BSRA No. 5

THE ETHER OF SPACE

A Compendium from the writings of:

Sir Oliver Lodge

Sir Arthur Eddington

J.W.N. Sullivan

Philip Frank

Ramon Natalli

On the Qualities of the Ethers and
Their Relation to the Physical World

By:

Meade Layne, M.A.

Director,
Borderland Sciences Research Associates
1946 - 1959

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The Concept of the Ether(s) and Its Relation To the Phenomenon of the Flying Saucer Aeroforms

A Compendium by Meade Layne, M.A. Founder and Director of Borderland Sciences Research Associates, 1946 - 1959

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Its Relation to the Phenomena of
the Aeroforms (Flying Saucers).

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SECTION I. Introductory Note by Mr. Layne

The present brochure contains as principal items a reprint of several chapters from an old work by Sir Oliver Lodge, entitled "The Ether of Space", brief quotations from Sir Arthur Eddington's "The Nature of the Physical World", from J.W.N. Sullivan's "Limitations of Science", and still more important than these, in my opinion, a discussion of the basics of the whole matter by Ramon Natalli, who is referred to again at the end of this note. The special relevance of this material is to the phenomena of the Aeroforms (Flying Discs, Flying Saucers, etc) - which we prefer to call ether ships or ether craft, the Vimanas of the ancients. These craft and their operators, who have often visited our planet in times past, have now been appearing in increasing numbers since about 1947 or '48, and have caused much controversy and speculation. It would be a waste of time to enter upon any dispute as to their actuality, if such a question still exists. But we are, all of us, whether we desire it or not, deeply concerned with the nature and origin of these craft, as hinted by the term we have applied to them.

For six years past (July 1953) the present writer and Associates have received repeated assurances that the aeroforms are truly etheric in nature, and this interpretation has proved adequate for all the complex phases of their performance and appearance. It has been, and remains the only satisfactory and inclusive explanation anywhere advanced, and can be shown to be both good science and acceptable metaphysics.

That is not to say that it is "satisfactory" to a great number of people who do not understand the concept of the ethers even in its most elementary sense, or who imagine that this concept has been discarded by modern science. The Western mind has not been conditioned to this type of thinking, or has been conditioned adversely to it, and it is folly to expect to overcome this attitude by any last-hour attempt at enlightenment. Yet because this concept will have to be integrated sooner or later with the whole of our thinking -- if any part of our culture should survive -- we have continued to put out such information as may be helpful to the few.

I have quoted extensively from Lodge, because he is the best known of the early investigators of the properties of the ether, conceived as a homogeneous medium or continuum; because he emphasizes the extreme density of the ether, and the nature of ordinary matter as being rarefactions of agregates of modified ether units -- and because these ideas

must be grasped if the phenomena of the aeroforms are to be understoood. I am aware that the type of picture-thinking employed by Lodge and other scientists and mathematicians of his time is now dated. It has been superseded by a purely mathematical approach. I have tried to cover this point by including, at the end of this brochure, two pages entitled "New Approach and New Difficulties".

The existence of the ether(s) as the fundamental entity of the physical universe is not to be disposed of by regarding it as a kind of mathematical ghost. The quotations from Sullivan allow full importance to opponents of the Ether idea, and it seems probable that whereas Sir Oliver chose to build his case on "the more familiar and tractable electron" as a modified ether formation, he might now build it about the proton or nuclear mass. It is even possible that he might, in lieu of a true continuum, develop the concept of an infinite series of interpenetrating ethers of increasing fineness and density. These would possess properties sui generis, yet intelligible to modern scientific speculation. Sir Oliver himself glimsped a number of such possible developments, and did not sonsider them destructive to his own pioneer explorations.

As to Dr. Sullivan's "Limitations of Science", the book is recognized as brillian and basically sound; nevertheless his distaste for the Etheric hypothesis is so pronounced that we shall do well to consider as an antidote the passages quoted from Eddington, who tells us that "although the expression 'velocity through the ether' is meaningless, this does not mean that the ether is abolished. We need an ether . . . we postulate an ether to bear the characters of the interspace." Even within the past few months the press has attributed remarks of a similar nature to Einstein. It is therefore incorrect to suppose that the concept of ether, or ethers, equated with space, has been discarded by contemporary science, where the most remarkable displays of mathematical acumen lead us directly into cloud banks of metaphysics -- a subject which includes the problems of the final nature of matter and of the act of knowing (ontology and epistemology); hence not within the domain of science at all.

Now the ether which has been postulated in connection with the phenomena of the aeroforms (Flying Saucers) really refers to but a few out of an infinite number of ethers -- i.e., to a few of the innumerable vibratory rates which constitute the plenum of space. The attempt to think of space as being nothingness and not-nothingness at the same time is of course logical nonsense. Just as the question as to whether ether is matter or not is mainly one of semantics, depending on the definition of matter adopted. It is surprising to note that even Eddington seems to have fallen into some confusion over this point. (N.P.U., page 31).

What is to be said concerning the essay of Natalli, really the chief opus and objective of this brochure? Shall we keep silent as to his identity, real or alleged -- or have the effrontery to say openly that he was an Italian astronomer of the 17th Century, and is still an astronomer and mathematician of most exceptional abilities -- and that the present writer and his Associates have talked with him for many hours, usually at weekly intervals, for some seven years past. So too

we have talked with many others by the same means, in normal and easy fashion, putting questions on scores of subjects, and have published thousands of pages of such conversations. I shall not elaborate on this matter here, except to say that long experiencehhas shown these invisible friends to be learned and honorable people, normal humans in every way, but with many advantages of knowledge and environment. We have never known them to practise deceit, and they have never claimed omniscience; but on many subjects they despair of making us understand what they believe to be the true facts and partial answers.

The comments of Natalli are a good example of this. They came not through deep trance but by clairaudient dictation, and Natalli spent many hours revising his forms of expression and trying to convey them to the intermediary, Mark Probert, for whom we express our deep appreciation of uncompensated time and gifts. He is one of the greatest psychics or mediums now living.

At the end of this gratuitous labor by both, Natalli sounded a familiar note of discouragement. "You and your science. Your space-time frames of reference and inability to think outside of them! Your ignorance of sub-atomic matter, of force, of the ethers, of light and electricity and gravity! Your smug impatience with metaphysics! Your inability to conceive of the countless worlds and peoples, races and civilizations, the multiforms of life and things which swarm about you. . . Ignorance is not bad, unless you will to remain ignorant. It is not bad to stumble and fall, unless you prefer to remain where you have fallen. . . I feel a sense of deep frustration, having dictated so many words to Mark with so little hope that they will be truly helpful. . . "

At the end of the second volume of his Cultural History, the historian Egon Friedell remarks "the next chapter in the history of the 20th Century culture will be the story of the Light from the Other Side". Shall we have to add the familiar text, that "the Light shineth in the darkness but the darkness comprehendeth it not"? Even the short statement we have given here, as to the origin of the Natalli essay, would be sufficient to stultify it in the minds of most of our intellectuals. Our hope is that at least a few physicists will be willing to read it with an eye to its content only, without being prejudiced by its origin. For in spite of all opposition, the tide of the new knowledge rises -- the old-new knowledge, even in the gathering shadows of what may be a racial and planetary debacle. . .

Meanwhile the visitors from other worlds, from the omnipresent ethers and the unthinkable depths of space throng our skies -- and certainly not from any passing curiosity or to amuse themselves by our bepuzzlement. No, there is -- there must be -- serious business afoot, ("trouble in space" Natalli says), which tomorrow or after-tomorrow will uncover itself to us. And there is, at this late hour, little or nothing we can do about it. Little or nothing, that is except one thing -- to try to learn, to open our minds, to understand what is going on, to help others to quietude of mind; and if great disasters followed by some new and beneficent governance are in the making, to endure, to accept, and to cooperate.

* * *

Section II

ETHERIAL DENSITY

Chapter VI, from "The Ether of Space", by Sir Oliver Lodge

This (preceding material) leads us to enter upon the question of whether it is possible to determine with any approach to accuracy the actual density or massiveness of the ether in space, compared with those forms of matter to which our senses have made us accustomed.

