THE ELOGIUM OF SIR ISAAC NEWTON pdf

1: A Brief Survey of Sir Isaac Newton's Views on Religion | Religious Studies Center

The Elogium of Sir Isaac Newton: By Monsieur Fontenelle, by Bernard Le Bovier De Fontenelle starting at $ The Elogium of Sir Isaac Newton: By Monsieur Fontenelle, has 4 available editions to buy at Alibris.

Hatch - University of Florida Newton, Sir Isaac , English natural philosopher, generally regarded as the most original and influential theorist in the history of science. In addition to his invention of the infinitesimal calculus and a new theory of light and color, Newton transformed the structure of physical science with his three laws of motion and the law of universal gravitation. Three centuries later the resulting structure - classical mechanics - continues to be a useful but no less elegant monument to his genius. Here Newton entered a new world, one he could eventually call his own. Although Cambridge was an outstanding center of learning, the spirit of the scientific revolution had yet to penetrate its ancient and somewhat ossified curriculum. And by all appearances his academic performance was undistinguished. Since the university was closed for the next two years because of plague, Newton returned to Woolsthorpe in midyear. There, in the following 18 months, he made a series of original contributions to science. In April , Newton returned to Cambridge and, against stiff odds, was elected a minor fellow at Trinity. Success followed good fortune. In the next year he became a senior fellow upon taking his master of arts degree, and in , before he had reached his 27th birthday, he succeeded Isaac Barrow as Lucasian Professor of Mathematics. The duties of this appointment offered Newton the opportunity to organize the results of his earlier optical researches, and in , shortly after his election to the Royal Society, he communicated his first public paper, a brilliant but no less controversial study on the nature of color. After an initial skirmish, he quietly retreated. Nonetheless, in Newton ventured another yet another paper, which again drew lightning, this time charged with claims that he had plagiarized from Hooke. The charges were entirely ungrounded. Twice burned, Newton withdrew. In , Newton suffered a serious emotional breakdown, and in the following year his mother died. These studies, once an embarrassment to Newton scholars, were not misguided musings but rigorous investigations into the hidden forces of nature. While the mechanical philosophy reduced all phenomena to the impact of matter in motion, the alchemical tradition upheld the possibility of attraction and repulsion at the particulate level. By combining action-at-a-distance and mathematics, Newton transformed the mechanical philosophy by adding a mysterious but no less measurable quantity, gravitational force. Ironically, Robert Hooke helped give it life. In November , Hooke initiated an exchange of letters that bore on the question of planetary motion. Sometime in early , Newton appears to have quietly drawn his own conclusions. Meanwhile, in the coffeehouses of London, Hooke, Edmund Halley, and Christopher Wren struggled unsuccessfully with the problem of planetary motion. Finally, in August , Halley paid a legendary visit to Newton in Cambridge, hoping for an answer to his riddle: What type of curve does a planet describe in its orbit around the sun, assuming an inverse square law of attraction? Although Newton had privately answered one of the riddles of the universe--and he alone possessed the mathematical ability to do so--he had characteristically misplaced the calculation. After further discussion he promised to send Halley a fresh calculation forthwith. In partial fulfillment of his promise Newton produced his De Motu of From that seed, after nearly two years of intense labor, the Philosophiae Naturalis Principia Mathematica appeared. Arguably, it is the most important book published in the history of science. Although the Principia was well received, its future was cast in doubt before it appeared. But to no effect. After publishing the Principia, Newton became more involved in public affairs. In he was elected to represent Cambridge in Parliament, and during his stay in London he became acquainted with John Locke, the famous philosopher, and Nicolas Fatio de Duillier, a brilliant young mathematician who became an intimate friend. In , however, Newton suffered a severe nervous disorder, not unlike his breakdown of The cause is open to interpretation: Each factor may have played a role. During his London years Newton enjoyed power and worldly success. His position at the Mint assured a comfortable social and economic status, and he was an active and able administrator. After the death of Hooke in , Newton was elected president of the Royal Society and was annually reelected until his death. In he published his second major work, the Opticks, based largely on work completed decades before. He was knighted in Although his creative years had passed, Newton continued to exercise a profound influence on the development of science. His tenure as president has been described as tyrannical and autocratic, and his control over the lives and careers of younger disciples was all but absolute. Newton could not abide contradiction or controversy - his quarrels with Hooke provide singular examples. But in later disputes, as president of the Royal Society, Newton marshaled all the forces at his command. But between and his return to Cambridge after the plague, Newton made fundamental contributions to analytic geometry, algebra, and calculus. In essence, fluxions were the first words in a new language of physics. Although his predecessors had anticipated various elements of the calculus, Newton generalized and integrated these insights while developing new and more rigorous methods. The essential elements of his thought were presented in three tracts, the first appearing in a privately circulated treatise, De analysi On Analysis ,which went unpublished until In , Newton developed a more complete account of his method of infinitesimals, which appeared nine years after his death as Methodus fluxionum et serierum infinitarum The Method of Fluxions and Infinite Series, In addition to these works, Newton wrote four smaller tracts, two of which were appended to his Opticks of The result of this temporal discrepancy was a bitter dispute that raged for nearly two decades. The ordeal began with rumors that Leibniz had borrowed ideas from Newton and rushed them into print. It ended with charges of dishonesty and outright plagiarism. The Newton-Leibniz priority dispute--which eventually extended into philosophical areas concerning the nature of God and the universe--ultimately turned on the ambiguity of priority. It is now generally agreed that Newton and Leibniz each developed the calculus independently, and hence they are considered co-discoverers. But while Newton was the first to conceive and develop his method of fluxions, Leibniz was the first to publish his independent results. Shortly after his election to the Royal Society in , Newton published his first paper in the Philosophical Transactions of the Royal Society. This paper, and others that followed, drew on his undergraduate researches as well as his Lucasian lectures at Cambridge. In , Newton performed a number of experiments on the composition of light. Through a brilliant series of experiments, Newton demonstrated that prisms separate rather than modify white light. Contrary to the theories of Aristotle and other ancients, Newton held that white light is secondary and heterogeneous, while the separate colors are primary and homogeneous. Briefly, in a dark room Newton allowed a narrow beam of sunlight to pass from a small hole in a window shutter through a prism, thus breaking the white light into an oblong spectrum on a board. Then, through a small aperture in the board, Newton selected a given color for example, red to pass through yet another aperture to a second prism, through which it was refracted onto a second board. What began as ordinary white light was thus dispersed through two prisms. The selected beam remained the same color, and its angle of refraction was constant throughout. A subtle blend of mathematical reasoning and careful observation, the Opticks became the model for experimental physics in the 18th century. But the Opticks contained more than experimental results. In effect, since light unlike sound travels in straight lines and casts a sharp shadow, Newton suggested that light was composed of discrete particles moving in straight lines in the manner of inertial bodies. Further, since experiment had shown that the properties of the separate colors of light were constant and unchanging, so too, Newton reasoned, was the stuff of light itself--particles. At various points in his career Newton in effect combined the particle and wave theories of light. In his earliest dispute with Hooke and again in his Opticks of , Newton considered the possibility of an ethereal substance--an all-pervasive elastic material more subtle than air--that would provide a medium for the propagation of waves or vibrations. From the outset Newton rejected the basic wave models of Hooke and Huygens, perhaps because they overlooked the subtlety of periodicity. If dark rings occurred at thicknesses of 0, 2, 4, Following the first edition, Latin versions appeared in and , and second and third English editions in and Here he posed questions and ventured opinions on the nature of light, matter, and the forces of nature. For the same reasons, he also assumed a circular orbit and an inverse square relation. The next step was to test the inverse square relation against empirical data. The problem was to obtain accurate data. In November , nearly 15 years after the moon test, Hooke wrote Newton concerning a hypothesis presented in his Attempt to Prove the Motion of the Earth As a result of this exchange Newton rejected his earlier notion of centrifugal tendencies in favor of central attraction. When Halley visited Cambridge in , Newton had already demonstrated the relation between an inverse square attraction and elliptical orbits. Halley personally financed the Principia and saw it through the press to publication in July No discussion of Newton would be complete without them: Following these axioms, Newton proceeds step by step with propositions, theorems, and problems. In Book II of the Principia, Newton treats the Motion of bodies through resisting mediums as well as the motion of fluids themselves. The purpose of Book II then becomes clear. G is a constant whose value depends on the units used for mass and distance. To demonstrate the power of his theory, Newton used gravitational attraction to explain the motion of the planets and their moons, the precession of equinoxes, the action of the tides, and the motion of comets. It became the physical and intellectual foundation of the modern world view. Throughout his career Newton conducted research in theology and history with the same passion that he pursued alchemy and science. Although these writings say little about Newtonian science, they tell us a good deal about Isaac Newton. Although Newton was dutifully raised in the Protestant tradition his mature views on theology were neither Protestant, traditional, nor orthodox. In the privacy of his thoughts and writings, Newton rejected a host of doctrines he considered mystical, irrational, or superstitious. In a word, he was a Unitarian. His passion was to unite knowledge and belief, to reconcile the Book of Nature with the Book of Scripture. But for all the elegance of his thought and the boldness of his quest, the riddle of Isaac Newton remained.

