

DECISIVE EXPERIMENTS in MODERN PHYSICS

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MARCO TODESCHINI

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MODERN PHYSICS**



MARCO TODESCHINI

Italian scientist born April 25 - 1899 at Valsecca in Bergamo.

He served in the 1915 - 18 war as reserve Lieutenant Army Engineer and Aircraft Pilot. Demobilized at the end of the war, he obtained the degree of Doctor in electrical engineering at the Polytechnic University of Turin. He frequented post-university courses specializing in various branches of physics and biology, gaining the relative diplomas of Professor.

Nominated Captain in the regular Army, he served at the Study and Research Division of the Military Engineers and in the well equipped laboratory of this State Organization, he carried out many inventions and he compiled a classical series of theoretical and experimental researches, succeeding in finding the modalities with which the physical, biological and psychological phenomena are developed and connected. Of these phenomena he

determined the precise mathematical relations reciprocal and as a whole, coordinating and including them all in a unitary cosmic science, mother of all, called therefore: « PSYCHOBIOPHYSICS ».

Twice promoted for scientific merits till to the rank of Colonel, he was nominated I^o grade Principal Professor of rational mechanics and electronics at the Biannual Perfection Course for High Level Engineering of the Technical Service of Military Engineers at Rome, where he was university professor, collaborator with Marconi and Levi-Civita. (*)

In 1947 he returned to Bergamo to dedicate himself completely to the researches and publications concerning the universal science discovered and elaborated by him, which had a world echo and has been judged to be of exceptional value, because it achieved 9 aims which for centuries had been tried in vain:

1) — *He found and described the series of tests on the optical transmissions, which give the experimental certainty that space in every point of the Universe is not empty, because it acts like a fluid material, mobile and dynamically active having a density 10^{20} times less than water.*

2) — *With these tests he found that fluid space has movements of rotation and revolution around the astronomical masses, which conciliates and explains the result of Michelson's experiments and deviations of the rays that come to us from the stars in harmony with the general validity of Galilei's relativity which implicates and confirms that the speed of light varies in accordance with that of the references' system.*

3) — He demonstrates mathematically and experimentally that the Universe is made of fluid space only the whirls of which form the atomical and astronomical systems, these appear to us like material with its encircled fields of attraction forces; the oscillations of the fluid space instead, according to their frequencies, appear to us like different qualities of radiating energy. (Monosubstantiality of the physical world).

4) — He identifies the different energetic fields of physics in the single fluid dynamic field showing that all natural phenomena exclusively consist in special movements of fluid space ruled by only one mathematical equation. (Uniphenomenic principle of objective world).

5) — He reveals how such movements when they hit against the sense organs of the human body, provoke in these currents of electrons, which transmitted along the nervous lines to the brain, cause in the psyche, and only in it, the sensation of light, heat, electricity, force, sound, odour, taste, etc. (Psychogenesis of the sensitive qualities).

6) — He discovers the marvellous electronic technology of all the organs of sensation, of motion and regulation of the peripheral, middle and central nervous system, determining the action and reaction that explicate between material of the objective physical world, the human body and the psyche.

7) — He determines the 10 equations of correspondance between the deceleration of the matter against our human body and the various feelings arisen in our psyche, revealing that it is not only the force F which is equal to the product of mass and acceleration ($F = m a$), but also all the aforesaid other sensations S , which are equivalent to this product $S = m a$. (Principle of psychophysic equivalence).

8) — Fundamental characteristic of this unitary science is having found the theoretical and experimental demonstrations in the mathematical, physical, philosophical and neurological field that the displays of light, electricity, heat, sound, odour, taste, force, etc. are not to be found either in the objective world (where they have for physical reality only unidirectional or alternate movements of fluid space), or in the sensorial organs and in the nervous lines of the observing subject (where they have for neurological reality only a very rapid succession of collisions between running electrons and atoms). Such displays, non existant in the objective and subjective world, lasting in us for a period of time without occupying space, are without volumetrical material consistence; they are the specific sensations given to us by the various intensities and frequencies of material collisions extending from the objective world to the brain organs; they are spiritual sensations that therefore rise and are to be found only in our psyche which also is inextended and immaterial. Therefore: sensations, voluntary movements, memory, thought, reason, understanding are the direct experimental proof of the existence in us of a psyche of spiritual nature, that identifies therefore with the human soul. So for the first time, have been determined, with the severe Galilei's method, the direct and measurable manifestations of a Spiritual Being: our own, the same that Religion claims the existence through faith since millenniums.

9) — From the experimental fact that the forces are immaterial sensations that rise in our psyche when the matter decelerates against our body and that these are also dynamic property with which the psyche can move our hands in order to give an acceleration to surrounding bodies, derives the certainty that the forces can be perceived and emitted only by Spiritual Beings. From the experimental fact that our soul can emit only weak

forces, derives the certainty that the large force that move the masses of the Universe, can only come from an Almighty Spiritual Entity.

Consequently the particular movements of fluid space in which all phenomena of the Universe are identified, are made by immaterial forces that come from the spiritual World and from God, whose existence is so proved with all the good material and spiritual consequences that such scientific certainties can give to mankind.

This unitary science has been judged the most clear, coherent, vast and organic cosmic synthesis possible in our times. Tried on the sure testing benches of the Universe, its reliability has resulted unquestionable for the following double series of actual confirmations: A) From the single equation of space-dynamic on which it is based, have been deduced all the laws regarding nuclear and atomic physics, chemistry, optics, acoustics, electromagnetism, thermodynamics, astronomy, and the relations between waves and corpuscles; these laws, deduced for the first time by classic dynamics following the chain of cause and effects, correspond with all those laws deduced empirically in the various branches of science, and to the new relations which explain the physic signification of phenomena till now mysterious. B) From his conceptions hundreds of practical applications have been deduced both in the medical and in the physic field confirming it in its parts and in its marvellous ensemble.

Therefore in Europe and in America « Psychobiophysics » faculties have been founded, and its principles have been introduced in the books now used in Universities and in High Schools; scientists have exposed it in thousands of articles in newspapers, magazines, books, in radio and television lectures, in physics or medical International Congresses.

Todeschini has been nominated Honory President, Vice President and Member of 25 Academies and Scientific Societies both italian and foreign; Knight Offr. of the italian Cr., and Knight Offr. of « Merits of the Italian Republic ».

For the wide, new and decisive contribution brought to all branches of sciences with his physic and neurology experiments and with the unitary cosmic science discovered by him, he has been recently proposed for the Nobel Prize.

His principal publications are:

- [1]— « THE THEORY OF APPEARANCES » (Universal fluidodynamics)
- [2]— « THE PSYCHOBIOPHYSICS » Unitary science of world
- [3]— « WHAT IS THE KEY OF THE UNIVERSE »
- [4]— « DECISIVE EXPERIMENTS IN MODERNE PHYSICS »
- [5]— « UNIFICATION OF MATTER AND ITS FIELDS OF FORCES »

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INTRODUCTION

This essay, giving the analytical and experimental demonstrations of the general validity of Galilei's relativity, is the best tribute that could be paid to celebrate his birth, four centuries ago.

Many great scientific merits shine like diamonds in the crown of this universal genius, the most precious and profitable of all being the determination of the laws of composition of movements, that is, the conception of cinematics solidly based on Euclidean geometry. This has been obscured in the last fifty years because it had been thought that the classical relativity founded by Galilei was contradicted in the optical field and so outdated by Einstein's relativity.

In this book it is shown that that prejudice is unsustainable in the light of the more documented scientific acquisitions of recent times.

This argument is of great interest to scientific progress which is tightly bound to the development of physics' theories, that is to those systems of conceptions, of equations and experiments with which man has tried to reconstruct the picture of the world.

Today it is easy to realise that physics' theories subdivide into two main groups: the classical ones — based on Galileo's relativity — and the ones conflicting with them conceived since 1905, and based on Einstein's elaboration of the anti-relativity of speed of light.

The great problem of our century consists in proving which of the two relativities actually exists in the Universe.

For this purpose one must bear in mind that there are two indispensable conditions to which a theory must comply in order to be true.

1 - *The postulate lying at the base of the theory under examination must not contrast with any of the specific branches of classic mathematics.*

2 - *Such postulate must not contrast with experimental results.*

These two conditions, of indisputable and certain scientific rigour, should allow us to decide at last whether the relativity which

is in conformity with physical reality is that of Galilei or that of Einstein.

Galilei's relativity states that if a traveller walks the length of a train with speed «C» which is running with speed «V» in the same way and direction, the absolute speed «W» of that traveller, in regard to an observer standing still on the siding, amounts to the addition of the two component speeds, namely:

$$W = C + V \quad (1)$$

Now, if one imagines that instead of a traveller it is a ray of light which moves with speed «C» from one point to another of the Earth, and if one considers the Earth as a car running with speed «V» round the Sun in the same way and direction of the said ray, the resulting speed «W» of such ray shall likewise be still expressed by the equation (1) when seen by a motionless observer not involved with the revolution movement of our planet.

Einstein's relativity, being based on the postulate of light's constant speed in regard to any observer, states that the resulting speed is:

$$C = C + V \quad (2)$$

Now, it is clear that the last is a false equality, because it is impossible that the addition of two addends not zero is equal to one of them.

Equation (2) therefore conflicts with algebra; substituting figures for letters, it also conflicts with elementary arithmetics. If one substitutes the symbolic letters with arrows with length proportional to their speeds, one sees that equation (2) conflicts with classic cinematics. Lastly if one considers the corresponding distances covered in time's unity one finds that (2) is also in contrast with Euclidean geometry, which assures us that the addition of two rectilinear segments is equal to a segment whose length is the addition of the two single lengths.

Since the postulate of light's constant speed is in contrast with all branches of classic mathematics, it does not fulfill the first of the two conditions cited above as necessary for a postulate to be considered true; consequently it should have been abandoned.

Einstein, however, holding that such a principle could conciliate light's astronomical aberration with the result of Michelson's expe-

riment, imposed the same principle as a postulate. — In order to eliminate the grave contrast between it and the various branches of mathematics, Einstein substituted them with his anti-relativity which destroys Galilei's relativity — and with a tetradimensional geometry in contrast with that of Euclide. In this way his new hypothetic obtruse theories of tensorial calculus could justify the false equality (2).

It is evident that to change mathematics when the account does not balance is an arbitre which, if introduced in economics would bring failure to any administration, and, if accepted in science, would lead to endless erroneous conceptions, each one with innumerable geometries and cinematics adapted to justify those same conceptions. In this way it would no longer be possible to ascertain which conception to choose, how to sift the true from the false; just as it would be impossible to establish a ship's course with a thousand compasses each one pointing to a different magnetic pole.

Science would be deprived of calculus which is its most powerful instrument of research, detection and control, as well as being the most secure and severe sieve for any postulate or theory. To change mathematics, which are the logic of quantity, is an inadmissible arbitre for two reasons: first, it deprives science of the security of calcul's validity in selecting the true from the false theories; second it introduces the suspicion that mathematical laws, which master and rule every phenomen in the wonderful cosmic order, do not exist in the Universe.

No wonder, then, that a high number of great scientists opposed the arrival of pseudo-relativity, but they all tried to demonstrate its lack of validity by only pointing out its multiple contradictions with the various mathematical branches; these contradictions had already been admitted by Einstein himself and had been eliminated by him by means of his arbitrary substitution of calculus' various branches; this substitution made any disproof of his theory means of ineffective; the theory was tolerated only for lack of another one able to conciliate the two optical phenomena for which it had been ideated.

Even accepting the aforesaid intolerable arbitrary assumption it is clear that Einstein's new relativity and geometry prove reliable only if the postulate of light's constant speed, and its consequent impassableness, is actually verified in nature. This makes it evident that the only way to belie his pseudo-relativity is to give experimental and analytical demonstrations that the speed of light is relative and that astronomical aberration, the result of Michelson's experi-

ment and all the other so called « crucial proofs » summoned to its support, can well and uniquely be explained with Galilei's relativity.

Now these proofs have been fully attained as it is shown by the following facts.

In 1953 American scientist Harold Peake of the U.S. Navy Research Laboratory provoked in a cathodic rays tube the displacement of a luminous mark at a speed higher than that of light, of 22.000 Km/sec.

Later, in March 1956 at the 25th International Convention of the American Society of Physics, the scientist Oppenheimer revealed that the behaviour of anti-particles and the occurrence of sub-atomic phenomena are in sharp conflict with Einstein's relativity, and in harmony with Galilei's. The return to classical physics should therefore be needful.

Finally, Italian scientist Marco Todeschini with the series of optical tests described in this book, demonstrated analytically and experimentally that:

- light's astronomical aberration,
- the result of experiments by Michelson, Morley, Picard, Sthael, and Miller,
- the displacement of astral rays passing near the Sun,
- the refraction angle which light undergoes through transparent mediums,
- the displacement of perihelion of atom's peripheric electrons and that of the planet Mercury,
- the effects of Doppler, Fizeau, Kaufmann, and Mossbauer,
- the energy delivered by the atom bomb,
- energy's variation by « quanta » in the passage of an electron from one layer to another of atomic field,
- the conciliation between the laws of dynamics and those of electromagnetism

are explainable quantitatively and physically with an unitary cosmic science based on fluid-dynamics in perfect harmony with classical cinematics; therefore all the above quoted phenomena belie the postulate of light's speed constancy. Such postulate conse-

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quently appears in complete contrast with both mathematics' various branches and experimental facts.

It follows that Einstein's relativity, both restricted and generalised, based on the aforesaid postulates, does not comply with the two indispensable conditions indicated above as necessary to prove a postulate true.

The enormous importance of the conclusion that it is Galilei's relativity and not Einstein's which is found in the Universe, can be properly valued when one considers that it allows modern theoretical physics to eliminate all its uncertainties and antitheses, proceeding on a ground of solid reality and opening wide horizons to scientific progress and its practical application.

Professor Todeschini in fact, having demonstrated the general validity of classic relativity, could, on this base, elaborate an unitarian cosmic science which reveals how all physical, biological and psychical phenomena are developed and connected; he could likewise determine their reciprocal mathematical relations and coordinate them all in a unitary vision of the world which is the most vast, profound, rational and clear synthesis possible nowadays; it is also the most probable synthesis because it is in accordance with analytical and experimental data acquired in the various branches of modern knowledge.

MARCO TODESCHINI

DECISIVE EXPERIMENTS
IN
MODERN PHYSICS

A CURA DI
FIORENZO ZAMPIERI

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author of this work

In this book the author shows the methods and results of his optical experiments in which a fluid stream has been detected and measured. This stream has a speed of 9,335 Km/sec and turns round our planet in the same direction of its rotation, thus causing the fall of bodies on it. Demonstrations show that the Earth is also pushed by a fluid stream which has a speed of 60 Km/sec and which drags it in its revolutionary movement, causing the gravity which keeps the Earth bound to the Sun. It is shown how the two streams and their particular values explain and balance between them the results of Michelson's experiment and astronomic aberration without disputing the general validity of Galilei's classic relativity.

Other analytical and experimental confirmations are described, from which emerge some fundamental principles on the transmission of light, on structure of material and its fields of attraction and alternate forces. These principles are suitable to resolve all antitheses introduced by unsustainable hypotheses in modern theoretical physics.

The numbers in square brackets refer to works by the same author which are listed at the beginning of the book for consultation.

Dr. N. W. Walker, D. Sc.

CHAPTER I

NEEDS AND MOTIVES FOR NEW EXPERIMENTS

The history of science testifies that for centuries man has resorted to two conflicting hypotheses in order to explain natural phenomena: the assumption of a cosmic space filled with an invisible fluid substance called « ether », (whose whirls would form atomic and astronomic systems of material, and whose waves would constitute the various forms of radiating energy), and the assumption of an empty cosmic space capable of transmitting by unknown ways

mysterious gravitational, electromagnetical, thermic, luminous forces; said forces would be emanated by isolated masses of unknown genesis and structure.

In order to decide which of the two assumptions corresponded to natural reality, it was imperative to make experiments revealing the structure of space. To this end tests were chosen — regarding light's transmission — which were the most suitable to reveal the existence of ether and of its streams, in case light spread itself by means of undulatory movements of such fluid medium.

Experimental basis of modern physics thus found ground in two optical phenomena: angular deviation of luminous rays reaching us from the stars (namely the astronomical aberration discovered by Bradley in 1728), and the result of Michelson's experiment accomplished in 1887.

These two experiments led respectively to the following conclusions:

- a motionless ether exists in the whole Universe
- it exists, but in proximity of the Earth it moves jointly with it in its revolutionary movement round the Sun.

Both tests were in agreeance about ether's existence and the fact that light adds its own speed to that of the medium by which it is carried.

Consequently these two basic principles, having been confirmed by the aforesaid celebrated experimental results, should never have been questioned; it still remained to ascertain, though, whether the two conflicting cinetic conditions attributed to ether were really necessary in order to explain those two optical phenomena, or if the last could occur all the same with only one and particular movement of the fluid medium in proximity of our planet.

In spite of this serious and logical need of further researche and contrary to aforesaid experimental results, in 1905 Einstein denied the existence of ether and postulated the constancy of light's speed in regard to any observer however moving. In this way he broke the classic relativity of Galilei confirmed by centuries of experience.

The intolerable absurdities to which Einstein's theory leads, the many unanswered questions and the contradictions met in sub-atomic field caused the theory to be denied by the 25th Convention of American Physic Association and at Lindau's Convention of Nobel prizes which both took place in 1956 [3].

Nevertheless, the mind of the people was hypnotized for 50 years into believing in an empty space which would deprive actions at distance of physic support, and would not allow any explanation of genesis and structure of material, or of its fields of forces and undulatory energies. This belief has reduced science to the present critical condition of not being able to explain the modality ruling phenomena's development and connections; it is even impossible to deduce their laws because of Heisenberg's principle of indetermination.

The only way to extract theoretical physics from the impass into which had been led by the said anti-scientific theses was first the return to the straight path of classic cinematics, and to the conception of ether, (the only one which had been in agreeance with the two celebrated experiments quoted); next, to examine whether the several conflicting physical qualities attributed to ether could be restricted to a single one able to explain all natural phenomena.

Following this direction, I substituted the conception of weightless ether (as 'till now conceived by physics) with a fluid space which, besides having a three dimensional extension, would also possess a constant and very feeble density (10^{20} less than water). I could demonstrate that the particular movements of this unique fluid substance, invisible, continuous and primordial, but dynamically active, explain all objective phenomena and their laws both qualitatively and quantitatively. They also explain the corresponding subjective psychical phenomena (feelings of forces, electricity, sound, heat, light etc.) which arise in us when these particular movements come up against our sensory organs [1].

From my unitary theory it follows that the Sun is located in the centre of a huge solar spheric field of fluid rotating space, which moves subdivided like an onion in many concentric layers having constant thickness and rotation speed diminishing with the increase of the square roots of their radiuses.

From my theory it also follows that the Earth is located in the centre of a similar smaller rotating field placed at the periphery of the bigger solar one.

The solar stream of fluid space having an absolute speed V_a of 60 Km/sec hits the planetary sphere and drags it (with the Earth in its centre) round the Sun with the speed V_p of 30 Km/sec. Therefore the relative speed V_r of solar stream in regard to our planet amounts to 30 Km/sec.

To check whether this theoretic conclusion corresponded or

not with physical reality, it was necessary to proceed to the following operations:

- a) make a *first decisive test* able to detect and measure the stream of fluid space which turns round the Earth and forms its own particular planetary fields.
- b) make a *second decisive test* to check whether Doppler's effect and Fizeau's effect were in agreeance with Galilei's relativity or with Einstein's.
- c) make a *third decisive test* to check whether or not a ray undergoes an angular deviation when passing through a fluid stream.
- d) demonstrate analytically that astronomical aberration is caused by the deviation that stars' rays undergo when crossing the fluid stream which drags the Earth.
- e) demonstrate that the result of Michelson's experiment is in harmony with classic cinematics.
- f) demonstrate that the validity of Galilei's relativity is not contradicted by optical transmissions.
- g) demonstrate that «space-dynamics» theory conciliates the laws of mechanics with those of electromagnetism.

CHAPTER II

DECISIVE EXPERIMENT N. 1

This experiment, the result of which was reported in the International Press in January 1961, has been made with an apparatus of my own design and with a series of test which lasted several years. The experiment was based on the unquestionable fact that bodies falling on the Earth take acceleration (g) and on the assumption that this acceleration is given to them by the circulation of fluid space round our planet. The centripetal acceleration of this fluid circulating with speed V must then be equal to (g), that is:

$$\frac{V^2}{R} = g \quad (1)$$

From this equation one takes the value of peripheric speed V of fluid space in regard to the Earth:

$$V = \sqrt{g R} \quad (2)$$

As bodies' acceleration (g) decreases inversely to the square of their distances from the Earth's centre, that is

$$g = \frac{K}{R^2} \quad (3)$$

introducing this value in expression (2) and putting $K^{1/2} = K_1$ we have

$$V = \frac{K_1}{\sqrt{R}} \quad (4)$$

At the equator $g = 9,78 \text{ m/sec}^2$ and $R = 6378284 \text{ m}$.

If the radius connecting the place of the experiment with the Earth's centre forms an angle α with the equatorial plane (fig. 2), acceleration (g_1) and radius R_1 of the local parallel are:

$$g_1 = \frac{g}{\cos^2 \alpha} \quad R_1 = R \cos \alpha$$

introducing these two values in (2) we have:

$$V = \sqrt{\frac{g R}{\cos \alpha}} \quad (5)$$

As in Bergamo, where I have made the experiment, the parallel is $45^{\circ}40'$ and the cosine of this angle is 0,715, introducing this value in (5) we have:

$$V = \sqrt{\frac{9,78 \times 6378284}{0,715}} = 9335 \text{ m/sec} \quad (6)$$

which last is the value of rotation speed of fluid space in regard to Earth which I should have found if my theory was true.

It is evident that in the conditions I provided, a luminous ray emitted by an earthly source, besides propagating in the surrounding space with the speed typical of optical waves, also takes upon itself the speed of the fluid medium by which it is carried.

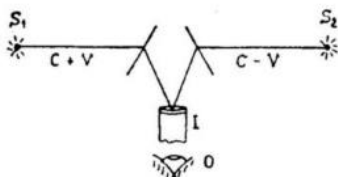


Fig. 1

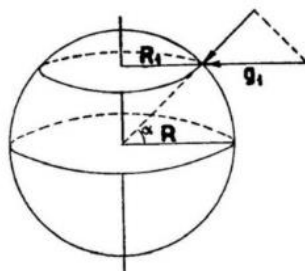


Fig. 2

Consequently, two rays simultaneously leaving from two terrestrial localities diametrically opposed run towards each other to cover the same distance, that is shall need different times while running to reach the central point of the distance between the two places of dispatch this, because the speeds of those rays are not equal in respect to the Earth, as one of them goes up the stream and the other goes down.

