

## The Difference Jesus Makes: Education & Science

We're in a series on the difference Jesus has made in our world. So far, we've seen that the changes brought about by those who follow Jesus have been nothing less than monumental. Where lives were once thrown on the dump heap because they were considered worthless, Christian belief has led to both valuing human life and going to great lengths to make those lives better through the acts of compassion that we briefly looked at last week.

A critic of Christianity might at this point say something like, "Well, that's all nice and good that Christians have shown compassion and done some nice things for others through the years. They've done a lot of bad things, too, and one of the worst has been to try to hold back the advance of science, to limit human knowledge, to keep us in the dark ages when it comes to the discoveries that modern science has been making."

It's a sign of the lack of education that one can expect in a university context today that few are aware that education and science are where they are because followers of Jesus led the way and today I want to show you how these Christians blazed the paths that have produced modern science and the education system that we know.

First, some background. Aristotle was the giant of all the ancient philosophers, a student of Plato and a teacher to Alexander the Great. He believed that knowledge could only be acquired through reasoning, through the deductive processes of the mind. A philosopher didn't do experiments to find out if his conclusions were true - such physical activities were for slaves, not for thinkers and free men.

Aristotle also taught that the gods were not separate or distinct from the world, but were intertwined into the natural world. For example, he believed that the planets had an inner intelligence, an *anima*, that caused them to move. This is really a form of pantheism, that the gods are in everything and a part of everything. Aristotle didn't believe that the universe had a beginning, but assumed that it has always been -- therefore, no need for a Creator.

So strong was Aristotle's influence, even amongst the Christian scholars of the Middle Ages, that those who began to break away from his paradigm, his pattern for doing philosophy, faced serious opposition. One of the first of these was Roger Bacon, whose challenge of Aristotle's methods landed him in jail (or perhaps 'house arrest') for 14 years, a prisoner of the Franciscan order to which he belonged!

But, ultimately, it was the Christian view of God that prevailed and it was the Christian view of God that first made science even possible. It was not until scholars began to see God as distinct from nature, as a separate being, that experiments on the natural world became a legitimate path to knowledge. Before that time, people looked at a tree and saw a god or a spirit or some dead ancestor and they wouldn't think of conducting an experiment on that tree. Once the church realized that Aristotle's teaching was pantheistic and not compatible with the teaching of Scripture, then the

door swung wide open for Christians to discover all they could about this world that God had created.

And that became the driving force for scientists for the next five hundred years. Professor Lynn White, who taught at Princeton and Stanford and UCLA, wrote "From the thirteenth century onward into the eighteenth, every major scientist, in effect, explained his motivations in religious terms." Modern textbooks omit this information, even though it was the religious conviction of these pioneers of science that was the dominant factor in the scientific work that they did. Let's take a look at some of these pioneers and indications of their Christian faith.

William of Occam lived from 1280-1349 and is credited with the principle that says that what can be done or explained with the fewest assumptions should be used -- the principle is still valid in research today and is known as "Occam's Razor". More than a scientist, Occam also wrote theological papers, one on the Lord's Supper (the communion), and the other on the body of Christ, both of which had influence two centuries later on a young monk named Martin Luther.

Leonardo da Vinci was brilliant as an artist, an inventor and as a scientist, especially in his study of human anatomy. He was also outspokenly critical of some of the abuses of power that he saw in the Catholic Church of his day, the selling of indulgences and the trade in relics. He once said, "I see Christ once more being sold and crucified and his saints martyred." He was critical of the clergy for their lack of morality, values and education. But his own faith resonates through his notebooks where he wrote about the gift of reason God has given us that enables us to discover His mysteries. I like this quote: "I obey you, Lord, first, for the love I ought, in all reason, to give you; secondly, because you can shorten or prolong the lives of men."

In the field of astronomy, there are three names that stand out beyond all others of their time: Copernicus, Kepler and Galileo. Both Copernicus and Galileo were Roman Catholics, which meant that they were expected to make their discoveries -- not in support of the Scriptures, but in support of Aristotle's reasonings. So, while Copernicus was able to work out the mathematics of the earth's orbit around the sun, he was reluctant to publish his findings. But one modern scholar tells us that, "No historian will cover up the facts that a Lutheran prince subsidized the publication of his work, that a Lutheran theologian arranged for the printing and that a Lutheran mathematician supervised the printing." Yet, what you read and hear today is mostly that "the Church" stood opposed to scientific discovery.

