# SIR ISAAC NEWTON

# AND MODERN ASTRONOMY

by

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Although this essay is self-contained, it is also to be the second part of a trilogy of which the other two parts are called *Galileo Versus the Geocentric Theory of the Universe* and *Einstein and Modern Physics*. In consequence, there are frequent cross-references between this essay and the other two, which make it, while certainly not necessary, never-theless obviously desirable that all three parts of the trilogy be read in con-junction with each other. The cross-references do not affect the argument of the essay.

(It may also be worth mentioning that the author has written another essay called *Evolution or Creation?*, which, although not designed to be part of this group of essays, is nevertheless on a subject which falls into the same general category.)

Grateful acknowledgement is given to Professor Richard Westfall for permission to quote extensively from his book, *Never at Rest* (Published by Cambridge University Press.)

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# SIR ISAAC NEWTON AND MODERN ASTRONOMY

## 1. Introduction

On page 504 of *The Sleepwalkers* Arthur Koestler wrote:

> During the last quarter-millennium of unprecedented human change, Newton has enjoyed an influence and authority only comparable to that of Aristotle in the two previous millennia. If one had to sum up the history of scientific ideas about the universe in a single sentence, one could only say that up to the seventeenth century our vision was Aristotelian, after that Newtonian.[1] Copernicus and Tycho de Brahe, Kepler and Galileo, Gilbert and Descartes lived in the no-man's-land between the two.

According to St. John's Gospel, chapter 15 verse 19, Jesus said:

> If you had been of the world, the world would love its own: but because you are not of the world, but I have chosen you out of the world, therefore the world hateth you.

Newton has certainly received the adulation of the world.[2] This is not in itself sufficient grounds to condemn him – Aristotle, after all, is mentioned by Koestler in the same context and I do not condemn him – but it should make the alert observer immediately suspicious; and closer examination shows that there is no shortage of grounds for further suspicion. I shall mention a few of them.

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[1] Some would argue with Koestler and say that our vision about the universe was now Einsteinian rather than Newtonian. Important and revolutionary though the influence of Einstein has been,. however, Einstein's universe does not contradict Newton's as Newton's contradicts Aristotle's. Rather than destroying Newtonian physics, Einstein's contribution (for convenience I am making the assumption in this chapter that Einstein was responsible for the contribution attributed to him although this will be questioned in the next chapter) was a means, and a very necessary means, of preserving it. This is summarized in the following extract from an article titled *Einstein Challenged* in the Economist of 5th February, 1977. "The world of Newtonian physics which Einstein took by storm already had cracks in it. Newton postulated rest and motion in relation to immovable absolute and featureless space, a concept which he later refined to that of luminiferous ether. But the famous Michelson-Morley experiment (described in the previous chapter – N.M.G.), though designed to establish the velocity of the earth with respect to the ether, failed to find any velocity... Einstein did not replace Newton but refined him." (Emphasis added – N.M.G.)

[2] Not the least significant sign of Newton's recognition by the world was the appearance in the 1970's and 1980's of his portrait on the English one pound bank note. I show in chapter ... that the Bank of England was founded and is run by the enemies of society and it can be taken as reasonably certain that anyone honoured by the current generation of the enemies of society would have been selected for the privilege for good reason. It is, for instance, safe to predict that Alfred the Great, a genuine English Christian hero, will never appear on a bank note issued by the Bank of England.

## 2. Some Highlights of the Life and Character of Newton

In the year 1696, after spending thirty-one years (following his graduation) in the university life at Cambridge,[3] he was appointed Warden of the British Mint by Charles Montague who had just become Chancellor of the Exchequer.[4] Why did he receive this appointment? Although it appears that he worked hard in the office, which he filled at the crucially important period of history when the Bank of England had just been formed, he was certainly not given it because of any expectation that he might contribute towards solving the Mint's problems.[5] Firstly, Newton had shown no *indication* of being an authority on the subject of money. Secondly, all authorities were agreed that by the time Newton filled it the position at the Mint had become a sinecure. The question therefore becomes: Why did Newton receive a sinecure?

