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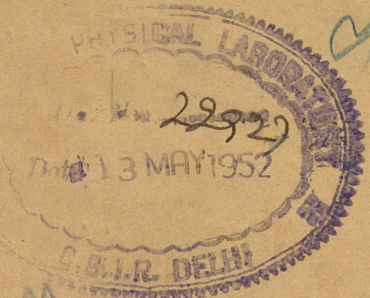

To

नाम The Director,

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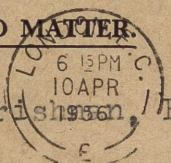

Sir K. S. Krishnan, F.R.S.,

National Physical Laboratory of India,

Hillside Road,

Delhi, India.

TELEPHONE:
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10 April 1956

Messrs. Taylor and Francis, Ltd., beg to acknowledge the receipt of your MS. which has been forwarded to the referees.

The Drude Dispersion Formula, etc.

With compliments and thanks.

A. J. WILSON
B.A. (Cey) Ph. D. (Lond)
Lecturer in Government
University of Ceylon

3, Augusta Hill
Peradeniya

14. 4. 1958.

Dear Sir Krishnan

I enclose herewith a reprint of my article on "Minority Safeguards in the Ceylon Constitution" from the Ceylon Journal of Historical and Social Studies. I hope you will find it of some interest.

My best wishes to you

I remain

Yours very sincerely

A. Jeyaratnam Wilson.

Dr. T. K. N. TRIVIKRAM
Phone 62778

52 Shivaji park,
Bombay 28, India

18-12-1953

Dear Dr.Krishnan,

I have great pleasure in sending you the enclosed document in theoretical physics. May I request you to be so good as to favour me with a reply regarding your reaction to it?

Thanking you very much,

Cordially yours,

T. K. N. Trivikram

FUNDAMENTALS OF EINSTEIN-RELATIVITY REFUTED. TRUE RELATIVITY PRESENTED. THE "ETHERON" THEORY ADVANCED.

By

T.K.N.Trivikram

Synopses of two papers on the above subjects.

PRINTED IN INDIA,

for free distribution to those concerned, at 52 Shivaji Park, Bombay, 28.

18-12-1953

PAPER ONE

FUNDAMENTALS OF EINSTEIN-RELATIVITY REFUTED. TRUE RELATIVITY PRESENTED.

By T. K. N. TRIVIKRAM

Proposition 1. THAT, The Michelson interferometer is unsuited for proving or disproving the ether; and The Michelson-Morley experiment is incapable of giving any result other than the negative: ether or no ether, drift or no drift.

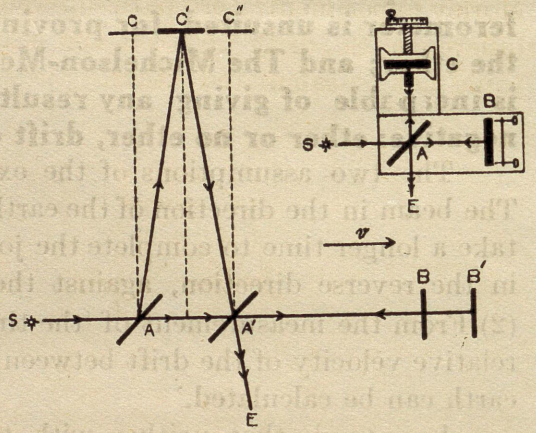
The two assumptions of the experiment are: (1) The beam in the direction of the earth's motion 'should take a longer time to complete the journey than if sent in the reverse direction, against the earth's motion.' (2) From the measurement of 'the time difference, the relative velocity of the drift between the ether and the earth can be calculated.'

I contend, that neither with the apparatus, nor with the experiment, could these two assumptions be verified. The 'result' was negative, not because the assumptions were wrong; but because the apparatus and the experiment were unsuited for proving them.

