

Christian Calculus

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The Impact of Christian Faith on Mathematics & Science: Yesterday & Today

Rogers 109 (Engineering Building), September 29, 5:30-7:00pm

FREE PIZZA & DRINKS!



Dr. Robert J. Marks II, Distinguished Professor of Electrical and Computer Engineering

The New Atheism claims being a scientist and a Christian is like being a vegan butcher.

But both today and in history, many scientists, mathematicians and engineers are motivated in their work by the uncovering of the precise orderliness, underlying simplicity, and inherent beauty of God's creations. Many not only study the creation, but have pursued the identity of the Creator and have found Him in the foundational tenets of Christianity. Some of these scientists are:

- o Isaac Newton - the father of classical physics and co-creator of calculus
- o Michael Faraday - the founder of electrical engineering
- o Blaise Pascal - mathematician extraordinaire and inventor of the first computer
- o Leonhard Euler - the most prolific mathematician of all time
- o George Washington Carver - the "father of the peanut"
- o Louis Pasteur - the father of microbiology
- o Thomas Bayes - the founder of statistical inference
- o James Clerk Maxwell - the formulator of electromagnetics
- o Francis Collins - Director of the Human Genome Project and on and on...



Marks is the recipient of numerous professional awards, including a NASA Tech Brief Award and a best paper award from the American Brachytherapy Society for prostate cancer research. He is Fellow of both IEEE and The Optical Society of America. His consulting activities include Microsoft Corporation, Pacific Gas & Electric, and Boeing Computer Services. His research has been funded by organizations such as the National Science Foundation, General Electric, Southern California Edison, EPRI, the Air Force Office of Scientific Research, the Office of Naval Research, the Whitaker Foundation, Boeing Defense, the National Institutes of Health, The Jet Propulsion Lab, Army Research Office, and NASA.

In 2010, Dr. Marks was listed by CollegeCrunch.com as one of "The 20 Most Brilliant Christian Professors," and, in 2013, one of "the 50 smartest people of faith" at TheBestSchools.org.



Sponsored by the American Scientific Affiliation (Baylor Student Chapter); the School of Engineering & Computer Science; the Departments of Electrical & Mechanical Engineering

Isaac Newton - the father of classical physics and co-creator of calculus; Michael Faraday - the founder of electrical engineering; Blaise Pascal - mathematician extraordinaire and inventor of the first computer; Leonhard Euler, the most prolific mathematician of all time; George Washington Carver – the “father of the peanut”; Louis Pasteur – the father of microbiology, Thomas Bayes - the founder of statistical inference, James Clerk Maxwell, the formulator of electromagnetics, Francis Collins, Director of the Human Genome Project, and on and on. We know these and other great scientists and mathematicians have made monumental contributions to knowledge. We know what they did but, typically, not who they were nor what motivated their work. The new atheism claims being a scientist and Christian is like being a vegan butcher. Indeed, both today and in history, numerous scientists, mathematicians and engineers are motivated in their work by the uncovering of the precise orderliness, underlying simplicity, and inherent beauty of God's creations. Many not only study the creation, but have pursued the identity of the Creator and have found Him in the foundational tenets of Christianity.

The Silent Purge



Christians persecuted everywhere.

Overtly in Mideast by Radicals

In US

Chick fil a

Phil Robertson

On college campuses:

Inter Varsity & Cru kicked off campuses

THE WALL STREET JOURNAL. | OPINION

HOUSES OF WORSHIP

A Campus Crusade Against the Constitution

Limiting First Amendment rights for Christians undercuts rights for everyone else.

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61 Comments

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By HARVEY A. SILVERGLATE

Sept. 18, 2014 7:01 p.m. ET

In my lifetime I have been fortunate to see private associations within civil society promote astonishing social and political advancements in civil rights for African-Americans, women and gays. The voices of a like-minded minority, when allowed to associate and present a unified message, can be powerful. Yet we cannot pick and choose which groups have rights. Thus the current controversy surrounding evangelical Christian organizations on college campuses is a test of our commitment to liberal and constitutional ideals.

Earlier this month the California State University System "de-recognized" 23 campus chapters of the InterVarsity Christian Fellowship (IVCF). This decision stems from a December 2011 chancellor's executive order stating that "No campus shall recognize any . . . student organization unless its membership and leadership are open to all

How come?

Ideology

Freedom from Religion Foundation

Phony Battle of Religion & Science

Why? Anyone can attend, but anyone can't be an officer. Diversity requires anyone can be an officer – even an atheist.

4



Cal State University strips official status from InterVarsity Christian Fellowship

By Josh Dulaney

LA Daily News

POSTED: 09/28/2014 09:27:41 PM PDT

By Josh Dulaney, LA Daily News

After refusing to eliminate a requirement that leaders affirm a doctrine of faith, a Christian student organization has returned to Cal State University this fall without the financial help, recruitment opportunities and community standing other groups enjoy.

InterVarsity Christian Fellowship chose not to comply with a 2011 executive order signed by former Chancellor Charles B. Reed that prohibits CSU schools from recognizing any student group that denies membership and leadership to students based on a variety of factors, including religion. The well-known group, while welcome on campus, no longer has official club status in the 23-campus system.

While the organization — which opened its first chapter in 1947 in San Luis Obispo and lists CSU chapters at Pomona, Northridge, Los Angeles and Long Beach among others — is open to all students, its bylaws require chapter leaders to agree with the organization's doctrine.



Chante Shazel (center) joins other members of the CSULB InterVarsity Christian Fellowship in...

Science and Faith: Separate But Equal? Answer...



Two Spheres Model:

“Keep religion in the churches” is the first sphere

Science is the second sphere

Let's keep the two sphere's separate.

“Separate but Equal” is a lie from the old racist Jim Crow south.



Let's Concentrate on Science & Faith & Universities

“Scientist & Christian” is viewed by two sphere’s advocates as “Vegan Butcher”

Who gets to define “SCIENCE” – asked by Richard Sternberg in Expelled

“Science must exclude God.” is a philosophical statement – not a scientific one.

“Only things proven by science can be believed.” cannot be proven scientifically.

Why does Science think it today has a corner on truth?

1. Thomas Watson, chairman of IBM, 1943. "I think there is a world market for maybe five computers."
2. Ernest Rutherford is credited with splitting the atom for the first time. He won Nobel Prize in 1908 for Chemistry. "The energy produced by the breaking down of the atom is a very poor kind of thing. Anyone who expects a source of power from the transformation of these atoms is talking moonshine."
3. Robert Millikan, American physicist and Nobel Prize winner, 1923. "There is no likelihood man can ever tap the power of the atom."

4. Dennis Gabor, British physicist received a Nobel Prize for inventing the hologram.
"Transmission of documents via telephone wires is possible in principle, but the apparatus required is so expensive that it will never become a practical proposition."
5. Lord Kelvin, president, Royal Society, 1897.
"Radio has no future."
"X-rays will prove to be a hoax."
"Heavier-than-air flying machines are impossible."

The New Atheists



Dawkins



Myers



Hitchens



Provine



"Christian theism must be rejected by any person with even a shred of respect for reason" George H. Smith, Atheist Philosopher

Richard Dawkins "[Bible miracles] are very effective with an audience of unsophisticates and children" Richard Dawkins.

"Most people, I believe, think that you need a God to explain the existence of the world, and especially the existence of life. They are wrong, but our education system is such that many people don't know it."

Eugenie Scott

"Intelligent Design is ultimately a science stopper."

Christopher Hitchens

"I think religion is a deadly threat to the survival of the species and to the continued evolution of the brain."

Sam Harris

"The fact that 40% of American scientists believe in God indicates that 60% of scientists aren't doing their jobs."

P.Z. Myers

Archie Bunker "Faith is when you believe something no one in their right mind believes."

Peter Atkins



Peter Atkins: Professor of Chemistry at the University of Oxford and a Fellow of Lincoln College. He is a writer of popular chemistry textbooks, including Physical Chemistry, Inorganic Chemistry, and Molecular Quantum Mechanics.

No explanatory power. (Refuted later by Lennox)

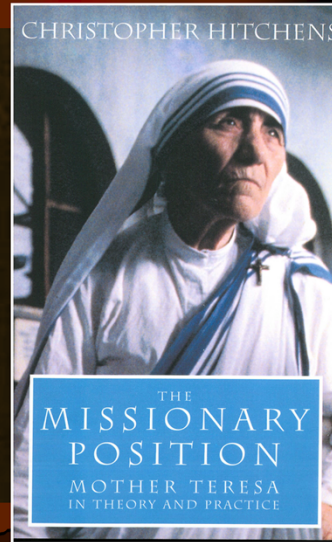
Religion is “Evil”

Beware of Amish terrorists!

But where does this idea of “evil” come from? It is ironic that an appeal is made to good and evil when there is no God.

Video clip from: Expelled: No Intelligence Allowed

Religion is Evil? Christopher Hitchens



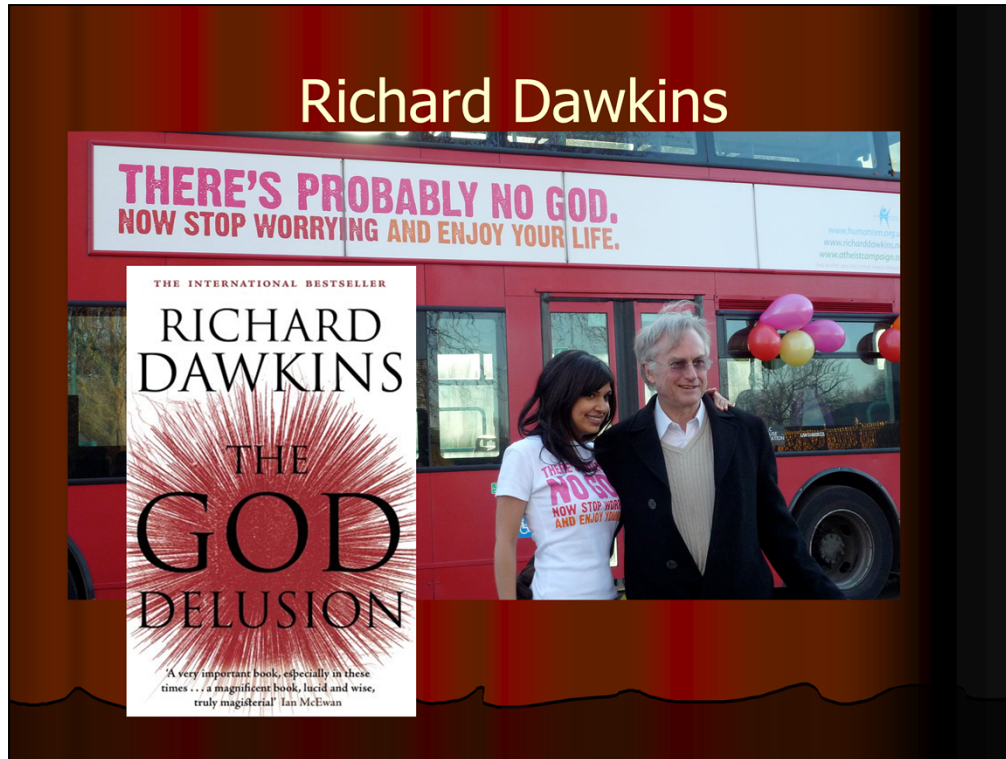
How far does this go?

Christopher Hitchens:

"[Mother Teresa is a] religious fundamentalist, a political operative, a primitive sermonizer, and an accomplice of worldly secular powers."

"[Mother Teresa's] success is not ... a triumph of humility and simplicity. It is another chapter in the millennial story which stretched back to the superstitious childhood of our species, and which depends on the exploitation of the simple and the humble by the cunning and single-minded."