I can immediately forestall any suggestion that it was offered to him in recognition of his services to science. Politics in England in the period following the so-called Glorious Revolution in which King James II was dethroned and William of Orange installed in his place was simply not like that. For confirmation of this I turn to a massive and often very informative biography of Newton published in 1980 called *Never at Rest* by Professor Richard Westfall – a book, incidentally, which I shall find valuable to use often in this chapter; because while Westfall is an admirer of Newton, and therefore cannot be accused of prejudice against him, he does not omit uncomfortable facts even when he clearly does not like what he is having to write.

Of Newton's appointment to the Mint, Professor Westfall writes:

> "We can only speculate on Montague's motives... The politics of revolutionary England did not ordinarily operate on that friendly basis. Patronage was the very marrow of power, and it is unlikely that he would have extended such a ripe plum as the Wardenship of the Mint wantonly. The Whig Junta was known for quite the opposite... What advantages could Montague have expected to extract from the appointment?" (*Never At Rest* by Richard Westfall: p. 557)

Westfall cannot answer the question, but. there are a number of things scattered in his biography and in others indicating that Newton was an agent of the international

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[3] He was Lucasian Professor of Mathematics.

[4] Montague was eventually made Earl of Halifax. He was clearly an important conspirator of the time, being one of the main architects of the new financial machinery set up in England after the formation of the Bank of England and also President of the Royal Society, which, as is described in chapter ..., was set up in conspirational circumstances as one of the most important public arms of the secret societies.

[5] The Mint did in fact have severe problems at that time caused by coin clipping which had started in the reign of Charles II and by the 1690's had become such an epidemic that coins were no longer accepted at face value. The crisis is described well in Richard Westfall's biography of Isaac Newton, *Never at Rest*.

revolutionary forces that feature in other parts of this book, and this is all that would be necessary to account for the favour given to him. Let us look at some of these indications.

First, almost immediately after the publication of his major work, *Philosophiae Nuturalis Principia Mathematica* (Mathematical Principles of Natural Philosophy), Newton leapt into prominence in politics in one of the turning points of English history, taking very much the revolutionary side. Indeed by the time Newton's publisher had performed the act, obligatory in connexion with all new books, of presenting a copy of the *Principia* to the King, Newton had, in the words of Richard Westfall, "placed himself irrevocably in the ranks of James II's enemies." This is how it happened.

In accordance with his ambition to reconvert England to the Catholic Faith without violence James had been using the well established procedure of making important university appointments by letters mandate to appoint Catholics to vacant fellowships in the colleges of oxford and Cambridge. In 1687, a crisis arrived when a letter mandate was delivered appointing a Benedictine monk called Father Francis to the degree of Master of Arts at Cambridge without having to take the normally mandatory oath to uphold the Anglican religion. The King was perfectly within his rights, both legally and according to precedent (Cambridge University had confirmed many degrees on visiting Catholic dignitaries as a result of letters mandate in the recent past), but Father Francis intended to reside at Cambridge and participate in the affairs of the university. Evidently fearful that his efforts at conversion might be all too successful, the authorities at Cambridge decided to take a stand, and much the most import ant. contribution to the resistance was made by Newton[6] Not least, as Westfall says, because of Newton and despite the patent. illegality of the University's stand, Father Francis did not receive the degrees.

A second clue is that "we know almost nothing about Newton's activities during the year and a half between the Cambridge hearing and the revolution which deposed James II," (*Ibid.* p. 479) although Westfall makes it clear that there is no doubt, from the circumstantial evidence supplied by the few facts we do know, that Newton had joined the leaders of opposition to the King. (*Ibid.* p. 480) From