No directional effect. In the apparatus, the two beams that go in the opposite directions, each comes back upon itself, thus completely neutralising the directional effects. If it were somehow possible for the fringes to be formed at distances of AB′ in the first position (fig.1), and AC′ in the second position (fig.2), we would certainly be in a position to talk of two beams in opposite directions. But, as fringes are formed only

at A′ in both the positions, and as A′ marks the end of the *return* of the beams upon themselves in both the cases, we could not talk any more of a beam 'in the direction of the earth's motion,' and another 'against the earth's motion.' It is as if no beam were sent in any *direction!*

Fig. 1



No Path Difference; No Time Difference. The beam AB′ (fig.1) sent in the direction of the earth's motion, takes a longer time to travel the distance than AC′ (fig.2) sent in the reverse direction, because the distance it travels is longer. In the first position, $AB' = c + v$; but in the second position, $AC' = c - v$. This difference would certainly be indicated by any interferometer that could give us fringes at distances of B′ in the first, and C′ in the second, positions. But, such interferometers have not been discovered as yet. In all the Michelson type of interferometers, fringes

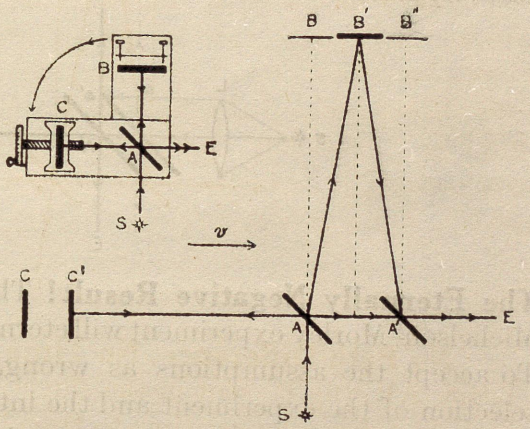
are obtainable only at A′ in both the positions, at the end of the return paths.

First path $AB'A' = c + v + c - v = 2c.$

Second path $AC'A' = c - v + c + v = 2c.$

The path difference is zero. So fringes would never shift in the Michelson interferometer in the Michelson–Morley experiment. Zero path difference gives zero time difference. So, drift between the ether and the earth could not be calculated either.

Fig. 2



The perpendicular beam. The path difference between the forward beam and the perpendicular beam given to us as dv^2 / c^2, is an absolute impossibility. 'Since all the stars show the same displacement it follows that the velocity of light must be independent of that of its source.' So the diagonals AC′ and C′A′ (fig.1) are out of the question. On the contrary, the AC of fig.1 could return only as CA extended as shown in

fig.3, and would never form a fringe with its twin at A′. Instead, aa′C′A′ will form a fringe with AB′A′ (fig.3), and these two are exactly equal to each other. So, there is neither path difference, nor dv^2 / c^2 in the beams sent in the two directions.

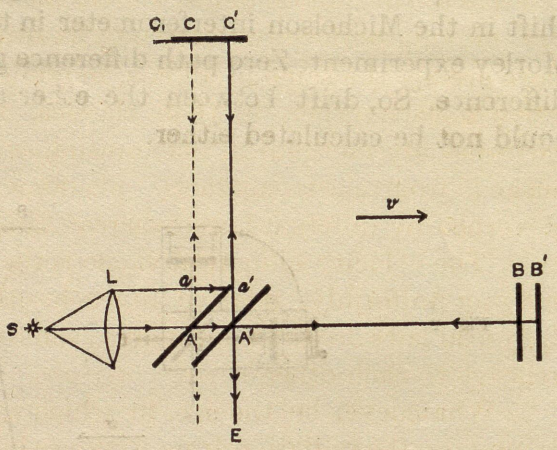


Fig. 3 Showing the correct beam–paths in M.M. experiment

The Eternally Negative Result! The result of the Michelson–Morley experiment will eternally be negative. To accept the assumptions as wrong, where it is the selection of the experiment and the interpretation that are wrong, is too much to be expected of any one.

The basis and the inspiration for Einstein's relativity namely, the M. M. experiment and its 'result', thus fizzle out. All assumptions in the theory built upon the 'negative' result also go.

The Ether and 'Dynamic' Space! If any experiment disproves the ether, it equally disproves 'dynamic' space. The experiment was on the medium of light transmission; and not on the name we gave to it.