The arguments on which an estimate may be made of the density of the ether as compared with that of matter depend on the following considerations, the validity of which again is dependent upon an electrical theory of matter. In this theory or working hypothesis an assumption has to be made; but it is one for which there is a large amount of justification, and the reasons for it are given in many books -- among others, in my book on "Electrons", and likewise at the end of the new edition of "Modern Views of Electricity", also in my Romanes lectures published in 1903. Put briefly, the assumption is that matter is composed in some way or other of electrons; which again must be considered to be essentially peculiarities, or singularities, or definite structures in the ether itself. Indeed, a consideration of electrons alone is sufficient for the argument, provided it be admitted that they have the mass which experiment shows them to possess, and the size which electrical theory deduces for them; the basis of the idea -- which indeed is now experimentally proved -- being that their inertia is due to their self-induction, i.e., to the magnetic field with which they must be surrounded as long as they are in motion.

The mass or inertia of an electron is comparable to the thousandth part of that of an atom of hydrogen. Its linear dimension, let us say its diameter, is comparable to the one hundred thousandth part of which is commonly known as molecular or atomic dimensions; which itself is part the ten-millionth part of a millimeter.

Hence the mass and the bulk of an electron being known, its density is determined, provided we can assume that its mass is all dependent on what is contained whthin its periphery. But that last assumption is one that quite definitely cannot be made; its mass is for the most part outside itself, and has to be calculated by magnetic considerations.

These details are gone into in my paper in the "Philosophical Magazine" for April 1907, and in Chapter XVII of "Modern Views of Electricity." But without repeating arguments here, it will suffice to say that although the estimates may be made in various ways, differing entirely from each other, yet the result in differences are only slight; the calculated densities come out all of the same order of magnitude; namely, something comparable to 1012 c.g.s. units; that is to say, a million million grammes per cubic centimeter, or 1000 tons to the cu.mm.

But, throughout, we have seen reason to assert that the ether is incompressible; arguments for this are given in "Modern Views of Electri-

city", Chapter I. And indeed, the fundamental medium filling all space, if there be such, must, in my judgement, be ultimately incompressible; otherwise it would be composed of parts, and we should have to seek for something still more fundamental to fill the interstices.

The ether being incompressible, and an electron being supposed to be composed simply and solely of ether, it follows that it cannot be either a condensation or rarefaction of that material, but must be some singularity of structure, or some portion otherwise differentiated. It might, for instance, be something analogous to a vortex ring, differentiated kinetically -- i.e., by reason of its rotational motion, from the remainder of the ether; or it might be differentiated statically, and be something which would have to be called a strain-center or a region of twist, or something which cannot be very clearly at present imagined with any security; though various suggestions have been made in that direction.

The simplest plan for us is to think of it, the electron, somewhat as we think of a knot on a piece of string. The knot differs in no respect from the rest of the string, except in its tied-up structure; it is of the same density with the rest, and yet it is differentiated from the rest; and, in order to cease to be a knot, would have to be untied -- a process which as yet we have not yet learned how to apply to an electron. If ever such a procedure becomes possible, then electrons will thereby be resolved into the general body of the undifferentiated ether of space -- that part which is independent of what we call "matter".

The important notion for present purposes is merely this; that the density of the undifferentiated or simple ether, and the density of the tied-up or beknotted or otherwise modified ether constituting an electron, are one and the same. Hence the argument above given, at least, when properly worked out, tends to establish the etherial density as of the order 10^{12} times that of water.

There ought to be nothing surprising (though I admit that there is something very surprising) in such an estimate; inasmuch as many converging lines of argument tend to show that ordinary matter is a very porous or gossamer-like substance, with interspaces great as compared with the spaces actually occupied by the nuclei which constitute it. Our conception of matter, if it is to be composed of electrons, is necessarily rather like the conception of a solar system, or rather of a Milky Way; where there are innumerable dots here and there, with great interspaces between. So that the average density of the whole of the dots or material particles taken together -- that is to say, their aggregate mass compared with the space they occupy -- is excessively small.

In the vast extent of the cosmos, as a whole, the small bulk of actual matter, compared with the volume of empty space, is striking -- as we shall show directly; and now on the small scale, among the atoms of matter, we find the conditions to be similar. Even what we call the densest material is of extraordinarily insignificant massiveness as compared with the unmodified ether which occupies by far the greater proportion of its bulk.

When we speak of the density of matter, we are really though not consciously expressing the group-density of the modified ether which constitutes matter -- not estimated per unit, but per aggregate; just as we might estimate the group or average density of a cloud or mist. Reckoned per unit, a cloud has the density of water; reckoned per aggregate, it is an impalpable filmy structure of hardly any density at all. So it is with a cobweb, so perhaps it is with a comet's tail, so also with the Milky Way, with the cosmos, and, as it now turns out, with ordinary matter itself.

For consider the average density of the material cosmos. It comes out almost incredibly small. In other words, the amount of matter in space, compared with the volume of space it occupies, is almost infinitesimal. Lord Kelvin argues that ultimately it must be really infinitesimal (Philosophical Magazine, August 1901 and January 1902); that is to say that the volume of space is infinitely greater than the total bulk of matter which it contains. Otherwise the combined force of gravity -- or at least the aggregate gravitational potential -- on which the velocity generated in material bodies ultimately depends, would be far greater than observation shows it to be.

The whole visible universe, within a parallax of 1/1000th second of arc, is estimated by Lord Kelvin as the equivalent of a thousand million of our suns; and this amount of matter, distributed as it is, would have an average density of 1.6×10^{-23} grammes per c.c. It is noteworthy how exceedingly small is this average or aggregate density of matter in the visible region of space. The estimated density of 10^{-23} c.g.s means that the visible cosmos is as much rarer than a "vacuum" of a hundred millionths of an atmosphere, as that vacuum is itself rarer than lead.

It is because we have reason to assert that any ordinary mass of matter consists, like the cosmos, of separated particles, with great intervening distances in proportion to their size, that we are able to maintain that the aggregate density of ordinary stuff, such as water or lead, is very small compared with the continuous medium in which they exist, and of which all particles are supposed to be really composed. So that lead is to the ether, as regards density, very much as the vacuum above spoken of is to lead. The fundamental medium itself must be of uniform density everywhere, whether materialized or free.

CHAPTER VIII of Lodge's "Ether of Space"

FURTHER EXPLANATIONS CONCERNING THE DENSITY AND ENERGY OF THE ETHER

A reader may suppose that in speaking of the immense density or massiveness of ether, and the absurdly small density or specifici gravity of gross matter by comparison, I intend to signify that matter is a rarefaction of the ether. That, however, is not my intention. The view I advocate is that the ether is a perfect continuum, an absolute plenum, and that, therefore, no rarefaction is possible. The ether inside matter is just as dense as the ether outside, and no denser. A material unit -- say an electron -- is only a peculiarity or singularity of some kind in the ether itself, which is of perfectly uniform density everywhere. What we "sense" as matter is an aggregate or grouping of an enormous number of such units.

How, then, can we say that matter is millions times rarer or less substantial than the ether of which it is essentially composed? Those who feel any difficulty here, should bethink themselves of what they mean by the average or aggregate density of any discontinuous system, such as a powder, or a gas, or a precipitate, or s snow-storm, or a cloud, or a Milky Way.

If it be urged that it is unfair to compare an obviously discrete assemblage like the stars, with an apparently continuous substance like air or lead, the answer is that it is entirely and accurately fair; since air, and every form of matter, is essentially an aggregate of particles, and since it is always their average density that we mean. We do not even know for certain their individual atomic density.

The phrase "specific gravity or density of a powder" is ambiguous. It may mean the specific gravity of the dry powder as it lies, like snow; or it may mean the specific gravity of the particles of which it is composed, like ice.

So also with regard to the density of matter; we might mean the density of the fundamental material of which its units are made -- which would be ether; or we might, and in practice do, mean the density of the aggregate lump which we can see and handle; that is to say, of water, or iron, or lead, as the case may be.