While the Catholic church did stand opposed, the Reformation church provided the strongest backers of these new discoveries. Perhaps that's the best explanation for why Kepler was able to carry Copernicus' work so much further, while Galileo was being dragged before the Inquisition. Kepler was a Lutheran and Galileo was a Catholic. The Calvinists, which made up the other branch of the Reformation in those early days, were also supportive of scientific discovery and founded the Royal Society in London in 1645 - 7 or its ten scientists were Puritans.

Building on Kepler's discoveries was Isaac Newton who wrote, "God governs the world invisibly, and He has commanded us to worship Him, and no other God . . . He has revived Jesus Christ our Redeemer, who has gone into the heavens to receive and prepare a place for us, and ... will at length return and reign over us." He had a very Christ-centred faith.

Leibniz was a contemporary of Newton and together they are credited with developing the theory of differential calculus. He saw the Bible as God's authoritative word and maintained that there was no conflict between true faith and valid reason.

Blaise Pascal is known for many things, including his invention of the syringe and the hydraulic press and for his discoveries in physics. He is not as well known for his statement, "We know God only through Jesus Christ."

If you were to hear the names Volta, Ohm and Ampere, you might think you were hearing people who made some discoveries related to electricity -- you'd be right. Volta once said, "I am not ashamed of the Gospel; may it produce good fruit." Ohm humbly admitted that he could only finish his writing if God gave him length of days. Ampere once wrote, "One of the most striking evidences of the existence of God is the wonderful harmony by which the universe is preserved..."

You will have heard the name of Michael Faraday and may even remember that he discovered how to make electricity available for varied applications, that he was the first to make liquid out of a gas and the inventor of the generator. You may not have heard that he was part of a group of Christians who firmly believed the Bible and trusted in Jesus as God's only Son. He not only read his Bible daily, but donated a significant portion of his income to the church and frequently visited and cared for the sick.

Lord Kelvin, who made his mark in science by establishing the scale of absolute zero and by founding thermodynamics was a Christian who took the controversial position that faith and science are highly compatible. He is quoted as saying, "If you think strongly enough, you will be forced by science to the belief in God."

If you took chemistry in school you heard about Boyle's law, perhaps even heard Robert Boyle described as the 'father of chemistry'. You would not have heard in that chemistry class that Boyle was as interested in theology as he was in chemistry or that he contributed money to help fund Bible translations. He served as governor of the Corporation for the Spread of the Gospel in New England and his will included provision for foreign mission work and for the "Boyle Lectures" which were to be evangelistic talks.

Antoine Lavoisier was a Christian in France who showed the world that oxygen was necessary for combustion and who demonstrated the law of conservation of energy.

A devout Quaker, John Dalton, was the first to publish the atomic weights of some elements, the initial version of the periodic table, earning him the title "father of atomic theory".

Joseph Priestley was a chemist and a clergyman who discovered oxygen, hydrochloric acid, nitrous oxide and sulfur dioxide. He once wrote to some French politicians and philosophers arguing for certainty of Jesus' resurrection.

The study of medicine also contains the names of many Christians, including Louis Pasteur who once said, "The more I know, the more does my faith approach that of the Breton peasant." James Simpson, who discovered chloroform which was the first "anaesthetic" received his inspiration from the biblical story of creation in which God put Adam into a "deep sleep" in order to create woman out of man. His greatest discovery, in his own words, was "that I was a sinner and Jesus Christ is the Saviour."

Joseph Lister, another sincere Christian, taught surgeons to use antiseptics and to sterilize their surgical instruments, greatly reducing infections and prolonged lives.

Is that all? No, there are many others who made notable contributions to the advancement of science. There are many more names and stories than there is time for us to talk about them today. But I think it's important to discuss what motivated these Christians to do the scientific work that they did. Why did science not rise up in Egypt or in Greece or in India or China? What is it about the Christian world view that caused these pioneers to look into the mysteries of the creation and seek to unlock them while in other cultures such exploration was frowned on?

We've already seen that in Greece and Rome the idea of getting your hands dirty by doing experiments was a non-starter. It wasn't dignified enough for the pure thinkers, the philosophers, who felt that pure reason should guide our search for knowledge. Egypt only used mathematics and geometry to design their pyramids -- they limited their explorations to those things that served their practical goals. The pervasive animistic beliefs of Hinduism led India to reject the path of scientific exploration and technological innovation. A similar story could be told of China, where the belief that nature was in itself a kind of god kept people from studying what they didn't think they could ever understand.