Proposition 2. True Relativity. THAT, The velocity of light, if unimpeded, is always the same only in the medium of light transmission, i. e. in its own co-ordinate system, which is also the absolute c.s; The velocity of light is not influenced by that of the source, but is relative to the motion of the source, the receiver, and all c. s. moving uniformly relative to its own c. s; Physical laws are *not* the same in all c. s. moving uniformly relative to each other, in that classical transformation governs only mechanical phenomena, as contradistinguished from electromagnetic phenomena which are governed by different laws; whereas Einstein maintains that 'The velocity of light in vacuo is the same in all c. s moving uniformly, relative to each other'; and that 'physical laws are the same in all c. s. moving uniformly, relative to each other.'

Whatsoever be the c. s. in which a source of light is moving, the radiation from it moves in a different c. s. which we might call for the present the electromagnetic c. s.

The peculiarity of this e.m.c.s. is that it does not move; and the radiations in it are neither inertial nor accelerational, and therefore could not be brought either under the special or under the general relativity theory. For, special relativity deals with inertial systems where 'the law of inertia, as formulated by Newton, is valid'. which law states that 'any body persists in a state of rest or uniform motion in a straight line, unless acted on by some external force'; whereas, in radiation there is no 'body' that 'moves' at all, or obeys in any way the law of inertia, according to the assumptions of the 'etheron

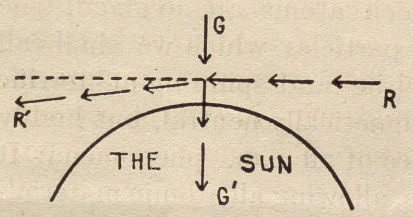
theory' (vide Paper 2): that radiation is only the transmission of a condition of vibration from particle to particle of the medium of transmission, and not motion of particles from source to other places. Acceleration too deals with motion of bodies, to which my answer is the same.

If 'physical laws are the same in all c.s. moving uniformly, relative to each other,' then, not only the velocity of light, but also the velocities of ships, trains, and all things should be the same in all c.s. ..... . The very fact that Einstein has to put the case of light as an exception shows that all physical laws are not the same ..... . If, in an idealized experiment I travel in a room in the direction of a beam of light, with the velocity of light, the velocity of light relative to my velocity would certainly be zero. But Einstein might say, if the room and I travel with the velocity of light, we would both shrink into nothing, and the question of relative velocity would never arise. My reply would be that: if light is material, and if light travels at the velocity of light, and if still light particles — quanta — survive, my room and I would survive, and the velocity of light would relatively be zero. Einstein's relativity is an impossibility.

Proposition 3. THAT, Light is not a 'material object'; Our experiences concerning light which made scientists regard it as a material object are not the results of the characteristics of light as such, but those of the material basis which transmits light; It is not light that is influenced by gravity, but the medium of its transmission; When light 'travels', nothing material, no particle,

neither 'corpuscle' nor 'quantum' of a material nature is bodily transported from the source of emission to the surface of diffusion or absorption or reception; It is a light-similium rather than the light itself that is transmitted; This similium, even like that of heat, is only a temporary condtion, a condition of agitation, a rate and type of frequency of motion and waving of an electromagnetic quality, passing through the particles of the medium of transmission, so much so, what is transmitted is only a condition, and nothing material; and, As is the case with heat and light, so is it with all electromagnetic phenomena; Whereas modern physics and Einstein maintain that light is matter travelling places, though uncertainty has made them refer to it in the rather vague and evasive terms of 'energy quanta'!

Deflection. The bending of light beams as they pass near the sun may be explained thus. The medium of transmission of light is stationary, and made up of particles highly susceptible to the influence of electromagnetic phenomena. (Paper 2). We have luminiferous molecules at the source of light, and mediumistic particles in the medium of transmission. Those at the source are in a state of e.m. photo-vibration; and those of the medium are in an exactly similar vibration during the transmission. Gravitation, if it is powerful enough, as it is said to be while close to the sun, acts as an additional force on the



particles of the medium, influencing the resultant of the mediumistic vibration in such a way that, instead of one particle darting forward and influencing the one next to it in the original path of transmission, it darts towards and influences one below the original path, and nearer the sun; and that in turn doing the same to the next, and so on; thus a bend in the path, gravityward, is effected. The influence of gravity is on the medium; and not on light itself. Light is the effect of a condition. A condition is not pulled by gravity!