In saying that the density of matter is small -- I mean, of course, in the last, the usual, sense. In saying that the density of ether is great -- I mean that the actual stuff of which these highly porous aggregates are composed is of immense, of well-nigh incredible, density. It is only another way of saying that the ultimate units of matter æe few and far between -- i.e., that they are excessively small as compared with the distances between them; just as the planets of the solar system, or worlds in the sky, are few and far between -- the intervening distan-

ces being enormous as compared with the portions of space actually occupied by lumps of matter.

It may be noted that it is not unreasonable to argue that the density of a continuum is necessarily greater than the density of any disconnected aggregate; certainly of any assemblage whose particles are actually composed of the material of the continuum. Because the former is "all there", everywhere, without break or intermittance of any kind; while the latter has gaps in it -- it is here and there but not everywhere. Indeed, this very argument was used long ago by that notable genius, Robert Hooke, and I quote a passage which Professor Poynting has discovered in his collected posthumous works and kindly copied out for me.

Professor Poynting interprets this singular attempt at utterance thus: "All space is filled with equally dense materia. Gold fills only a small fractinn of the space assigned to it, and yet has a big mass. How much greater must be the total mass filling that space."

This tacit assumption here made is that the particles of the aggregate are composed of one and the same continuous substance -- practially that matter is made of ether; and that assumption, in Hooke's day, must have been only a speculation. But it is the kind of speculation which time is justifying, it is the kind of truth which we all feel to be in process of establishment now.

We do not depend on that sort of argument, however, what we depend on is experimental measure of the mass, and mathematical estimate of the volume, of the electron. For calculation shows that however the mass be accounted for -- whether electrostatically, or magnetically, or hydrodynamically -- the estimate of ratio of mass to effective volume can differ only in a numerical coefficient, and cannot differ as regards order of magnitude. The only way out of this conclusion would be the discovery that the negative electron is not the real or the main matter-unit, but is only a subsidiary ingredient; whereas the main mass is the more bulky positive charge. That last hypothesis, however, is at present too vague to be useful. Moreover, the mass of such a charge would in that case be unexplained, and would need a further step; which would probably land us in much the same sort of etherial density as is involved in the estimate which I have based on the more familiar and tractable negative electron.

It may be said, Why assume any definite density for the ether at all? Why not assume that, as it is infinitely continuous, so it is infinitely dense -- whatever that may mean -- and that all its properties are infinite? This might be possible were it not for the velocity of light. By transmitting waves at a finite and measurable speed, the ether has given itself away, and has let in all the possibilities of calculation and numerical statement. Its properties are thereby exhibited as essentially finite -- however infinite the whole extent of it may turn out to be. Parenthetically, we may remark that "gravitation" has not yet exhibited any similar kind of finite property; and that is why we know so little about it.

ETHER AND MATTER - The Mechanical Necessity for a Continuous Medium Filling Space

In this chapter (Chap. VIII) I propose to summarize in simple and consecutive form most of the arguments already used. Thirty years ago Clerk-Maxwell gave to the Royal Institution of Great Britain a remarkable address on "Action At A Distance". It is reported in the Journal R. I, Vol. VII, and to it I would direct attention. Most natural philosophers hold, and have held, that action at a distance across empty space is impossible; in other words, that matter cannot act where it is not, but only where it is. The question, Where is it? is a further question that may demand attention and require more than a superficial answer. For it can be argued on the hydro-dynamic or vortex theory of matter, as well as on the electrical theory, that every atom of matter has a universal though nearly infinitesimal prevalence, and extends everywhere; since there is no definite sharp boundary or limiting periphery to the region disturbed by its existence. The lines of force of an isolated electric charge extend throughout illimitable space. And though a charge of opposite sign will curve and concentrate them, yet it is possible to deal with both charges, by the method of superposition, as if they existed separately without the other.

In that case, therefore, however far they reach, such nuclei clearly exert no "action at a distance" in the technical sense.

Some philosophers have reason to suppose that mind can act directly on mind without intervening mechanism -- and sometimes that has been spoken of as genuine action at a distance; but no proper conception or physical model can be made of such a process, nor is it clear that "space" and "distance" have any particular meaning in the region of psychology. The links between mind and mind may be something quite other than physical proximity; and in denying action at a distance across empty space I am not denying telepathy or other activities of a non-physical kind. For although brain disturbance is certainly physical, and is an essential concomitant of mental action whether of the sending or receiving variety, yet we know from the case of heat that a material movement can be excited in one place at the expense of corresponding movement in another, without any similar kind of transmission or material connection between the two places: the thing that travels across vacuum is not heat.

In all cases where physical motion is involved, however, I would have a medium sought for. It may not be matter, but it must be something; there must be a connecting link of some kind, or the transference cannot occur. There can be no attraction across really empty space. And even when a material link exists, so that the connection is obvious, the explanation is not complete; for when the mechanism of attraction is understood, it will be found that a body really only moves because it is pushed by something from behind. The essential force in nature is the <u>vis a tergo</u>. So when we have found the "traces" or discovered the connecting thread, we still run up against the word "cohesion", and we ought to be exercised in our minds as to its ultimate meaning. Why the whole of a rod should follow, when one end is pulled,

is a matter requiring explanation; and the only explanation that can be given involves, in some form or other, a continuous medium connecting th the discrete and separated particles or atoms of matter.

When a steel spring is bent or distorted, what is it that is really strained? Not the atoms -- the atoms are only displaced; it is the connecting links that are strained -- the connecting medium -- the ether. Distortion of a spring is really distortion of the ether. All stress exists in the ether. Matter can only be moved. Contact does not exist between the atoms of matter as we know them; it is doubtful if a piece of matter ever touches another piece, any more than a comet touches the sun when it appears to rebound from it; but the atoms are connected, as the comet and sun are connected, by a continuous plenum without break or discontinuity of any kind. Matter acts on matter only through the ether. But whether matter is a thing utterly distinct or separate from ether, or whether it is a specifically modified portion of it -- modified in such a way as to be susceptible of locomotion and yet continuous with all the rest of the ether, which can be said to extend everywhere far beyond the bounds of the modified and tangible portion -- are questions demanding, and I may say in process of receiving, answers.

Every such answer involves some view of the universal and possibly infinite uniform omnipresent connecting medium, the Ether of Space.

It has been said, somewhat sarcastically, that the ether was made in England. The statement is only an exaggeration of the truth. I might even urge that it has been largely constructed in the Royal Institution; for, I will summarize now the chief lines of evidence on which its existence is believed in, and our knowledge of it is based.

First of all, Newton recognized the need of a medium for explaining gravitation. In his "Optical Queries" he shows that if the pressure of thismedium is less in the neighborhood of dense bodies than at great distances from them, dense bodies will be driven toward each other; and that if the diminution of pressure is inversely as the distance from the dense body, the law of force will be the inverse square law of gravitation.

All that is required, therefore, to explain gravity, is a diminution of pressure, or increase of tension, caused by the formation of a matter unit -- that is to say an electron or corpuscle. And although we do not yet know what an electron is -- whether it be a strain center, or what kind of singularity in the ether it may be -- there is no difficulty in supposing that a slight, almost infinitesimal, strain or attempted rarefaction should be produced in the ether whenever an electron comes into being -- to be relaxed again only on its resolution and destruction. Strictly speaking, it is not a real strain, but only a stress; since there can be no actual yield, but only a pull or a tension, extending in all directions toward infinity.

The tension required per unit of matter is almost ludicrously small, and yet in the aggregate, near such a body as a planet, it becomes enormous.

The force with which the moon is held in its orbit would be great enough to tear asunder a steel rod four hundred miles thick, with a tenacity of 30 tons per square inch; so that if the moon and earth were connected by steel instead of gravity, a forest of pillars would be necessary to whirl the system once a month round their common center of gravity. Such a force necessarily implies enormous pressure or tension in the medium. Maxwell calculates that the gravitational stress near the earth, which we must suppose to exist in the invisible medium, is 3000 times greater than what the strongest steel could stand; and near the sun it should be 2500 times as great as that.

The question has arisin in my mind, whether, if the whole sensible universe -- estimated by Lord Kelvin as equivalent to about a thousand million suns -- were all concentrated in one body of specificalble density, the stress would not be so great as to produce a tendency toward etherial disruption; which would result in a disintegrating explosion, and a scattering of the particles once more as an enormous nebula and other fragments into the depths of space. For the tension would be a maximum in the interior of such a mass; and, if it arose to the value 10^{33} dynes per square centimeter, something would have to happen. I do not suppose that this can be the reason, but one would think there must be <u>some</u> reason, for the scattered condition of gravitative matter.

