Theory of Gravitation and The Light

by

L.C. Bairagi
Preface

(A) To Part – I (Theory of Gravitation):

At present there are many theories about gravitation along with Einstein's relativistic theory. But none of the theories has come out successful. Here a theory, which is a complete solution to the gravitation, is given in a simple manner that has been named here cosmic pressure that can explain the attractive nature & long range of gravitational force & can also explain the equivalence principle. Here a gravitational force has also been derived with the help of this theory, which almost coincides with that of Newton. This theory can also give the explanation of nuclear force, molecular binding energy, electrostatic repulsive force, the expanding universe, the weak force, the black holes & the cosmology.

(B) To Part – II (Theory of Light):

With help of the base of part I, part II is also based, & it is mainly a research & in this research the actual nature of light is found out & to do this, the wave nature of light is completely cancelled & its particle nature is fully established in all respects, & thereby dual nature theory of light, & Einstein’s special theory of relativity & Quantum mechanics which are based on the dual nature theory of light are thrown into jungle, & Galilean relativity & Newtonian mechanics have regained their previous status.

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#### Theory of Gravitation

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Theory of Light

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PART –I

Theory of Gravitation
Theory of Gravitation

1.1. The Gravitation:

It is clearly established by the works of many physicists such as Messerschmitt in Germany, Compton, Turner & Furbish in America & Duperies in England that the intensity of cosmic particles varies with diurnal change. It goes a maximum at midday & a minimum at midnight & a marked change in intensity of cosmic particles occurs as much as 10% during the solar bursts (J. B Rajam 1950, reprinted in 1980). So it can be concluded that the sun & the other stars are the sources of cosmic particles & we can anticipate that cosmic particles are being ejected continuously from billions of stars & are moving with high & low different velocities in straight lines in all directions through the empty space, due to inertia of motion, unless they collide with any particle or with any material body & they are almost symmetrically distributed all over the universe (empty space). In a certain place in the space, the motions of the cosmic particles at any moment are shown in the figure 1.1(a). Of course, all the material bodies & all the known & unknown elementary particles that are in relative motion in the cosmos, are treated here as cosmic particles.

Now, if a stationary material body 'A' is isolated in any place in the universe as shown in the figure 1.1 (b), then some of cosmic particles come toward the isolated body & some go away passing by the isolated body. The by passing cosmic particles do not strike or touch the isolated body & do not give any pressure on the isolated body. But the cosmic particles which come toward the isolated body, strike on the isolated body & thus give a pressure on the isolated body, which may be named Cosmic Pressure. Of course, these cosmic particles strike on the isolated body in two ways, normally & obliquely, where obliquely striking particles are not shown in the figure. In the above process, the isolated body gets cosmic pressure continuously from all directions around it due to the continuous strokes by the cosmic particles which come toward it [figure 1.1 (c)]. As a result, the net force on the isolated body due to this cosmic pressure is zero & the body still remains at rest, as shown in the figure 1.1 (c).
Figure -- 1.1
Now, if two stationary bodies 'A' & 'B' are placed at a somewhat distance from each other in the space, as shown in the figure 1.1 (d), instead of the single body 'A', then both the bodies get cosmic pressure from all sides around them, due to the continuous strokes of cosmic particles on them, except on the face to face sides of both the bodies due to the obstacles made by themselves. As a result two net forces act on the two bodies toward each other & thus present an attraction which is nothing but Gravitation & the force with which they attract each other is Gravitational force.

On the other hand, every material body holds intermolecular spaces & these spaces may be considered as straight & curve tunnels, as shown in the figures 1.1(e), 1.1(f) & 1.1 (g). When a cosmic particle comes parallel to a straight tunnel & goes through the straight tunnel, as shown in the figure 1.1 (e), then it may not collide with any constituent particle & may not give any pressure on the material body. But when a cosmic particle comes unparalled to the straight tunnel & goes through the straight tunnel, as shown in the figure 1.1 (f), or when a cosmic particle goes through a curve tunnel, as shown in the figure 1.1(g), likewise a light photon goes through a light pipe, then it strikes several times inside the tunnel of the material body & gives pressure inside the material body & thus contributes toward the gravitational force.

In the case of high penetrating power cosmic particles, they may penetrate both the material bodies as shown in the figure 1.1(g). But they lose their energy in every successive collision during the penetration. So the downward force on the upper body in penetrating the upper body from up to down by a cosmic particle is greater than the downward force on the lower body in penetrating the lower body from up to down by the same comic particle & thus also presents an attraction of the two bodies. In this process, very high penetrating power neutrinos also contribute toward the gravitational force. Of course, if the lower body is very less massive than the upper body, then a repulsion may occur between the two bodies in the case of a double body penetration phenomenon. But in the case of the earth & a material body in front of it, the first case, that is, the case of attraction occurs & the net gravitational force is obtained by the sum of the forces given by all cosmic particles - big & small, & lower & higher penetrating powers.
1.2. Factors of the Gravitational force:

From the figure 1.1 (d), it is easy to understand that, as much as the bodies are big in volume, the number of strokes of cosmic particles at any moment on them increases; but the number of strokes on the face to face sides of both the bodies decrease, due to increase of obstacles made by themselves & as a result their attraction increases. So, the volume is a factor of the gravitational force.

On the other hand, every material body holds intermolecular spaces & some cosmic particles may go through these spaces without any collision within the material body, as shown in the figure 1.1 (e). These cosmic particles do not take part in gravitational force. Moreover these particles may strike the opposite body as shown in the figure 1.1 (h) & thereby may decrease the gravitational force. But in lower density bodies, the intermolecular spaces are big & in higher density bodies, the intermolecular spaces are small. So the gravitational force in the case of lower density bodies is low & in the case of higher density bodies is high. So, density is also a factor of the gravitational force.

But, volume $\times$ density = mass.

So, mass is a factor of the gravitational force, which agrees to Newtonian gravitational force.

Again, from the figure 1.1 (d), it is also easy to understand that, as far as the distance between the two bodies is long, the number of strokes on the face to face sides of both the bodies increases & as a result decreases their attraction. So, distance is another factor of the gravitational force, which also agrees to Newtonian gravitational force.

1.3. The Gravitational Force of Gases & the Brownian Movement:

In the previous section, we have seen that the gravitational force of lower density bodies is low due to big intermolecular spaces. But in the case of gases these intermolecular spaces are very large. So, the gas molecules have a little gravitational
effect. Moreover, due to very big intermolecular spaces, the gas molecules can move freely. So, when a cosmic particle strikes on any gas molecule, it runs freely in straight line, unless it collides with any other gas molecule or with the wall of the containing vessel, which agrees to the fundamental postulates of kinetic theory of gases. Of course, secondary tertiary etc. cosmic particles & cosmic particle showers are also produced in this way, in the atmosphere & they also contribute toward the gravitational force.

In the case of a liquid, the intermolecular spaces are not so big as in the case of gases. But the molecules of a liquid are loosely bounded unlike that of a solid. So, when a cosmic particle strikes on a visible particle suspended in a liquid, or on a smoke particle in air, Then the visible particle in liquid or the smoke particle in air may run some distance through the liquid or through the air, in a straight line, unless another cosmic particle strikes on it or it strikes on another particle & changes its direction, & thus presents the Brownian Movement.

1.4. Acceleration due to Gravity & the Equivalence Principle:

In the figure 1.1(i), a small body 'b' is placed at a somewhat distance from the earth 'E'. Here it is seen that the earth gets force from all sides around it, due to the strokes of cosmic particles except on a very small area under the small body 'b'. So the earth's motion toward the small body is very slow which may not be considered. On the other hand, almost there is no such stroke on the earth facing side of the small body due to very big obstacle made by the earth & as a result the small body moves toward the earth rapidly. As the cosmic particles are striking continuously on the back side (against the earth facing side) of the small body, the force acts continuously on the small body toward the earth & hence the small body accelerates toward the earth. Again, as far as the small body advances toward the earth, the rate of negligible number of strokes on its (small body) earth facing side also decreases & as a result, its motion toward the earth increases more rapidly. That is, the acceleration of the small body toward the earth increases with the decrease of its distance from the earth, which agrees to fact. The most important phenomenon of the acceleration due to gravity is that, from the same height, without any obstacle, all terrestrial bodies fall on the earth
with the same acceleration which is known as equivalence principle (weak equivalence principle). Let us search for this phenomenon.

In the figure 1.2, a very big & strong fence is placed at a place in the space, which shields all the cosmic particles. That is, no body or no particle can go from one side of the fence to the other. In the upper side of the fence, cosmic particles run from left to right, right to left, up to down (toward the fence); but no particle runs from the fence to the up. Now, two material bodies $B_1$ & $B_2$ have been placed at somewhat equal distances from the fence. Here both the bodies are of the same geometric shapes & are made up with the same substances of equal densities. The breadth & height of both the bodies are also the same, but the length of $B_2$ is twice that of $B_1$. So the area of the upper side of $B_2$ & the mass of $B_2$ are double that of $B_1$. Now, according to the section 1.1, body $B_1$ gets cosmic pressure on its every side except the lower side (front side of the fence). As the left & right sides of one body are of equal area, the forces on both the sides due to the cosmic pressure are equal, but opposite in direction. So they cancel each other &
contribute no net force on the body. The net force on the body due to the cosmic pressure comes only from the upper side of the body. Now if \( A_1 & F_1 \) are the area of the upper side of \( B_1 \) & net force on \( B_1 \) respectively \(
\wedge P \) be the cosmic pressure, then

\[
F_1 = PA_1 \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots
or, \[ a_2 = \frac{PA_1}{m_1} \] \[(1.7)\]

\[ \therefore F_1 = PA_1, \text{eq. (1.1)} \]

From the equations (1.3) & (1.7), we have \[(1.8)\]

which shows the same acceleration of different material bodies toward the big fence irrespective of their different volumes & masses! The above situation occurs in the case of the great earth & the material bodies in front of it, & thus explains the equivalence principle (weak equivalence principle), that is all terrestrial bodies fall on the earth with the same acceleration & agrees to the falling body experiment of Galileo, pendulum experiment of Newton & torsion balance experiment of Eötvös (Will’93).

This is not the whole story of the equivalence principle. Let us place the body B_2 of the figure 1.2, perpendicularly before the earth surface, as shown in the figure 1.3, so that the upper side of B_2 faces to the right. Here the body is considered as very flat which is not shown in the figure.

In the figure 1.3, AB represents the terrestrial body B_2 of the figure 1.2, & on the left & right sides of AB, the cosmic particles strike perpendicularly & obliquely & give perpendicular & oblique pressures. Here the perpendicular pressures on both the left & right sides of AB are equal in magnitude, but opposite in direction. So they cancel each other & contribute no net force on AB, which is not shown in the figure 1.3. But the oblique cosmic pressures are not opposite in direction & do not cancel each other. Of course, no cosmic particle comes from the lower side except a little number of transmitted & reflected particles from the earth & almost no oblique or perpendicular pressure comes to AB from the lower side due to the very big obstacle made by the earth. The only oblique pressure comes from the upper side & acts on the left & right sides of AB at different angles from 0° to 90°. In the figure 1.3, only the oblique pressure from the right side is shown. For simplicity, it may be considered that all the oblique pressures act on AB at 45° angle & this consideration will not alter the
actual result. This direction of $45^0$ angle may be considered as the average direction of the oblique pressures.