PAPER 2

Proposition 4. The Etheron Theory Of The Ether. THAT; The Ether exists; It is not made up of atoms and molecules, still it is material, being composed of the substance out of which atoms are evolved. The ether material consists of particles which we shall call etherons, transparent, virile and spinning at terrific speed, electrically and magnetically neutral, but highly susceptible to the influence of all e.m. phenomena; It is porous; It is permeable, allowing all atomic materials to pass through it; It is not a fluid; and is not blown about from place to place, nor is it dragged along by any substance moving through it however high the speed might be; It is, in no sense of the word, viscous, nor does it adhere to things (which spin in it) to form the 'transverse waves' of the earlier, and even present day, theorists; It is not solid as it does not prevent solids from passing through it; It is stationary, the

etherons being held in position amongst themselves by stupendous forces of attraction of a gravitational type which they acquire by virtue of the tremendous speed of their spin coupled with a partially hollow interior; Neither the partially hollow interiors of the etherons nor the interspaces between them are vacuumatic in the absolute sense, for, absolute emptiness is non-existence, and non-existence has no place in existence; and, All interspaces between the etherons and the hollows within them are filled with an infinitely thin and infinitely rarified, but absolutely continuous, type of matter with only a pulsation, a heaving between an utmost and a next-to-it stages of levity.

This last assumption might not be demonstrable experimentally. But logic and sense have their place in science; and here is as far as they could carry us in physics.

Etherons. Each etheron is confined to its own sphere of activity, which is within the surrounding etherons. It could whirl, oscillate, rotate, or move in any way characteristic of it in between the surrounding etherons; and never move beyond. There are different types of etherons. They exist interspersed, each responding to its corresponding wave — heat, light, radio, or whatever else it might be. The difference between them might be in weight, density, speed and course of the vibration, any of these or all of these, which go to decide their susceptibility to the different e.m. phenomena.

The 'Field' is not a mere vacuumatic reality, but a material reality: the material being of the class of

etherons. If we sprinkle iron filings on paper placed over a bar magnet, as many tiny magnets are formed as there are iron particles, and they all arrange themselves along the lines of force of the magnet. The force is imparted to these particles, not by emptiness, nor 'at a distance', but by the tiny electric fields formed all along the routes by still tinier vibrating magnets of magnetc-etherons, invisible absolutely, but absolutely apparent when we present a compass anywhere in the field.

The Etheron Theory Successfully Explains All Optical Phenomena, whereas not one of the existing theories could cover them all.

Rectilinear Propagation of Light. The photo-etherons in contact with a source of light begin to vibrate exactly in the same way as the molecules of the source. This vibration is passed on from one to another of the photo-etherons in the rectilinear way, because whatever be the nature of the vibration or wave, all e.m. waves have a forward motion in straight lines in the direction of the radii diverging from the source.

Reflection. A ray of light from source S falls on mirror M at an angle of 45°. The molecule S at the source has the forward motion of light. The photo-etheron S′ charged by S responds and takes up the vibration of S, which is natural to it. S″ takes it up, and

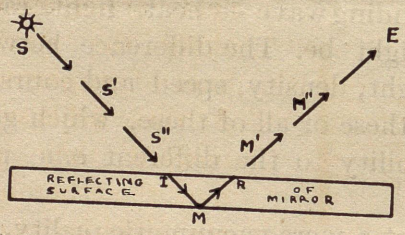
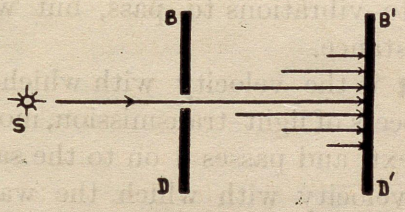


Fig. 5

passes it on to M. If the reflecting surface of the mirror is not opaque, but transparent, the ray SM would have continued in the direction SM produced, and never given a reflection in the direction of ME. But the mirror is opaque, and the ray is reflected. What happens at M is what is interesting to note. Instead of the analogy of a ball thrown at a wall employed in the explanation of the mechanical theory, the etheron theory uses the analogy of a ball at rest on the floor, hit by a stick, at an angle of 45°. The ball bounds in the opposite direction at the same angle of 45°. The velocity of S″ × its mass, is the 'stick' that hits the 'ball' M, imparting the force IM to it. M being a particle of the mechanical type, in obedience to the mechanical law, it gives the force back in the opposite direction, and at the same angle; and reflection results. The mirror passes through the ether all right, but does not allow the light vibration to pass through it. The reflecting surface of the mirror is a bad 'conductor' of light vibration. The molecule M into which the light vibration was passed, throws it back. It is like a tennis racket that catches the ball and throws it back, but allows the air to pass through it.