Too little is known, however, about the mechanism of gravitation to enable us to adduce it as the strongest argument in support of the existence of an ether. The oldest valid and conclusive requisition of an etherous medium depends on the wave theory of light, one of the founders of which was the Royal Institution Professor of Natural Philosophy at the beginning of the last century, Dr. Thomas Young.

No ordinary matter is capable of transmitting the undulations or tremors that we call light. The speed at which they go, the kind of undulation, and the facility with which they go through vacuum, forbid this.

So clearly and universally has it been perceived that waves must be waves of something -- something distinct from ordinary matter -- that Lord Salisbury, in his presidential address to the British Association at Oxford, criticized the ether as little more than a nominative case to the verb to undulate. It is truly <u>that</u>, though it is also truly more than that; but to illustrate that luminiferous aspect of it, I will quote a paragraph from the lecture of Clerk-Maxwell's to which I have already referred:

"The vast interplanetary and interstellar regions will no longer be regarded as waste places in the universe, which the Creator has not seen fit to fill with the symbols of the manifold order of His kingdom. We shall find them to be already full of this wonderful medium; so full, that no human power can remove it from the smallest portion of space, or produce the slightest flaw in its infinite continuity. It extends unbroken from star to star; and when a molecule of hydrogen vibrates in the dog-star, the medium receives the impulses of these vibrations, and after carrying them in its immense bosom for several years, delivers them, in due course, regular order, and full tale, into the spectroscope of Mr. Huggins at Tulse Hill."

This will suffice to emphasize the fact that the eye is truly an etherial sense-organ -- the only one which we possess, the only mode by which the ether is enabled to appeal to us; and that the detection of tremors in this medium -- the perception of the direction in which they go, and some inference as to the quality of the object which has emitted them -- cover all that we mean by sight and seeing.

I pass, then, to another function: the electric and magnetic phenomena displayed by the ether; and on this I will only permit myself a very short quotation from the writings of Faraday, whose whole life may be said to have been directed toward a better understanding of these ethereous phenomena.

Faraday conjectured that the same medium which is concerned in the propagation of light might also be the agent in electromagnetic phenomena. "For my own part," he says, "Considering the relation of a vacuum to the magnetic force, and the general character of magnetic phenomena external to the magnet, I am much more inclined to the notion that in the transmission of the force there is such an action, external to the magnet, than that the effects are merely attraction and repulsion at a distance. Such an action may be a function of the aether, for it is not unlikely that, if there be an aether, it should have other uses than simply the conveyance of radiation."

This conjecture has been amply strengthened by subsequent investigations.

One more function is now being discovered; the ether is being found to constitute matter -- an immensely interesting topic, on which there are many active workers at the present time. I will make a brief quotation from Professor Sir J.J. Thomson, where he summarizes the conclusion which we all see looming before us, though it has not yet been completely attained, and would not by all be similarly expressed:

"The <u>whole</u> mass of any body is just the mass of ether surrounding the body which is carried along by the Faraday tubes associated with the atoms of the body. In fact, all mass is mass of the ether; all momentum, momentum of the ether; and all kinetic energy, kinetic energy of the ether. This view, it should be said, requires the density of the ether to be immensely greater than that of any known substance."

Yes, far denser -- so dense that matter by comparison is like gossamer, or a filmy imperceptible mist, or a milky way. Not unreal or unimportant -- a cobweb is not unreal, nor to certain creatures is it unimportant, but it cannot be said to be massive or dense; and matter, even platinum, is not dense when compared with the ether. Not till last year, however, did I realize what the density of the ether must really be, compared to that modification of it which appeals to our senses as matter, and which for that reason engrosses our attention.

Is there any other function possessed by the ether, which, though not yet discovered, may lie within the bounds of possibility for future discovery? I believe there is, but it is too speculative to refer to, beyond saying that it has been urged as probable by the authors of "The

Unseen Universe", and has been thus tentatively referred to by Clerk-Maxwell:

"Whether this vast homogeneous expanse of isotropic matter is fitted not only to be a medium of physical interaction between distant bodies, and to fulfill other physical functions of which, perhaps, we have as yet no conception; but also. . . to constitute the material organism of beings exercising functions of life and mind as high or higher than ours are at present -- is a question far transcending the limits of physical speculation."

And there for the present I leave that aspect of the subject.

ETHER AND MATTER

I shall now attempt to illustrate some relations between ether and matter.

The question is often asked, is ether material? This is largely a question of words and convenience. Undoubtedly, the ether belongs to the material or physical universe, but it is not ordinary matter. I should prefer to say it is not "matter" at all. It may be the substance or substratum or material of which matter is composed, but it would be confusing and inconvenient not to be able to discriminate between matter on the one hand and ether on the other. If you tie a knot on a bit of string, the knot is composed of string, but the string is not not ommposed of knots. If you have a smoke or vortex ring in the air, the vortex-ring is made of air, but the atmosphere is not a vortex-ring; and it would be only confusing to say that it was.

The essential distinction between matter and ether is that matter moves, in the sense that it has the property of locomotion and can effect impact and bombardment; while ether is strained, and has the property of exerting stress and recoil. All potential energy exists in the ether. It may vibrate, and it may rotate, but as regards locomotion it is stationary -- the most stationary body we know; absolutely stationary, so to speak, our standard of rest.

All that we ourselves can effect, in the material universe, is to alter the motion and configuration of masses of matter; we can move matter by our muscles; and that is all we can do directly; everything else is indirect.

But now comes the question, How is it possible for matter to be composed of ether? How is it possible for a solid to be made out of fluid? A solid possesses the properties of rigidity, impenetrability, elasticity, and the like; how can these be imitated by a perfect fluid such as the ether must be?

The answer is, they can be imitated by a fluid in motion; a statement which we make with confidence as the result of a great part of Lord Kelvin's work. It may be illustrated by a few experiments (given on page 119 of the original text of Sir Oliver Lodge's book).

GENERAL STATEMENT AS TO NEGATIVE RESULTS IN THE SUBJECT

It is noteworthy that almost all the observations which have been made with negative results as to the effect of the earth's orbital motion on the ether are equally consistent with complete connection and complete independence between ether and matter. If there is complete connection, the ether near the earth is relatively stagnant and negative terrestrial results are natural. If there is complete independence, the ether is either absolutely stationary or has a velocity potential, and the negative results are, as has been shown, thereby explained. Direct experiment on the subject of ether-viscosity proves that that is either really or approximately zero and substantiates the "independence" explanation. (p. 137)

Just as the rigidity of the ether is of a purely electric character and is not felt mechanically -- since mechanically it is a perfect fluid -- so its density is likewise of an electro-magnetic character and cannot be moved by mechanical means. It is by far the most stationary body in existence; though it is endowed with high intrinsic energy of local movement, analogous to turbulence, conferring on it gyrostatic properties. . . The mechanical density of matter is a very small portion of the etherial density. (p. 156)

* * *

Section III EXCERPTS FROM "THE LIMITATIONS OF SCIENCE"

By J.W.N. Sullivan, Viking Press 1933 and
Mentor Book M35, 4th Printing, 1949

The nature of light is still one of the fundamental puzzles of science. The only period when men of science thoought they knew all about it was during the first half of the 19th Century, when the ether theory was being worked out. . . The first man to put forth this idea (that light has a definite velocity) was Romer in 1675. . . The fact that light takes time to travel made the question of its propagation acute. . . By the beginning of the 19th Century the wave theory, or ether theory, was flourishing; it is one of the most amazing instances in science of a theory which goes on from success to success and yet turns out to be wrong. . . It was an attempt to explain the phenomenon of light mechanically. A vast medium was supposed to fill all space and the mathematicians set themselves the task of working out its properties. . . Until Einstein showed that there was no reason to suppose the ether existed. . . (pgs. 46 ff)