As the body AB is very flat so that the force on its head (on the top), due to the cosmic pressure may be neglected in comparison with the force due to the pressure on the left & right sides. Now from the right angled triangle ABC of the figure 1.3, we have

$$\frac{AC}{AB} = \sin 45^0 = \frac{1}{\sqrt{2}}$$

or, \( AB = AC\sqrt{2} \)
If now, \( P \) be the perpendicular pressure (pressure at 90° angle) due to the strokes of the cosmic particles & if \( F \) be the force on \( AC \) due to the perpendicular pressure, then

\[
F = P \times AC
\]

But the same force \( F \) acts on \( AB \) obliquely. So, if \( P' \) be the oblique pressure on \( AB \), then

\[
F = P' \times AB
\]

\[
\therefore P \times AC = P' \times AB
\]

or,

\[
P' = \frac{P \times AC}{AB} = \frac{AC \times P}{AC \sqrt{2}}
\]

\[
\therefore P' = \frac{P}{\sqrt{2}} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.10)
\]

If \( F_{AB} \) is the force on \( AB \) from the right side due to this oblique pressure \( P' \), then

\[
F_{AB} = P' \times AB = \frac{P}{\sqrt{2}} \times AB
\]

or,

\[
F_{AB} = \frac{AB}{\sqrt{2}} \times P \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.11)
\]

If now, \( F_{R-R} \) be the resolved part of the force from the right side of \( AB \) due to the oblique pressure, toward the earth, then

\[
F_{R-R} = F_{AB} \cos 45° = \frac{AB}{\sqrt{2}} \times P \times \frac{1}{\sqrt{2}}
\]

or

\[
F_{R-R} = \frac{1}{2} AB \times P \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.12)
\]

Since the surface at the right side of \( AB \) of the figure 1.3, is \( A_2 \) of the figure 1.2, therefore

\[
F_{R-R} = \frac{1}{2} A_2 \times P
\]

or,

\[
F_{R-R} = \frac{1}{2} F_2 \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.13)
\]

[\(: F_2 = PA_2; e q u . (1.4) \]
Similarly, if \( F_{R-L} \) be the resolved part of the force from the left side of AB due to the oblique pressure, toward the earth, then

\[
F_{R-L} = \frac{1}{2} F_2 \quad \text{........(1.14)}
\]

But the resolved part of the force from the right side of AB due to the oblique pressure, toward the left side is equal & opposite of the resolved part of the force from the left side of AB due to the oblique pressure, toward the right & they cancel each other.

So the net force on AB will be the sum of \( F_{R-R} \) & \( F_{R-L} \) & it will act toward the earth & this net force will be the gravitational force on the body AB. If \( F_G \) be the gravitational force on AB, then

\[
F_G = F_{R-R} + F_{R-L} = \frac{1}{2} F_2 + \frac{1}{2} F_2
\]

or, \( F_G = F_2 \quad \text{...............(1.15)} \)

Now, if \( a_3 \) be the acceleration of the perpendicularly placed body AB toward the earth, due to the gravitational force \( F_G \), then

\[
a_3 = \frac{F_G}{m_2} = \frac{F_2}{m_2} = \frac{2F_1}{2m_1} = \frac{F_1}{m_1} = \frac{PA_1}{m_1}
\]

\[
\therefore \quad a_3 = \frac{PA_1}{m_1} \quad \text{..........(1.16)}
\]

which coincides to \( a_1 \) & \( a_2 \) of the equations \( (1.3) \) & \( (1.7) \) & agrees to the equivalence principle!

It is here noted that, though the perpendicular body AB of the figure 1.3 is considered as very flat, there also falls cosmic pressure on its head, which produces a little force on its head. But, according to the equations \((1.13), (1.14) \) & \((1.15)\), this little force is equal to the sum of resolved parts of forces given by the oblique pressure on the left & right sides of B2 of the figure 1.2, which was not considered there. So the net force, that is, the gravitational force on the terrestrial body B2 in the figures 1.2 & 1.3 remains the same irrespective of the thickness of the body. Hence the acceleration of the body in both the figures 1.2 & 1.3 remains the same & explains the equivalence principle.
But these are also not the whole story of the equivalence principle. In the figure 1.4 two material bodies A & B are placed before the earth at equal distances from the earth surface. Here both the bodies are of equal volumes & of the same shape. But the density of B is double that of A.

**Figure -- 1.4**

So the mass of B is double that of A. Therefore, according to the section 1.2 & figure 1.1 (h) the earth's gravitational force on B is double that of A. Now, if the masses of A & B are \( m_A \) & \( m_B \), & the earth's gravitational forces on A & B are \( F_A \) & \( F_B \) respectively, then

\[
m_B = 2m_A
\]

&

\[
F_B = 2F_A
\]

Now, if \( a_A \) & \( a_B \) are the accelerations of A & B respectively, due to the earth's gravitational forces on them, then

\[
F_A = m_A a_A
\]

&

\[
F_B = m_B a_B
\]

but,

\[
F_B = 2F_A
\]

or,

\[
m_B a_B = 2m_A a_A
\]

or,

\[
2m_A a_B = 2m_A a_A \quad [\because m_B = 2m_A]
\]

\[
\therefore a_B = a_A \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.17)
\]
which shows the same acceleration of different terrestrial bodies irrespective of their different densities & masses, & agrees to the equivalence principle!

But this is not the final of the equivalence principle. Actually the net force on anybody due to the cosmic pressure (due to the strokes of the cosmic particles) does not depend on the geometric surface area of the body. It depends on the total cross-section of collisions of cosmic particles with the constituent particles of the material body. But this total cross-section of a body may vary with rearrangement of the constituent particles of the body & this rearrangement may occur if the material body changes its orientation. So the earth gravitational force on any material body may differ slightly in its different orientations & hence the acceleration. Now, if the acceleration of a material body differs at its different orientations, the accelerations of different material bodies may also differ from one another, which agrees to the Nördtvedt effect, the modern Eötvös type experiments & Eöt-Wash experiment (Will'93). Now the question arises, is the equivalence principle incorrect? Yes, according to the Nördtvedt effect, modern Eötvös type experiments & Eöt-Wash experiment, the equivalence principle is not correct in the fine estimation. But roughly it may be considered as correct.

1.5. Determination of some total forces:

(a) A total Force of Tension:

In the figure 1.5, two weights $W_1$ & $W_2$ of equal masses are joined with help of a string & are hanging from two moveable pulleys $P_1$ & $P_2$ which are also hanging from other two pulleys $P_3$ & $P_4$ which can run freely over a horizontal bar AB two ends of which are tied at two posts AC & BD. Pulleys $P_3$ & $P_4$ are joined to the posts AC & BD with two other little strings $P_3J$ & $P_4K$ so that the arrangement is now in an equilibrium position.

In this situation, the pulleys $P_1$ & $P_2$ experience two forces toward each other, due to the hanging weights $W_1$ & $W_2$ & the string $P_1P_2$ experiences a tension of total force of amount $W_1 + W_2$. If $T$ be the total force of tension of the string $P_1P_2$, then

$$T = W_1 + W_2.$$
Now, if the strings $P_3 J$ & $P_4 K$ are cut off at the same time, then both the pulleys $P_1$ & $P_2$ advance to each other with a total force $F$ given by

$$F = T = W_1 + W_2$$

(b) A total Force of strain:

In the figure 1.6, two wooden balls A & B are joined with a rubber tape CD by means of two hooks C & D & the rubber tape is deformed with the help of two hanging weights $W_1$ & $W_2$ by means of two pieces of thread & two fixed pulleys $P_1$ & $P_2$. Here the rubber tape is experienced two forces due to the weights $W_1$ & $W_2$ & a strain is formed within the rubber tape & the total force of the strain will be equal to the sum of the forces due to the weights $W_1$&$W_2$. If $F$ be the total force of this strain, then

$$F = W_1 + W_2$$
Now if the weights \( W_1 \) & \( W_2 \) are cut off at the same time, then both the balls move to each other due to a pull made by this total force of strain

\[
F = W_1 + W_2
\]

(c) A total force of pulls:

In the figure 1.7 (a), two boats A & B are floating on still water & the boat A pulls the boat B by a force \( F_1 \) with the help of a rope CD by means of a rotator handle H placed on the boat A. Here the boat A is joined to a fixed post \( P_1 \) with the help of another rope. So, the boat B advances toward the boat A with the force \( F_1 \).

In the figure 1.7 (b), the boat B pulls the boat A by another force \( F_2 \) in the same way as the boat A has done in the figure 1.7 (a). Here the boat B is joined to another fixed post \( P_2 \) with another rope. But the boat A is not joined to any fixed post. So the boat A advances towered the boat B with the force \( F_2 \).
But in the figure 1.7 (c), both the boats pull each other in the above ways, boat A pulls boat B by a force $F_1$ & boat B pulls boat A by another force $F_2$ at the same time. Here none of the boats is joined to any post. So both the boats advance toward each other due to the forces acted upon them & the total force of their pulls, that is, the total force of the system will be the sum of the two forces $F_1$ & $F_2$. If $F$ be the total force of pulls of the two boats, then

$$F = F_1 + F_2.............................. (1.20)$$
1.6. Derivation of the Gravitational Force:

In the figure 1.8, two material bodies A & B of masses $m_1$ & $m_2$ are placed in the space at the positions P & Q respectively, at a long distance from each other, just beyond which no perceptible gravitational force acts between them. That is, it may be considered that, at these positions gravitational force begin to act between the two bodies & they begin to accelerate toward each other. Let us suppose, the bodies A & B have reached the positions C & D respectively by a time $t$ as shown in the figure.

Now, according to the section 1.1 (figure 1.1 (d)), if $F_1$ & $F_2$ are the net forces acted upon the bodies A & B respectively, due to the cosmic pressure, & $a_1$ & $a_2$ are accelerations of the bodies due to the forces $F_1$ & $F_2$ respectively, measured from a third frame of reference, then

$$F_1 = m_1 a_1$$
$$F_2 = m_2 a_2$$

At the positions P, the initial velocity of A was zero. So, if $v$ be the final velocity of the body A, just after the time period $t$, at the position C, then

$$a_1 = \frac{v - o}{t}$$
$$\therefore F_1 = m_1 \frac{v - o}{t} = m_1 \frac{v}{t}$$
But, for a very short time period $t$,

$$v \equiv \frac{PC}{t}$$

$$\therefore F_1 = m_1 \frac{PC}{t^2} = m_1 \frac{PC}{t^2}$$

Before the time period $t$, the distance $PQ$ & $CD$ were equal. But by the time period $t$, the distance $PC$ is lengthened from zero to $PC$ & the distance $CD$ is shortened by the same amount from the left side. But by the same time $t$, the body $B$ has also moved from the position $Q$ to $D$ & the distance $CD$ is also shortened by another amount $QD$ from the right side. When the masses $m_1$ & $m_2$ are equal, their accelerations $a_1$ & $a_2$ will be equal & $PC$ will be also equal to $QD$. That is, in the case, when $PC$ is lengthened from zero to $PC$, then $CD$ is shortened by twice time of $PC$. So, it may be assumed that $PC$ varies inversely with the square of $CD$.

$i.e.$, $PC \propto \frac{1}{CD^2}$

or, $PC = K \frac{1}{CD^2}$

where $K$ is a constant of proportionality.

$$\therefore F_1 = m_1 \frac{PC}{t^2} = m_1 \frac{k}{CD^2} = \frac{K m_1}{CD^2}$$

But for a fixed period of time, $t$ is a constant. So in that case, $\frac{k}{t^2}$ is also a constant.

$$\therefore F_1 = G \frac{m_1}{CD^2}$$

where $G = \frac{K}{t^2}$ = a new constant. If $d$ represents the distance $CD$, then

$$F_1 = G \frac{m_1}{d^2} \text{~~~~~~~~~~~~(1.21)}$$

Similarly, $F_2 = G \frac{m_2}{d^2} \text{~~~~~~~~~~~~~(1.22)}$

Now, the gravitational force between the bodies $A$ & $B$ will be the total attractive force between them & according to the section 1.5, this total attractive force
will be the sum of the forces $F_1$ & $F_2$. So, if $F$ be the gravitational force between the material bodies A & B of the figure 1.8, then

$$F = F_1 + F_2 = G \frac{m_1}{d^2} + G \frac{m_2}{d^2}$$

or $F = G \frac{m_1 + m_2}{d^2}$ ..............A (1.23)

which agrees to the section 1.2 & almost coincides with that of Newton except the plus sign between the masses instead of multiplication. Here $G$ is the universal gravitational constant according to this theory.

