

Greetings in the name of our Lord Jesus Christ! In this edition I'll be looking at light in the scriptures.

I'm extending an invitation for submissions to be published in The Gospel Notes Newsletter. The primary criteria for inclusion are these:

1. It should be oriented towards the Gospel of Jesus Christ.
2. It should use the scriptures as a source of information.
3. It should include the references for any quoted 3rd party sources.
4. It should not be political.

***In addition, if you have a testimony to share, please send that to me as well and let me know if you would like it to be included in a future edition of the newsletter. Please keep in mind the four criteria listed above where applicable.***

Also, if you have particular subjects that you would like me to cover in the Newsletter, please let me know.

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If at any time you do not wish to receive this newsletter, please let me know. Your responses to me are confidential unless you request otherwise.

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Genesis 1

6 And I, God, said, Let there be light; and there was light.

7 **And I, God, saw the light, and that light was good.** And I, God, divided the light from the darkness.

Isaiah 9:2 **The people that walked in darkness have seen a great light;** they that dwell in the land of the shadow of death, **upon them hath the light shined.**

John 8:12 Then spake Jesus again unto them, saying, **I am the light of the world;** he that followeth me shall not walk in darkness, but shall have the light of life.

1 John 1:5 This then is the message which we have heard of him and declare unto you--that **God is light,** and in him is no darkness at all.

1 Nephi 5:77 And **I will also be your light in the wilderness;**

Doctrine and Covenants 90:6a **The glory of God is intelligence or, in other words, light and truth;**  
and light and truth forsaketh that evil one.

Light is a very interesting thing. From the perspective of science, it is still quite the mystery in many respects, even though we have learned a great deal about light in the past century and a half. Studies of the nature of light led to quantum physics and many discoveries about the nature of energy and matter, ultimately leading to both Einstein's famous equation  $E=mc^2$  as well as our understanding of fusion in stars and the ability for the Internet to stretch across hundreds of miles without the use of copper wires or wireless technologies.

In physics the study of light has led to the realization that while it has no mass or substance, it can exert force on material objects, and that it can behave in seemingly intelligent ways depending on how you measure it in experiments – the so-called particle-wave duality behavior of light. That is, in some experiments light behaves like little balls that travel in straight lines until they strike something, or they can behave like waves in similar fashion as waves of water might ripple out across a pond. These strange behaviors have led some to make philosophical speculations about the universe involving what may only be termed as metaphysics.

From studies in the early twentieth century it was discovered that in the right conditions, you can take a very high energy photon (a “packet” of light”) and it can spontaneously break down into two particles that do have mass. Einstein's  $E=mc^2$  equation shows that this can happen, but similarly it can go the other way – two sub-atomic particles can collide and release a high energy photon.

You may be surprised that Einstein did ***not*** receive his Nobel Prize in physics for his special or general theories of relativity. Rather, he received his Nobel Prize for his 1905 paper on the Photo-Electric effect which describes the way that light can strike the surface of a material and dislodge electrons from their atoms, which means the electron can be free to roam around in a conductive material. The impact of that paper has been profound for us today – the entire field of photovoltaic cells for generating electrical power is based on the principles that Einstein outlined in that early paper.

The nature of light has driven much of scientific research since before the days of Isaac Newton, but it has driven much of what we know in the modern world of electronics, radio, television, and other forms of communication, along with power generation (think fission and fusion) and military technologies, to name a few.

Light is fast. So fast that it is ***the*** standard of measure against which all other speed or velocity measurements can be compared. Seemingly nothing can go faster – in the entire universe.

Light cannot be measured directly – it can only be measured by the effects it has on things. Want to know the wavelength of light? Use something physical that can be affected by it. Want to know how much of it there is (the intensity)? See what effect it has on something.

Even our ability to see the world around us is dependent on how light can cause chemical changes within our eyes, but unless it strikes something that is physical we really have no way of observing its behavior.

The scriptures at the beginning of this little foray into light illustrate that there is something very important about how light is used in scripture, not only because it identifies Jesus Christ as the light of this world, but it shows us that the things we have discovered in the last few centuries about light is validated by the scriptures in every respect.

