

# **IN A DIFFERENT LIGHT**

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Original Thought: May 2000

Final Edit: January 2001

## **THE STORY SO FAR**

“In the 17th century Sir Isaac Newton declared that light was corpuscular, that is, made of particles. Though there were some outstanding questions, this view was accepted for over 100 years. Then in 1803 Thomas Young proved that light produced an interference pattern after it passed through a narrow slit. Such an interference pattern is a distinctive indicator of a wave. His experiment, along with subsequent work by Fresnel, soon persuaded scientists that light must be a wave. In the 1860's James Clerk Maxwell produced some brilliant mathematics, today known as Maxwell's equations, and proved that electricity and magnetism were integrally related as one phenomenon. As a byproduct, his equations showed that there should exist a certain kind of wave, consisting of a special interlocked pattern of oscillating electric and magnetic waves, an electromagnetic wave. Based on other empirically known constants associated with electricity and magnetism, his equations yielded a calculated value for the speed of this electromagnetic wave. The speed was exactly the same as the velocity of light that had been calculated by other experiments. This remarkable discovery demonstrated that not only were electricity and magnetism one phenomena, but light, a phenomenon seemingly quite unrelated, was also an aspect of the same electromagnetic phenomena. After these developments, and for some time thereafter, scientists understandably had thorough confidence that light was indeed a wave. We find the encyclopedia's description of the events that followed below:

As the 20th century opened, it seemed that optical theory had attained a completeness and perfection, which hardly left room for further development. But this complacent view faced a series of rude shocks as previously unknown phenomena concerned with the interaction of light and matter were discovered. These apparently could not be reconciled with the theory of electromagnetic waves, but required a modified corpuscular theory. [Encyclopedia Britannica]

In 1888 several different workers discovered the photoelectric effect. If light shines on the surface of a metal, negatively charged particles are ejected from the surface of the metal. The details of this phenomenon cannot be reconciled with Maxwell's electromagnetic explanation of light. In 1899 Philip Lenard was able to explain this phenomena as ejected electrons since J. J. Thompson had conclusively identified the existence of an electron in 1897, but the final explanation required two more major developments in quantum mechanics. In 1900 Max Planck had suggested a form of quantization that properly predicted the results found in the black body problem. But Planck felt the mathematics he had introduced for the first time into the sciences were only that, just a mathematical trick to make the answers come out right.

In 1905 Einstein took the audacious step of explaining the photoelectric effect using the principle of quantization introduced by Max Planck. Einstein suggested that the quantization of Planck is more than a mathematical trick, it reflects a fundamental aspect of the true description of reality. Einstein's interpretation required that light, in some real fundamental sense, act as a particle and not as a wave. He named his new particle a photon.

Understandably, scientists did not race to embrace the radical new view of Einstein on the quantization of light. For more than a decade, Einstein stood alone in his view. In 1913 Einstein was recommended for membership in the Prussian Academy of Sciences and the letter of recommendation prepared by Max Planck himself read:

In sum, one can hardly say that there is not one among the great problems, in which modern physics is so rich, to which Einstein has not made a remarkable contribution. That he may have missed the target in his speculations, as, for example, in his hypothesis of the light quanta, cannot really be held too much against him, for it is not possible to introduce really new ideas even in the exact sciences without taking a risk. [*The Cosmic Code* by Heinz Pagels p. 15]

Einstein's "really new idea", received some experimental confirmation in 1914 by the U.S. physicist Robert A. Millikan who established that radiation exhibits some properties normally associated with particles. Nevertheless, Millikan, in 1915, said:

Despite ... the apparent complete success of the Einstein equation, the physical theory of which it was designed to be the symbolic expression is found so untenable that Einstein himself, I believe, no longer holds to it." [*The Cosmic Code*, by Heinz Pagels, p. 15]

Despite the doubts of others, Einstein did hold to his theory and in the following decade was vindicated. In 1921 Einstein received the Nobel Prize in Physics for his services to physics and especially for his explanation of this photoelectric effect. Despite the accolade, there was still opposition to his theory. Finally, in 1923-1924 the American atomic physicist Compton and Debye, a Dutch physicist, made independent theoretical predictions for the scattering of photons from another particle, the electron. Their predictions assumed that light consisted of actual particles with definite energy and directed momentum as though they were small bullets. Compton performed the necessary experiments and the experiments did indeed confirm the particle assumption. After this result Einstein's proposal of the particle nature of light was quickly accepted."