1.7. Alternative Method:

In the figure 1.9, two material bodies A & B are situated in the space at a distance $d$ from each other. According to the section 1.1, two resultant forces will act upon the two bodies toward each other, due to two resultant cosmic pressures on them. If $P_1$ & $F_1$ be the resultant cosmic pressure & resultant force respectively on the material body A, & $A_1$ be the surface area of the body A, as shown in the figure, then

$$F_1 = P_1 A_1$$

At a certain distant $d$, $P_1$ is a constant.

$\therefore$ $F_1 \propto A_1$
For a certain temperature & pressure, the density of a material body is constant & in that case the surface area of the material body varies directly with its mass. So, if \( m_1 \) is the mass of \( A \), then

\[
A_1 \propto m_1
\]

\[
\therefore F_1 \propto m_1
\]

But likewise the inverse square law of intensity of light, the force \( F_1 \) will be inversely proportional to the square of the distance \( d \).

\[
\text{i.e. } F_1 \propto \frac{1}{d^2}
\]

\[
\therefore F_1 \propto \frac{m_1}{d^2}
\]

\[
\text{or, } F_1 = G \frac{m_1}{d^2} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.24)
\]

where \( G \) is a constant of proportionality.

Similarly, if \( F_2 \) & \( m_2 \) are the resultant force on \( B \) & mass of \( B \) respectively, then

\[
F_2 = G \frac{m_2}{d^2} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.25)
\]

Now, if \( F \) be the gravitational force between the material bodies \( A \) & \( B \), then according to the section 1.5,

\[
F = F_1 + F_2 = G \frac{m_1}{d^2} + G \frac{m_2}{d^2}
\]

\[
\text{or, } F = G \frac{m_1 + m_2}{d^2} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.26)
\]

which fully coincides to the equation (1.23) of the section 1.6.

1.8. Review of the Newtonian process:

With the help of Kepler's laws of planetary motion, Newton first determined the centripetal force of a planet toward the sun, as:
\[ F_p = \frac{4\pi^2 m}{Kr^2} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1.27) \]

where, \( F_p \) is the centripetal force of the planet, \( m \) is the mass of the planet, \( r \) is the distance of the planet from the sun & \( K \) is a constant of proportionality.

Then he thought, if the sun attracts the planet, the planet also attracts the sun. If this force of attraction depends on the mass of the planet, then it should also depend on the mass of the sun. So, he related the term \( \frac{4\pi^2}{K} \) with the mass of the sun, as:

\[ \frac{4\pi^2}{K} = GM \]

where \( M \) is the mass of the sun & \( G \) is a new constant, & thus Newton got the attractive force between the sun & a planet, as:

\[ F_{ps} = G \frac{Mm}{r^2} \]

But this may not be the case. If the planet's attraction towards the sun is:

\[ F_p = \frac{4\pi^2 m}{Kr^2} \quad \text{[equ. (1.27)]} \]

then the sun's attraction towards the planet will be

\[ F_s = \frac{4\pi^2 M}{Kr^2} \]

Where \( M \) is the mass of the sun ; & according to the section 1.5, the total attractive force between the sun & a planet will be given by

\[ F_{ps} = F_p + F_s = \frac{4\pi^2 m}{Kr^2} + \frac{4\pi^2 M}{Kr^2} = \frac{4\pi^2}{K} \left( \frac{m + M}{r^2} \right) \]

or, \[ F_{ps} = G \frac{M + m}{r^2} \]
where, \( G = \frac{4\pi^2}{K} \) a new constant.

Now if 'F' & 'd' stand for \( F_{ps} \) & \( r \) respectively, then

\[
F = G \frac{M + m}{d^2} \quad \text{........................................ (1.28)}
\]

which fully coincides to the gravitational force of the previous sections (Sections 1.6 & 1.7).

1.9. Earth's Gravitational Force & Acceleration due to Gravity in the case of terrestrial bodies:

In the figures 1.1(d) & 1.8 of the sections 1.1 & 1.6 respectively, we saw that the gravitational attraction is actually the shiftments of two bodies toward each other by the cosmic pressure. But in the figure 1.2 of the section 1.4, we saw the one body shiftment of gravitational force, body A or B toward the fence. Here the big & strong fence is unmoveable & this situation occurs in the case of our great earth & the material bodies infront of it (figure 1.1(i)), which develops the equivalence principle. Here the very little shiftment of the earth may not be considered. So the earth gravitational force is a special case of gravitation & it will be got from the equation (1.21) or (1.22), but not from the equation (1.23). If a terrestrial body of mass \( m \) is situated at a distance \( d \) from the earth & if \( F \) be the gravitational force on the terrestrial body toward the earth, then from the equation (1.21) or (1.22), we have

\[
F = G \frac{m}{d^2} \quad \text{........................................ (1.29)}
\]

Now, if \( a \) be the acceleration of the terrestrial body toward the earth due to the gravitational force \( F \), at the distance \( d \) from the earth, then

\[
F = ma
\]

\[
\therefore \quad ma = G \frac{m}{d^2}
\]

or, \( a = G \frac{1}{d^2} \) \( \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.30) \)
Here the mass of the terrestrial body is absent, which agrees to the equivalence principle. But the earth is not completely strong (opaque) & not infinite big, as the fence of the figure 1.2. So the above equation (equ. 1.30) may not give the actual magnitude of the acceleration due to gravity in the case of a terrestrial body.

Now call the equation (1.23). According to this equation, the gravitational force between the earth of mass $M$ & a terrestrial body of mass $m$ placed at a distance $d$ from the earth is given by

$$F = G \frac{M + m}{d^2}$$

But,

$$F = ma$$

$$\therefore ma = G \frac{M + m}{d^2}$$

If $M$ is $n$ times of $m$, then

$$ma = G \frac{mn + m}{d^2}$$

or,

$$a = G \frac{n + 1}{d^2} \ldots \ldots \ldots \ldots (1.31)$$

If $n \gg 1$, then

$$a = G \frac{n}{d^2} \ldots \ldots \ldots \ldots (1.32)$$

Here $n = M / m$ is present in the above equation, which shows the accelerations of different terrestrial bodies are not exactly the same & agrees to the Nördtvedt effect, modern Eötvos type experiments & Eöt-wash experiment (will'93).

The equation (1.32) will not also give the actual magnitude of the acceleration due to gravity in the case of terrestrial bodies. The combination of the equations (1.30) & (1.32) will give more accurate result than the equation (1.30) or (1.32) alone. To do this, let us multiply the equation (1.30) by the equation (1.32) & thus we have,

$$a^2 = (G \frac{1}{d^2}) (G \frac{n}{d^2})$$

$$\therefore a = G \frac{n^{1/2}}{d^2} \ldots \ldots \ldots \ldots \ldots (1.33)$$
It is easy to understand that at little distances from the earth center the equation (1.30), at little distances from the earth surface the equation (1.32) & at long distances from the earth surface the equation (1.33) will be more acceptable. So, to get a general equation for the acceleration due to gravity, we may write

\[ a = G \frac{n^r}{(R+r)^2} \quad 0 \leq r \leq 1 \]

where, \( R \) is the radius of the earth & \( r \) is the distance from the earth surface. When \( r = 0 \), the equation (1.34) reduces to the equation (1.30) & when \( r=1/2 \), it reduces nearly to the equation (1.33).

1.10. Experimental Tests:

(a) Test of \( G \frac{m_1 m_2}{d^2} \) & \( G \frac{m_1 + m_2}{d^2} \):

Both the gravitational forces \( G \frac{m_1 m_2}{d^2} \) & \( G \frac{m_1 + m_2}{d^2} \) are identical in nature & are satisfied by this cosmic pressure theory of gravitation (Sections 1.1, 1.2, 1.6). But in the section 1.8, a wrong point has been found out in the derivation of \( \frac{m_1 m_2}{d^2} \). Moreover, there are two dimensions of mass in \( G \frac{m_1 m_2}{d^2} \) where in \( G \frac{m_1 + m_2}{d^2} \) one. So the gravitational force \( G \frac{m_1 + m_2}{d^2} \) is more acceptable than \( \frac{m_1 m_2}{d^2} \). Though an experimental test may finalize the matter, description of which is given below.

Let us consider one set of gravitational force between two material bodies of masses \( m_1 \) & \( m_2 \), & another set of gravitational force between other two material bodies of masses \( m_3 \) & \( m_4 \). Now, if \( d \) be the distance of the material bodies in both the cases & \( G \) be the gravitational constant, then according to Newton, the two sets of gravitational force will be given by \( G \frac{m_1 m_2}{d^2} \) & \( G \frac{m_3 m_4}{d^2} \).

Let us denote these two forces by \( F_{N,m_1-m_2} \) & \( F_{N,m_3-m_4} \), So the ratio of these two sets of gravitational forces is given by,
\[
\frac{F_{N,m_1m_2}}{F_{N,m_1m_4}} = \frac{G \frac{m_1m_2}{d^2}}{G \frac{m_3m_4}{d^2}} = \frac{m_1m_2}{m_3m_4} \quad (1.35)
\]

But according to the section 1.6 of this part, these two gravitational forces will be given by \(G \frac{m_1+m_2}{d^2}\) & \(G \frac{m_3+m_4}{d^2}\)

Now, if \(F_{L,m_1m_2}\) & \(F_{L,m_3m_4}\) denote these two forces, then their ratio will be given by

\[
\frac{F_{L,m_1m_2}}{F_{L,m_3m_4}} = \frac{G \frac{m_1+m_2}{d^2}}{G \frac{m_3+m_4}{d^2}} = \frac{m_1+m_2}{m_3+m_4} \quad (1.36)
\]

Now a practical determination of the two sets of gravitational forces between the bodies of masses \(m_1\) & \(m_2, m_3\) & \(m_4\) with the help of a Cavendish apparatus may tell whether \(F_N\) of Newton or \(F_L\) of Lalit is correct. If \(F_{P,m_1m_2}\) & \(F_{P,m_3m_4}\) be the practical gravitational forces, \(l\) be the length of the arm of the Cavendish apparatus, \(\tau\) be the torque of the wire (fiber) per degree twist of the apparatus, \(\theta_1\) & \(\theta_2\) are the total twists of the fiber due to the deflecting moments \(lF_{P,m_1m_2}\) & \(lF_{P,m_3m_4}\) respectively, of the same Cavendish apparatus, then

\[
lF_{P,m_1m_2} = \tau \theta_1 \quad \& \quad lF_{P,m_3m_4} = \tau \theta_2
\]

\[\therefore \quad \frac{lF_{P,m_1m_2}}{lF_{P,m_3m_4}} = \frac{\tau \theta_1}{\tau \theta_2} \quad \text{or} \quad \frac{F_{P,m_1m_2}}{F_{P,m_3m_4}} = \frac{\theta_1}{\theta_2} \quad \text{........} \quad (1.37)
\]

Now, if \(\frac{\theta_1}{\theta_2}\) more coincides to \(\frac{m_1m_2}{m_3m_4}\) of the equ.(1.35), then \(F_N\) is correct & if \(\frac{\theta_1}{\theta_2}\) more coincides to \(\frac{m_1+m_2}{m_3+m_4}\) of the equ.(1.36), then \(F_L\) is correct.

It is here noted that whatever gravitational force is correct, there is no harm to the cosmic pressure theory of gravitation.
(b) Test of Cosmic pressure:

When a comet comes near the sun & passes around the sun, then its tail always remains against the sun & this happens due to the radiation pressure from the sun. But this radiation pressure is nothing but the cosmic pressure in this thesis. So it is confirmed that the sun & hence the other stars eject cosmic particles which give pressure on other material bodies.