Wow



Richard Dawkins, zoologist, evolutionary biologist, and author. He is an emeritus fellow of New College, Oxford, and was the University of Oxford's Professor for Public Understanding of Science

Picture: Ariane Sherine and Richard Dawkins at the Atheist Bus Campaign launch

Three parts of the video clip:

1. Loosing his faith
2. The likelihood of God
3. What he thinks of God

Frank Turik's two point definition of New Atheists:

1. THERE IS NOT GOD
2. I HATE HIM

Video clip from: Expelled: No Intelligence Allowed

Richard Dawkins



Three clips:

1. Loosing his faith
2. The likelihood of God
3. What he thinks of God

Frank Turik's definition of New Atheists:

1. THERE IS NOT GOD
2. I HATE HIM

Video clip from: Expelled: No Intelligence Allowed

P.Z. Myers



Paul Zachary "PZ" Myers is a biology associate professor at the University of Minnesota Morris (UMM). He is founder and co-author of the Pharyngula science blog.

Myers has called me “disillusioned” on his BLOG.

Clip contents:

1. Science caused his atheism
2. Religion is fairy tales
3. More Science, Less Religion

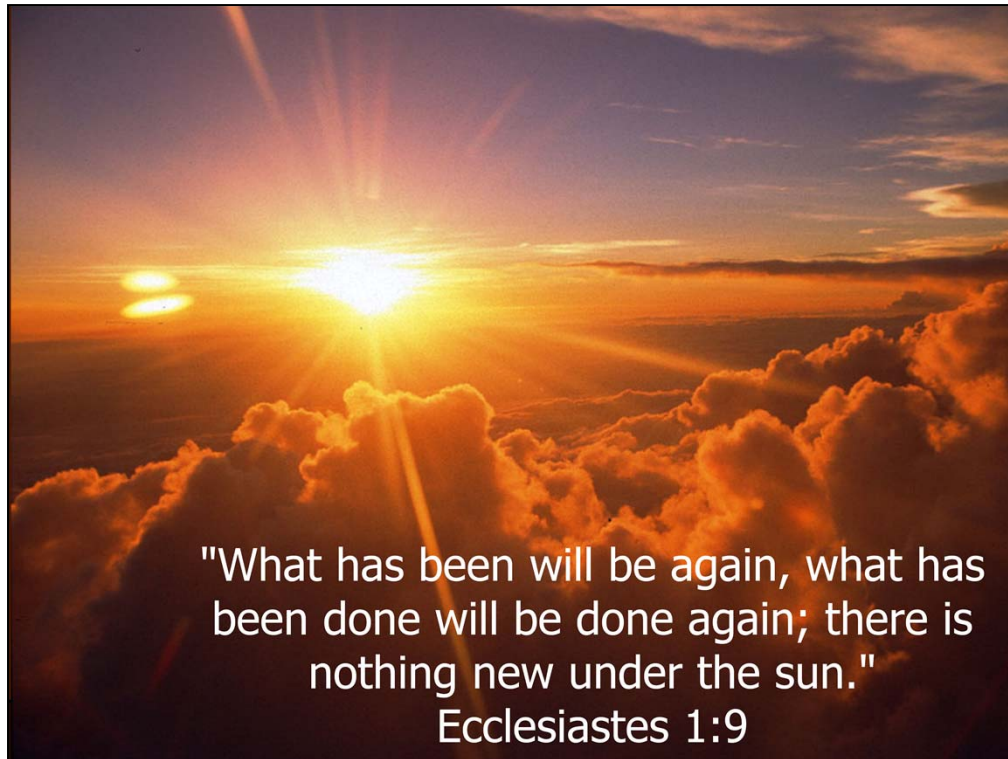
Video clip from: Expelled: No Intelligence Allowed

William Provine



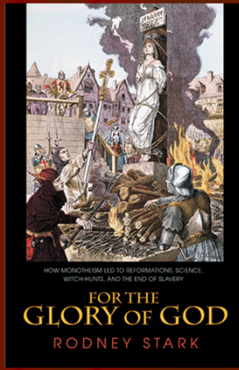
William B. Provine is a Distinguished University Professor at Cornell University
Professor in the Departments of History, Science and Technology Studies, and Ecology and
Evolutionary Biology

1. Evolution was not taught in Tennessee
2. Science caused him to loose his faith
3. The consequences of loosing faith: no free will, no hope = An honest atheist



"What has been will be again, what has
been done will be done again; there is
nothing new under the sun."
Ecclesiastes 1:9

This passage includes the debate on God



Rodney Stark

Nothing new under the sun: "The falsehood that science required the defeat of religion was proclaimed by such self-appointed cheerleaders as Voltaire, Diderot, and Gibbon who themselves played no part in the scientific enterprise - a pattern that continues."

Rodney Stark is an Distinguished Professor at Baylor University. He is co-director of the Institute for Studies of Religion.

Takeaways:

None of the new atheists are giants (Have made contributions, yes)

This is not new stuff

How does New Atheism position about
science vs. faith stand up to history?



HISTORY OF SCIENCE...



“... the Christian world ... gave birth in a clear, articulate fashion to the experimental method of science itself.”

Loren Eiseley, “Darwin’s Century” (Garden City, NY, Doubleday, 1958, Doubleday Anchor Books, 1961), p.62.

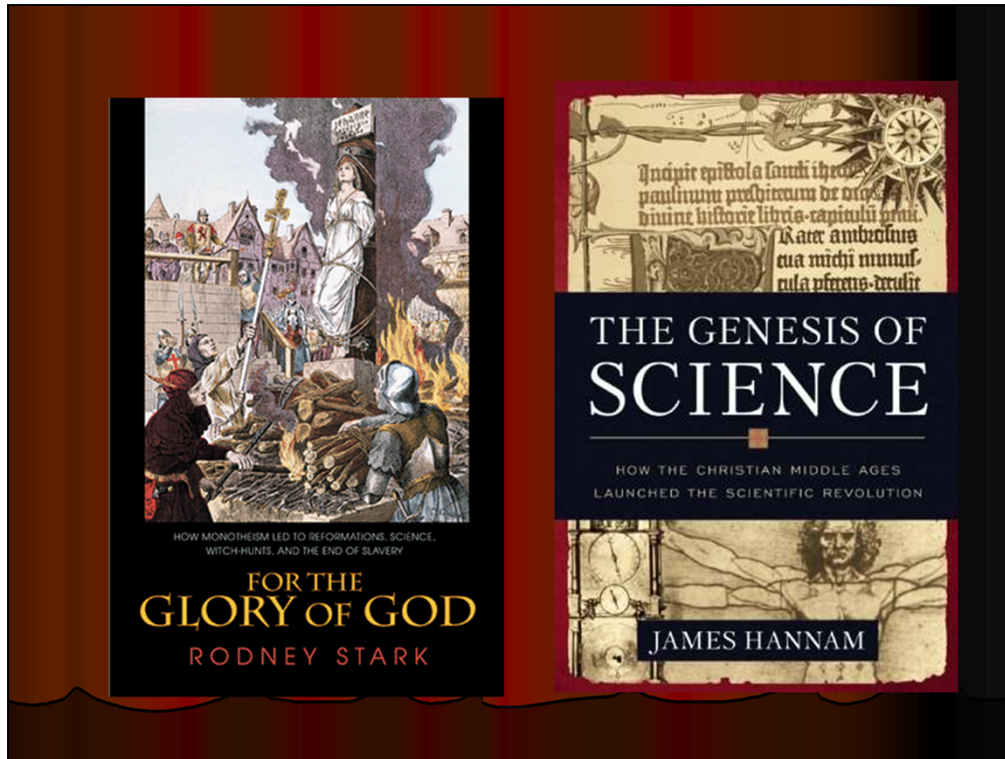
Christianity played a major part in the development of science.



HISTORY OF SCIENCE

**“... Hebrew and Christian
belief in a deity who was at
once a Creator and Law-
giver rendered ... [the idea
of the ‘laws of nature’]
valid.”**

· A.R. Hall, Historian



The role of Christianity in the birth of modern science: Two Books

“Christian theology was essential for the rise of science.” Rodney Stark

Stark notes:

Astrology was everywhere. It lead to astronomy only in eastern Europe.
 Alchemy was everywhere. It lead to chemistry only in eastern Europe.

China contributed some

- Chinese remainder theorem (math)
- Recreational gun powder

Mideast:

- Arabic numerals: 1,2,3,4,5,...
- Algorithm: a mangled transliteration of Arabic al-Khwarizmi “ [Abu Ja'far Muhammad ibn Musa al-Khwarizmi (1550's)] native of Khwarazm,”
- Algebra: Arabic al jebir "reunion of broken parts," as in computation

Historical Muslim Barrier: If one claims repeatable physical laws that Allah can't change on a whim, this is an insult to Allah. The proponent would violate shirk.

Christian View: Anselm's Ontological Argument: Preamble – God is greater than anything we can experience or imagine.

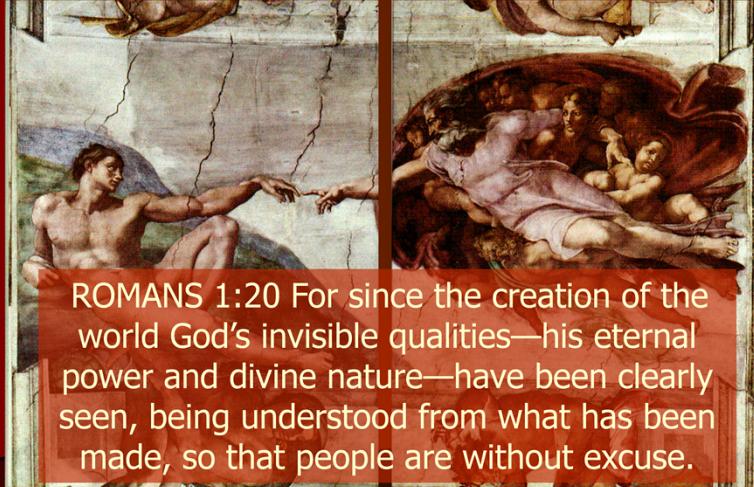
References:

Rodney Stark For the Glory of God: How Monotheism Led to Reformations, Science, Witch-Hunts, and the End of Slavery (2004)

James Hannam The Genesis of Science: How the Christian Middle Ages Launched the Scientific Revolution

Hannam: Physics degree at Oxford. Cambridge PhD in the History and Philosophy of Science.

Why Christians? In Science & Math, Researchers see God's Laws in Creation.



ROMANS 1:20 For since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that people are without excuse.

Are we numbed by familiarity?



- “The more I study nature, the more I stand amazed at the work of the Creator. Into his tiniest creatures, God has placed extraordinary properties ...”

Louis Pasteur (1822-1895)

“The more I study nature, the more I stand amazed at the work of the Creator. Into his tiniest creatures, God has placed extraordinary properties ...”

Louis Pasteur (1822-1895)

John Hudson Tiner, *Louis Pasteur - Founder of Modern Medicine*, Milford, MI: Mott Media, Inc., 1990, p.75.)

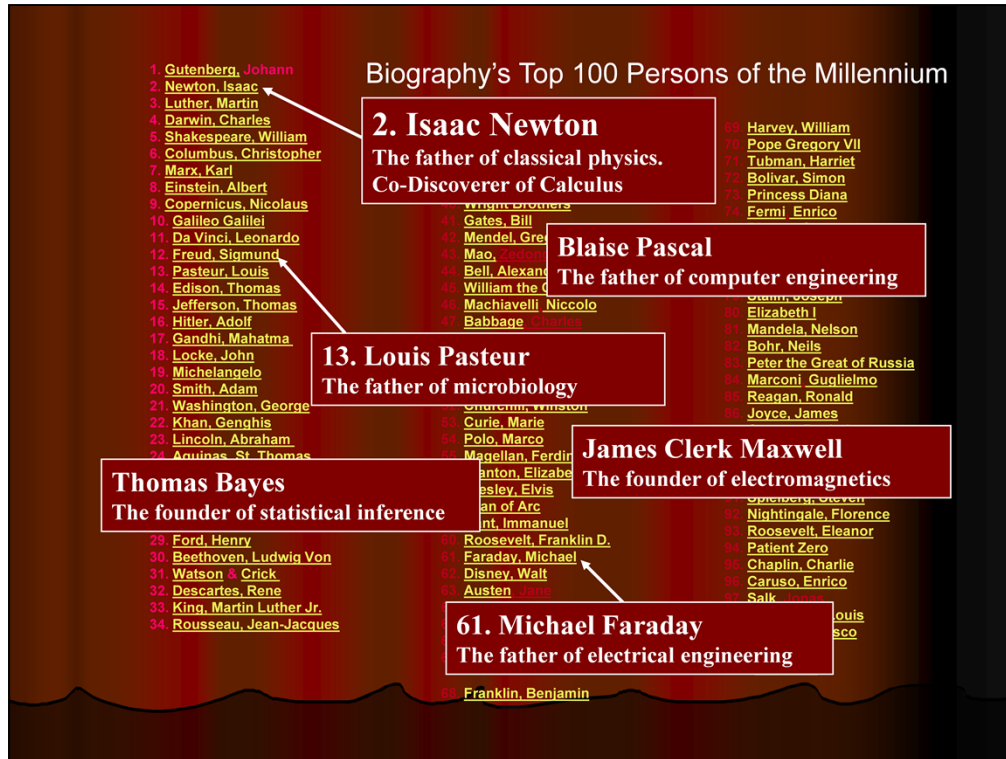
“God is going to reveal to us things He never revealed before if we put our hands in His.”