Diffraction. Light being an e.m. phenomenon, fields are created all along the straight lines of propagation. As these fields sweep onward they pass over the etherons in the shadow region,



converting them into active photo-etherons of less and less intensity, because of greater and greater dilution in distribution. Each succeding etheron gets an additional row or so of etherons outside it involved, and thus the light, into the shadow region, is effected.

Fresnel Diffraction Rings and Fraunhofer Diffraction Bands. The etheron vibrations so link themselves into chains of varying lengths as to form wavelets and waves. The wavelets, by interference, cause diffraction rings and bands.

Refraction. Young, Fresnel and Fizeau thought that refraction was due to a compression of the ether inside transparent bodies. Scientists generally had accepted the view as correct until recently, when they threw the ether itself out. But the etheron theory maintains that the ether does not have different resistances in different things. Planets, water, glass, all pass through the ether with the same ease. The density of the ether in all substances is the same. The refractive indices in different things are different because of the differences in their 'conductivities' to light, if I may so use the word. As in the case of heat and electricity, so with light too, there is conductivity. Any material that throws out by reflection or diffusion the photo-vibration of ethrons is said to be opaque. Transparent things are those that allow photo-vibrations to pass, but with varying degrees of resistance.

Velocity of Light is the velocity with which an etheron, during the process of light-transmission, moves forward to meet the next, and passes it on to the same in free space; or, the velocity with which the waves

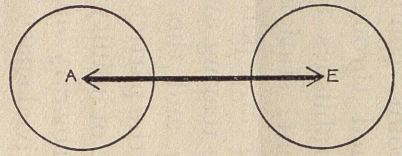
formed by the etheron vibrations pass through free space: which is the same.

Light as Energy. Quantum theory says that light is composed of showers of photons of energy quanta. The etheron theory is nothing if not a theory of energy. For, in it, light is the result of the stupendous vibratory activity of photo-molecules and -etherons.

The Fifth Dimension: Cause, or Cause-Effect. Any event is a happening in cause: a projection of the cause: always an effect: a movement from cause to effect. Time and space are adventitious on cause–to–effect: incidental to them; all the same, part and parcel of all events.

Space as Cause and Prior State of Ether. The etheron theory assumes an infinity of space of infinitely thin material; non–porous, non–granular, absolutely continuous; heaving in waves between an ultimate and a penultimate states of levity; an ultimate cause of all.

As time passes, the heaving gathers greater and greater momentum towards its denser nature, the crests of the waves reach a saturation point, condensation sets in, and 'space–vapour' is formed throughout the infinite expanse. This 'vapour' establishes a parallel existence with and within its parent, stationary like the parent, but unlike it, granular and porous. The condensation is a process of terrific tearing away from the parent. The force of the tearing, and the vigour of further condensation are such, that the particles formed spin with a speed touching the verge of infinity of speed. (Not by any means the petty arbitrary infinity of 186,000 m/sec.) Let us call the derived space 'granular



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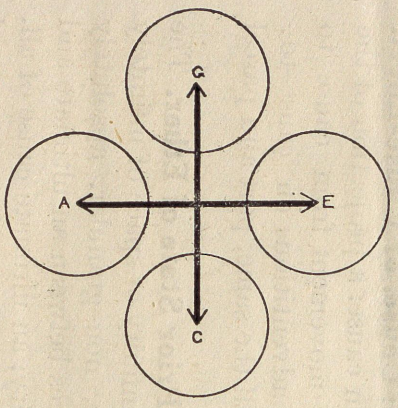

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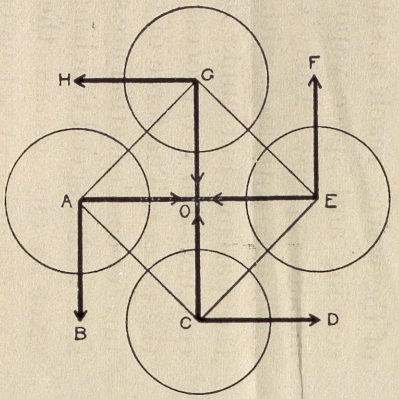
Evolution of a longitudinal, into a circular wave. In nature, circular waves do not exist as such; but move in alternately reverse semi-circles.