At this central point the waves resulting from the crossing of the two single rays will show a certain interference.

The devise I used (fig. 1) to find out whether this interference actually took place or not, was made from two sources (S_1-S_2) of monochromatic light situated on a straight line at a distance of two meters from each other. Near the middle were placed two reflecting plates symmetrically bent so that they would deviate the rays as they came from the two opposite lamps and would cause their superposition on the screen of an interferometer (I), making visible to the observer (O) fringes of interference.

To calculate in advance this displacement, one proceeds as follows: granted that the rays emitted simultaneously from the opposite lamps (S_1-S_2) have different speeds, they shall meet at a point (D) distant from the middle (O) of a fraction Δl ; one finds

first the value of Δl . then subtracting from this value the entire number of waves' lengths which it contains, one finds the wave's fraction of displacement of each fringe of interference.

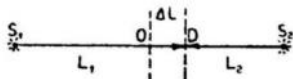


Fig. 3

Indicating with $(2L)$ the distance between the two sources, and with L_1 and L_2 the distance covered by the rays to meet each other, it is evident that

$$2L = L_1 + L_2 \quad (7)$$

But these same distances are equal respectively to the product of speed V_1 and V_2 of the two rays by the common time (t) necessary to cover them, that is:

$$L_1 = V_1 t \quad L_2 = V_2 t \quad (8)$$

Replacing these values in (7) one obtains:

$$2L = V_1 t + V_2 t \quad (9)$$

from which one draws the expression of time (t) , namely:

$$t = \frac{2L}{V_2 + V_1} \quad (10)$$

Speed V_1 of the ray coming down the stream is obtained by the addition of the wave's speed C and the speed V of fluid medium by which it is carried, or:

$$V_1 = C + V \quad (11)$$

Likewise, speed V_2 of the ray coming up the stream is obtained by the difference between wave's own speed C and the speed V of fluid medium running opposite, or:

$$V_2 = C - V \quad (12)$$

Putting in (10) the values (11) and (12), after some easy reductions,

$$t = \frac{L}{C} \quad (13)$$

Introducing in the first of (8) the values of time given by (13), it follows

$$L_1 = \frac{V_1 L}{C} \quad (14)$$

Consequently the two rays meet at distance ΔL from the middle given by the

$$\Delta L = L_1 - L \quad (15)$$

and, replacing in the last formula the value of space L_1 given by (14) and the value of V_1 given by (11), one obtains:

$$\Delta L = \frac{L V}{C} \quad (16)$$

As the known terms are:

- Half-distance between the two sources $L = 1.10^3$ mm.
- Speed of the stream $V = 9.335.10^3$ mm/sec
- Luminous wave's speed $C = 3.10^{11}$ mm/sec

replacing these numerical values in (16) one has:

$$\Delta L = \frac{1.10^3 \times 9.335.10^3}{3.10^{11}} = 0,031116 \text{ mm.} \quad (17)$$

which is the fringes' displacement expressed in mm.

As $\lambda = 0,0006$ mm.

is the wave's length of the employed light, distance ΔL expressed by means of fringes number results:

$$\frac{\Delta L}{\lambda} = \frac{0,031116}{0,0006} = 51,86 \quad (18)$$

At the central point of the interferometer there will be a displacement of

$$51,86 - 51 = 0,86 \text{ waves lengths}$$

When the above described apparatus was fixed so that the propagation of the two opposite rays took place in the same direction as Earth's rotation, namely tangentially to the local parallel, in all the experiments a displacement from the centre of 51,86 fringes with a displacement of 0,86 waves' lengths was found.

This confirms experimentally that:

1) *Space is not empty, but it is made of a material substance having constant density, mobile like a fluid.*

2) *Light's speed is the vectorial addition of constant speed C of its own propagation in the fluid space plus speed V of the medium by which it is carried.*

3) *A stream of fluid space turns round Earth's surface at a speed of $V = 9335$ m/sec relative to our planet.*

4) *Earth is located at the centre of a spheric field of rotating fluid space which moves subdivided like an onion in concentric spheric layers each having constant thickness and rotation speed inversely proportional to the square root of their radiuses.*

CHAPTER III

DECISIVE EXPERIMENT N. 2

We must now demonstrate theoretically and experimentally that Galilei's classic relativity is in perfect harmony with the results of optical tests by Fitzeau and with Doppler's effect - following what we proposed at letter *d*) of Chapter 1.

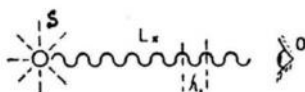


Fig. 4

Doppler's effect, as known, consists in the fact that if an observer (O) approaches a star (S) the number of waves ν_2 his eyes receive in one second is bigger than the number of waves ν_1 which they would have received had he remained still at distance L_x from the luminous source.

In the last case the time employed by light to run distance L_x at speed C is clearly

$$T_x = \frac{L_x}{C} \quad (19)$$

from which one has

$$\frac{L_x}{T_x} = C \quad (20)$$

Calling λ_1 the wave's length, and N_1 both the number of waves contained in the distance L_x and the number of periods of time T_1 contained in time T_x it follows:

$$L_x = \lambda_1 N_1 \quad T_x = T_1 N_1 \quad (21)$$

Replacing these values in (20) one has

$$\frac{L_x}{T_x} = \frac{\lambda_1}{T_1} = C \quad (22)$$

As the observer receives ν_1 waves in one second, and in one second are contained ν_1 periods - namely $T_1 \nu_1 = 1$, or

$$\nu_1 = \frac{1}{T_1} \quad (23)$$

introducing this value in (22) one obtains:

$$\lambda_1 \nu_1 = C \quad (24)$$

Supposing that the observer approaches the luminous source with speed V, while the luminous wave (made by it) runs towards

him with speed C , the observer will be under the impression of being still, while the light runs towards him at a relative speed resulting from the addition of the two said compounding speeds:

$$W = C + V \quad (25)$$

The time needed by the ray to reach the observer's eye is consequently smaller, because the latter doesn't await it motionless, but moves towards it; this time T'_x therefore is:

$$T'_x = \frac{L_x}{C + V} \quad (26)$$

from which, considering the first of the (24), and posing $T'_x = T_2 N_1$:

$$\frac{L_x}{T'_x} = \frac{\lambda_1}{T_2} = C + V \quad (27)$$

and, since $T_2 v_2 = 1$, it follows

$$\lambda_1 v_2 = C + V \quad (28)$$

From ratio of the last expression with (24) one has:

$$v_2 = v_1 \left(\frac{C + V}{C} \right) \quad (29)$$

which, though deduced from the principles of Galilei's classic relativity, matches perfectly the analytical expression of Doppler's effect as drawn experimentally.

From (24) and (28) it is shown that wave's length (λ_1) remains the same for observers either still or moving; this is physically clear since oscillations caused by the source, though dilating in ever widening circles, keep unchanged their reciprocal distances; they are waves of the surrounding fluid medium which are a physic objective phenomenon that can't be altered by conditions of stillness or movement of the observing subject. The moving observer, when running towards the waves, meets in one second a greater number (v_2) of them than (v_1) he would if he were standing still.

Einstein, postulating the constance of light's speed in regard

both to the motionless observer and the moving one, instead of (28) keeps valid the following:

$$\lambda_2 \nu_2 = C \quad (30)$$

But Einstein postulated also the shortening of dimensions lying in the same direction of movement, according to (75); therefore the wave's length - to not contradict his pseudo-relativity - should be:

$$\lambda_2 = \lambda_1 \sqrt{\frac{C^2 - V^2}{C^2}} \quad (31)$$

It follows that, admitting with Einstein the validity of (29) and (31) as well as the equivalence between (24) and (30), one arrives to the relation

$$\lambda_1 \nu_1 = \lambda_1 \nu_1 \sqrt{\frac{C^2 - V^2}{C^2}} \left(\frac{C + V}{C} \right) = C \quad (32)$$

which is a false equality.

The (30) requires the shortening of wave's length with the rise of frequency, in open contrast with (28) confirmed by Doppler's effect.

Doppler's effect and (28) both assure us that if an observer approaches a luminous source, light's speed increases in regard to him, since the length of the received ray's wave stays unchanged, while the oscillation's frequency increases.

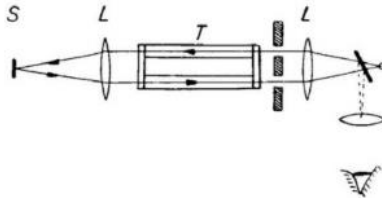


Fig. 5

Doppler's effect denies then the postulate of light's constant speed, which is the basis of Einstein's relativity.

Hence the need of accomplishing a new experiment in order to ascertain whether the wave's length remains unchanged, or if it varies with the movement of the medium which carries the wave.

This experiment has been effectuated by me with an apparatus similar to that employed by Fizeau (fig. 5), made with two tubes closed at both ends by two parallel glasses; in each tube water runs, but in opposite ways, with speed V . The rays emitted by the luminous source, after passing through the lens (L), are forked through two slits. The beam of light passing through the upper tube was reflected by mirror (S) and, coming back in the lower tube, was deviated by the plate leaning towards the spectroscope for observation. The other beam made the opposite run. If the liquid was still, the superposition of the two beams produced some interference, and the central fringe corresponded to waves in accordance. Viceversa, if the liquid moved following the direction shown by the arrows, one of the beams was going through the tube in the same way of the water, and the other in the opposite direction, arriving later to the interferometer, thus causing a displacement of fringes.

In my tests the displacement was of half of a wave's length, as expected from the calculation made in accordance with Galilei's law of movements composition. This calculation is here reported in order to point out that Fizeau's experiment is not in opposition with classic relativity.

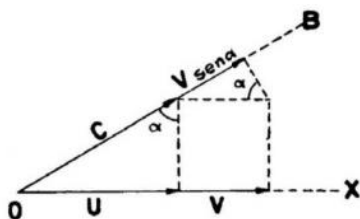


Fig. 6

In fact, if water is kept still, we know that the ray of light passing through it is bent to refraction angle α , thus deviating towards direction OB (fig. 6).

The speed (u) of the ray entering the tube in the former direction

OX is consequently the projection of vector C on the said direction OX, namely:

$$u = C \sin \alpha = C \frac{u}{C} \quad (33)$$

If instead the liquid is put in motion with speed V directed in the same way as (u), the resulting speed of both liquid and ray is given by the addition of those two components, as

$$u + V = C \sin \alpha + V \quad (34)$$

The speed of the ray alone on direction OB results from the addition of the vector representing speed C and the vector ($V \sin \alpha$) obtained by projecting liquid's speed V on the said direction OB, or

$$C + V \sin \alpha \quad (35)$$

The projection of the aforesaid ($C + V \sin \alpha$) on direction OX is therefore:

$$(C + V \sin \alpha) \sin \alpha = C \sin \alpha + V \sin^2 \alpha \quad (36)$$

Light's speed increase ΔV due to the drag by water is consequently obtained subtracting (36) from (34):

$$\Delta V = (C \sin \alpha + V) - (C \sin \alpha + V \sin^2 \alpha) \quad (37)$$

from which one has:

$$\Delta V = V - V \sin^2 \alpha = V (1 - \sin^2 \alpha) = V \left(1 - \frac{u^2}{C^2}\right) \quad (38)$$

Summed up speed total V_t of light when leaving the tube full of moving water is the addition of speed (u) it had when the liquid was still, plus the rise ΔV acquired because of the partial dragging, or:

$$V_t = u + V \left(1 - \frac{u^2}{C^2}\right) \quad (39)$$

and posing $C = u n$, where with (n) one means the refraction index of water, considered (33), (39) becomes:

$$V_1 = \frac{C}{n} + V \left(1 - \frac{1}{n^2}\right) \quad (40)$$

which, though deduced following Galilei's relativity, corresponds exactly with the one found experimentally by Fizeau.

It is advisable to show here that Einstein's pseudorelativity for the same case leads instead to the following relation:

$$V_1 = \frac{V + \frac{C}{n}}{1 + \frac{CV}{C^2 n}} = \frac{C}{n} + V \left(1 - \frac{1}{n^2}\right) \quad (41)$$

which is a false equality.

However, the experiment was accomplished by me, not in order to ascertain the validity of (40), already verified by Fizeau, but exclusively in order to ascertain whether wave's length kept itself unaltered or not.

I have been able to check that light's speed (u) remained unaltered when the liquid was kept still, and so equal to the product of its wave's length λ_1 by its frequency ν_1

$$\lambda_1 \nu_1 = u \quad (42)$$

Viceversa, provoking the run of water in the tube, ray's speed rose following equation (40); but even with the increase of frequency, wave's length remained unaltered namely it resulted:

$$\lambda_1 \nu_2 = u + V \left(1 - \frac{1}{n^2}\right) \quad (43)$$

In fact, the spectrum's lines of the used monochromatic light, though all displacing themselves towards ultra-violet (this way

showing clearly the increase of frequency), maintained among themselves the same distance they had when water was motionless, confirming that wave's length hadn't changed.

In conclusion, both the calculation and the result of decisive experiment N. 2 made by me state that Doppler's effect as well as the result of Fizeau's tests are in perfect harmony with Galilei's relativity and in perfect antithesis with that of Einstein.

Recently several physicists have fostered the « latest illusion » of having found, after 50 years of fruitless research, the undeniable proof of pseudo-relativity; in fact by comparing the frequency of oscillation of an atomic time-piece situated on the Earth with that of an atomic time-piece placed on a rocket launched into space at high speed, different frequencies were found.

But, with that, those technicians haven't realised that they were forcing an open door; because the variation of frequency expressed by (29) is foreseen from both Loretz's and Galilei's transformation equations.

Having experimentally ascertained this variation of frequency does not mean having given confirmation on one or the other group of transformations. For that purpose, one should have ascertained whether the wave's length varies in accordance with (31) or stays unchanged following (28). But confirmation of the last thesis has been attained by the above described decisive experiment N. 2 accomplished by me. This experiment, for its specific finality and its result, detaches itself from that of Fizeau, thus increasing enormously its range and its physical significance.

CHAPTER IV

DECISIVE EXPERIMENT N. 3

Following what has been said at letter (c) of Chapter 1st, we must now demonstrate theoretically and experimentally that a ray of light, when crossing perpendicularly a stream of fluid space, or any other gas or liquid or transparent solid, undergoes an angular deviation causing its trajectory to lean like that of a boat crossing a river. In other words, I want to demonstrate that the light, besides undergoing the longitudinal displacement verified by Fizeau's experiment, is submitted also to a transversal one.

The device adopted by me for this purpose (fig. 7) consisted of a metallic disc (1) placed horizontally and movable at will round its vertical axis (Z). At the periphery of this disc was a hole (A-A₁)

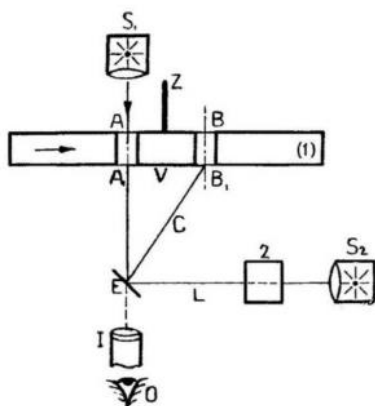


Fig. 7

with a glass plate which would allow the vertical passage of light's ray emitted by source (S_1) and directed towards the little semi-transparent plate (E); the last was inclined so that in its middle could converge also a horizontal ray arriving from source (S_2) after having crossed a glass plate (2) kept permanently steady and having the same thickness as the one placed in the disc's hole; glass (2) was located at the same distance (L) from the inclined plate (E) as glass (1); both rays were directed by plate (E) towards the interferometer (I) to be examined by the observer (O).

When disc (1) was kept still, both rays, having travelled an equal distance and been refracted the same way, superimposed themselves on the little plate (E) in a fringe disposed at the centre of the reticle of interferometer (I).

On the contrary, if one made disc (1) turn at speed V, the fringes were submitted to a displacement, towards one way or its opposite, depending which way the disc was rotated; this displacement corresponded exactly to the one expected from the calculation made by me following Galilei's relativity.

Actually, turning the disc, the ray falling on (A) while reaching

point (A_1) was carried parallel to itself with speed V , so that the trajectory run ($A-A_1$) would superimpose itself on trajectory ($B-B_1$).

Light therefore would appear under the disc not at point (A_1), but at point (B_1), from which point the luminous perturbation would spread in concentric waves through the motionless fluid medium to all directions and with speed (C). The ray received by the little plate (E) was not then the (A_1-E), but the (B_1-E) deviating with angle α and having speed (C).

Since the projection of such speed on direction (A_1-E) for Pythagora's theorem is:

$$W = C \cos \alpha = C \sqrt{\frac{C^2 - V^2}{C^2}} \quad (44)$$

it follows that time (T_v) needed by the ray to cover distance (A_1-E) = L is:

$$T_v = \frac{L}{C \sqrt{\frac{C^2 - V^2}{C^2}}} \quad (45)$$

The ray propagating towards horizontal direction OX and coming from source (2) needs time (T_x) to cover the same distance L given by:

$$T_x = \frac{L}{C} \quad (46)$$

From the ratio of (45) with (46) one has

$$\frac{T_v}{T_x} = \frac{1}{\sqrt{\frac{C^2 - V^2}{C^2}}} \quad (47)$$

or

$$T_v = \frac{T_x}{\sqrt{\frac{C^2 - V^2}{C^2}}} \quad (48)$$

From (46) one obtains:

$$\frac{L}{T_x} = \frac{\lambda_1}{T_1} = C \quad (49)$$

or

$$\lambda_1 \nu_1 = C \quad (50)$$

From (45) one obtains:

$$\frac{L}{T_v} = \frac{\lambda_1}{T_2} = C \sqrt{\frac{C^2 - V^2}{C^2}} \quad (51)$$

or

$$\lambda_1 \nu_2 = C \sqrt{\frac{C^2 - V^2}{C^2}} \quad (52)$$

From the ratio of the last with (50) one has:

$$\nu_2 = \nu_1 \sqrt{\frac{C^2 - V^2}{C^2}} \quad (53)$$

which has always proved true by the many experiments made by me with the apparatus described above. Notwithstanding the limited values of speed V impressed to the disc, I have been able to measure the displacement in fractions of waves, since each of these waves spreads in 10^{-15} seconds, and the interferometer could estimate 10^{-7} part of each of them, giving me also the disposal of a time-piece capable of valuating the tenth of one thousandth of milliardth of milliardth of one second.

During the course of this experiment I was able too to ascertain that the length of wave λ_1 had remained unaltered both with the disc in motion and or with the disc still.

The ray coming across the disc with speed C was submitted to a total removal in the transversal direction with speed V; for this reason a motionless observer staying at point (E) received the ray leaning against the disc's rotation at an angle α determined by the following relation:

$$\sin \alpha = \frac{V}{C} \quad (54)$$

The experiment has been repeated with the same conclusion putting the luminous source (S_1) at the centre (O) of a cylindrical box (fig. 8) and obliging the ray to pass through a hole (A) made in the box' wall. Keeping the box still, frequency and wave's length were such to correspond to relation (50). On the contrary, turning the box at speed V, light's frequency, as received from the outside, lessened, whilst the wave's length remained constant, in perfect agreeance with relation (52).

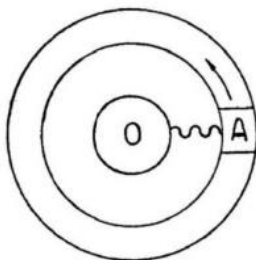


Fig. 8

The analytical proceedings and the experiment we have just described affirm therefore that a light's ray crossing a fluid stream or a moving solid transparent medium undergoes (in regard to a still bystander) an angular deviation which bends its course towards the stream's direction.

Consequently, every time we will come across an angular

deviation of luminous rays, we will have the experimental proof that the deviation has been caused by a certain material substance displacing itself perpendicularly to the direction of the luminous ray running through it; the material substance may be solid, or liquid, gassy, or dissolved in the state of fluid space, visible or invisible. And since astronomical aberration reveals to us the deviation of rays arriving to us from the stars, this same aberration gives an experimental confirmation that the luminous wave, before reaching us, has not spread through the vacuum, but has travelled across the field of rotating fluid space which surrounds the Sun and forces the Earth to make its revolution round the Sun. I will give analytical demonstration of this further on.

Just as much can be said about the refraction angle which deviates a luminous ray when crossing a transparent and motionless medium. In fact, with my theory, even atomic nucleus, when spinning on the axis, drags into circulation its surrounding fluid space; that is why a luminous ray going across the atomic field of a transparent material undergoes an angular deviation which is exactly the same as that of refraction actually observed in various materials.

At the end of Chapter III, I demonstrated that the ray crossing the transparent medium has a speed $u = C \sin \alpha$; consequently rotation speed of atomic fields is then determined by the relation:

$$V_A = C \cos \alpha \quad (55)$$

On this basis I have been able to determine mathematical relations between rotation speed of the various atoms, their masses and their refraction index, so laying the foundations of a new space-dynamic optic in perfect harmony with Descartes's and Galilei's laws.

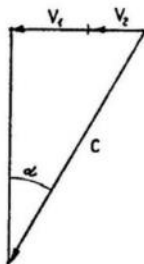


Fig. 9

There is one third phenomenon in which luminous rays' angular deviation can be observed: this occurs when the luminous rays pass near the Sun and reach us from the stars which, owing to celestial projection, appear to be alongside the Sun. In fact, the Sun rotates on its axis at speed V_1 equal to 2 Km/sec and, following my theory, drags in movement the surrounding fluid space. Likewise the Earth, spinning on its axis at speed V_2 equal to 0,463 Km/sec, turns around itself the adjacent fluid space. It follows that a light's ray in order to reach us must cross both the solar and the terrestrial turning field of fluid space; the ray thus shall undergo the deviation of a certain angle α whose sinus will be determined by the ratio between the addition of vector V_1 and vector V_2 representing the speed of each field, and vector C representing the speed of the luminous wave (fig. 9), namely:

$$\sin \alpha = \frac{V_1 + V_2}{C} \quad (56)$$

Substituting symbols with their numerical values, one has:

$$\sin \alpha = \frac{2,463}{300.000} = \frac{1}{121721} \quad (57)$$

and, passing from the value of the sinus to the value of the angle and bearing in mind that the unity at the numerator is in radians, and each radian corresponds to 206265'', one finds:

$$\alpha = \frac{206265}{121721} = 1'',69 \quad (58)$$

which is precisely the exact value of inclination angle made by astral rays as it has actually been measured by astronomers at solar eclipses.

This phenomenon is then explainable physically and quantitatively with Galilei's classic relativity, with no need of applying to that of Einstein, which in fact succeeds to foresee only the half of the observed value, imputing the other half to a kind of abstruse gravitational attraction that light would ensue from the Sun.