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He had left the world a plenum, and he now finds it a vacuum. At Paris the universe is seen composed of vortices of subtile matter; but nothing like it is seen in London. In France, it is the pressure of the moon that causes the tides; but in England it is the sea that gravitates towards the moon; so that when you think that the moon should make it flood with us, those gentlemen fancy it should be ebb, which very unluckily cannot be proved. For to be able to do this, it is necessary the moon and the tides should have been inquired into at the very instant of the creation. You will observe farther, that the sun, which in France is said to have nothing to do in the affair, comes in here for very near a quarter of its assistance. According to your Cartesians, everything is performed by an impulsion, of which we have very little notion; and according to Sir Isaac Newton, it is by an attraction, the cause of which is as much unknown to us. At Paris you imagine that the earth is shaped like a melon, or of an oblique figure; at London it has an oblate one. A Cartesian declares that light exists in the air; but a Newtonian asserts that it comes from the sun in six minutes and a half. The several operations of your chemistry are performed by acids, alkalies and subtile matter; but attraction prevails even in chemistry among the English. The very essence of things is totally changed. You neither are agreed upon the definition of the soul, nor on that of matter. Descartes, as I observed in my last, maintains that the soul is the same thing with thought, and Mr. Locke has given a pretty good proof of the contrary. Descartes asserts farther, that extension alone constitutes matter, but Sir Isaac adds solidity to it. How furiously contradictory are these opinions! His countrymen honoured him in his lifetime, and interred him as though he had been a king who had made his people happy. The English read with the highest satisfaction, and translated into their tongue, the Elogium of Sir Isaac Newton, which M. But when it was found that this gentleman had compared Descartes to Sir Isaac, the whole Royal Society in London rose up in arms. So far from acquiescing with M. And even several who, however, were not the ablest philosophers in that body were offended at the comparison, and for no other reason but because Descartes was a Frenchman. It must be confessed that these two great men differed very much in conduct, in fortune, and in philosophy. Nature had indulged Descartes with a shining and strong imagination, whence he became a very singular person both in private life and in his manner of reasoning. This imagination could not conceal itself even in his philosophical works, which are everywhere adorned with very shining, ingenious metaphors and figures. Nature had almost made him a poet; and indeed he wrote a piece of poetry for the entertainment of Christina, Queen of Sweden, which however was suppressed in honour to his memory. He embraced a military life for some time, and afterwards becoming a complete philosopher, he did not think the passion of love derogatory to his character. He had by his mistress a daughter called Froncine, who died young, and was very much regretted by him. Thus the experienced every passion incident to mankind. He was a long time of opinion that it would be necessary for him to fly from the society of his fellow creatures, and especially from his native country, in order to enjoy the happiness of cultivating his philosophical studies in full liberty. Descartes was very right, for his contemporaries were not knowing enough to improve had enlighten his understanding, and were capable of little else than of giving him uneasiness. He left France purely to go in search of truth, which was then persecuted by the wretched philosophy of the schools. However, he found that reason was as much disguised and depraved in the universities of Holland, into which he withdrew, as in his own country. For at the time that the French condemned the only propositions of his philosophy which were true, he was persecuted by the pretended philosophers of Holland, who understood him no better; and who, having a nearer view of his glory, hated his person the more, so that he was obliged to leave Utrecht. Descartes was injuriously accused of being an atheist, the last refuge of religious scandal: Such a persecution from all sides, must necessarily suppose a most exalted merit as well as a very distinguished reputation, and indeed he possessed both. Reason at that time darted a ray upon the world through the gloom of the schools, and the prejudices of popular superstition.

At last his name spread so universally, that the French were desirous of bringing him back into his native country by rewards, and accordingly offered him an annual pension of a thousand crowns. Upon these hopes Descartes returned to France; paid the fees of his patent, which was sold at that time, but no pension was settled upon him. At last Descartes was snatched from the world in the flower of his age at Stockholm. His death was owing to a bad regimen, and he expired in the midst of some literati who were his enemies, and under the hands of a physician to whom he was odious. He lived happy, and very much honoured in his native country, to the age of fourscore and five years. It was his peculiar felicity, not only to be born in a country of liberty, but in an age when all scholastic impertinences were banished from the world. Reason alone was cultivated, and mankind could only be his pupil, not his enemy. One very singular difference in the lives of these two great men is, that Sir Isaac, during the long course of years he enjoyed, was never sensible to any passion, was not subject to the common frailties of mankind, nor ever had any commerce with women-a circumstance which was assured me by the physician and surgeon who attended him in his last moments. We may admire Sir Isaac Newton on this occasion, but then we must not censure Descartes. The opinion that generally prevails in England with regard to these new philosophers is, that the latter was a dreamer, and the former a sage. Very few people in England read Descartes, whose works indeed are now useless. On the other side, but a small number peruse those of Sir Isaac, because to do this the student must be deeply skilled in the mathematics, otherwise those works will be unintelligible to him. Sir Isaac Newton is allowed every advantage, whilst Descartes is not indulged a single one. According to some, it is to the former that we owe the discovery of a vacuum, that the air is a heavy body, and the invention of telescopes. In a word, Sir Isaac Newton is here as the Hercules of fabulous story, to whom the ignorant ascribed all the feats of ancient heroes. In a critique that was made in London on M. Descartes extended the limits of geometry as far beyond the place where he found them, as Sir Isaac did after him. The former first taught the method of expressing curves by equations. This geometry which, thanks to him for it, is now grown common, was so abstruse in his time, that not so much as one professor would undertake to explain it; and Schotten in Holland, and Format in France, were the only men who understood it. He applied this geometrical and inventive genius to dioptrics, which, when treated of by him, became a new art. And if he was mistaken in some things, the reason of that is, a man who discovers a new tract of land cannot at once know all the properties of the soil. Those who come after him, and make these lands fruitful, are at least obliged to him for the discovery. Geometry was a guide he himself had in some measure fashioned, which would have conducted him safely through the several paths of natural philosophy. Nevertheless, he at last abandoned this guide, and gave entirely into the humour of forming hypotheses; and then philosophy was no more than an ingenious romance, fit only to amuse the ignorant. He was mistaken in the nature of the soul, in the proofs of the existence of a God, in matter, in the laws of motion, and in the nature of light. He admitted innate ideas, he invented new elements, he created a world; he made man according to his own fancy; and it is justly said, that the man of Descartes is, in fact, that of Descartes only, very different from the real one. He pushed his metaphysical errors so far, as to declare that two and two make four for no other reason by because God would have it so. However, it will not be making him too great a compliment if we affirm that he was valuable even in his mistakes. He deceived himself, but then it was at least in a methodical way. He destroyed all the absurd chimeras with which youth had been infatuated for two thousand years. He taught his contemporaries how to reason, and enabled them to employ his own weapons against himself. If Descartes did not pay in good money, he however did great service in crying down that of a base alloy. I indeed believe that very few will presume to compare his philosophy in any respect with that of Sir Isaac Newton. The former is an essay, the latter a masterpiece. But then the man who first brought us to the path of truth, was perhaps as great a genius as he who afterwards conducted us through it. Descartes gave sight to the blind. These saw the errors of antiquity and of the sciences. The path he struck out is since become boundless. In fathoming this abyss no bottom has been found. We are now to examine what discoveries Sir Isaac Newton has made in it. On Attraction The discoveries which gained Sir Isaac Newton so universal a reputation, relate to the system of the world, to light, to geometrical infinities; and, lastly, to chronology, with which he used to amuse himself after the fatigue of his severer studies. I will now acquaint you without prolixity if possible with the few things I have been able to comprehend of all these sublime ideas. With regard to the system of our world disputes were a long time maintained, on the cause that turns the planets, and keeps them in their orbits; and on those causes which make all bodies here below descend towards the surface of the earth. The system of Descartes, explained and improved since his time, seemed to give a plausible reason for all those phenomena; and this reason seemed more just, as it is simple and intelligible to all capacities. But in philosophy, a student ought to doubt of the things he fancies he understands too easily, as much as of those he does not understand. Gravity, the falling of accelerated bodies on the earth, the revolution of the planets in their orbits, their rotations round their axis, all this is mere motion. Now motion cannot perhaps be conceived any otherwise than by impulsion; therefore all those bodies must be impelled. But by what are they impelled? All space is full, it therefore is filled with a very subtile matter, since this is imperceptible to us; this matter goes from west to east, since all the planets are carried from west to east. Thus from hypothesis to hypothesis, from one appearance to another, philosophers have imagined a vast whirlpool of subtile matter, in which the planets are carried round the sun: When all this is done, it is pretended that gravity depends on this diurnal motion; for, say these, the velocity of the subtile matter that turns round our little vortex, must be seventeen times more rapid than that of the earth; or, in case its velocity is seventeen times greater than that of the earth, its centrifugal force must be vastly greater, and consequently impel all bodies towards the earth. This is the cause of gravity, according to the Cartesian system. But the theorist, before he calculated the centrifugal force and velocity of the subtile matter, should first have been certain that it existed. Sir Isaac Newton seems to have destroyed all these great and little vortices, both that which carries the planets round the sun, as well as the other which supposes every planet to turn on its own axis. First, with regard to the pretended little vortex of the earth, it is demonstrated that it must lose its motion by insensible degrees; it is demonstrated, that if the earth swims in a fluid, its density must be equal to that of the earth; and in case its density be the same, all the bodies we endeavour to move must meet with an insuperable resistance. Sir Isaac shows, that the revolution of the fluid in which Jupiter is supposed to be carried, is not the same with regard to the revolution of the fluid of the earth, as the revolution of Jupiter with respect to that of the earth. He proves that there is no such thing as a celestial matter which goes from west to east since the comets traverse those spaces, sometimes from east to west, and at other times from north to south. In fine, the better to resolve, if possible, every difficulty, he proves, and even by experiments, that it is impossible there should be a plenum; and brings back the vacuum, which Aristotle and Descartes had banished from the world. Having by these and several other arguments destroyed the Cartesian vortices, he despaired of ever being able to discover whether there is a secret principle in nature which, at the same time, is the cause of the motion of all celestial bodies, and that of gravity on the earth. But being retired in , upon account of the Plague, to a solitude near Cambridge; as he was walking one day in his garden, and saw some fruits fall from a tree, he fell into a profound meditation on that gravity, the cause of which had so long been sought, but in vain, by all the philosophers, whilst the vulgar think there is nothing mysterious in it. He said to himself, that from what height soever in our hemisphere, those bodies might descend, their fall would certainly be in the progression discovered by Galileo; and the spaces they run through would be as the square of the times. Why may not this power which causes heavy bodies to descend, and is the same without any sensible diminution at the remotest distance from the centre of the earth, or on the summits of the highest mountains, why, said Sir Isaac, may not this power extend as high as the moon? And in case its influence reaches so far, is it not very probable that this power retains it in its orbit, and determines its motion? But in case the moon obeys this principle whatever it be may we not conclude very naturally that the rest of the planets are equally subject to it?