George Washington Carver (1865-1943)

(who named his laboratory *God's Little Workshop*.)

Ethel Edwards, *Carver of Tuskegee* (Cincinnati, Ohio; Ethyl Edwards & James T. Hardwick, 1971) pp.141-42.

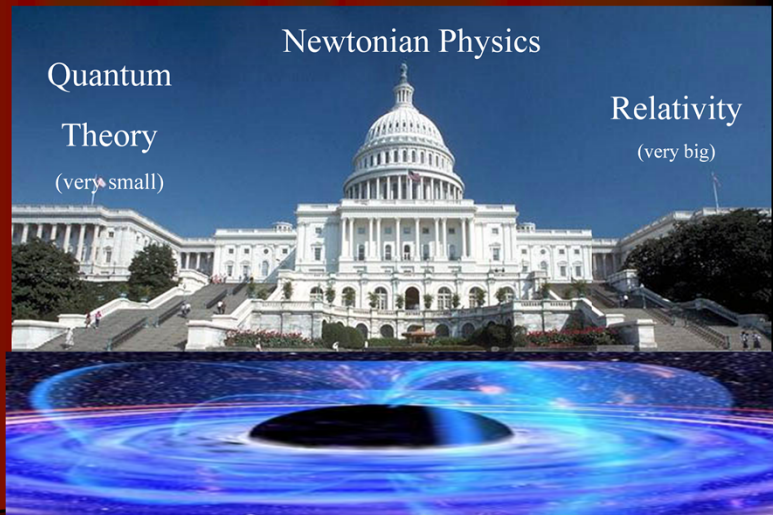
Louis Pasteur (John Hudson Tiner, *Louis Pasteur - Founder of Modern Medicine*, Milford, MI: Mott Media, Inc., 1990, p.75.)



<http://www.biography.com/features/millennium/index.html>

Sir Isaac Newton (1642-1727)

“...one of the greatest names in the history of human thought”



Sir Isaac Newton Contributions



Stamps: Great Britain, Poland, France, Former Soviet Union, Germany, Congo

Apple's Newton

Newton's cradle

Sir Isaac Newton Contributions

Newton (mks unit for force)
Newton's Three Laws of Motion
Newton's rings
Newton Optimization
Newtonian Physics
Newtonian Fluid
Newton Raphson Method
Newtonian telescope
Newtonian dynamics
Newtonian constant of gravitation =
 $6.672\ 59 \times 10^{-11}\ \text{m}^3\ \text{kg}^{-1}\ \text{s}^{-2}$

Stamps: Great Britain, Poland, France, Former Soviet Union, Germany, Congo

Apple's Newton

Newton's cradle

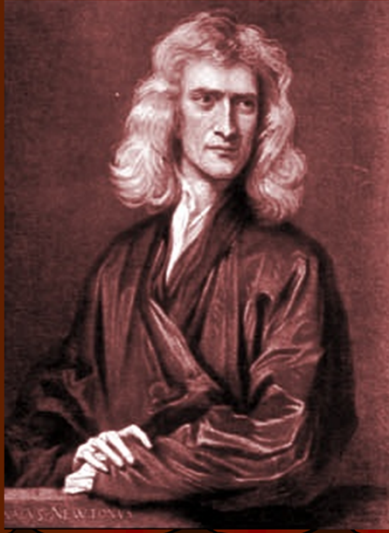
God observed in nature...

**"[The] beautiful system of
the the sun, planets and
comets could only
proceed from the
council and dominion of
an intelligent and
powerful Being."**

Isaac Newton

Newton's Philosophy of Nature: Selections From His Writings (Hafner Publishing, 1953)

From *Opticks* by Isaac Newton



“God in the beginning formed matter in solid, massy, hard, impenetrable, moveable particles, of such sizes and figures, and with other such properties, and in such proportion to space, as most conduced to the end for which He formed them.”

From *Opticks* by Isaac Newton

(still in print)

Rephrasing of Revelation 4:11

“Thou art worthy, O Lord, to receive glory and honour and power: for thou hast created all things, and for thy pleasure they are and were created.”



Newton on Atheism

**“Atheism is so
senseless and odious
to mankind that it never
had many professors.”**

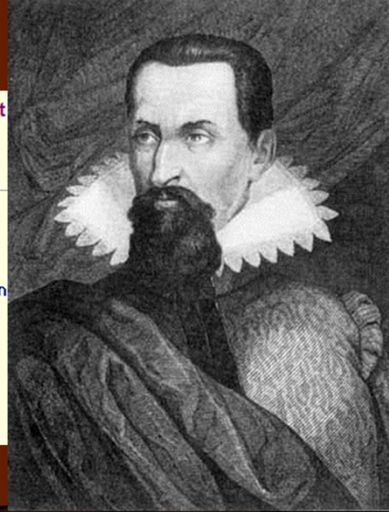
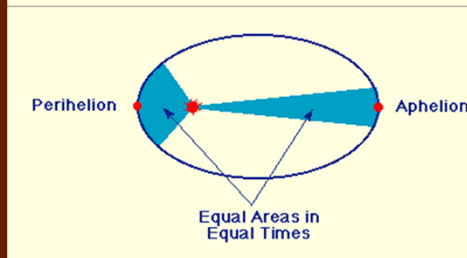
Isaac Newton quoted from

Newton's Philosophy of Nature: Selections From His Writings (Hafner Publishing, 1953)

Johannes Kepler (1571-1630)

- Kepler's Laws

II. The line joining the planet to the Sun sweeps out equal areas in equal times as the planet travels around the ellipse.



<http://www.leaderu.com/offices/schaefer/docs/scientists.html>

<http://csep10.phys.utk.edu/astr161/lect/history/kepler.html>

Johannes Kepler (1571-1630)



- Kepler's Laws

III. The ratio of the squares of the revolutionary periods for two planets is equal to the ratio of the cubes of their semimajor axes.

$$\frac{P_1^2}{P_2^2} = \frac{R_1^3}{R_2^3}$$

<http://www.leaderu.com/offices/schaefer/docs/scientists.html>

<http://csep10.phys.utk.edu/astr161/lect/history/kepler.html>

Johannes Kepler



- "When asked: Why do you do science?", Kepler answered that he desired in his scientific research to obtain a sample test of the delight of the Divine Creator in his work and to partake of his joy."

"Throughout his life, Kepler was a profoundly religious man. All his writings contain numerous references to God, and he saw his work as a fulfilment of his Christian duty to understand the works of God. Man being, as Kepler believed, made in the image of God, was clearly capable of understanding the Universe that He had created. Moreover, Kepler was convinced that God had made the Universe according to a mathematical plan."

<http://www.leaderu.com/offices/schaefer/docs/scientists.html>

<http://www-gap.dcs.st-and.ac.uk/~history/Mathematicians/Kepler.html>

Michael Faraday (1791-1867)



$$\oint \mathbf{E} \cdot d\mathbf{r} = -\frac{d}{dt} \iint_S \mathbf{B} \cdot d\mathbf{A}$$

$$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$

$$F = N_A e$$

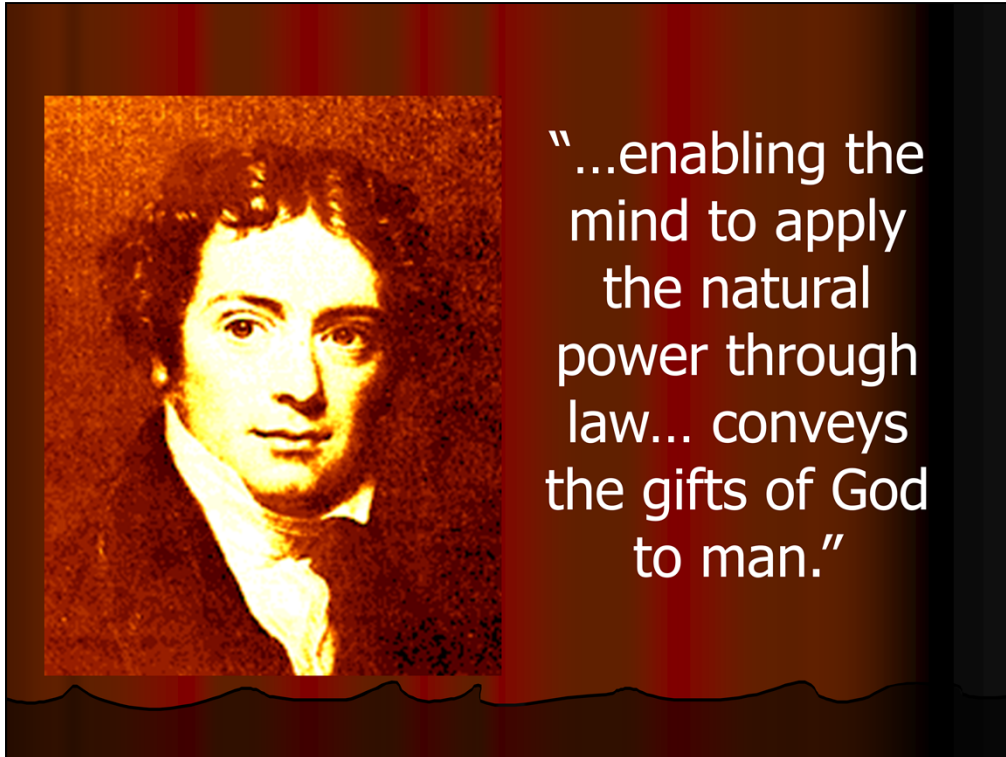
The Father of Electricity **Faraday's Contributions**

- **Faraday's Law**
- Discovered electromagnetic induction: generators, motors & transformers.
- **The Faraday Effect**
- **A magneto-optic effect in which the polarization plane of an electromagnetic wave is rotated under the influence of a magnetic field parallel to the direction of propagation.**
- **Discovered Benzene**
- **Build first practical electric motor.**
- Farad = unit of capacitance
- Daraf (??)
- Faraday's constant =
 $F = 96485.309 \text{ C mol}^{-1}$

Coined the terms

electrode,
anode,
cathode

electronic



Faraday was offered and refused the Presidency of the Royal Society. He responded no... "I must remain plain Michael Faraday to the very last."

Reference:

...enabling the mind to apply the natural power through law... conveys the gifts of God to man.

— Michael Faraday

Notes for a Friday Discourse at the Royal Institution (1858).

“[Faraday’s] standard of duty was supernatural. It was formed entirely on what he held to be the revelation of the will of God in the written word, and throughout all his life his faith led him to act ... to the the very letter of it.”

Faraday’s Biographer: Dr Bence Jones "The Life and Letters of Faraday". See also <http://www.iee.org.uk/publish/faraday/faraday2.html>

George Washington Carver

"God is going to to
reveal to us things
He never revealed
before if we put our
hands in His."