In the beginning paragraph of this thesis we have also seen that the sun & other stars are the sources of cosmic particles & the intensity of cosmic particles at the earth surface goes a maximum at the midday & a minimum at the midnight. So, the cosmic pressure on a material body at the earth surface & hence the weight (gravitational force) of a material body at the earth surface will go a maximum at midday & a minimum at midnight. To verify this phenomenon, I weighed a material body (a cup) at midday & at midnight of a day with a sensitive elastic balance (like a spring balance) & found a slight increase (0.0032 percentage) of its weight at midday than at midnight, which verifies the cosmic pressure & hence the cosmic pressure theory of gravitation.

To avoid the moon's attraction on the weights, I chose the 8th day after the full moon for the midday & midnight measurements of the weights, when the sun & the moon were situated at right angle at the earth.

1.11. The Nuclear Force:

In the section 1.2, we have seen that the gravitational force of higher density bodies situated at shorter distance is high. But the density of nucleons within a nucleus is very high & they are situated at close contact by deep touch, that is, they are situated at the shortest distance. No such big spaces are present within a nucleus unlike intermolecular spaces within molecules & almost no cosmic particle can go through a nucleus. So all the cosmic particles, which come towards a nucleus, take part in gravitational force (Section 1.1). So the gravitational force among the nucleons within a nucleus is very high, which is known to us as the Nuclear Force.

But the peculiar property of the nuclear force is its short range. Without close contact of nucleons, that is, beyond the touch of nucleons among themselves, no
nuclear force acts among them. To explain this phenomenon, let us remember the famous Magdeburg Hemispheres Experiment performed by Otto Von Guericke in 1654. Before Guericke none could believe the tremendous force of atmospheric pressure. When the circular edges of the two hollow hemispheres were brought to close contact by deep touch with each other & the air was exhausted from inside of the hollow sphere, then eight horses at each side, that is, a total of sixteen horses were needed to separate the hemispheres. Now, if we use two solid hemispheres of very smooth circular faces, instead of two hollow hemispheres & bring them to touch themselves deeply, we will get the same result. Here also several horses will be needed to separate them. In this case, air exhaust will not be needed, because of no air is present between the solid hemispheres, when they touch each other deeply. This deep touch of the two solid hemispheres may be done easily by use of some drops of any liquid between them. Now instead of two solid hemispheres, if we use two plane plates, three plane plates etc. or if we use two fractional parts of solid spheres, three fractional parts of solid spheres etc. or if we use several solid spheres in close contact by deep touch, as shown in the figure 1.10, we will get the same result.

Here the interesting phenomenon is that, if the solid hemispheres or the plane plates, or the fractional parts of solid spheres or the several solid spheres are situated at a little distance from one another, no force acts between them to hold them together, because of entrance of air between them. That is, beyond the close contact by deep touch, no force acts between the hemispheres or among the spheres to hold them together, & the same phenomenon occurs among the nucleons with in a nucleus, where the cosmic pressure hold them together & presents the nuclear force. Beyond the close contact by deep touch of the nucleons, the strong nuclear force vanishes & thus explains the short range of the nuclear force. It is here also noted that, there is no harm to hold this force among the protons as well as among the neutrons. That is, this force is independent of charge.
1.12. The Molecular Binding Energy:

The atoms within a molecule or the molecules within a solid material body, are also situated at close contact by touch themselves & the cosmic pressure hold them together, likewise the nucleons within a nucleus (Section 1.11). But the molecules hold intermolecular spaces & these spaces are very big in comparison with a nucleus & many cosmic particles. So a large number of cosmic particles which are small in comparison with intermolecular spaces go through these intermolecular spaces & these cosmic particles do not take part in gravitational force. So the gravitational force among the atoms within a molecule or the gravitational force among the molecules within a solid material body is very much less than the nuclear force, which is known to us as the molecular binding force or commonly the Molecular Binding Energy.

1.13. The Electrostatic Repulsive Force & The Expanding Universe:

In the section 1.1(Figure 1.1(d)), we have seen that, when two material bodies are placed side by side in any place in the universe, then the cosmic pressures on the face to face sides of the two bodies become less than the cosmic pressure on the opposite sides of the two bodies, due to less number of strokes by the cosmic particles on the face to face sides than the opposite sides of the two bodies, due to obstacles made by themselves & thus present the gravitational attraction.

But, if the material bodies be two sources of cosmic particles, then they themselves will eject cosmic particles, & the cosmic particles ejected by one material body will strike on the other & also create cosmic pressures on the face to face sides of both the material bodies. Now, if the cosmic pressures created by the cosmic particles ejected by the bodies themselves, on the face to face sides, become greater than the cosmic pressures on the back sides of the two bodies, then both the bodies will go away from each other & thus will present a repulsion between the two bodies & the same phenomenon occurs in the case of two like electrically charged bodies, where the electrically charged bodies are also the sources of cosmic particles.
In the beginning paragraph of this thesis (Section 1.1), we have anticipated that stars are sources of cosmic particles. So any two stars will go away from each other likewise two like electrically charged bodies & thus explains the expanding Universe, instead of the illusory Big-Bang theory.

1.14. The Weak Force:

Though there is no such big space in a nucleus unlike the intermolecular spaces within a molecule, yet there always remain internuclear spaces. If a little cosmic particle of sufficient energy enters into a loosely bounded nucleus through a internuclear space, it can strike out some portion of the nucleus, resulting the alpha decay. The nuclear constituent particles also may be broken into powders by energetic cosmic particles & these powders may be ejected as beta & gamma decays. When a free elementary particle is stricken by a cosmic particle, it may be split into two or more parts or its shape may be changed which is easy to break into several parts afterwards & this is the illustration of decay process of free elementary particles.

1.15. The Black Hole:

In the figure 1.1(c) of the section 1.1 we have seen that when any material body is isolated in any place in the universe, it gets cosmic pressure from all around it. But due to this pressure the volume of the material body becomes small & thereby the density of it becomes high. Of course, some of cosmic particles which strikes at the isolated body, bunch of out & some remains at rest at the isolated body & thus they increase the mass of the isolated body. Now if the material body is isolated for a long time, then its density & mass becomes high day by day & thus after a very long period of time the material body becomes a Black Hole.

The black hole created in the above process may not be a singular case in the universe. There may be so many black holes in the universe.

1.16. The Cosmology:

A black hole is highly attractive in nature. It attracts all the material bodies & minute particles around it. When a black hole comes within the range of another black
hole, then both the black holes attract each other vigorously & collide & break down into fragments & minute particles (cosmic particles), which take part in gravitational force, & thereby heavy bodies, even other black holes begin to create again & these process of creation & break down go on in cyclic order without any stop, within the universe of four dimensions. The universe has no beginning point & also has no ending point. It was present in past time & it will be present in future time for ever.

1.17. Discussions & Conclusion:

1. This cosmic pressure theory of gravitation can explain the attractive nature & long range of the gravitational force & can also explain the equivalence principle (Section 1.1 & 1.4)

2. This theory has found out the factors of gravitational force that agree to that of Newton (Section 1.2).

3. This theory is able to give a gravitational force that almost coincides with that of Newton (Sections 1.6 & 1.7).

4. In the section 1.8, a wrong point has been found out in the derivation of gravitational force by Newton.

5. This theory can also explain the fundamental postulates of the Kinetic Theory of Gases & the Brownian Movement (Section 1.3).

6. This theory is able to give the acceleration due to gravity, which agrees to fact (Section 1.4).

7. This theory can explain nicely the nuclear force, that is, strong interaction, short range & charge independent of nuclear force (Section 1.11).

8. This theory can explain the molecular binding energy (Section 1.12).

9. This theory can explain the electrostatic repulsive force & the expanding universe (Section 1.13).

10. This theory can explain the weak force (Section 1.14).

11. This theory can explain the black holes (Section 1.15).

12. This theory can explain the cosmology too (Section 1.16).

13. This theory can explain the origin of cosmic particles (section- 1.1).
14. In the gravitational force \( F = \frac{G m_1 m_2}{d^2} \) of Newton, two dimensions of mass are present; where in \( F = \frac{G m_1 + m_2}{d^2} \) one. So the gravitational force \( F = \frac{G m_1 + m_2}{d^2} \) is more acceptable than \( F = \frac{G m_1 m_2}{d^2} \).

15. Both the gravitational forces \( \frac{G m_1 m_2}{d^2} \) & \( \frac{G m_1 + m_2}{d^2} \) are satisfied by this cosmic pressure theory of gravitation. So whatever force is correct, there is no harm to the cosmic pressure theory of gravitation (Sections 1.1, 1.2, 1.6 & 1.10(a)).

16. On the other hand, no other theory can explain all the above natures of the gravitational force. Only Einstein was able to explain the equivalence principle & some other properties of the gravitational force with the help of his general relativity, but failed to explain the attractive nature of gravitational force which is the main property of the gravitational force. Rather, his general relativity gives the repulsive nature of gravitational force what he mentioned as "a gravitational field of a special kind" (A. Einstein 1920, reprinted 1970) & to remove this discrepancy he tried heart & soul in a long & hard mathematical process by generalizing his theory, but failed to arrive at success (A Einstein 1920, reprinted 1970).

Though Einstein's general relativity has failed to find out the clue of gravitation, it is the pioneer of all other gravitational theories that are trying to find out the clue of gravitation, & it rules over gravitation for a long time. Someone advanced to save the theory. But, "the predictions of general relativity are fixed; the theory contains no adjustable constants so nothing can be changed. Thus every test of the theory is potentially a deadly test. A verified discrepancy between observation & prediction would kill the theory, & another would have to be substituted in its place" (Will' 93).

So this theory of gravitation based on cosmic pressure presented here, should be accepted.

17. Strictly maintenance of equivalence principle gives the proof of Einstein’s theory of gravitation; any violation of it (equivalence principle) disproves the theory completely. But, the Nordtvedt effect, the modern Eötvös type
experiments & Eötv-Wash experiment show a clear violation of the equivalence principle (Will’93). So Einstein’s theory of gravitation is not fact; it is false. On the other hand, the equivalence principle presented by my theory of gravitation based on cosmic pressure (Sections 1.4 & 1.9) fully agrees to the Nordtvedt effect, the modern Eötvös type experiments & Eötv-Wash experiment.

So, Einstein Theory of Gravitation must be rejected & this Theory of Gravitation must be accepted.

18. Moreover, if more than one theories are presented for a single purpose & if all the theories are proved by experiments, then the simplest among all the theories will be accepted and the others will be rejected. As this theory of gravitation based on cosmic pressure presented here is the simplest among all, so this theory of gravitation will be accepted and the others will be rejected.

References

PART – II

Theory of Light
Theory of Light

2.1. History of the Theory of Light:

In 1637, Descartes derived Snell’s law of refraction with the help of particle view of light (Ajoy Ghatak-1992). In 1672, Newton proposed in detail the particle nature of light. According to his view, light is a stream of corpuscles (minute particles) ejected from light sources. He also explained the phenomena of reflection & refraction of light from his particle view. But those explanations are not satisfactory & are not granted by experiment either.

In 1678, Huygens proposed the wave nature of light, which is known as Huygens’ principle. According to Huygens, light propagates as waves with high speed through any all-pervading medium called ether & the reflection & refraction of light can be explained with the help of this principle (David Halliday & Robert Resnick-1990). But by the experiment of Michelson & Morley, the existence of the ether medium has been completely vanished (Arthur Beiser – Concept of Modern Physics – Revised Edition). So Huygens’ Principle fell in trouble.

In 1864, Maxwell came with electromagnetic theory of light. He mathematically showed that the speed of his electromagnetic wave is nearly the same as the speed of light & thereby he proposed that light is nothing but electromagnetic waves, which can also propagate without any medium. But the propagation of a wave without any medium is till now confusing.