3: Isaac Newton - Wikipedia

*The elogium of Sir Isaac Newton: by Monsieur Fontenelle, [Bernard Le Bovier de Fontenelle] on www.enganchecubano.com *FREE* shipping on qualifying offers. The 18th century was a wealth of knowledge, exploration and rapidly growing technology and expanding record-keeping made possible by advances in the printing press.*

Here are 10 facts you may not have known about Newton. He really did not like his stepfather. Newton was an avid list maker and one of his preserved lists included all of the sins he felt he had committed up until the age of 19 his age at the time. One of them included, "Threatening my father and mother Smith to burne them and the house over them. The three-year-old Isaac was sent to live with his grandmother. He was born quite premature: His mother said he could fit in a quart-sized cup upon birth. At least, not the way the legend goes. The story you probably know is that Mr. Newton was sitting under a tree contemplating life when an apple struck him on the head, simultaneously making a light bulb about gravity go off. The real story according to the man himself is that Newton was merely looking out the window when he happened to see the fruit drop. Even then, some Newton scholars think the story involving the apple was entirely made up. He was a stutterer, but it puts him in good company. Other people who habitually tripped over their tongues included Aristotle, Moses, Winston Churchill and Charles Darwin. Despite being born on January 4, he was born on Christmas Day. Worried about the supposed apocalypse in ? Newton spent a lot of time studying the subject. In fact, he believed that God had chosen him specifically to interpret the Bible â€" and concluded that the world would end no sooner than He was a genius, to be sure, but not much of a politician. In his year as a member of parliament, he spoke up only once â€" and that was to tell someone to close a window. His dog set his laboratory on fire, ruining 20 years of research. Some historians believe that Newton never even owned a dog, hypothesizing that he left a window open and a gust of wind knocked over a lit candle. Late in life, Newton suffered a nervous breakdown and became known for rather eccentric behavior. Too much mercury can drive a man mad, of course, and that may have been exactly what it did to Isaac Newton. Then again, maybe not:

4: Sir Isaac Newton Facts for Kids

Get this from a library! The Elogium of Sir Isaac Newton: By Monsieur Fontenelle, perpetual secretary of the Royal academy of sciences at Paris.. [Fontenelle, M. de].