Still, recently (1961) Dr Mossbauer has repeated (fig. 8) the experiment made by me with rotating disc and luminous rays, using

this time, gamma rays. He placed two atomic time-pieces; one made of a source of such rays (cobalt 57), and fixed on the disc's centre (O); and the other made of an absorbant material (iron's isotope 57) put at the periphery of the same disc and moving with it. He ascertained that, keeping the disc still, and then turning it at speed V, the time needed by absorbing stuff (A) to tune in resonance with radiation emitted by source (O) increased while the frequency lessened, exactly in accordance with the law expressed by (53) drawn by me from Galilei's relativity. Viceversa Mossbauer claimed that this result was the «crucial proof» of Einstein's pseudo-relativity. But we have shown that this illusion comes from not having considered that the frequency's variation observed and expressed by (53) was to be expected in agreement with both relativities.

In order to confirm Einstein, Mossbauer should have ascertained an increase of wave's length λ_2 when lessening the frequency ν_2 , so to prove true the relation

$$\lambda_2 \nu_2 = C \quad (59)$$

which is the basis of pseudo-relativity.

But the aforesaid increase doesn't occur at all, as I ascertained with decisive experiments N. 2 and N. 3.

CHAPTER V

NEW EXPERIMENTALLY PROVED INTERPRETATION OF ASTRONOMICAL ABERRATION

We perform now the operation mentioned at letter (d) of Chapter 1st, namely demonstrate that the stream of fluid space having speed $V = 30$ Km/sec in regard to the Earth is not in conflict with astronomic aberration, but on the contrary explains fully this phenomenon.

For this purpose, let's consider a star (S_0) sending a light's ray perpendicularly to the direction of the stream which drags our planet.

This ray, touching at point (A) the stream's fluid, will produce in the latter a semicircularly dilating wave. This means that point (A) behaves as a new emission centre, sending out diverging rays

into the stream's fluid; the stream's fluid drags away those rays in the direction of its own movement with speed $2V = 60 \text{ Km/sec}$.

It is evident that, while light travels with one of those rays at speed C , the aforesaid stream displaces the ray parallel to itself with speed $2V$, taking it into position DO_2 . Let's assume that this displacement took time Δt .

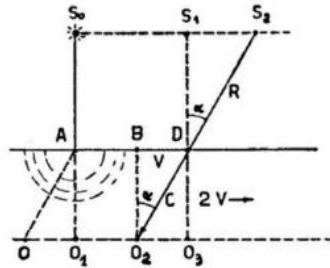


Fig. 10

If Earth is at point O_1 in the instant when the ray reaches point A , it will be at point O_2 after time Δt , as the revolution speed is the half of the speed of fluid stream. It follows that the observer on the Earth will receive the deviated ray DO_2 instead of the straight one AO_1 , and so it will look to him as though the star were in position S_2 instead of the more arreared position S_0 where it actually was at time $t-\Delta t$.

We can therefore represent speed C of light when covering distance DO_2 with a vector proportional to that distance and lying in the same direction; likewise we can represent stream's speed V relative to Earth with vector BD equal to the distance covered by it in the assumed lapse of time. From triangle O_2BD then it results:

$$\sin \alpha = \frac{V}{C} \quad (60)$$

and substituting C and V with their numerical values as given below

$$\sin \alpha = \frac{30}{3 \cdot 10^8} = \frac{1}{10^4} \quad (61)$$

Considering that the unity put at numerator of the (61) is expressed in radians and each radiant corresponds to 206265'', one has:

$$\alpha = \frac{206.265}{10.000} = 20'',6265 \quad (62)$$

which is exactly the value of aberration angle α of rays coming to us from the stars as it has been actually measured.

It is clear that if one wishes to calculate the distance S_0S_2 between the star's real position and its apparent one, one must bear in mind that the aforesaid distance is the addition of two segments: S_0S_1 due to the stream's displacement, plus segment S_1S_2 due to ray's inclination, namely:

$$S_0S_2 = S_0S_1 + S_1S_2 \quad (63)$$

Since $S_0S_1 = AD$ and AD depends on speed $2V$ of fluid stream which impels the Earth and on time Δt needed by the ray to cross the stream, one has:

$$S_0S_2 = 2V \Delta t + S_1S_2 \quad (64)$$

But the stream has constant thickness, therefore time Δt needed by light to go across it shall be constant too; one can then write:

$$S_0S_1 = AD = 2V \Delta t = K \quad (65)$$

Calling R the distance between point S_2 and point D , from triangles' S_1S_2D and BDO_2 similitude one has:

$$\frac{V}{C} = \frac{S_1S_2}{R} \quad (66)$$

from which one obtains:

$$S_1S_2 = \frac{R V}{C} \quad (67)$$

Putting the values of (65) and (67) in (63), the same (67) can be written:

$$S_0 S_2 = K + \frac{R V}{C} \quad (68)$$

It must be remarked that until present the astronomic aberration α has been drawn from its tangent's value instead from that of its corresponding sinus, but it is clear that choosing vector O_2D to represent speed C instead of vector O_2B , the value of aberration angle results identical in both cases, as demonstrated by expression (62).

Astronomy until to-day has considered only the length K_1 run by our planet at speed V during the time Δt_1 (light's time) needed by light to reach us from the observed star, so that:

$$K_1 = V \Delta t_1 \quad (69)$$

So it shall be necessary from now on to subtract from the above written length the length ($V \Delta t$) run by the Earth while the ray comes across the fluid stream, and add to it the distance expressed by (65):

$$(V\Delta t_1 - V\Delta t) + 2V\Delta t = V(\Delta t_1 + \Delta t) \quad (70)$$

Confronting (69) with (70) one realises that the difference $V\Delta t$ between spaces as calculated so far in Astronomy and the one actually run because of the presence of the stream, is very small, considering the exiguity of time Δt needed by light to travel across the short thickness of our planet's stream — in comparison with time Δt_1 necessary to cover the huge distance between the star and the Earth.

The two elucidations given above bring some adjustments on conception and calculation of real position of stars and planets; these perfections, though not too impressing, yet are fit to determine with greater accuracy those positions and give us evidence that luminous rays reaching us from the stars undergo a deviation, known as aberration, because before joining us they pass across a stream of fluid space which transports them parallel to themselves; so we do not receive the ray crossing perpendicularly the stream, but the ray leaning against the stream at an angle proportional to speed V between the Earth and the fluid space which envelopes it.

An interesting detail: as the ray arriving from star S_2 is inclined at angle α , speed W with which it passes perpendicularly through the stream is given by projection of speed C in that direction:

$$W = C \cos \alpha = C \sqrt{\frac{C^2 - V^2}{C^2}} \quad (71)$$

This last confirms that speed W of the ray crossing the stream is inferior (in regard to the terrestrial observer) to speed C of wave's propagation. Astronomical aberration therefore is the experimental proof fully denying the postulate of light's constant speed on which pseudo-relativity is based, as shown by (71).

CHAPTER VI

THE RIGHT INTERPRETATION OF MICHELSON'S EXPERIMENT

We proceed now to the operation mentioned at letter e) of chapter 1st, to find out whether the speed of 60 Km/sec of the fluid stream hitting the Earth is in conflict with Michelson's experiment and classic relativity or not.

That experiment, as it is known, was based on the assumption that if a motionless ether existed in the whole Universe — as (mistakenly) light's aberration seemed to require — our planet travelling inside such a medium in its yearly revolution movement should have been subjected to an ether's stream of about 30 Km/sec speed and directed in the opposite direction; therefore, for a terrestrial observer light's speed should have appeared different in the various directions; two rays on our planet covering equal distances but differently oriented should also have needed different times.

To find out whether that happened or not two luminous rays were simultaneously dispatched: one towards the direction OP of Earth's revolution, the other towards the perpendicular direction OA ; after having run the same length ($L_x = L_y$) both rays were reflected on starting point O by means of mirrors P and A in order to be able to measure the eventual displacement (fig. 11).

In fact, calling C the speed of light and V the speed of our planet, times T_x and T_y needed by the two rays to cover distances L_x , L_y

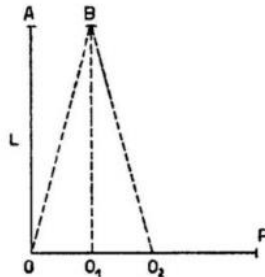


Fig. 11

moving with the Earth while the surrounding ether stays still, should have been:

$$T_x = \frac{2 C L_x}{C^2 - V^2} \quad (72) \quad T_y = \frac{2 L_y}{\sqrt{C^2 - V^2}} \quad (73)$$

Michelson's experiment showed that the time needed by the two rays to cover the same lengths (L) oriented as above were identical and both expressed by the following equation:

$$T = \frac{2 L}{C} \quad (74)$$

This last, as I have demonstrated on page 29 of my « Theory of appearances » proves that our planet in its revolution movement drags with itself its surrounding medium of ether just as it carries along its atmospherical quilt, and this makes us certain that the Earth is in the centre of an ether's planetary sphere and that both turn round the Sun with the same speed revolution of 30 Km/sec.

On the other hand, the phenomenon of astronomical aberration — as I demonstrated in Chapter V — assures us that the Earth and its planetary sphere are immersed in one of the solar whirl's layers

having a speed of 60 Km/sec and dragging them both at the speed of 30 Km/sec round the Sun.

Finally, it is to be noticed that both solar whirl and the terrestrial planetary one are made by a series of concentric spheric layers of ether having constant thickness and rotation' speed inversely proportional to the square root of their radiuses, as I evinced from decisive experiment N. 1 and as it has been evidenced by Miller's experiment, which we will discuss further on.

These rotation and revolution movements of ether had never been considered and this fact led Lorentz and Einstein to propose two postulates, each of them able to make equations (72) and (73) equal to (74). But each and not only one of those three equations is experimentally ascertained, and this denies the postulates.

Nevertheless, I will give here the scientific demonstration of the inadmissibility of the aforesaid postulates, and give proofs that ether's particular movements (discovered by me) explain fully astro-nomic aberration as well as Michelson's and Miller's experiment results, in harmony with Galilei's relativity.

Actually Lorentz, in order to conciliate Michelson's experiment with classic cinematics, assumed that regulus OP had shortened in regard to regulus OA because of ether's pressure in direction of the movement, and this shortening would be such that:

$$L_x = L_y \sqrt{\frac{C^2 - V^2}{C^2}} \quad (75)$$

Actually, putting that value in (72), the last becomes identical to (73). To make them both equal to (74), Lorentz assumed that time T_y had undergone a certain dilation in comparison with time T valid in a motionless system because of ether's pressure against the time-piece's balance, so that it would be:

$$T_y = \frac{T}{\sqrt{\frac{C^2 - V^2}{C^2}}} \quad (76)$$

Both (72) and (73) follow from Galilei's transformation equations:

$$x' = x - v t \quad t' = t \quad (G)$$

which relate coordinate x of a point in a motionless system to that x' of the same point in a moving system; (75) and (76) then could be made equal to (74) only by replacing transformation equations (G) with the following:

$$x' = \frac{x - Vt}{\sqrt{\frac{C^2 - V^2}{C^2}}} \quad t' = \frac{t - \frac{V}{C^2} x}{\sqrt{\frac{C^2 - V^2}{C^2}}} \quad (77)$$

which were adopted by Einstein as new transformation equations for his pseudo-relativity instead of those (G) of Galilei.

But bodies' shrinking and times' dilatation have never been proved experimentally. The fact that both (75) and (76) rest upon Earth's relative speed V (which changes with the chosen system of reference), implies that the regulus placed along direction X of Earth's movement has simultaneously as many numberless different lengths as there are innumerable different mobile systems from which it could be measured. Still more absurd is the fact that in order to make calculus and Michelson's experiment agree, this regulus should have (even with an unique reference system) as many innumerable different lengths as there are innumerable directions in which the regulus can be oriented, each depending on the versus run by the luminous ray.

So, the regulus placed along direction X should shorten, while the ray travels from O to P , and stretch when the ray comes back from P to O . Since Lorentz admits that light's speed is relative and varies according to ray's propagation direction and versus, it follows that in order to determine the relations of time and space between the system where transmission takes place and the chosen reference system, it would be necessary, as I demonstrated [3], to have countless transformation equations of the same kind of those represented by (77); all these countless equations though would result unreliable, since the values of time and space drawn from them would all be different; it would then be impossible to ascertain which value actually occurs in physical reality.

..

Einstein, in order to equalise (72) and (73) and make them both identical to (74) postulated the constance of light's speed in regard to any observer however moving, so that in those equations one could estimate:

$$\frac{C}{C^2 - V^2} = \frac{1}{\sqrt{C^2 - V^2}} = \frac{1}{C} \quad (78)$$

But in mathematics those are false equalities, algebraical errors; substituting to the letters their numerical values they are also elementary arithmetical mistakes. If in equation (78) one substitutes literal symbols with vectors corresponding to speeds, one notices that they are also in conflict with Galilei's classic cinematics; lastly, if one considers the distances run in the time's unity, one finds that (78) is in conflict also with Euclidean geometry.

Since the aforesaid theses lead to unsustainable absurdities, it was our duty to try to find more trustworthy and orthodox solution.

This is what have I done, discovering first, with decisive experiment N. 3 and then with calcul in Chapter V, that rays originating from the stars undergoe an inclination known as aberration, be cause before reaching us they cross a stream of fluid space having an absolute speed $V_A = 60$ Km/sec which hits the planetary sphere surrounding the Earth and which drags them both as a whole at revolution speed $V_p = 30$ Km/sec. (fig. 12).

Since the values of the above mentioned speeds are taken with reference to a coordinates system anchored to the Sun, one can write:

$$V_n = V_A - V_p = 60 - 30 = 30 \text{ Km/sec.} \quad (79)$$

This represents relative speed V_n with which the solar stream of fluid space overpasses the Earth in its revolution movement. We shall then have:

$$V_n = V_p \quad (80) \quad \text{and} \quad V_A = 2 V_p \quad (81)$$

Speed V_p of our planet is known from astronomical observations, relative speed V_n of fluid stream is confirmed by aberration; consequently absolute speed $V_A = 2 V_p$ which hits the planetary sphere is an indisputable reality predicted by me in my universal space-dynamics « Theory of Appearances ».

If the Earth and the planetary fluid field which surrounds it and follows it in its revolution movement had no relative motions among themselves, the light would spread in all directions with the same speed C it has inside the fluid space; it would then be impossible with experiments accomplished in such field to detect the presence of some relative speeds, which actually would not exist. But we know from decisive experiment N. 1 that the Earth is in the middle of a turning field of fluid space (planetary sphere) which subdivides in concentric layers having relative speeds expressed by equation(2); for this reason we have been able to measure the relative speed as given by (6).

So it remains clear that with optical transmission made on the Earth with rays not overtaking the planetary sphere we can only give evidence of rotation relative speed between our planet and its surrounding fluid space, but never of the revolution speed of solar field's fluid space, because the latter occurs outside the terrestrial field's planetary sphere.

We can detect and measure the revolution speed of solar field's fluid space only with rays which arrive from the stars and are therefore obliged to cross the turning solar field before reaching us, as astronomic aberration shows.

Michelson's experiment was based on the erroneous conception that the Earth, while moving itself inside the motionless ether, was subjected to a stream of this medium of 30 Km/sec. directed in opposition to its revolution movement, and on the assumption of being able to measure the speed of such stream. But we have already shown that the solar stream of fluid space is directed along the same versus as its revolutionary movement, has the speed of 60 Km/sec., and that it is impossible to measure it with rays which do not cross it. In Michelson's experiment, on the contrary, the rays were produced on the Earth and were travelling along trajectories always inside the terrestrial planetary sphere.

That is why Michelson's experiment could only measure rotation relative speed between the Earth and its surrounding fluid space, as I succeeded to, with a different device.

Now the matter is to demonstrate that rotation relative speed $V = 9335$ m/sec. which I have theoretically drawn from bodies' acceleration (g) and experimentally proved with decisive experiment N. 1' is not in conflict with the results of Michelson's and Miller's experiments.

For this purpose, imagine the use of the same apparatus as

used by those two experimenters, broadcasting simultaneously two luminous rays: one towards Earth's rotation direction OP, and the other towards the perpendicular direction OA; after having covered the same distance (L) both rays are reflected on starting point (O) by means of two mirrors P and A, in order to detect the eventual dephasing corresponding to rotation speed V of fluid space in regard to the Earth. (fig. 11).

This stated, let's first calculate the time T_x needed by the ray sent along Earth's rotation direction to cover the go and return of distance (L). For an observer moving jointly with the Earth, the speed of the ray when going from O to P results from the addition of speed C of light's propagation plus speed V of the fluid stream in regard to Earth, or:

$$C + V \quad (82)$$

On the way back from P to O the ray's speed shall be the difference between wave's own speed C and speed V of the fluid which drags the ray into the opposite way, or:

$$C - V \quad (83)$$

The time T_{xa} required for the way on is the ratio between the covered distance (L) and the speed as expressed by (82), or:

$$T_{xa} = \frac{L}{C + V} \quad (84)$$

The time required for the way back shall be, taking (83) into consideration:

$$T_{xb} = \frac{L}{C - V} \quad (85)$$

Then the whole time T_x needed by the ray to go and come back shall be given by the (84) plus the (85), namely:

$$T_x = \frac{2 L C}{C^2 - V^2} \quad (86)$$

Let's compute now the time T_y needed to cover both ways the distance OA by the ray sent perpendicularly to Earth's rotation movement (fig. 13).

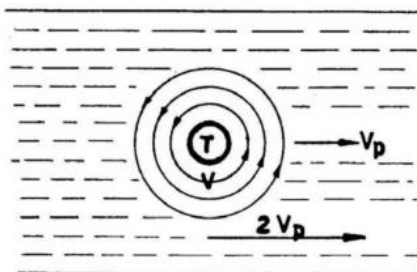


Fig. 12

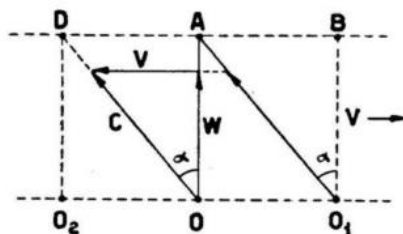


Fig. 13

The ray sent along direction OA is carried by the stream parallel to itself into superimposing on O_1B ; for this reason the ray ends up its course at point B and can not be reflected by the mirror put in A because the mirror is fixed to the Earth and so has remained behind; the mirror can reflect only the ray propagating along the inclined direction OD and having speed C .

This ray, carried by the stream with speed V parallel to itself into superimposing on O_1A , ends up its run exactly on mirror A , from whence it can also be reflected back for its return.

Manifestly, as it follows from fig. 13, it is:

$$\sin \alpha = \frac{V}{C} \quad (87) \quad \text{and} \quad \cos \alpha = \sqrt{\frac{C^2 - V^2}{C^2}} \quad (88)$$

Since the ray going with speed C from O to D is carried parallel to itself with speed V , it covers the motionless distance $OA = L$ with relative speed W given by:

$$W = \sqrt{C^2 - V^2} \quad (89)$$

The time T_{vA} taken for the way on is given by:

$$T_{vA} = \frac{L}{\sqrt{C^2 - V^2}} \quad (90)$$

The time T_{vR} needed for the way back shall clearly be the same for the aforesaid considerations, namely:

$$T_{vR} = \frac{L}{\sqrt{C^2 - V^2}} \quad (91)$$

Total time T_v for the way on and the way back is given by the addition of (90) and (91):

$$T_v = \frac{2L}{\sqrt{C^2 - V^2}} \quad (92)$$

Now, confronting (86) with (92) one notices that the time needed by the light to go and come back along direction X tangential to one of Earth's parallel circles is not equal to the one needed by the light to go and come back along perpendicular direction Y disposed on the radius of the same parallel circle.

(72) and (73) found by Michelson for the purpose (unattainable) of measuring revolution speed are equal to (86) and (92) found by me for the purpose (attainable) of measuring rotation speed. Michelson, then, should have detected at least some fringes' displacement in connection with rotation speed. It must be remarked though that the aforesaid two equivalent groups of equations are not suitable to provide the theoretic displacement of fringes which we are looking for, and this for two reasons. First, because those formulas have been made on the assumption of rays propagating through a rectilinear

fluid stream, while this stream is circular, since it turns round the Earth. Second, because those two equations take into consideration — as run by the rays — distance L , while the distance actually run is much bigger, though both starting and arrival points are at the opposite ends of that distance.

For the first consideration, the rays sent with speed C along direction OD , while spreading through the circular fluid stream,

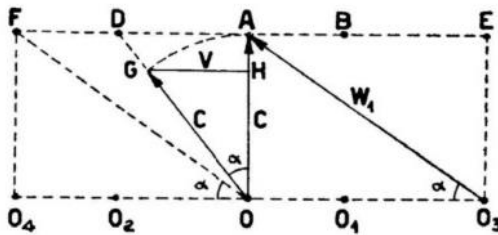


Fig. 14

undertake the same angular speed of this stream; they then turn round point O of angle α till when they superimpose themselves on $OA = L$. (fig. 14). therefore it shall be:

$$OD \cos \alpha = OA = L \quad (93)$$

Dividing distance L by speed C we obtain the value of time t_{VA} , namely:

$$t_{VA} = \frac{L}{C} \quad (94) \quad \text{from which one has } L = t_{VA} C \quad (95)$$

Time T_{VA} needed to cover the same distance when the fluid transversal stream had been imagined rectilinear was given by (90); from this last, then, and from (88) it follows:

$$L = T_{VA} \sqrt{\frac{C^2 - V^2}{C^2}} C = T_{VA} C \cos \alpha \quad (96)$$

But the first members of (95) and (96) are equal, making those two equations equivalent; we can then write:

$$T_{yA} \cos \alpha = T_{yA} \sqrt{\frac{C^2 - V^2}{C^2}} = t_{yA} \quad (97)$$

The last tells us that: « *Time (T_{yA}) employed by the ray to cover distance (L) lying along direction Y across the rectilinear stream is bigger than that (t_{yA}) really needed, because the stream is circular; so the ray propagating itself along direction OD with speed C turns at an angle α which matches, in the rotation sense, the phase displacement between the Earth and the fluid stream* ».

The same can be said of the propagation along the perpendicular direction X . Indeed, if the stream is rectilinear, the value of the speed will be given by (84) and we shall have:

$$L = (C + V) T_{xA} \quad (98)$$

As the stream is, on the contrary, circular, we shall have:

$$L = \frac{C + V}{\cos \alpha} t_{xA} \quad (99)$$

Since those two last equations are equal, we have:

$$T_{xA} \cos \alpha = t_{xA} \quad (100)$$

(86) and (92) must be multiplied by $\cos \alpha$ in order to take into consideration the rotation of the stream; so we shall have, for the way on and the way back:

$$T_x \cos \alpha = \frac{2 L C \cos \alpha}{C^2 - V^2} \quad (101)$$

$$T_y \cos \alpha = \frac{2 L \cos \alpha}{\sqrt{C^2 - V^2}} \quad (102)$$

In the last equation substituting for $\cos \alpha$ its value given by (88) we have:

$$t_x = \frac{2L}{C \sqrt{\frac{C^2 - V^2}{C^2}}} \quad (103)$$

$$t_y = \frac{2L}{C} \quad (104)$$

With regard to the second reason why (72) and (73) as well as (86) and (92) are not suitable to provide the theoretical displacement of fringes connected with Earth's rotation, we notice: while running distance OA with speed C, the ray is carried by the transversal fluid stream parallel to itself into superimposing on distance O₂A. This ray then ends up its run at point E; therefore it can not be reflected by the mirror put in A, which is fixed on the Earth and so retained in an arreared position. This mirror can reflect only the ray propagating along direction OF which is bent at angle α . This ray is carried parallel to itself into superimposing on tract O₃A and ends up its course at mirror A from whence it is returned.