Named his research
lab *God's Little
Workshop.*



George Washington Carver (January 1864?– January 5, 1943), was an American scientist, botanist, educator, and inventor. The exact day and year of his birth are unknown; he is believed to have been born into slavery in Missouri in January 1864.

Soil Scientist. Popularized plant rotation to restore nitrogen

Discovered three hundred uses for peanuts and hundreds more for soybeans, pecans and sweet potatoes

adhesives, axle grease, bleach, buttermilk, chili sauce, fuel briquettes (a biofuel), ink, instant coffee, linoleum, mayonnaise, meat tenderizer, metal polish, paper, plastic, pavement, shaving cream, shoe polish, synthetic rubber, talcum powder and wood stain.

Donald Knuth



- Computer Scientist Extraordinaire
- "The father computer science"
- Authored multi volume "The Art of Computer Programming"
- Knuth is the creator of the Tex computer typesetting system

Also called "The father of the analysis of algorithms"

Donald Knuth is a Professor Emeritus at Stanford University

"The Art of Computer Programming" has 10's of thousands of citations. (Google Scholar)

Almost every mathematician in the world writes their papers and dissertations using LaTeX. Many engineers (like me) and physicists too.

Wikipedia:

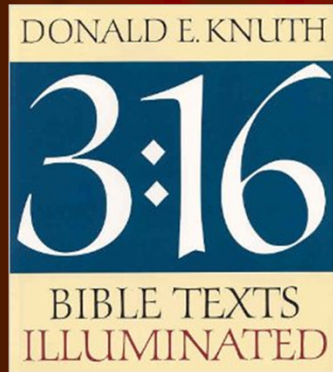
Donald Knuth (January 10, 1938) is an American computer scientist, mathematician, and Professor Emeritus at Stanford University.[2]

He is the author of the multi-volume work The Art of Computer Programming.

Knuth has been called the "father" of the analysis of algorithms. He contributed to the development of the rigorous analysis of the computational complexity of algorithms and systematized formal mathematical techniques for it. In the process he also popularized the asymptotic notation. In addition to fundamental contributions in several branches of

theoretical computer science, Knuth is the creator of the TeX computer typesetting system, the related METAFONT font definition language and rendering system, and the Computer Modern family of typefaces

Donald Knuth



- Knuth studied the Bible like he graded student's programming.
- "It's tragic that scientific advances have caused many people to imagine that they know it all, and that God is irrelevant or nonexistent. The fact is that everything we learn reveals more things that we do not understand... Reverence for God comes naturally if we are honest about how little we know."

Quote is from the book.

Some 3:16 Verses;

John 3:16

For God so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life.

2 Timothy 3:16 King James Version (KJV)

¹⁶All scripture is given by inspiration of God, and is profitable for doctrine, for reproof, for correction, for instruction in righteousness:

Matthew 3:16 King James Version (KJV)

¹⁶And Jesus, when he was baptized, went up straightway out of the water: and, lo, the heavens were opened unto him, and he saw the Spirit of God descending like a dove, and lighting upon him:

Luke 3:16 King James Version (KJV)

¹⁶ John answered, saying unto them all, I indeed baptize you with water; but one mightier than I cometh, the latchet of whose shoes I am not worthy to unloose: he shall baptize you with the Holy Ghost and with fire:

Timothy 3:16 And without controversy great is the mystery of godliness: God was manifest in the flesh, justified in the Spirit, seen of angels, preached unto the Gentiles, believed on in the world, received up into glory.

Genesis 3:16

Unto the woman he said, I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children; and thy desire *shall be* to thy husband, and he shall rule over thee.

Exodus 3:16

Go, and gather the elders of Israel together, and say unto them, The LORD God of your fathers, the God of Abraham, of Isaac, and of Jacob, appeared unto me, saying, I have surely visited you, and *seen* that which is done to you in Egypt:

Thomas Bayes (1702 – 1761)

Bayes Theorem

$$P[A | B] = \frac{P[B | A]P[A]}{P[B]}$$



Baysian Inference: Making classifications using an historical data base.

Foundation of most modern e-mail spam filters.

•Reverend Bayes was a pastor of the Presbyterian Chapel in Tunbridge Wells, 35 miles southeast of London.

•Bayes didn't bother to publish his mathematical work. It was all published posthumously. Bayes was elected Fellow of the Royal Society in 1742 having no published works on mathematics.

Bayes *did* publish about his faith. “God always does that which is right and fit, and that all his moral attributes, [namely] justice, truth, faithfulness, mercy, patience, [etc.] are but so many different modifications of rectitude.” Thomas Bayes, “Divine Benevolence”, 1731.

D.R. Bellhouse, “The Reverend Thomas Bayes FRS: a Biography to Celebrate the Tercentenary of his Birth” <<http://www.stats.uwo.ca/faculty/bellhouse/bayesbiog.pdf>>

Thomas Bayes, Divine Benevolence, 1731, and D.R. Bellhouse, “The Reverend Thomas Bayes FRS: a Biography to Celebrate the Tercentenary of his Birth”
<<http://www.stats.uwo.ca/faculty/bellhouse/bayesbiog.pdf>>

James Clerk Maxwell

Maxwell's Equations

$$\nabla \cdot \vec{D} = \rho$$

$$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$

$$\nabla \cdot \vec{B} = 0$$

$$\nabla \times \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$$



Quotes about Maxwell's equations:

"To anyone who is motivated by anything beyond the most narrowly practical, it is worth while to understand Maxwell's equations simply for the good of his soul" **J.R. Pierce, *Electrons, Waves and Messages*, Hanover House, 1956.**

"Was it a god who wrote these lines..." **Ludwig Boltzmann – Nobel prize winner in Physics - on Maxwell's equations (quoting a line from Goethe).**

"The formulation of these [Maxwell's] equations is the most important event since Newton's time" **Albert Einstein**

"[Maxwell's equations] can be appreciated, by those who understand them, on an aesthetic level." **Halliday & Resnick, *Physics II*, Wiley (1962) – a widely used undergraduate Physics text.**

Einstein kept a photograph of Maxwell, [Michael Faraday](#) and Newton. on his study wall

Blaise Pascal

(1623-62)



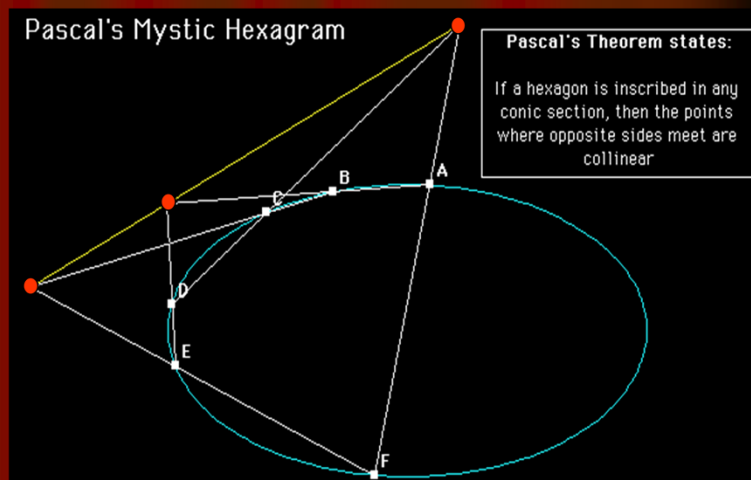
PASCAL: a high level programming language designed by Niklaus Wirth in 1974 as a teaching language for computer scientists.

Pascal's Law: the pressure in a fluid is transmitted equally to all distances and in all directions. (hydraulics!)

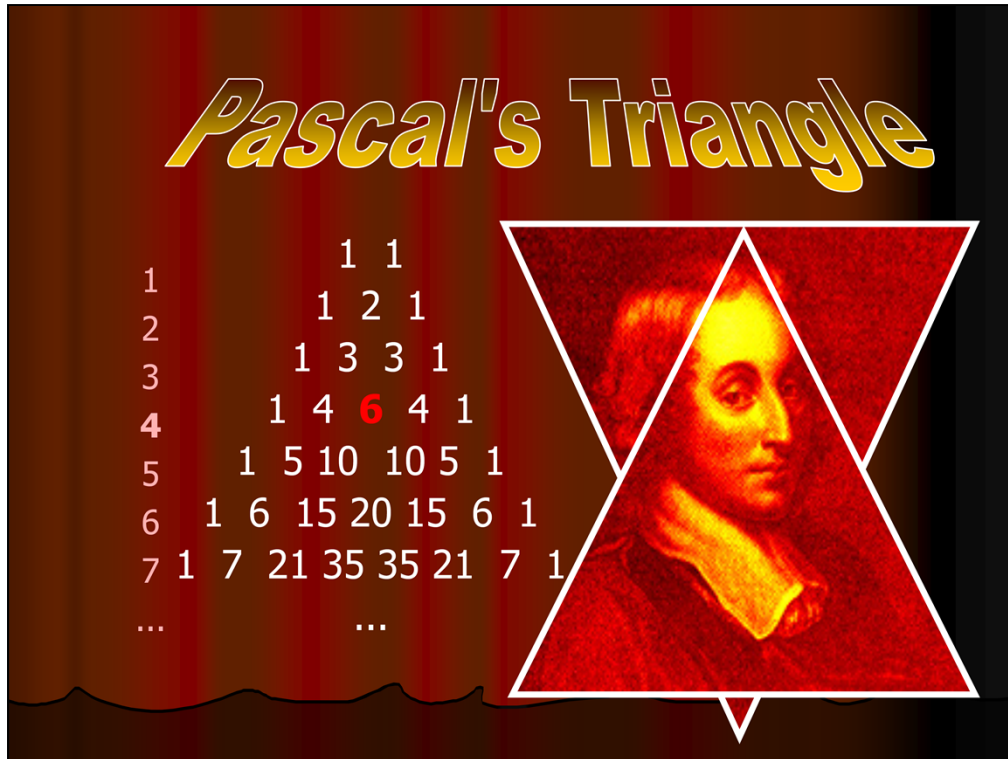
PASCAL: A unit of pressure. 1 bar equals 100,000 Pascal

Pascal's triangle.

Pascal: the Mathematician

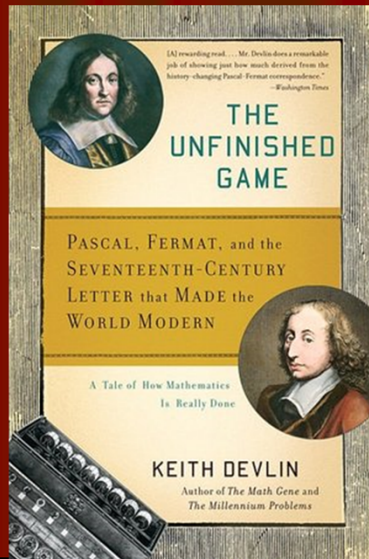


<http://www.norfacad.pvt.k12.va.us/project/pascal/blaise3.htm>



A table of binomial coefficients

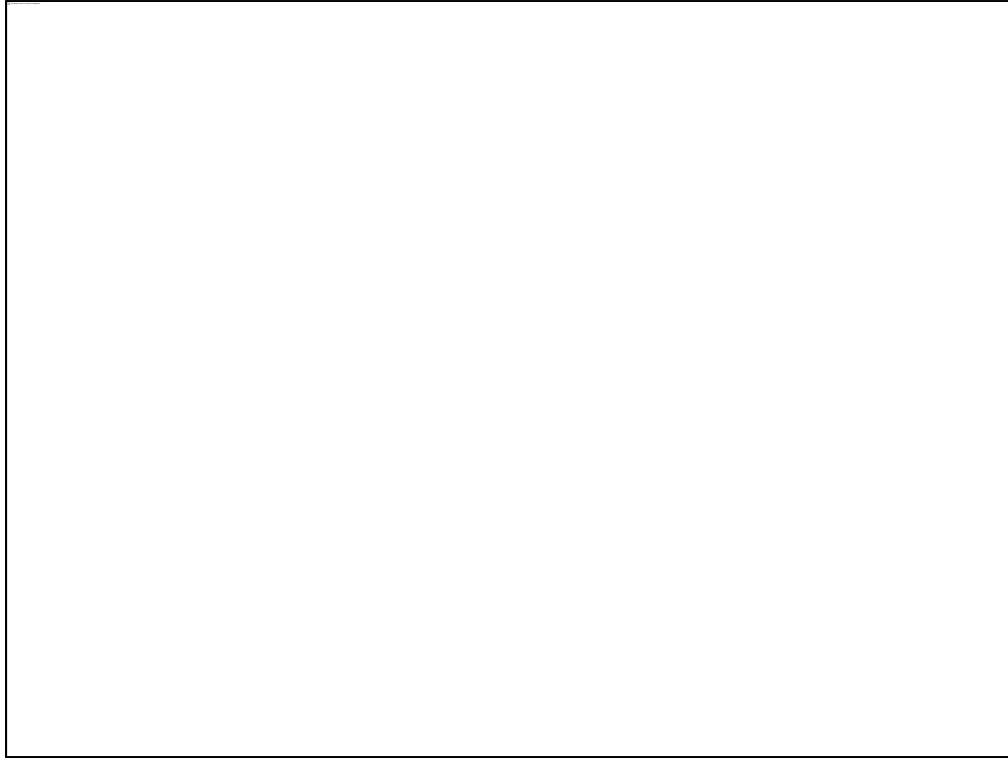
Probability



The doctrine of probabilities dates to the correspondence of Pierre de Fermat and Blaise Pascal (1654).