In 1900, Planck came with quantum theory of light, which is roughly similar to that of Newton. He proposed that light is not radiated continuously, it is emitted as quanta of energy & the energy of a light quanta is given by \( E = h \nu \), where \( \nu \) is the frequency of propagation of light energy. That is, a hot body radiates light energy as quanta & then it propagates as wave. Einstein advanced further with Planck’s idea. He proposed that light not only emits as quanta but also travels & absorbs by any matter as quanta of energy \( E = h \nu \), & with the help of his idea he nicely explained the photoelectric effect, which cannot be explained with the wave theory of light. He
named the light quanta as photon. Though the photoelectric effect can be explained with the help of quantum theory of light, but till now with the help of quantum theory, none could explain reflection, refraction, diffraction, interference & polarization of light, which can be explained with the help of wave theory.

In the above discussion, we see that all the four theories of light can be summarized as two; particle theory given by Descartes, Newton, Planck & Einstein, & wave theory given by Huygens & Maxwell. The particle theory can explain some phenomena, such as photoelectric effect, Compton effect, photograph production, X-Ray production that cannot be explained by the wave theory. On the other hand, the wave theory can explain reflection, refraction, interference, diffraction & polarization of light, which cannot be explained by the particle theory. Then question arose, what is the actual nature of light? Physicists fell in horns of dilemma. Finding no other way, they accepted particle & wave both the theories of light & that acceptance is now known as dual nature theory of light or modern theory of light, which was first done by de-Broglie in 1924 by the proposal of matter wave.

2.2. Review of Huygens’ Principle:

Huygens’ principle is basically a geometrical construction as shown in the figure 2.1, & states that all points on a wave front can be considered as point sources for the production of spherical secondary waves. After a time the new position of the wave front will be the surface of tangency to these secondary wavelets (David Halliday & Robert Resnick-1990). In the figure 2.1, parallel light rays are going from the left to the right, & at anytime, the light has reached in the plane a b c d . Then according to Huygens, the points a,b,c,d will produce the secondary spherical waves as shown in the figure, & the spherical surface e f g h i j will be the next wave front.
In the figure, it is seen that the light not only goes in the forward direction from the plane a b c d, but also goes in all directions, even in the backward direction. But this does not happen in practical. Parallel light rays do not go in the backward direction. Of course, it was tried to avoid this discrepancy by assuming that the intensity of the spherical waves is not uniform in all directions; varies continuously from a maximum in the forward direction to a minimum of zero in the backward direction. But why this will happen? Is there any cause to happen this? No. Moreover this assumption goes in favor of particle nature of light, because a moving particle (matter) possesses only forward direction. Even, in this assumption the intensity in the sideward directions is not zero. So in the sideward directions, Huygens’ light waves should go. But this does not happen in practical either. So, Huygens’ principle is defective. But it is able to give a more or less satisfactory explanation of reflection & refraction of light, which Newton failed to do with his corpuscular theory. So Huygens’ principle is not completely rejected from us till now. In future, if we have a satisfactory explanation of reflection & refraction of light from its particle nature, then we will completely reject Huygens’ principle.

Figure -- 2.1
2.3. Modification of Newton’s 3rd Law of Motion:

![Diagram](image)

**Figure -- 2.2**

In the figure 2.2 (a), a playing ball hits on a wall normally, & after hitting the wall, the ball goes back also normally & this happens in practical. In this case, Newton’s 3rd law of motion says, “To every action, there is an equal opposite reaction”. That is, when the ball hits on the wall, the wall also hits on the ball just oppositely & the ball goes just in the opposite direction. But in the figure 2.2(b), a ball hits on a wall obliquely with an angle \( \theta \) to the normal to the wall & after hitting the wall, the ball goes along OB with the same amount of angle \( \theta \) to the normal & this also happens in practical. In this case, the ball does not go in the opposite direction & we cannot apply Newton’s 3rd law of motion to explain the phenomenon. So, the 3rd law of motion is defective & it should be modified. If we modify it as, “To every incident action, there is an equal reflected reaction”, we can easily explain both the cases in the figures 2.2 (a) & 2.2 (b).

2.4. Reflection of Light from its Particle Nature:

If we consider light as electrically neutral elastic particles, we can easily explain the reflection of light from the modified 3rd law of motion as mentioned in the previous section. It is here noted that reflection occurs due to obstruction of moving light photons by the molecules & nucleus of the obstructor & the refraction occurs due
to transmission of light photons through the intermolecular spaces of light transparent substances, which is given in detail in the section 2.5.

2.5. Refraction of Light from its Particle Nature:

In the figure 2.3(a), a material body ‘A’ is situated in any place in the free space. According to the figure 1.1(c) of the section 1.1 of the first part of this book, the body ‘A’ gets cosmic pressures ‘P’s from all sides & all these pressures are equal in magnitude. In the figure 2.3(b), the material body ‘A’ of the figure 2.3(a) is replaced in the mid point of a piece of water medium which is also placed in the free space. Here all the cosmic particles which run along the area of the material body ‘A’, do not strike on the body ‘A’; some are reflected & some are opposed by the water medium, as shown in the figure, & the rest go through the intermolecular spaces of the water medium & strike on the body ‘A’ & give pressures ‘p’s on ‘A’. Here, though all the pressures ‘p’s on the body ‘A’ are equal in magnitude, but they are not equal to the pressures ‘P’s in the free space of the figure 2.3(a), they are less than ‘P’s. That is, the cosmic pressure on a body within a medium is less than the cosmic pressure on the same body in the free space. Of course, the cosmic particles which come to the material body ‘A’, they all do not hit on the body ‘A’, some go through the intermolecular spaces of the material body ‘A’, which were not shown in the figure.
In the figure 2.4(a), the material body ‘A’ of the figure 2.3 (b) is again replaced just aside to a piece of glass medium. Here the cosmic pressures on ‘A’ from all sides are not equal. According to the figure- 2.3(b), the pressure ‘p’ from the glass side of the figure 2.4(a) is less than the equal pressures ‘P’s from the free space sides.

In the figure 2.4 (b), the path of a moving photon of visible light is shown. Here the photon first travels through a free space & comes normally to a rectangular glass medium & then goes through the glass medium & finally again through the free space, as shown in the figure. In the figure, six positions of the moving photon are shown. Immediate before we have illustrated that all the material bodies get cosmic pressures in the free space & as we have considered here a light photon as a particle (matter), so it also gets cosmic pressures on it. That is the cosmic particles which are
very little in comparison with the light photon, hit on the light photon & thus give pressure on it. In the position 1 of the figure 2.4(b), the cosmic pressures ‘P’s on the photon from any two opposite directions normal to the path of the photon are equal in magnitude in the free space & hence the moving photon goes forward in a straight line & advances normally to the surface of the glass medium, as shown in the figure. In the position 2, the cosmic pressures ‘P’s on the photon from the two opposite direction normal to the path of the photon, are also equal in magnitude & hence the photon touches the glass surface normally & enters into the glass medium in the same straight line. In the position 3, the opposite pressures ‘p’s on the photon within the glass medium are also equal in magnitude, though they are less than ‘P’s of the position 2 in the free space. So the photon leaves the upper surface of the glass medium normally & goes in the same straight line within the glass medium. In the position 4, the photon also gets two opposite pressures ‘p’s of equal magnitude & goes in the same straight line also within the glass medium. In the position 5, the opposite pressures ‘p’s are also equal in magnitude & hence the photon leaves the glass medium normally & goes in the same straight line. In the position 6, the photon again gets two opposite pressures ‘P’s of equal magnitude in the free space & goes in the same straight line also & thus the photon all alone goes in a straight line, when it comes normally to the glass surface.

In the figure 2.4(c), the path of a moving photon of visible light is also shown. Here the photon also first travels through the free space, but comes obliquely to the surface of a rectangular glass medium & then goes through the glass medium & at last again through the free space. In the figure, eight positions of the photon are shown. In the position 1 of the figure 2.4(c), the cosmic pressures ‘P’s on the photon from the two opposite directions normal to the path of the photon are equal in magnitude & hence the moving photon goes forward in a straight line, as shown in the figure. In the position 2, the cosmic pressures on the photon from the two opposite directions normal to the path of the photon, are also equal in magnitude & the photon also goes in the same straight line. In the position 3, the situation of the cosmic pressures on the photon is the same as that of the position 2 & the photon goes in the same straight line also. Of course, here the pressure P from the left side is the sum of the reflected
pressure $P_r$ from the glass surface & the transmitted pressure $P_t$ through the glass medium, as shown in the figure. But in the position 4, the pressure $P$ normal to the path of the photon from the free space side & the pressure $p$ from the glass side are not equal in magnitude. According to the figure 4(a), the pressure $p$ normal to the path of the photon, from the glass side is less than the pressure $P$ normal to the path of the photon from the free space side & hence the photon bends to the left at this position & goes through the intermolecular spaces of the glass medium & causes to happen refraction. In both the positions 5 & 6, the pressures ‘$p$’s from the two opposite directions normal to the path of the photon, are also equal in magnitude & the photon goes in another straight line within the glass medium. In the position 7, the photon again faces two unequal pressures normal to the path of the photon, likewise in the position 4. Here the pressure $P$ from the free space side is greater than the pressure $p$ from the glass side & the photon bends to the right. In the position 8, the photon again gets pressures ‘$P$’s of equal magnitude from the two opposite directions normal to the path of the photon, & goes again in another straight line, in the free space.

Here we have a satisfactory explanation of refraction of light from its particle nature & in the section 2.4, we had also a satisfactory explanation of the reflection of light from its particle nature, & in 1637, Descartes derived Snell’s law of refraction with the help of particle view of light (Ajoy Ghatak-1992). So we need not further retain Huygens’ principle of light. Now we can completely reject it, as mentioned at the end of the section 2.2.

2.6. Review of the Explanation of Foucault’s Experimental Result:

According to the explanation of Newton with his corpuscular theory of light, the speed of light in any medium is greater than in a free space or than in a less dense medium & according to Huygens’ wave theory, the speed of light in any medium is less than in a free space or than in a less dense medium. In 1850, Foucault showed by an experiment that light travels more slowly in water than in air, which ruled out the corpuscular theory of Newton (David Halliday & Robert Resnick-1990). But no body tried to find out the actual phenomenon behind it. Let us search for this.
In the figure 2.5, a light photon (particle) passed through the equal widths ‘d’ of free space, air medium & water medium. In the free space the photon faced no counter & came down in a straight line. But in the air medium, the photon collided with air molecules & came down through a zigzag path whose total length is greater than the wide ‘d’. So the photon has taken more time to traverse the equal wide ‘d’ in the air medium. In the lower part of the figure, that is, in the water medium, the photon has collided with more molecules & has come down through a more zigzag path than in the air medium, whose total length is also greater than the total path length in the air medium. So the photon has taken also more time to traverse the equal wide ‘d’ in the water medium than in the air medium.

In the above illustration (Figure 2.5), we saw that, the photon has taken more time to traverse the equal with ‘d’ in denser medium & this is why Foucault got the lower velocity of light in denser medium; but not due to the illusory geometrical construction of the wave theory given by Huygens.

2.7. Explanation of Diffraction of Light from its Particle Nature:

According to gravitation, any two material bodies attract each other. Now if we consider light photons as particles, they must have masses & any light opaque material
body or any material body will attract them, when they (light photons) pass by the edge of the material body & the photons’ path will bent from its original path, which is nothing but the diffraction of light.

Now likewise Newton, if we consider that, light photons are of different masses, then the photons of different masses will be attracted by different forces & will diffract at different angles when they pass by the edge of a opaque material body.

Moreover, if we assume that the photons of different masses do not possess all the possible masses, that is, the masses of the different photons are not continuous, they are quantized, then the photons of different quantized masses will not be attracted by continuous forces, but by some discontinuous forces & will not diffract at all the possible angles, but at some definite angles & will produce a pattern of light on a screen placed behind the material body with regular gaps, which is nothing but the diffraction pattern of light. The gaps are the black bands of the pattern.