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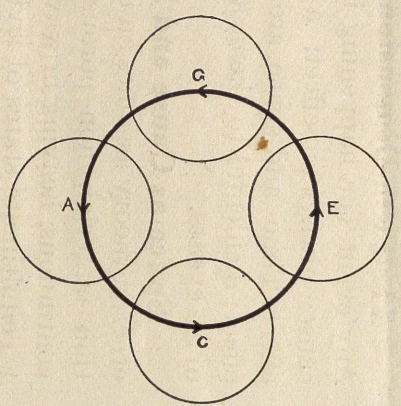

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The forward e.m. vibration of an etheron is the basic and primary e.m. wave. The wavelets and waves we talk of are formed by larger and larger numbers of such active etherons.

space', as distinguished from its source 'continuous space'.

The space particles get more and more evolved and mattery (through what all stages, let us not tarry and count), until at last we have a final set of particles with their own 'rest vibrations', and their own varying susceptibilities to different e.m. vibrations: the etherons we are now familiar with.

Some of these etherons (and more and more, as demands arise) evolve still further, and get modified, into electrons, protrons, positrons, and other particles that go to make up the various atoms. It is for experimental physicists to prove the validity of these subtle assumptions as far as could be done. A few physical laws would always remain unprovable. But, there will come a stage when what is proved would be enough to know clearly and convincingly of even things that defy proof.

Five-Dimensional Photo Wave. The etheron theory maintains that the photo-etheron vibration is five-dimensional: 1, an up and down; 2, a side to side; 3, a forward (and backward); 4, a movement in time; and 5, a movement from cause to effect. A simultaneous up-and-down and side-to-side vibration gives us a circle (figs. 7 to 10). If, as the circle is being formed, a continuous forward push is given, we get a spiral. If we regard the multicurve seen in the symbol of a photon as the side-view of the spiral (fig. 11), and fig.12 as a three-fourths view of the same, the course of the photo-etheron might be regarded as made up of three and a half spirals. If the lead of the entire curve is taken as 1, and the diameter of the spiral also

as 1, the total length of the vibration-spiral would be 11·045. So, if the velocity of light is 1, the velocity of

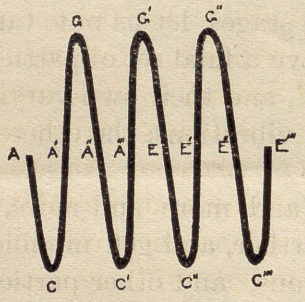

Fig. 11

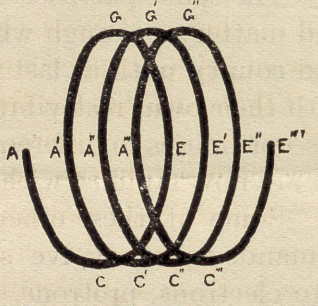

Fig. 12

a spot at A (fig. 12) travelling the 3 1/2 spirals would be 11·045: in other words 186,000×11·045, or a little over 20 million m/sec.

Highest Velocity! The introduction of 186,000 m/sec as the upper limit of velocities, is highly arbitrary, artificial and non-permissible. There are many velocities of which we know nothing as yet. So we have no right to regard *c* as the highest yet. Moreover, there is a speed, which we could easily prove to be greater than *c*, without upsetting accepted premises. Light is today taken to be material, and travelling distances in waves. A wave of a material does not move forward like a rigid multicurved steel wire. On the contrary, there is a wriggling, a moving of something from end to end of it, all along its curves. If it is a particle, the particle, if a filament, every spot of it, has to cover the entire length of the curve before it describes the next. A curve is longer than the straight line that connects the two ends of the curve. When we talk of the velocity

of light, we mean, that represented by the vector AE′″. But the speed of a dot A moving on the curve, to E′″, is much greater. This is a speed definitely higher than *c*. This position is unchallengeable. So, the acceptance of *c* as the upper limit of velocity is unforgivable.