### **A DROP IN THE BUCKET: WHAT WE KNOW**

As we read the previous history concerning the dual nature of light, it should become obvious to the reader that mankind's understanding of Light has come through many a trial and error. The theory of the dual nature of light may itself be found to be, just that, another theory in the long list of trial and error. As we examine the theory, we may find it of use to relate it to a more practical problem by analogy. As we do so, we

may begin to see the error of our ways. First, let us ask a simple question regarding our understanding of light: “Is light really so hard to comprehend that we must force it to conform to our own experimentations and limited knowledge? Or, are we looking at it all wrong?” I believe that the reality is simpler than our imagination would have us believe. Consider for a moment the following analogy:

A small pebble is dropped into the center of a pond. The water is disturbed and waves begin to encircle the impact point, moving outward towards the edge of the pond. (See Figure 1) Now consider that without water, there would be no wave. The wave itself is made of the molecules of water as they bob up and down. (See Figure 2) The question would then arise, does the water itself move outward or does the appearance of the waves move outward? The answer: the water itself merely moves up and down in different locations, and the appearance of waves seems to emanate from a central location. (See Figure 2) The ‘*appearance*’ of waves moving outward is a kind of optical illusion. The water does not actually move steadily outward at all, but rather, the moving water molecules disturb the adjacent water molecules until they too begin to move up and down, and this continues until the edge of the pond is reached. The point to this analogy is that the outward movement is merely an illusion. The water never really travels from point A to point B at all. The disturbance in the medium (water) does, however, set off a chain reaction of disturbances that continually domino until point B is also disturbed into moving up and down. (See Figure 2)

Figure 1

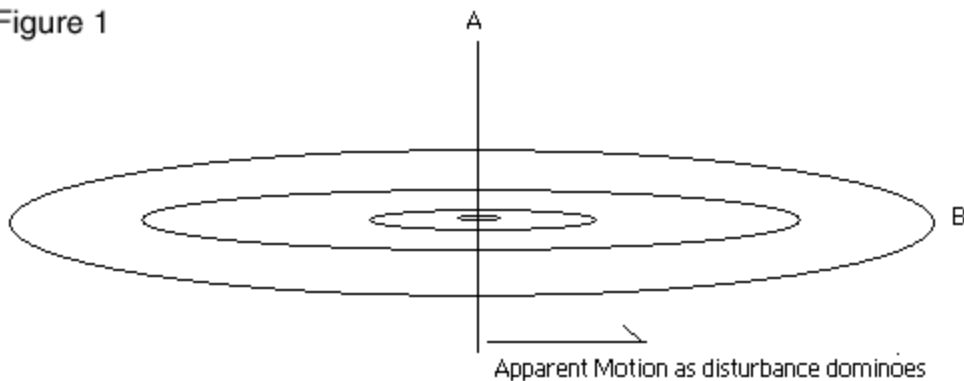
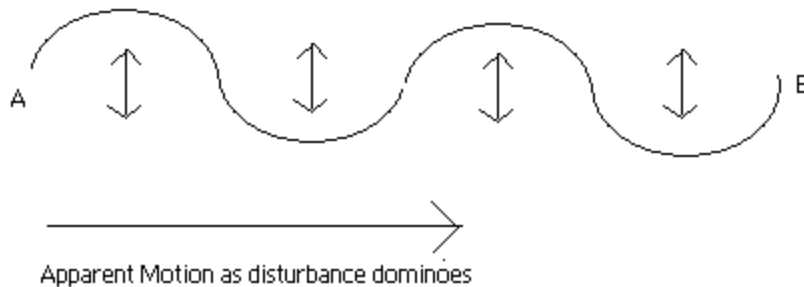


