

GREAT BOOKS OF THE WESTERN WORLD

A GREAT BOOK OF THE WESTERN WORLD ESSAY

THE GREAT BOOKS OF THE WESTERN WORLD: ROBERT MAYNARD HUTCHINS, *EDITOR IN CHIEF*. MORTIMER J. ADLER, *ASSOCIATE EDITOR*. *MEMBERS OF THE ADVISORY BOARD*: STRINGFELLOW BARR, SCOTT BUCHANAN, JOHN ERSKINE, CLARENCE H. FAUST. ALEXANDER MEIKELJOHN, JOSEPH J. SCHWAB, MARK VAN DOREN. *EDITORIAL CONSULTANTS*: A.F.B. CLARKE, F.L. LUCAS, WALTER MURDOCH. WALLACE BROCKWAY, *EXECUTIVE EDITOR*. WILLIAM BENTON, *PUBLISHER*. ENCYCLOPAEDIA BRITANNICA, INC. CHICAGO, LONDON, TORONTO. THE UNIVERSITY OF CHICAGO. *THE GREAT BOOKS IS PUBLISHED WITH THE EDITORIAL ADVICE OF THE FACULTIES OF THE UNIVERSITY OF CHICAGO*. COPYRIGHT IN THE UNITED STATES OF AMERICA, 1952 BY ENCYCLOPAEDIA BRITANNICA INC.

A GREAT BOOK OF THE WESTERN WORLD ESSAY MOTIVATED BY READING

VOLUME 34: 'NEWTON AND HUYGENS'

IN THE GREAT BOOKS OF THE WESTERN WORLD SERIES OF BOOKS

Title of Essay: Consequence of Sir Isaac Newton's 'Principia'

Sir Isaac Newton (1642—1727) published a Book called "Mathematical Principles of Natural Philosophy" (throughout this paper now known as 'The Principia') on May the 18th in 1686, at the age of 44 (see page 2 of Footnote 1). This Book brought him great fame throughout the scientific world, and he was given many honors and awards (see pages 'Preface ix and x' of Footnote 1). On the one hand his explanation of how the World worked in a Mathematical and Mechanical way influenced all modern scientific development. On the other hand the explanation of how the World worked in a Mathematical and Mechanical way required its readers to bring into serious question the reason to believe in occult explanations such as Gods and spirits. This is a genuine Consequence of Sir Isaac Newton's 'Principia'.

In this Essay I will (1) present important insights into Newton's personal life in order to show how so very secretive he was about his scientific work and publications. By presenting this evidence, we are allowed to say that Newton's published 'Principia' represents his firmly agreed upon scientific outlook. (2) I will then present the entire 'PREFACE TO THE FIRST EDITION' of his Book called "Mathematical Principles of Natural Philosophy" (see pages 1 and 2 in the Book mentioned in Footnote 1), and I do this to present the original message and re-discover the genuine impact this important Publication has (or would have had) on the educated reader. (3) I will then present or show how Newtonian Scientists or Scientists in general must decide on what path to take when considering religion in science, a profound Consequence of Sir Isaac Newton's 'Principia'.

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(1) In this section will now present important insights into Newton's personal life in order to show how so very secretive he was about his scientific work and publications. By presenting this evidence, we are allowed to say that Newton's published 'Principia' represents his firmly agreed upon scientific outlook. Let us read the following quotation discovered in The Encyclopedia of Philosophy, to find out more about the matter:

In personality Newton was quiet and only rarely given to laughter. He did not communicate his ideas readily and was far from being a quick or facile speaker. Morbidly sensitive to criticism, he was so possessive about his own work that not only was he reluctant to publish it, but when he did, he

only rarely acknowledges the specific contributions of others. This was the case despite his statement-made as much in an attempt to pacify Robert Hooke as in modesty-that what he accomplished was done because he "stood on the shoulders of giants". When his priority was questioned or when he was crossed in other ways, he grew resentful, even vindictive, threatening to withdraw entirely from science. On more than one occasion, he used the power of his reputation or office to crush others. Even some of his closest friends John Locke and Charles Montague (Earl of Halifax), suffered from his suspicions. In the dispute over the discovery of the calculus, he masterminded the words and actions of his younger followers, who questioned not only Leibnitz's priority but also his honesty, as he was accused of stealing Newton's ideas. (It is now granted that Newton and Leibnitz arrived at the calculus independently)." End of quotation. (See page 490 of Footnote 2.)

