared to the other smaller objects that may be near it.

This is the reason that man, accustomed to viewing small objects moving in regard to this huge earth, has always searched for an ultimate place of rest in the universe.

Observing our universe as an open ended, steady state universe, we see that the quest for the smallest particle in nature will be an unrewarding quest.

Space, in this relativistic universe, is unbounded as we get smaller just as it is unbounded just as we get larger. . Therefore there can be no smallest particle. . In fact, we may have another paradox. . What do the terms larger and smaller actually mean?

Another thought that should be conveyed before we conclude is this: If we could become small enough, we would see that an electron would view the atoms nearby in much the same manner as we view the stars and galaxies thst encircle us.

On the other hand, the way we view the electron's world would be similar to the way in which some super giant would envisage us along with our solar system and our galaxy.

Therefore by using our knowledge that the forces existing in the microcosm are obtained in the same way as those in the macrocosm, we can substitute one world for the other when we wish to change our perspective from how the universe appears to man, to how the universe appears to another object that is larger or smaller than man.

The law that we have studied in this book is the Law of Relative Motion, and we must constantly keep in mind that as we change our perspective, or rather get the other object's viewpoint, we must always use *Mach's principle* and measure the movement of an object against the inert mass of its surroundings.

If, in other words, two objects move on parallel paths in the same direction through surroundings that have a greater mass than before then these same two objects will have a greater attraction.

In conclusion we have found that we have pieced together some more of the dinosaur's bones and we have a better idea of the structure of the creature.

Mathematicians now can concentrate their energies on not just probabilities, but now they can build using certain factual truths which will last as long as man himself and will never again need changing.

Einstein was thoroughly convinced that man would one day find the answer to the way in which the universe functioned. . Proclaiming this one day he said, "Der lieber Gott würfelt nicht." . This is a German colloquialism that loses its meaning when translated word for word, but what Einstein essentially meant was this: The good God had a plan. He didn't just throw dice around.

Fate, however, prevented Einstein from ever witnessing that plan.

Einstein said that we would someday find the answer.

Heisenberg and Bohr said that this answer would forever remain uncertain.

It seems to me that Einstein's logic has won.

THAT FIRST 1966 BOOK ENDS HERE.

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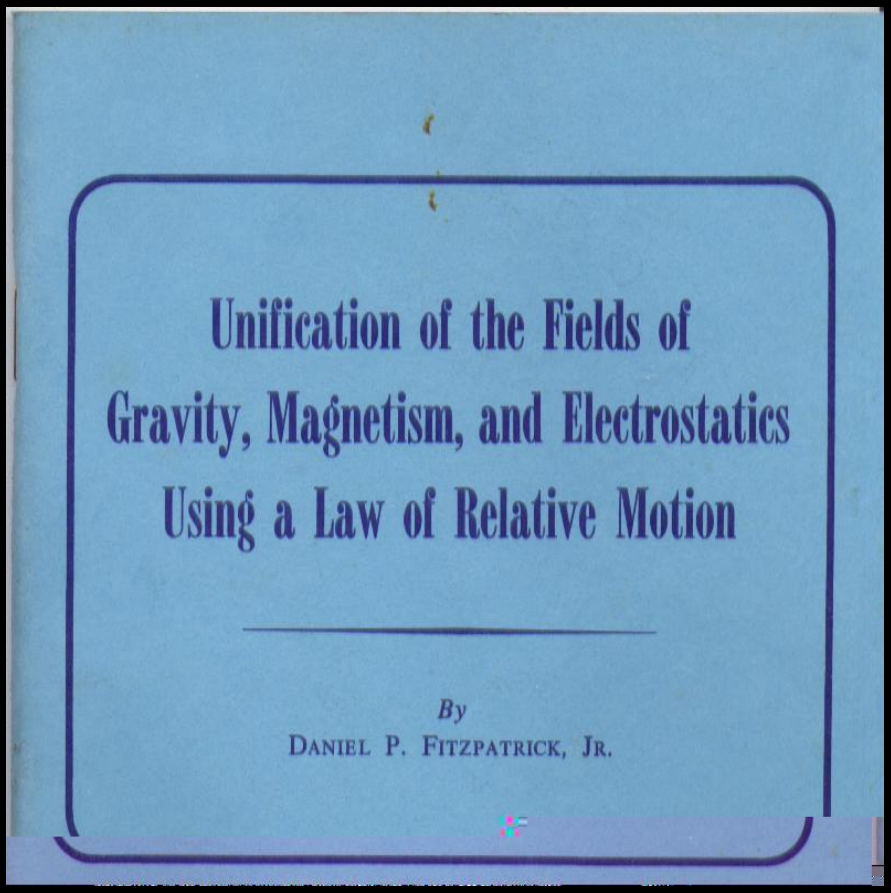

Unification of the Fields of
Gravity, Magnetism, and Electrostatics
Using a Law of Relative Motion

By
DANIEL P. FITZPATRICK, JR.