Speed W₁ with which the ray covers this space is soon found from the following proportion drawn from the similitude of triangles OGH, OAO₃:

$$V : C = C : W_1$$

whence:

$$W_1 = C \left(\frac{C}{V} \right) = C n = \frac{C}{\sin \alpha}$$

This way we have confirmed (in harmony with what was expressed by (40)), the discovery that « the ratio between speed C of luminous wave and speed V of fluid stream by which it is carried, is equal to refraction index (n.) ».

Multiplying the values of times expressed by (103) and (104) by speed W₁ we obtain the lengths L_x and L_y of spaces really run

on the way on and back by the two rays dispatched along the two considered directions, namely:

$$L_x = \frac{\frac{2 L C}{V}}{\sqrt{\frac{C^2 - V^2}{C^2}}} \quad (105) \quad L_y = \frac{2 L C}{V} \quad (106)$$

The difference ΔL between the two travelled distances therefore is:

$$\Delta L = L_x - L_y = \frac{2 L C}{V} \cdot \frac{1}{\sqrt{\frac{C^2 - V^2}{C^2}}} - \frac{2 L C}{V} \quad (107)$$

Developing in series the second ratio in the diminuendo, one has:

$$\frac{1}{\sqrt{1 - \frac{V^2}{C^2}}} = 1 + \frac{1}{2} \frac{V^2}{C^2} + \frac{3}{8} \frac{V^4}{C^4} + \dots \quad (108)$$

Substituting this value in (107) limiting to the first two terms, one has:

$$\Delta L = \frac{2 L C}{V} \left(1 + \frac{1}{2} \frac{V^2}{C^2}\right) - \frac{2 L C}{V} = \frac{L V}{C} \quad (109)$$

which is identical to (16) already found by us in Chapter 1. This identity tells us that even with an apparatus like the one used by Michelson (with two rays running equal distances both ways along directions perpendicular to each other) one should have found the same fringes of displacement encountered with decisive experiment n. 1, in which the two rays were instead oriented along the same direction and moving against each other; one should have also detected and measured the presence of one stream of fluid space turning round the Earth with speed $V = 9,935 \text{ Km/sec}$.

Were such results achieved - or not?

If one checks the scientific reports on this subject, one notices:

1^o) in Michelson's experiment accomplished from 1881 'till 1885 in Cleveland at 180 metres above sea level;

2^o) in experiments made by him together with Morley from 1887 to 1904 on Mount Wilson at 1.700 metres above sea level, and

3^o) in experiments repeated by Picard and Sthael in Belgium in 1926 on a balloon at 2.500 metres above sea level, displacements of fringes were recorded which were of negligible entity in regard to those expected from a stream of 30 Km/sec.

Here I hasten to emphasize that in the quoted recordings at the end of this page (*) it is also written that interferometres used were not able to detect a speed of less than 7,5 Km/sec.; this, added to the speed deducible from the displacement, (deemed negligible), gives a value of speed very near to that of rotation found by me.

In consideration of such instrumental lack of precision, Miller actually used a more sensitive interferometer, able to detect a stream's relative speed up 'till 3,5 Km/sec., and from 1921 to 1925 he accomplished thousands of experiments on Mount Wilson; in those experiments Miller always measured a relative speed amounting to one third of that of Earth in its movement of revolution, which value is very near to the one measured by me with decisive experiment n. 1.

At the end of this book I give the demonstration that space is not empty, but is made up of an incompressible material substance, mobile like a fluid and with constant density 10^{20} less than water and that if one wants to explain natural phenomena one must substitute ether (conceived as a compressible gas) with this substance. Accepting from now on such substitution, this chapter can be condensed as follows:

1) *The results of Michelson's, Miller's, Picard's and Sthael's experiments give us the certainty that the Earth is placed in the center of a planetary spheric field of fluid space both turning round the Sun with same rotation speed of about 30 Km/sec.*

(*) — *Philosophical Magazine* - 1887 - U.S.A.

— *Philosophical Magazine* - May 1905 - U.S.A.

— *Proceeding of the national Academy of Sciences* - June 1925 - U.S.A.

— *L'Astronomie* - Gauthier Villars - Paris - January 1927.

2) *Miller's experiment and my own decisive experiment n. 1 make us certain that a stream of fluid space turns round the Earth with a speed of 9,335 Km/sec. varying with latitude.*

3) *Experiments made by Michelson, Morley, Picard, Sthael, Miller and myself, as well as light's astronomic aberration, are all in agreeance with Galilei's classic cinematics. They also give confirmation that the Earth is placed at the centre of a turning field of fluid space. Each of these fields is subdivided like an onion in many spheric layers each having constant thickness, and rotation speed inversely proportional to the square root of their radiuses.*

4) *The existence of solar turning field of fluid space, of Earth's planetary field, as well as of the streams of their concentric spheric layers, is confirmed by centripetal accelerations, by gravitational forces, and finally by revolution speeds that such circular streams convey both to the planets moving round the Sun and to the bodies falling on the Earth.*

5) *The mysterious gravitational force which Sun and Earth seem to emanate through their surrounding empty space is the same as the centripetal force which the fluid space turning round the masses of Sun and Earth exerts on bodies when plunged in it.*

6) *The results of all the aforesaid optical experiments prove to us that light's speed is relative to the chosen reference system, as is the speed of anything else in movement.*

There are two consequences from the experimental results cited above: first, they confirm that gravitational fields are originated by fluid space turning round astronomic masses, so identifying gravity force with the centripetal push exerted by that medium on bodies immersed in it; they confirm too that light consists of waves produced in such medium; these confirmations make us sure that the universe's unitary science can not be other than the spatio-dynamics.

Second consequence, all those experimental results deny the postulate of light's constant speed, put as the basis of physical theories since 1905 untill nowadays, and make us certain that such theory does not correspond to physical reality and so can not be accepted by official science.

The experimental results in fact confirm that in the Universe it is Galilei's relativity which is actually verified, and not Einstein's.

The two consequences are positive because there is not only the invaluable merit of having found the right way, but also that of having renounced the wrong one.

CHAPTER VII

THE GENERAL VALIDITY OF GALILEI'S RELATIVITY

Let's proceed now to the operation mentioned at letter f) of chapter I, namely to demonstrate that the general validity of classic cinematics is not rendered ineffective by optical transmissions, provided that one takes into the right consideration the presence and speed of the fluid which transports the wave. This is the same as to demonstrate that the time of a luminous propagation occurring on a certain system is invariable even if computed from any other system however moving in regard to the first.

For brevity's sake, we will examine the specific propagations considered in chapter VI in order to ascertain whether the time taken for those broadcasts estimated by a terrestrial observer are equal or not to the relative times computed by a motionless bystander, (i.e. one not sharing revolution and rotation movement of our planet).

We have already seen that times T_{xA} , T_{xB} , and T_x for the way on, the way back and the total run along direction X of revolution in regard to the terrestrial observer are expressed by (84), (85), (86) when the stream hitting the Earth is rectilinear.

The matter is now to calculate which will be the value of such times when regarded by a motionless bystander — again in the case of the rectilinear stream.

For that observer the distance run by the ray on the way on from O to P (fig. 15) will look like the addition of tract L plus tract ΔL travelled by the Earth at revolution speed V_p during time T_{xA} , or:

$$L + \Delta L = L + V_p \cdot T_{xA} \quad (110)$$

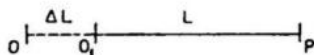


Fig. 15

The speed with which the ray runs that distance shall be given by the addition of wave's speed C plus speed V of the stream carrying the ray, plus speed V_p of Earth's revolution:

$$C + V + V_p \quad (111)$$

Time T'_{xA} shall be given by the ratio between the space expressed by (110) and the speed expressed by (111), namely:

$$T'_{xA} = \frac{L + V_p \cdot T_{xA}}{C + V + V_p} \quad (112)$$

But the value of time T_{xA} is evidently expressed by (84) and introducing this value in (112) it results:

$$T'_{xA} = \frac{L + \frac{V_p \cdot L}{C + V}}{C + V + V_p} = \frac{L}{C + V} \quad (113)$$

Time T'_{xR} needed by the ray for the way back from P to O will be, following the same considerations:

$$T'_{xR} = \frac{L - V_p \cdot T_{xR}}{C - V - V_p} \quad (114)$$

Introducing in the last, the value of T_{xR} given by (85), we have:

$$T'_{xR} = \frac{L - \frac{V_p \cdot L}{C - V}}{C - V - V_p} = \frac{L}{C - V} \quad (115)$$

Total time T'_x to go and come back along direction X of Earth's rotation shall therefore be the addition of (114) and (115), or:

$$T'_x = \frac{2 L C}{C^2 - V^2} \quad (116)$$

If the stream is circular, the value of time t'_x will be obtained by multiplying the last term by $\cos \alpha$, namely:

$$t'_x = T'_x \cos \alpha = \frac{2 L C}{C^2 - V^2} \cos \alpha \quad (117)$$

Putting in (117) the value of $\cos \alpha$ given by (88), one has:

$$t'_x = \frac{2L}{c \sqrt{\frac{C^2 - V^2}{C^2}}} \quad (118)$$

Comparing now (84), (85), (86), (103), with (113), (115), (116), (118) one finds:

$$T_{xA} = T'_{xA}; T_{xR} = T'_{xR}; T_x = T'_x; t_x = t'_x \quad (119)$$

which tell us that the three values of time needed by the ray to propagate itself along direction X of Earth's rotation movement respectively on the way on, on the way back and for both ways, have the same value — if the stream is *rectilinear* — whether they are calculated in regard to a motionless observer tied with a coordinates system settled in the Sun's centre, or calculated in regard to a terrestrial bystander. If the stream is *circular* there is the same result as the times valued are identical to either the terrestrial observer or to the motionless one, as shown by the four formulas of (119).

We show now that the same invariability of times in regard to either of the two observers also occurs along direction Y lying across Earth's rotation movement.

The three values of time in regard to the observer moving with the Earth have already been determined by (90), (91) (92), when the stream is *rectilinear*. Let's see now which are their values in regard to the motionless observer (fig. 16). For him, the ray sent along direction Y spreads through the fluid space of Earth's planetary sphere as though passing across a running vehicle. Actually, the ray dragged with speed V_p by Earth's revolution movement transversely to propagation O_sR , and furthermore displaces itself with speed V because of relative rotation between the planetary sphere space and the Earth.

The ray has therefore a resulting speed given by the addition of revolution speed V_p plus rotation speed V; its trajectory (O_sH) then displaces parallelly to itself and superimposes onto (O_sB).

In the meantime the Earth, as a consequence of its revolution movement, carries jointly the regulus $L = O_sH$ parallelly to itself

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into superimposing on tract OA; mirror A then does not receive ray (O₁B), but ray (O₁A) which is leaning towards the stream.

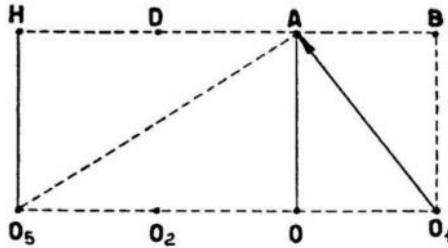


Fig. 16

For the motionless observer at point O₅, the ray which departed from the same point O₅ has reached the mirror at A; consequently for him the ray has run distance O₅A; the length of such distance is given by Pythagora's theorem from the following:

$$O_5A = \sqrt{O_5O^2 + OA^2} \quad (120)$$

But distance O₅O is obtained by multiplying Earth's revolution speed V_p by time T_{vA} needed by the ray to cover distance L, and expressed by formula (90); we can write then:

$$O_5O = V_p \cdot T_{vA} = \frac{V_p \cdot L}{\sqrt{C^2 - V^2}} \quad (121)$$

As OA = L, distance O₅A formerly expressed by (120), becomes:

$$O_5A = \sqrt{L^2 + \frac{V_p^2 \cdot L^2}{C^2 - V^2}} = L \sqrt{\frac{C^2 - V^2 + V_p^2}{C^2 - V^2}} \quad (122)$$

Speed W with which O₅A is run, is the resultant of speed V_p active in tract O₅O and the one with which is covered the perpendicular distance (OA) expressed by (89),

$$W = \sqrt{C^2 - V^2 + V_p^2} \quad (123)$$

Time T'_{YA} needed for the way on is then found by dividing the distance expressed by (122) by the speed expressed by (123), namely:

$$T'_{YA} = \frac{L \sqrt{\frac{C^2 - V^2 + V_p^2}{C^2 - V^2}}}{\sqrt{C^2 - V^2 + V_p^2}} = \frac{L}{\sqrt{C^2 - V^2}} \quad (124)$$

Time T'_{YR} needed for the return AO will be for the same reason:

$$T'_{YR} = \frac{L}{\sqrt{C^2 - V^2}} \quad (125)$$

Therefore total time T'_Y for both ways along direction Y perpendicular to Earth's rotation shall be given by the addition of (124) plus (125):

$$T'_Y = \frac{2L}{\sqrt{C^2 - V^2}} \quad (126)$$

If the motionless observer takes into consideration that the stream is circular, he is bound to multiply the two terms of the last equation by $\cos \alpha$ in order to obtain the value of time t'_Y , or:

$$t'_Y = T'_Y \cos \alpha = \frac{2L \cos \alpha}{C \sqrt{\frac{C^2 - V^2}{C^2}}} \quad (127)$$

In (127) substituting $\cos \alpha$ with its value given by (88), one has:

$$t'_Y = \frac{2L}{C} \quad (128)$$

Comparing (90), (91), (92), (102), with (124), (125), (126), (128) one realises that:

$$T_{YA} = T'_{YA}; T_{YR} = T'_{YR}; T_Y = T'_Y; t_Y = t'_Y \quad (129)$$

which tell us that the times needed by the ray to propagate along direction Y perpendicular to that of rotation movement — for the way on, the way back, and for both ways — have the same value either calculated in regard to a motionless observer anchored to a coordinates system fixed at the Sun's centre, or calculated in regard to a terrestrial bystander — if the stream is *rectilinear*. If the stream is *circular* one arrives to the same conclusion, as shown by the last equality (129).

We come to the point now where it is necessary to make clear that there are two quite different kinds of valuation and comparison of cinematic entities, which have often been mistaken for each other, with great detriment to scientific advancement; they are:

A) - The comparison between values of cinematic dimensions concerning a phenomenon taking place inside a certain system, when such values are drawn by the measures directly taken by an observer staying inside the same system, and the values of those dimensions when indirectly deduced by means of Galilei's transformation equations by other observers staying on other reference systems moving with uniform rectilinear motion in regard to the system where the phenomenon occurs.

B) - The comparison between values of cinematic quantities concerning the same phenomenon, but occurring inside different systems, when each of those values has been drawn from the direct measures each observer has taken inside his own system.

Regarding comparison type A), we have shown that both space covered by an optical perturbation and its speed during the run, undergo identical variations when passing from one reference system to another; we have shown that the value of both those variations depend upon the relative speed that the reference system has in regard to the system in which the light's propagation occurs. Therefore the ratio between those two quantities (meaning the time needed for the broadcasting) stays unchanged in regard to any reference system however moving.

Regarding type B), we have shown that the light takes different times to run from one end to the other of tract (L), when tract (L)

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is placed on systems differently moving in regard to each other, because wave's own speed compounds with the relative speed between the system where the optical transmission occurs, and the fluid medium investing it.

In other words: the time taken by an optical transmission to occur inside a certain system has the same value in regard to any Universe's reference system. (Absolute time).

If the same optical transmission occurs inside systems differently moving, the times needed are different. (Local time for phenomenon's occurrence).

Thus, for instance, time t_x taken by a luminous ray to cover both ways of the length of a regulus L anchored to any system, but disposed alongside the direction of the fluid stream turning round the system, is given, (on the ground of our demonstration) by (103), which we rewrite here simplified:

$$t_x = \frac{2 L}{\sqrt{C^2 - V^2}} \quad (130)$$

This formula tells us that time t_x needed for going and returning takes different values depending on relative speed V between the system where the transmission occurs and the fluid stream which hits it.

It follows that if during a certain time (t) that transmission occurs (n_1) times in one system, and (n_2) times in another, single times T_1 and T_2 needed for each broadcast will be:

$$t = n_1 T_1 = n_2 T_2 \quad (131)$$

from which one has:

$$\frac{T_2}{T_1} = \frac{n_1}{n_2} = n \quad (132)$$

which is the same as saying that if one assumes the period T_2 as time's unity in one of the two considered systems, and T_1 in the other, the first unity is (n) times bigger than the second just as one Country's lengths unity may be bigger or smaller than that of another Country.

But this does not mean that the same period in one system runs in time T_2 whereas in the other system (having a smaller value) it runs in time T_1 ; it merely means that the same optical transmission in one system and along a certain well determined direction takes place more or less quickly than inside the other system.

Actually, the go and return of the luminous ray between mirror A and P along direction X ruled by (130) can be regarded as an oscillating movement, whose period T_2 is bigger (and frequency n_2 consequently smaller) when occurring inside the system having higher speed V_2 than the period T_1 (and frequency n_1) occurring inside another system having speed $V_1 < V_2$.

So, bodies' shrinkage and times' dilation predicted in Loretz' transformation equations and forming the basis of Einstein's pseudo-relativity do not happen at all in natural reality; actually, they were postulated (as we have shown) following an erroneous physical interpretation both of astronomic aberration and of Michelson's experiment.

One could remark that the reasons why those equations are of no use for determination of the particular value of dilated time of each system is because this dilation does not occur and those times remain unchanged; they could however be used to determine the different duration needed by the occurrence of the same optical transmission on different systems moving with different speeds. But such appliance of Lorentz transformation equations must be made with care. In fact, the ensuing light's speed W is given by geometrical addition of speed C of wave's propagation in the fluid medium, plus fluid medium's relative speed in regard to the system inside which the transmission takes place, or:

$$W = C + V \cos \alpha \quad (133)$$

where with α has been called the angle between the direction of the considered propagation and the direction along which happens the translation of both the system and the fluid stream. One soon sees that, according to (133) the light takes inside the same system as many innumerable different speeds as there are innumerable directions spreading fanlike from emission sources. Consequently the time needed to cover the distance L along the aforesaid directions shall be expressed by:

$$T = \frac{L}{C + V \cos \alpha} \quad (134)$$

Inside a certain system one can choose as time's unity one of the innumerable values which (133) can have — and not that unique one considered by Lorentz' transformation equation.

In my publications I have shown that all objective physical phenomena originate from the presence of relative speeds between adjacent layers of fluid space; the translatory and undulatory movements thus aroused in the surrounding fluid medium, when hitting our sensory organs, produce in them some electron currents; these currents are conveyed to the brain along the nervous lines, and give rise to the various feelings of force, electricity, light, heat, etc., exclusively in our psyche.

It follows that objective physical phenomena (spacial movements) and their qualities, namely the feelings aroused in us, (psychical phenomena), rise, endure, change or extinguish-according to the rising, changing, or cancelling of relative movements between fluid space's adjacent layers and their ensuing continuous or alternative decelerations of fluid medium against our senses' organs.

Therefore, the increase of a system's speed does not cause (as Einstein believed) neither the shrinkage of bodies placed in it or any time's dilation; the increase of speed — leaving unaltered both lengths and times — has rather the effect of altering the speed between what the system carries with itself and the surrounding fluid medium, thus giving way to the change of objective physical phenomena and of the corresponding psychical subjective ones apprehended by us. This amounts to the same as to assume that bodies' movements do not occur in the empty space, but on the contrary inside the fluid space having constant density, which can so oppose or help those same movements by means of its inertial and frictional forces. It follows that Newton's dynamic laws, (which take into consideration only the inertia of the body isolated in the empty space), as well as Maxwell's laws on electro-magnetism (which take into consideration only the actions of the surrounding medium), are not suitable to give us the exact and complete picture of natural phenomena: those laws must therefore be replaced by the laws drawn from spacial fluid dynamics, which take into consideration all actions and reactions between the body and its surrounding fluid medium.

On the basis of this physical reality, it is clear that a force of any kind, when applied to a body, has the effect of impressing on it an acceleration which does not depend only from its mass, but also from the inertial and frictional resistences of the surrounding medium, resistences which are proportional to the square of relative speed

between body and fluid medium. The value of this relative speed is given by the difference between the body's own instantaneous speed and the speed of the surrounding fluid space; this difference (on account of Galilei's equations) does not change its value if computed in regard to any reference system however moving. It follows that Galilei's equations as well as the laws ruling physical phenomena are invariants in the whole Universe (comparison type Δ).

With this I intend to bring forward that the universal invariancy of phenomenical laws is not at all attained by Lorentz's transformation equations or by Einstein's pseudo-relativity; with those laws one obtains only the invariancy of that particular expression of inertial force as was postulated by Newton; this particular expression tells us that it is impossible by means of mechanical devices to realise whether one is placed inside a motionless system or inside a system moving with rectilinear and uniform motion. But if all this — we want to point out — can be true in a space absolutely empty, it is not so at all in a fluid space substantiated with constant density. As a matter of fact, if we rely on the last physical reality, space-dynamics take us to the opposite conclusion, namely that it is possible to size the speed of a rectilinearly and uniformly moving system in regard to the speed of the fluid medium which invests it. This has been shown:

- by decisive experiment n. 1 accomplished by me
 - by astral light's aberration
 - by Doppler's effect occurring when the Earth runs towards a star
- which all three although having been made and measured on our planet state clearly the speed of the Earth.

Notwithstanding what has been said above, one might think that Lorentz's transformation equations and Einstein's pseudo-relativity should not be abandoned because they have conciliated the contrast between Newton's dynamics and Maxwell's electro-magnetism; this contrast can be traced to the fact that, while inertial forces, being proportional to accelerations, remain unchanged in regard to any reference system moving with a uniform and rectilinear motion — electromagnetic forces instead, depending also from light's speed C and from speed V of the moving electrised corpuscle — have not the same referential invariancy.

Indeed, Lorentz's transformation equations have been adopted by Einstein in order to demonstrate that from them one could draw

expressions of inertial force which make it independent from rectilinear uniform movement of any reference system; one could draw also expressions of electro-magnetic forces which make them dependant on reference system's speed.