We are in process of replacing (the mechanical explanation) by a different set of ideas. But it is not clear what the new set will be. The electron is a very hazy entity. . . We are not sure that we have found the right concepts. our notions of space and time are likely not subtle enough. . . It is probable that some of the questions we are putting to Nature are just meaningless. (51 ff)

The problem (as to whether the earth carried the ether along with it) was, as we now know, a pseudo-problem. Michelson concluded, from the negative results of his experiment, that the earth did so effect the ether, but this conclusion is opposed to certain trustworthy astronomical observations. . . Einstein showed the way out by asserting that the velocity of light is always the same (Special Theory, 1905). . . Minkowski showed the significance of this by regarding space and time as aspects of amore fundamental reality -- the four-dimensional space-time continuum (1908). (52 ff)

Nature knows nothing of the distinction we make between space and time. This is a psychological pecularity. There is nothing absolute about space and time. . . but there is a relation called the interval on which all observers agree -- and all agree on measurements that refer directly to the four-dimensional continuum. This continuum involved a new geometry (the Riemannian). Gravitation is a <u>geometrical</u> property of this continuum, not a force at all. It is an inherent property of space-time. But geometrical schemes deal with matter in bulk; the ultimate constituents of matter involve laws of a different kind. (55 ff)

Max Planck did not assert that energy itself is atomic, but thought there was some kind of mechanism in the atom which caused it to emit energy in quanta. The idea that energy itself is atomic is due to Einstein and the concept applies to space and time also, as to matter and electricity. Yet the wave theory of light could not be abandoned, and

the concept of a "wavicle" has been evolved. . . Bohr's theory of the atom fulfilled the requirements of the quantum theory for a time but has now been definitely abandoned. . . The more we investigate the nature of matter the more incomprehensible it becomes. . . The "wabes" are as immaterial as a "wave" of suicide. . . They are waves of probability. These "waves" seem merely to be a mathematical device, yet experiment seems to confirm their existence. It is difficult to avoid the conclusion that the experiments have not yet received their right interpretation. (66 ff).

The attempt to fashion a mechanical theory of light led to the creation of the ether, the most wasteful product of human ingenuity that science has to show (pg. 139). The ether became too complicated to be credible. . . Attempts to represent electricity as a strain in the ether have been given up. . . As far as physics is concerned we do not need to know the nature of the entities with which we deal, but only their mathematical structure. The old (Newtonian) entities and the new are on the same footing. . . We have knowledge only of pointer readings, never of entities themselves (141). . . <u>All</u> the pictures which science now draws of Nature are mathematical pictures (143). . . But mathematical characteristics, it may be argued, are also put into Nature by us (143) . . . Jeans says that space, time, sequence, laws of Nature, seem to be structures of pure thought. . .

* * *

Thus, in the book above quoted, a brilliant physicist rejects (perhaps too decisively) the "ether-wave" theory -- yet is not so much concerned to destroy the concept as to show how it has become unnecessary and is now replaced by a purely mathematical approach. Yet the whole trend of the book (the <u>limitations</u> of science) is to lead physics into metaphysics, and to show (with quotations from many distinguished scientists) that all aspects of Nature, of matter, of human experience appear in the last resort as being mental concepts, partaking of the nature of thought, mind, or consciousness. "Truth" in science (he repeats) is a matter of convenience -- will the theory explain and predict observable phenomena? And when a theory meets these requirements, it is still partial and tentative and subject to revision -- as the whole past history of science exemplifies. With final or ultimate causes, the ultimate nature of matter, entery, and consciousness, science has nothing to do.

Is it possible to construct a thinkable theory of the universe without recourse to picture-thinking at all? This question is not so easily dismissed as mathematicians seem to believe. If it is possible, it is certain that such a construction leaves the common man without mental recourse save fiction, dream, and the glamour of mystical experience. Yet to undermine what men call truth is a great and necessary service, since it leads to the understanding that "absolute" truth does not exist for human consciousness.

For a somewhat different treatment of the ether theory let us quote briefly from Eddington's "Nature of the Physical World", Macmillan and Cambridge University Press, 1929.

Section IV EXCERPTS FROM "NATURE OF THE PHYSICAL WORLD"

"Thirty years ago there was much debate over the question of ether-drag -- whether the earth moving round the sun drags the ether with it. At that time, the solidity of the atom was unquestioned, and it was difficult to believe that matter could push its way through the ether without disturbing it. It was surprising and perplexing to find by experiment that no convection of the ether occurred. But we now realize that the ether can slip through the atoms as easily as through the solar system, and our expectation is all the other way. . . For the present the two things which concern us are (1) its extreme emptiness, and (2) the fact that it is made up of electrical charges. . . (4).

"The constancy of a measuring scale is the rock on which the structure of physics has been reared. The rock has crumbled and simultaneously all the other supports have collapsed. (This crumbling is the result of the Fitzgerald Contraction; a measuring rod contracts when placed along the line of motion of the earth and is longer when across the line of motion.) There is no guarantee that all methods of measuring are not subject to systematic error -- we do not know if the error occurs or not and it is probably impossible to know. (19)

"The theory of relativity is bound up with the impossibility of detecting absolute velocity. Motion is change of position relative to something. . . in physics motion with respect to the ether would be called absolute. No etherial frame has been found. Velocity through the ether is as meaningless as north-east from the north pole.

"This does not mean that the ether is abolished. We need an ether. The physical world is not to be analyzed into isolated particles of matter or electricity with featureless interspace. We have to attribute as much character to the interspace as to the particles, and in present day physics quite an army of symbols is required to describe what is going on in the interspace. We postulate ether to bear the characters of the interspace as we postulate matter or electricity to bear the character of the particles.

"In the last century it was widely believed that ether was a kind of matter, having properties such as mass, rigidity, motion, like ordinary matter. . . Logically this was abandoned by the numerous nineteenth century investigators who regarded matter as vortices, knots, squirts, etc., in the ether; for clearly they could not have supposed that ether consisted of vortices in the ether. . . Nowadays it is agreed that ether is not a kind of matter. Being non-material, its properties are sui generis. We must determine them by experiment; and since we have no ground for any preconception the experimental conclusions can be accepted without surprise or misgiving. Characters such as mass and rigidity will naturally be absent in ether, but the ether will have new and definite characters of its own. In a material ocean we can say that a particular particle of water which was here a few moments ago is now over there; there is no corresponding assertion that can be made about the ether. If you have been thinking of the ether in a way that takes for granted this property of permanent identification of its par-

ticles, you must revise your conception. We cannot find our velocity through the ether; we cannot say whether the ether in this room is flowing out through the north wall or the south wall. The question would have a meaning for a material ocean. . . but not for the ocean of ether. The ether itself is as much to the fore as it ever was, in our present scheme of the world. . . (32)

"We must rid our minds of the idea that the word space in science has anything to do with void. It has the meaning of distance, volume, etc., quantities expressing physical measurement just as much as force is a quantity expressing physical measurement. The rather crude statement that Einstein's theory reduces gravitational force to a property of space ought not to arouse misgiving. In any case the physicist does not conceive of space as void. Where it is empty of all else there is still the ether. Those who for some reason dislike the word ether, scatter mathematical symbols freely through the vacuum, and I presume they must conceive some kind of characteristic background for these symbols. I do not think anyone proposes to build even so relative and elusive a thing as force out of entire nothingness."(137)

Excerpts from Philip Frank's "EINSTEIN: HIS LIFE AND TIMES"

Translated from the German manuscript by George Rosen, edited by Shuichi Kusaka, Alfred A. Knopf, New York, 1953.