[6] Westfall makes it clear that Newton prepared the documentation for the hearing which James II ordered after the letter mandate had been rejected and also further documentation which was hastily put together after the Vice-Chancellor of the University, after "a wretched showing" at the hearing, had been stripped of his office. One of Newton's drafts (which was not used) contained the following words which are remarkable for a man who is described by some of his biographers as being a friend of religious liberty. "Men of the Roman Faith have been put into Masterships of Colleges. The entrance into Fellowships is as open. And if foreigners (graduates from outside Cambridge) be once incorporated it will be as open to them as to others. A mixture of Papists and Protestants in the same university can neither subsist happily nor long together." (*Ibid.* p. 478)

this evidence, and the fact that he was the recipient of patronage at Cambridge immediately after the revolution, together of course with the fact of the appointment to the Mint that he was to receive a few years later, it is difficult to doubt that during this missing eighteen months of his life he was heavily engaged in the conspiracy to overthrow James in favour of Willam of orange.[7] Finally, if there is any doubt left, he was a member of the infamous Convention Parliament which declared the throne of England vacant as a result of James "abdication" and vested the crown in William and Mary: thanks to a contemporary pamphlet which published a blacklist of the hundred and fifty who opposed the Bill of Settlement and in which Newton's name does not appear, "we have solid evidence to assert that Newton stood squarely with the majority that declared James had forfeited the crown and that tendered it to William and Mary on 13th February, 1690." (*Ibid.* p. 484) I think we now have a fair idea of why Newton received his sinecure.

If, after the foregoing, there could be any doubt that Newton was a member of one or more of the secret societies warring against God and the human race, his involvement and the circumstances surrounding his involvement with the occult art of alchemy remove such doubt completely. Merely to state that he studied alchemy[8] is note in itself sufficient to condemn him; for it was considered a legitimate subject for investigation in the Middle. Ages, and even saints such as St. Thomas Aquinas had written about it. Newton's involvement with alchemy was very different from that of St. Thomas, however. I shall not attempt to convey an idea of his findings, which were fully in accord with occult tradition before and since, for this would take up much more space than would be useful.[9] Nevertheless I believe that it is well worth quoting a few passages from Richard Westfall on the background to Newton's chemical writings, since they show very clearly, especially to those who have some knowledge of the occult, that Newton was a secret-society initiate and adept.[10]

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[7] The following information given by Westfall is perhaps further circumstantial evidence of this. "As soon as Newton was elected (to the Convention Parliament in 1689) he set out for London and on the 17th January he dined with no less a person than William of Orange". (*Ibid.* p. 483) This is remarkable for there is no direct evidence that they had ever met before.

[8] Alchemy can be most briefly defined as the mediaeval equivalent of chemistry, and in most cases if not all was an occult science. (One of the more persistent aims of the alchemists was the transmutation of baser metals into gold.) For further information (which will probably be interspersed with a certain amount of misinformation) I refer the reader to any standard encyclopaedia.

[9] Professor Westfall gives some sort of summary in *Never at Rest*: pp. 290-309.

[10] From other evidence, at least one, and probably the main, secret society to which Newton almost certainly belonged was that of the Rosicrucians, founded by Francis Bacon (see chapter...)

Not all the entries in Newton's chemical glossary (composed around 1666) confined themselves to straightforward primary chemistry – or "rational chemistry", as those call it who wish to pretend that Newton did not leave behind a vast collection of alchemical manuscripts ... (*Ibid.* p. 284)

The order of development of Newton's chemical notebook is significant. He did not stumble into alchemy, discover its absurdity, and make his way to sober, "rational", chemistry. Rather he started with sober chemistry and gave -it up rather quickly for what he took to be the greater profundity of alchemy. (*Ibid.* p. 285)

Those who believe the Newtonian world to be reality should be disturbed at this evidence of Newton's preference of illusion over reality.

The evidence is clear that he was already at that stage (he was in his forties) a privileged member of an important occult society. More evidence is to come.

Westfall continues:

> Solid evidence shows that however it began Newton's alchemical activity included his personal introduction into the largely clandestine society of English alchemists. His reading in alchemy was not confined to the printed word. Among his manuscripts is a thick sheaf of alchemical treatises, most of them unpublished, written in at least four different hands. Since Newton copied out five treatises plus some recipes, the collection appears to have been loaned to him for study but. then, for whatever reason, not returned. (*Ibid*. p. 286)

During the following twenty-five years, Newton continued to receive a flow of alchemy manuscripts which he himself copied. These manuscripts offer one of the most intriguing aspects of his career in alchemy. Where did they come from? (*Ibid.* p. 288)