But this way the conflict has not been settled, because Newton's inertial forces still remain proportional to accelerations, while the electro-magnetic ones are proportional to speeds.

In order to eliminate this conflict, pseudo-relativity's mathematical artifices are not effectual; one must prove that mechanical forces as well as electro-magnetic forces depend upon light's speed C , and that they are proportional to some accelerations which vary according to relative speed V existing between bodies and space fluid medium. This does not in any way involve the modification of Galilei's transformation equations, but implies the substitution of Newton's inertial equation (valid only in vacuum) with the corresponding equation drawn from space-dynamics, which takes into consideration physical reality as well as actions and reactions between bodies and the fluid medium in which they are immersed.

Here next we speak of the suitability of this unitary science of Cosmos to solve the above mentioned conflict.

CHAPTER VIII

SPACE-DYNAMICS CONCILIATE THE LAWS OF ALL PHENOMENA

We proceed now to the operation quoted at letter (*g*) of Chapter I namely we must demonstrate that if space is made of some material fluid substance, dynamics' laws are expressed by formulas that are not in contrast with those of electromagnetism.

To this end, we point out that Newton's inertia equation:

$$F = m a \quad (135)$$

presupposes two conditions: first, that the movement of mass m takes place in vacuum; second that the mass m undergoes an acceleration (a) having the same direction as the applied force F

But neither of the aforesaid conditions actually occur in physical reality; space is not empty but is endowed with specific density

and any mass, being made of atoms turning on themselves and transferring through this fluid medium, is subject to Magnus' effect which deviates bodies' trajectory in regard to the applied force's direction.

So, for instance, when the spherical missiles of medieval artillery launched through the atmosphere came from the mouth of the cannon turning round their own axis, they used to twist themselves perpendicularly to their axis, so deviating from the line of impulsion because of the asymmetrical frictional resistance. (Magnus effect).

So we start to inquire how (135) changes when instead of taking place inside the vacuum the movement occurs inside a fluid space having density (d_0) 10^{20} times less than that (d_A) of water, equal, that is, to the inverse of the number expressing in cm/sec. the square of light's speed C . or:

$$d_0 = \frac{K_0 d_A}{C^2} \quad (136)$$

Let's assume, first, that we are dealing with a sphere of mass (m) and of main surface (A), lacking any rotation motion; the frictional resistences then are symmetrical in regard to the trajectory run by its centre under the impulsion of the applied force F .

Resistance R due only to fluid medium's inertia when displaced by the sphere moving with speed V shall be (following classic fluid-dynamics laws):

$$R = \frac{K_0 d_A A V^2}{C^2} \quad (137a)$$

By the increasing of speed V , resistance R keeps on rising continuously till when its value becomes equal to the one of applied force F ; the sphere's movement then becomes uniform with limit constant speed C , and we can write:

$$F = \frac{K_0 d_A A C^2}{C^2} \quad (137b)$$

From ratio between (137)a and (137)b we obtain:

$$\frac{R}{F} = \frac{V^2}{C^2} \quad (138)a \quad \text{from which: } R = F \frac{V^2}{C^2} \quad (138)b$$

If the force F were (n) times bigger or smaller than the considered one, instantaneous resistance R would just as well be (n) times bigger or smaller; therefore (138)a and (138)b have general validity. Actually, multiplying numerator and denominator of (138)a by (n) , the value of the ratio remains unchanged.

Before reaching uniform motion, the sphere is evidently submitted to resulting force F_n such as:

$$F_n = F - R \quad (139)$$

which becomes, substituting for R its value given by (138)b:

$$F_n = F \left(\frac{C^2 - V^2}{C^2} \right) \quad (140)$$

Substituting for F its value given by (135), one has:

$$F_n = m a \left(\frac{C^2 - V^2}{C^2} \right) \quad (141)$$

Dividing both terms of the last equation by mass (m) we have:

$$a_n = a \left(\frac{C^2 - V^2}{C^2} \right) \quad (142)$$

which tells us that: « acceleration a_n acquired by the sphere by effect of opposing fluid's inertial resistance is not constant, but lessens by the increasing of body's speed V , until becoming null when the sphere reaches light's speed C ; consequently light's speed C stands as an impassable limit in regard to the surrounding medium ».

(141) can be also written as follows:

$$F_n = a \left(m - m \frac{V^2}{C^2} \right) \quad (143)$$

the mass (m_p) of fluid displaced by the moving sphere evidently is:

$$m_p = m \frac{V^2}{C^2} \quad \text{one will have: } F_R = a (m - m_p) \quad (144)$$

Consequently it follows that only when sphere's translation speed V is equal to the light's speed C , ($V = C$) the mass of the displaced fluid becomes equal to the body's mass ($m_p = m$), and force F_R becomes nul, as shown from (144).

So this conclusion can be drawn: a body impelled by some force accelerates until when the mass of the fluid displaced by it becomes equal to the mass of the body; this happens at light's speed C because of space's specific density.

It is then untrue that moving bodies increase their material masses, as believed by Einstein, but it is perfectly true that as a consequence of their rising speeds they increase the mass (m_p) of fluid displaced by them.

Logical and physical meaning of this conclusion appear evident if one considers that when body's mass (m) becomes equal to that (m_p) of the displaced fluid, any acceleration applied to the body is equal and opposite to displaced fluid's deceleration; opposite forces then result equal and annul each other. In this case one has:

$$m a = m_p a \quad (145)$$

The body then does not accelerate any more and keeps constant the attained speed C .

This way one finally succeeds in understanding why bodies can not overtake the speed of light in regard to the medium inside which they are moving. It is clear though, that even that limit speed, valued by a reference system moving opposedly to the body, will seem increased by a quantity equal to the relative speed between the system and the body.

Let's now assume (fig. 17) that the sphere referred to turns round its own axis with the same speed as light's, and besides undergoes speed V normal to that axis because of the force applied to it; the sphere then will be submitted to some frictional resistences asymmetrical in regard to the rectilinear trajectory, because on one side it meets the fluid medium with speed $C + V$, and on the other side with speed $C - V$. In other words, the sphere will be subjected

to Magnus effect, by which resulting force F_R given by (141) bends at a certain angle α from the direction of the applied force F towards the sphere rotation's versus; this angle α is given by the following

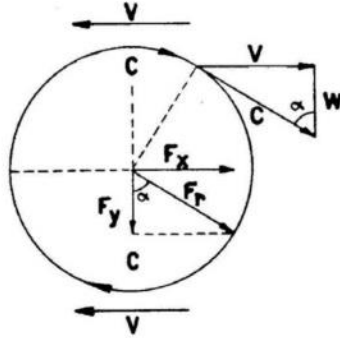


Fig. 17

relations, (after speeds and forces triangles' similitude sketched in fig. 17):

$$\sin \alpha = \frac{V}{C} \quad \cos \alpha = \frac{\sqrt{C^2 - V^2}}{C} \quad (146)$$

It follows that force's F_R components F_x and F_y (lying respectively in the direction of the applied force and on itsperpendicular one) are:

$$F_y = F_R \cos \alpha = F_R \frac{\sqrt{C^2 - V^2}}{C} \quad (147)$$

$$F_x = F_R \sin \alpha = F_R \frac{V}{C} \quad (148)$$

and substituting for F_R its value given by (140), one has:

$$F_y = F \frac{V^2}{C^2} \quad (149) \quad F_x = F \frac{V^2}{C^2} \frac{V}{C} \quad (150)$$

Posing $F_x = m a_x$; $F_y = m a_y$, bearing in mind (135), and dividing both terms of the last (149) and (150) by the mass (m), we have:

$$a_y = a \left(1 - \frac{V^2}{C^2} \right)^{3/2} \quad (151) \quad a_x = a \left(1 - \frac{V^2}{C^2} \right) \frac{V}{C} \quad (152)$$

which tell us that: « because of the asymmetry in regard to fluid space medium of frictional forces born during its rotation and translation movement, the sphere undergoes a longitudinal acceleration (a_x) different from the transversal one (a_y); both accelerations are functions of light's speed C and of relative speed V between the body and the surrounding fluid medium ».

Einstein, on the contrary, has found with his relativity the following formulas for longitudinal acceleration (a_x) and for the transversal one (a_y):

$$a_y = a \sqrt{\frac{C^2 - V^2}{C^2}} \quad (153) \quad a_x = a \left(1 - \frac{V^2}{C^2} \right)^{3/2} \quad (154)$$

which differ from (151) and (152) drawn from my theory.

It must be noted nevertheless that the resultant of the two perpendicular accelerations (a_x) and (a_y) as defined by me with equations (151) and (152) is just the diagonal of the parallelogram whose sides are the vectors representing the two component accelerations; the value of this resultant is given from Pythagora's theorem by the following:

$$\sqrt{a_x^2 + a_y^2} = a_n \sqrt{\cos^2 \alpha + \sin^2 \alpha} = a_n \quad (155)$$

which is in perfect harmony with vectorial quantities' classic composition as well as with Euclidean geometry.

Viceversa, the addition of the two accelerations (153) and (154) as postulated by Einstein leads to the equation:

$$\sqrt{a_x^2 + a_y^2} = a_n \sqrt{\cos^2 \alpha + \frac{1}{\cos^2 \alpha}} \quad (156)$$

which tells us that resulting acceleration (a_n) does not correspond any more to the diagonal of the parallelogram having as sides the

component accelerations, because the term under root on the second side of (156) is not equal to 1 (equal to the unity), as it happens for the corresponding term of (155) found by me.

For this reason Einstein was obliged to postulate a geometry in which Pythagora's theorem would result false.

In plain words, basic hypotheses of Einstein's theory are ruled by equations like (32) and (78) in open conflict with mathematics and algebra — or like (156) in full antithesis with geometry and cinematics; Einstein, instead of considering such conflicts as crucial evidences of the unsustainable nature of his hypotheses — and rejecting them, changed calcul's classic doctrines and fundamental putting in their place a pseudo-relativity (which breaks the general validity of Galilei's relativity) and a non Euclidean geometry — so that they could justify the mistakes and physical and mathematical absurdities above indicated.

This is an arbitre that, if accepted, would introduce in science endless erroneous conceptions, with corresponding endless cinematics and geometries suitable to justify them; it would not be possible any more, then, to ascertain which cinematics and geometry to choose in order to select the true from the false, the same way that it would be impossible to establish the course of a ship on the basis of innumerable compasses pointing to innumerable directions of Earth's magnetic pole. Science would be deprived of calculus, which is its most powerful tool for research and control, the most sure and severe sieve of any postulate and theory.

As a matter of fact, the postulate of light's constant speed, being in contrast with all mathematical branches as well as with all optical experiments does not fulfil any of the two essential conditions to be considered true; therefore it can not be acquired by official science because it would destroy all its possible basis; so it must be abandoned, to prevent its leading minds towards dead ends with enormous delay in the advancement of science.

It may be considered necessary to call on a test to decide on the validity of (151) or (153). The only experiment suitable for this purpose is that of Kaufman, accomplished by launching some electrons at considerable speeds inside a cathodic tube, and deviating them from their rectilinear trajectory lying along axis X towards the perpendicular direction by means of an electro-magnetic field (fig. 18). It stands out that the fall Y of electrons towards the attraction centre is subject to the known Galilei's equation:

$$Y = \frac{1}{2} a_v t_{vA}^2 \quad (157)$$

which tells us that the space Y covered during the fall depends at all from the mass of the falling body demonstrated with his celebrated experiments in the tower of Pisa; but it depends:

- from acceleration (a_v) impressed by the attraction field
- from time t_{vA} of the actual fall

All this in open opposition with what Einstein affirmed, that is, the independence of the electron's fall from its transversal mass.

For the verification we intend to do, it will be enough to introduce in (157) the value of acceleration and time as determined by space-dynamics, and then those determined by pseudo-relativity — and check which of the two theories gets confirmed by the result of Kaufmann's experiment.

Substituting in (157) the value of acceleration (a_v) found by me with expression (151), one obtains the distance covered by the electron during its fall, namely:

$$Y = \frac{1}{2} a \left(\frac{C^2 - V^2}{C^2} \right)^{3/2} T_{vA}^2 \quad (158)$$

The value expressed by (158) would be the one actually met, if no other relative displacements occurred between the electron and

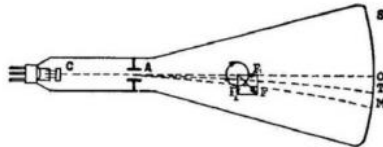


Fig. 18

the cathodic tube, but this isn't true, as the particle is subjected to Magnus effect while displacing itself from one end to the other;

because of Magnus effect the particle's trajectory bends in regard to the cathodic tube of angle α , whose cosine is given by (146).

It follows that time t_{yA} really needed by the electron during its fall is smaller than T_{yA} expressed by (158); in agreeance with the (97) it is then:

$$t_{yA} = T_{yA} \cos \alpha = T_{yA} \sqrt{\frac{C^2 - V^2}{C^2}} \quad (159)$$

Squaring the last expression one has:

$$t_{yA}^2 = T_{yA}^2 \left(\frac{C^2 - V^2}{C^2} \right) \quad (160)$$

Introducing the last value in (158) we obtain:

$$Y = \frac{1}{2} a \sqrt{\frac{C^2 - V^2}{C^2}} t_{yA}^2 \quad (161)$$

Well, Kaufmann's experiment has fully verified the validity of (161), and that is why my theory receives an unquestionable confirmation by that test.

On the contrary, substituting in (157) the value of acceleration (153) as given by Einstein's theory, one has:

$$Y = \frac{1}{2} a \sqrt{\frac{C^2 - V^2}{C^2}} T_{yA}^2 \quad (162)$$

In pseudo-relativity the time T_{yA} of a moving body is given by (76); squaring the value of (76) and remembering that $T = 2t_{yA}$ and $T_y = 2 T_{yA}$:

$$T_{yA}^2 = \frac{t_{yA}^2}{\frac{C^2 - V^2}{C^2}} \quad (163)$$

Substituting this value in (162) one obtains:

$$Y = \frac{1}{2} a \frac{t^2_{vA}}{\sqrt{\frac{C^2 - V^2}{C^2}}} \quad (164)$$

Now, this equation is in complete contrast with the result of Kaufmann's experiment which consequently does not establish a « crucial evidence » of his theory, as Einstein claimed, but on the contrary a sure denial of it.

Kaufmann's experiment then proves that: « *Electrons turn round themselves with light's speed C, and while transferring themselves along the ampulla undergo the Magnus' effect; which shows that the inside of the cathodic tube, though bereft of air, yet behaves as fluid space substantiated by constant density 10²⁰ times less than water* ».

From everything said above it ensues the experimental demonstration that the material mass of an electron as well as that of any moving body does not vary with the movement, nor takes different values along the two orthogonal directions, but remains unaltered. What varies however is the resultant acceleration a_n to which the mass is subjected; this acceleration, because of its bending from the applied force's direction, undergoes longitudinal (a_x) and transversal (a_y) values different from those unique constant ones directed alongside the applied force acceleration (a) which the body would receive if its atoms (of which it is made) did not turn round themselves, and if the movement took place in an empty space, as assumed in Newton's unreal hypothesis put at the basis of the dynamics founded by him.

Newton's dynamics fundamental equation (135) must therefore be replaced by space-dynamics equations (140), (149) and (150) which take into consideration actions and reactions between moving bodies and the ambient fluid medium.

Those quoted new expressions lead to a discovery of great importance: « *Mechanical forces, as well as the electro-magnetic ones, are proportional to accelerations dependant from light's speed C and varying with relative speed V between the bodies and the space fluid medium* » CVD.

Hence, there is no contradiction between mechanics and electro-magnetism, if one considers the space supplied with constant density.

The antithesis between Newton's second proportionality law

and that of Maxwell is owed to the fact that the first had been drawn from considering space empty, and the second, viceversa, had been drawn from electro-magnetic experiments accomplished in the real space, which has a specific density. Such conflict can not be conciliated by means of mere mathematical artifices, as here the matter is not of formulas, but of two opposite physical realities.

With this I want to stress, that:

- even admitting the mathematical mistake $C + V = C$, in homage to the postulate of light's constant speed, postulate which breaches the general validity of Galilei's relativity;
- even admitting that the motion has the inexplicable effect of dilating time and shrinking bodies, increasing their masses and making them acquire different values alongside the longitudinal and the transversal direction;
- even admitting the belie that the material has the unconceivable character of bending the empty space (namely the void).
- even admitting the conception of a hyperspace which, by having more than the three experimental dimensions (and those same non homogeneous among themselves because of their hybrid mixture with time) — reduced the picture of the world to an unreal and obscure abstracton of tensors (without however explaining phenomena and unifying fields);
- in spite of all that, it remains a fact that pseudo-relativity can not conciliate the conflict between dynamics and electro-magnetism because for this purpose a three-dimensional space is required also supplied with constant density (as shown by me), while all the hypotheses cited above originated and lean on the ether's repudiation namely on the belie of the empty space.

Besides, if one wished to be so anti-scientific as to pass blind fold over the numerous clefts and abysses of such contradictions and absurdities, and persisted in believing trustworthy the pseudo-relativity, asserting that it is the only theory which can give explanation of equivalence between material and energy, and from which can be drawn the pertaining equation:

$$E = m C^2 \quad (165)$$

one would utter two affirmations contrary to the truth.

..

Actually, the physical significance of that equation has remained in the dark for all scientists, including Einstein, (as openly declared by Oppenheimer at the 1955 Atom Convention of Geneva), who had not succeeded in making clear how so much energy could come out of motionless material, why such energy has an immaterial mass, and what light's speed C has to do with the material.

It is believed that that famous equation originates from transformation equations (77), which made Einstein think that the following relation exists between the mass (m_1) of a moving body and the one (m) of the same when motionless:

$$m_1 = \frac{m}{\sqrt{\frac{C^2 - V^2}{C^2}}} \quad (166)$$

But, if it is true that multiplying both sides of the last equation by C^2 when the body is motionless (speed $V = 0$), one obtains (165); it is not less true that multiplying also both sides of the same equation by acceleration (a) or by speed C , always when $V = 0$ one obtains the following relations:

$$F = m a \quad (167) \qquad I = m C \quad (168)$$

which would enable us to hold (with the same legitimacy) that the material is also equivalent to a force F , as well as to an impulse I , and not exclusively to an energy E , as believed by Einstein.

I wish here to point out that with Einstein's pseudorelativity one arrives till (166); to pass from (166) to (165) Einstein was obliged to introduce a postulate which does not ensue from his relativity, and which arrives to the absurd conception of considering that a motionless material can be equivalent to an energy, having an immaterial mass.

Actually, if mass (m) has no speed, it ensues $C = 0$, and putting this value in (165), we have $E = 0$.

On the other hand, if energy has no material mass, $m = 0$ and putting this value in (165), we have again $E = 0$.

Lastly, as we have already shown, the postulate of light's constant speed is not met in the universe therefore transformation equations (77), drawn by that postulate, are not reliable; neither it is

true that the material mass of a body increases when the body is in motion. Consequently, famous equation (165) must be drawn from quite different conceptions than those of pseudo-relativity.

Starting only from my theory's conception that all things of the Universe are uniquely made of fluid space having density C^2 times less than water, and consequently even the smallest granular particle of material consists of a sphere turning on itself with light's speed C in regard to the space fluid medium; one can attain to the famous (165).

In fact, multiplying and dividing the mass (m) of a proton by the square of light's speed, we can write, in full mathematical legitimacy:

$$m = \frac{m}{C^2} C^2 \quad (169)$$

Bearing in mind (136), we notice that mass (m_0) of fluid space, kept within the sphere bounding the proton in regard to the surrounding ambient:

$$\frac{m}{C^2} = K m_0 \quad (170)$$

where K is a dimensional constant equal to $1/K_0$.

Putting in (169) the value of (170), we have:

$$m = K m_0 C^2 \quad (171)$$

which leads us to this discovery: « *Proton's mass (m) is proportional to the product of mass (m_0) of fluid space contained in its volume by the square of light's speed C with which this space fluid's sphere turns on itself* ».

In order to demonstrate how I have arrived to (165), one must consider that proton mass (m) is plunged in the atom's nuclear sphere.

According to my theory, (fig. 19) atom consists of a small spheric field of rotating fluid space, which moves subdivided like an onion, in spheric concentric layers having constant thickness, and rotation speeds decreasing inversely to the square root of their radiuses. The atom, then, is formed like a miniature solar field; as all material's aggregation systems it must be subjected to the same mechanism

(independent of their size), in order to be ruled by the same law; because dynamics equations must not lose their general validity and must be available for all masses, independent of their sizes;

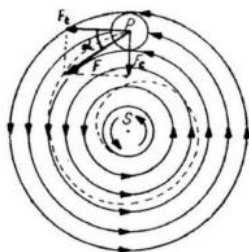


Fig. 19

because material obeys the same laws; finally, because such conditions are necessary to attain the unitarian science which rules the Universe. (fig. 20).

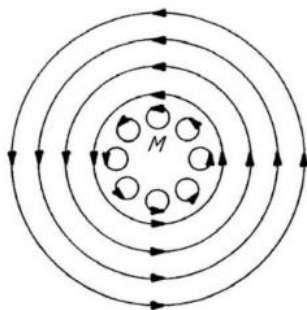


Fig. 20

Bearing this in mind, one soon realises that the proton of mass (m) plunged in the spheric layer which forms the border of atom nucleus, getting pushed by the stream of fluid space turning in that layer, acquires revolution speed W ; thus its cinetic energy E shall be:

$$E = \frac{1}{2} m W^2 \quad (172)$$

Calling the distance between proton and nucleus' centre (r), and the number of revolution turns accomplished in one second (n) speed W is given by:

$$W = 2 \pi r n \quad (173)$$

Now, the nucleus' radius of radioactive atoms results $r = 2.10^{-12}$ cm.

The number of turns (n) is equal to frequency of gamma rays emitted by the nucleus, namely $n = 3,36.10^{21}$. Introducing then these values in (173), one has:

$$W = 2 \pi \times 2.10^{-12} \times 3,36.10^{21} = 42,4.10^9 = 1,41 \times 3.10^{10} \quad (174)$$

But, being $1,41 = \sqrt{2}$, and $3.10^{10} = C$ (Speed of light in cm/sec.), we have:

$$W = \sqrt{2} \cdot C \quad (175)$$

Substituting this value in (172), one obtains:

$$E = m \frac{(\sqrt{2} \cdot C)^2}{2} = m C^2 \quad (176)$$

which last, though having been drawn from my space-dynamic theory which is in perfect harmony with Galilei's classic relativity, identifies itself completely with the famous (165), whose physical meaning stands this way very clear.

The (176) actually discloses that: « *The energy of a nuclear proton's mass (m) is of cinetic nature and is owed to the fact that the proton, pushed by the fluid space's turning stream of the nucleus' last layer where it is plunged, winds round the atom's centre with speed 1,41 times greater than that (C) of light* ».