The 17th century was a time of intense religious feeling, and nowhere was that feeling more intense than in Great Britain. Descartes had also made light central to the mechanical philosophy of nature; the reality of light, he argued, consists of motion transmitted through a material medium. Newton fully accepted the mechanical nature of light, although he chose the atomistic alternative and held that light consists of material corpuscles in motion. The corpuscular conception of light was always a speculative theory on the periphery of his optics, however. An ancient theory extending back at least to Aristotle held that a certain class of colour phenomena, such as the rainbow , arises from the modification of light, which appears white in its pristine form. Descartes had generalized this theory for all colours and translated it into mechanical imagery. Through a series of experiments performed in and , in which the spectrum of a narrow beam was projected onto the wall of a darkened chamber, Newton denied the concept of modification and replaced it with that of analysis. Basically, he denied that light is simple and homogeneousâ€”stating instead that it is complex and heterogeneous and that the phenomena of colours arise from the analysis of the heterogeneous mixture into its simple components. He held that individual rays that is, particles of given size excite sensations of individual colours when they strike the retina of the eye. He also concluded that rays refract at distinct anglesâ€”hence, the prismatic spectrum, a beam of heterogeneous rays, i. Because he believed that chromatic aberration could never be eliminated from lenses, Newton turned to reflecting telescopes ; he constructed the first ever built. The heterogeneity of light has been the foundation of physical optics since his time. There is no evidence that the theory of colours, fully described by Newton in his inaugural lectures at Cambridge, made any impression, just as there is no evidence that aspects of his mathematics and the content of the Principia, also pronounced from the podium, made any impression. Rather, the theory of colours, like his later work, was transmitted to the world through the Royal Society of London, which had been organized in When Newton was appointed Lucasian professor, his name was probably unknown in the Royal Society; in , however, they heard of his reflecting telescope and asked to see it. Pleased by their enthusiastic reception of the telescope and by his election to the society, Newton volunteered a paper on light and colours early in On the whole, the paper was also well received, although a few questions and some dissent were heard. One can understand how the critique would have annoyed a normal man. The flaming rage it provoked, with the desire publicly to humiliate Hooke, however, bespoke the abnormal. Newton was unable rationally to confront criticism. Less than a year after submitting the paper, he was so unsettled by the give and take of honest discussion that he began to cut his ties, and he withdrew into virtual isolation. In , during a visit to London, Newton thought he heard Hooke accept his theory of colours. He was emboldened to bring forth a second paper, an examination of the colour phenomena in thin films , which was identical to most of Book Two as it later appeared in the Opticks. The purpose of the paper was to explain the colours of solid bodies by showing how light can be analyzed into its components by reflection as well as refraction. His explanation of the colours of bodies has not survived, but the paper was significant in demonstrating for the first time the existence of periodic optical phenomena. In Newton combined a revision of his optical lectures with the paper of and a small amount of additional material in his Opticks. A second piece which Newton had sent with the paper of provoked new controversy. Hooke apparently claimed that Newton had stolen its content from him, and Newton boiled over again. The issue was quickly controlled, however, by an exchange of formal, excessively polite letters that fail to conceal the complete lack of warmth between the men. Although their objections were shallow, their contention that his experiments were mistaken lashed him into a fury. The correspondence dragged on until , when a final shriek of rage from Newton, apparently accompanied by a complete nervous breakdown, was followed by silence. The death of his mother the following year completed his isolation. For six years he withdrew from intellectual commerce except when others initiated a correspondence, which he always broke off as quickly as possible. Influence of the Hermetic tradition During his time of isolation, Newton was greatly influenced by the Hermetic tradition with which he had been familiar since his undergraduate days. Newton, always somewhat interested in alchemy , now immersed himself in it, copying by hand treatise after treatise and collating them to interpret their arcane imagery. Under the influence of the Hermetic tradition, his conception of nature underwent a decisive change. Until that time, Newton had been a mechanical philosopher in the standard 17th-century style, explaining natural phenomena by the motions of particles of matter. Thus, he held that the physical reality of light is a stream of tiny corpuscles diverted from its course by the presence of denser or rarer media. He felt that the apparent attraction of tiny bits of paper to a piece of glass that has been rubbed with cloth results from an ethereal effluvium that streams out of the glass and carries the bits of paper back with it. This mechanical philosophy denied the possibility of action at a distance; as with static electricity , it explained apparent attractions away by means of invisible ethereal mechanisms. About , Newton abandoned the ether and its invisible mechanisms and began to ascribe the puzzling phenomenaâ€”chemical affinities , the generation of heat in chemical reactions , surface tension in fluids, capillary action , the cohesion of bodies, and the likeâ€”to attractions and repulsions between particles of matter. More than 35 years later, in the second English edition of the Opticks, Newton accepted an ether again, although it was an ether that embodied the concept of action at a distance by positing a repulsion between its particles. Newton, however, regarded them as a modification of the mechanical philosophy that rendered it subject to exact mathematical treatment. As he conceived of them, attractions were quantitatively defined, and they offered a bridge to unite the two basic themes of 17th-century scienceâ€”the mechanical tradition, which had dealt primarily with verbal mechanical imagery, and the Pythagorean tradition, which insisted on the mathematical nature of reality. The Principia Planetary motion Newton originally applied the idea of attractions and repulsions solely to the range of terrestrial phenomena mentioned in the preceding paragraph. But late in , not long after he had embraced the concept, another application was suggested in a letter from Hooke, who was seeking to renew correspondence. Hooke mentioned his analysis of planetary motionâ€”in effect, the continuous diversion of a rectilinear motion by a central attraction. Newton bluntly refused to correspond but, nevertheless, went on to mention an experiment to demonstrate the rotation of Earth: He sketched the path of fall as part of a spiral ending at the centre of Earth. He was mistaken in the charge. Moreover, unknown to him, Newton had so derived the relation more than 10 years earlier. Nevertheless, Newton later confessed that the correspondence with Hooke led him to demonstrate that an elliptical orbit entails an inverse square attraction to one focusâ€”one of the two crucial propositions on which the law of universal gravitation would ultimately rest. In and , Newton dealt only with orbital dynamics; he had not yet arrived at the concept of universal gravitation. Courtesy of the Joseph Regenstein Library, The University of Chicago Universal gravitation Nearly five years later, in August , Newton was visited by the British astronomer Edmond Halley , who was also troubled by the problem of orbital dynamics. Already Newton was at work improving and expanding it. Significantly, De Motu did not state the law of universal gravitation. For that matter, even though it was a treatise on planetary dynamics , it did not contain any of the three Newtonian laws of motion. Only when revising De Motu did Newton embrace the principle of inertia the first law and arrive at the second law of motion. The second law, the force law , proved to be a precise quantitative statement of the action of the forces between bodies that had become the central members of his system of nature. By quantifying the concept of force, the second law completed the exact quantitative mechanics that has been the paradigm of natural science ever since. The quantitative mechanics of the Principia is not to be confused with the mechanical philosophy. The latter was a philosophy of nature that attempted to explain natural phenomena by means of imagined mechanisms among invisible particles of matter. The mechanics of the Principia was an exact quantitative description of the motions of visible bodies. Newton was able to show that a similar relation holds between Earth and its Moon. The distance of the Moon is approximately 60 times the radius of Earth. Newton compared the distance by which the Moon, in its orbit of known size, is diverted from a tangential path in one second with the distance that a body at the surface of Earth falls from rest in one second. The law of universal gravitation , which he also confirmed from such further phenomena as the tides and the orbits of comets , states that every particle of matter in the universe attracts every other particle with a force that is proportional to the product of their masses and inversely proportional to the square of the distance between their centres. When the Royal Society received the completed manuscript of Book I in , Hooke raised the cry of plagiarism , a charge that cannot be sustained in any meaningful sense. Hooke would have been satisfied with a generous acknowledgment; it would have been a graceful gesture to a sick man already well into his decline, and it would have cost Newton nothing. Newton, instead, went through his manuscript and eliminated nearly every reference to Hooke. Such was his fury that he refused either to publish his Opticks or to accept the presidency of the Royal Society until Hooke was dead. International prominence The Principia immediately raised Newton to international prominence. In their continuing loyalty to the mechanical ideal, Continental scientists rejected the idea of action at a distance for a generation, but even in their rejection they could not withhold their admiration for the technical expertise revealed by the work. Young British scientists spontaneously recognized him as their model. Within a generation the limited number of salaried positions for scientists in England , such as the chairs at Oxford , Cambridge, and Gresham College, were monopolized by the young Newtonians of the next generation. Newton, whose only close contacts with women were his unfulfilled relationship with his mother, who had seemed to abandon him, and his later guardianship of a niece, found satisfaction in the role of patron to the circle of young scientists. As a consequence, he was elected to represent the university in the convention that arranged the revolutionary settlement. In this capacity, he made the acquaintance of a broader group, including the philosopher John Locke. Newton tasted the excitement of London life in the aftermath of the Principia. The great bulk of his creative work had been completed. Seek a place he did, especially through the agency of his friend, the rising politician Charles Montague, later Lord Halifax. Finally, in , he was appointed warden of the mint. Although he did not resign his Cambridge appointments until , he moved to London and henceforth centred his life there. Fatio was taken seriously ill; then family and financial problems threatened to call him home to Switzerland. In he suggested that Fatio move to Cambridge, where Newton would support him, but nothing came of the proposal. Four months later, without prior notice, Samuel Pepys and John Locke, both personal friends of Newton, received wild, accusatory letters. Pepys was informed that Newton would see him no more; Locke was charged with trying to entangle him with women. The crisis passed, and Newton recovered his stability. Only briefly did he ever return to sustained scientific work, however, and the move to London was the effective conclusion of his creative activity. Added to his personal estate, the income left him a rich man at his death. The position, regarded as a sinecure, was treated otherwise by Newton. During the great recoinage, there was need for him to be actively in command; even afterward, however, he chose to exercise himself in the office. Above all, he was interested in counterfeiting. He became the terror of London counterfeiters, sending a goodly number to the gallows and finding in them a socially acceptable target on which to vent the rage that continued to well up within him. Interest in religion and theology Newton found time now to explore other interests, such as religion and theology. In the early s he had sent Locke a copy of a manuscript attempting to prove that Trinitarian passages in the Bible were latter-day corruptions of the original text. When Locke made moves to publish it, Newton withdrew in fear that his anti-Trinitarian views would become known. In his later years, he devoted much time to the interpretation of the prophecies of Daniel and St. John , and to a closely related study of ancient chronology.

THE ELOGIUM OF SIR ISAAC NEWTON pdf

5: Week 6 Readings

Dick, Dom and Fran from 'Absolute Genius' describe the life and scientific work of Sir Isaac Newton. He was born in at a time when the laws of nature were a mystery.