After looking at various items of evidence, Westfall says:

> The essential mystery of the alchemy manuscripts remains unclassified. The man who isolated himself from his colleagues in Trinity College, Cambridge, and discouraged correspondence from philosophical peers in London apparently remained in touch with alchemists from whom he received manuscripts.
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> The mystery refuses to be ignored. The manuscripts survive - unpublished alchemical treatises, copied by Newton, the originals of which are unknown... In 1696 an unnamed and shadowy figure ... visited Newton in Cambridge to discourse on alchemy. They did not meet by chance; the man came to find him. Newton recorded the conversation in a memorandum.
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> Alchemy formed the initial subject of a correspondence with Robert Boyle which commenced in 1676. His friendships with John Locke and Fatio de Duillier involved alchemy, but both of them began only in the late 1680's. Otherwise nothing. One of the major passions of his life, as testified by a vast body of papers which stretched over thirty years, a pursuit which included contact with alchemical circles as attested by his copies of unpublished treatises, remained largely hidden from public view and

remains so today.

> The experience of another collector, Elias Ashmole, helps in assessing Newton's manuscripts. In the preface of *Theatrum chemicum britannicum*, Ashmole declined to name the source of his treatises because they preferred not to see their names in print. His diary recorded a visit, not wholly unlike that which Newton received in 1696, when an unknown and mysterious man appeared at his door ready to reveal the Art. One remembers as well the elusive Eirenaeus Philalethes, who cloaked his identity in a pseudonym so effectively that only in this present generation have we learned with reasonable assurance he was George Starkey. We know that Newton also composed an alchemical pseudonym – *Jeova sanctus unus*,[11] an anagram of Isaacus Neutonus – and as knowledge of his alchemical activity becomes known, we may learn that Newton fed treatises into the same network from which he received them.
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> Meanwhile, against the background of deliberate secrecy, we can at least speculate that otherwise unexplained events in his life were alchemically motivated. (*Ibid*. p. 288)

Westfall then mentions a number of unexplained events. We can indeed so speculate, Mr. Westfall; we can indeed.

Although I have already said enough to justify my having suggested that Newton should be looked at with the gravest suspicion, before turning to his work there are two further aspects of Newton the man that are worth examining, both because they shed important light on his character and thus give further indication of what we might expect from his work, and also because they are so little known.

The first is his religious beliefs. As will already have been deduced by the reader from his activities in connection with Father Francis, "he hated and feared Popery," (*Ibid*. p. 483) and in addition he was, in the words of Arthur Koestler, "a crank theologian ... who held that the tenth horn of the fourth beast of the Apocalypse represented the Roman Catholic Church." (*The Sleepwalkers* by Arthur Koestler: p. 536) Indeed he was worse. As can clearly be seen from voluminous manuscripts that survive, Newton had early in his life reached the conviction that a massive fraud beginning the fourth and fifth centuries had perverted the legacy of the early Church, and that central to the fraud was the Scriptures, which he believed had been corrupted to support the doctrine of the Trinity. (*Never at Rest* by Richard Westfall: p. 313) "In Newton's eyes, worshipping Christ as God was idolatry, to him the fundamental sin." (*Ibid*. p. 314) To this it can be added that he did not even have the courage to make his views public, as would surely have been encumbent in a man of principle who saw his compatriots engaged in what he believed to be "the fundamental sin" of idolatry even if martyrdom had been the

[11] Bearing in mind that Newton's religious beliefs were Arian, as will be shown shortly, it is safe to describe this anagram as a piece of calculated anti-Christianity and, from the professinq Christian that Newton was (his Arianism was secret), blasphemy. By calling Jehova the one holy being, Newton is denying the holiness, and presumably the divinity, of the other two Divine Persons.

result. He not only refused to make his "important discovery", a phrase used by one of his friends who shared the same views,[12] public; in order to preserve appearances and to avoid damage to his career and popularity, he even continued to commit the "fundamental sin" himself until just before he died. Westfall tells us:

> No one considered Arians a threat to the state. They were a threat rather to the moral foundations of society.[13] Newton was well aware that the vast majority of his compatriots detested the views he held – more than detested, looked upon them with revulsion as an excretion that fouled the air breathed by decent persons... His heterodoxy allowed him every concealment... As long as he was willing occasionally to take the sacrament of the Church of England,[14] the law required nothing of him at which he need balk. Only on his deathbed did he venture to refuse the sacrament.[15] (*Ibid*. p. 486)

The last general feature of Newton that I shall look at. is his morality. To do so, I shall select another incident in connection with the Mint, his promotion from duty Warden to Master of the Mint in 1699. We have seen excellent reasons for his having received the original sinecure. What did he do to earn the further promotion?