In Christianity, where God stood above the natural world, the picture was very different. Christians believe that God is a rational being, that He created things according to laws by which His Creation is ordered and that we can discover and learn from those laws as He gives us insight. According to the renowned philosopher of science, Alfred North Whitehead, the origin of science required Christianity's insistence on the rationality of God. If God is rational and we are created in His image, then we are created with the ability to explore and, to some degree, to understand, what God has made and how it all works. Which is the basis for modern science.

They were inspired by Scriptures such as Psalm 19:

*The heavens tell of the glory of God  
The skies display His marvelous craftsmanship  
Day after day they continue to speak  
Night after night they make Him known  
They speak without a sound or a word;*

*their voice is silent in the skies  
Yet their message has gone out to all the earth  
And their words to the ends of the world.*

This is an invitation to discover God, to know Him, to know His thoughts, to gain greater appreciation for His wisdom, to understand His character and, through the centuries, men and women have pursued that knowledge because God has invited us to do that. He wants to be known. And a desire to know Him and to understand more about Him is the beginning of science. Let me take you to the words of Albert Einstein, who said a lot on this subject:

*I'm not an atheist, and I don't think I can call myself a pantheist. We are in the position of a little child entering a huge library filled with books in many languages. The child knows someone must have written those books. It does not know how. It does not understand the languages in which they are written. The child dimly suspects a mysterious order in the arrangement of the books but doesn't know what it is. That, it seems to me, is the attitude of even the most intelligent human being toward God. We see the universe marvelously arranged and obeying certain laws but only dimly understand these laws. Our limited minds grasp the mysterious force that moves the constellations.*

Einstein is also famously quoted as saying, "I am not interested in this phenomenon or that phenomenon. I want to know God's thoughts - the rest are mere details." What Einstein expressed is what scientists for centuries were pursuing, to know God through what God had made and through the laws of nature which govern the universe.

Not only have Christians led the way in discovering the mysteries of the universe, but they have led the way in communicating those discoveries, not to just a select few, the elite classes in society, but to everyone. Christians were the first to include women in religious training and to incorporate large numbers of girls in their episcopal schools and in their monastic schools. By the way, the episcopal schools taught seven subjects: grammar, logic, rhetoric, arithmetic, music, geometry and astronomy.

Although this took place quite broadly from the fourth century on, the idea of widespread, even universal, public education was really a child of the Reformation. Martin Luther was a strong advocate of a state-supported public school system that would be open to all who desired an education, including boys and girls, and from all social classes, from rich to poor. His co-worker, Philipp Melanchthon, successfully persuaded the civic authorities to implement the first public school system in Germany. A system of grades was first advocated by a Christian in Germany, who also developed the university preparation school known as the gymnasium, used widely in Europe. It was a Christian, Friedrich Froebel, who started Kindergarten in an attempt to teach children from a young age that the world of people and of nature was closely connected to God.

It was Christians who developed sign language and began schools for the deaf, primarily so that they could teach the good news of the gospel to those who couldn't

otherwise know of God's great love for them.

Louis Braille, a dedicated Christian who had lost his sight at the age of three, developed a language of raised dots which allowed the blind to read. Compare this to Romans and Greeks who threw blind infants into the ocean and who consigned those children who later became blind to a life as a galley slave, for boys, or a prostitute, for girls. As he was dying, Braille said, "I am convinced that my mission is finished on earth; I tasted yesterday the supreme delight; God condescended to brighten my eyes with the splendor of eternal hope."

Sunday Schools were begun by Christians in order to teach the children of the poor how to read and write. Universities grew out of theological colleges -- places like Harvard and Yale, Columbia and Princeton, even the University of California, Berkley, all began as church schools. So did the great schools of Europe: Oxford, Cambridge, Paris, Heidelberg, Basel

From early days, Christians have been devoted to knowing more about God's world, and then teaching that knowledge to others. It's changed the world from ivory-towered theory to practical knowledge, and from superstition and fear to wonder and the ability to adapt. So, if someone tells you that religion has been the enemy of science and would like to keep us all in the dark ages, tell them they're wrong, and tell them that Jesus gave us a love for truth, and a desire to know all we can about the world He created for us. And then ask them if they would like to know the truth -- the way, the truth, and the life.