What do we learn from this remark? Well, we can say that Newton did not like criticism of any kind and in fact he was very 'Morbid' about the matter. We can say, then, if this is true, that 'The Principia' was very, very carefully examined for possible criticism before it was ever published; and consequentially we may say that Newton knew quite well what he had written in 'The Principia' concerning God, or more importantly, what he had purposely left out concerning the need for one. We need not worry, then, that what he presented in 'The Principia' concerning this very important spiritual matter was a genuine mistake or that the 'The Principia' were the writings of a hurried and ambitious man. Instead we may say that 'The Principia' was the result of a cool, careful and clear-headed thinker. We also are informed by the above quotation that Newton was reluctant to publish his works; but if he was reluctant to publish his scientific works, then how much more reluctant would he have been to allow or even publish articles or essays about his private life or activities (see Footnote 6). Therefore Newton's private life would not have been known to anyone beyond his closest of friends. These several Facts about the way Newton worked and published are important to recognize and keep in mind. In a word we can say this 'The Principia' as it was published, is precisely what Newton wanted the public to read. Importantly, and in summary, we are allowed to say that Newton's carefully published 'Principia' represents his firmly agreed upon scientific outlook.

(2) In this section of the Essay I will present the entire 'PREFACE TO THE FIRST EDITION' of his Book called "Mathematical Principles of Natural Philosophy"

(see pages 1 and 2 in the Book mentioned in Footnote 1), and I do this in order to present the original message and re-discover the genuine impact this important Publication has (or would have had) on the educated reader. But at this point remember what we have just said about Newton and the undeniable Fact that he published only what he precisely wanted to say and what he only wanted us to read. This said let me present the following quotation, discovered in Volume 34: Newton and Huygens in The Great Books of the Western World (see Footnote 1) and I start the quotation:

PREFACE TO THE FIRST EDITION

Since the ancients (as we are told by Pappus) esteemed the science of mechanics of great importance in the investigation of natural things, and the moderns, rejecting substantial forms and occult qualities, have endeavored to subject the phenomena of nature to the laws of mathematics, I have in this treatise cultivated mathematics as far as it relates to philosophy. The ancients considered mechanics in a twofold respect: as rational, which proceeds accurately from demonstration, and practical. To practical mechanics all the manual arts belong, from which mechanics took its name. But as artificers do not work with perfect accuracy, it comes to pass that mechanics is so distinguished from geometry that what is perfectly accurate is called geometrical; what is less so, is called mechanical. However the errors are not in the art, but in the artificers. He that works with less accuracy is an imperfect mechanic; and if any could work with perfect accuracy, he would be the most perfect mechanic of all, for the description of right lines and circles, upon which geometry is founded, belongs to mechanics. Geometry does not teach us to draw these lines, but requires them to be drawn, for it requires the learner should be first taught to describe these accurately before he enters upon geometry, then it shows how by these operations problems may be solved. To describe right lines and circles are problems, but not geometrical problems. The solution of these problems is required from mechanics, and by geometry the use of them, when so solved, is shown; and it is the glory of geometry that from those few principles, brought from without, it is able to produce so many things. Therefore geometry is founded in mechanical practice, and is nothing but that part of the universal mechanics which accurately proposes and demonstrates the art of measuring. But since the manual arts are chiefly employed in the moving of bodies, it happens that geometry is commonly referred to their