In the case of a single slit diffraction pattern, the light photons go through a slit & are attracted by both the walls of the slit & the attractions of different photons of different quantized masses going through different distances from the walls of the slit are different. So the photons of different quantized masses going through different distances diffract at different angles toward the walls of the slit with regulars gaps as explained above. Now the photons which go through the central line of the slit are attracted equally by both the walls of the slit & go in a straight line without bending to any wall of the slit & hence produce a single slit diffraction pattern on a screen placed behind the slit with a bright spot at the center of the diffraction pattern.

It is here noted that the diffraction pattern of light has no direct explanation from the wave nature of light. The physicists, who believe in wave nature of light, first explain double slit interference pattern & then they explain diffraction pattern with the help of the interference pattern. But to explain the interference pattern of light, they use two light waves of equal wave length & of equal amplitude with the analogy of interference pattern of water waves from two slits. But in the case of passing of water waves through a single slit, such two waves of equal amplitude are absent. So, how the explanation of diffraction pattern of light is possible with the analogy of water waves? Of course, here they consider the reflected waves as the second wave. But the
reflected wave of a water wave is very feeble, that is of little amplitudes & these little amplitudes are not equal to the amplitudes of the incident waves (direct waves) & cannot form a prominent interference pattern as that of light.

2.8. Explanation of Double Slit Interference Pattern of Light from its Particle Nature:

If the two slits of the Young’s experiment are situated at a very long distance from each other, then the patterns (bands) will be likewise two separate single slit diffraction patterns of light photons as explained in the previous section. Now, if we bring the slits close to each other, then the two diffraction patterns will come to each other, & if we continue to bring the slits close to each other, then a time will come when some portion of a diffraction pattern will overlap on the other & will form a combined diffraction pattern on the screen with a big bright spot on the overlapping area on the screen, that is, a big bright spot will be formed in the middle of the combined diffraction pattern which is nothing but the interference of light & the pattern is the interference pattern.

2.9. Explanation of Polarization of Light from its Particle Nature:

In the figure 2.6(a), light particles (photons) are going in parallel to each other from the left to the right & fall on a opaque screen A, so that no light photon falls on another equal size opaque screen B placed behind the screen A in parallel, & no light is seen at an eye placed behind the screen B, as shown in the figure.

Now two very narrow slits of equal wide & of equal length are made in the middle of the two screens, as shown in the figure 2.6(b). In the figure, the slits are situated at right angle to each other, so that some light photons go through the slit of the screen A, & these photons have landed on the screen B. But almost no photon can go through the slit of the screen B & as a result almost no light is seen at the eye placed behind the screen B.
Now, the screens are rotated so that the slits in the screens are made parallel, as shown in the figure 2.6(c). In these positions of the screens, the light photons which go through the slit of the screen A, can also go through the slit of the screen B, as shown in the figure. As a result, light particles (photons) can land on the eye placed behind the screen B, which is nothing but polarization of light.

2.10. Review of Matter Wave of de-Broglie:

Let, flocks of bullets are running from a gun periodically, as shown in the figure 2.7(a). Here the motions of the bullets are linear. As the flocks of the bullets are going periodically, their total motion is shown like a longitude sound wave. But actually it is not like a sound wave, because the bullets are not moving back & forth likewise the motions of air molecules in the case of a sound wave. Even this is not actually any wave neither longitude nor transverse. Even the question of transverse wave does not arise at all.
Now, if the bullets run one by one as shown in the figure 2.7(b), then the total motion of the bullets is also shown like a longitude wave, though the motion is not a wave motion. It is here interesting to note that both the above motions have frequencies & assumed to have wavelength as shown in the figure 2.7(c). But actually they are not any wave & the kinetic energy of any bullet must not depend on these frequency & assumed wavelength. The kinetic energy $\frac{1}{2} mv^2$ depends only on the mass & the velocity of the bullet.

Now, if any one conducts any experiment to find out the frequency & wavelength of the bullets in the figures 2.7(a) & 2.7(b), he may get so too (Figure 2.7(c)); though we can never consider that the motions of the bullets are wave
motions. In the figure 2.7(d), a single bullet is running from a gun. Here the motion of the single bullet is also a linear motion. But this motion has no frequency & no assumed wavelength. So the motions of particles in the free space due to inertia of motion are actually linear motions, but not wave motions. So de-Broglie’s idea of matter wave is a wrong & illusory idea. Moreover, it violates Newton’s 1st law of motion which is an ever truth & experimentally verified law of nature. It is here noted that to obtain matter wave (matter wavelength) which is now known as de-Broglie wave, de-Broglie used Planck’s & Einstein’s energy equations \( E = hv \) & \( E=mc^2 \) respectively. But both the equations have errors, which are given in the sections 2.11 & 2.16 in detail.

It is here also noted that, according to my thesis, ‘Energy force & time’ (Indian Journal of Theoretical Physics, Vol. 32, No. 2, 1984, page-165-174) the momentum of a particle serves its energy also & it is the base of all kinds of energies.

### 2.11. Error in Estimation of Photon Energy by Plank & Einstein & its Correction:

Planck quantized the energy & estimated the lowest amount of emitted light energy by \( E=hf \) where \( f \) is the frequency of propagation of light energy. By the supposition of the lowest amount of energy, Planck gave some what particle nature of light. But by introducing the term \( f \) (frequency) he also recognized the wave nature of it & Planck’s idea was also so. That is, light emits as quanta & then propagates as wave, which is an illusory idea. Then advanced Einstein. He proposed that light not only emits as quanta \( hf \) but also propagates & absorbs by any matter as the same quanta \( hf \) & to do these he also did the same error as Planck. That is, Einstein also used the term \( f \) (frequency) to estimate the quantized light energy & did the same error as Planck. Now a question is, how will we estimate the kinetic energy of a light photon? In the previous section, we saw that the kinetic energy of a particle never depends on its frequency, it depends only on its mass & velocity & it will be simply \( \frac{1}{2} mv^2 \). So, if we consider a light photon as a particle, then the kinetic energy of a light photon will be \( \frac{1}{2} mc^2 \), where \( m \) is the mass of the photon & \( c \) is its velocity.
From the knowledge of the previous section (Figure-7(d)), it is also clear that a single photon must not have any frequency. Even it may not be assumed to have any frequency. Now another question arises, what will be the condition of Einstein’s photoelectric equation \( T_{\text{max}} = h\nu - h\nu_o \), which gives nicely the explanation of photoelectric phenomenon. It will be simply modified as, \( T_{\text{max}} = \frac{1}{2} mc^2 - \frac{1}{2} m_0 c^2 \), where \( m_o \) is the threshold mass, that is the lowest amount of mass of a photon, below which no photo electron is extracted from a particular metal plate & \( \frac{1}{2} m_0 c^2 \) is the work function of the metal surface. It is here noted that both Planck & Einstein considered a light photon as a ‘packet’ of energy. But here light photons are considered as fully particles (matter) likewise Newton.

2.12. Analysis of Faraday’s Law of Induction:

Faraday’s law of induction states that change of magnetic flux, that is change of magnetic lines of force through a loop of electric conductor produces an electric current within the loop. But why the change of magnetic lines of force through a loop of electric conductor produces a electric current within the loop? At present we know that electric current is nothing but flow of electrons within a electric conductor & from the base of production, electric currents are four in kinds, Voltaic current (current from a battery), thermo electric current (Seeback effect), photo electric current (photo electric effect) & Faraday’s induction current. In the case of a Voltaic current, electrons are produced by chemical reaction & flow within the electric conductor. In the case of a thermo electric current, electrons are knocked out by heat energy & flow within the electric conductor & in the case of a photo electric current, light photons knock out electrons from a metal plate & make to flow within the electric conductor. But where do the electrons come from in the case of Faraday’s induction current? These electrons either come from the magnet, that is the magnetic lines of force are themselves the flow of electrons, or likewise the photo electric current, the electrons are knocked out from the loop of electric conductor (metallic loop) by any kind of neutral particles flowed from the magnet. That is the magnetic lines of force are the flow of some kinds of unknown neutral particles which knock
out the electrons from the metallic loop. But at the end of this section we will see that the magnetic lines of force are not the flow of electrons. So, here the second possibility occurs. Of course, magnetic lines of force make long channels (graves) through iron filings, which proves the flow of some particles from the magnetic poles with regular gaps & these regular gaps also prove that the particles do not come out from all the arbitrary points of a magnetic pole, they come out from some definite points of a magnetic pole. But, unlike photo electric current, Faraday’s induction current is not produced without any relative motion between the magnet & the metallic loop. Of course, without relative motion, only a momentary current flows within the loop, when the loop suddenly enters into the lines of force & then the momentary current is ceased. Now a question is why the momentary induction current is ceased unlike that of photoelectric current? The answer is that, in the case of a photo electric current, the photons fall on a metal plate in a random way & knocks out electrons from the metal plate continuously. But in the case of Faraday’s induction current the magnetic particles do not come from all the arbitrary points of the magnetic pole & they do not fall on the body of the metallic loop in a random way, they fall on the body of the metallic loop on some definite points with regular gaps & knock out the elections from the atoms on that definite points & cease the knock out able electrons of the atoms of that definite points within a very short time & thereby the induction current ceases. Now, if we move the magnet or the loop, then the magnetic particles of magnetic lines of force fall on some other points on the body of the metallic loop & produce another momentary current within the loop. Now, if we continue the movement of the magnet or the loop, then the momentary Faraday’s induction current becomes a continuous electric current. So it is here clear that the change of positions of magnetic lines of force on the body of the metallic loop produces Faraday’s induction current within the loop.

Now let us look back at the first possibility. If the magnetic lines of force are themselves the flow of electrons, then the Faraday’s induction current would flow continuously without any relative motion between the magnet & the loop. But this does not occur in practical. So the magnetic lines of force are themselves not the flow
of electrons, they are the flow of some unknown neutral particles which knock out electrons from the body of the metallic loop.

2.13. Review of Maxwell’s Electromagnetic Theory of Light:

In 1864, Maxwell mathematically showed that the speed of his electromagnetic wave is almost the same as that of the speed of light & thereby he proposed that light is nothing but electromagnetic waves & most of the physicists of that time, even Einstein of latter time were highly convinced at that proposal. Now a question is, the speed of a Bangladeshi tiger Chita may be the same as the speed of an airplane. But, are the Chita & the airplane the same entity? No. The Chita is a living animal & the airplane is a non-living flying machine. So the same speed of the electromagnetic wave & that of the light does not prove that they are the same thing. Of course, both the light & the electromagnetic wave are the same thing in the sense that both they are minute particles which are given at the previous sections & at the end of this section too. It is here noted that Maxwell derived the speed of his electromagnetic wave as: 

\[ c = \sqrt{\mu_o \varepsilon_o} \],

where \( \mu_o = 4 \pi \times 10^7 \) weber / amp-m, which is an assigned value. (David Halliday & Robert Resnick-1990, page 986, 848).

Now let us come to another point. To derive the speed of an electromagnetic wave, Maxwell first used Faraday’s law of induction which he (Maxwell) mathematically wrote as: 

\[ \oint E \cdot dl = -d\Phi_B / dt \].

But in the previous section we saw that the actual cause of Faraday’s induction current is not due to the change of magnetic flux with time. Even in some cases, Faraday’s induction current may be flowed continuously without change of net magnetic flux, as illustrated below.

In the figure 2.8(a), a copper rod of length L is rotating at a uniform angular frequency in a uniform field of magnetic induction \( \mathbf{B} \) & develops an emf between the two ends of the rod (David Halliday & Robert Resnick-1990, page-880). Now, if we connect a hard wire \( \mathbf{W} \) of electric conductor at the two ends of the rod, as shown in the figure 2.8(b), then a loop will be constructed & this loop will also rotate at the same angular frequency in the uniform field of magnetic induction \( \mathbf{B} \) & no change of net...
magnetic flux through the loop will occur, as shown in the figure. Since an emf is developed at the two ends of the rotating rod before the connection of the wire to construct the loop (Figure 2.8 (a)), hence a Faraday’s induction current must flow within the rotating loop without change of net magnetic flux through the rotating loop (Figure 2.8 (b)).