This is what Voltaire, who visited England many years later, wrote in his *Dictionnaire Philosophique*:

> I thought in my youth that Newton made his fortune by his merit. I supposed that the court and the city of London named him Master of the Mint by acclamation. No such thing. Isaac Newton had a very charming niece, Madame Conduitt, who made a conquest of the minister Halifax. Fluxions and gravitation would have been of no use without a pretty niece.

"Madame Conduitt" (born Catherine Barton) was the daughter of Newton's sister and initially Newton's ward: after the death of her father, which had left her

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[12] This was Willam Whiston, who in his *Authentic Records* wrote the following illuminating words: "Sir I.N. was one who had thoroughly examined the state of the Church in its most critical juncture, the fourth century. He had early and thoroughly discovered that the Old Christian Faith, concerning the Trinity in particular, was then changed; and that what has long been Arianism is no other than old uncorrupt Christianity; and that Athanasius (who is a canonized saint – N.M.G.) was the grand and wicked Instrument of that Change. This was occasionally known to the few who were intimate with him all along; from whom, notwithstanding his prodigiously fearful, cautious, and suspicious temper, he could not always conceal so important a discovery." It should not be thought that this is the only indication of Newton's Arianism, for Westfall presents a mass of evidence in his book. Arianism is the name given to the denial of the divinity of Christ, and is so called because the first important propagation of this heresy, in the fourth century, was organised by a priest called Arius.

[13] The meaning of the word Arian is given in the previous footnote. The twentieth century reader may find it difficult to see why Arianism should be a threat to the foundations of society. The reasoning behind this opinion, which is in fact perfectly logical, is set out in chapter ...

[14] The Church of England Communion service did not purport to involve the change of bread and wine into the real Body and Blood of Christ as does the Catholic Mass, but it did unambiguously affirm His divinity.

[15] Westfall adds that John Conduitt, the husband of Newton's niece Catherine, (of whom more will be told in the next few paragraphs) recorded this with embarrassment and tried to explain it away (p. 487).

mother destitute, she had come to live with Newton in London and spent twenty years with him, remaining even after she had married John Conduitt. She was indeed, as Voltaire said, "very charming." According to Westfall, "By every account, Catherine Barton possessed unlimited charm, a woman of great beauty and wit."(*Ibid.* p. 595) Also the dates fit; for Newton became Master of the Mint not long after Catherine's arrival in London.[16] The question is: is there any truth in Voltaire's allegation that Newton put her beauty and wit to his own good use? Or rather, for we can hardly expect to find direct evidence that Montague sold the Mastership of the Mint to Newton in exchange for his niece's favours, is there good indication that Newton was the sort of man for whom such a transaction would have been by no means unthinkable, and, if there is, that Voltaire's allegation provides the explanation that most reasonably fits the facts?

Here, taken from pages 594-601 of his biography of Newton, are some of Richard Westfall's findings and thoughts on the subject.