Keith Devlin, *The Unfinished Game: Pascal, Fermat, and the Seventeenth-Century Letter that Made the World Modern* (2010)

(This is a great book)

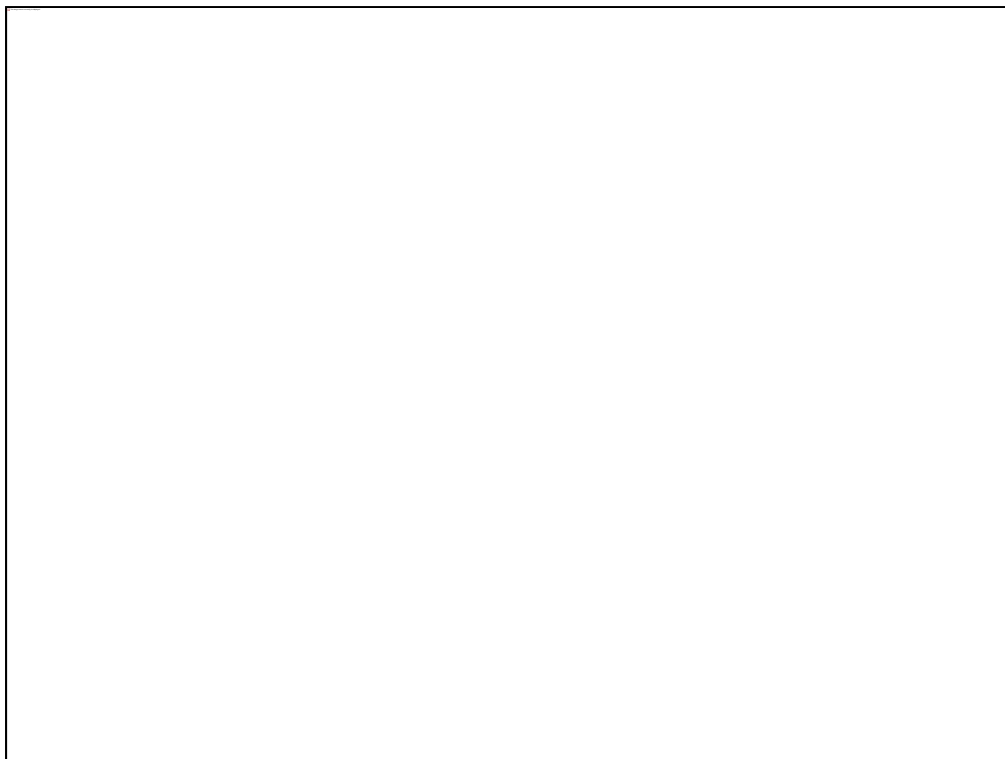


In 1642, Pascal began to create a machine that would be similar to an everyday calculator to help his father with his accounting job.

He finished the final model in 1645.

He presented one to Queen Christina of Sweden and he was allowed a monopoly over it by royal decree.

<http://www-groups.dcs.st-and.ac.uk/~history/index.html>



“The Master of us all” from Laplace

Euler: The Master of Us All

William Dunham (1999)

Went blind

He had 229 Pubs – AFTER HE DIED

Euler angles defining a rotation in space.

Euler approximation

Euler brick

Euler characteristic in algebraic topology and topological graph theory, and the corresponding Euler's formula

Euler circle

Eulerian circuit

Euler class

Euler's constant

Euler cycle

Euler's criterion

Euler derivative

Euler diagram

Euler's disk

Eulerian graph

Euler–Rodrigues parameters

The Euler integrals of the first and second kind, namely the beta function and gamma function.

Euler's line – relation between triangle centers

Euler–Mascheroni constant or Euler's constant $\gamma \approx 0.577216$

Eulerian matroid

Euler's number, e , the base of the natural logarithm.

Euler operator – set of functions to create polygon meshes

Euler parameters

Eulerian path, a path through a graph that takes each edge once.

Euler polynomials

Euler pseudoprime

Things names after Euler

Euler's criterion	Euler angles defining a rotation in space.
Euler derivative	Euler approximation
Euler diagram	Euler brick
Euler's disk	Euler characteristic in algebraic topology and topological graph theory, and the corresponding
Eulerian graph	Euler's formula
The Euler integrals of the first and second kind, namely the beta function and gamma function.	Euler circle
Euler's line – relation between triangle centers	Eulerian circuit
Euler–Mascheroni constant or Euler's constant $\gamma \approx 0.577216$	Euler class
Eulerian matroid	Euler's constant
Euler's number, e , the base of the natural logarithm.	Euler cycle
Euler operator – set of functions to create polygon meshes	Eulerian path, a path through a graph that takes each edge once.
Euler parameters	Euler polynomials
	Euler pseudoprime
	Euler–Rodrigues parameters
	Euler's rule

Euler spline	Euler transform
Euler squares	Euler's formula $e^{ix} = \cos x + i \sin x$ in complex analysis.
Euler substitution	Euler's formula for planar graphs or polyhedra: $v - e + f = 2$
Euler summation	Euler's formula for the critical load of a column
Euler system	Euler's continued fraction formula
Euler's three-body problem	Euler product formula – for the Riemann zeta function.
Euler's sum of powers conjecture	Euler–Maclaurin formula (Euler's summation formula)
Euler equations (fluid dynamics)	Euler–Rodrigues formulas
Euler's equations (rigid body dynamics)	Euler's homogeneous function theorem
Euler–Bernoulli beam equation	Euler's totient function
Euler–Cauchy equation	Euler hypergeometric integral
Euler–Lagrange equation	Euler's identity $e^{i\pi} + 1 = 0$.
Euler–Lotka equation	Euler's four-square identity
Euler–Poisson–Darboux equation	
Euler's pump and turbine equation	
Euler–Tricomi equation	

Euler's number, $e \approx 2.71828$,
Euler's idoneal numbers
Euler numbers are an integer sequence.

Euler number (physics), the cavitation number in fluid dynamics.

Euler number (topology) – now, Euler characteristic

Euler–Mascheroni constant
Eulerian integers are the numbers of form $a+b\omega$ where ω is a complex cube root of 1.

Euler's homogeneous function theorem

Euler's infinite tetration theorem

Euler's rotation theorem

Euler's theorem (differential geometry)

Euler's theorem in geometry, relating the circumcircle and incircle of a triangle.

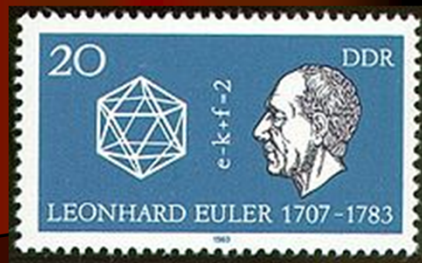
Euclid–Euler theorem

Euler–Fermat theorem

Euler's adding-up theorem in economics

Euler's first law about the linear momentum of a body

Euler's second law about the sum of the external moments about a point



Leonhard Euler

"For since the fabric of the universe is most perfect and the work of a most wise Creator, nothing at all takes place in the universe in which some rule of maximum or minimum does not appear."



Were all motivated by belief in

God?

Pierre Simon
Laplace (1749-1827).

$$X(s) = \int_0^{\infty} x(t)e^{-st} dt$$



Laplace transform

Laplace Noise

Laplace helped to establish the metric system.

Napoleon asked Laplace why God was not mentioned in any of his work on celestial mechanics. Laplace responded ...

“Sire, je n’avais pas besoin de cette hypothese.”

“Sire, I had no need of that hypothesis.”



Petr Beckmann, “A History of Pi”, St. Martin’s Press, 1971.

Theist ≠ Christian

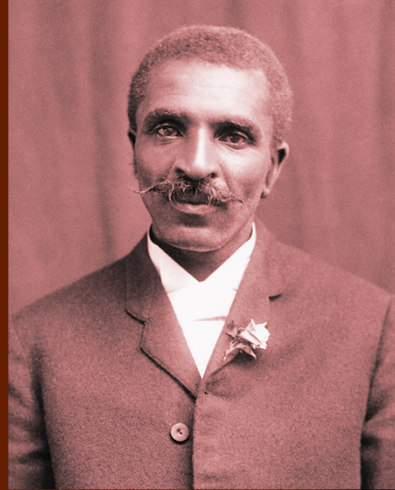
Christian: The knowing of God, the creator of the universe, personally. Belief in God's supremacy and saving grace made possible through the sacrifice of His son, Jesus Christ.

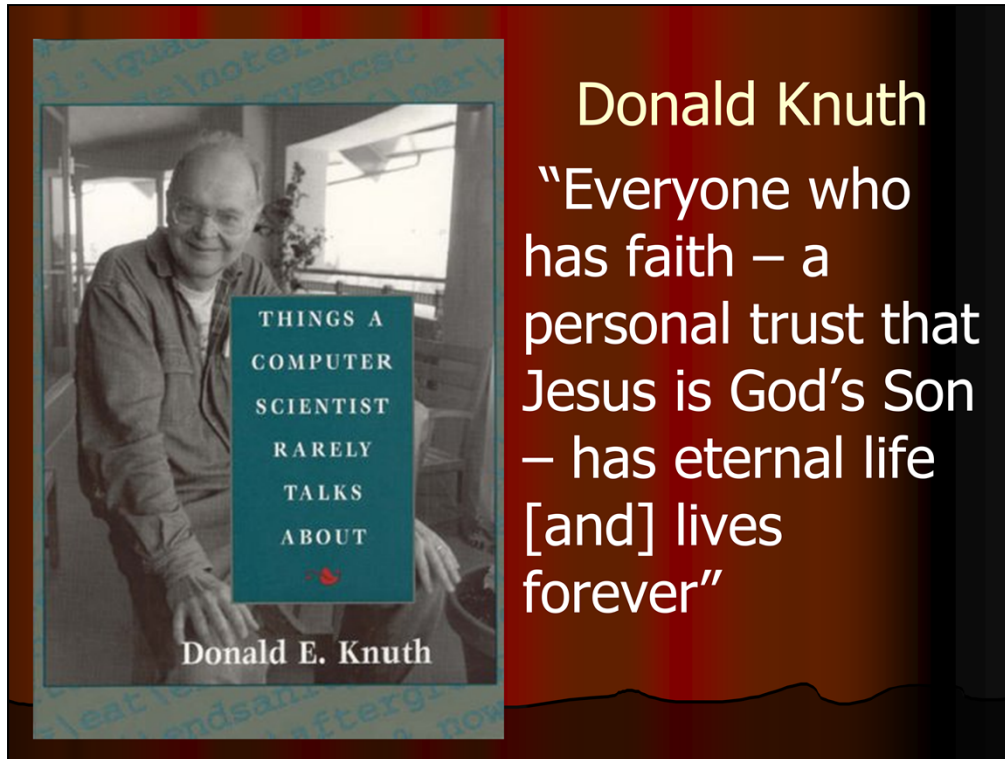
What were the belief of these theist scientist?