![Figure 2.8](image)

**Figure – 2.8**

Now let us come to the displacement current of Maxwell’s electromagnetic equations which is solely the own contribution of Maxwell. The Ampere’s law which is the result of Orested experiment is that an electric current produces a magnetic field, which Maxwell mathematically expressed as $\oint B \cdot dl = \mu_o j$, & according to Maxwell’s language, Faraday’s law of induction is that a changing magnetic field produces an electric current & with the counterpart symmetry, Maxwell thought that a changing electric field would also produce a magnetic field & he (Maxwell) mathematically wrote his thinking as:

$$\oint B \cdot dl = \mu_o \epsilon_o \frac{d\phi_E}{dt} = \mu_o i_d$$

is now known as displacement current. But in the previous section we saw that the change of positions of magnetic lines of force on the body of the metallic loop is responsible for Faraday’s induction current, but not changing magnetic field & then the counterpart symmetry of the change of positions of magnetic lines of force...
produces a current will be the change of positions of electrons produces magnetic 
lines of force which fully occurs in Ampere’s law (Orested experiment). So 
Maxwell’s thinking of counterpart symmetry which developed the displacement 
current, is a wrong thinking & his derivation of the speed of an electromagnetic wave 
in collaboration with his displacement current is a wrong derivation.

In the section 2.12, it was explained that magnetic field is the spread of 
magnetic lines of force & magnetic lines of force are the flow of magnetic particles 
from the magnetic poles. Similarly, the electric field is the spread of electric lines of 
force & electric lines of force are the flow of electric particles from the electric 
charges.

Now let us come to the propagation of Maxwell’s electromagnetic waves 
through empty space, as shown in the figure 2.9 (David Halliday & Robert Resnick-
1990, Page-980). In the figure, it is seen that mechanical vibrations (oscillations) of 
two opposite electric charges produce closed loops of electric lines of force 
(Figure 2.9(c)) & escape into the empty space (Figure 2.9(d)), which is also a wrong 
& illusory idea, because at the top of an antenna of a radio transmitter or a television 
transmitter such mechanical vibrations do not occur.

In the section 2.10, we saw that de-Broglie waves are actually ejection of 
particles, that is motions of particles in straight lines at a constant frequency & 
in the previous section we saw that the magnetic flux that is the magnetic lines 
of force is actually the flow of magnetic particles. So, Maxwell’s 
electromagnetic waves are actually the ejection of magnetic & electric particles 
at a constant frequency through the vacuum & these particles go in straight 
lines due to inertia of motion, & Hertz’s production of electromagnetic waves 
are actually the production of electric & magnetic particles, & the transmission 
& reception of radio waves by Jagadish Chandra Bose of Bangladesh (The 
Electrician-(of England) – 5 February 1895 The Engineer – (Of London) – 5 
February 1897) & later on developed by Marconi (David Halliday & Robert 
Resnic-1990-Page 55 of Appendix-K) are actually the transmission & reception 
of radio particles. The high antennae of a radio transmitter &
Figure – 2.9
Receiver, & a television transmitter & receiver are the direct proof of radio particles. These radio particles are ejected from transmitter antenna at a constant frequency & come in straight lines due to inertia of motion & hit the receiver antenna at the same frequency & knock out the electrons from the metal of the receiver antenna at the same frequency & make flow a fluctuating electric current within the circuit of the receiver antenna at the same frequency. It is here also noted that a wave can go in a curve path, but a moving particles can never without any external or internal force. Now, if the radio particles are actually waves, they can go in curve paths & the antennae are not needed to make so high.

![Figure – 2.10](image)

Now a question arises. If the magnetic lines of force are actually the flow of magnetic particles & run due to inertia of motion, why they go in curve paths? The answer is that when two particles which themselves also eject smaller particles continuously likewise radio active substances, run side by side, then the smaller particles ejected from one hit on the other & thus give pressure on the other & vice versa, & the two original particles go in curve paths, as shown in the figure 2.10.

It is finally noted that Maxwell also predicted linear momentum & radiation pressure of his electromagnetic waves & Nichols, Hull & Lebedev experimentally verified those (David Halliday & Robert Resnick –1990), which prove the particle
nature of Maxwell’s electromagnetic wave & disprove the wave nature of it, because without mass linear momentum cannot exist & without linear momentum pressure cannot be created.

2.14. Extension of Explanation of the result of Michelson-Morley Experiment:

In 1887 Michelson & Morley performed an experiment to demonstrate directly the existence of ether medium. They took two equal arms at right angle in their apparatus. The viewing screen of their apparatus appeared crossed with a series of bright & dark interference fringes. They thought that the fringes were formed due to phase difference of the two adjacent light waves used in their apparatus due to different round trip times of the two light waves through the ether current. Then they rotated the apparatus by 90° angle with a hope that the fringes would be shifted due to exchange of orientations of the two light beams (waves) through the ether current. But they found ‘no shift’ of any fringe & thereby they & other physicists rendered the ether hypothesis. The experiment was performed in different seasons of the year & at different locations. But the result was always the same. ‘No fringe shift’ was found. So the physicists also concluded that the speed of light in a free space is the same for all observers regardless the motion of source or of observer (Arthur Beiser—Concept of Modern Physics—Revised Edition). Of course, these conclusions were drawn on the basis of the wave nature of light. But in the sections 2.7 & 2.8 we saw that diffraction & interference patterns are formed on the basis of the particle nature of light. In the Michelson-Morley’s apparatus, the light beam first passed through a collimator & finally through the tube of the telescope, & the interference fringes were formed due to the gravitational attraction of the light photons by the walls of the collimator & the telescope as explained in the sections 2.7 & 2.8. So, by the rotation of the apparatus, we cannot expect any fringe shift. Michelson & Morley took equal lengths of the two arms of their apparatus & expected the fringes shift due to the unequal round trip times of the two light beams through the ether current & ‘no fringe shift’ proves no ether.
Now, if we take two unequal lengths of the two arms of their apparatus & if the light beams are actually light waves, then due to two unequal path lengths, the two beams must not arrive at the viewing screen in equal time & in the same phase, even in the absence of the ether. So the fringes shift must be during the rotation of the apparatus by 90° angle due to exchange of orientations of the two light beams & this was done by Kenedy & Thrn Diek (Mohammad Tofazzal Hossain Sarker-1983). But none of them found any fringe shift during the rotation of their apparatus. So we can conclude that light beams are not light waves; even they (light beams) have no wave character. They are fully particles. Here we have seen that Michelson & Morley’s experiment with equal arms of their apparatus completely cancelled the ether hypothesis, & the experiment with unequal arms of the apparatus completely cancelled the wave nature of light which was absent in our thought.

2.15. Review of Lorentz Transformation:

Before Einstein, Lorentz obtained a set of transformation equations, which are known as Lorentz transformation. To obtain these equations, Lorenz used the same speed of light pulse spread out from the same light source (Arthur Beiser--Concept of Modern Physics-Revised Edition). For a frame of reference S, he wrote \( x = c t \), where \( c \) is the speed of light pulse, \( x \) the distance traversed by the light pulse by time \( t \). For another frame of reference \( S' \) which is moving with a uniform velocity \( v \) in the + x direction, he wrote \( x' = c t' \) for the same light pulse. But he did not mention that from what frame of reference the light pulse is spread out. Since light pulses are actually light particles (sections 2.10 to 2.14), they must follow particle mechanics in full & they must possess inertia of rest & inertia of motion. So both the equations \( x = c t \) & \( x' = c t' \) must not be correct for the same light pulse spread out from the same light source. In spite of this, if both the equations be correct, that is,

\[
\text{if} \quad x = c t, \quad \& \quad x' = c t',
\]

then

\[
c = \frac{x}{t} \quad \& \quad c = \frac{x'}{t'}
\]

\[
\therefore \quad \frac{x}{t} = \frac{x'}{t'} \quad \text{or} \quad \frac{x}{x'} = \frac{t}{t'}
\]
But according to the length contraction & time dilation which were obtained on
the basis of Lorentz transformation equations,

\[ x > x' \] (length contraction) \[ \therefore \frac{x}{x'} > 1 \]

\[ \& \quad t < t' \] (time dilation) \[ \therefore \frac{t}{t'} < 1 \]

\[ \therefore \frac{x}{x'} \neq \frac{t}{t'} \quad \text{or,} \quad \frac{x}{t} \neq \frac{x'}{t'} \]

So, the two \( c \)'s in the equations \( c = x / t \) \& \( c = x' / t' \) that is, the two \( c \)'s in the
equations \( x = c t \) \& \( x' = c t' \) are not the same, they are of different magnitudes & both
the equations \( x = c t \) \& \( x' = c t' \) are not correct for the same light pulse spread out from
the same light source. But \( x = c t \) is correct for the light pulse spread out from the
light source placed in the reference frame \( S \) \& \( x' = c t' \) is also correct for the light
pulse spread out from the light source placed in the reference frame \( S' \), but not in the
frame \( S \). So the Lorentz transformation equations were based on wrong idea.
Therefore they are not the correct equations. Here Galilean transformation equations
are the correct & sufficient equations.

2.16. Review of Einstein’s Special Theory of Relativity:

Einstein’s special theory of relativity is based on two postulates proposed by
Einstein himself to satisfy both the principle of relativity based on Newtonian
mechanics, & Maxwell’s wave theory of light. The first states that the laws of physics
may be expressed in equations having the same form in all frames of reference
moving at constant velocity with respect to one another. And the second states that the
speed of light in a free space has the same value for all observers regardless of their
states of motion. The first postulate is correct. But the second is not. Here Einstein had
done the same wrong as Lorenz. Here he (Einstein) did not mention the position of the
source of light either. Is it placed in the first inertial frame of reference or in the
second? In the sections 2.10 to 2.14 we saw that light photons are fully particles
(matter). So they must follow Newtonian mechanics, that is, they must possess inertia of rest & inertia of motion. Now, if the light source is placed in the first inertial frame of reference, that is, in the frame $S$, then the speed of light must not be the same to all observers placed in both the frames of reference. Similarly, if the light source is placed in the second inertial frame of reference, that is, in the frame $S'$, then the speed of light is not the same for all observers placed in both the frames of reference either. But, if the source of light is placed in the first frame & the speed of light be $c$ to an observer in the first frame, then the speed of light also be $c$ to an observer in the second frame, where the light source would be placed in the second frame, but not in the first. If the light source & the observer both are placed in the first inertial frame of reference & the observer measures the distance $x$ traversed by a light photon of speed $c$, by time $t$, then $x = c \ t$. Similarly, if the light source & the observer both are placed in the second inertial frame of reference & the observer measures the equal distance $x$ traversed by a light photon of speed $c$, by time $t$, then $x = c \ t$ also, which remains invariant & agrees to the first postulate of the special theory of relativity. So the first postulate of the special theory of relativity is correct in all respects but the second is not. It should be modified as: the speed of light is the same in all inertial frame of reference, where both the light source & the observer are in the same inertial frame.

Moreover, the second postulate of Einstein’s special theory of relativity develops a very unusual situation. Let one of the two different inertial frames of reference is moving at constant velocity with respect to the other. Now if a flare is fired from either of the two origins of the two frames, when they coincide with one another, then according to the second postulate, both the two observers at the two different origins of the two different inertial frames of reference shall see a sphere of light expanding with themselves at the center of the sphere, which is quite impossible & thereby disproves the second postulate.

Here the second postulate of the special theory of relativity is modified. So all the next approaches which were done in collaboration with the second postulate, such as, time dilation $t = t_0 \sqrt{1 - v^2 / c^2}$, length contraction $L = L_0 \sqrt{1 - v^2 / c^2}$, relativistic
mass equation $m = m_0 / \sqrt{1 - v^2 / c^2}$, mass energy relation $E = mc^2$ etc. have errors & they should be corrected according to the modified second postulate.