Hi.

I wrote this book, pictured above, in 1966 because while working on an overhaul problem of the RCA RADAR scope at Pan American Airlines I realized by using Ampere's 1825 laws, instead of the more commonly used Faraday-Maxwell electrical laws, I could not only see the direction that the electron was spinning but Ampere's laws also showed me why I was being attracted to this Earth. . I was more in-phase with the Earth and more out-of-phase with the surroundings: gravity, therefore, was a combination of attractive forces from Earth and repelling forces from the surroundings. . I will never forget that day as long as I live.

The electrons traveling through wires are sort of corkscrewing and not orbiting, but they still are spinning. . While that orbiting picture might not be quie accurate the relative motion aspect of it all certainly will withstand the test of time.

The above book may eventually turn out to be recognized as an important science publication. . There were only 10,000 of them printed. . If you have one then you had better hold on to it and not sell it because someday it may become a valuable item.

In spite of the tons of garbage put out by university presses throughout the world telling otherwise, there are two things that Einstein was absolutely right about:

#1. There is no aether. . No aether is needed if we utilize Milo Wolff's (SR) 'Space Resonance' concept.

#2. The speed of light (C) is the fastest velocity that our reference frame is "tuned to". . Again here we need to consider Milo Wolff's (SR) concept, and view Einstein's analogy in light of the (SR), a bit different than even Einstein saw it.

And there is a caveat to the above. . The speed of light is NOT the fastest speed for many other reference frames such as the

space-time reference frame of the quark. . That is C^2 . . More about this later.

The preponderance of the evidence, now coming in, is squarely on the side of this Ampere-relative motion concept as seen in the Law of Relative Motion that was laid out in the above book. . New pieces of the puzzle are rapidly falling into place with knowledge obtained by the various space telescopes and these new revolutionary non mechanical gyros. . All of this is pointing in this Ampere-relative motion direction.

Names, words or phrases that you do not understand on this page, or on the previous pages, can be clarified by simply copying them and then pasting them into *Google*. . Add quote marks to get exact phrase such as "space telescopes".

I'd suggest that you learn what a space-time interval is by clicking on this *space-time interval* link. . But please look at this formula for the space-time interval: $ds^2 = (cdt)^2 - dl^2$ . . Please note the term (cdt) where c = the speed of light. . . This is the speed of not only light but action at a distance and if this changes, as will be shown, then the space-time interval is NOT invariant but will also change.

I intend to show you that in the quark realm the term C in the above space-time interval formula changes to C^2.

In other words the - supposedly invariant - space-time interval CHANGES.

Quarks, that have a 'scalar wave resonance' frequency one octave higher than the electron, will have an entirely different space-time interval and therefore an entirely different space-time realm from ours.

What this page is mostly about is the fact that things that are viewed as merely ***motion*** in a reference frame realm of a certain

space-time interval may be viewed as a force in an entirely different space-time interval reference frame.

When you are observing things in the microcosm and macrocosm, you are looking at things that are in various different space-time interval, reference frame realms.

They have an entirely different space-time from yours.

This is the reason we THINK we see all these different, distinct forces.

Milo Wolff showed us the electron is a scalar wave resonance resonating with ALL the surrounding electrons. . This IS important.

It is the makeup of BOTH the surroundings and the entities themselves that determine if and when a scalar wave resonance will develop.

They come like keys on a piano - ONLY at certain spots in this infinite frequency spectrum.

And some get entirely eliminated such as the positron gets entirely eliminated by harmonics emanating from the tri-quark entities making up both the neutron and proton.

But every distinct scalar wave resonance entity has its own space-time interval.

Why ? . . Because the term c in the space-time interval formula means the speed of action at a distance and this changes for every scalar wave resonance frequency.

Scalar resonances are those things, we know exist, such as quarks, electrons, assemblages of quarks and electrons, orbitals, orbits, solar systems, galaxies, and etc.

Your science laws cover only a small scalar wave resonance bandspread of this infinite frequency spectrum.

Therefore your science laws are merely nothing but subset rules for another '*gauge* ' like those used in quantum mechanics.