"If one differentiates between statements about new physical occurrences and the proposal for a new mode of expression, one can formulate what is exactly meant by claiming the relativity of time. If we use the expression 'time interval' with respect to a specific system of reference, we can describe the phenomena in a simpler way than by using the traditional expression 'time interval without specification'. Einstein's relativity of time is a reform in semantics, not in metaphysics. (63)

"Einstein's proposal that the word simultaneous should mean only 'relative to a specific system of reference' would again be an improvement in semantics. (64)

"Einstein. . . suggested that the term ether be dropped so as to prevent the rise of any idea that one is dealing with a material medium . . . discussed another proposal: namely, the word ether be used for curved space, or what amounts to the same thing, for the gravitational field present in space. (168)

On page 263 Frank quotes Wildon Carr: "The adoption of the principle of relativity means that the subjective factor, inseparable from knowledge in the very concept of it, must enter positively into physical science. . . Hitherto the scientific problem has been to find a place for mind in the objective system of Nature and the philosophical problem to validate the obstinate objectivity of Nature. . . Now when the reality is taken in the concrete, as the general principle of relativity requires, we do not separate the observer from what he observes, the mind from its object, and then dispute as to the primacy of the one

over the other." Frank observes: "According to this foregoing paragraph the achievement of the relativity theory for religion is simply that it provided a place for mind in nature, which during the period of mechanistic physics, had been regarded as completely 'material and mindless'."

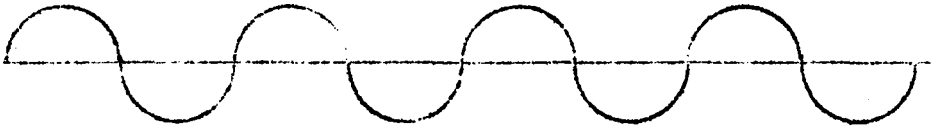
Section V THE ETHER OF SPACE and THE TIME VACUUM

By Ramon Natalli, a member of Mark Probert's Inner Circle

In attempting to express my thoughts in reference to space or what is sometimes spoken of as the ethers, it must be expected I shall suffer many hazards, and not all of them will be due alone to the modus operandi in getting these thoughts through to your world via my medium, Mark Probert, but also because the use of words to explain what should and can only be properly expressed in mathematical symbols is an entirely new approach for me. However, as you are well aware, "To not venture is to lose before one starts". So I'll start; but let us remember we are working with little more than theories, then we will not be too dismayed when we run into one of the "dead ends" that this sort of work is fraught with.

It is my opinion, sir, that we do not have to postulate a homogeneous state in considering the problem of space and the theory of increasingly denser fields. Were we to assume the particles that go to make up such fields to be moving in a straight line the homogeneous theory would be tenable, but this is not the case. All any particle is, is "light", or what is sometimes called a "photon". And light moves in what you today call "quanta", and quanta is produced in what may be called a "wave" or undulatinn pattern which contains very definite crests and troughs, and if we are to picture such waves at all they would look as the word wave implies they should look, like this:

Maximum intensity of motion --



Lowest points of inertia --

By each successive motion the particles make on the downward arc they lose a degree of kinetic energy and thereby suffer an increasing state of inertia. These various states or kinds of motion permit an infinite number of these vibrating points to work one within the other without any one of them interfering, or in any way infringing one upon another. This falling into deeper and deeper states of inertia causes the particles to discharge increasingly shorter bands of kinetic energy from the central mass to its satellite bodies, thus causing those bodies to drop inward to the central mass or nuclei to the rate of heat

dissipation.

Although that which is called matter is made up of an infinity of points, there is yet a state of finiteness for all of these points in what is called time. It is not a state of obliteration that the point suffers, but a change of its mode of motion. Nevertheless, as far as the sense of perceptions are concerned, these points have suffered a very definite end. And I think it well to add that even some of your most sensitively balanced instruments would fail to register such frequencies.

It is said "a series of points creates a line and a series of lines forms a surface", b ut I think it would be better to say "a certain number of frequencies form a measurable surface" in any given time frame. To speak of a volume in regard to space is to be making note of a definite measurement of something, and one simply cannot conceive of a given quantity of that which is called space, but only that which has its being IN a body called space. The measurement of a vacuum in any and all time frames or dimensions would be 0.1, the 1 simply acting as a vacuum surface. Fractions are pure abstractions, and while they can be talked about and to a certain degree mathematically used in any given time frame, they are really a quality of matter, and not a quantity. If this is true, then we can say the mathematical value of all time frames would be 1 plus X = 1 in quanta. The "1" acting as any given number of light radiations it may take to form a surface and the mean rate of oscillation of such radiations become the time element for that particular surface or dimension. This is also why one never sees that which is called the thing itself, while existing in his own time frame. Actually there is no such condition as a thing <u>itself</u>. All is sensing, and all sensing is due to a constant rate of any particular quantity of radiations. So that the "thing" itself can be but the flux of what is called radiant energy. And I believe this to be the true state of "things" on all levels of time, or better -- Consciousness.

The nature of the reality of things in any one of these surface worlds and all the characteristics that lend the quality of realness is not in the things themselves, but is dependent upon the structural nature of the sense organ called the body and the manner in which it has been conditioned in its environment.

To presuppose a condition called the thing itself, would be to presuppose a something called the "first" cause, and it is my belief that to postulate a first cause would be presupposing a beginning and an end, and while there is, as I've stated before, an Alpha and Omega, they can be thought of only as the highest and lowest points in frequency of radiant energy, or we may call it the ebb and flow in a time frame. The omega of one time-frame becomes the alpha of another. A phenomenon that may seem strange to some of us is that while two or more particles may take up the same space, they cannot do so in what is called time -- therefore, "time" is the existing "wall" between "things". That is, time as frequencies.

In fear the reader may assume that what I have thus far written has been in reference to what he calls his "matter" world alone, I would like to dispel that thought here and now. The "Matter" world is

only one of the endless "surface worlds", and has no more reality to it outside of its own time frame than (say), has a dream.

Dreams are but an extended state of one's awareness sense, and the same is true of the so-called death state. Unfortunately, perhaps, man has been caught up in the hypnotic glitter of what is called his matter world, or wakeful state of awareness; he has come to believe it is the only state of reality there is. But dating back from the beginning of man's incarceration in the matter world, there have always been a few in each generation who have not been satisfied with the way things seem to be, and so have acquired a burning desire to know the nature of that which seems to have the quality of be-ness to it. These less hypnotized beings came in time to be called "truth seekers", and later, scientists. As long as they held to the former title they learned a little something, and those who lived in their times shared that something with them. But when they adopted the latter, they started to specialize, and in their specialization they became as mysterious as the things they sought, and therefore had nothing to share with anyone. Physical science became something distinctly different from mental science. The physical scientist became lost in his little physical world, and the mental scientist simply became lost.

That the physicist has gleefully chased his matter world into a state of (pardon my shroud) ghostly nothingness, and the psychologist his mental world into a (for him) despairing state of somethingness, is not at all surprising or alarming. What is very alarming, however, is the fact that these pursuers of life now stand upon their individual borders of somethingness and nothingness with much wailing and gnashing of teeth, both stubbornly refusing to give in to the other.

That which is called Concsiousness is a field of patterns -- patterns wrought out of what can only be termed inner and outer experiences of an individual. Actually, there are no such states as inner and outer. We get the illusion of the existence of these two seemingly diverse states by making comparisons with our bodies and other bodies that seem extended in space before us. This field of patterns is not a static one but is in a constant state of flux, moving the individual into an incessant action, no matter what the nature of the vehicle it may be functioning in; and whatever the direction this stream may take on to, it is always to that one, a very concrete field of reality. Confusion is itself a state of reality to the one who is suffering it, otherwise he would not be suffering it. (Who would know this better than those who live in your world of today?) But the greatest reason back of the confusion lies in the fact that the people as a whole, have not been taught to be consciously aware of their individual acts. This low state of awareness causes our experiences to be painfully dull and vague, so our senses become jaded and we see and otherwise register little more than about ten percent of what is going on in our environment in the so-called physical world. Is it any wonder, then, that when we shift our state of awareness into other fields, such as the dream world, we find it to be equally vague and painful?

I think it need not be added that we will build our so-called after-death state with the same invalid timber.

The dream world need not be a world of frustrated desires and inhibitions anymore than does the "outside" world. We must simply realize that we are where our Mind is -- Mind is place, and place is but another word for space. The thinking creates energy in that mind-space. This mental energy is worked into definite geometrical patterns, or designs, which are of themselves neither complicated nor simple. The latter two words are sense words, and belong to the body which is itself a geometrical pattern. The nervous system then, with the brain acting as the receiving station, takes these lines of force and within its conditionally limited scope as a measuring instrument, creates from them a myriad of forms and shapes that have become known by such familiar names as mineral, plant, fish, fowl and man. This self-same action takes place throughout the entire scheme called consciousness.