It is here noted that some Physicists illustrate the muon drop phenomenon as the practical evidence of time dilation & length contraction of the special theory of relativity. Muons are generally created in the upper regions of the atmosphere & their life time (half-life) is very short & they come down a long distance up to the sea level within their short life time. In this point they (some Physicists) show by a calculation that without time dilation or length contraction a muon may not reach the sea level within its short life time. But they should understand that to an observer on the earth, what factor $(1/\sqrt{1 - v^2 / c^2})$ of time dilation increases the life span of a muon, the same factor also increases the life span of a ‘second’, the time measuring unit. So during the fall of a muon from the upper region of the atmosphere to the sea level, the total number of seconds remains the same & the muon travels $x = c t$, the same distance, if the time dilation does occur or not. Similarly, in the reference frame of a dropping muon, if the path length of the muon is contracted by the factor $\sqrt{1 - v^2 / c^2}$ of the length contraction, then the meter scale to measure the path length is also contracted by the same factor $\sqrt{1 - v^2 / c^2}$. So, to a dropping muon, the total number of meters, that is, the total path length remains the same, if the length contraction does occur or not. So, the muon drop paradox can not be solved by the time dilation or the length contraction of the special theory of relativity. It is here also noted that the life time of muons means the half–life of muons. So all muons do not possess the equal life span. The muons of long life may reach the sea level & there is nothing astonishing here. Even muons may be created at the lower level of the atmosphere & can reach the sea level.

It is also noted that the second postulate of Einstein's special theory of relativity has been modified here. So the second postulate has lost its speciality & turned back into Galilean relativity.
2.17. Review of De Sitter’s & Kennith Brecher’s analysis of Double Star Phenomenon:

According to simple emission theory of light which is known as Ritz’s theory under Galilean transformation, the speed of light depends on the velocity of source or of observer. But according to the second postulate of the special theory of relativity of Einstein which is originally Lorentz’theory, the speed of light does not depend on the velocity of the source or of the observer.

Now let us come to a double star phenomenon, which gives the verification of Einstein’s theory. In the case of a double star, one of them circles the other around their common center of mass & to do this, once it comes near the Earth & another time it goes away from the earth & here Willem De Sitter argued that the circling star would usually have an orbit that caused it to have alternating approach & recession velocities & light emitted from the star at different parts of the orbital path would then travel toward us (the Earth) at different speeds & the ‘fast’ light given off during approach would be able to catch up with & even overtake ‘slow’ light emitted earlier during a recessional part of the star’s orbit & the star would present an image that was scrambled due to out of sequence (Reference no. 4).

De Sitter made a study of double stars (1913) & found no case where the star’s image appeared scrambled. So he concluded that the simple emission theory (Ritz’s theory) on the speed of light is wrong, & Einstein’s theory is correct.

But this is not the actual case. There is a great mistake in De Sitter’s supposition. He supposed the earth as a stationary body. But likewise the circling star of a double star system, our earth also circles the sun once a year & the actual phenomenon is shown in the figure 2.11.

At the upper part of the figure 2.11, star S of a double star system circles the other, where the other star was not shown in the figure. At the lower part of the figure, our earth E circles the sun, where the sun was not shown in the figure either. For simplicity, let the speeds of both the circlings are \( v \), the direction of both the circlings are clockwise, the radii of both the circles are the same & the plane of both the circles is also the same.
Now, if \( c \) is the speed of light emitted from a stationary source, then according to Ritz’s theory, the speed of light emitted from the moving star S at the position A, toward the earth E at the position M, is \((c+v)\).

But at the position M, the earth E is not stationary, it is moving away from the star S at the same speed \( v \) & its velocity in the direction of AM is also \( v \). So, according to Ritz’s theory, to an observer on the earth E at the position M, the velocity of light emitted from the star S at the position A will be: \((c+v) - v = c\). On the other hand, at
the position N, the earth is approaching the star S at the velocity $v$ & at the position B, the star S is going away from the earth also at the velocity $v$. So, to an observer on the earth at the position N, the velocity of light emitted from the star S at the position B will be $c - v + v = c$. So, even according to Ritz’s theory, the velocity of light emitted from a circling star of a double star to an observer on the earth within the conditions stated above, always remains the same ($c$). Therefore, no scrambling of the circling star of a double star system will be observed from the earth & hence De Sitter’s analysis of a double star phenomenon is wrong, & the second postulate of Einstein’s special theory of relativity is also wrong.

It is here also noted that, in the foot note, De Sitter also dismissed the idea that light might travel at a fixed speed that was partially dependent on the original speed of the emitter (De Sitter double star experiment, From Wikipedia, the free encyclopedia).

Now let us come to the x-ray pulses which come from out side of the earth. There are about 200 known discrete x-ray sources lying in the Galaxy & the near by Magellanic Clouds of which some are double star systems also. Of these, about ten are now known to pulse regularly. In these cases, Kenneth Brecher argued (1977) that if the second postulate of the special theory of relativity is not correct, then the pulses of the ten x-ray sources would not come to us regularly, they would come irregularly (Physical review letters, 24 October 1977, vol. 39, No. 17, Page -1051-1054).

But in the previous example (Figure-2.11), we saw that, to an observer on the earth, the speed of light from a double star system remains the same ($c$) under Ritz theory also. So, the incoming regular pulses from x-ray sources in double star systems also be possible under Ritz’ theory. To explain these, Einstein’s theory is not needed.

It is here also noted that within 200 known discrete x-ray sources lying in the Galaxy, only ten are pulsating regularly, but the others irregularly. So, Einstein’s theory on the speed of light must not be valid in those cases. If the speed of light would be constant irrespective of the motion of the source or of the observer, then all the x-ray pulses from all the known 200 Galactic x-ray sources must come to our earth regularly.
In the previous example (Figure 2.11), for simplicity, we assumed that both the circlings of one of the double star & that of our earth are in the same order with the same speed, with the same radius & also in the same plane. But these may not happen exactly in double star cases. Even one of the circlings of the figure 2.11, may be opposite of the other, as shown in the figure 2.12. At the right side of the figure 2.12, the star S & the earth E both are approaching each other at the same speed $v$. So according to Ritz’s theory, to an observer on the earth at the position M, the velocity of light emitted from the star at the position A, will be: $(c+v) + v = (c+2v)$. But at the left side of the figure 2.12, the star S & the earth E both are going away from each other at the same speed $v$. So according to Ritz’s theory, to an observer on the earth at the position N, the velocity of light emitted from the star at the position B, will be: $(c-v) -v = (c-2v)$. But $(c-2v) < (c+2v)$ & the reception of light photon by the earth at the
position N from the star at the position B occurs later on the reception of light photons by the earth at the position M from the star at the position A. So, no ‘out of sequence’ of reception of light by the earth will be occurred & no ‘scrambling’ of the star will be observed during their journeys from M to N via P, & A to B via T respectively. But during their journeys from N to M via Q, & B to A via R, the smaller speed \((c-2v)\) at the left side occurs earlier than the higher speed \((c+2v)\) at the right side. But during these journeys, both the earth & the star remain at their longer distances from each other & the flight times of light photons from the star to the earth will also be longer. So during these journeys, the ‘out of sequence’ of reception of light photons by the earth & hence the ‘scrambling’ of the star either may occur or not under both Ritz’s, & Einstein’s theories. So the observations of ‘no scrambling’ by De Sitter & no irregular x-ray pulses by Kenneth Brecher due to ‘no out of sequence’ neither confirm Einstein’s theory nor cancel Ritz’s theory.

Now let us come to another point. If \(c\) be the speed of light emitted by a stationary source & if \(c'\) be the speed of light emitted from a moving source at velocity \(v\), then according to Ritz’s theory, \(c' = c \pm v\) & according to Einstein’s theory \(c' = c\). Now these two equations may be expressed in a single equation as: \(c' = c \pm kv\), where \(k = 1\) for Ritz’s theory & \(k = 0\) for Einstein’s theory. Here De Sitter & Kenneth Brecher tried to show the value of \(k\) as zero to establish Einstein’s theory. But they failed to do so. De Sitter somehow showed \(k < 0.002\) & Kenneth Brecher somehow showed \(k < 2 \times 10^{-9}\). But to establish Einstein’s theory \(k\) must need to be completely zero. Any value of \(k\), what ever be small, except zero goes in favor of Ritz’s theory, & against Einstein’s theory.

At the end of this section, I like to mention that, though De Sitter failed to observe the scrambling of the circling star of any double star due to the long distance from the earth, we often observe the scrambling of meteors near the earth. When a wandering meteor comes near the earth, it drops on the earth surface at a increasing high velocity due to the earth’s attraction & burns through the atmosphere & then we easily see the scrambling of the burning meteor, which verifies Ritz’s theory & cancels Einstein’s theory.
2.18. Practical Evidences & Verification of Masses of Photons: -

(a) When a Comet goes around the sun, its tail always remains against the sun due to the pressure of the sun light (radiation pressure) which gives the practical evidence of masses of the sun light, because without mass, linear momentum cannot exist & without linear momentum, pressure cannot be created which was also mentioned in the section 2.13.

(b) A lamp light appears more feeble in the sun light than in dark. This occurs due to the obstruction of the photons of lamp light by the photons of sun light which gives the particle nature of them & the practical evidence of masses of light photons. If the lamp light & the sun light are waves, they can cross one another without making any hamper of one by the other & the lamp light would not be appeared feeble in the sun light.

(c) Very recently some researchers of Ohaio University of America conduct an experiment on some rats. They divided the rats into two parts & kept one part into dark & the other in light, & supplied equal food & facilities to both the parts. Only after eight weeks, they (researchers) observed that the rats in light has became 50% more massive than the rats in dark, which directly verifies the mass of light photons (The Barisal Protidin – 17 October 2010).

2.19. Discussions & Conclusion: -

(1) In the section 2.2, Huygens’ principle of light is found to be defective.
(2) In the section 2.3, Newton’s 3rd law of motion is modified as a general law.
(3) In the section 2.4, the reflection of light is explained from its particle nature.
(4) In the section 2.5, the refraction of light is explained from its particle nature.
(5) In the section 2.6, the explanation of the experimental result of Foucault is reviewed & it is found that the lower velocity of light in denser medium is not due to Huygens’ principle of light, but particle nature of light given by Newton.
(6) In the section 2.7, diffraction of light is explained from its particle nature.
(7) In the section 2.8, double slit interference of light is also explained from the particle nature of light.
(8) In the section 2.9, Polarization of light is explained from its particle nature.
(9) In the section 2.10, de-Broglie wave is found to be an illusory & wrong idea.
(10) In the section 2.11, Planck & Einstein’s photon energy is corrected & Einstein’s photoelectric equation is modified, & light photons are considered to be fully particles (matter), but not quanta (packet) of energy likewise Planck & Einstein.
(11) In the section 2.12, the actual cause of Faraday’s law of induction for production of electric current is found out.
(12) In the section 2.13, Maxwell’s electromagnetic theory of light is found to be wrong.
(13) In the section 2.14, the wave nature of light is completely cancelled & its particle nature is fully established in all respects.
(14) In the section 2.15, Lorentz transformation equations are found to be wrong.
(15) In the section 2.16, the second postulate of Einstein’s special theory of relativity is found to be wrong & has been modified as a correct postulate & thereby the special theory of relativity has lost its specialty & turned back into Galilean relativity.
(16) In the section 2.17, a great mistake is found out in De Sitter’s analysis of double star phenomenon & its correction has been done & the scrambling of a meteor is illustrated & to do these, the second postulate of Einstein’s special theory of relativity is cancelled & Ritz’s theory is established.
(17) In the section 2.18, practical evidences & verification of masses of light photons are given.

So, now we should completely reject the wave nature of light & accept only its particle nature in all respects. That is, light is nothing but minute particles. Therefore, the dual nature theory of light, & Einstein’s special theory of relativity & quantum mechanics which are based on dual nature theory of light are thrown into jungle, & Galilean relativity & Newtonian mechanics have regained their previous status.
References:


--------The End--------