George Washington Carver

"JESUS SAID ONE MUST
BE BORN AGAIN,
MUST BECOME AS A
LITTLE CHILD. [YOU]
MUST LET NO
LAZINESS, NO FEAR,
NO STUBBORNNESS
KEEP [YOU] FROM
[YOUR] DUTY."





Donald Knuth

"Everyone who has faith – a personal trust that Jesus is God's Son – has eternal life [and] lives forever"

Knuth discusses his Christian faith. (He is a Lutheran).

This quote is from Knuth's commentary on John 3:16.

An affirmation of how a person embrace scientific and logical disciplines be a devout Christian.

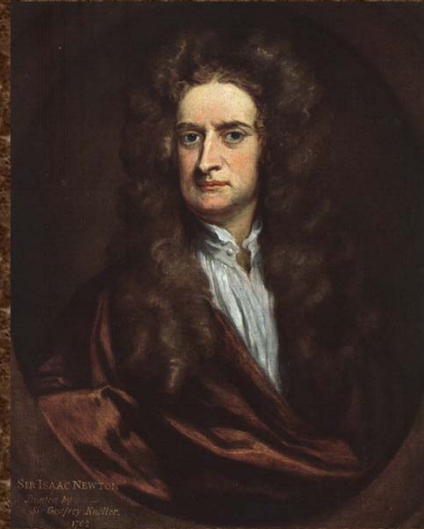
“There is one God, the
Father, ever-living,
omnipresent, omniscient,
almighty, the Maker of
heaven and earth, and
one Mediator between
God and man, the man
Christ Jesus....”

Sir Isaac Newton



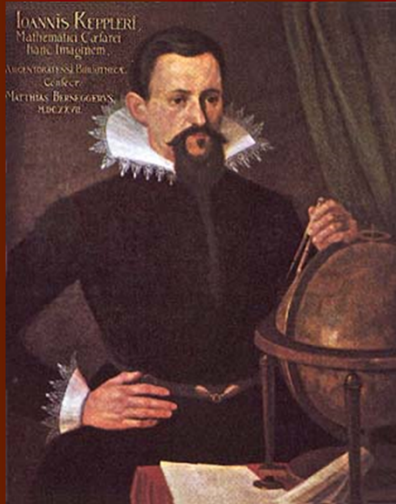
“We account the Scriptures of God to be the most sublime philosophy. I find more sure marks of authenticity in the Bible than in any profane history whatsoever... Worshiping God and the Lamb [Jesus Christ] in the temple: God, for his benefaction in creating all things, and the Lamb, for his benefaction in redeeming us with his blood.”

Sir Isaac Newton




Tryon Edwards, D.D., *The New Dictionary of Thoughts-A Cyclopedia of Quotations* (Garden City, NY: Hanover House, 1852; revised and enlarged by C.H. Catrevas, Ralph Emerson Browns, and Jonathan Edwards [descendent, along with Tryon, of Jonathan Edwards (1703-1758), president of Princeton], 1891; Sir Isaac Newton. Henry H. Morris, *Men of Science-Men of God* (El Cajon, CA: Master Books, A Division of Creation Life Publishers, Inc., 1988), pp. 23-26. The Standard Book Company, 1955,1963), P. 47. Henry H. Halley, *Halley's Bible Handbook* (Grand Rapids, MI: Zondervan Publishing House, 1927, 1965), P. 19. Charles E. Jones, *The Books You Read* (Harrisburg, PA: Executive Books, 1985), P. 118.

Johannes Kepler



"I believe only and alone in the service of Jesus Christ. In Him is all refuge and solace."

<http://www.leaderu.com/offices/schaefer/docs/scientists.html>



**“[T]hough the thought of death brings the thought of judgment, it also brings to the Christian thought of Him [Jesus Christ] who died, ... [and] rose again for the justification of those who believe in Him.”
Michael Faraday**

“Speculations! I know nothing about speculations. I’m resting on certainties. ‘I know my Redeemer liveth’ and because He lives I shall also live.” purported to Faraday near death when queried by reporters about “speculations” of life after death.

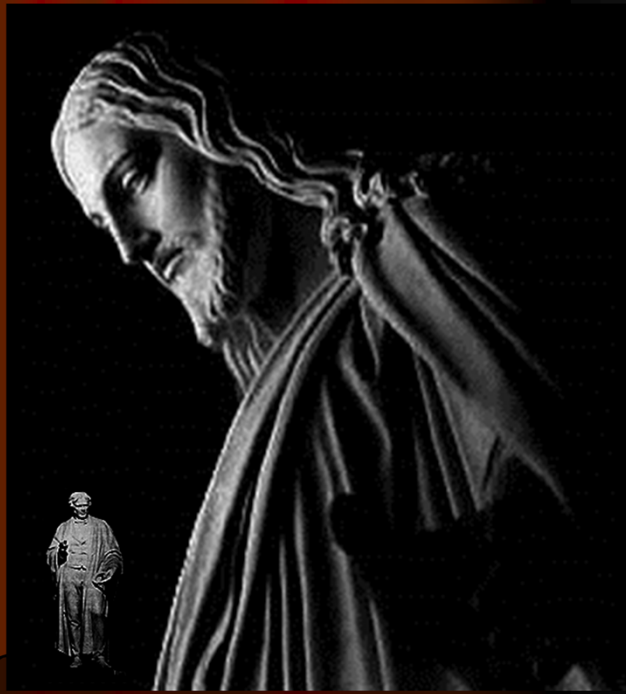
His Sandemanian denomination was an offshoot of the Church of Scotland.

Quotes from: Walter Jerrold, *Michael Faraday, Man of Science*, p. 120. Stephen Abbott Northrop, D.D., *A Cloud of Witnesses* (Portland, OR: American Heritage Ministries, 1987; Mantle Ministries, 228 Still Ridge, Bulverde, Texas), p. 147.

Michael Faraday: Father of Electronics, Ludwig Charles, 1978, Herald Press, Scottsdale, PA.

**“Christ [is] the
power of God
and the wisdom
of God. The
Christian
religion is a
revelation and
that revelation
is the Word of
God.”**

***Michael
Faraday***



George Wilson, *Short Biographies for the People*, Vol. IV. Stephen Abbott Northrop, D.D., *A Cloud of Witnesses* (Portland, Oregon: American Heritage Ministries, 1987; Mantle Ministries, 228 Still Ridge, BuIverde, Texas), p. 147-8.

James Clerk Maxwell

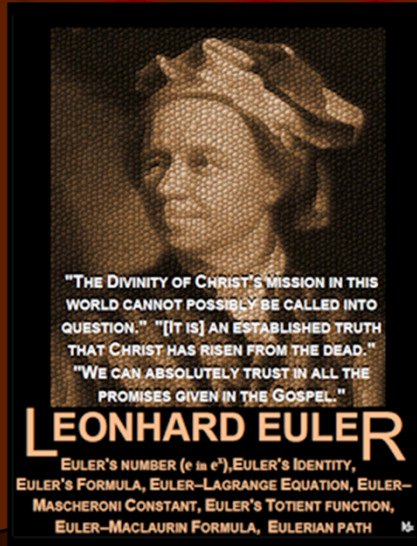
“Think what God has determined to do to all those who submit themselves to his righteousness and are willing to receive his gift [of eternal life in Jesus Christ]. They are to be conformed to the image of his Son and when that is fulfilled and God sees they are conformed to the image of Christ, there can be no more condemnation.”

James Clerk Maxwell.



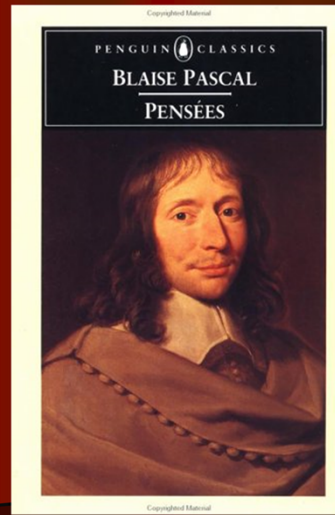
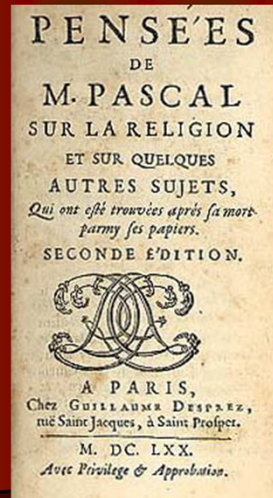
<http://www.leaderu.com/offices/schaefer/docs/scientists.html>

Leonhard Euler



1. "THE DIVINITY OF CHRIST'S MISSION IN THIS WORLD CANNOT POSSIBLY BE CALLED INTO QUESTION."
2. "[IT IS] AN ESTABLISHED TRUTH THAT CHRIST HAS RISEN FROM THE DEAD."
3. "WE CAN ABSOLUTELY TRUST IN ALL THE PROMISES GIVEN IN THE GOSPEL."

Blaise Pascal

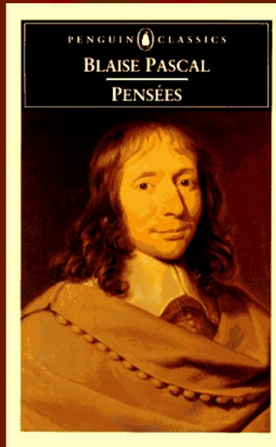


The *Pensées* (literally, "thoughts")

1670 edition Shown on left

Pascal's *Pensées* is a masterpiece, and a landmark in French literature.

Blaise Pascal



"We know God only through Jesus Christ... through Jesus Christ we know God. All who have pretended to know God, and **prove Him without Jesus Christ, have only had impotent proofs."**

"There is a God-shaped vacuum in the heart of every man, which only God can fill through His Son Jesus Christ."

PASCAL's Wager

"How can anyone lose who chooses to become a Christian? If, when he dies, there turns out to be no God and his faith was in vain, he has lost nothing - in fact, he has been happier in life than his nonbelieving friends. If, however, there is a God and a heaven and hell, then he has gained heaven and his skeptical friends will have lost everything in hell!"



Pascal's Wager

“How can anyone lose who chooses to become a Christian? If, when he dies, there turns out to be no God and his faith was in vain, he has lost nothing - in fact, he has been happier in life than his nonbelieving friends. If, however, there is a God and a heaven and hell, then he has gained heaven and his skeptical friends will have lost everything in hell!”

Henry H. Morris, *Men of Science-Men of God* (El Cajon, CA: Master Books, A Division of Creation Life Publishers, Inc., 1988), pp. 15-16.

Pascal's Wager: A Venn Diagram

	You Believe!	You Don't Believe.
No God	<p>At least you led a good life!</p> 	<p>Life with limited purpose</p> 
God Exists	<p>Eternity With God!</p> 	<p>Eternity Without God</p> 



On November 23, 1654, Blaise Pascal's horses bolted and plunged off a bridge. Pascal was thrown into the roadway. He saw this as a warning directly from God.

That night he experienced a Christian conversion. When light flooded his room, Pascal accounts how he recognized Jesus, the Word. For the rest of his life Pascal carried around a piece of parchment sewn into his coat--a parchment inscribed with documentation of his conversion. Here are some of the contents.

Pascal's Conversion *(cont)*

"Jesus Christ

I have separated myself from Him:

**I have fled from Him,
denied Him,
crucified Him.**

Let me never be separated from Him.

**We keep hold of Him only by the ways taught in the
Gospel.**

Renunciation, total and sweet.

Total submission to Jesus Christ and to my director.

Eternally in joy for a day's training on earth.