magnitude, and mechanics to their motion. In this sense rational mechanics will be the science of motions resulting from any forces whatsoever, and of the forces required to produce any motions, accurately proposed and demonstrated. This part of mechanics, as far as it extends to the five powers which relate to the manual arts, was cultivated by the ancients, who considered gravity (it not being a manual power) no otherwise than in moving weights by those powers. But I consider philosophy rather than arts and write not concerning manual but natural powers, and consider chiefly those things that relate to gravity, levity, elastic force, the resistance of fluids, and the like forces, whether attractive or impulsive; and therefore I offer this work as the mathematical principles of philosophy, for the whole burden of philosophy seems to consist in this — from the phenomena of motions to investigate the forces of nature, and then from these forces to demonstrate the other phenomena; and to this end the general propositions in the first and second books are directed. In the third book I give the example of this in the explication of the System Of The World; for by the propositions mathematically demonstrated in the former books in the third I derive from the celestial phenomena the forces of gravity with which bodies tend to the sun and the several planets. Then from these forces, by other propositions which are also mathematical, I deduce the motions of the planets, the comets, the moon, and the sea. I wish we could derive the rest of the phenomena of Nature by the same kind of reasoning from mechanical principles, for I am induced by many reasons to suspect they may all depend on certain forces by which particles of bodies, by some causes hitherto unknown, are either mutually impelled towards one another, and cohere in regular figures, or are repelled and recede from one another. These forces being unknown, philosophers have hitherto attempted the search of Nature in vain; but I hope the principles here laid down will afford some light either to this or some truer method of philosophy.” End of quotation (see Footnote 1 and also see Footnote 5)

(3) In this last section of the Essay and keeping the above quotation from Newton’s ‘Principia’ in mind, I will now present or show how Newtonian Scientists or Scientists in general must genuinely decide on what path to take when considering religion in science, a profound Consequence of Sir Isaac’s ‘Principia’. Although if we read the above passage ourselves we can perhaps see where my line of thought is generally going, I would like to enrich the discussion by offering the following insights

from the Article "Newton, Isaac (1642—1727)" discovered again in The Encyclopedia of Philosophy (see Footnote 2), it reads:

{Newton's} **Image and Influence:** Descartes's physical theory continued to vie with Newton's for primacy on the Continent throughout the first quarter of the eighteenth century. Newton's views finally triumphed, however, due not only to the defect of Cartesianism but also to the efforts of popularizers like Voltaire. Newton's views began to have an impact on areas outside science itself. Mechanics came to be regarded as the ultimate explanatory science: phenomena of any kind, it was believed, could and should be explained in terms of mechanical conceptions, and the Scientific Method of 'Principia' could and should be extended to all fields of human endeavor.

Newton's mechanical theory was used to support both the deistic view that God had created the world as a perfect machine that then required no further interference from him, and the theistic view that he had to interfere continually in order to preserve the stability of the universe. Newton himself favored the latter view, but God's function of maintaining the stability of the solar system was dispensed with by Pierre Simon Laplace, who showed that on the basis of Newtonian theory, the system was stable despite perturbations. Thus the Newtonian theory came to increasingly favor Deism, and eventually a view of the universe as determined by inexorable laws. Mechanism thus became equated with determinism, and the Newtonian world picture came to be thought of as a picture of a Newtonian world machine. These ideas are typified in Laplace's view that a supreme intelligence, armed with the knowledge of the positions and velocities of all particles in the universe at any moment, could deduce the state of the universe at any other time.

To the eighteenth and much of the nineteenth centuries, Newton himself became idealized as the perfect scientist: cool, objective, and never going beyond what the facts warrant to speculative hypotheses. The "Principia" became the model of scientific knowledge, a synthesis expressing the Enlightenment conception of the universe as a rationally ordered machine governed by simple mathematical laws. To some, even the fundamental principles from which the system was deduced seemed to be a-priori truths, attainable by reason alone." End of quotation (and see page 491, Footnote 2).