"The suggestion that Newton owed his elevation to the mastership to Catherine's influence appears so wildly inprobable as not to merit serious consideration," is his opening confession of faith. Clearly if we wish to give serious consideration to such a suggestion we shall have to do so without his help, for in his world people in high places do not behave in such a fashion. This does not mean that we can obtain no help from him in establishing certain facts about the matter, however; for he adds: "The wider ramifications of the story, that is, her supposed involvement with Halifax, and Newton's involvement in it, do not evaporate with equal ease." (*Ibid.* p. 597)

> With Halifax the libertine, Victorian eulogizers could not bear to associate Newton. Nor could they bear the thought, the point of Voltaire's jibe, that Newton used the degradation of his niece to advance his own career. (*Ibid.* p. 596)

Nevertheless,

> …in the light of Halifax's bequest,... that Catherine Barton was his mistress is believable... On the 1st February 1713 he drew up a second codicil to his will which revoked

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[16] Newton's Victorian eulogizers tried to disprove the allegation by pointing out that Newton became Warden of the Mint in 1696, by which date Catherine had not reached her seventeenth birthday and Montague could hardly have set eyes on her. Whatever the truth of the matter, that argument is certainly no disproof, because Voltaire's specific words were "Master of the Mint", and that appointment, as already mentioned, was more than three years later by which time Catherine had almost certainly reached London. A much more serious apparent clash of dates lies in the fact that Montague resigned as First Lord of the Treasury in November 1699, a month before the death of Thomas Neale, the Master of the Mint whom Newton replaced. However, as Westfall points out, Neale had been failing in health for several years and "manoeuvring to appoint his successor may well have begun before his death."(*Ibid.* p. 597) To anyone who has had any experience of politics, "would certainly have begun" would have been more happily chosen words than Westfall's "may well have begun".

> the first (which already contained a handsome bequest) and replaced it with one nothing short of magnificent. To Isaac Newton he left £100... To his niece, Mrs. Catherine Barton, he bequeathed £5,000 with a grant during her life of the rangership and lodge of Bushey Park (a royal park immediately north of Hampton Court) and all its furnishings and, to enable her to maintain the house and garden, the manor of Apscourt in Surrey. (*Ibid*. p. 599)

And, although an official life of Halifax commissioned by his heir soon after his death claims that "that noble peer's Complaisance to her proceeded wholly from the great Esteem he had for her Wit and most. exquisite Understanding," nevertheless, as Westfall truly remarks,

> Whatever the Victorians made of it, most people in the twentieth century take such a bequest as a stiffer price than wit. and understanding normally command... (*Ibid*. p. 598)

> This much is certain: Newton did not propose that his niece should lose the fortune. Among his papers are notes on and suggested changes in the legal documents between Catherine Barton and Halifax's heir that carried the bequest into effect... and, far from feeling shame, Newton kept a protrait of Halifax in his room, as the Abbe Alari noted when he visited him ten years later. (*Ibid*. p. 601)

Without a direct admission from Montague or Newton we can never prove that Newton's promotion and his co-operation with "the degradation of his niece" were linked but we certainly have sufficient evidence that the suggestion is far from unreasonable. We have, after all, seen evidence earlier in this chapter that Newton was unscrupulous. We also know that the degradation did not take place without his full consent, for the authority of a man in his position – the head of the family with a young niece whose father was dead and was living with him – was far greater than can even be imagined in the late twentieth century, and if nothing else he could have banished her from his house. Why did he cooperate? Unless there was some considerable hidden advantage to him it was much against his interests to do so, for as Westfall shows his niece's behaviour was a cause of much scandal which could not help but reflect on him. There can be little doubt, therefore, that some considerable hidden advantage existed.

It is interesting to note the attitude of Westfall, who as I have mentioned is a strong protagonist of Newton's, to the light which the affair throws on the character of his subject. "It has beeen felt," he writes defensively, "that his acquiescence to his niece's relation to Halifax, which was not a legal marriage, must somehow diminish his stature."(*Ibid*. p. 600) We can well see how such a thought might have entered into people's minds, and we wait with curiosity for Westfall to show us why a wholehearted admiration for his hero can, nevertheless, still be justified.

For all his genius he was a man like all of us, having similar moral choices in terms not altered by his intellectual achievement. ..(*Ibid*. p. 600)

We can agree so far, although we should add that his intellectual capacity gives him more responsibility than most of the rest of us have, because his ability to do good or harm is much greater.

> He knew what compromise was.

My goodness, he did!

> His pretence of religious conformity for social acceptance and material benefit was not utterly incommensurable with acquiescence in a most advantage liaison.

Once again, we can be happy to agree.