Light has energy. If you have ever used a solar-powered calculator, or if you use solar panels to charge batteries or power anything electronic, you know this to be true. You might think to yourself, “sure, we have known about the energetic characteristics of light for millennia” you would only be partly right. In past history, light was only used to help see in the dark or to help warm us up on cold days, but the direct relationship between light and energy has only recently been “discovered” by science.

With understanding comes ability. Knowing a few things about light we have collectively been able to take advantage of it in ways never before possible. Yes, it has been used to signal messages across miles of distance using various methods, but the ability to focus it, to produce it and to “control” it has increased by leaps and bounds because of advances in technology.

But at its fundamental core, it is still a great mystery. The current description of it is just that – a description. The thing with science is that it never actually “knows” exactly how something works. Instead, the scientific method provides us with means to model the behavior of the natural world more and more accurately to the observed behaviors of things, but it is ultimately just an approximation of what that reality is.

Think of it like this – if we observe that the trash cans of the neighborhood are full on Thursday nights but empty on Friday afternoons, we can hypothesize that there is an event that takes place between Thursday nights and Friday afternoons by which the trash cans purge themselves of trash. As we collect more precise data, we can narrow that down to a time period of a few hours on Friday morning. We can collect statistical data which might show the trash cans to have some variability in the times during which the trash in the can is no longer present, and we can use equations to describe that statistical behavior, but it does not ultimately tell us **how** the trash is getting out of the cans. We can then use those equations to try to predict when the trash cans will be empty with greater and greater precision, even if the means by which the trash disappears is never known.

This odd little scenario I’ve described is much of what happens in science – it seeks to model the universe in such a way that the information we collect can be used in practical ways to understand the behaviors of things or to take advantage of those behaviors. But lest any scientist should tell you that they **know how** something happens, remind yourself that what they think they know and what they actually know are sometimes not quite the same thing.

This was actually recognized by a famous physicist named Werner Heisenberg, and his discovery has had profound implications in all of physics. It’s called the Heisenberg Uncertainty Principle. What he discovered through much research is that there are two properties of a particle – usually a proton, neutron, electron, or atomic nucleus, that you cannot know about with perfect precision at the same time. Suppose that a proton is traveling and you are able to measure its speed with

perfect accuracy – the Uncertainty Principle says that if you know the speed of the proton exactly, you cannot know its position exactly at the same time – by a small amount determined by the Planck Constant, often represented using the letter  $h$ . You can know its position, but there is a certain amount of uncertainty about the exact position. Likewise, if you do happen to know its position exactly, you cannot know its speed exactly at the same time, again by a small amount determined by  $h$ . That level of uncertainty may be extraordinarily small, but it is noticeable. Thus, it's a little like a hot potato – you can hold it but only long enough to throw it back in the air because it's too hot to hold.

This seemingly small realization in physics – the Uncertainty Principle, tell us that even if we had the most perfect means at our disposal, we cannot measure two things perfectly (though that does not explain why I cannot cut two boards the same exact length). Science is an approximation, and this is one of the reasons why it is an approximation: the laws of nature that we understand prevent it from being exact.

Through the prophet Joseph Smith, Jr, we find in the Doctrine and Covenants that light and truth is the glory of God. That verse alone deserves a very detailed examination - perhaps at a later date - but we should be reminded that the Glory of God is described many times in scriptures as being bright and beyond our common understanding.

When we think we understand God, we may grasp one or more of his attributes very keenly, but it does not mean that we understand all of his characteristics. To attain to a perfect knowledge of God is something that, frankly, we can't do in our mortal forms. There must be a degree of separation until our mortality is no longer the hindrance.

In the Doctrine and Covenants, section 22, we are again shown something rather unique about God's presence:

D&C 22:1 The words of God which he spake unto Moses at a time when Moses was caught up into an exceeding high mountain; and he saw God face to face, and he talked with him; and the glory of God was upon Moses; therefore, Moses could endure his presence.

D&C 22

6c And the presence of God withdrew from Moses, that his glory was not upon Moses; and Moses was left unto himself; and as he was left unto himself, he fell unto the earth.