This long, rich quotation allows us to see the long-term bird's eye view of the impact Newton's 'Principia' has had on society ever since its publication; and importantly for over 200 years it also has been required reading for the most accomplished scientists. As the above quotation explains, the idea and designs of God as a Creator (or any non-measurable or quantifiable 'occult' activity) are pushed by Newton further and further out of the every-day life of general scientific practice; and if we affirm the fact that 'The Principia' was carefully examined by Newton before it was ever published, and we have verified this Fact, then it is not a mistake to say that Newton was personally responsible in a very large way of introducing the important question as to whether there is a need for a God in the scientific world view. But let us now remember what we have said earlier: *"In a word, 'The Principia' as it was published is precisely what Newton wanted the public to read and nothing else. In summary we are allowed to say that Newton's carefully published 'Principia' does represent his affirmed scientific outlook (also see Footnote 4)."* If this is true, and it is, then Newton has intentionally requested a vast number of literate people to see and understand the structure of the universe or World his way, and his way requires the removal of absolutely anything that cannot be measured and explained by mathematics. God is simply not required to explain natural phenomena.

Again and my point is this, and it is a slim point to make: if one reads the Newtonian 'PREFACE' without knowing anything else about Newton, only the very mild and greatly hidden implication that God is required in Science, obtains. In our general rush to discuss Newton's wonderful findings, it seems that the important and obvious remark that he has also decided to remove the 'occult' qualities from all scientific endeavors goes largely unmentioned. Remember, if we did not know anything about the author of this work other than what he published, and for many this was indeed the case, then it is not that much of a struggle to justify that Newton has admitted into scientific enquiry the suggestion of scientific atheism. — And to argue that God is implied by Newton's praise of geometry fails if we follow his careful explanation as to what geometry actually is: it is the descriptive ideal of observable, measurable natural phenomena.

Let us ponder this following remark again, a remark that is found in Newton's above 'PREFACE':

...Then from these forces, by other propositions which are also mathematical, I deduce the motions of the planets, the comets, the moon, and the sea. I wish we could derive the rest of the phenomena of Nature by the same kind of reasoning from mechanical principles, for I am induced by many reasons to suspect they may all depend on certain

forces by which particles of bodies, by some causes hitherto unknown, are either mutually impelled towards one another, and cohere in regular figures, or are repelled and recede from one another. These forces being unknown, philosophers have hitherto attempted the search of Nature in vain; but I hope the principles here laid down will afford some light either to this or some truer method of philosophy.” (This quotation comes from Newton’s ‘PREFACE’ found earlier in this Essay but also see Footnote 1.)

Carefully said, is not this also the very first general workable idea of a Cosmic Grand Unified Scientific Theory? If so, we can conclude that his Grand Unified Scientific Theory is only to be explained using the tools of mathematical regulations. But if this is what Newton is suggesting, then it follows that all objects, and relationships of objects (and that would include the motions and activities of humanity itself), would necessarily require the elimination of not only the spirit and soul of humanity, but at the vast Cosmic level the elimination of spiritual notion of God. I want to make my point clear: if there is no mistake in what Newton wanted to publish, and we have argued there isn’t, then in the ‘PREFACE’ to his work called “Mathematical Principles Of Natural Philosophy” (discovered on page 1, Volume 34 of The Great Books Of The Western World), Newton is arguing carefully and concisely for a world where God isn’t mentioned and for a worldview where reason does not require it. Could any other conclusion be reached? And could anyone reading this Book when it was first published in 1686, think any differently not knowing anything at all about the very private scientist called Sir Isaac Newton?

In summary Sir Isaac Newton (1642—1727) published a Book called ‘Mathematical Principles of Natural Philosophy’ (throughout this paper now known as ‘Newton’s Principia’) on May the 18th in 1686, at the age of 44 (see page 2 of Footnote 1). This Book brought him great fame throughout the scientific world, and he was given many honors and awards (see pages ‘Preface ix and x’ of Footnote 1). On the one hand his explanation of how the World worked in a Mathematical and Mechanical way influenced all modern scientific development. On the other hand the explanation of how the world Worked in a Mathematical and Mechanical way required its readers to deny the existence of God, or more weakly, to seriously bring into question the reason to believe in the occult.