> For that matter, he knew what sexual attraction was – and, from every indication, its gratification, of necessity outside the bonds of holy wedlock. Bishop Burnett said that he honoured Newton "for something still more valuable than all his Philosophy for being the whitest Soul he ever knew..."

This, in view of what we know about Newton, tells us much about Bishop Burnett, who plays an important role in some of the events described in chapter ...

> ... but close examination of his treatment of Hooke and Flamsteed,[17] to name no more, has revealed some dark stains on the erstwhile whitest soul. There is no reason to separate sexual behaviour from other moral conduct. Newton's role in history was intellectual not moral leadership... For me at least, the recognition of his complexity as a man helps in understanding the price his genius exacted. I find it hard to reconcile the Principia with a plaster saint. (Ibid. p. 601)

This is the crux of the matter. It is the point at which it is vital to part company with Westfall. Probably in no century in the whole of history other than our own could a man have seriously suggested that leadership of any kind be separated from moral virtues. Even the loathsome Bishop Burnett, whom I show in chapter ... to be in the very top rank of the really evil men of his day, realized the necessity at least to pretend that Newton was a man of moral integrity if his work was to have the desired credibility.

The point is that, even for strictly practical reasons alone, morals and intellect cannot be split neatly into two separate compartments with, as Westfall implies, the one having no connection with the other. In the first place, once we know a man to be immoral and to be prepared to go to any lengths to better his own material position, we also know that there is at least as good a chance that he will be trying to lead us towards falsehood as towards truth. Indeed we can go so far as to say that if there should exist the group of people whose existence is postulated

[17] I refer the reader to *Never At Rest* for a description of various episodes in connection with them.

throughout my book – people who wish to deceive us and are in a position to pay someone like him for help in furthering their plans – he will almost certainly be prepared to prostitute himself and give such help. In the second place, even in the unlikely event that the motives of such a man are pure, we cannot expect. that. his manner of arguing will be honest. As we saw with Galileo, who used the demonstrably false argument. that the phenomenon of ocean tides proved his theory of a heliocentric universe, an immoral man will be totally unscrupulous in his attempts to show that what he believes is true, and in this way he will deceive not only others but. frequently also himself. Far from his moral character being irrelevant to his intellectual leadership, therefore, it is of the highest importance. And in view of what we have now learnt about Newton's standards of morality, not to take the most critical look at his work which has exercised such a dominating influence on the world ever since would be madness; and even greater madness would be to put. any trust in any arguments used by him that we cannot follow.

Let us therefore now begin at last to look at Newton's work, which is the principle purpose of this chapter. It has been necessary to spend some time painting in the background, and what has been shown may convince many that Newton, far from being "the whitest soul" that Bishop Burnett ever knew, was one of the blackest souls that ever lived, but. we must not lose sight of the fact that this section of my book is not principally about truth and virtue but about cosmology. And therefore the purpose of the background is not to establish Newton's moral stature solely for the sake of doing so – but to help us assess the value of his work. The primary question that we are trying to answer, in other words, is not whether he was good but whether he was right., whether what he said was true.[18]

To attempt to assess all Newton's work in the space of a short chapter is of course impossible. The range of subjects that he covered in the *Principia* alone was vast, and outside the *Principia* the number of other subjects he treated, such as

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[18] I add that in asking this question it is not necessary to question Newton's genius. As is shown in other places in this book, and indeed in the example of Satan himself, a towering intellect can just as easily lead a person to the incorrect as to the correct answers. That I do not need to, and therefore shall not, try to disprove his genius for the purpose of assessing whether he was right or wrong does not, incidentally, mean that I necessarily accept his genius as an established fact. Apart from any evidence to the contrary that may be suggested in the rest of this chapter it must be remembered (a) that for an unscupulous person plagiarization is always a possibility (indeed another prominent scientist of the day and fellow-member of the Royal Society, Robert Hooke, even before the book's publication "insisted that Newton had stolen the *Principia* from him" (*Ibid.* p. 47) but his claim, although persistently pressed, was unsuccessful); and, (b) that when a man is a member of an occult society it is always possible that he is not giving to the world something original but merely acting as an instrument for the propagation of something that the society now deems it appropriate to launch into society (examples of this are given elsewhere in the book). Thus, while there is no doubt that Newton was a man of powerful intellect, whether he was an originating genius is much more open to question.