This result is in contrast with the postulate of light's constant speed, since this postulate implies that no existing body can have a speed higher than light's. The experimental verification of (165) then does not establish the most perfect confirmation of Einstein's relativity, but on the contrary supplies its most astounding denial.

If we now accept that in any atom's nucleus there are (n) protons

of mass (m), and (n_1) neutrons of mass (m_1), we know that the total mass M shall be:

$$n m + n_1 m_1 = M \quad (177)$$

Since each of these particles has a revolution speed $W = \sqrt{2} C$ total energy (E_t) contained inside the nucleus shall be:

$$E_t = M C^2 \quad (178)$$

This equation tells us that: « *Energy possessed by a motionless body is equal to the sum of internal revolution kinetic energy of all particles forming each of its atoms, multiplied by the number of atoms constituting the same body* ».

Substituting in (176) the value of mass (m) as given by (171), one has:

$$E = m C^2 = K m_0 C^4 \quad (179)$$

which discloses that: « *Kinetic energy of a proton coming out from a nucleus is equal to the product of its mass (m) by the square of light's speed (C); it is also equal to the product of mass (m_0) of fluid space constituting the proton's sphere by the fourth power of light's speed* ».

A proton springing from nucleus is then supplied with the enormous amount of energy given by (165), because it is launched from the atom with speed W which is 1,41 times bigger than that of light's speed impressed on it by the atom's spinning fluid field, which behaves like a cyclotron. Atoms of radio-active substances are an experimental confirmation of our discovery.

If the proton sprung from the atom meets other particles and delivers to them all its energy gained from its translation movement, it stops; but its material mass does not null itself, as inside it still remains the internal kinetic energy expressed by (171) and caused by the spinning movement of fluid space spheric layers by which it is made.

In such conditions, if the proton contacts an anti-proton, their oppositely spinning fields brake each other's course till when they end up motionless, like the surrounding fluid space from which then they stop distinguishing, thus losing their granular individuality; the annullment of protons' fields also nullifies the centripetal fluidynamical force which kept their peripheral neutrins bound to protons' centre, so that those particles are thrown through space with light's speed.

The collision between a proton and an anti-proton hence has the consequence of destroying the two corpuscles and emitting the kinetic energy corresponding to the one owned by the ejected neutrins — as it has been experimentally confirmed.

The conception of anti-material, introduced by Dirac in order to explain the last result, is therefore absurd, since both particles and anti-particles are material little spheres differing only in this, that they spin oppositely.

Likewise the conception that anti-proton has a negative mass (as ensuing from pseudo-relativity), is completely negated.

From what we have demonstrated above the following discovery follows: « *A particle or an anti-particle, motionless outside the atom and lacking any translation speed (C), does not own the energy expressed by (165), but only the energy expressed by (171) due to rotation movement of fluid space spheric layers constituting them. If even this rotation movement stops, the corresponding internal kinetic energy annuls, but still remains the material mass (m_0) of motionless fluid space filling the volume of the considered particle, which is indestructible. Fluid space, ultimate material constituting all things, is not energy except when enlivened by motion* ».

Granular material, its attracting, or alternative fields all consist of spinning or oscillating motions of fluid space; hence energy's various forms aren't other than various sensitive shapes of kinetic energy, the only reality existing in the objective phenomenonic world.

Famous equivalence (165) then is well explained and only attainable by the admission of the internal kinetic energy of each particle, (namely of fluid space of which it consists) and the external kinetic energy due to their revolution movement; this all in accordance with Leibnitz' live force equation formulated in 1700 and with no recourse to pseudo-relativity, which is unsuitable for the purpose.

CHAPTER IX

CENTRE-MOVED FIELDS OF ATTRACTION

On the ground of the analytical and experimental demonstrations above shown many people have repudiated the restricted pseudorelativity, but some do not yet make up their minds to recant the general one (which postulates the equivalence between inertia and gravitation) because of the conviction, that

bodies' weight, is due to the relative acceleration between them and the Earth, just like the pressure towards the bottom felt by the passenger of a lift in the instant when the lift pulls up, pressure which the passenger can interpret as a floor's attracting force.

On this subject too, then, ideas must be clarified. As gravity appears in all points of our globe, the last should dilate with acceleration (g) towards all radial directions, but there is nothing indicating that. It is necessary then to admit that it is the bodies which accelerate towards the Earth — and not viceversa. When bodies contact the ground, their relative acceleration is nul; so one is bound to admit as shown in my theory that the force which pulls them to the Earth is caused by a fluid, which, turning round the Earth, produces in them a centripetal pressure with the effect of making them fall and then keeping them pressed to the ground.

Einstein, having repudiated ether and acknowledged the vacuum, could neither explain gravity with such principle nor in any other way.

Actually, he was obliged to postulate that the effect of a mass, like the mass of Sun, is that of producing in the time-space some camberings which would serve as rails for the running planets already endowed with an indistructable movement, namely of perpetual inertia. This is the same as saying that the planets move by themselves. Then, quite naturally, some questions arise: How is it possible that the empty space, meaning the void, can bend and can also offer some resistance to the centrifugal forces that moving bodies develop running curved trajectories? Why should material have the strange property of bending space? Who gave movement to celestial bodies?

The other objection against general pseudo-relativity as unitary science is that it stands in clear contrast with Plank's theory, as the first is based on the assumption that the forces of astronomical fields vary with continuity from one point to another, whereas the second postulates instead the discontinuous structure of atomic field as well as of its forces.

It is then necessary to demonstrate here that my theory, while displaying and harmonising the nature of the involved forces both of the astronomical fields and of the atomic ones, draws the laws common to them perfectly matching the laws found by experimental observation.

To this purpose I point out that I gave my theory the name of

« *space-dynamics* » not only because it shows that all physical phenomena are one with fluid space particular movements; but also because all dynamic quantities and their variations have been expressed by means of spacial coordinates. So, for instance, spaces, speeds, acceleration, revolution and rotation times of masses plunged in centro-moved fields of fluid space have all been expressed by means of distance (R) between the planet and the field's centre. This enabled me to resolve with elementary algebra and geometry, problems which so far have required infinitesimal and tensorial calculus; this way an enormous analytical simplification, as well as a clear phenomena' understanding and wide possibility of new syntheses has been attained; all this in the third millennium will succeed in bringing the scientific knowledge at present taught in the Universities to the easy assimilation of secondary school pupils.

After this, I am going to demonstrate how space-dynamics is suitable to explain the mechanism and the laws of attractive fields from the atoms to the stars.

These fields are all made of a fluid space sphere which moves subdivided like an onion in spheric concentric layers having constant thickness and rotation speeds subjected to the areas' law drawn from fluído-dynamics which can be written as follows:

$$\frac{2 \pi n R^2}{T} = K \quad (180)$$

where (R) indicates the layer's radius, (T) the time's lapse taken by one layer to accomplish a full revolution around its centre, and (n) the number of revolutions which following layers must fulfil in order to comply to the areas' law (180).

From hydraulic experiments made by me it results that angle Θ drawn by successive layers is inversely proportional to the square root of their radiuses, or:

$$\Theta = 2 \pi n = \frac{K_1}{R^{1/2}} \quad (181)$$

Placing this value in (180) and putting $K_1 : K = K_2$, one has:

$$T = K_2 R^{3/2} \quad (182)$$

Squaring (181) and putting $K_1^2 = K_3$, one finds the equation of trajectory run by a planet plunged inside the field, namely:

$$R \theta^2 = K_3 \quad (183)$$

The centripetal acceleration (a_c) of a fluid space field point turning round the Sun with speed V at distance R from the field's centre shall be:

$$a_c = \frac{V^2}{R} = \frac{4 \pi^2 R}{T^2} \quad (184)$$

Replacing in the last equation the value of time T expressed by (182), and putting $4 \pi^2 : K_2^2 = K_4$, we shall have:

$$a_c = \frac{4 \pi^2 R}{K_2^2 R^3} = \frac{K_4}{R^2} \quad (185)$$

Force F_1 exerted by the fluid space against planetary mass (m_1) plunged in it, thus pushing the same mass towards the Sun, is given by:

$$F_1 = \frac{K_4 m_1}{R^2} \quad (186)$$

For the same reason force F_2 exerted by the fluid space field turning round the Earth against the Sun's mass (m_2), thus pushing the Sun towards the planet, shall be:

$$F_2 = \frac{K_5 m_2}{R^2} \quad (187)$$

Equalizing (186) to (187) in accordance with the principle of equivalence between action and reaction, we have:

$$k = \frac{K_4}{m_2} = \frac{K_5}{m_1} \quad \text{from which} \quad K_4 = k m_2 \quad (188)$$

Placing this value of K in (186) one has:

$$G = k \frac{m_1 m_2}{R^2} \quad (189)$$

Formulas (186) and (187) tell us that: « *Gravity is not a mysterious force of attraction emanated by solid masses through the surrounding vacuum, but a force of centripetal pressure exerted by the rotating fluid-dynamic field on masses plunged in it* ».

Speed V with which each layer accomplished one single full revolution round the field's centre is easily found by putting in (180) $n = 1$, and substituting time T with its expression given by (182), namely:

$$V = \frac{2 \pi R}{T} = \frac{2 \pi R}{K_2 R^{3/2}} = \frac{K_0}{R^{1/2}} \quad (190)$$

in which one has put $2 \pi / K_2 = K_0$.

The formal identity between (190) ascertained in the solar field and (4) ascertained in the terrestrial one tells us that: « *Each material mass, from electron till galaxies nucleus, is at the centre of its own spheric field of rotating fluid space; this field moves subdivided like an onion in concentric spheric layers having constant thickness and rotation speeds inversely proportional to the square root of their radiuses* ».

Bearing this in mind, and remembering that with (171) we have demonstrated that proton's mass (m) forms when the fluid space sphere constituting its volume spins on itself with light's speed C, one adds to this the following discovery and unification: « *Each grain of material and its surrounding field are made of the same substance, both being movements of spheric layers of fluid space rotating on themselves at great speed in regard to the motionless fluid space ambient* ».

Dividing both sides of (180) by (R), and squaring them, we obtain the expression of cinetic energy E which the stream of rotating fluid space of each layer can give the mass (m_1) plunged in it, namely:

$$E = \frac{m_1 4 \pi^2 n^2 R^2}{T^2} = m_1 \frac{K^2}{R^2} \quad (191)$$

Consequently, if the planetary mass (m_1) displaces itself from one spheric layer (N_1) having radius (R_1) into another (N_2) having

a bigger radius (R_2) (or viceversa) — gives (or receives from) the field the corresponding variation of cinetic energy ΔE expressed by the following relation:

$$\Delta E = m_1 K^2 \left(\frac{1}{R_1^2} - \frac{1}{R_2^2} \right) \quad (192)$$

As the thickness of each layer is constant, we can put it equal to (R_0). Then, calling N the progressive number of concentric layers, the radius of any of them shall be:

$$R = R_0 N \quad (193)$$

Introducing this value in (192) one has:

$$\Delta E = \frac{m_1 K^2}{R_0^2} \left(\frac{1}{N_1^2} - \frac{1}{N_2^2} \right) \quad (194)$$

Dividing the last by $h = m_1 2 \pi K$, one has:

$$\frac{\Delta E}{h} = \frac{K}{2 \pi R_0^2} \left(\frac{1}{N_1^2} - \frac{1}{N_2^2} \right) \quad (195)$$

Giving to K its value of (180), for the layer having radius R_0 equal to the one of the atom's nucleus, and considering that for one single full revolution it is $n = 1$, one has:

$$K = \frac{2 \pi R_0^2}{T_0} \quad (196)$$

Introducing this value of K in (195) one has:

$$\frac{\Delta E}{h} = \frac{1}{T_0} \left(\frac{1}{N_1^2} - \frac{1}{N_2^2} \right) \quad (197)$$

Since number (n_0) of revolutions divided by time (T_0) is equal to frequency (ν_0) we can write:

$$\nu_0 = \frac{1}{T_0} \quad (198)$$

Introducing this value in (197) we obtain frequency's variation ($\Delta\nu$) an electron undergoes when displacing itself from one layer to another, namely:

$$\Delta\nu = \frac{\Delta E}{h} = \nu_0 \left(\frac{1}{N_1^2} - \frac{1}{N_2^2} \right) \quad (199)$$

This equation tells us that: « *When one particle launched at great speed collides with an atom's spheric field, the blow causes some planetary electrons to pass from one layer to another of atom's fluid field; this passage causes a variation of their revolution speeds, and consequently variation of their centrifugal forces, which make the atom's baricentre oscillate, thus producing some oscillations inside the fluid space ambient which spread themselves in all directions with the frequency given by (199).* »

Therefore those oscillations are not either electric or magnetic, or luminous, or acoustic waves, but waves of fluid space which only when hitting our sensorial organs produce in them some currents of electrons; these currents, transmitted to the brain by means of the nervous lines give rise in our psyche to the feelings of force, electricity, light, heat etc., according to their own particular frequencies.

We can then sum up as follows: « *The material, its fields of attraction forces as well as the oscillating ones aren't other than rotating or oscillating movements of fluid space.* »

From the formulas drawn in this Chapter we can take the following certainties:

From (183) we discover that: « *In regard to a triad of coordinated axes anchored to the centre of a field of rotating fluid space, the trajectory run by a periphtric mass plunged in the field is made of two opposite and symmetric branches of a spiral. Actually, the mass approaches or wanders away from the field's centre according to whether its centrifugal force is smaller or bigger than the centripetal one belonging to the rotating fluid of the layer where the mass has been plunged. The mass displaces itself from* »

the apbelion to the peripbelion, which are the double points where the two symmetric and opposite branches of the spiral meet. If the revolution speed of the mass is such that its centrifugal force stays always below the fluid's centripetal one, the palanetary mass falls on the mass placed at the field's centre, following the centripetal branch of the spiral. If on the contrary the centrifugal force of the mass remains always bigger than the centripetal one of the field rotating fluid space, the planetary mass swerves away towards the infinite following the opposite centrifugal branch of the spiral».

In my works [1], [2], [3], I have demonstrated that electrons rotating round the atom's nucleus, planets rotating round the Sun, stars rotating round the centre of a galaxy, and bodies falling on the Earth, all follow the spiral curve determined by equation (183). Fig. 21-22.

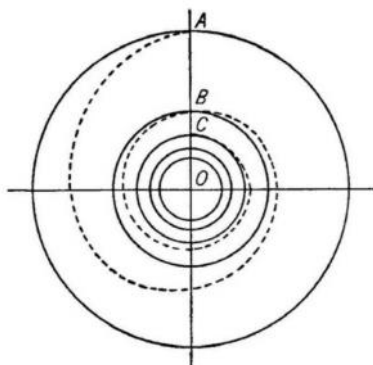


Fig. 21

It is also unified in this way the form of trajectory followed by any masses plunged inside the central fields. These fields, having the same structure and dynamics, could not — as believed till nowadays — push along different trajectories bodies differently shaped.

The first Kepler's law must therefore be replaced by the one which we have just enunciated.

The (180) tells us that: « *The areas covered during equal times by the vector radius joining the Sun to the planet — are equal* ».

(182) tells us that: « *The squares of planets' revolution time are proportional to the cubes of radiuses of successive concentric layers where they are plunged* ».

The (189) tells us that: « *The force by which the planetary peripheric mass is pushed towards the central mass is proportional to both masses and inversely proportional to the square of their reciprocal distances* ».

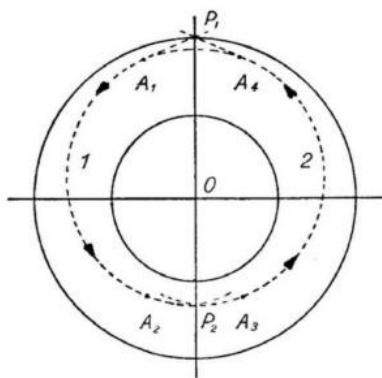


Fig. 22

(194) tells us: « *The electron, while passing from one layer to another, undergoes a variation by steps (ΔE) of kinetic energy, because this variation is inversely proportional to the squares of successive layers, radiuses which vary by steps because of the constant thickness of the same layers* ».

(199) tells us that: « *Frequency's variation ($\Delta \nu$) of the wave emitted by an atom when an electron displaces itself from one layer to another is given by the ratio between the energy's variation (ΔE) and Planck's constant (h); the last is equal to areas' constant K multiplied by 2π times the electron's mass (m).*

The astronomic laws of Kepler (180) and (182), that (189) of Newton, and the atomic ones (194) and (199) of Bohr are therefore deducible by calcul only if starting from the space-dynamics conception of fields.

In order to understand well how it happens that a mass plunged inside a rotating fluid stream is not only dragged into a revolution movement round the field's centre, but also into approaching or wandering away from it, it is necessary to take into consideration that the planetary mass spinning on itself and also overrun by a fluid stream is subject to Magnus' effect; consequently the fluo-dynamic force F which pushes it is bent (as we have demonstrated

in Chapter VIII) at an angle $\delta = (90 - \alpha)$ in regard to the vector radius joining it with the field's centre. (fig. 19).

Resultant force F then decomposes in two forces F_r , and F_c expressed by (147) and (148); the first of them pushes the mass into the revolution movement round the field's centre, while the second drives it towards, or away from the same centre. Taken into account that the value of force F_c is given by (147), I have demonstrated that while the planetary mass runs the trajectory along the spiral's two opposite and symmetric branches, the spiral spins slowly and continually on its own pole.

This result is confirmed by the displacement of atomic electrons' perihelion, which originates the multiple rays observed by Sommerfeld and by the slow displacement of Mercury's perihelion. Both phenomena are then caused and explained by Magnus' effect in agreement with Galilei's relativity; consequently those phenomena too belie Einstein's theory.

I wish to state here that in the atomic fields the space concentric layers, having different rotation's speeds, create among themselves, by curling up, the rotation of small spheres of space which are the planetary electrons. These last, rolling without sliding between two layers having different speeds, (like planetaries of a differential bearing), run a revolution movement round the central nucleon with their axis more or less bent on the equatorial plane of the central moving field. It ensues that such electrons are subjected to the Magnus' effect, and consequently undergo the push of resultant force (R) having three components: component F_x directed towards the field's centre, which balances the centrifugal force caused by the electron's revolution movement; component F_y tangent to the field's circular lines, which brings forth and keeps going the electron's revolution movement; component F_z lying along a direction normal to the first two.

Force F_x , which drives the electron against the nucleus, acting like the force of gravity, and therefore identifies with it; force F_y producing the electron's revolution movement equivalent to an electric current identifies itself with the electro motive force; third component F_z , directed perpendicularly to the other two, coincides with the magnetic force which appears at the electron's rotation poles. (Fig. 23).

It is this way revealed that three forces: gravitic, electric and magnetic are of the same physical nature, being the orthogonal

components (due to Magnus' effect) of space-dynamic force, the only one ruling the material from atom to stars.

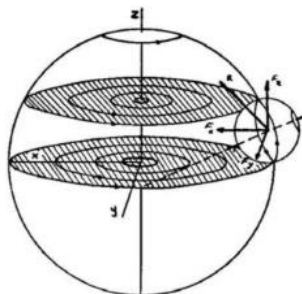


Fig. 23

I have been able to determine the mathematical relations inter-current between the three forces gravitic, electric and magnetic which depend from the fluido-dynamic one, obtaining this way physical and analytical unification of the three mysterious fields into the single space-dynamic field, the unique one to be found in the objective world [4].

By means of a series of systematic tests accomplished at the Centre for Studies and Experiments of Army Engineering I could ascertain that a spinning sphere plunged in the middle of a tank full of water gave rise in the liquid to a central moving field which pushed the spinning spheres placed at its periphery in to revolving round it following the law of planets' movement round the Sun and that of electrons round the nucleus.

I could also ascertain that the central sphere attracted one of the peripheric ones with a force proportional to their masses and inversely proportional to the square of their reciprocal distances in perfect harmony with Newton's gravitation law (expressing the value of the force by which two fragments of whatever material attract each other) and with Columb's law (expressing the force by which two electric and magnetic masses attract each other).

Attraction force results proportional to the product of spinning speeds with the revolution speeds of the peripheric mass.

The description and results of such experiments are reported in my books listed at the beginning of this pamphlet.

CONCLUSION

After what I have reported, it appears demonstrated, both analytically and experimentally that:

1 — *Space is not empty, but is a material substance mobile like a fluid, supplied with a three dimensional extension and with a density 10^{20} times less than water's.*

All things in the Universe are composed of this unique substance, invisible, continuous, primordial but dynamically active.

Certain particular sets of fluid space spheric concentric layers, having constant thickness and rotating speeds decreasing inversely with the square root of their radiuses, form the nuclear particles, atomic and astronomic systems as well as their attraction fields.

Fluid space undulatory movements, on the contrary, and only when lapping our human bodies, cause the oscillators of one or the other of our sensory organs to enter in to resonance according to their intensity and frequency. The currents of electrons thus arisen are broadcast to the brain through the nervous lines, producing in our psyche (and exclusively in it) the corresponding feelings of force, light, electricity heat, sound, odour, taste, etc.

One unique objective reality, the motion of fluid space, is the constituting of the material, its attraction and oscillating fields and all other physical phenomena. (Uniphenomenic principle of objective world).

The various different characters that material, inertial force, mechanic impulsion, cinetic energy seem to own in themselves, are the corresponding immaterial sensations arisen in our psyche by each of those four objective realities. (Polyphenomenic principle of subjective world).

2 — *The Sun is at the centre of a huge spheric field of rotating space which moves subdivided like an onion in concentric spheric layers supplied with constant thickness and having rotation speeds inversely proportional to the square root of their radiuses.*

The Earth too is at the centre of its own smaller planetary rotating field, plunged at the periphery of the bigger solar one.

The solar layers of fluid space among which our planet is plunged have an average rotation speed of $V_n = 60 \text{ km./sec.}$ This stream hits the planetary sphere and drags it round the Sun with the Earth placed in its centre, at the average revolution speed of $V_v = 30 \text{ Km/sec.}$ The relative speed of solar stream in regard to our planet has the value $V_n = 30 \text{ Km/sec.}$

The planetary field of fluid space at the Earth's surface, spins at the average speed of $9,335 \text{ Km/sec.}$; this speed varies according to the latitude angle.

3 — *General validity of Galilei's relativity, as well as light's astronomical aberration, and the result of experiments by Michelson and Miller are conciliable among themselves and explainable both physically and analytically only admitting the truth of the above number 2.*

4 — *All nuclear particles are made of the same material, being spheres of fluid space spinning on themselves at an average speed $1,41$ times bigger than that of light in regard to the space fluid medium.*

5 — *The proton's mass (m) is proportional to the product of mass (m_0) of fluid space contained in its spheric volume by the square of light's speed (C).*

6 — *The energy owned by the mass (m) of a nuclear proton is of cinetic nature. This energy is due to the fact that proton, pushed by the rotating fluid space stream of the last nucleus' layer where it is plunged evolves round the atom's centre with a speed $1,41$ times bigger than that of light C .*

7 — *The cinetic energy of a proton leaving the nucleus is equal to the product of its mass (m) by the square of light's speed C , ($E = mC^2$); this energy is also equal to the product of mass (m_0) of fluid space constituting the proton's sphere by the fourth power of light's speed C , ($E = m_0 C^4$).*

8 — *The energy owned by a motionless body is equal to the addition of internal rotation and revolution cinetic energy of all the particles consti-*

tuting each of its atoms multiplied by the number of atoms constituting the same body.