In this Essay I have (1) presented important insights into Newton’s personal life in order to show how so very secretive he was about his scientific work and publications. By presenting these insights, we are allowed to say with some confidence

that Newton's published 'Principia' represented his firmly agreed upon scientific outlook. (2) I then presented the entire 'PREFACE TO THE FIRST EDITION' of his Book called "Mathematical Principles of Natural Philosophy" (see pages 1 and 2 in the Book mentioned in Footnote 1), and I did this in order to present the original message and re-discover the genuine impact this important Publication has (or would have had) on the educated reader. (3) I then presented or showed how Newtonian Scientists or Scientist in general must seriously decide on what path to take when considering religion in science, a profound Consequence of Sir Isaac Newton's 'Principia'.

FOOTNOTES

Footnote 1: Before me I have Volume 34 'Newton & Huygens' The Great Books Of The Western World and on page 1 of this Book is Newton's 'PREFACE TO THE FIRST EDITION' (May 18, 1686) and this is precisely what has been quoted in my paper. [These are the complete Publishing details: Volume 34, The Great Books of the Western World. Robert Maynard Hutchins, Editor in Chief. Mortimer J. Adler, Associate Editor. William Benton, Publisher. Encyclopedia Inc., Chicago, London, Toronto. The University Of Chicago. The Great Books is published with the editorial advice of the faculties of the University Of Chicago. Copyright in the United States of America, 1952. A biography of Sir Isaac Newton (1642—1727) is provided at the front of this Book.

Footnote 2: Article "Newton, Isaac (1642 —1727)" is written by Dudley Shapere and is found on pages 489, 490 and 491, in the Book called The Encyclopedia of Philosophy, Volume 5 and 6 Complete and Unabridged. Paul Edwards, Editor in Chief. Macmillan Publishing Co., Inc. & The Free Press. New York. Collier Macmillan Publishers. London. Copyright 1967. This Reprint Edition 1967.

Footnote 3: The following highly insightful quotation is discovered on page 538, in Chapter 6: The Rise of Science: Modern Philosophy, in the Book: A History of Western Philosophy, by Bertrand Russell. An Essandess Paperback Book. Simon and Schuster, New York. Tenth Paperback Printing, 1964. Bertrand Russell writes: MODERN PHILOSOPHY: THE RISE OF SCIENCE: In the remainder of this Chapter I shall try to state briefly the philosophical beliefs which appeared to follow from seventeenth century science and some of the respects in which modern science differs from that of Newton. The first thing to note is the removal of all traces of animism from the laws of physics. The Greeks, though they did not say so explicitly, evidently considered the power of movement a sign of life. To common-sense observation it seems that animals move themselves, while dead matter only moves when impelled by an external force. The soul of an animal, in Aristotle, has various functions, and one of them is to move the animal's body. The sun and planets, in Greek thinking, are apt to be gods, or at least regulated and moved by Gods. Anaxagoras thought otherwise, but was impious. Democritus thought otherwise, but was neglected, except by the Epicureans, in favor of Plato and Aristotle. Aristotle's forty-seven or fifty-five unmoved movers and divine spirits, and are the ultimate source of all motion in the universe. Left by itself, any inanimate body would soon become motionless; thus the operation of soul on matter has to be

continuous is motion is not to cease. All this was changed by the first law of motion. Lifeless matter, once set moving, will continue to move forever unless stopped by some external cause. Moreover the external causes of change or motion turned out to be themselves material, whenever they could be definitely ascertained. The solar system, at any rate, was kept going by its own momentum, and its own laws; no outside interference was needed. There might still be some need of God to set the mechanism working; the planets, according to Newton were originally hurled by the hand of God. But when he had done this, and decreed the law of gravitation, everything went on by itself without further need of divine intervention. When Laplace suggested the same which are now operative might have caused the planets to grow out of the sun, God's share in the course of nature was pushed still further back. He might remain as Creator, but even that was doubtful, since it was not clear that the world has a beginning in time. Although most of the men of science were models of piety, the outlook suggested by their work was disturbing to orthodoxy, and the theologians were quite justified in feeling uneasy. Another thing that resulted from science was a profound change in the conception of man's place in the universe. In the medieval world, the earth was at the center of the heavens, and everything had a purpose concerned with man. In the Newtonian world, the earth was a minor planet of a not especially distinguished star; astronomical distances were so vast that the earth, in comparison, was a mere pin-point. It seemed unlikely that this immense apparatus was all designed for the good of certain small creatures on this pin-point. Moreover, purpose, which had since Aristotle formed an intimate part of the conception of science, was now thrust out of scientific procedure. Anyone might still believe that the heavens exist to declare the glory of God, but no one could let this belief intervene in an astronomical calculation. The world might have a purpose, but purpose could no longer enter into scientific explanations." This ends the quotation from Bertrand Russell's Book: A History of Western Philosophy, and see page 538, 'Chapter 6: The Rise of Science'. We get a very clear picture of what Newton's new ideas are about, especially the idea that when the universe is set in motion it remains in motion.

