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David Brewster

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Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton

Sir David Brewster (1781–1868) was a Scottish physicist, mathematician, astronomer, inventor, and writer of international reputation. His biography of Sir Isaac Newton, published in 1855 and reissued in 1860, was the result of over twenty years' research, undertaken while publishing hundreds of scientific papers of his own. Brewster made use of previously unknown correspondence by Newton, and his own scientific interests, particularly in optics, meant that he was able to understand and explain Newton's work. It covered the many facets of Newton's personality and work, remaining the best available study of Newton for over a century. Brewster reveals much about the science of his own time in his handling of earlier centuries, and as a cleric was obviously uncomfortable about the evidence of Newton's unorthodox religious views and alchemical studies. Volume 1 covers the period up to about 1700, and includes disputes with Leibniz over the development of calculus.

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David Brewster

Frontmatter

[More information](#)

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David Brewster

Frontmatter

[More information](#)

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VOLUME 1

DAVID BREWSTER



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Frontmatter

[More information](#)

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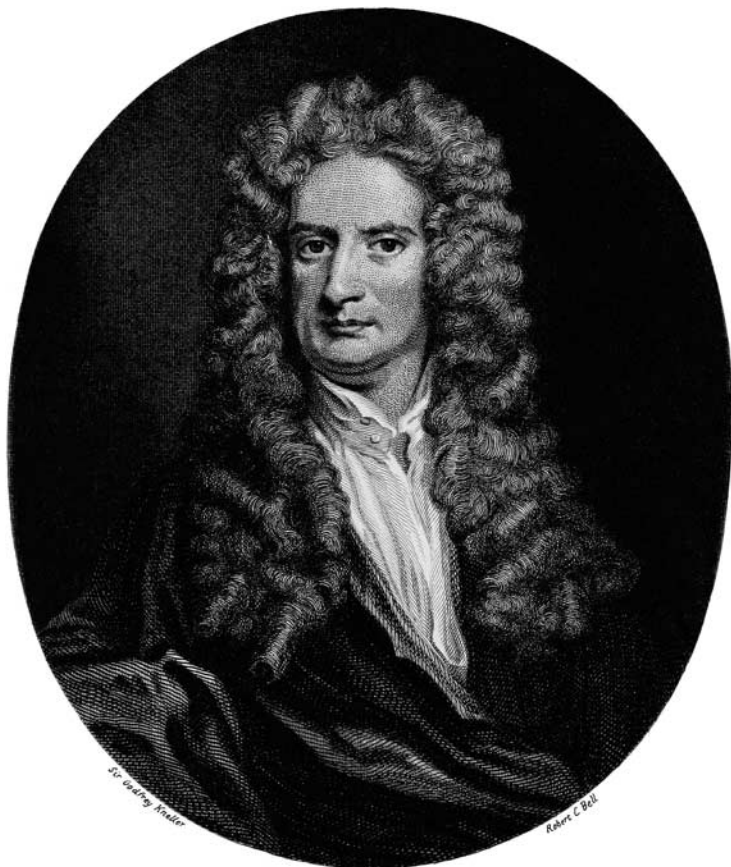
Cambridge University Press

978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir
Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)



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David Brewster

Frontmatter

[More information](#)

MEMOIRS
OF
THE LIFE, WRITINGS, AND DISCOVERIES
OF
SIR ISAAC NEWTON.

BY SIR DAVID BREWSTER, K: H.

A.M., LL.D., D.C.L., F.R.S., AND M.R.I.A.,

One of the Eight Associates of the Imperial Institute of France—Officer of the Legion of Honour—
Chevalier of the Prussian Order of Merit of Frederick the Great—Honorary or Corresponding
Member of the Academies of St. Petersburg, Vienna, Berlin, Turin, Copenhagen,
Stockholm, Munich, Göttingen, Brussels, Haerlem, Erlangen, Canton de
Vaud, Modena, Florence, Venice, Washington, New York, Boston,
Quebec, Cape Town, etc. etc.; and Principal and Vice-
Chancellor of the University of Edinburgh.

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Cambridge University Press

978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir
Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

*Ergo vivida vis animi pervicit, et extra
Processit longe flammantia mœnia mundi;
Atque omne immensum peragravit mente animoque.*
LUCRETIUS, Lib. i. l. 73.

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978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

TO HIS ROYAL HIGHNESS

PRINCE ALBERT, K. G.