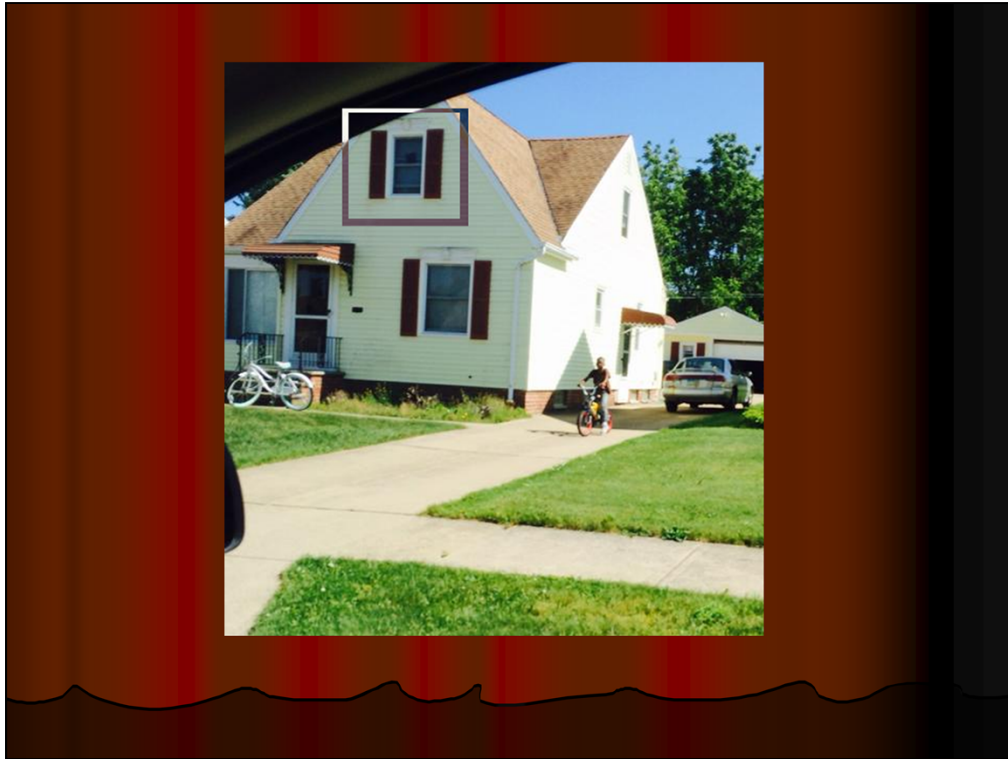
"I will not forget thy words." (Ps 119:16) Amen.

Pascal's Prayer

Almighty God, who gave your servant Blaise Pascal a great Intellect, that he might explore the mysteries of your creation, and who kindled in his heart a love for you and a devotion to your service: Mercifully give us your servants, according to our various callings, gifts of excellence in body, mind, and will, and the grace to use them diligently and to your glory, through Jesus Christ our Lord, who lives and reigns with you and the Holy Spirit, one God, now and for ever."

PRAYER (traditional language): Almighty God, who didst grant to thy servant Blaise Pascal a Great intellect, that he might explore the mysteries of thy creation, and didst kindle in his heart a love for thee and a devotion to thy service: Mercifully grant to us thy servants, according to our several callings, gifts of excellence in body, mind, and will, and the grace to use them diligently and to thy glory, through Jesus Christ our Lord, who liveth and reigneth with thee and the Holy Spirit, one God, now and for ever.

(translation by Emile Caillet and John C. Blankenagel, *Great Shorter Works of Pascal*, Philadelphia, Westminster Press, 1948). See <http://justus.anglican.org/resources/bio/233.html>



In the summer of 1970, I gave my life to Christ in the upstairs bedroom of my home in Garfield Hts. Ohio.

With clarity, I realized my fallen nature. I knew that a righteous judge would not judge me on my good deeds, only my crimes. And Christ, through his crucifixion and resurrection, would pay the penalty for my crimes if I asked. So I did, and promised I would follow him that day forward.

And that defines a Christian.

What about today?

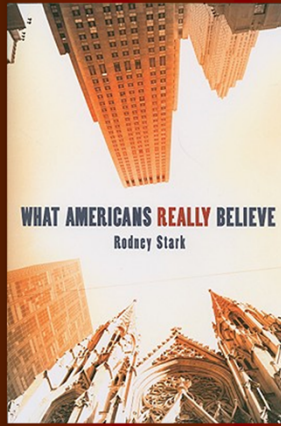
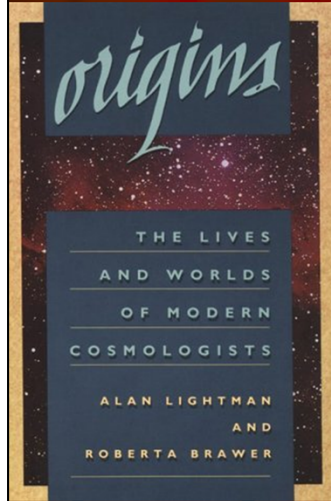


TABLE 6	
Percent of Americans Who Belong to a Local Congregation	
1776	17%
1850	34%
1860	37%
1870	35%
1890	45%
1906	51%
1916	53%
1926	56%
1962	59%
1980	62%
1990	64%
2005*	69%

* From the Baylor survey¹⁷

2008

What About Today ?



“...contrary to popular myth, scientists appear to have the same range of attitudes about religious matters as does the general public.” Alan Lightman



<http://www.leaderu.com/offices/schaefer/docs/scientists.html>

Lightman is an MIT prof publishing in Harvard Press

Richard Bube

chairman of the department of materials science at Stanford said:

“There are proportionately as many atheistic truck drivers as there are atheistic scientists.”

References

(MIT) in *Origins* 1992 published by Harvard.

“References to God continued in the scientific literature until the middle to late 1800's. It seems likely that the lack of religious references after this time seem more from a change in social and professional conventions among scientists rather than from any change in

underlying thought. **Indeed, contrary to popular myth, scientists appear to have the same range of attitudes about religious matters as does the general public.” Alan Lightman**

John Polkinghorne



Science reveals an "intelligence beyond the universe"

Rev. Dr John Polkinghorne,

Knighted in 1997. Sir Rev. Dr John Polkinghorne, (technically incorrect to call him "Sir John Polkinghorne".)

Studied with Abdus Salam in Paul Dirac's group (both Nobel Prize Winners)

Professor of Mathematical physics at Cambridge from 1968 to 1979

Princeton, Berkeley, Stanford, and at CERN in Geneva

High-energy properties of Feynman integrals and the foundations of S-Matrix theory.

Polkinghorne resigned his chair to study for the priesthood, becoming an ordained Anglican priest in 1982.

He served as the president of Queens' College, Cambridge from 1988 until 1996.

Numerous books on faith and science.

Religion and science are complementary more today than ever

(No two spheres!)

Evidence from creation. Pasteur's quote comes to mind. Romans 1:20 also

Can Atheism be Debated?

Recall Peter Atkins



Remember Atkins' unchallenged claims from the beginning of the talk?
Here they are again.

Peter Atkins with William Lane Craig

Atheists can buckle when confronted. Here is the transcript of this clip. The host is William F. Buckley who you will hear at the end say “So put that in your pipe and smoke it.”

Atkins: Do you deny that science cannot account for everything?"

Craig: Yes I do deny that science...

Atkins: So what can't it account for?

Craig: Well, had you brought that up in the debate, I had a number of samples that I was going to give. I think there are a great number of things that can't be scientifically proven but are all rational to accept.

Atkins: Such as?

Craig: Let me list five.

1. Logical and mathematical proofs cannot be proven by science. Science presupposes logic and math so that proving them by science would be arguing in a circle.
2. Metaphysical truth, like there are other minds other than my own or that the external world is real or that the past was not created five minutes ago with an appearance of age are rational beliefs that cannot be scientifically proven.
3. Ethical beliefs about statements of value are not accessible by the scientific method. You can't show by science whether the Nazi scientists in the camps did anything evil opposed to the scientists in western democracies.
4. Aesthetic judgements (number four) cannot be judged by the scientific method because the beautiful, like the good, cannot be scientifically proven.
5. And finally, and most remarkably, would be science itself. Science cannot be justified by the scientific method. Science is permeated by unprovable examples. For example, in the special theory of relativity, the whole theory hinges on the assumption that the speed of light is constant in a one way direction between any two points A and B. But that strictly cannot be proven, but we need to assume that in order to hold to the theory.

Atkins: But you're missing the whole point.

Buckley: So put that in your pipe and smoke it.

Atkins: Yeah. All right. OK.

Craig: So none of these beliefs can be scientifically proven yet they are accepted by all of us.

(The numbering of the points was added)

John Lennox



Christ is "the only solution that makes sense"

John Lennox is Professor of Mathematics at Oxford. He is a Fellow in Mathematics and Philosophy of Science at Green Templeton College, Oxford University.

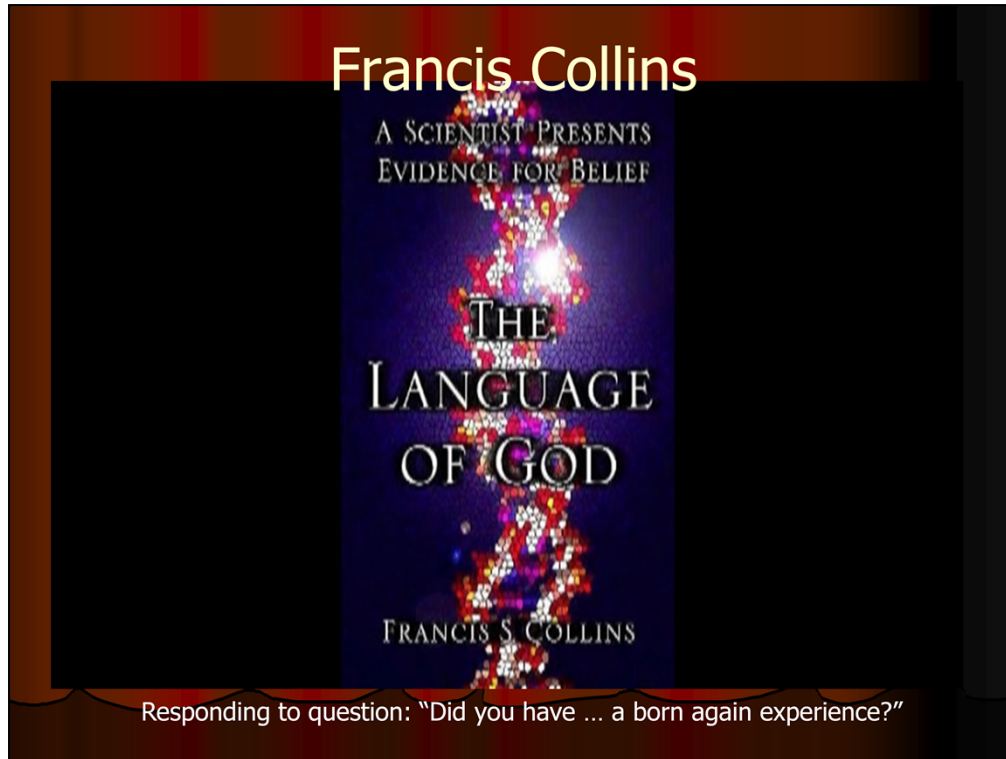
He attended the last lectures of C. S. Lewis

He debated Dawkins & Hitchens. His debate with Dawkins on youtube is great: A Christian confronting the claims of a new atheist.

Lennox asks: "Why do you believe in consciousness & energy even though you don't understand what they are?"

Christianity has explanatory power - contrary to Atkins's claim.

Conclusion: "Christ is the only solution that makes sense."



Dr. Francis S. Collins is noted for his discoveries of disease genes and for heading the Human Genome Project (HGP) which, for the first time, mapped human DNA.

Collins wrote the New York Times bestseller, *The Language of God: A Scientist Presents Evidence for Belief*, which discusses Collins' conversion from atheism to Christianity, and evaluates the evidence for Christianity.

A Founder of BioLogos

He currently serves as Director of the National Institutes of Health.

John Sanford




"We are dying because of the fall. Our only hope is Christ"

Dr. Sanford is a plant geneticist. He is prolific inventor with more than 32 issued patents. At Cornell Sanford and colleagues developed the "Biolistic Particle Delivery System" or so-called "gene gun".