Figure 2



The next question that one should ask him or her self involves a chicken and egg scenario. The question is this: “Does the water exist because of the waves, or do the waves exist because of the water?” The answer: neither, for the water cannot make waves in and of itself, *and neither do the waves create their own environment in which to propagate*. Outwardly moving waves are simply an illusion in the medium that is the water. This is a vital point for the discussion to follow, as this is the silly question that science seems to be asking regarding the existence of light and its properties.

### **THE MEDIUM WHICH SCIENCE DENIED**

Modern science states that light has the ability to create its own propagation medium. In other words, the waves create the water in which they move. This idea seems preposterous to even the most amateur of observers. One cannot simply create something from nothing. There must be a medium in which light travels or else it cannot travel at all.

Perhaps modern science has been looking at the wrong side of the coin. Perhaps what we call light is not light at all, but merely an outwardly moving illusion from a disturbance in a *real* medium. Kindly think back to the pebble that was dropped into the pond for a moment. The waves that appear to move outward were not in actuality moving outward, but instead, the water molecules that moved steadily upward and downward affected the water molecules that were closest to them. This chain reaction of dominoes continued and created the illusion of movement toward the edges of the pond. Similarly, is it possible that we are seeing an illusion of a wave through a real medium that we do not yet fully understand? Are we calling this disturbance propagation light? If so, would this explain the problems in isolating the properties of something that is really just an illusion? What would be the similar problems of trying to quantify the real properties of the waves in the water as an actual matter and force, rather than understanding that it is a mere illusion in a real medium which produces force with its mass. It would be difficult, at best, to understand how the waves could exist without the medium of water. One might even begin to think that there was both particle and wave involved in the phenomenon. This observation, however, would never lead to the truth about the real medium or the illusion that apparently propagated through it.

Consider the problems of recent years pertaining to light. Einstein once stated, along with many other noted scientists, that light traveled at a constant velocity, known as  $C$ , or the speed of light. ( $C=3 \times 10^8$  m/s). In very recent years, it has been clearly shown that this velocity is actually reducing throughout the universe. It has also been shown that through the proper application of a Bose-Einstein Cloud, light can actually be reduced to a humanly visible velocity. These new findings appear to shatter much of Einstein’s thoughts and theories based on the principle of the speed of light as an absolute constant. How could this be? How could this universal constant be altered? Is light really so fragile and transitory? Surely, there must be something about light that we are missing.

In order to understand the phenomenon that we presently call ‘Light’, I would suggest that for the duration of this thesis, that we assume ‘Light’ to be a mere illusion as

we currently define and know it. I would suggest that we now consider that there is a real medium that has real properties and has the ability to be affected by forces in order to produce real disturbances within the medium. These disturbances are vibrations and frequencies that can affect the surrounding medium enough to create the illusion of movement transversally within the medium. These real disturbances we will call illusionary waves. These illusionary waves are what science has been studying and up till now been calling 'Light'. This 'Light' as science has known it is not a real quantum at all, but is an illusion. Its movement is merely a measurement of how fast the vibrations in the medium will affect the surrounding medium like dominoes falling into one another. These illusionary waves throughout the medium in no way change the real properties of the medium. These waves are not to be a measurement of the medium in any way. These waves, if measured via traversal movement would not produce a constant velocity on which to rely as a standard, especially if the mediums density could be altered. As we know from other mediums, mediums can be altered, thus changing the velocity and properties of the resulting waves. This is where the problem with modern science's view on light resides. Light, as science knows it, could not have an alterable velocity if it were unaffected by passing through any medium. Light, as science knows it, is supposedly independent of a medium, and indeed needs no medium to propagate at all! These ideas are now shattered by direct application of the Bose-Einstein cloud.