CHANCELLOR OF THE UNIVERSITY OF CAMBRIDGE.

SIR,

IN dedicating this Work to your Royal Highness, I seek for it the protection of a name indissolubly associated with the Sciences and the Arts. An account of the Life, Writings, and Discoveries of Sir Isaac Newton might have been appropriately inscribed to the Chancellor of the University of Cambridge, the birthplace of Newton's genius, and the scene of his intellectual achievements ; but that illustrious name is more honourably placed beside that of a Prince who has given such an impulse to the Arts and Sciences of England, and whose views, were they seconded by Statesmen willing to extend Education and advance Science, would raise our country to a higher rank than it now holds among the nations of Europe, in the arts of Peace and of War. It is from the trenches of Science alone that war can be successfully waged ; and it is in its patronage and liberal endowment that nations will find their best and cheapest defence.

Cambridge University Press

978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

vi

DEDICATION.

That your Royal Highness may be enabled to realize those noble and patriotic views respecting the national encouragement of Science, and the consolidation of our Scientific Institutions, which you have so much at heart, and that you may long live to enjoy the reputation which you have so justly earned, is the ardent wish of,

SIR,

Your Royal Highness's

Humble and obedient Servant,

DAVID BREWSTER.

ST. LEONARD'S COLLEGE,
ST. ANDREWS, *May* 12, 1855.

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978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

PREFACE.

IN consequence of the wide circulation of the Life of Sir Isaac Newton, which I drew up for the "Family Library" in 1831, I was induced to undertake a larger work, in order to give a more detailed account of his Life, Writings, and Discoveries. For this purpose I applied in 1837 to the Honourable Newton Fellowes, one of the trustees of the Earl of Portsmouth, for permission to inspect the Manuscripts and Correspondence of Sir Isaac, which, through his grandniece, Miss Conduitt, afterwards Lady Lymington, had come into the possession of that noble family. Mr. Fellowes kindly granted my request, and his amiable and accomplished son, Mr. Henry Arthur Fellowes, who, had he lived, would now have been Earl of Portsmouth, met me in June 1837, at Hurtsbourne Park, to assist me in examining and making extracts from the large mass of papers which Sir Isaac had left behind him.

In this examination our attention was particularly directed to such letters and papers as were calculated to throw light upon his early and academical life, and, with the assistance of Mr. Fellowes, who copied for me several important documents, I was enabled to collect many valuable materials unknown to preceding biographers.

After the death of Sir Isaac, his nephew, Mr. Conduitt, drew

Cambridge University Press

978-1-108-02556-0 - *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Volume 1

David Brewster

Frontmatter

[More information](#)

viii

PREFACE.

up a memorial, containing a sketch of his life, for the use of Fontenelle, the Secretary to the Academy of Sciences in Paris, whose duty it was to write his Eloge, as one of the eight Associates of the Academy. This memorial was published by Edmond Turnor, Esq., in his "Collections for the History of the Town and Soke of Grantham," and was supposed to contain all the information that Mr. Conduitt could collect from persons then alive, and from other sources, respecting Sir Isaac's life. This, however, was a mistake. After the publication of Fontenelle's Eloge, Mr. Conduitt resolved to draw up a Life of his illustrious relative, and, with this view, he wrote the following letter, requesting the assistance of Sir Isaac's personal friends :¹—

"6th February 1723.

"SIR,—I have taken the liberty to trouble you with some short hints of that part of our honoured friend, Sir I. Newton's life, which I must beg the favour of you to undertake, there being nobody, without dispute, so well qualified to do it as yourself. I send you, at the same time, Fontenelle's Eloge, wherein you will find a very imperfect attempt of the same kind ; but I fear he had neither abilities nor inclination to do justice to that great man, who had eclipsed the glory of their hero, Descartes. As Sir I. Newton was a national man, I think every one ought to contribute to a work intended to do him justice, particularly those who had so great a share in his esteem as you had ; and as I pretend to nothing more than to compile it, I shall acquaint the public in the Preface, to whom they are indebted for each particular part of it.

¹ This letter is docquetted by Conduitt, "Letter sent by me concerning Sir I. N.'s Inventions."

Cambridge University Press

978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

PREFACE.

ix

“I am persuaded that the hints I have sent you are very imperfect, and that your own genius will suggest to you many others much more proper and significant, and I beg of you to put down everything that occurs to your thoughts, and you think fit to be inserted in such a work.