7a And it came to pass that it was for the space of many hours before Moses did again receive his natural strength like unto man; and he said unto himself,

7b Now, for this cause I know that man is nothing, which thing I never had supposed; but now mine eyes have beheld God, but not my natural but my spiritual eyes; for my natural eyes could not have beheld, for I should have withered and died in his presence;

7c but his glory was upon me, and I beheld his face, for I was transfigured before him.

What Moses described as his spiritual eyes shows us that the glory of God is transformative in some manner, allowing pure understanding where it could not otherwise exist by natural means. To my mind this seems like the “hindrance” that we have in understanding the things of God can be overcome by the very act of God. Moses beheld truth beyond our understanding. That understanding has to come from above because we cannot reach it from beneath that veil of mystery – that uncertainty.

This also tells me that God is not a “natural” being as we know natural beings such as ourselves. There is something in what Moses saw that leads me to that conclusion.

D&C 22

4a And I have a work for thee, Moses, my son; and thou art in the similitude of mine Only Begotten; and my Only Begotten is and shall be the Savior, for he is full of grace and truth;

4b but there is no God beside me; and **all things are present with me, for I know them all.**

5 And now, behold, this one thing I show unto thee, Moses, my son; for thou art in the world, and now I show it unto thee.

6a And it came to pass that Moses looked and beheld the world upon which he was created.

6b And as **Moses beheld the world, and the ends thereof, and all the children of men, which are and which were created,** of the same he greatly marveled and wondered.

One of the “discoveries” of science is that light does not experience time as we do. We describe it as a self-propagating wave of energy, but that is just an explanation and not an absolute truth. Einstein’s theories of relativity show that if you were to travel faster and faster, approaching the speed of light, the universe would seem to slow down around you. If you actually were to reach the speed of light, you would never observe the passage of time in the universe. You could travel from one end of the universe to the other and in the entire time it took you to travel that distance, you would never know that any time had passed – you would have started on one end and ended on the other and you’d wonder why the universe no longer exists – you’d wonder why it “passed away.”

You could observe the entire history of the universe in a moment of time.

So yes, light never experiences time. Neither does God.

Alma 19:38 Now whether there is more than one time appointed for men to rise, it mattereth not; for all do not die at once; and this mattereth not; **all is as one day with God; and time only is measured unto men;**

2 Peter 3:8 But concerning the coming of the Lord, beloved, I would not have you ignorant of this one thing--that **one day is with the Lord as a thousand years and a thousand years as one day.**

Luke 4:5 And the Spirit taketh him up into a high mountain, and **he beheld all the kingdoms of the world in a moment of time.**

What this tells me is not that when we measure the voltage coming out of a solar panel that we are measuring God, but rather that the closest analogy we can make to the existence of God is in the properties that we find consistently attributed to light. I do not believe that is an accident because even with all our careful centuries of observations, measurements, and theories about the natural properties of light, we still don’t understand it. The light of God is even greater and even further beyond our ability to find out by the limited and purely technological means we might create to do so.

God is called the father of lights, and Jesus is called the light of the world, and these two terms illustrate that the light and truth we are called to believe in and have faith in is so much more than just what makes a sunny day warm and a cloudy day cooler.

The works of the Spirit of God, like faith, are not things that we can necessarily observe, but we can observe the effects of faith on us and the world around us.

What is interesting to me as one who studied physics and astronomy in college is that the natural forces we use and depend on are entirely unobservable in the direct sense. We do not see gravity, but we can see the effects of gravity. We do not see magnetism, but we can measure the effects of magnetism. We cannot see electricity, but we can see and measure the effects of electricity on the natural world.

In other words, we experience and use the invisible forces in this world without ever having been able to touch, taste, smell, see or hear them. And yet, there are some people who use these invisible forces every single day that are opposed to the idea that there are in fact invisible forces that are not natural ones. There are effects of those invisible forces that we can detect on the lives of people. And lest we should forget, these “natural” forces were created by God for our benefit.

Genesis 1:6 And I, God, said, Let there be light; and there was light.