Strange as it may seem:

what I am going to try to impress upon you herein is that gravity, charge and magnetism are merely motions in ***three*** different space-time interval realms. . Yet they are seen by us as three distinct forces in our ***fourth*** space-time realm.

Milo Wolff has already shown us that his 'space resonances' (SR) effectively unify the 4 fundamental forces.

As this book points out: there is only one common element in the fields of the four fundamental forces and that is:

(SR) motion relative to same frequency surroundings.

So if a unified field answer, for those extremely different fields is sought, it MUST be as a concept of relative motion, and Ampere in 1825 gave us the best laws ever for examining things such as that.

I saw, way back in 1966, that it was all nothing but relative motion in regard to the surroundings and that gravity, charge and magnetism were merely certain motions in their respective spin/orbit frequency reference frame realms that '*appeared* ' to me as gravity, charge and magnetism in my reference frame realm.

But the most important thing that I have learned, so far, in this search for a common law for all these invisible forces, was taught to me by Kurt Gödel whose famous proof shows us that if we try to look at this entire universe from one, single reference frame then we are defeating our purpose, if we want to see the 'big picture'.

You are condemned to thinking you have universal laws when all you have are subset rules for one reference frame if your mind remains only in one, single reference frame realm. . You are then like a radio that stays tuned to only one frequency.

Kurt Gödel is saying: you are forced to see 4 different fundamental forces only because you allow your mind to remain tuned to a specific subset reference frame realm.

You MUST shift to, and use, different reference frames - the same way different '*gauges* ' are used in quantum theory - if you want to see the 'big picture' or see any universal laws.

There is no such thing, in present science, as global gauge invariance for this entire universe. . In other words our present science, that restricts us to one single reference frame realm, can have NO universal laws. . All we have now are subset rules for each particular fundamental force. . This shows our world is a wave world and we are really using different '*gauges* ' just like in quantum theory.

We are finding out that we must view things - not as we see them in our realm - but as they really are, in their own space-time

reference frame realms, and with *Dr. Milo Wolff's* elegant yet simple mathematical proof, that the electron is a scalar wave '*space resonance* ' (SR), we can now view things as scalar wave resonances in their own space-time realms. . Plus Milo has given us the math to do this.

Milo has shown us that we must now view all things as both waves and particles just as we presently view light.

What several scientists have recently discovered shows that the above 1966 book was the first publication on earth to correctly point out the approximation of *everything*, that Dirac predicted we'd find or the first genuine *unified field theory* that Einstein was looking for.

If we merely add *frequency* to the Law of Relative Motion in the above book then we get a frequency modification of *Ampere's laws 1825* which are a similar set of laws that become the epitome of the quest in the above book.

Milo Wolff's '*space resonances* ' (SR) and his wave density concept are the cornerstones upon which this universe is built. . His *Minimum Amplitude Principle* show us how waves behave. . It and this frequency modification of *Ampere's laws 1825* are similar in that they both take into consideration the surroundings (Mach's principle). . Watch what they show us.

The reason that Ampere's laws work is that this universe is really nothing but a wave universe all throughout from the microcosm to the macrocosm

The *Superposition principle* is the CORNERSTONE of wave action behind those above laws of Ampere.

It's simple

just as Einstein predicted.

As it pertains to scalar '*space resonances* '

this is it, below:

Scalar, standing wave '*space resonances* ', with similar same frequency surrounding entities, give us what we term particles, orbitals, orbits, inertial qualities and our concept of time.

These spinning, standing wave, scalar '*space resonances* ', that we see as particles, orbitals, agglomerations of particles or orbits, produce lower frequency transverse waves that give us ALL our vector forces.

Repulsive force (space) - between these scalar wave '*space resonances* ' - is produced by out of phase transverse waves, while in phase transverse waves create no space or cause, what we term, attractive forces.

Believe it or not: this entire universe is as simple as that explanation above.

However, not only all the surroundings (via Mach's principle), but their frequencies, now must also be taken into consideration, therefore the mathematics involved will be the very reciprocal of simplicity

I saw part of this first in 1966 using the Law of Relative Motion.

Later I added the necessary frequency modification to it to obtain these similar set of laws *Ampere's laws 1825* or *The "A" Laws* that are modified laws of Ampere which allow you to work out problems both in the microcosm or macrocosm or here in more electrical problems than you can solve with the present, most used, Faraday-Maxwell concept.