A new direction must now be taken in order to understand where science has gone astray. This new direction requires a starting point. I choose as my reference the LDS Standard works. If the reader does not agree with this point as a reference, let the science of the resulting concept be challenged for its own merits.

### **REDEFINITIONS**

I begin with a simple statement of proposed reality. I propose that we redefine the word 'Light' to be representative of the medium in which the current idea of 'Light' propagates. I further propose that this medium has no limits in terms of space and time. In other words, I propose that this medium exists in and through all things of the Universe. This fact would also lend to the idea that the medium itself need not travel, as it has already arrived at all destinations. Certain alterations of the medium could produce vibrations with fixed frequencies that may *appear* to travel. Please refer back to the analogy of the pebble in the pond and remember that, although the waves appear to move, they are simply propagated disturbances within the medium of the water. In fact, the water itself does not continually move in the direction of the apparent velocity at all. These disturbances in the medium are what science currently thinks of as light and have a relatively common speed of C through most of our naturally occurring environments. Fact: This velocity can be altered and is not constant. This alteration of C can be reproduced through the alteration of the actual medium itself. Again, it is of utmost importance that we understand that when we measure C, we are measuring an illusionary wave through a real medium.

Now, on to the LDS Standard works. In the Book of Doctrine and Covenants, Section 88, verses 7-13:

7 Which truth shineth. This is the light of Christ. As also he is in the sun, and the light of the sun, and the power thereof by which it was made.

8 As also he is in the moon, and is the light of the moon, and the power thereof by which it was made;

9 As also the light of the stars, and the power thereof by which they were made;

10 And the earth also, and the power thereof, even the earth upon which you stand.

11 And the light which shineth, which giveth you light, is through him who enlighteneth your eyes, which is the same light that quickeneth your understandings;

12 ***Which light proceedeth forth from the presence of God to fill the immensity of space--***

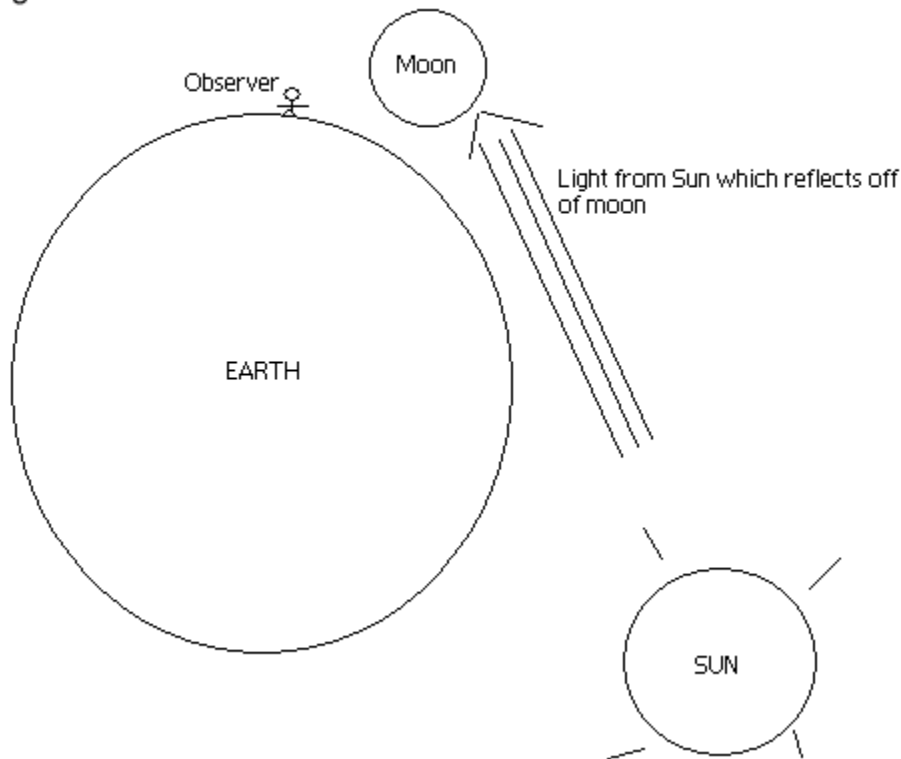
13 ***The light which is in all things***, which giveth life to all things, which is the law by which all things are governed, even the power of God who sitteth upon his throne, who is in the bosom of eternity, who is in the midst of all things.