When Saul, before he was Paul, was traveling to Damascus, he saw something that made him realize he had been making a terrible mistake.

Acts 9

3 And as he journeyed, he came near Damascus; and **suddenly there shined round about him a light from heaven.**

4 And he fell to the earth and heard a voice saying unto him, Saul, Saul, why persecutest thou me?

5 And he said, Who art thou, Lord? And **the Lord said, I am Jesus whom thou persecutest;** it is hard for thee to kick against the pricks.

6 And he, trembling and astonished, said, Lord, what wilt thou have me to do? And the Lord said unto him, Arise and go into the city, and it shall be told thee what thou must do.

7 And **they who were journeying with him saw, indeed, the light** and were afraid; but they heard not the voice of him who spake to him.

This “light from heaven” was Jesus Christ. To Saul, Jesus Christ became indeed “the light of the world” very literally. It temporarily blinded Saul to the point he had to be healed because his blindness to the truth had made him literally blind to the Lord.

Modern day astronomers have observed much to their surprise that it appears that the universe is expanding. They see this in how the light from very distant galaxies (massive collections of stars that are mutually bound by gravity together) seems to indicate that almost everywhere they look the galaxies are racing away from each other in all directions. As two objects approach each other or as they move away from each other the light they shine is shifted towards the blue or to the red ends of the light spectrum, and for almost every galaxy there appears to be slightly more red color than they should be if they were at rest or if they were moving towards us.

The natural conclusion is that when everything is moving apart, like when we see an expanding balloon or an exploding firework, the universe must also be expanding. That leads to questions about ***why*** the universe is expanding. Without any other explanation, it has been proposed that there is a type of energy present everywhere in the universe that cannot be seen which is causing

this expansion. They call it “dark energy” because they cannot see it – only the apparent effects of it - while having the characteristics of energy which can cause an acceleration “outward.”

What is this “dark energy”? Well, that’s the kicker – no one seems to be able to explain it. They believe it exists because of the behavior of those distant galaxies, but what form that energy takes is entirely unknown. We can’t measure it because, well, it only seems to be present in those distant parts of the universe.

To my mind and understanding this is one of the surest “natural” discoveries that illustrates both the infinite power of God and his character trait of being a Creator. The universe expands not because of the existence of some invisible natural force, but because the universe is continuing to be created by a being who has declared that this is one of his key characteristics.

The fact that scientists made this discovery by using light is not an accident. Light reveals truth, and in no less of a way we find that to be the case here, even when the conclusions people reach may be skewed or simply wrong. The truth is there for the understanding even with the understanding is not present.

I’ve spent a great deal of time thus far discussing the science and theories of light and various forces, tying some of them fairly loosely to the scriptures. But in all of these things it seems to be equally clear that what we know about the basic elements of light, energy, matter, etc., is a direct analog to things that are spiritual. What we measure and use in the natural world is something that compares to spiritual things, albeit in a rather limited manner.

The world in which we live is intended to be a place of learning for us:

Alma 19:91 Therefore, as they had been carnal, sensual, and devilish by nature, **this probationary state became a state for them to prepare; it became a preparatory state.**

How we decide to learn is up to us, but we **can** use this world to learn of things that have spiritual meaning. The parables Jesus gave show us this. He “likened” or compared physical things and circumstances with spiritual things concerning the kingdom of God. This isn’t just my opinion though:

Alma 16

54 The scriptures are laid before thee; **yea, and all things denote there is a God, yea, even the earth and all things that are upon the face of it, yea, and its motion;**

55 **Yea, and also all the planets which move in their regular form do witness that there is a Supreme Creator.** And yet do ye go about, leading away the hearts of this people, testifying unto them there is no God? And yet will ye deny against all these witnesses?

There is what you might call an “intuitive leap” that we have to make, and it is not something we can force to happen. Some might call it a “leap of faith,” but regardless there is a time in our lives when we come to a realization that what we observe around us is just a small part of the larger world. It is a moment when the things we read in the scriptures are brought to a focus and we can realize that they aren’t just words for us to be guided by. They show us the path to a greater form of life than we had been aware of before.