In the above I've used the word "thinking" as being the process of creating energy. I would like to make clear, however, that the material tissue structure called the brain does not think. The brain is but the mechanical instrument impinged upon by the aforementioned lines of force telling the Mind-self that some form of motion has been made. The Mind-self also knows nothing about what is called thinking or reasoning, nor of making inference. These are also sense or feeling words, and belong to the physical machine which has been conditioned to respond to lines of force in given ways, depending upon its environment. Indeed, the Mind-self has no existence per se apart from its symbol making. But the moment it creates a line of motion it automatically becomes the body called space in which the motion is born, and motion gives birth to the impression called time. The body being limited in its ability to respond in exactly the same manner to a given stimulus beyond a given length of time, finds itself in due course rejecting the lines of force which caused that stimulus by the simple process of not registering them. At the same time, however, it is accepting new ones. This kind of action, then, is what lends the body-self the impression of change. Change implies motion, motion implies space, space implies zero inertia, and zero inertia implies the simple fact that the sense organ called the body has ceased to register motion in its time frame.

In the Name of Light, I am your Brother,

Ramon Natalli

NATALLI ON THE TIME-VACUUM

(The above material was dictated clairaudiently to Mark Probert by Natalli.for this brochure on "The Ether of Space". The following was given through trance mediumship in March 1952 and approaches the problems of space and density from a somewhat different angle. It is, however, highly relevant to our present material and is included here for that reason, Natalli speaking through Probert.)

I am going to say something which may not be quite understood. While we have various densities it is still a difficult matter to reckon with, because it will be supposed by your scientists that in the last analysis the density would be so great that the medium could only

be described as homogeneous. I have recently worked out a theory part of which at least may be known to you.

If we look at densities as blending slowly we arrive at a density which will be to all intents homogeneous. But is not really the case. By basing on the quantum theory, each state is periodical -- a period behavior of the atoms. This period state can only come about (be conceived of) by thinking in this manner. The action of the atom in each grade of density is not a stable condition, but one which appears and disappears -- a kind of blinking, so to speak, in lawful sequence.

In each passing second or other fraction of time there is a different form of motion. A phenomenon of action taking place in one density will cause another form of action to take place in another density. It is this action taking place in different dimensions which creates what you call form.

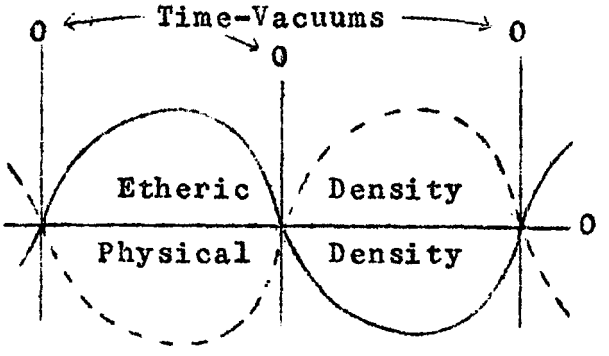
Now, we wonder where the atom is in the fraction of time it is not in action. There is a time-vacuum existing between the period-states of motion. When an action takes place in the atomic world here in this density, it creates another form of action in another density. Here we have cause-and-effect in play and spanning the gulf of the time interval. This can only be a time-vacuum. There is a stream of force passing between the two densities. Due to the fact that we cannot ever get to a state of nothingness, this field that we call the time interval we may call a play going on between the two. . (notes defective). . a play or interchange between the proton and the neutron. They exchange energies until there is a kind of absorption of one of them. We wonder what has happened to the one, and how the absorption takes place again. Both are sending off energies, and those of one are picked up .. bodies.

You have in this exchange a complete breakdown of the atomic body, and it pours itself across this time-vacuum into another dimension, where in forming an atomic structure in this dimension it is moving at a different rate of speed. Possibly it has lost some of its electronic bodies in this new dimension, and possibly it has added new ones, thereby creating a substance that will make form of a different.kind. The atom in this new dimension will create a web-like structure with other atoms that will make a solid for that dimension.

Your time-vacuum lies in the exchange of a neutron and proton in which one of these has absorbed the energy of the other. In that moment you have a time vacuum. But it is so fragmentary in its time period that there is as yet no way I know of to measure it.

The fractions of time are not really as we perceive them. The motion is so fast that we cannot make any estimate. But, there is a pause in this time-field that is a complete nothingness. This is basically a heat action, and can be thought of according to a dimension of time as a magnetic or electromagnetic field according to the time interval between. We can say in either case that it is magnetic or electrical or electromagnetic, or that it is pure heat, depending largely on its use in any particular dimension of time. A passing point that is

without atomic structure. The atom pours itself out into another dimension of time, across the time-field. This is space-time, or a space vacuum between the nucleus and and the electron.



In the division of matter into fractions one must keep on dividing and it seems that you must come to the end of matter in your time dimension only; for there are still endless fractions to be divided in other dimensions. Scientific minds have for ages tried to figure out by mathematics (which seems the only way) how to destroy matter (or energy or substance) completely. It can be done, but only in your dimension of matter or time.

In the atom of your physical world, the nucleus is itself made up of other atoms with electronic bodies.

In the series of emanations, alpha, beta, gamma, etc., the gamma ray is the most potent. It is the essence of pure kinetic energy. This moves, or the particles of this wave move in a jagged vibratory motion -- in a saw-tooth motion. This gives the wave its high penetrative power. Matter in forming structures creates a web or net. This is a web of energy between atoms. The radiation of the gamma ray on your plane destroys this energy web. It does not strike the nodes or atoms themselves. This causes confusion in the atom world. The nodes undergo a form of fission. This takes place in the physical organisms also, as in some forms of cancer. The psyche works thru the body as electricity works through a machine. Its action IS electricity. There are many kinds of electricity. There is that which is magnetic and that which is non-magnetic. As yet you know very little about these kinds. Individuals undergoing electrical treatment should be typed as to electrical frequencies. This can be done quite easily by means of isotopes.

* * *

NEW APPROACH AND NEW DIFFICULTIES, conclusion by Meade Layne.

That the existence and nature of the ether apparently receives less attention now than formerly, by no means indicates that its existence has been disproved or is of minor importance, but rather that a different approach has been developed. Even the inferences drawn from the negative results of the Michelson-Mor ley experiments and others of similar purpose, were not that the ether did not exist, but that in the neighborhood of the earth it is carried along by the earth's movement.

The concept of the ether as a continuum arose from the discovery that light (a phenomenon of the ether) has a measurable velocity. Newton (though he speculated on the presence of some universal medium) and

other mathematicians of his time, considered that gravity, magnetism and other forces were instantaneous in their action, that is, the factors of time and space were not considered at all. But if light has velocity this implies space and time, and also some medium through which the motion is propagated. It was thought that such a medium must be homogeneous, otherwise the crossing of the interspaces would still have to be accounted for.

This ether-wave theory of light is mechanistic and involves picture thinking, which is now almost ruled out of scientific hypotheses. However, it is true that the ether-wave theory was unable to support the structures raised upon it, and research showed that such a continuum must possess incredible and contradictory qualities.

J.W.N. Sullivan remarks, that "truth to a scientist merely means convenience". This principle should never be lost sight of. Science is pragmatic and follows the maxims of the "As if" philosophy. All forms of motion, for example, are studied as if pure or free motion were in a straight line. No examples of such straight-line motion are found in Nature, but the concept enables us to classify and study the types which are observable. It enables us to think the universe in fuller degree, and so constitutes a "scientific truth" -- which may, however, be modified or replaced by some later truth at any time.

As the ether-wave hypothesis proved more and more difficult, other and new concepts developed concurrently. Several new geometries were worked out, that of Rieman being of special importance; also a new concept of energy (the quantum theory), both of which are basic in the work of Einstein; also the wavicle theory of light, which does not require or permit picture thinking. In all these developments we are in the field of pure mathematics.

But the escape from picture thinking into pure mathematics has turned out to be an escape into metaphysics. This much abused term includes, when properly used, the two subjects of ontology and epistemology (the nature of substance and the nature of the act of knowing).