In the previous verses we find it interesting that light proceeds forth to fill the immensity of space. (*We also side note in verse 11 that apparent light is somehow the same as the ability to learn.*) This idea that light is everywhere is of extreme importance. It can further be understood by the following verse in D&C 88:49:

**The light shineth in darkness, and the darkness comprehendeth it not; ...**

This verse brings the understanding that can be gained by any amateur astronomer who gazes at the Moon and wonders at why it can glow so brightly when its light source, the Sun, cannot be seen giving a stream of light to it. The light literally shines through the darkness of space, unbeknownst to the surrounding darkness, until it strikes an object. If the observer looks at the space between the Moon and the Sun, they will only see darkness. They will never see the light shining from the Sun to the Moon. (See Figure 3)

Figure 3



Once we realize that light fills the immensity of space, we ask, how much space. The following verse answers that question for us.

D&C 88:37 And there are many kingdoms; for *there is no space in the which there is no kingdom; and there is no kingdom in which there is no space*, either a greater or a lesser kingdom.

Here we are to understand that space encompasses everything in the Universe. Light is therefore, in and through all things in space, which is everywhere. Light itself does not travel, as it has no need, it is already there. What we are measuring and calling light is merely an illusionary motion caused by a disturbance in a medium that propagates outward from the source of disturbance. This is obviously the source of our mistakes as we ponder the speed and nature of light.

### RAMIFICATIONS

This new theory would propose serious modifications to common understandings both scientifically and religiously as pertaining to light. Maxwell's equations regarding light would need to be revamped. Einstein's own equations would also bring new understanding of space and time, as light would now be a variable rather than a constant.

## **“PRACTICAL” APPLICATIONS**

Past experiments have shown that not only have we sped up the disturbance we call light, but that we have slowed it down considerably. How can this be explained in lieu of our new found understanding? Consider the simple fact that sound travels much faster through steel than it does through air. Why? Sound travels faster in steel because the particles in steel are much more dense than the particles in air. In other words, the medium is much more dense. The denser the medium, the faster the propagation, and vice versa. Bingo. If we now believe that what we call light is actually a propagation of a disturbance through a medium, then it would make perfect sense as to why the propagation speed can be altered in either direction. The reason: the density of the medium was altered. But how can we use this knowledge in a practical way?

## **SURFING THE ALTERED MEDIUM**

Consider the fact that if we alter the medium of light in a tube reaching from here to the moon, then we could propagate a disturbance at any speed we choose. We could literally send a signal (perhaps a single electron) from here to the moon at ten times the speed  $C$  by altering the medium in the tube to be ten times more dense than ‘normal’. This is astounding in and of itself, but constructing such a tube would be difficult if not almost impossible. Perhaps there is a better way. If we were to construct a small box that we could encapsulate within an altered medium, which we made to be ten times the density of the ‘normal’ medium, and then push the medium towards the moon, what would occur? The point is this: what is the difference between sending an electron through a medium and sending the medium through the electron? I would argue, none. It is simple relativity. If an electron can pass through the medium at ten times the standard rate of travel due to a change in medium, then why would it not push the medium at 10 times the rate in the opposite direction? If this can be shown through experimentation to be accurate, then it may be possible to create an encapsulation that would travel at any speed we deem appropriate through merely altering the density of the medium of the capsule, and not the surrounding medium. This alteration of the medium is something that we have already accomplished. The capsule, would in effect, pull the ‘normal’ medium and its inhabitants through its altered medium at a super accelerated rate.