Tom Van Flandern, noted astro physicist with the University of Maryland, tells us that the speed of gravity is substantially greater than the speed of light. . The proof of this, says Tom Van Flandern, is that gravity has no detectable aberration (propagation delay) but light definitely has. . Read what he says in his *web page*.

As Tom Van Flandern tells us, in his web page, his Celestial Mechanics instructors at Yale taught him that gravitational interaction between everything had to be taken as instantaneous. .

What's that!. . Run that by me again. . Yale says gravity acts faster than light? . Yale says gravity acts instantly? . Hey, what's going on here?. . Everyone knows that's impossible! . Shades of Isaac Newton!

Yes, I'm afraid that's true. . In Celestial Mechanics, gravity must be considered as acting instantly. . And yes that is faster than the speed of light.

Even considering gravity acting at the speed of light is far, far too slow to keep this entire universe stabilized.

Are we seeing things instantaneous or are we seeing an '*apparent* ' speed of C^2 ? ? ? . . And C^2, my old friend Adrian Bagley had to remind me, is acceleration. . More about this later.

Chapter 19.

ENTER
Murray Gell-Mann's
realm of the Quark

Before we do enter Murray Gell-Mann's quark realm, I have to state 'No man is an island.' and I must stop here now and thank others for their help. . At Pan American Airlines, even though I had my pilot's license, First Class Radio license and Airframe and Powerplant mechanics license, I was continually asking all the specialists about things and their help aided me in getting Pan Am's many airliners back into the air again.

I want to thank Fulbright Scholar ***Milo Wolff*** for his many e-mail letters about the wave structure of matter (WSM), along with his book 'Exploring the Physics of the Unknown Universe' that enabled me to look into SU(2) space and his specialty, the realm of the electron and see his mathematical proof that the electron is indeed a standing wave scalar '*space resonance* '. . I also am indebted to Tom Van Flandern for pointing out to me that the erudite reader will never accept such a thing as squaring the speed of light, because while C^2 is acceptable in the realm of mathematics, it is not acceptable as a '*speed* ' particularly in our reference frame (our realm).

As Tom Van Flandern said in an e-mail to me, "When you square a speed, it likewise can no longer be a speed. In fact, in physics, speed squared has the units and the property of energy. (It is energy per unit mass.)"

My statement about C^2 was also noted by Dr. Sol Aisenberg, another well known astro physicist, who read it, and posted this crystal clear, concise argument to the above in the following words:

"Speed has the dimensions of L/Sec. . Speed squared has the dimensions of L*L/sec*sec. . How can you explain the difference in dimensional analysis - a standard verification technique in physics?"

To both of these men, and others asking the same question, I have to say, Yes, this m/s speed becomes $(m/s)^2$ acceleration now, doesn't it?. . It is indeed happening.

Are all of you so blind that you can't see what this universe is doing?

Don't you see what this squaring the speed of light is telling you?

If you consider solid entities to be Milo Wolff's space resonances then you are seeing the cause of the Newton-Einstein Principle of Equivalence.

Squaring the speed of light does give a speed that is too fast in our reference frame. . But according to Wheeler and Feynmann, we can assume such a speed does exist in another space-time realm if it is not directly observable in our reference frame, which in this case it is not, because it only '*appears* ' to be faster than the speed of light. . Also before we give such a concept as '*squaring the speed of light* ' an absolute no, let us enter the realm of the quark.

In fact, as we enter the space-time realm of the quark we see what Tom Van Flandern and Sol Aisenberg are discussing is especially important.

It gives us a vitally important link between our realm and the quark realm.

Speed squared in our reference frame becomes '*what we see* ' as actual energy in the quark's realm or reference frame.

By the same token: quark to quark binding energy - to those quarks in the 'fixed stars' - '*appears* ' to us here in our reference frame as speed at the rate of C^2.

Quarks reside in an entirely different realm than we do. . Quantum theorists call it a different '*gauge* '. . String theorists call it a different '*dimension* '. . Actually I believe the relativity description is the most accurate: *The space-time interval of the quark realm is entirely different from the space-time interval of our realm here.*

Things that are not possible here - such as a speed of C^2 can exist in the realm of the quark. . But we will see this as a form of energy.

Isn't this the gist of astro physicists Sol Aisenberg's and Tom Van Flandern's statements ? ?

These *Ampere's laws 1825* or *The "A" Laws* will enable you to entirely leave your reference frame realm and actually step into those other frequency spin/orbit realms.

You must not forget that each spin/orbit frequency realm has a different symmetry and a different space-time interval. . Quantum theorists will call this a different '*gauge* '.