“I conjure you not to put off what I take the liberty to recommend to you. As on one hand the complying with my request will be a mark of your gratitude to your old friend, and an eternal obligation on me, so your delaying it will be the most mortifying disappointment to,

“ Sir,

“ Your most humble Servant,

“ JOHN CONDUITT.”¹

Although Mr. Conduitt had at this time resolved to compile a Life of Sir Isaac, and had obtained much information from Dr. Stukely, Mr. Wickins, and Dr. Humphrey Newton of Grantham, yet he seems to have so far relinquished his design, that in June 1729, nearly eighteen months after the date of his letter, he intimates to a friend² that “he has *some thoughts* of writing the Life of Sir Isaac Newton himself.” That he made the attempt, appears from an indigested mass of manuscript which he has left behind him, and which does not lead

¹ I have not succeeded in ascertaining to whom this letter was addressed. It was probably a circular sent to more than one person. I have found a letter from John Craig, and a paper by De Moivre, which have the appearance of being answers to it, but the dates of both are earlier than that of Conduitt's letter. In a letter dated April 16, 1729, Conduitt made a similar application to Professor Machin.

² In a letter on the subject of a large “monumental picture to Newton's memory,” for Conduitt himself. This letter is docketed, “sent to Westgarth,” who seems to have been then in Italy.

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978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

us to regret that he abandoned his design. The materials, however, which he obtained from Mrs. Conduitt, and from the friends of Newton then alive, are of great value ; and, in so far as Mr. H. A. Fellowes and I could make an abstract of these and other manuscripts during a week's visit at Hurtsbourne Park, I have availed myself of them in composing the first volume of this work, which was printed before the papers themselves came into my hands.

Before I began the second volume, which contains the history of the Fluxionary controversy, and the Life of Newton subsequent to the publication of the first edition of the *Principia*, I had the good fortune to obtain from the Earl of Portsmouth, through the kindness of Lord Brougham, the collection of manuscripts and correspondence which the late Mr. H. A. Fellowes had examined and arranged as peculiarly fitted to throw light on the Life and Discoveries of Sir Isaac. In these manuscripts I found much new information respecting the history of the *Principia*, which, though it might have been more appropriately placed in the first volume, I have introduced into those chapters of the second which relate to the period when the other editions of the *Principia* were published.

In the different controversies in which Newton's discoveries involved him, his moral character had never been the subject of suspicion. In Hooke, he found a jealous but an honest rival, who, though he claimed discoveries which substantially belonged to Newton, never cast a reproach upon his name ; and amid all the bitterness of the Fluxionary controversy, Leibnitz and Bernoulli, and their anonymous auxiliaries, never hesitated to acknowledge the purity of Newton's motives, and the scrupulous correctness of his conduct. It was reserved for

Cambridge University Press

978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

PREFACE.

xi

two English astronomers, the one a contemporary and the other a disciple, to misrepresent and calumniate their illustrious countryman.

In 1835, the scientific world was startled by the publication of Baily's *Life of Flamsteed*, a huge volume, deeply affecting the character of Newton, and, strange to say, printed and circulated throughout the world, at the expense of the Board of Admiralty. The friends of the great philosopher were thus summoned to a painful controversy, which, had it been raised in his lifetime, would have been summarily extinguished; but a century and a quarter had elapsed before the slumbering calumnies revived, and it was hardly to be expected that the means of defence would have enjoyed the same vitality. Under these circumstances Mr. Fellowes and I anxiously searched, but in vain, for the letters of Flamsteed to Newton, and other relative documents which were necessary for his defence. In this difficulty, some of the admirers of Newton, among whom I must mention my friend Mr. Robert Brown, the distinguished President of the Linnean Society, sent me some important facts; but valuable as they were, they were not sufficient to refute the calumnies of the Astronomer-Royal. From this embarrassment, however, I have been relieved by the receipt of all Flamsteed's letters and other important papers which Newton had carefully preserved, and which Mr. Fellowes had discovered and set aside for my use. With these documents I trust I have been able, though at a greater length than I could have wished, to defend the illustrious subject of this work against a system of calumny and misrepresentation unexampled in the history of science.

When I published my *Life of Newton* in 1831, I had not

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David Brewster

Frontmatter

[More information](#)

seen his correspondence with Mr. Cotes and other mathematicians in the Library of Trinity College. Mr. Halliwell, however, who had made copious extracts from these manuscripts, kindly put them into my hands; but the subsequent publication of the correspondence by Mr. Edleston, has enabled me to make a more advantageous use of these valuable materials.

