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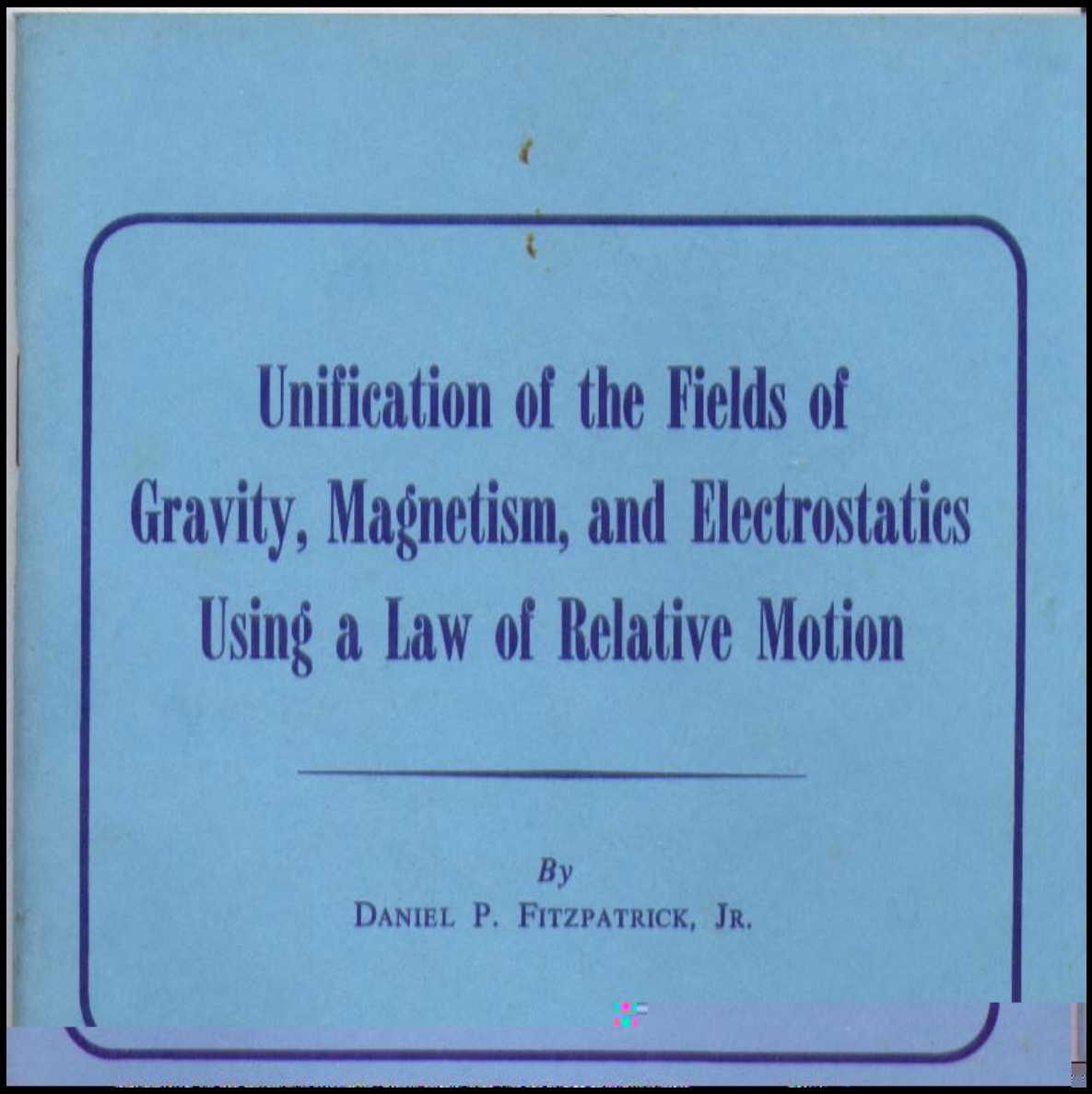

# Unification of the Fields of Gravity, Magnetism, and Electrostatics Using a Law of Relative Motion

By

DANIEL P. FITZPATRICK, JR.

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section.
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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:

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