Until 1998, he was a professor of Horticultural Sciences at Cornell University. In 1998 he retired on the proceeds from the sale of his biotech companies, and continued at Cornell as a courtesy associate professor.

Author of "Genetic Entropy & The Mystery Of The Genome"

Takeaways...



- Science and faith are not mutually exclusive. One illuminates the other.
- The battle is ideological – not scientific
- There is nothing new under the sun
- Faith in Christ is not correlated with intellect.
- Science apologetics run deep.

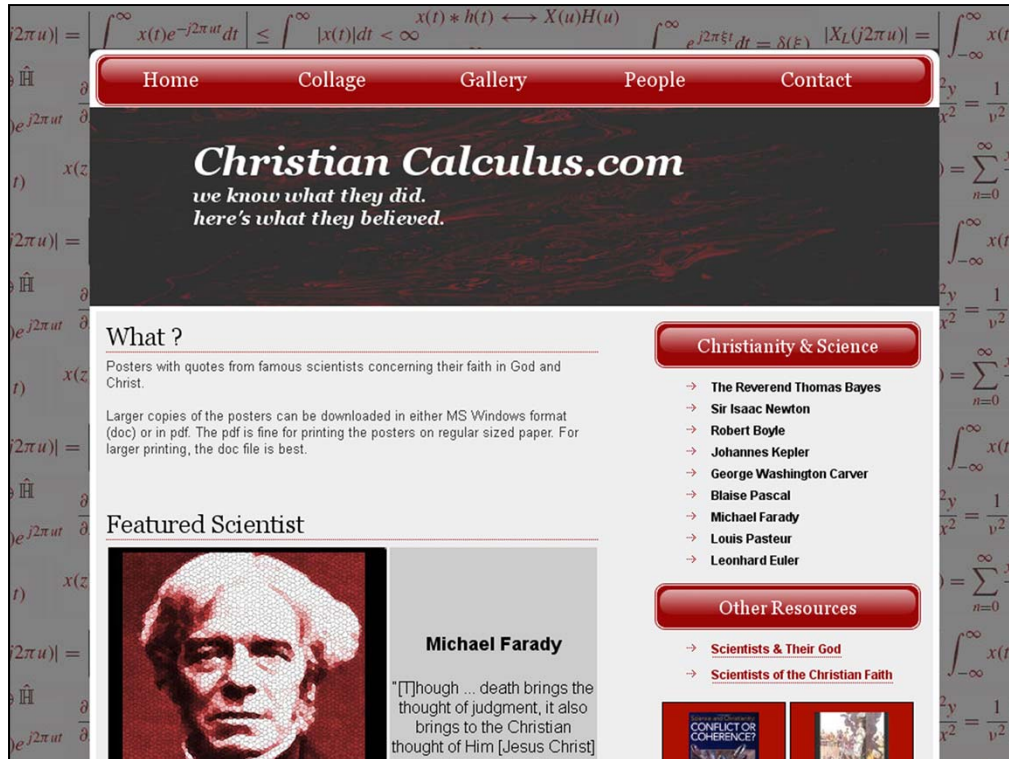
What is the appeal of Christ?

Science and faith are not mutually exclusive. One illuminates the other.

The battle is ideological – not scientific. “Science is the only truth” and similar statements are not scientific (they cannot be proven by science.)

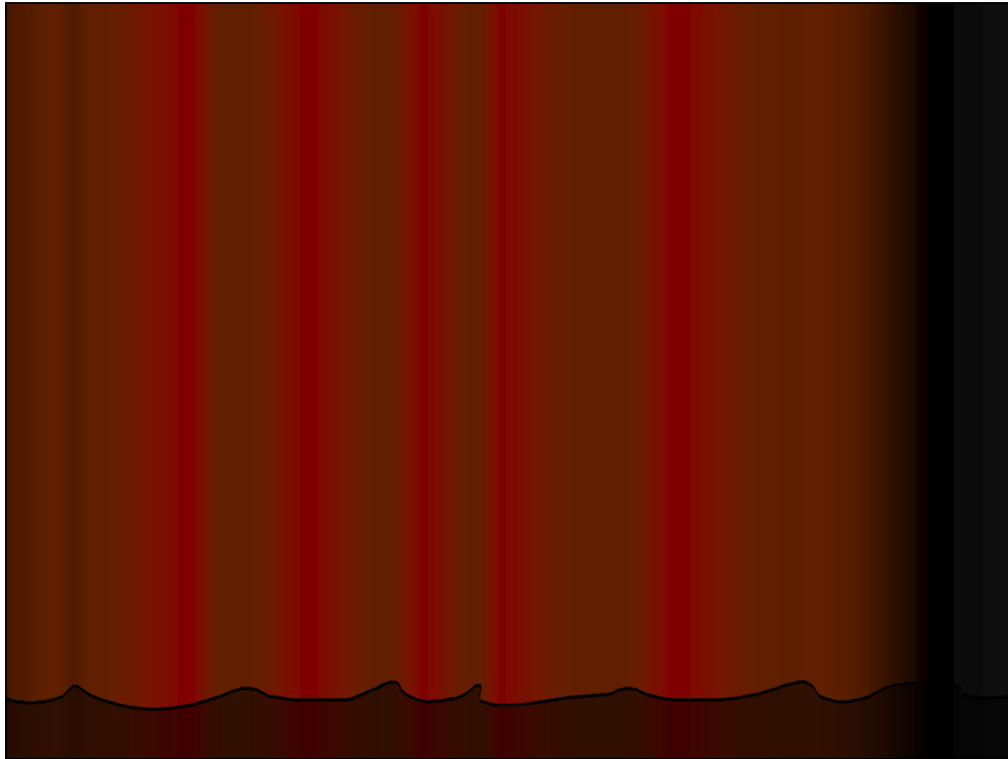
There is nothing new under the sun: Atheists have been dissing Christianity throughout history.

Faith in Christ is not correlated with intellect: A genius with a 200 IQ can embrace the Gospel. So can a child with Down Syndrome. Science apologetics run deep: One can merely swim on the surface, or one can dive deep.



For more information, go to

ChristianCalculus.com



The more thoroughly I conduct scientific research, the more I believe that science excludes atheism.

[Lord Kelvin](#) Read more at

http://www.brainyquote.com/quotes/authors/l/lord_kelvin.html#x2S6ZvLZorvPTEH8.99

The atheistic idea is so nonsensical that I cannot put it into words.

[Lord Kelvin](#) Read more at

http://www.brainyquote.com/quotes/authors/l/lord_kelvin.html#x2S6ZvLZorvPTEH8.99

<http://www.leaderu.com/offices/schaefer/docs/scientists.html>

J. J. Thomson made this statement in *Nature*,


In the distance tower still higher [scientific] peaks which will yield to those who ascend them still wider prospects and deepen the feeling whose truth is emphasized by every advance in science, that great are the works of the Lord.

John Suppe

Member of the U.S. Academy of Sciences and noted professor of geology at Princeton, expert in the area of tectonics, began a long search for God as a Christian faculty member. He began attending services in the Princeton Chapel, reading the Bible and other Christian books. He committed Himself to Christ and had his first real experience of Christian fellowship in Taiwan, where he is on a fellowship. He states:

Some non-scientist Christians, when they meet a Christian, will call on to debate evolution. That is definitely the wrong thing to do. If you know what problems scientists have in their lives—pride, selfish ambition, jealousy—that's exactly the kind of thing Jesus Christ said that He came to resolve by His death on the cross. Science is full of people with very strong egos who get into conflict with each other. The gospel is the same for scientists as it is for anyone. Evolution is basically a red herring; if scientists are looking for meaning in their lives, it won't be found in evolution. I have never met a non-Christian who brought up evolution with me.


- Extra Slides



"THERE IS A GOD-SHAPED VACUUM IN THE HEART OF EVERY MAN, WHICH ONLY GOD CAN FILL THROUGH HIS SON JESUS CHRIST."

BLAISE PASCAL


METRIC UNIT FOR PRESSURE PASCAL'S WAGER
INVENTOR OF PASCALINE COMPUTER
PASCAL'S NEGATIVE BINOMIAL DISTRIBUTION
PASCAL'S TRIANGLE



"GOD ALWAYS DOES THAT WHICH IS RIGHT AND FIT, AND THUS ALL UNUSUAL ATTRIBUTES, (NAMELY) JUSTICE, TRUTH, FAITHFULNESS, MERCY, PATIENCE, [ETC.] ARE BUT SO MANY DIFFERENT MODIFICATIONS OF RECTITUDE."

THE REVEREND **THOMAS BAYES**

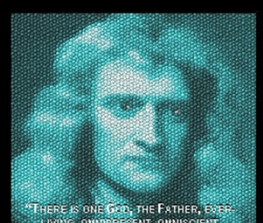
BAYES THEOREM
BAYESIAN INFERENCE BAYESIAN STATISTICS



"JESUS, NO ONE WHO WAS BORN A MAN, MUST BECOME AN ETERNAL CHILD. IF YOU MUST LET NO BUSINESS NO PAIN, NO SWEETNESS KEEP YOU FROM YOUR DUTY."

GEORGE WASHINGTON CARVER

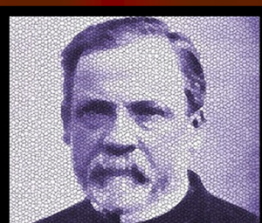
AMERICAN BOTANIST & INVENTOR OF OVER 300 AGRICULTURAL PRODUCTS



"THERE IS ONE GOD, THE FATHER, EVER-LIVING, OMNIPRESENT, OMNISCIENT, ALMIGHTY, THE MAKER OF HEAVEN AND EARTH, AND ONE MEDIATOR BETWEEN GOD AND MAN, THE MAN CHRIST JESUS."

SIR ISAAC NEWTON

NEWTON'S LAWS OF MOTION THE CALCULUS
METRIC UNIT FOR FORCE NEWTONIAN PHYSICS
NEWTONIAN TELESCOPE UNIVERSAL GRAVITATION
NEWTON'S RINGS NEWTON-RAPHSON METHOD



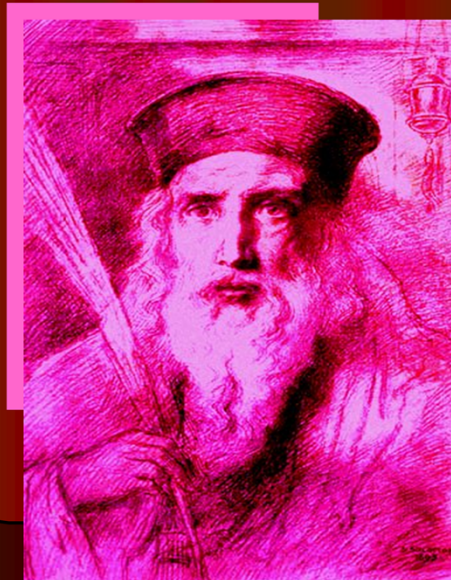
"THE MORE I STUDY NATURE, THE MORE I STAND AMAZED AT THE WORK OF THE CREATOR. INTO HIS TINIEST CREATURES, GOD HAS PLACED EXTRAORDINARY PROPERTIES ..."

LOUIS PASTEUR

PASTEURIZATION IMMUNOLOGY
CONFIRMED THE GERM THEORY OF DISEASE

More Info:
ChristianCalculus.org

Solomon's Sage Advice for Scholars...



OPEN RESEARCH!

"There is no such thing as consensus science. If it's consensus, it isn't science. If it's science, it isn't consensus. Period." A lecture by Michael Crichton at California Institute of Technology (2003) [[Link](#)]

Ecclesiastes 12

11 The words of the wise are like goads, their collected sayings like firmly embedded nails-given by one Shepherd.

12 Be warned, my son, of anything in addition to them.

12b. Of making many books there is no end, and much study wearies the body.

13. Now all has been heard; here is the conclusion of the matter: Fear God and keep his commandments, for this is the whole [duty] of man.