Dr. Monk, Bishop of Gloucester and Bristol, had "often expressed in private a wish and request that some one of the many accomplished Newtonians who are resident in that society would favour the world by publishing the whole collection,"¹ and I have no doubt that it was from this public expression of it, in his able and interesting *Life of Dr. Bentley*, that the Masters and Seniors of Trinity College resolved to publish the correspondence.

This valuable work, edited by Mr. Edleston, Fellow of Trinity, is a most important contribution to the History of Mathematical and Physical Science. The admirable synopsis which it contains of Newton's Life;—the learned and able annotations illustrative of his history; and the explanatory notes on the letters themselves, throw much light on the subjects to which they refer, and have been of essential service to me in the composition of this work. But in addition to the obligations which I owe to Mr. Edleston, in common with every friend of science, I have to acknowledge others of a more personal kind. During the printing of the second volume, which he has had the kindness to peruse, I have received from him much new and important information, and availed myself of his judicious criticisms and useful suggestions.

To Professor De Morgan, to whom the public owes a brief

¹ *Life of Bentley*, p. 180.

Cambridge University Press

978-1-108-02556-0 - *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Volume 1

David Brewster

Frontmatter

[More information](#)

PREFACE.

xiii

but interesting biographical sketch of Newton, and who has carefully investigated various points in the Fluxionary controversy, I have been indebted for much information, and for his kind revision of the sketch I had given of the early history of the Infinitesimal Calculus. On a few questions in the life of Newton, and the history of his discoveries, my opinion differs somewhat from his; but I have been able to confirm, from the documents in my possession, many of his views on important points which he was the first to investigate and to publish.

From my late amiable and distinguished friend Professor Rigaud of Oxford, too early cut off in his scientific career, I obtained valuable aid whenever I encountered difficulties or required information. His "Historical Essay on the Principia," which he generously offered to withhold from the public, till I had finished the present work, is a most important contribution to the history of Newton's discoveries, and I am glad to be able to complete the correspondence between Newton and Halley, which Mr. Rigaud was the first to publish in its genuine state.

The Rev. Jeffrey Ekins, Rector of Sampford, whose family, from their connexion with Newton, have been long in possession of several of his theological manuscripts and letters, has obligingly sent me copies of many of them, and has otherwise favoured me with much useful information.

To Lord Brougham, Sir John Lubbock, Mr. Cutts Barton, and other friends, I have to return my best thanks for the assistance they have given me.

In concluding this Preface, I can hardly avoid referring to Sir Isaac Newton's religious opinions. In the chapter which

Cambridge University Press

978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

xiv

PREFACE.

relates to them I have touched lightly, and unwillingly, on a subject so tender ; and in publishing the most interesting of the manuscripts in which these opinions are recorded, I have done little more than submit them to the judgment of the reader. Though adverse to my own, and I believe to the opinions of those to whom his memory is dearest, I did not feel myself justified, had I been so disposed, to conceal from the public that which they have long suspected, and must have sooner or later known. What the gifted mind of Newton believed to be truth, I dare not pronounce to be error. By the great Teacher alone can truth be taught, and it is only at His tribunal that a decision will be given on those questions, often of words, which have kept at variance the wisest and the best of men.

ST. LEONARD'S COLLEGE,
ST. ANDREWS, *May* 12, 1855.

Cambridge University Press

978-1-108-02556-0 - *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Volume 1

David Brewster

Frontmatter

[More information](#)

CONTENTS OF VOLUME I.

CHAPTER I.

	PAGE
Great Discoveries previous to the Birth of Sir Isaac Newton—Pre-eminence of his Reputation—The Interest attached to the Study of his Life and Writings—His Birth and Parentage—An only and Posthumous Child—Notice of his Descent—Inherits the small Property of Woolsthorpe—His Mother marries again—Is sent to a Day-school—His Education at Grantham School—His idle Habits there—His Love of Mechanical Pursuits—His Windmill, Water-clock, Self-moving Carriage, and Kites—His Attachment to Miss Storey—His Love of Drawing and Poetry—His Unfitness to be a Farmer—His Dials, Water-wheels, and Anemometer—Leaves Grantham School—His Commonplace Book and College Expenses,	1-16

CHAPTER II.