9 — A particle, or an anti-particle motionless outside the atom, having no translation speed (C), does not own the energy ($E = mC^2$), but only the internal energy ($E_0 = m_0C^2$) caused by the rotation movement of fluid space spheric layers of which it is made. If even this movement stops, the corresponding internal kinetic energy becomes nul; the space sphere constituting the particle, become motionless like the surrounding space, does not distinguish from it any more and loses its granular individuality together with all physical and chemical properties.

10 — Each material mass, from electron till galaxies' nucleus is at the centre of its own spheric field of spinning fluid space, which moves subdivided like an onion in concentric spheric layers having constant thickness and rotation speeds inversely proportional to the square root of their radiuses. These fields are ruled by the same laws, which are confirmed by those drawn by astronomical observation and experiments made on the atom, its nucleus and its particles.

11 — In regard to a triad of coordinate axes anchored at the centre of a spinning field of fluid space the trajectory run by the periphelic masses plunged in the field consist of the two opposite and symmetric branches of a spiral characterized by the equation: $R\Theta^2 = K$. Indeed the mass goes nearer or farther from the field's centre according to whether its centrifugal force is smaller or bigger than the centripetal one belonging to the rotating fluid of the layer where the mass is placed; the mass displaces itself from the apbelion to the perihelion, the double points where the two opposite and symmetric branches of the spiral meet. If the mass' revolution speed is such that its centrifugal force stays always below the fluid's centripetal one, the planetary mass falls on the mass placed at the field's centre, following the centripetal branch of the spiral. If on the contrary the mass' centrifugal force remains always bigger than the fluid's centripetal one, the planetary mass swerves away toward the infinite following the opposite branch of the spiral.

12 — The electron, while passing from one layer to another, undergoes a variation by steps (ΔE) of kinetic energy because this variation is inversely proportional to the square of successive layers' radiuses, which vary by steps because of the constant thickness of the same layers.

13 — *Frequency's variation ($\Delta\nu$) of the wave emitted by an atom when an electron displaces itself from one layer to another is given by the ratio between the energy's variation (ΔE) and Plank's constant (h); the last is equal to areas' constant K multiplied by 2π times the electron's mass (m).*

14 — *A planetary mass spinning on itself and plunged at the periphery of a rotating field is subjected to the Magnus' effect; consequently it undergoes the push of resultant force F_n which has three components: the first F_x , centripetal, which coincides with the force of gravity; the second F_y , tangent, which drives the mass into accomplishing its revolution round the field's centre; and the third F_z which identifies itself with the magnetic force which appears at the mass' rotation poles.*

It is this way revealed and demonstrated that the three forces: gravitic, electric and magnetic are not mysterious entities of different physical nature, but are of the same kind, being all three the orthogonal components (due to Magnus' effect) of space-dynamic force, the only one ruling the material from atom to stars.

15 — *Any variation of a body's speed left to itself can be regarded as caused by streams of fluid and dense space which, decelerating against the body, drag it into following their trajectories, and by means of their waves make it oscillate; otherwise that variation can be regarded as caused by continuous or alternate forces of mysterious nature emanating from a mass, of genesis and structure unknown, propagating through the vacuum, attracting or causing the bodies to oscillate — as though they had been plunged in gravitic, electric, magnetic, thermic, luminous etc. fields. (Alternative of mathematical laws' equivalence).*

16 — *Since the unique reality of physical objective world is the movement of fluid space, the real cause of bodies' acceleration is that indicated as first alternative at point N. 15. The mysterious manifestations of forces, gravity, light, electricity, heat, sound, odour, taste are not to be found in the objective world, because they are real sensations exclusively arisen in our psyche, when the space's movements hit our senses' organs.*

17 — *By means of 10 equations of psycho-physic equivalence generalising Newton's inertia's law ($F = ma$), I have demonstrated the correspondence between material's decelerations against our human body and the various feelings arisen in our psyche, revealing that it is not only the force which is equal to the product of mass and acceleration, but also all the af-*

resaid other sensations (S), which are equivalent to this product ($S = m a$) (Principle of psychophysical equivalence).

18 — The resultant speed of light is the vectorial addition of constant speed C of its wave's propagation in the fluid space and speed V of this same medium which carries it.

19 — The speed of light is not constant in regard to any reference system, but varies according to the relative movement of each system in regard to the fluid where the transmission occurs.

20. — The space covered by an optic perturbation and the speed with which it has been run, undergo an equal variation while passing from one reference system to another; the value of such variation depends from the relative speed between the reference system and the speed of the system where the propagation occurs.

21. — The time needed by an optic transmission in order to cover the distance between two points fixed on a certain system remains unchanged even if computed in regard to any other system however moving in respect to the first, as unchanged also remains the time in which any other physical phenomenon occurs. Time is not a dimension relative to the chosen reference system, but a dimension absolute in the whole Universe.

22. — Inside the same system, light's speed varies according to the angle between the considered propagation direction and that of translation of the fluid space stream which hits the system.

23. — An optical transmission, in order to cover equal distances placed on two differently moving systems needs different times. (Local time for phenomic development).

24. — If an observer approaches or leaves a luminous source the wave's length of the ray he receives remains unaltered, while the frequency of the oscillation varies in regard to him.

25. — A light's ray when going perpendicularly across a rectilinear or a circular fluid space stream is carried parallel to itself with the stream's speed V , so that the motionless observer placed on the verge opposit the luminous source shall receive the ray bent against the stream's direction at a certain angle α ; the sinus of this angle is given by the ratio between the stream's speed V and the propagation speed C of the leaning ray. The speed

with which the ray goes perpendicularly through the stream results consequently inferior to that C of the wave's propagation and equal to $W = C \cos a$.

26. — The rays of the stars, before reaching us and while passing through the fluid space stream which drags our planet round the Sun, bend at an angle, the sinus of which is determined by the ratio between the relative speed of the stream in regard to the Earth (30 Km/sec.) and the propagation speed of the luminous wave (3.10^5 Km/sec.). The terrestrial observer receives the ray leaning towards the stream's direction and to him the speed with which the ray has crossed orthogonally the stream becomes $W = C \cos a$.

27. — Astral rays passing near and on the sides of the Sun before reaching us undergo a double angular deviation while crossing both the solar and the terrestrial fluid space rotating fields; the sinus of such angle is determined by the ratio between the addition of rotation speeds of the said fields (2,463 Km/sec.) and that of light (3.10^5 Km/sec.).

28. — The luminous rays going across motionless transparent substances undergo the deviation at an angle the cosinus of which is equal to the ratio between rotation speed (V_a) of fluid space fields constituting the atoms of that substance and that C of light. The speed with which the ray passes across the transparent medium results $u = C \sin a$. The speed of rotating atomic fields is determined by $V_a = C \cos a$.

29. — If a light's ray goes through a transparent substance moving with speed V along the same direction and versus the speed with which the ray is dragged is given by $V_r = C \sin \alpha + V \cos^2 \alpha$.

30. — Kaufmann's experiment demonstrates that the airless space inside a cathodic tube is supplied with constant density 10^{20} inferior to water's, that electrons spin on themselves with light's speed and are subjected to Magnus' effect; consequently, any other fragment of material being composed of particles spinning on themselves, undergoes the same effect.

31. — Newton's second law, by which the masses take accelerations proportional to the applied forces and directed along the same forces' direction, is in conflict both with physical reality and with electro-magnetism's laws because: first, it is based on the hypothesis (contradicted experimentally) of an empty space; second because it takes into consideration only bodies' inertia, neglecting the reactions of the medium through which the bodies move;

such reactions cause the alteration of bodies' acceleration and make them deviate from the applied force's line of action.

Therefore mechanic's second law of proportionality must be replaced by the (140), (149), (150) drawn from space-dynamics; the last takes into consideration both the physical reality that space has a density 10^{20} times less than water's and the inertial and frictional forces of this fluid which favour or oppose the bodies' movements.

The new laws tell us that because of the fluid medium's inertial resistance the force applied to a body causes it to undertake a resultant acceleration (a_n) which depends from the light's speed (C) and from the relative speed (V) between the body and its surrounding fluid space; because of lack of symmetry of the friction developed in the rototranslatory movement of atomic nucleuses constituting the body, the body itself is subjected to Magnus' effect; hence the resultant acceleration (a_n) deviates from the line of action of the applied force and acquires the longitudinal value (a_x) and the transversal value (a_y) differing from each other.

32. — When a body gets pushed into motion by a force, the inertial and frictional force of the surrounding fluid space (opposing the movement) increase, lessening in the meantime the acceleration of the body, until there is no more acceleration when those resistences become equal to the applied force; this happens when the mass of fluid space becomes equal to that of the body, namely when their speeds are both equal to light's speed C .

33. — The energy obtained by material's disintegration identifies itself with the internal kinetic energy already owned by the material because each of its particles consist of central moving fields of fluid space supplied with constant density; these fields spin on themselves at a speed 1,41 times bigger than light's and with the same speed they revolve also round the nuclear centre.

The 38 fundamental aforesaid principles are experimentally proved true: by light's astronomical aberration; by the results of experiments by Michelson, Morley, Picard, Sthael, and Miller; by the displacement of astral rays passing near the Sun; by the refraction angle light undergoes when passing through transparent mediums; by atoms' and Mercury's periphelion displacement; by the decisive three experiments accomplished by me; by Doppler's, Fizeau's, and Kaufmann's effects; by the energy released by the atomic bombs; by energy's variation by steps in the passage of an electron from one layer to another of atomic field; by the attained

compounding of dynamics laws with those of electro-magnetism; and by the fact that they lead (by means of space-dynamics) to explain quantitatively and physically all phenomena in perfect harmony with mathematics, algebra, Euclidean geometry and with the general validity of Galilei's relativity. Consequently all theories in antithesis with the above related 33 principles must be rejected as belied by the aforesaid experimental responses and in clear contrast with classic sciences.

The wide range of experimental and analytical demonstrations exposed in this pamphlet is soon outlined when one considers that they allow the elimination of all antitheses introduced in modern physics by erroneous conceptions, thus resolving its present crisis; those demonstrations, confirming the existence of a single material substance substratum of all things in the Universe, have made possible the elaboration of that unitary cosmic science which has been man's aspiration for centuries.

On the secure ground of these experimental and analytical results I have been able to demonstrate that all objective physical phenomena aren't other than particular movements of fluid and dense space. This way I have unified all experimental sciences in a single one, mother of all others: space-dynamics, which attains the importance of universal mechanics. With it, the myriad of phenomena and laws which so far have kept science divided in different branches, could be reduced to few and clear fluid dynamic actions, ruled by a unique mathematical general equation, with enormous simplification of calcul and conceptions.

First I took into consideration that fluid space movements, when hitting the human body, put in resonance its sensory organs, thus causing some electronic currents, transmitted to the brain along the nervous lines, to arise in our psyche, (and exclusively in it) the various feelings of electricity, light, heat, sound, taste, force etc.; I have been able then to display the marvellous electronic technology of our organs of sense, motion and regulation of our central and peripheric nervous system. I drew from it a clear vision of the ways by which physical, biological and psychic phenomena develop and connect among themselves; I could determine the precise mathematical relation of those phenomena in regard to each other, singularly, and as a whole, coordinating them all in a unitary cosmic science, called, just for this reason, « Psychobiophysics ». The last is proved true by the fact that from the general equation of space-dynamics on which it is based I have been able

to draw all experimental laws ruling all phenomena belonging to the various sciences, and by the fact that it has received hundreds of practical applications and some theoretic developments confirming it in its parts and in its synthetic ensemble. For all this the reader can consult my publications [1] [2] [3] [4] [5].

I am pleased to announce the experiments recently accomplished by physicists Emmanuel Borgognone and Dominique Mattiotto, who have confirmed the aforesaid results acknowledging the movements of fluid space in some particular electro-magnetic effects and who are experimenting the variation of light's speed in all directions inside a medium deprived of atmosphere.

The report concerning these works has been recorded in the book entitled: « *Theoric and experimental bases of the new electrotechnics* » published by the two above quoted scientists.

I want to make known also the scientific work of Prof. Renato De Luca, Chairman of the Italian Committee for Research and Experiments of Applied Mathematics, as it deserves the highest consideration.

By means of a vast and profound analysis Prof. De Luca has demonstrated that if it had been believed that classic physics were unsuitable to explain energy's distribution in black body's spectre it was because man had tried to resolve this problem by means of thermodynamics' fundamental equations which in their turn are based on a formula on bodies' dilatation increase $(1 + \alpha t)$, which results erroneous, since logically this increase is viceversa proportional to $(1 + \alpha)^t$.

Actually, Renato De Luca, after having determined how all thermodynamics' equations transform themselves with the introduction of the new relation discovered by him, has shown that the equations so modified are suitable for the calculation of bodies' thermic dilatations as well as of their specific heat at the various temperatures, of values of gasses' cinetic energy, of electric conductivity according to temperature, of thermic energy emitted by radiations, and of stars' temperatures. A series of records show an amazing correspondence between the values drawn from the new equations and those derived from experiments.

But what is most important is that Plank's equation, which gives the energy in function of absolute temperatures, and which demands renunciation of the principles of classic dynamics, is replaced by another equation, which is in agreeance with those principles and answers perfectly the experimental results.

These genial researches have been reported in a booklet entitled «*Critical considerations on modern physics*», which is clear, exact and convincing.

In another pamphlet just as interesting as the aforesaid one, entitled «*Critical consideration on Einstein's theory*» Renato De Luca, while revising Lorentz' transformation equations which are at the basis of that theory, shows with precise and remarkable logic its absurdities, its contradictions and its inadmissibility.

Ultimately, Borgognone's and Mattiotto's experiments, as well as De Luca's mathematical analyses assure us that also in the fields of electro-magnetism and thermo-dynamics Galilei's relativity is verified.

The works of those scientists are of an exceptional scientific value because they help to resolve physics' present crisis and to lead it on the right path of classic relativity.

MARCO TODESCHINI

THE THEORY OF APPEARANCES

SUMMARY BY Dr. Pr. Ing. P. GATTY
PRESIDENT U.S.L.A. UNIVERSITY - S. SALVADOR

THE MATERIAL REALITIES

The most important problem of physics can be condensed in the following question: — What is the cause of material's movement?—

It seems easy to answer this question because it is clear that one can move a body hitting it with another solid body, or dragging it with a liquid or gassy stream or even making it oscillate on the sea's waves. But against this experimental certainty one can remark that there are some bodies which seem to be moving without being hit by others for instance: a piece of iron when attracted by a magnetic kernel; a weight falling on the Earth; the satellites turning round their planets; the planets having a revolution movement round the Sun; the stars moving in all directions; the electrons spinning round the atomic nucleus; the molecules oscillating while transmitting sounds, heat, pressure; the electrons of a receiving wire, which undertake an alternative movement when plunged in an hertzian field, etc.

In order to explain all those movements, either one acknowledges that the aforesaid masses are bound to run their orbits because they are pushed by the stream of some fluid invisible substance (ether) and the mentioned particles vibrate because of the waves of the medium in which they are plunged; or one admits that bodies are attracted and roused in oscillation by means of some mysterious gravitational, electric, magnetic, thermic, luminous, acoustic etc forces issued from surrounding masses of unknown genesis and structure, forces even more mysteriously transmitting themselves through the vacuum.

But accepting the latter hypothesis would mean to establish as many causes for material's movements as there are different kinds of forces taken into consideration, it also implies the impossibility of leaving out the first hypothesis, being experimentally certain that bodies can be moved hitting them with another body; it means, lastly, to admit a multiplicity of different causes of material's movement; while in order to arrive to the Universe's unitary mechanics, which is the human hope since centuries, it is necessary to trace the causes of all movements to a single force.

Only if inertial force can be proved identifying itself with all those forces or only if one succeeds to demonstrate that those forces are all produced by bodies' impacts, classic dynamics (in which the only considered force is the inertial one) becomes that unitarian mother science comprehending (as particular branches) nuclear and atomic physics, chemistry, astronomy, optics, electro-magnetism, thermodynamics, acoustics etc.

But admitting the impact as the single cause of all movements, implies that there must be everywhere some material which, with its butting action arises translatory, rotatory and oscillatory movements on the bodies, even if such hitting material is not to be seen; it implies the conception that space is not empty, but filled with a fluid supplied with density and constituting all bodies in the Universe, as well as the medium in which they are plunged; the whirls of such fluid substance could be regarded as atomic and astronomic systems constituting the various materials while its waves, according to their oscillation frequencies, would form the different kinds of radiating energy which would then reduce to only one, the cinetic energy.

In order to corroborate this enticing unitary thesis it had to be proved that the various perceptible qualities of the cinetic energy (light, electricity, heat, magnetism, sound, etc.) which so far had been regarded as physical realities occurring inside the material and transmissible through space, though having their physical support in the fluid ether's undulatory movements, do not identify themselves with the ether, nor are they to be found in the objective world, but they are feelings stirred up exclusively inside us, when the material, or ether, hits our human body.

Man had never before tried to find and to determine how and where such perceptible qualities of material and cinetic energy were born; this has made impossible the explanation of the world, by means of either the hypothesis of the full or of the empty space, causing both those hypotheses to be alternately tried in vain for centuries.

The first of those hypotheses, as above said, assumes that the masses of the Universe are plunged inside a space full of ether, in which whirls and waves can form, as in a lake full of water.

With this hypothesis Descart pictured the solar system as a huge whirl of ether, in which the planets would be plunged and forced to rotate round the central axis; Lord Kelvin, extending this conception on atoms, conceived atoms ultra-microscopic ether's

whirls; Fresnel explained the ondulatory nature of light as a vibration of this fluid medium, and later Hertz, proving that electromagnetism propagates itself through space by means of waves, confirmed the existence of a medium capable of vibration.

The second hypothesis, on the contrary, assumes that the masses of the Universe are surrounded by an empty space; with this hypothesis Newton explained how astral bodies' movements could keep unaltered eternally, as they wouldn't be braked by any resistant medium. He conceived that the planets, enlivened with a rectilinear movement of mythical origin, while passing near the Sun, and because of the mysterious force of gravity, were deviated into elliptic trajectories. Then, Weber, in order to explain electricity and magnetism, admitted that those two physical agents were condensed inside the masses and were exerting attraction and repulsion actions at distance in the vacuum, in analogy with Newton's gravity force.

In short, about the end of the last century, physics had reached this inadmissible point: nearly 60% of phenomena could be explained only with the hypothesis of full space (ether), and the remaining 40% almost exclusively with the hypothesis of the void. Neither of the two resulted suitable to explain the totality of phenomena, while on the other hand both the two hypotheses together could not be adopted because they were in conflict with each other. In order to decide which of them corresponded with natural reality, Michelson accomplished an optical experiment, which should have definitely proved whether ether existed or not.

The misinterpretation of the results of this celebrated experiment led Einstein into denying ether's existence and assuming that light consisted of quanta of energy deprived of material mass, called « photons », propagating through the vacuum by unknown ways. This idea had been taken from Plank, who in 1900, studying the thermic power of the black bodies, had arrived to the realisation that each radiating energy propagated itself through space without decreasing and by way of an unknown mechanism. From this hypothesis affirmed by Bohr, and converted into doctrine by Heisenberg, Dirac and de Broglie, one managed to represent the relations between atom's structure and the nature of its radiations by means of one mathematical equation; to each material particle was joined the corresponding energy and demonstration was given that any physical reality, material or energy, does not vary in a continuous manner, but only by way of successive additions of elementary very small and indivisible quantities (quanta).

This way, one managed to conceive material and energy like discontinuous entities and like two identical phenomena manifesting themselves under two different appearances.

Schrödinger, imagining the atomic nucleus like a pulsating point, came to elaborate an ondulatory kind of mechanics which was in agreeance both with the periodic nature of light and its transmission by photons; he conceived though, a kind of wave completely abstract, representing the variation of probability of finding a photon on the various points of space and again in the next instant, thus depriving the wave of any physical support as well as of the mechanism suitable for its propagation through space. All this, without being able to explain how the luminous oscillations — which keep unaltered their wave's lengths and their frequencies from the emission source till the arrival point — could be regarded as probability's waves, which on the contrary do not keep constant either of those two typical quantities.

Heisenberg, in marked contrast remarking that it is not possible to watch an ultra-microscopic phenomenon without altering it with the radiation used to give rise to the same, chose to give up determining the shape of the trajectory run by the electron round the nucleus and to stand by the simple recording of the frequencies emitted by the excited atom, which he considered the only physical reality experimentally sure. Consequently he abandoned the model of atom conceived by Bohr as an astronomical system ruled by Newtonian mechanics and built new mechanics exclusively for the atom (quantistic) in order to explain the discontinuity of forces which atom shows; this way he came to break the uniqueness of laws which should rule both the small atomic assemblings and the immense astronomic ones of the material; besides, being unable to determine the electrons' position and their trajectory round the nucleus, he came to the admission that physics were impotent to establish the laws of ultramicroscopic world.

After 1900 it was believed that the secular conflict between the two famous hypotheses was resolved by chosing that of the vacuum; but, with that, physics were bound to renounce to phenomena's explanation and to claim its impotence to draw its laws deterministically.

Now, if a science fails to those two finalities for which it has been founded, it is not any more a science.

In order to solve this crisis it was necessary to have the analytical and experimental demonstrations of the real structure of cosmic

space, and to this purpose Todeschini has found and given us such demonstrations as related in this booklet.

On the sure ground of the results which confirm the existence of a single fluid substance constituting all bodies in the Universe and also filling the space in between, it becomes scientifically acceptable to conceive material masses, their attraction fields and each quality of ondulatory energy as particular movements of that primordial, invisible but dynamically active substance; one notices clearly the connection and the mutual dependence among those three manifestations localised in different points in the continuity of the fluid medium constituting them and linking their singular and assembled actions and reactions. We have attained the most simple fundamental idea of Cosmos; the last, if bound to be a unique whole, can't but be made of a unique substance, substratum of all physical things and phenomena.

On the ground of such experimental facts Todeschini demonstrated that: material, gravity, light, electricity, magnetism, heat, sound, odour, taste, force, nuclear, atomic, chemical, astronomic actions, as well as reactions between waves and particles — are all appearances of a unique physical and objective reality: the fluid space' movement (Uniphenomenal principle of physical world).