In magnis, voluisse sat est. The scituation I was then in, gave me no further opportunity of inquiry, than what I have here done. Such is chiefly the present work. But in that especially of so great a man, every reader burns with a desire of knowing somewhat of the primordia, the preparation and presages of his extraordinary abilitys; of the height to which he carryed; and the foundation on which he built, a new philosophy. I succeeded so far as to gather these materials in the critical time when they were only to be had. I have waited for this life to be done, as it deserves; and have not been overhasty, in printing, what was wrote 27 years ago. What I have to say on his life is divided into 3 parts. What I knew of him personally, whilst I resided in London, in the flourishing part of my life. If matters are now somewhat changed, tis owing to the natural revolutions incident to mundane affairs. I have therefore herein contributed my endevors to satisfy their eager curiosity: I drew it up for the entertainment of the members of the Royal Society; to which your Lordship is so conspicuous an ornament. What I knew of him in the earlier part of my own life. What I knew of the latter part of his life. I shall likewise add, what occurs to me of my own knowledg. I lived in country obscurity, for above 20 years after his death; which was the fit season to gather all the notices of the most flourishing part of his time. I was then student in Corpus Christi College, in what we call there junior Sophs year, being the 3d after admission. Such was then the felicity of Brittain. Brook Taylor, Mr W. I answerd, the chief room was where Sir Isaac Newton sat. Sir Isaac said they were very fine entertainments; but that "there was too much of a good thing; it was like a surfiet at dinner. I went to the last opera," says he, "The first act gave me the greatest pleasure. The second quite tired me: Others would have paid only the simple value of the glass. I had the curiosity to visit the place where Sir Isaac was born. I carryd a print of it to Sir Isaac, with which he was highly pleasd, and at the same time gave me a book of the new edition of his admirable treatise on opticks: Some persons influenced Sir Isaac against his inclination, to take to the opposite party, and I lost it by a very small majority. We did not enter into any very particular detail about it. I confirmed his sentiments by adding, that I could demonstrate as I apprehended that the architecture of Solomons temple was what we now call Doric. I had a brother there in business, who had a family. Sir Isaac expressed an approbation of my purpose: I had the satisfaction to find, that I had fallen into the same sentiments, with him, and indeed I could not but observe with surprize that he was master of every part of curious learning: Halley, astronomer Royal, at the observatory Greenwich: Mr Martin Folkes, Dr. Brook Taylor, my self, Mr. Sir Isaac had a particular esteem for him, always inquired after his health, when he knew, I had been at Grantham: This is excusable from the nature of the inquiry. His daughter was marryed to the honorable John Wallop esqr. Mr Mason, at my request, searching into some old Town chests, at length met with a few vellum leaves, being the parish register from anno to inclusive; the very year Sir Isaac was born. Thus far Sir Isaac. John Newton of Westby in Baingthorp parish, Lincolnshire, in the college of arms taken William Newton 4th son baptized at Westby 30 aug. Newton of Hather created baronet. John Newton of Westby aforesaid son and heir of John, purchased an estate at Wulsthorp in Colsterworth parish in that county; by deed dated 19 dec. Richard Newton of Wulsthorp aforesaid, inherited the said purchasd lands, as appears by a recital in a deed dated 30 dec. Robert Newton of Wulsthorp aforesaid inherited the same purchasd lands, after the death of his father as is mentiond in the aforesaid deed of 15 Carolus I. Witham Lincolnshire by whom she had several children. She dyed at Stamford in Lincolnshire, Isaac was a common name in this family. Some of them still remain at Cathorp. But they know it has been in the Newton family, ever since Queen Elizabeths time. She had three children by him. The same prelate founded Corpus Christi College in Oxford. I have an old picture of him, painted on wood, which I bought at Stamford. Henry Moor, of Christs college, Cambridg; who was born in the great old house, almost over against mine, but more southward; being the first house on the left hand, coming from London, adjoining to the road leading toward Harlaxton. Some lime trees grow before the door. I suppose either by rack-work, as they call it, or by a string winding its self round an axis. I was informed that he made another waterclock, which performed by dropping out of a cistern. Sir Isaac when a lad here at School, was not only expert at his mechanical tools, but equally so with his pen. He made a picture of king Charles I. Vincent of this town repeated them to me, by memory. A secret art my soul prepares to try, If prayers can give me, what the wars deny. Earths crown thats at my feet, I can disdain: I rather suppose, he copyed the print from the frontispiece of Eikon Basilice. Vincent is a widow gentlewoman living now at Grantham aged Storey, a physician at Buckminster, near Colsterworth. His mother lived all this while at north witham, in her husbands rectory house. Smith but not of so large a form as the old one, which was become very ruinous; that wherein Sir Isaac was born. I set out at the same time, on my journy. So the Foxgloves has not its name from fox, but folkes, popelli, meaning in old language what we now call fairies: He took him home to the school house, to board with him; and soon compleated him in the learned languages. I left that part of his history intirely to Mr Conduit: Bentley knew a good deal of it. Halley had wrote a considerable quantity of papers relating to this subject. I have heard it as a tradition, whilst I was student at Cambridg, that when Sir Isaac stood for bachelor of arts degree, he was put to second posing, or lost his groats, as they term it; which is lookd upon as disgraceful. He faild not upon all occasions, to give a just encomium of him. He would work very hard upon these. I have heard, that he had gone considerable lengths in his experiments on sounds, which doubtless he would have brought to as great perfection as his optics. She went thither on a visit to her son Benjamin Smith. Friend endevord at a thing of this sort, which is not unworthy of commendation; his purpose was some attempt to supply our want of it.

6: Religious views of Isaac Newton - Wikipedia

Sir Isaac Newton PRS FRS (25 December - 20 March /27) was an English mathematician, astronomer, theologian, author and physicist (described in his own day as a "natural philosopher") who is widely recognised as one of the most influential scientists of all time, and a key figure in the scientific revolution.