Bertrand Russell humorously yet seriously describes an electron as a "wave of probability with nothing to wave in". Eddington denies that the ether is abolished, and goes on to say in "Nature of the Physical World", page 31; "We have to attribute as much character to the interspaces as to the particles. . . quite an army of symbols is required to describe what is going on in the interspace. We postulate ether to bear the characters of the interspace as we postulate matter or electricity to bear the characters of the particles." The ether, he says, is non-material in the sense that its properties are sui generis. If we ask what the word space means in the above quotation, we may be told that it is action. expressed by mathematical symbols. If we ask for a description of an electron, we may be told to think of it as a kind of nucleus in a spinning mist, spearated in space from the nucleus of its atom -- and again the word space has no content except the "army of symbols". And if light is a wavicle or wave-particle, we are to think of this wave as being one of probability and/or energy, or action which can be dealt with as an entity by mathematical means.

Such concepts may appear absurd to the layman but of course are far from being so, and are intellectual achievements of a high order. The upshot, however, is physics cum metaphysics in an inseparable blending.

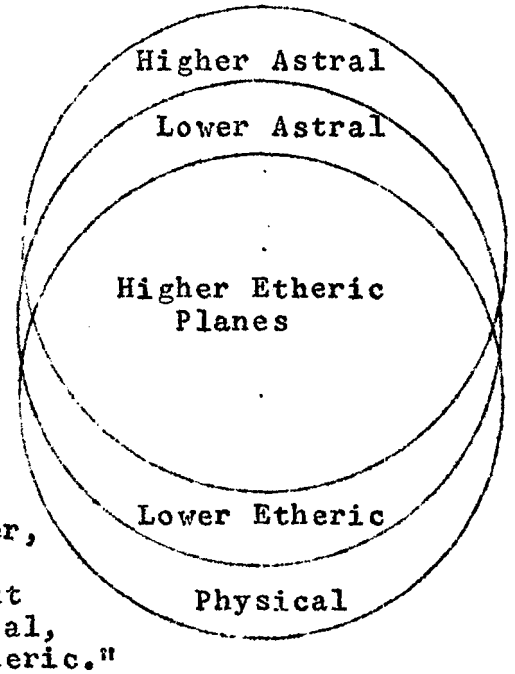
These remarks obviously touch only the surface of an immense subject, and their object is only to warn some few of our readers against certain statements of a smug scientism. To quote Eddington again, "Velocity through the ether is meaningless, but the ether itself is as much to the fore as it ever was, in our present scheme of the world."

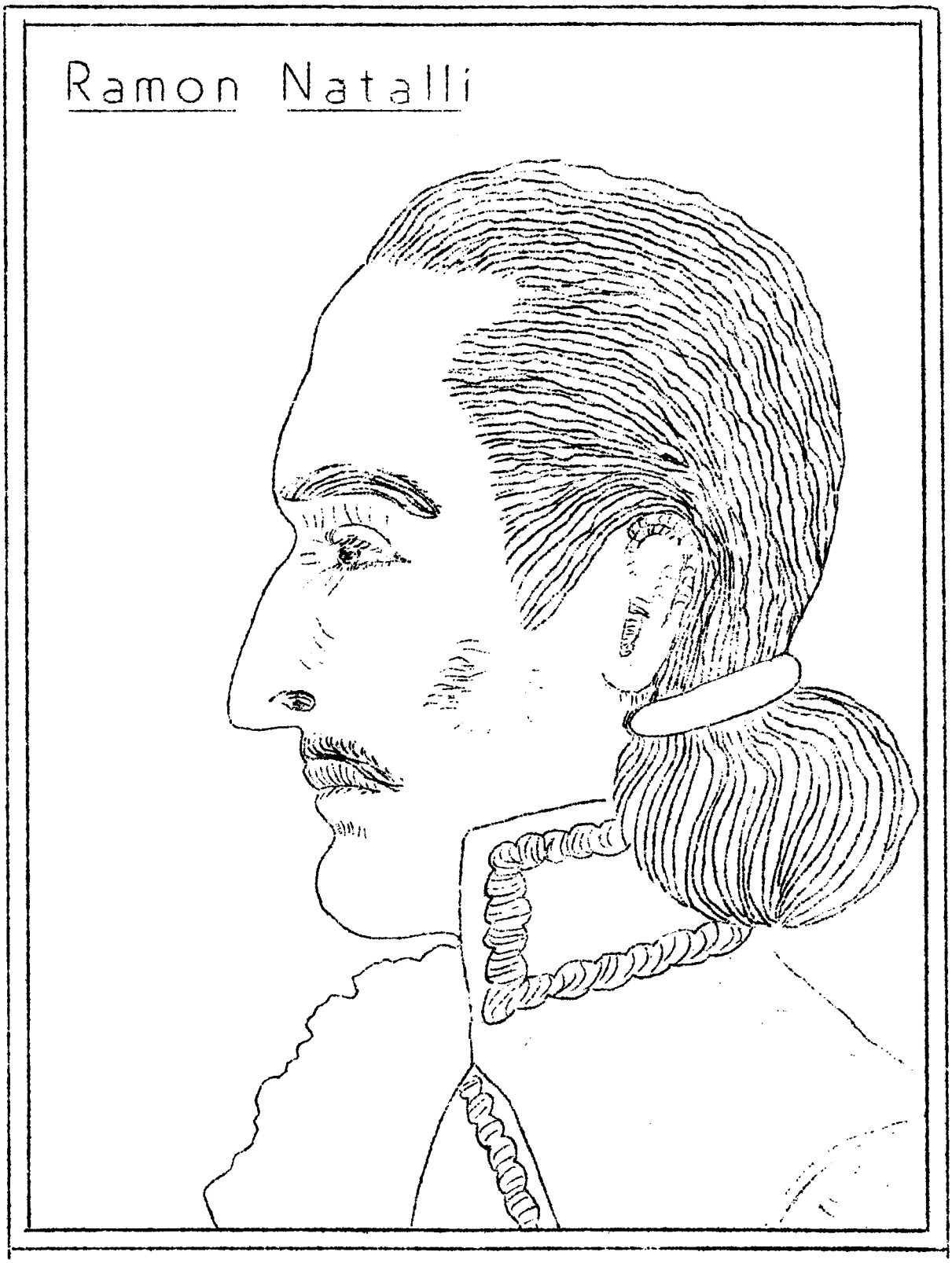
Our booklet, "The Ethership Mystery and Its Solution" (BSRA No. 4, 40 pages, $1.00), is concerned with the thesis that there are a series of particularate ethers of increasing density and fineness, and of course beyond our spectra of sense perception. The vast interspaces of the atom are not nothingness, but are successively occupied, so to speak. Or better, space equates with extremely dense matter. Or again, space, like time, is a 4th-dimensional state of matter. Objects and events of other dimensions become perceptible when their energy rates are converted to our level, and between these planes of vibration there is continual commerce, conversion and interchange. Humans and human-like beings, and countless other living things, and objects visible and invisible pass back and forth. In this wonderful yet commonplace fact lies the secret of the Visitation -- the visible coming and going of the Etheric Guardians and their multiform craft.

As a final word to this "Ether of Space" brochure, we recommend a careful and unprejudiced examination of the sections dictated by the astronomer and mathematician, Ramon Natalli. Whether they will receive much attention is indeed doubtful, but he has presented them in the true spirit of science, and we at least make the gesture of offering them to our readers.

THE INTERPENETRATION OF THE PLANES

"Physically considered, these 'planes' are distinguished by varying rates of vibration; spiritually considered they are varying states of consciousness," said Natalli at a later date to Meade, concerning the overlapping circle diagram at right. "Substance as earth men know it takes on the tangibility suited to earth consciousness on the lower etheric, and it is from this region that your sky phenomena burst into view, and also your psychic phenomena. At death, man's sojourn in the lower etheric is very short lived. But he does not enter the higher etheric, but goes right on through it, with no consciousness of it, to the lower astral. Later, and depending on his mental activity, he enters the higher spheres of the astral. But in order to make any contact other than mental, he must make it through and by the lower etheric."





Ramon Natalli
Drawn from a portrait painted by Mark Probert