Hence, all sciences unite themselves in single one, mother of them all: Spacedynamics, which rises so to the important level of universal mechanics. With it, the thousands of laws and phenomena which so far separated science in a series of different branches — are reduced to a small number of clear fluid dynamic actions; it ensues a great simplification of calcul and a clarity near to obviousness of the ways through which physical phenomena develop and are connected.

THE PSYCHOBIOPHYSICAL REALITIES

On the whole, this theory shows that the Universe is only made of fluid space having a very small material density; when this fluid space moves in certain series of spheric concentric layers spinning round their common centre with rotation speeds inversely proportional to the square root of their radiuses — forms the elementary particles, nuclear, atomic, molecular and astronomic systems, which all appear to us as perceptible material as well as fields of attractive forces. The ondulatory movements of the same fluid space, moreover,

...

when reaching our sensory organs, rouse in our psyche, and exclusively in it, feelings of force, electricity, light, heat, sound, taste, odour etc.

Such sensations then don't exist in the physical objective world, they are appearances of the physical objective world though being spiritual subjective indisputable realities, since we perceive them directly. On the contrary, fluid space and its movements constituting all material phenomena are realities of physical objective world, extending or developing inside the three volumetric dimensions and are not therefore to be found in our psyche, which takes no volume.

From this discovery, of which we will give the demonstrations later it follows the unexpected revelation that we live inside a dark, atonic, colourless, athermic, odourless, tasteless world, even lacking of forces and electricity. This world is only enlivened by continuous or alternate fluid space movements; which, only when coming to break against our sensory organs, arise the resonance of some oscillators which provoke in their turn in our psyche the corresponding feelings.

To each physical phenomenon originated by some particular fluid space movement, corresponds a special psychical one consisting in the feelings stirred in our spirit when that movement hits our senses' organs.

Todeschini demonstrated the correspondence between material's deceleration against the human body and the sensations (S_n) stirred in our psyche by means of 10 psychophysical equations generalising Newton's inertial law ($F = ma$); he discovered also that it is not only force's sensation which corresponds to the product of mass (m) by deceleration (a), but all other sensations as well are equal to the same product ($S_n = ma$).

This general principle of equivalence between inertia and sensations has a much wider and significant range than that postulated by Einstein solely between gravity and inertia, because it extends the equivalence of inertia to any forces of any nature; this principle also makes clear that the first sides of the above cited equations regard some sensations (S_n) which are perceptible different qualities and spiritual realities to be found only in our psyche; the second sides of those equations, instead, indicate the corresponding masses' accelerations which are all of the same nature and are to be found only in the material of physical objective world and in the material constituting our human body.

That had to be well clarified in order to understand that the afo-

resaid 10 equations are not equalities among quantities of the same nature, but are rather some connections between some perceptible spiritual qualities and some dynamic material quantities. All physics' mathematical equalities undertake this way a new meaning; one notices for the first time how quantities change into qualities, while science so far has never explained the genesis of the perceptible qualities of material, forces, impulses and energy, and whether the nature of such qualities is material or spiritual.

Actually, till now it was believed that in the objective physical world existed different kinds of material, force, impulse and energy according to the perceptible qualities that each of them seemed to own in themselves. Since now one must bear in mind that the theory of appearances has shown that those qualities arise exclusively in us as different sensations caused by the same single mechanic quality under which the four said entities are to be found in the objective world. In other words, this theory has shown us that the material of any kind is made of particles consisting of the same substance, being spheres of fluid space spinning very rapidly on themselves in regard to the surrounding fluid space medium; it has shown that the various different kinds of force are arisen in us by the sole inertia's force, which is equivalent to some masses' accelerations. ($F = ma$); that the different kinds of impulse have as objective reality only some quantities of movement, namely some masses' speeds ($I = mV$); that energy's various types are subjective appearances caused by cinetic energy, the only one to be found in the objective world.

It follows a deep modification of physics' conceptions and its language. So, for instance, from now on we must not any more think and say that a body owns a gravity force, or that it is charged with electricity, impregnated with magnetism; that it has a certain colour, a certain taste, a certain odour; that it is hot, that it gives a particular sound; but we shall rather think and say that there is no such force or any of the aforesaid qualities; that particles constituting that body are only fluid space rotating fields which attract or repel the bodies nearby with the same effect as the three above said mysterious forces; that its particles own only some vibrations which produce in the surrounding fluid space certain waves having optic, thermic or acoustic frequencies; those waves, striking across our senses' organs raise in our psyche the colours, the heat, the sound which to us all seem to come from the body. We shall think and say that the body has some molecules owning a particular electrolytic

resistance which gives its typical intensity to the electrons' currents producing in us the corresponding feelings of taste and odour.

We shall not think and say that an hydro-eletric power unity transforms force, impulsion and energy of potential nature in mechanic energy, and the last in thermic and luminous ones, because the water's molecules which are contained in the mountain lake, being plunged in the fluid space stream rotating round the Earth, receive from that stream certain accelerations which drive them towards the planet's centre, and for that reason running down the conduits till the hydro-electric power unity placed in the valley.

Accelerations and speeds of terrestrial fluid field are this way transmitted to the water, from it to the turbine's wheels and to the dynamo, and from the last to the electrons running along the lines till the utilising devices; these, entering into oscillation, produce in the fluid space some waves which we perceive as feelings of light, or heat, according to their particular frequencies.

All along the chain of causes and effects quoted above, there is no transformation of the quality of force, impulse or energy; these three entities remain always of mechanical nature, since from the start to the end there is only a transmission of blows among masses of different size.

The various perceptible qualities in which the mechanical quality seems to have transformed are therefore objective appearances, though being spiritual realities actually arising in our psyche as sensations changing their quality according to the variation of masses' sizes, accelerations and speeds caused in each ring of the dynamic chain just spoken of.

The enormous importance of that lies in the fact that together with objective physical phenomena also the biological and psychical subjective ones (which had been left out before) have been taken into consideration by the exact science. So, for instance: sound is a physical objective phenomenon if only the atmospheric silent vibration reaching our ears is considered; it is instead a biological subjective phenomenon, if one considers only the corresponding electrons' stream aroused along the acoustic nerve when that atmospheric vibration hits the tympanum's membrane of our ears; lastly, it is a spiritual phenomenon, if one considers only the acoustic sensation born in our psyche when that current reaches the detector of telencephalion, psyche's seat.

We can record the atmosphere's silent oscillations with Kundt's apparatus; with a frequentiometre the electrons' currents running

along the acoustic nerve; we perceive directly the sound; on the ground of such facts we are assured of the existence, process and connection both of the physical phenomenon and the biological and spiritual ones constituting sound.

Contrary to what has been believed so far, biological and spiritual phenomena are experimentally ascertainable like physical ones. With those, though, Galilei's experimental method, still followed by the science which takes into consideration only physical objective phenomena, is inadequate to reality's description; it must then be reformed and extended into comprehending also the biological and spiritual phenomena rising in the subject observer, otherwise there is the risk of attributing to physical phenomena (space's movements), some qualities (sensations) which they have not and projecting those qualities on things; this would lead us to a false science of the object and into searching in the world some ghosts like the perceptible different appearances given us by material, inertial force, mechanic impulse and kinetic energy.

A century was lost because of having missed these considerations into the search in the objective world of the mysterious force above mentioned and into the attempt of unifying their fields.

Actually, physical phenomena, namely the movements of material either solid, or liquid, or gassy, or dissolved in the state of fluid space, when coming to break themselves against our body, not only are altered by our sensory organs, and transformed in electrons' currents, but are also changed into phenomena of spiritual nature (sensations) by the psyche which receives them and values them under that last qualitative and immaterial form.

Each phenomenon is a function of three variables: a psychical, a biological and a physical one; each of the three components must be exactly indicated if one wants to distinguish which is the real objective reality and which is the subjective and spiritual one.

The aforesaid determinations have allowed Todeschini to discover the electronic technology of nervous system which connects the actions of physical objective world with their representations perceptible from our spirit, revealing also the mechanism of knowledge thus resolving the gnoseologic problem which has tired in vain the philosophers.

From the above said it follows that only when there is relative movement and a certain hitting action between material and the human body we perceive the corresponding sensations. So, for instance, making our hand move inside motionless water, we feel

a sensation of force on the palm and the back of the hand because there is relative movement between the hand and the liquid.

Viceversa, keeping them both motionless, we don't notice any force, as there is no relative movement. So, if we run against an acoustic vibration, the number of waves hitting our ear in one second increases, that is, its frequency increases in regard to us; consequently the acoustic sensation aroused in us varies according to our relative speed in regard with the wave's speed. If on the contrary we get away from the acoustic source with an ultra sound speed, the wave doesn't manage to hit our ears, and we hear no sound.

When the material hits our sense organs it causes the oscillation of their atoms; they emit their peripheric electrons, which hit the successive atoms; consequently a series of consecutive very fast blows propagates itself along the nervous lines arising in our psyche, once arrived to the brain, and according to their frequencies and intensities, the corresponding sensations. The electrons' current which travels along the nervous lines has no part of electricity, of light; of heat, of force, of sound, of odour, or of taste, being only a very fast succession of corpuscular blows.

The material of the world surrounding us, as well that of our body, can only transmit motions and blows; therefore sensations and the psyche where they are born must be immaterial, that is of spiritual nature.

The distinguishing trait of Todeschini's theory among all the others, is that of having found and given the physical, mathematical, neurological and experimental demonstration that sensations are born exclusively inside our psyche and, like it, are of spiritual nature.

This has allowed him to discover and determine the marvellous electronic technology of our organs of sense, of motion, of regulation and coordination of central and peripheric nervous system presiding over all vegetative and psychical functions; it enabled him to reconstruct the electric outline of each of them, of their links of connections, including the complex and admirable schema of the supreme centre the human brain.

Thus he revealed and demonstrated that: our auditive organ is formed and works like a telephone, of which the ear is one of the microphones, the acoustic nerve the transmitting line and the appliance placed in the encephalon is the other receptive microphone. Atmospheric waves, which have acoustic but silent frequencies and come from the outside world, hit the tympanum's membrane of our

ear, are transformed by Corti's organ in electronic vibrations; the last, conveyed along the fibres of the acoustic nerve give rise in our psyche to different sonorous sensations according to the frequency of the electric current arriving to the brain, this frequency is equal to that of the atmospheric wave which had hit our ear.

The organ of sight is made and works like a television set, transmitting by wire where the eye is the camera, the optic nerve is the transmission line and the receiving set is placed in the centre of the brain where is the seat of psyche. The dark fluid space waves supplied with optic frequency which come from the outside world are received on the bottom of the ocular bulb's retina subdivided in a million cones and 100 million small sticks; they decompose the vibrating image into singular mechanical impulses, and transform them in current of electrons which, transmitted by the fibres of the optic nerve, are detected by the psyche under the appearance of light having different colours according to the frequencies of the arriving wave.

Heat's organ is made and works like some thermoelectric pliers, in which Krauser's corpuscles spread over our epidermis represent the bimetallic couple which transform in electric currents the molecular blows hitting our skin; those electric currents, transmitted along the nervous lines, arise in our psyche the feelings of heat having different temperatures according to the frequency and intensity of the currents reaching the brain's psychobiophysic centre.

The organ of taste is made and works like a telerheostat, in which the chalices scattered over our tongue and filled with saliva correspond to the electrolytic baths; these are linked by the nervous lines to the appliance placed in the brain. The food's molecules introduced into the chalices undergo a saline solution and according to their electric resistance they vary the intensity of the current transmitted to the brain, and from it taste is perceived by our psyche.

The organs of olfaction touch, electricity etc. are all some kind of transformers of mechanic impulses into electric currents which, transmitted to the brain create in the psyche the various sensations of odour, force, electricity.

The receiving sensory devices are double and symmetrically disposed in regard to the middle of the human body; they are connected to the brain by some bundles of nervous lines which are also double and symmetrical; these last cross each other and end up on the brain's two hemispheres' surfaces, thus forming in them two images, while we perceive only one; Todeschini has shown

that that is possible only if the two areas on opposite sides are connected by a central one where the two images could superimpose themselves into a single one, as it happens in an optic telemeter.

Following this conception, he has anatomically found the bundles of nervous fibres which link each of the two side surfaces to the corresponding central one placed in the telencephalon; they all form the 8 electrotelemeters of the senses. He found even the 8 telemeters of movements; he found also that the first central surfaces and the second ones form respectively the psychobiophysic centre of sensations and movements.

He also demonstrated that all nervous lines are made and work like some electricity's conductors, and their neurons like voltaic batteries in order to reinforce the currents weakened by the lines' resistance; that the gray matter of the spine formed by billions of neurones, works like an electric power unity in order to supply energy to all organs and circuits of the nervous system.

He demonstrated that the cerebellum is a combination of telemeters of direction and height automatically actuated or commanded by the psyche to coordinate the orientation of the bilateral organs of sense with those of the organs of movement towards a determined point and follow their eventual displacements; that, finally the brain is the supreme centre of command in which are disposed all the receiving apparatus of electric currents coming from the peripheric sense organs, all the transitory apparatus of the currents designated to teleactuate the organs of peripheric movements, all the hypophysis appliances for the automatic regulation of the glands and internal secretions, and of the peripheric corpuscles which preside over the different vegetative functions, as also the four psyche bio-physical centres that provoke the normal sensations in the psyche; the particulars of graphic symbols in written language, phonetic sounds of the spoken word and the centre which they use to actuate the organs of movement.

The psyche, although immaterial, has its seat of perception and of action in the four teleenphalic centres, as only in them the electric currents which come from the sense organs, arrive; these currents are transformed into sensations by the psyche; the nervous line suitable to transmit the electric currents which actuate the organs of movements leave only from the 4 teleenphalic centres towards the periphery.

The psyche is, therefore, the supreme command of the human body and it uses the apparatus of the brain in order to receive the

sensations which inform it about the objective, external physical world; the psyche uses the transmitters of the brain to manifest itself in the external world by means of movements, because we are unable to express our thoughts or to make any action if we do not move some part of our body.

But, as the sensations are not to be found in the material of the objective world, while in the human body they are immaterial activities which rise exclusively in the psyche, so the psyche must also be immaterial, it must not occupy a space as material does, must be without dimensions, that is, of a spiritual nature.

The psyche identifies itself with the soul; sensations, and voluntary movements, are its exclusive activity just as thought, conscience, memory and reason constitute the experimental proof of its existence in our brain.

THE SPIRITUAL REALITIES

If we follow the history of philosophy and science from 1600 we are struck by their profound idealogical contrast. In fact, the dawning experimental physics founded by Galilei, which excluded the observing subject and the bio-physical phenomena which rise in him, with the advent of positivism, orients itself decidedly towards the object, namely towards the material and its phenomena. These last were thus retained as the only realities, for which man had to look in order to find the « Prima causa » in the Universe, denying God and all spiritual and transcendent realities. Subsequently science arrived to the point of modern hermetic and one sided theories which reduce the idea of the world to an incomprehensible mathematical abstraction of tensors.

From that is derived the conception that the universe is founded on the irrational and ruled by the law of probability which has replaced the law of cause and effect. This leads to imagine that all things are derived from the automatic combination of different chemical elements and leads to the substitution of the blind action of chance to that of a supreme intelligence as First-Cause of the marvellous order noticed in Cosmos.

So the agnosticism of science, vaunted as a guarantee of impartiality, is an illusion since physics are actually one sided and, from their birth till the present, they have always been oriented exclusively

towards the material and the immanence. They were never turned to see whether the transcendent spiritual realities existed or not, although these are perceivable with the experimental method that is their prerogative and basis.

On the contrary, Philosophy, thousands of years old, had already taken into consideration these last realities, and with Descartes it began just then to follow a way that would have led, in the beginning, to a sceptic empiricism denying every possibility of objective knowledge, and in the end, to the immanent idealism which denies the very existence of the objective world and holds true only the spirit of the observing subject and his activities.

Philosophy and science so followed from that time two roads diametrically opposite, but which evidently took them far from the truth as it is clear that if the material and its phenomena produce in us subjective material representations it is also true that, in order to rise these feelings, there must exist outside ourselves, something truly objective, so that it can be different from what we perceive.

Consequently the most important problem consisted not only in distinguishing the objective realities from the psychic subjective ones, but in demonstrating mostly that the first are of material nature while the second are of spiritual nature.

Well, Todeschini has shown that there exists some material realities which occupy, or take place in the three volumetric dimensions and last for a certain duration of time, like fluid space and its spinning or oscillatory movements, but there also exists some realities which don't occupy or take place in the three volumetric dimensions but only in time as do sensations and the human soul.

Immaterial, namely spiritual, that is the characteristic demonstration of such theory. Material, even in its smallest particles, occupies a certain volume. Spirit, as well as its activities, and spiritual entities not being by definition of material nature occupy no volume tho' they occur within a certain time. So, for example, light, heat, force, electricity, taste, sound and odour, being subjective feelings do not occupy volume although the fluid space oscillations which rouse those sensations in us occur in the three volumetric dimensions.

Thought itself, being an activity of our spirit, occupies no volume although it occurs in a certain time. In fact, one cannot fill a bottle with thought, with heat or sound or with force, just as one cannot view the soul under a microscope nor grip it in a pincer as the positivists would like to think possible. The proof of the existence

of such spiritual realities has been found in three different fields by Todeschini.

In the philosophic field: by considering that sound, heat light, electricity can manifest themselves to us only when there is an impact between two masses because such entities do not exist inside the two masses *before* the impact and therefore they cannot give what they did not possess before hitting each other. Actually, before, during and after the impact only accelerations of the two masses are to be found, as well as vibrations of their molecules, atoms and electrons.

In the physic and mathematical field: the aforesaid demonstrations are drawn from experiments and equations of balance between the energies playing on the phenomena. The striking mass cannot transmit to the mass it hits force, heat, sound, electricity or light because after the impact the two masses and their constituting elements have the same total cinetic energy that they had before the impact; consequently they could not have acquired any further energy under the form of the aforesaid qualities otherwise this would lead to the mathematical absurdity that a certain quantity of energy can be equal to a double quantity, or to the physical absurdity that by means of the impact one can obtain twice as much energy as the amount employed to move the hitting mass. One must therefore realise that only if the oscillations of the hit mass transmit themselves to the surrounding fluid medium, and if these oscillations shake our sense organs producing there some electric currents transmitted to the brain, can they raise the same feelings in our psyche.

Lastly, in the neorological field: those demonstrations come from the realisation that the nervous lines of all sense organs are made like electric conductors and therefore they don't give way to sensations but exclusively to a very rapid succession of corpuscular shocks.

Actually, the optic nerve is opaque and does not give way to light; the acoustic nerve is like a telephone wire which does not transmit any sound but exclusively electric impulsions, etc.

Todeschini has shown all this, connecting the peripheric sense organs to the corresponding organs of the cerebral matter by means of conducting circuits disposed externally on the human body. This way he could detect that there were always some electric currents on the lines placed on the exterior each time the sense organ was struck by some physical vibration. By means of a frequenteometer he could establish that those currents had the same frequency as

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the wave striking the sense organ. Now, if in the brain material organ only electric currents are to be found, the psyche, which transforms those currents into sensations, is not a material organ but an immaterial entity. The great importance of these demonstrations does not depend only on the fact that for the first time man has managed to prove, by means of exclusively scientific arguments, the existence in us of a soul of spiritual nature, in harmony with religious faith, but also in the fact that forces are sensations which cannot be found in the physical world, that is, that they are immaterial activities which can be found exclusively inside entities like our soul and those of the spiritual world.

The ten physibiophysical equations indeed are valuable reading them both from right to left and vice versa. For instance, the first of them ($F = m a$) tells us that as a body hitting our organ of touch produces an electric current which the psyche transforms into a sensation of force, so also our soul, emitting a certain force addresses the electric current along the nerve which makes one of our hands move in order to displace something. The spiritual forces or the soul can so give acceleration to some masses. However, the small forces of our soul are only sufficient to liberate the electric energy concentrated in the grey matter of our spine and this is not strong enough to move all the masses of the universe. One must admit that the immense forces needed for that purpose all originate from the spiritual world. Since forces enter in all dynamic relations we are sure that they are the actions exerted by the spiritual world to the fluid space in order to make it accomplish all the particular movements in which, as we have just seen, all physic phenomena are identified. The conservation of the total quantity of movement ($m V$) in the physic world is therefore due to the conservation of the equivalent impulsion (I) of the corresponding forces of the part spiritual world ($I = m V$).

One must then admit that movement has been put in the universe by one First-Cause outside the universe, namely transcendent, which, being immaterial, is of spiritual nature.

This way one arrives to the scientifically proved certainty of the existence of the human soul, of the spiritual world and of God, as it is only from those three spiritual entities that forces can be emitted.

God's will is manifested in the laws which coordinate and orient those forces to move the fluid space with the modalities apt to give way to all the phenomena of the inorganic and organic physical

world, human body included, so that they obtain all the particular and general purposes that He wishes, that each day man is discovering in everything around.

The human soul on the contrary, cannot break the physical laws although being able to utilise them for its spiritual or physical well being — and even for purposes distinctly opposed to its well being — because it has the possibility of utilising the organic mechanism of the human body at its disposal in order to accomplish the action it chooses according to its free arbitre.

Lastly, following the chain of cause and effect constituting the irreversible course of finalities which tell us that from the solar system originate the mineral, vegetative and animal kingdoms till the human body, and not vice versa, Todeschini has shown that the final goal of the Universe is that of permitting the experience of terrestrial life to the human soul.

The Universe is, therefore, a defence system of the human soul, but such a system implies an intelligence which has conceived, built and coordinated it, so that each part and its ensemble answers to the precise aims of defence (both automatic and commandable) which are found in it. From that one deduces that the existence of the Universe demonstrates that of a Supreme Intelligence who has ideated and created it and who maintains it.

One further deduces that since each means of defence by command implies an intelligence which can utilise it, the existence of the functioning human body demonstrates the existence of the soul which uses it.

Todeschini has revealed that that soul has some neurologic organs and some faculties act not only to perceive sensations and actuate the body in order that it might live but that it has also the ability to remember sensations, to combine them, to form thought and understanding, to ideate and express itself in oral, written or figurative conventional language. It arrives to the point of abstract reasoning in order to understand not only phenomena and their laws but above all, to the understanding of the existence of its own self, of the spiritual world and of God.

This theory is much more vast and complete than that of Einstein because it comprehends in addition the biological and spiritual phenomena without whose consideration one cannot either explain the physical science or arrive to the unitary science of Cosmos; because it has unified the structure and laws of material and its attraction, continuous and alternative fields; it has determined the nature and

seat of sensory qualities of material as well as of cinetic energy; it has given the demonstrations of the existance of the human soul, of the spiritual world and of God., favouring the agreement between science and philosophy about the truths and supreme realities of religion, with all the good material and spiritual consequences that such scientific certainties can give to mankind.

This theory of Todeschini has demonstrated that one goes to God by means of faith and science, that the holy scripture and the greatest book of the world take us to Him.

P. GATTY