I'm not referring to the realization that God exists, but to the spiritual nature of all things. It causes us to think a little differently, like turning a corner in your mind and seeing a whole new vista. There is a time in which this light shines upon you and it gives you a new perspective on what life is and how it is to be valued.

Some might call it an epiphany, but I tend to believe it is closer to the revelation of Jesus Christ to you. The world around us is a template for the world that is to come, with similarities that show us the true form of what shall be, because we know that the world must also be transformed.

2 Peter 3

10 But the day of the Lord will come as a thief in the night, in the which the heavens shall shake, and **the earth also shall tremble, and the mountains shall melt and pass away with a great noise, and the elements shall be filled with fervent heat; the earth also shall be filled, and the corruptible works which are therein shall be burned up.**

11 If, then, all these things shall be destroyed, what manner of persons ought ye to be in holy conduct and godliness,

12 Looking unto and preparing for the day of the coming of the Lord, wherein the corruptible things of the heavens, being on fire, shall be dissolved, and the mountains shall melt with fervent heat?

13 Nevertheless, if we shall endure, we shall be kept according to his promise. **And we look for new heavens and a new earth wherein dwelleth righteousness.**

Revelation 21:1 **And I saw a new heaven and a new earth; for the first heaven and the first earth were passed away;** and there was no more sea.

3 Nephi 11

30 And he did expound all things, even from the beginning until the time that he should come in his glory--

31 Yea, even all things which should come upon the face of the earth, even **until the elements should melt with fervent heat, and the earth should be wrapped together as a scroll, and the heavens and the earth should pass away;**

32 And even unto the great and last day, when all people, and all kindreds, and all nations, and tongues shall stand before God to be judged of their works, whether they be good or whether they be evil;

33 If they be good, to the resurrection of everlasting life; and if they be evil, to the resurrection of damnation--being on a parallel, the one on the one hand and the other on the other hand, according to the mercy, and the justice, and the holiness which is in Christ, who was before the world began.

D&C 28

6a And again, verily, verily, I say unto you that when the thousand years are ended and men again begin to deny their God, then will I spare the earth but for a little season;

6b and the end shall come; and **the heaven and the earth shall be consumed and pass away; and there shall be a new heaven and a new earth;**

6c for all old things shall pass away, and **all things shall become new, even the heaven, and the earth, and all the fullness thereof--both men and beasts, the fowls of the air, and the fishes of the sea;**

6d **and not one hair, neither mote, shall be lost, for it is the workmanship of mine hand.**

We think of light in our common everyday experiences – the light of the Sun, flashlights, streetlights – all of which shine in darkness so that we can see the things that are around us. Now imagine a light that illuminates our minds so that we can see the things that are spiritual. Consider this:

Genesis 6 (Inspired Version)

37 And the Lord spake unto Enoch and said unto him, Anoint thine eyes with clay and wash them, and thou shalt see; and he did so.

38 And **he beheld the spirits that God had created, and he beheld also things which were not visible to the natural eye**; and from thenceforth came the saying abroad in the land: **A seer hath the Lord raised up unto his people.**

Elisha was given a similar gift from God:

2 Kings 6

15 And when the servant of the man of God was risen early and gone forth, behold, a host compassed the city both with horses and chariots. And his servant said unto him, Alas, my master! How shall we do?

16 And he answered, **Fear not; for they that be with us are more than they that be with them.**

17 And Elisha prayed and said, **Lord, I pray thee, open his eyes, that he may see.** And the Lord opened the eyes of the young man; and **he saw; and behold, the mountain was full of horses and chariots of fire round about Elisha.**

These things are a reality that we are not able to see with our eyes because they are only capable of perceiving the natural lights around us. But Elisha and his servant, as well as Enoch, could behold the light of things that is not natural – the spiritual light and truth.

We each have opportunities to see things that are beyond our natural sight if we view them with an eye of faith. Just as we study natural light, as believers in Christ we need to study the spiritual light of Christ.

Psalms 119:105 Thy word is a lamp unto my feet and a light unto my path.