Ward Moody Provo, UT: Jones is a professor emeritus of physics, Brigham Young University. Newton was certainly one of the greatest scientists who ever lived. He laid out the three laws of motion in his extraordinary Principia Mathematica. He discovered the law of universal gravitation, the famous inverse-distance-squared law. He wrote much about light and optics after performing his own original experiments on light. He rejected the authority of the Greek philosopher Aristotle and promoted experiment-based science. But it is not commonly known that Newton was also a devout Christian who wrote extensively about Christianity. We learn from his writings that he deeply studied the Bible along with writings of early Christian leaders. Notably, Newton concluded that the dogma of a Triune god was false doctrine and therefore refused ordination in the Anglican Church, a most unpopular decision that almost cost him his position at Cambridge University. Eventually the remainder came forth when the manuscripts were auctioned off in Introductory Thought Experiment Let us consider a quick thought experiment to get us thinking along Newtonian lines. Suddenly, at point P at the bottom the string breaks. Approximately which way will the puck goâ€"path number 1, 2, 3, or 4? When I have put this question to groups of people, the answers have included 1, 2, 3, and 4, with many not being at all sure what will happen. But we do not do science by voting. We perform an experiment. And when we actually perform the experiment, we find that the moving puck follows path 2. It does not travel outward or continue in a circle. Newton generalized the results of many such experiments in his famous three Laws of Motion. An object at rest tends to stay at rest, and an object in motion tends to stay in motion with the same speed and in the same direction unless acted upon by an unbalanced force. Initially the hockey puck was constrained by the unbalanced force of the string to move in a circle. Experiments, careful observations, and measurements form the basis of the scientific method, and anyone can use it, Mormon or Muslim, Baptist or Buddhist. Repeatability is the core strength of the scientific method. During the Middle Ages, people would often answer questions by an appeal to authority. This appeal to authority was the end of the discussion for many. Newton, however, rejected this appeal to authority and instead advocated the use of experiments and careful observations to find out what is true, which is the basis of the modern scientific method. A hundred years later, Newton showed that these elliptical orbits were the result of the gravitational force of the sun that could accurately be calculated using his famous law of gravity: Every point mass attracts every other point mass by a force pointing along the line intersecting both points. The force is directly proportional to the product of the two masses and inversely proportional to the square of the distance between the point massesâ€"in equation form: We have important issues today that are of general concern for society. For example, is global warming real? Is it man-caused or the result of natural fluctuations in temperature? We can get the answer by repeated, careful experiments, observations, and measurements rather than by dogmatic or political statements. A true scientist requires analysis based on experiments and observational evidenceâ€"it is not a matter of popular opinion or what some authority figure states. Questions important to society can be addressed by the scientific method, using experiments, then published in refereed journals. It is generally considered a major step in a nascent field of science when results are finally published in established peer-reviewed venues and journals. The scientific method has served us well for about years. Newton in Historical Context The following time line places Newton in historical context with other notables. Aristotle and Plato lived about four hundred years before Christ and their impact on Western culture has been considerable. Newton was certainly heavily influenced by Jesus Christ and the early Christian writers, for he quoted them abundantly in his writings. He took exception with some of the later Christian writers, after about AD Copernicus, Tycho Brahe, Kepler, and Galileo appeared on the scene just before Newton and paved the way for his research. Isaac Newton died in He wrote Optics, a study of light. In this scientific treatise, he paused to ask: And whence arises all that order and beauty which we see in the world? Was the eye contrived without skill in optics? And the ear without knowledge of sounds? The Supreme God is a Being eternal, infinite, absolutely perfect. He is not eternity and infinity, but eternal and infinite; he is not duration or space, but he endures and is present. Awake and arouse your faculties, even to an experiment upon my words, and exercise a particle of faith. Now, we will compare the word unto a seed. Now, if ye give place that a seed may be planted in your heart, behold, if it be a true seed, or a good seed, if ye do not cast it out by your unbelief, that ye will resist the Spirit of the Lord, behold, it will begin to swell within your breasts; and when you feel these swelling motions, ye will begin to say within yourselvesâ€"It must needs be that this is a good seed, or that the word is good, for it beginneth to enlarge my soul; yea, it beginneth to enlighten my understanding, yea, it beginneth to be delicious to me. And now, behold, because ye have tried the experiment, and planted the seed, and it swelleth and sprouteth, and beginneth to grow, ye must needs know that the seed is good. Let me therefore beg of thee not to trust to the opinion of any man concerning these things, for so it is great odds but thou shalt be deceived. Much less oughtest thou to rely upon the judgment of the multitude, for so thou shalt certainly be deceived. But search the scriptures thyself and that by frequent reading and constant meditation upon what thou readest, and earnest prayer to God to enlighten thine understanding if thou desirest to find the truth. Which if thou shalt at length attain thou wilt value above all other treasures in the world by reason of the assurance and vigour it will add to thy faith, and steady satisfaction to thy mind which he only can know how to estimate who shall experience it. There were so many differing interpretations of scriptureâ€"how could one make progress in finding out the meaning intended in the Bible? And further, it is not enough that a proposition be true or in the express words of scripture: Every truth, every sentence in scripture is not a fundamental article. It must be delivered in the express words of the first teachers, and appear to have been an article taught from the beginning. He quoted frequently from them and made a distinction between doctrines taught by those who lived during or soon after the Apostles and doctrines that appeared later in history. A prime example comes from his studies of the nature of God, which he based on the scriptures combined with the teachings of the early writers of the Christian church. Newton saw two major flaws in the Christian doctrine of the Trinity: It is now generally accepted by scholars that Athanasius was not its author and that it most likely dates from the late fifth or even early sixth century ADâ€"at least one hundred years after Athanasius. Whosover will be saved, before all things it is necessary that he hold the Catholic Faith. Which Faith except everyone do keep whole and undefiled, without doubt he shall perish everlastingly. And in this Trinity none is afore or after Other, None is greater or less than Another, but the whole Three Persons are Co-eternal together, and co-equal. So that in all things, as is aforesaid, the Unity in Trinity and the Trinity in Unity is to be worshipped. He therefore that will be saved, must thus think of the Trinity. Not satisfied with this passage, Newton went back and read the text of the Vulgate as well as the original Greek. The passage is not found in any early Greek manuscript, and it is not quoted by Greek Fathers, who, if they had known it, would certainly have used it in the Trinitarian controversies of the fourth century AD. Verily, thus saith the Lord unto you my servants, concerning the parable of the wheat and the tares: Behold, verily I say, the field was the world, and the apostles were the sowers of the seed; And after they have fallen asleep the great persecutor of the church, the apostate, the whore, even Babylon, that maketh all nations to drink of her cup, in whose hearts the enemy, even Satan, sitteth to reignâ€"behold he soweth the tares; wherefore, the tares choke the wheat and drive the church into the wilderness. Now though the unity of the Church depended upon the unity of the faith and therefore the rule of faith was unalterable, yet before the end of the second century some of the Latin churches in opposition to heretics began to add new articles to it. And after they had, by adding some articles in the language of the scriptures, made precedents for creating to themselves a creed-making authority: He quoted Malachi 3 and other scriptures in his commentary that are standard scriptural passages used by Latter-day Saints in discussing the restoration: Cities of Israel shall be desolate. The worship which is due to this God we are to give to no other nor to ascribe anything absurd or contradictious to his nature or actions lest we be found to blaspheme him or to deny him or to make a step towards atheism or irreligion. For as often as mankind has swerved from them, God has made a reformation. When the sons of Adam erred and the thoughts of their heart became evil continually, God selected Noah to people a new world. And when the posterity of Noah transgressed and began to invoke dead men, God selected Abraham and his posterity. And when they transgressed in Egypt God reformed them by Moses. And when they relapsed to idolatry and immorality, God sent Prophets to reform them and punished them by the Babylonian captivity. And when they that returned from captivity, mixed human inventions with the law of Moses under the name of traditions, and laid the stress of religion not upon the acts of the mind, but upon outward acts and ceremonies, God sent Christ to reform them. And when the nation received him not, God called the Gentiles. And now the Gentiles have corrupted themselves, we may expect that God in due time will make a new reformation. And in all the reformations of religion hitherto made, the religion in respect of God and our neighbor is one and the same religion. He utilized his great genius and powers of reasoning to produce his famous scientific discoveries including his laws of motion, the law of universal gravitation, studies in optics, and the invention of calculus. But he was also a devout Christian, and he brought this same intellectual genius to bear in his analysis of Christianity, and he based his beliefs on his own studies of the Bible along with the earliest Christian writers. Based on his studies he rejected the doctrine of the Trinity and proved that it was unbiblical. He also concluded from that there had been an apostasy from the true Church of Christ, and that at some future time there would be a restoration. Notes The author acknowledges Professor Michael D. Rhodes for a careful reading of this paper and numerous useful suggestions. Addison-Wesley, , William Innys, , ; spelling and punctuation modernized. Running Press, , â€”

7: Isaac Newton Biography - Newton's Life, Career, Work - Dr Robert A. Hatch

Isaac Newton was born on January 4, , in Woolsthorpe, Lincolnshire, England. The son of a farmer, who died three months before he was born, Newton spent most of his early years with his.

He became one of the most prominent mathematicians of his time. He discovered the theory of gravity, as well as ideas about the nature of color and light. All About Sir Isaac Newton, born in Sir Isaac Newton was born in His father, a farmer, died three months before Newton was born. When he was eighteen, he went to Cambridge University where he studied mathematics, physics and astronomy. When it reopened, Newton returned. He later became a professor there. Newton had many leadership roles. He was also the president of the Royal Society. Newton was brilliant, but he was difficult to be around. He argued with other scientists and was often grumpy. Sir Isaac Newton was born prematurely. He was tiny and very weak. He was not expected to live, but he did. Sir Isaac Newton loved school, math and science as a child. When he was 12, his mother returned for him after her second husband died. She pulled him out of school to make him a farmer. He did not like farming. Finally, he went back to school. When Newton went to college, he waited tables and cleaned the rooms of wealthy students. Newton discovered the theory of gravity. Sir Isaac Newton Vocabulary Curious: A video explaining the laws of Sir Isaac Newton. Was Sir Isaac Newton married? Sir Isaac Newton never married and he had few friends. He preferred to work alone.

8: BBC Class Clips Video - Discovering the work of Sir Isaac Newton

Isaac Newton () is best known for having invented the calculus in the mid to late s (most of a decade before Leibniz did so independently, and ultimately more influentially) and for having formulated the theory of universal gravity â€" the latter in his Principia, the single most.