Newton enters Trinity College, Cambridge—Origin of his Love of Mathematics—Studies Descartes' Geometry, and the Writings of Schooten and Wallis—Is driven from Cambridge by the Plague—Observes Lunar Halos in 1664—Takes his Degree of B.A. in 1665—Discovers Fluxions in the same Year—His first Speculations on Gravity—Purchases a Prism to study Colours—Revises Barrow's Optical Lectures, but does not correct his erroneous Opinions about Colours—Is elected a Minor Fellow of Trinity in 1667, and a Major Fellow in 1668—Takes his Degree of M.A.—His Note-Book, with his Expenses from 1666 to 1669—Makes a small Reflecting Telescope—His Letter of Advice to Francis Aston, when going upon his Travels—His Chemical Studies—His Taste for Alchemy—His Paper on Fluxions sent to Barrow and Collins in 1669,	17-32
--	-------

CHAPTER III.

Newton succeeds Barrow in the Lucasian Chair—Hyperbolic Lenses proposed by Descartes and Others—Opinions of Descartes and Isaac Vossius on Colours—Newton discovers the Composition of White Light, and the dif-	
--	--

Cambridge University Press

978-1-108-02556-0 - *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Volume 1

David Brewster

Frontmatter

[More information](#)

xvi

CONTENTS.

	PAGE
ferent Refrangibility of the Rays that compose it—Having discovered the Cause of the Imperfection of Refracting Telescopes, he attempts the Construction of Reflecting ones—Constructs a second Reflecting Telescope in 1668, which is examined by the Royal Society, and shown to the King—Discussions respecting the Gregorian, Newtonian, and Cassegrainian Telescope—James Gregory the Inventor of the Reflecting Telescope—Attempts to construct one—Newton makes a Speculum of silvered glass—Glass Specula by Short in 1730, and Airy in 1822—Hadley constructs two fine Reflecting Telescopes—Telescopes by Bradley, Molyneux, and Hawksbee—Short's Reflecting Telescopes with Metallic Specula—Magnificent Telescope of Sir William Herschel with a four-feet Speculum—Munificence of George III.—Astronomical Discoveries of Sir Wm. Herschel—Telescopes of Sir J. Herschel and Mr. Ramage—Gigantic Telescope of the Earl of Rosse with a six-feet Speculum—Progress of Telescopic Discovery—Proposal to send a fine Telescope to a Southern Climate, . . .	33-60

CHAPTER IV.

Newton writes <i>Notes on Kinkhuysen's Algebra</i> —and on <i>Harmonic and Infinite Series</i> —Delivers <i>Optical Lectures</i> at Cambridge—Is elected a Fellow of the Royal Society—Communicates to them his Discoveries on the different Refrangibility and Nature of Light—Popular account of them—They involve him in various Controversies—His Dispute with Pardies—With Linus—With Gascoigne and Lucas—The Influence of these Disputes on his Mind—His Controversy with Dr. Hooke and Monsieur Huygens, arising from their Attachment to the Undulatory Theory of Light—Harassed with these Discussions he resolves to publish nothing more on Optics—Intimates to Oldenburg his Resolution to withdraw from the Royal Society from his Inability to make the Weekly Payments—The Council agree to dispense with these Payments—He is allowed by a Royal Grant to hold his Fellowship along with the Lucasian Chair without taking Orders—Hardship of his Situation in being obliged to plead Poverty to the Royal Society—Draws up a Scheme for extending the Royal Society, by paying certain of its Members—The Scheme was found among his Papers—Soundness of his Views relative to the Endowment of Science by the Nation—Arguments in support of them, . . .	61-95
--	-------

CHAPTER V.

Mistake of Newton in supposing the Length of the Spectra to be the same in all Bodies—And in despairing of the Improvement of Refracting Telescopes—In his Controversy with Lucas he was on the eve of discovering the different Dispersive Powers of Bodies—Mr. Chester More Hall makes this Discovery, and constructs Achromatic Telescopes, but does not publish his Discovery—Mr. Dollond rediscovers the Principle of the Achromatic Tele-	
---	--

Cambridge University Press

978-1-108-02556-0 - *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Volume 1

David Brewster

Frontmatter

[More information](#)

CONTENTS.

xvii

	PAGE
scope, and takes out a Patent—Principle of the Achromatic Telescope explained—Dr. Blair's Aplanatic Telescopes—Great Improvements on the Achromatic Telescope by the Flint-Glass of Guinant, Fraunhofer, and Bontemps—Mistake of Newton in forming his Spectrum from the Sun's Disc—Dark Lines in the Spectrum—Newton's Analysis of the Spectrum incorrect—New Analysis of the Spectrum by Absorption, &c., defended against the Objections of Helmholtz, Bernard, and others—Change in the Refrangibility of Light maintained by Professor Stokes—Objections to his Theory,	96-111

CHAPTER VI.