Electromagnetic Basis of Sound. Audible sound is the result of percussion of one atomic material on another, be it a rub, tap, tearing or explosion. An atom, though electrically and magnetically neutral, is a mighty e.m. unit. A percussion on it, and a consequent change in shape and e.m. equilibrium, are fraught with significant consequences. Whenever there is a percussion, there are not only mechanical events such as a change of shape, and an audible sound conducted through the air; but also e.m. events: longitudinal e.m. vibrations and waves and *in*audible sounds that are transmitted through the ether. The result of this e.m. disturbance is recorded and transmitted by *phono*-etherons.

The speed of the e.m. sound-wave may be said to be $c \times \text{pi D} / \sin \text{theta} \times n$ (number of spirals in the vibration-path of the *photo*-etherons). Audible sound is very different from its e.m. basis, being the result of the air waves set up by the mechanical vibration of the material causing the sound.

CONCLUSION

Calculations. These differences from the assumptions of the relativity theory need not necessarily contradict the results of the equations and calculations in it. Thereby it does not mean that there is complete agreement with them all, either. The data available at

present are insufficient to warrant infallibility in formulæ and calculations. Gascoigne from Australia, and Fron of the University of California's Observatory, have just discovered, with photo-electric techniques, that the visible universe is twice as big as hitherto believed. That is that, in science! Some of our theories, scientific instruments, and outlook have to change considerably, before we could come out with correct figures, for all events. What I could do, I have done. What is premature; I shall refrain from doing.

No Quarrel Over A Name. If for any reason, or for no reason, contemporaries or future generations insist on calling the medium of e.m. transmission by a name other than 'the ether', or one in which 'space' is incorporated, after the manner of the ancient Aryans who called it 'gross space', I could not object. Only I might warn that space is stationary, and never 'dynamic' as Einstein calls it, while referring to it as a medium of e.m. transmission. I am in favour of 'ether' for three reasons: its etymology, its history, and the absence of any rhyme or reason in changing it.

Whatever anybody might decide to call it, the nature of the e.m. medium, as science progresses, would be found to be more and more in confirmation with the assumptions of the etheron theory.

My sincere thanks are due to Mr. Gopal M. Mestrey, Architect, and Mr. Srikrishna G. Mestrey for drawing some of the diagrams.

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About the author:

Professor Venkataraman holds the degrees of M.A. of the Madras University and M.Sc.Tech., Ph.D. and D.Sc. of the University of Manchester (England). From 1935-38 he was Reader in charge of the Section of Textile Chemistry in the Department of Chemical Technology in the University of Bombay, and from 1938 he has been Mody Professor of Chemical Technology and Director of the Department. He has visited many dyestuff factories in Germany, the United States and Great Britain, and he has been actively associated with chemical research for the Indian textile industry and with plans for establishing the manufacture of dyes in India.

For a quarter-century K. Venkataraman has worked on the chemistry of natural and synthetic organic coloring matters and related problems. Over 130 papers from his laboratory have appeared in Indian and British journals covering the constitution of natural coloring matters, synthetical methods in the flavone and isoflavone series, azoic dyes, vat and sulfurized vat dyes, and surface-active compounds.

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May 17, 1955

Sir. K. S. Krishnan F. R. S.
National Physical Laboratory of India
Hillside Road
New Delhi 12, India

Dear Sir. Krishnan:

I greatly appreciate receiving the 8 offprints of your papers on temperature distribution in an electrically heated filament and determination of thermal conductivities at high temperatures which you so kindly sent me.

By separate post I am sending you some of my papers which may be of interest to you.

Sincerely yours,

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PROF. Dr. BALTH. VAN DER POL
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GENÈVE, le 18th August 1955
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Sir K. S. Krishnan, F.R.S.,
c/o Consulate General of India,
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Dear Sir Krishnan,

As promised you yesterday, I herewith send you some 50 reprints. I have selected those which may be of some interest to you leaving out reprints published in the Dutch language, and also those of which no copies were anymore available. -

I was very glad to receive you yesterday in our office and hope to remain in contact.

With my best regards,

Yours sincerely,

Balth. v. d. Pol