Footnote 4: Article: "Newton" found in Volume 24 of The Britannica Encyclopedia, page 892. Moreover when we Read the article we learn that (a) on several occasions Newton was involved in scientific disputes and consequentially withdrew from meetings, conversations and public appearances; (b) Newton also refused to correspond at length with anyone; (c) and on one occasion Newton refused to write anything or publish anything for several years and until a certain gentleman named "Hook was dead." (d) Newton fell into a communication "silence" when his mother passed away. Meaning, again, it is fair to say that on the one hand it is true that that we cannot possibly leverage any clear pro- theistic sympathies within his 'Principia; but on the other hand it is also fair to say that it is just as difficult to leverage any Newtonian pro-theistic sympathies from other *generally accessible* sources.

Footnote 5: Article: "The History of Science" found in Volume 27 of the Britannica Encyclopedia, page 32. It is interesting how this article resonates with Newtonian philosophy, putting observation of natural phenomena before the *application* of mathematical laws or rational causation: "Science, then, is to be considered in this article as knowledge of natural regularities that is subjected to some degree of skeptical rigor and explained by rational causes. One final caution is necessary. Nature is known only thorough the senses, of which sight, touch and hearing are the dominant ones, and the human notion of reality is skewed towards the object of these senses. The invention of such instruments as the telescope, the microscope and the Geiger counter has bought an ever-increasing range of phenomena within the scope of the senses. This scientific knowledge of the world is only partial, and the progress of science follows the ability of humanity to make phenomena perceivable." Moreover the generalization of particular natural laws over several different phenomena (the Newtonian umbrella) therefore collating reality or the entire

World into a single rational outlook is mentioned in Newton's Preface, and is the genuine beginning of the most coherent Grand Unified Theory of Everything humanity has thought of so far.

Footnote 6: "Chapter 6: Eighteenth Century Philosophy. Isaac Newton," pages 423 and 424 in The Columbia History of Western Philosophy. Edited by Richard H. Popkin. Columbia University Press. New York. Copyright 1999. ISBN: 0-23-10128-7. We read: "Our Understanding of Newton's views and his place in seventeenth-and eighteenth century though have been greatly changed by the availability of his private papers. After Newton's death, his papers were given to his niece. In 1837, the papers - then belonging to the second Earl of Portsmouth, who had inherited them-were examined by Sir David Brewster. The first volume of Brewster's 'Memoires of the life, Writings, and Discoveries of Sir Isaac Newton (1855) contains material "calculated to throw light on Newton's early and academical life." Volume 2 (1855), {is} based upon a "collection of manuscripts and correspondence," {and} contains forty-six appendixes, with rich new material about Newton's scientific work, as well as many manuscripts and papers that reveals his abiding interest in alchemy and anti-Trinitarian theology." And the purpose of this quotation is to strengthen the point that when Newton published his 'Principia', it was afterwards not necessary to argument the existence of God in order to have an explainable understanding of the world or make room for God in scientific experiments. I am therefore suggesting that *because* the publication of his 'Mathematical Principles of Natural Philosophy' was so successful, he consequentially responsible for the revolutionary idea that no God is needed or required in order to understand the world. If so, then this would lead, to the promotion of 'scientific' Atheism.

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