Newton on the Cause of the Moon's Libration—Is occupied with the subject of Planting Cider Trees—Sends to Oldenburg his Discourse on Light and Colours, containing his Hypothesis concerning Light—Views of Descartes and Hooke, who adopt the Hypothesis of an Ether, the vibrations of which produce Light—Rejected by Newton, who proposes a Modification of it, but solely as an illustration of his Views, and not as a Truth—Light is neither Ether, nor its vibrating Motion—Corpuscles from the Sun act upon the Ether—Hooke claims Newton's Hypothesis as contained in his <i>Micrographia</i> —Discussions on the subject—Hooke's Letter to Newton proposing a Private Discussion as more suitable—Newton's Reply to this Letter, acknowledging the value of Hooke's Discoveries—Oldenburg the cause of the Differences between Hooke and Newton—Newton's Letter to Boyle on the subject of Ether—His conjecture on the Cause of Gravity—Newton supposed to have abandoned the Emission Theory—Dr. Young's supposition incorrect—Newton's mature judgment in favour of the Emission Theory,	112-132
---	---------

CHAPTER VII.

Newton's Hypothesis of Refraction and Reflexion—Of Transparency and Opacity—Hypothesis of Colours—The Spectrum supposed to be divided like a Musical String—Incorrectness of this Speculation—Hooke's Observations on the Colours of Thin Plates explained by the vibrations produced in the Ether by the Luminous Corpuscles—Hooke claims this Theory as contained in his <i>Micrographia</i> —Newton's Researches on the Colours of Thin Plates—Previous Observations of Boyle—Hooke's elaborate Experiments on these Colours—His Explanation of them—Dr. Young's Observations upon it—Newton acknowledges his obligations to Hooke—Newton's Analysis of the Colours seen between two Object-Glasses—Corrections of it by MM. Provostayes and Desains—Newton's Theory of Fits of easy Reflexion and Transmission—Singular Phenomenon in the Fracture of a Quartz Crystal—Newton's Observations on the Colours of Thick Plates—Recent Experiments on the same subject,	133-153
---	---------

VOL. I.

b

Cambridge University Press

978-1-108-02556-0 - *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Volume 1

David Brewster

Frontmatter

[More information](#)

xviii

CONTENTS.

CHAPTER VIII.

	PAGE
Influence of Colour in the Material World—Newton's Theory of the Colours of Natural Bodies—Coloured Bodies reflect only Light of their own Colour, absorbing all the other parts of White Light—The Colours of Natural Bodies are those of Thin Plates—The transparent parts reflecting one Colour and transmitting another—Arrangement of the Colours exhibited in Natural Bodies into Seven Classes—Coloured Juices and Solutions, Oxidated Films, Metals, &c. &c.—Newton's Theory applicable only to one class of Colours—Objections to it stated—Mr. Jamin's Researches on the Colours of Metals—Cause of Colours must be in the Constitution of Bodies—Examples of the Effect of Heat upon Rubies and Nitrous Gas—Effect of Sudden Cooling—On Phosphorus—Effect of Mechanical Action on Iodide of Mercury—Indication of a New Theory—And of the Cause of the Absorption of Definite Rays—Illustration of these Views in a remarkable Tourmaline,	164-188

CHAPTER IX.

Newton's Discoveries on the Inflexion of Light—Previous Researches of Hooke—Newton's Animadversions on them offensive to Hooke—Newton's Theory of Inflexion as described by Grimaldi, having made no experiments of his own—Discoveries of Grimaldi, which anticipate those of Hooke—Hooke suggests the Doctrine of Interference—Newton's Experiments on Inflexion—His Views upon the subject unsettled—Modern Researches—Dr. Young discovers the Law of Interference—Discoveries of Fresnel and Arago—Fraunhofer's Experiments—Diffraction by Grooved Surfaces—Diffraction by Transparent Lines—Phenomena of Negative Diffraction—Experiments and Discoveries of Lord Brougham—Explanation of Diffraction by the Undulatory Theory,	169-183
--	---------

CHAPTER X.