Early life of Isaac Newton Isaac Newton was born according to the Julian calendar , in use in England at the time on Christmas Day, 25 December NS 4 January [1] "an hour or two after midnight", [6] at Woolsthorpe Manor in Woolsthorpe-by-Colsterworth , a hamlet in the county of Lincolnshire. His father, also named Isaac Newton, had died three months before. Born prematurely , Newton was a small child; his mother Hannah Ayscough reportedly said that he could have fit inside a quart mug. Newton disliked his stepfather and maintained some enmity towards his mother for marrying him, as revealed by this entry in a list of sins committed up to the age of His mother, widowed for the second time, attempted to make him a farmer, an occupation he hated. Motivated partly by a desire for revenge against a schoolyard bully, he became the top-ranked student, [12] distinguishing himself mainly by building sundials and models of windmills. He set down in his notebook a series of " Quaestiones " about mechanical philosophy as he found it. In , he discovered the generalised binomial theorem and began to develop a mathematical theory that later became calculus. Soon after Newton had obtained his BA degree in August , the university temporarily closed as a precaution against the Great Plague. In April , he returned to Cambridge and in October was elected as a fellow of Trinity. However, by the issue could not be avoided and by then his unconventional views stood in the way. His studies had impressed the Lucasian professor Isaac Barrow , who was more anxious to develop his own religious and administrative potential he became master of Trinity two years later ; in Newton succeeded him, only one year after receiving his MA. Famous Men of Science. Most modern historians believe that Newton and Leibniz developed calculus independently, although with very different notations. Occasionally it has been suggested that Newton published almost nothing about it until , and did not give a full account until , while Leibniz began publishing a full account of his methods in His work extensively uses calculus in geometric form based on limiting values of the ratios of vanishingly small quantities: Starting in , other members of the Royal Society accused Leibniz of plagiarism. During that time, any Fellow of a college at Cambridge or Oxford was required to take holy orders and become an ordained Anglican priest. However, the terms of the Lucasian professorship required that the holder not be active in the church presumably so as to have more time for science. Newton argued that this should exempt him from the ordination requirement, and Charles II , whose permission was needed, accepted this argument. From to , Newton lectured on optics. Thus, he observed that colour is the result of objects interacting with already-coloured light rather than objects generating the colour themselves. As a proof of the concept, he constructed a telescope using reflective mirrors instead of lenses as the objective to bypass that problem. In late , [44] he was able to produce this first reflecting telescope. It was about eight inches long and it gave a clearer and larger image. In , the Royal Society asked for a demonstration of his reflecting telescope. He verged on soundlike waves to explain the repeated pattern of reflection and transmission by thin films Opticks Bk. However, later physicists favoured a purely wavelike explanation of light to account for the interference patterns and the general phenomenon of diffraction. In his Hypothesis of Light of , Newton posited the existence of the ether to transmit forces between particles. The contact with the Cambridge Platonist philosopher Henry More revived his interest in alchemy. He was the last of the magicians. Had he not relied on the occult idea of action at a distance , across a vacuum, he might not have developed his theory of gravity. In , Newton published Opticks , in which he expounded his corpuscular theory of light. He considered light to be made up of extremely subtle corpuscles, that ordinary matter was made of grosser corpuscles and speculated that through a kind of alchemical transmutation "Are not gross Bodies and Light convertible into one another, In the same book he describes, via diagrams, the use of multiple-prism arrays. Also, the use of these prismatic beam expanders led to the multiple-prism dispersion theory. Science also slowly came to realise the difference between perception of colour and mathematisable optics. Newton had committed himself to the doctrine that refraction without colour was impossible. He therefore thought that the object-glasses of telescopes must for ever remain imperfect, achromatism and refraction being incompatible. This inference was proved by Dollond to be wrong. The Principia was published on 5 July with encouragement and financial help from Edmond Halley. In this work, Newton stated the three universal laws of motion. Together, these laws describe the relationship between any object, the forces acting upon it and the resulting motion, laying the foundation for classical mechanics. They contributed to many advances during the Industrial Revolution which soon followed and were not improved upon for more than years. Many of these advancements continue to be the underpinnings of non-relativistic technologies in the modern world. He used the Latin word gravitas weight for the effect that would become known as gravity , and defined the law of universal gravitation. Here Newton used what became his famous expression "hypotheses non-fingo" [60]. With the Principia, Newton became internationally recognised. Cubic plane curve Newton found 72 of the 78 "species" of cubic curves and categorized them into four types. Newton also claimed that the four types could be obtained by plane projection from one of them, and this was proved in , four years after his death. Later life of Isaac Newton In the s, Newton wrote a number of religious tracts dealing with the literal and symbolic interpretation of the Bible. A manuscript Newton sent to John Locke in which he disputed the fidelity of 1 John 5: His first biographer, Sir David Brewster , who compiled his manuscripts for over 20 years, interpreted Newton to be questioning the veracity of passages referring to this, but never denying the doctrine of the Trinity as such. John â€”were published after his death. He also devoted a great deal of time to alchemy see above. Newton was also a member of the Parliament of England for Cambridge University in â€”90 and â€”2, but according to some accounts his only comments were to complain about a cold draught in the chamber and request that the window be closed. Newton became perhaps the best-known Master of the Mint upon the death of Thomas Neale in , a position Newton held for the last 30 years of his life. As Warden, and afterwards Master, of the Royal Mint, Newton estimated that 20 percent of the coins taken in during the Great Recoinage of were counterfeit. Counterfeiting was high treason , punishable by the felon being hanged, drawn and quartered. Despite this, convicting even the most flagrant criminals could be extremely difficult. However, Newton proved equal to the task. Newton successfully prosecuted 28 coiners. It is a matter of debate as whether he intended to do this or not. The French writer and philosopher Voltaire.

9: Newton by his contemporaries

Isaac Newton was one of the world's greatest scientists. He utilized his great genius and powers of reasoning to produce his famous scientific discoveries including his laws of motion, the law of universal gravitation, studies in optics, and the invention of calculus.

It was at first a pleasing divertisement to view the vivid and intense colors produced thereby; but after a while applying myself to consider them more circumspectly, I became surprised to see them in an oblong form; which according to the received laws of refraction, I expected should have been circular. The Oblong Spectrum They were terminated at the sides with straight lines, but at the ends the decay of light was so gradual that it was difficult to determine justly what was their figure; yet they seemed semi-circular. Comparing the length of this colored spectrum with its breadth, I found it about five times greater, a disproportion so extravagant that it excited me to a more than ordinary curiosity of examining from whence it might proceed. I could scarce think that the various thickness of the glass, or the termination with shadow or darkness, could have any influence on light to produce such an effect; yet I thought it not amiss first to examine those circumstances, and so tried what would happen by transmitting light through parts of the glass of divers thickness or through holes in the window of divers bignesses, or by setting the prism without so that the light might pass through it and be refracted before it was terminated by the hole; but I found none of those circumstances material. The fashion of the colors was in all these cases the same. Then I suspected whether, by any unevenness in the glass or other contingent irregularity, these colors might be thus dilated I then proceeded to examine more critically what might be effected by the difference of the incidence of rays coming from divers parts of the sun; and to that end measured the several lines and angles belonging to the image Then I began to suspect whether the rays, after their trajection through the prism, did not move in curved lines, and according to their more or less curvity tend to divers parts of the wall. And it increased my suspicion when I remembered that I had often seen a tennis ball, struck with an oblique racket, describe such a curved line. For a circular as well as a progressive motion being communicated to it by that stroke, its parts on that side where the motions conspire must press and beat the contiguous air more violently than on the other, and there excite a reluctancy and reaction of the air proportionably greater. And for the same reason, if the rays of light be globular bodies, and by their oblique passage out of one medium into another acquire a circular motion, they ought to feel the greater resistance from the ambient ether on that side where the motions conspire, and thence be continually bowed to the other. But notwithstanding this plausible ground of suspicion, when I came to examine it I could observe no such curvity in them. The gradual removal of these suspicions at length led me to the Experimentum Crucis, which was this: I took two boards and placed one of them close behind the prism at the window, so that the light might pass through a small hole, made in it for the purpose, and fall on the other board, which I placed at about 12 feet distance, having first made a small hole in it also for some of that incident light to pass through. Then I placed another prism behind this second board, so that the light, trajected through both the boards, might pass through that also and be again refracted before it arrived at the wall. This done, I took the first prism in my hand and turned it to and fro slowly about its axis, so much as to make the several parts of the image cast on the second board successively pass through the hole in it, that I might observe to what places on the wall the second prism would refract them. And I saw by the variation of those places that the light, tending to that end of the image toward which the refraction of the first prism was made, did in the second prism suffer a refraction considerably greater than the light tending to the other end. And so the true cause of the length of that image was detected to be no other than that light consists of rays differently refrangible, which without any respect to a difference in their incidence were, according to their degrees of refrangibility, transmitted toward divers parts of the wall. The Crucial Experiment Experimentum Crucis When I understood this I left off my aforesaid glass works, for I saw that the perfection of telescopes was hitherto limited, not so much for want of glasses truly figured according to the prescriptions of optic authors which all men have hitherto imagined , as because that light itself is a heterogeneous mixture of differently refrangible rays I shall now proceed to acquaint you with another more notable difformity in its rays, wherein the origin of colors is unfolded, concerning which I shall lay down the doctrine first and then, for its examination, give you an instance or two of the experiments, as a specimen of the rest. The doctrine you will find comprehended and illustrated in the following propositions: As the rays of light differ in degrees of refrangibility, so they also differ in their disposition to exhibit this or that particular color. Colors are not qualifications of light, derived from refractions or reflections of natural bodies as is generally believed , but original and connate properties, which in divers rays are divers To the same degree of refrangibility ever belongs the same color, and to the same color ever belongs the same degree of refrangibility. The least refrangible rays are all disposed to exhibit a red color The species of color and degree of refrangibility proper to any particular sort of rays is not mutable by refraction, nor by reflection from natural bodies, nor by any other cause that I could yet observe Yet seeming transmutations of colors may be made where there is any mixture of divers sorts of rays There are therefore two sorts of colors. The one original and simple, the other compounded of these. The original or primary colors are red, yellow, green, blue, and a violet-purple, together with orange, indigo, and an indefinite variety of intermediate gradations But the most surprising and wonderful composition was that of whiteness. There is no one sort of rays which alone can exhibit this. It is ever compounded, and to its composition are requisite all the aforesaid primary colors, mixed in a due proportion. I have often with admiration beheld that, all the colors of the prism being made to converge and thereby to be again mixed as they were in the light before it was incident upon the prism, reproduced light entirely and perfectly white, and not at all sensibly differing from a direct light of the sun These things considered, the manner how colors are produced by the prism is evident. For of the rays constituting the incident light, since those which differ in color proportionally differ in refrangibility, they by their unequal refractions must be severed and dispersed into an oblong form in an orderly succession, from the least refracted scarlet to the most refracted violet Why the colors of the rainbow appear in falling drops of rain is also from hence evident These things being so, it can be no longer disputed whether there be colors in the dark, nor whether they be the qualities of the object we see, nor perhaps whether light be a body. For since colors are the qualities of light, having its rays for their entire and immediate subject, how can we think those rays qualities also unless one quality may be the subject of and sustain another, which in effect is to call it substance. But why there is a necessity, that all those motions, or whatever else it be that makes colours, should be originally in the simple rays of light, I do not yet understand the necessity of, no more than that all those sounds must be in the air of the bellows, which are afterwards heard to issue from the organpipes; or the string, which are afterwards, by different stoppings and strikings produced; which string by the way is a pretty representation of the shape of a refracted ray to the eye; and the manner of it may be somewhat imagined by the similitude thereof: Now we may say indeed and imagine, that the rest or streightness of the string is caused by the cessation of motions, or coalition of all vibrations; and that all the vibrations are dormant in it: Newton alledgeth, that as the rays of light differ in refrangibility, so they differ in their disposition to exibit this or that colour: The motion of light in an uniform medium, in which it is generated, is propagated by simple and uniform pulses or waves, which are at right angles with the line of direction; but falling obliquely on the refracting medium, it receives another impression or motion, which disturbs the former motion, somewhat like the vibration of a string: Now, that the intermediate are nothing but the dilutings of those two primary, I hope I have sufficiently proved by [earlier] experiment Newton will think it no difficult matter, by my hypothesis, to solve all the phenomena, not only of the prism, tinged liquors, and solid bodies, but of the colours of plated bodies, which seem to have the greatest difficulty Newton hath any argument, that he supposes an absolute demonstration of his theory, I should be very glad to be convinced by it Tis true, that from my Theory I argue the Corporeity of Light; but I do it without any absolute positiveness, as the word perhaps intimates; and make it at most but a very plausible consequence of the Doctrine, and not a fundamental supposition, nor so much as any part of it; which was wholly comprehended in the precedent Propositions And therefore I chose to decline them all, and to speak of Light in general terms, considering it abstractly, as something or other propagated every way in streight lines from luminous bodies, without determining, what that Thing is; whether a confused Mixture of difform qualities, or Modes of bodies, or of Bodies themselves, or of any Virtues, Powers, or Beings whatsoever. And for the same reason I chose to speak of Colours according to the information of our