It's not so much that the microcosm is smaller and the macrocosm is larger. . The important thing to remember is that the microcosm is at a far higher frequency realm than we are here and the

macrocosm realm is at a far lower frequency realm than we are here.

Enough of that, we'll step back into our own realm again and take over where we left off.

The two things you have to ask yourself are:

1. Why does gravity '*appear* ' to act instantly or at a speed of C^2 ? ? ?

2. Why do we get the C^2 in Einstein's formula $E=MC^2$? ? ?

Is energy a calculus derivative ?

Is energy derived at a binding energy change rate of C^2 for quarks and C for electrons ?

Berkeley, Mach and Maxwell all said you had to consider the surroundings.

Is present science doing that? . . No, it isn't.

Once you come to realize that inertial mass is nothing more than quarks binding with other quarks in the surrounding 'fixed stars' then it's certainly looking more and more as if Berkeley, Mach and Maxwell were absolutely right .

C (the speed of light) is the binding energy change rate that electrons bind with other electrons

ENERGY - via electrons - is any shift (either more or less) of binding change of electrons between themselves (their local atom/molecule) and the inertial surrounding electrons.

C^2 (the speed of light squared) is the binding energy change rate that quarks bind with other quarks.

ENERGY - via quarks - is any shift (either more or less) of binding change of quarks between themselves (their local atom) and the inertial surrounding quarks in the 'fixed stars'.

Let's say Tom Van Flandern is right and let's say the speed of gravity *appears* to us in our reference frame - not quite as instantaneous - but a wee bit slower as C^2 (the speed of light squared).

This would not mean that there is such a speed as C^2 in our realm but that the speed of gravity would *appear* to us as C^2, here in our reference frame, particularly if the spin of certain quarks were spinning exactly one octave higher in frequency than the electrons.

Spinning quarks could attract other distant quarks similar to the way the spin of electrons, locked on certain orbitals, attract other distant electrons both in magnetism and sigma and pi bonding. . If this is so, then you not only have discovered what causes gravity but you will have solved the unified field quest put forth in the above book; . To boot you will have shown the reason for C^2 in Einstein's famous formula $E=MC^2$.

The above 1966 book explained all our invisible forces were caused by the same thing that gave us our constancy of light and Dr. Milo Wolff has mathematically proven it is all the constancy of light (or 'space resonance', scalar wave action *with all the surrounding electrons*). . Few realize yet, that Milo Wolff's contribution to science is truly immense. . In 1983 he mathematically showed why we get the Compton

wavelength and the de Broglie wavelength with scalar space resonances and how scalar resonances fit in not only with quantum theory but relativity as well. . Milo has given us the very first mathematical proof of *Mach's principle*, and his scalar wave math is the very first universal math that has the potential to be utilized in both the microcosm and macrocosm.

Also extremely important is the simple fact that - like the cyclic pitch needed by the helicopter blade - all the forces are derived by that same translational motion shown throughout this 1966 book. . As you will have noted, I have since found that frequencies are very important as well. . And last but not least is:

Saul Perlmutter's recent super nova study that shows - as Saul Perlmutter himself says - Einstein was right about his original cosmological constant, so this puts us back once more into a steady-state universe. . . In the many publications that I have sent to the Library of Congress in these past decades, and put out on the internet in the past years, I have always stated that this had to be a steady-state universe.

If the quark spin frequency, of certain quarks, is exactly one octave higher in frequency than the electron spin frequency, then the speed of gravity, inertial mass and the strong force [the speed of C^2 (spinning quarks attracting other distant quarks)] although physically impossible in our realm, will nevertheless be represented to us in our reference frame as C^2 (the speed of light squared) .

Knowing this, *and with a bit more reading*, you can even see why Erwin Schrödinger said charge was merely schaumkamm.

In other words space-time, gravity and inertial mass are all being produced *mainly* by the quark strong force - a weakened portion of which must emanate outside of protons and neutrons - and this is

all being produced (*as seen by us in our reference frame*) at the square of the rate that electrons propagate light.

Even though this **apparent** C^2 speed of gravity is not absolutely instantaneous, it will certainly *seem* to be instantaneous to us with the accuracy of our present measuring instruments.

Now add what you have learned here to what you will read and learn in the free e-books that you can get on the web page link below and you will then comprehend what Einstein was looking for, a genuine unified field theory. . And the concept is indeed simple as Einstein said it would be.

Thanks for taking the time to read all of this. . . Fitz

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