Miscellaneous Optical Researches of Newton—His Experiments on the Absolute Refractive Powers of Bodies—More Recent Experiments—His Conjecture respecting the Inflammability of the Diamond, confirmed by more Direct Experiments—His Erroneous Law of Double Refraction—His Observations on the Polarity of Doubly Refracted Images—Discoveries on Double Refraction in the present Century—His Experiments on the Eye of a Sheep—Results of them—His Three Letters on Briggs's New Theory of Vision—His Theory of the Semi-Decussation of the Optic Nerves—Partly anticipated by Rohault—Opinions of later writers on Vision, of Reid, Brown, Wollaston, Twining, and Alison, discussed—The true Laws of Sensation and Vision—Newton's Observations on the Impression of Strong Light upon the Retina—More recent Observations—His Reflecting Sextant—His Reflecting Microscope—His Reflecting Prism for Newtonian Telescopes—His Method of varying the Magnifying Power of Newtonian Telescopes—Newton's Treatise on Optics—His <i>Lectiones Opticæ</i> ,	184-218
---	---------

Cambridge University Press

978-1-108-02556-0 - *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Volume 1

David Brewster

Frontmatter

[More information](#)

CONTENTS.

xix

CHAPTER XI.

	PAGE
Astronomical Discoveries of Newton—Combined exertion necessary for the completion of Great Discoveries—Sketch of the History of Astronomy previous to the time of Newton—Discoveries of Nicolas Copernicus, born 1473, died 1553—He places the Sun in the Centre of the System—His Work on the Revolutions of the Heavenly Bodies, printed at the expense of Cardinal Schonberg, and dedicated to Pope Paul III.—Tycho Brahe, born 1546, died 1601—His Observatory of Uraniburg—Is visited by James VI.—Is persecuted by the Danish Minister—Retires to Germany—His Discoveries and Instruments—The Tyconic System—John Kepler, born 1571, died 1631—His Speculation on the Six Regular Solids—Discovers the Ellipticity of Mars' Orbit—His Laws of the Planetary Motions—His Ideas of Gravitation—His Religious Character—Galileo, born 1564, died 1642—The first to apply a Telescope to the Heavens—Discovers the Four Satellites and Belts of Jupiter—His Researches in Mechanics—Is summoned before the Inquisition for Heresy—Retracts his Opinions, but persists in teaching the Doctrine of the Earth's Motion—Is again summoned before the Inquisition—His Sentence to Imprisonment for Life—Becomes Blind—His Scientific Character—Labours of Bouillaud, and of Borelli—Suggestions of Dr Hooke on Gravity—His Circular Pendulum—His Experiments with it—His Views respecting the Cause of the Planetary Motions,	219-251

CHAPTER XII.

The first Idea of Gravity occurs to Newton in 1665—His first Speculations upon it—He abandons the Subject from having employed an erroneous measure of the Earth's Radius—He resumes the Subject in consequence of a discussion with Dr. Hooke, but lays it aside, being occupied with his Optical Experiments—By adopting Picard's Measure of the Earth, he discovers the Law of Gravity, and the Cause of the Planetary Motions—Dr. Halley goes to Cambridge, and urges him to publish his Treatise on Motion—The Germ of the Principia, which was composed in 1685 and 1686—Correspondence with Flamsteed—Manuscript of Principia sent to the Royal Society—Halley undertakes to publish it at his own expense—Dispute with Hooke, who claims the discovery of the Law of Gravity—The Principia published in 1687—The new edition of it by Cotes begun in 1709, and published in 1713—Character and Contents of the Work—General Account of the Discoveries it contains—They meet with opposition from the followers of Descartes—Their reception in foreign countries—Progress of the Newtonian Philosophy in England and Scotland,	252-299
---	---------

Cambridge University Press

978-1-108-02556-0 - *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Volume 1

David Brewster

Frontmatter

[More information](#)

xx

CONTENTS.

CHAPTER XIII.