Senses, as if they were Qualities of Light without us. Newton endeavours to maintain his new Theory concerning Colours. Me thinks, that the most important Objection, which is made against him by way of Quere, is that, Whether there be more than two sorts of Colours. For my part, I believe, that an Hypothesis, that should explain mechanically and by the nature of the motion the Colors Yellow and Blew, would be sufficient for all the rest, in regard that those others, being only more deeply charged as appears by the Prismes of Mr. Hook do produce the dark or deep-Red and Blew; and that of these four all the other colors may be compounded. Neither do I see, why Mr. Newton doth not content himself with the two Colors, Yellow and Blew; for it will be much more easy to find an Hypothesis by Motion, that may explicate these two differences, than for so many diversities as there are of others Colors. And till he hath found this Hypothesis, he hath not taught us, what it is wherein consists the nature and difference of Colours, but only this accident which certainly is very considerable of their different Refrangibility. Newtons Answer to the foregoing Letter And those different properties would evince it to be of a different constitution: Insomuch that such a production of white would be so far from contradicting, that it would rather illustrate and confirm my Theory; because by the difference of that from other whites it would appear, that other Whites are not compounded of only two colours like that. And therefore if Monsieur N. Newton, touching his theory of light and colours And, as in air the vibrations are some larger than others, but yet all equally swift Whence it may be, that the spirit of wine, for instance, though a lighter body, yet having subtiler parts, and consequently smaller pores, than water, is the more strongly refracting liquor In the fourth place therefore, I suppose light is neither aether, nor its vibrating motion, but something of a different kind propagated from lucid bodies. They, that will, may suppose it an aggregate of various peripatetic qualities. Others may suppose it multitudes of unimaginable small and swift corpuscles of various sizes, springing from shining bodies at great distances one after another; but yet without any sensible interval of time, and continually urged forward by a principle of motion, which in the beginning accelerates them, till the resistence of the aethereal medium equal the force of that principle To avoid dispute, and make this hypothesis general, let every man here take his fancy: Fifthly, it is to be supposed, that light and aether mutually act upon one another, aether in refracting light, and light in warming aether; and that the densest aether acts most strongly. When a ray therefore moves through aether of uneven density, I suppose it most pressed, urged, or acted upon by the medium on that side towards the denser aether, and receives a continual impulse or ply from that side to recede towards the rarer, and so is accelerated, if it move that way, or retarded, if the contrary And this may be the ground of all refraction and reflexion Now for the cause of these and such like colours made by refraction, the biggest or strongest rays must penetrate the refracting superficies more freely and easily than the weaker, and so be less turned awry by it, that is, less refracted; which is as much as to say, the rays, which make red, are least refrangible, those, which make blue and violet, most refrangible, and others otherwise refrangible according to their colour: On this ground may all the phenomena of refractions be understood: And this, I suppose, they will think an allowable supposition, who have been inclined to suspect, that these vibrations themselves might be light This celerity of the vibrations therefore supposed, if light be incident on a thin skin or plate of any transparent body, the waves, excited by its passage through the first superficies, overtaking it one after another, till it arrive at the second superficies, will cause it to be there reflected or refracted accordingly as the condensed or expanded part of the wave overtakes it there. I should here conclude, but that there is another strange phenomenon of colours, which may deserve to be taken notice of[: Lelong, 13 December I should be curious to learn what the Reverend Father Malebranche may have observed about colors. The subject is important. There is an experiment of M. Mariotte has challenged, and which should be examined above all. Newton claims that one can separate the colored rays from one another, so that after this separation refraction does not make them change color any further. Newton is not a physicist, his book is very curious and very useful to those who have the right principles in physics, and he is moreover an excellent mathematician. Everything I believe concerning the properties of light fits all his experiments. Lelong, 9 April I fear that M. Newton on colors with some preconceptions, and may not have used all of the care that could be given to them. Newton has worked at them for so many years, and since one cannot doubt his ability, it is not credible that he has recounted imaginary experiments. So I should wish that persons with all the necessary leisure, and who are willing to apply themselves sufficiently That is what Mr. Among these rays are those that produce the sensation of red, others the sensation of yellow, still others the sensation of other colors Furthermore it is also to be noted that all light of the same kind has its characteristic color and refrangibility, and that this color cannot be altered by any reflections or refractions For the rest I do not claim that these new ideas are incontestable and without difficulty. I only hope that they will contribute to extending further that investigation to which we are invited every day by the objects we see around us. This work was his Opticks, or treatise of Light and Colours, which first appeared in the year , after he had been making the necessary experiments for thirty years together. It is no small art to make experiments exactly. Every matter of fact which offers it self to our consideration is complicated with so many others, which either compound or modify it, that without abundance of skill they cannot be separated; nay without an extraordinary sagacity, the different elements that enter into the composition can hardly be guessed at. The fact therefore to be considered must be resolved into the different ones of which it is composed; and they themselves are perhaps composed of others; so that if we have not chosen the right road, we may sometimes be engaged in endless Labyrinths. The first total ray before the dissection, is white, and this whiteness arose from all the particular colours of the Primitive rays. No primitive coloured rays could be separated, unless they were such by their nature, that in passing through the same medium, or through the same glass prism, they are refracted at different angles, and by that means separate when they are received at proper distances. The different Refrangibility leads us to the different Reflexibility. But there is something more; for the rays which fall at the same angle upon a surface are refracted and reflected alternately, with a kind of play only distinguishable to a quick eye, and well assisted by the judgment of the Observer.

THE ELOGIUM OF SIR ISAAC NEWTON pdf

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