	PAGE
The Newtonian Philosophy stationary for half a century, owing to the imperfect state of Mechanics, Optics, and Analysis—Developed and extended by the French Mathematicians—Influence of the Academy of Sciences—Improvements in the Infinitesimal Calculus—Christian Mayer on the Arithmetic of Sines—D'Alembert's Calculus of Partial Differences—Lagrange's Calculus of Variations—The Problem of Three Bodies—Importance of the Lunar Theory—Lunar Tables of Clairaut, D'Alembert, and Euler—The Superior Tables of Tobias Mayer gain the Prize offered by the English Board of Longitude—Euler receives part of the English Reward, and also a Reward from the French Board—Laplace discovers the cause of the Moon's Acceleration, and completes the Lunar Theory—Lagrange's Solution of the Problem of Three Bodies as applied to the Planets—Inequalities of Jupiter and Saturn explained by Laplace—Stability of the Solar System the Proof of Design—Maclaurin, Laplace, and others, on the Figure of the Earth—Researches of Laplace on the Tides, and the Stable Equilibrium of the Ocean—Theoretical Discovery of Neptune by Adams and Leverrier—New Satellites of Saturn and Neptune—Extension of Saturn's Ring and its Partial Fluidity—Twenty-seven Asteroids discovered—Leverrier's theory of them—Comets with Elliptic Orbits within our System—Law of Gravity applied to Double Stars—Spiral Nebulæ—Motion of the Solar System in Space,	300-333

CHAPTER XIV.

History of the Infinitesimal Calculus—Archimedes—Pappus—Napier—Edward Wright—Kepler's Treatise on Stereometry—Cavalieri's Geometria Indivisibilium—Roberval—Torricelli—Fermat—Wallis's Arithmetica Infinitorum—Hudde—Gregory—Slusius—Newton's Discovery of Fluxions in 1655—General Account of the Method, and of its Applications—His Analysis per Equationes, &c.—His Discoveries communicated to English and Foreign Mathematicians—The Method of Fluxions and Quadratures—Account of his other Mathematical Writings—He solves the Problems proposed by Bernoulli and Leibnitz—Leibnitz visits London, and corresponds with the English Mathematicians, and with Newton through Oldenburg—He discovers the Differential Calculus, and communicates it to Newton—Notice of Oldenburg—Celebrated Scholium respecting Fluxions in the Principia—Account of the changes upon it—Leibnitz's Manuscripts in Hanover,	334-363
--	---------

Cambridge University Press

978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

CONTENTS.

xxi

APPENDIX TO VOLUME I.

	PAGE
No. I.—Letter from Mr. Newton to Francis Aston, Esq., a young Friend who was on the eve of setting out upon his Travels,	365
II.—An Hypothesis explaining the Properties of Light discoursed of in my several Papers,	368
III.—Drawing and Measures of the Eye of a Sheep,	388
IV.—Letter from Newton to Dr. Wm. Briggs,	390
V.—Second Letter of Newton to Dr. Briggs,	394
VI.—Newton's Fifteenth Query,	395
VII.—Description of the Optic Nerves and their Juncture in the Brain, by Sir Isaac Newton,	395
VIII.—Correspondence between Halley and Newton,	399
IX.—Halley's Verses prefixed to the Principia,	417
X.—Brief Notice of Professor Cotes,	418
XI.—Newton's Directions to Dr. Bentley for Studying the Principia, and John Craige's list of Authors to be read before Studying the Principia,	420
XII.—Draught Copies of the Scholium to Lemma ii. Book ii.,	426
XIII.—Letters from Wallis to Newton,	428

Cambridge University Press

978-1-108-02556-0 - Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton, Volume 1

David Brewster

Frontmatter

[More information](#)

LIST OF ENGRAVINGS AND WOODCUTS.

VOL. I.

PORTRAIT OF SIR ISAAC NEWTON,	<i>Frontispiece.</i>
THE HOUSE AT WOOLSTHORPE, THE BIRTHPLACE OF NEWTON, .	4
SIR ISAAC NEWTON'S REFLECTING TELESCOPE,	41
FRONT VIEW OF LORD ROSSE'S TELESCOPE,	56
BACK VIEW OF DO. DO.,	57

VOL. II.

ROUBILLIAC'S STATUE OF NEWTON IN TRINITY COLLEGE,	<i>Frontispiece.</i>
THE ROOMS OF SIR ISAAC NEWTON IN TRINITY COLLEGE, .	46
THE HOUSE OF SIR ISAAC NEWTON IN MARTIN STREET, .	193
ENGRAVING FROM A CAST OF SIR ISAAC NEWTON'S FACE, TAKEN AFTER DEATH,	338
ENGRAVING OF A BOX BELONGING TO SIR GEORGE HAMILTON SEYMOUR, G.C.B., WHICH WAS PRESENTED BY SIR ISAAC NEWTON TO THE EARL OF ABERCORN,	342