mathematics, the theory of light and colour, and theology, was greater still. Forced, therefore, to be selective, the approach I shall adopt is as follows. First I shall take a brief look at the circumstances of the publication of his most important and influential work, the *Principia* just mentioned, and at the reception with which it was greeted in order to see whether any further grounds for suspicion about its contents are suggested thereby. Then I shall take the theory which more than any other has made Newton one of the most famous men in history, the theory of gravitation, and subject it to scrutiny. Finally, then I shall take a look at the merits of the overall cosmological system which Newton gave us. I shall move forward from Newton's time and have a look at Newtonian universe to which the adoption of his thinking has logically and inevitably led us in the present day.

## 3. The Launching of the *Principia*

The *Principia* was published in 1687 and all the indications are that the publicity channels of that period were carefully orchestrated to ensure that it. appeared with the maximum impact. Indeed, although no-one even claimed to be able to understand it fully, to judge it as anything but a masterpiece was from the earliest days something that could not be contemplated. "Rumours of the coming masterpiece had flowed through Britain the first half of 1687," writes Westfall. "When the young Swiss mathematician, Nicolas Fatio de Duillier, arrived in London in the spring, he found intellectual circles aflutter with expectation of the book, which would, he was assured, remodel natural philosophy... Almost from the moment of its publication, even those who refused to accept its central concept of action at a distance recognised the *Principia* as an epoch-making book."(*Ibid.* p. 469) This is remarkable in view of the fact that it is certain that no one understood it at the time, and that it is doubtful if anyone has ever understood it since. "Across the channel John Locke set himself to mastering this book. Since he was not a mathematician he found the demonstrations impenetrable." It is far more likely that he found them so because they <u>were</u> impenetrable. "Not to be denied he asked Huygens if he could trust the mathematical propositions. When Huygens assured him he could, he applied himself to the prose and digested the physics without the mathematics." (*Ibid.* p. 470)

In other words Locke's acceptance of Newtonian physics was not based on logical proof but on blind trust. This was indeed a new and streamlined scientific method. The question is, of course: how much were Huygen's assurances worth? It is much easier for a famous mathematician to give a blind assurance than to admit that he does nor. understand it either, especially if he is not called upon to demonstrate that he understands it; and there is of course also the possibility

that Huygens was a member of the orchestra which was ensuring that the *Principia* was universally acknowledged to be "epoch-making".[19] Moreover we know that most mathematicians on their own admission found Newton's demonstrations as impenetrable as did laymen. According to Westfall, Gilbert Clerke, a mathematician as well as a philosopher, who had published a number of minor works, wrote to Newton about the *Principia* saying that he despaired of understanding it; (*Ibid.* p. 471) and a modern writer on mathematics, Professor Morris Kline, informs us: "The *Principia* is extremely difficult to read and is not at all clear to laymen, despite. statements by educators to the contrary. The greatest mathematicians worked for a century to elucidate fully the material of the book."( *Mathematics in Western Culture* by Morris Kline) In other words it is not at all clear to mathematicians either. When something takes a century to elucidate we have grounds for being suspicious, for, as is maintained often in this book, truth may be profound but it is not obscure. When a work is accepted as "epochmaking" and "a turning point for natural philosophy" long before it has been elucidated, it is positively demanded of us that we be very suspicious indeed.

## 4. The Universal Law of Gravitation

Of all Newton's contributions to what by most people would be called scientific knowledge, but by us, since we are at present investigating whether it is true, cannot yet be given a name (like "knowledge") which presupposes its accuracy, there is one in particular which has translated his name into legend. And if he is right about this one, his Universal Law of Gravitation, the fourth of his four basic laws of the universe,[20] we can perhaps forgive him much else about which he may be wrong. Formally stated, this law, if it be a law, says 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' squares of the distances between them."

And the first thing to be said about Newton's fourth law is that it is not a law at all, but simply a hypothesis.[21] Indeed it is not even a hypothesis. As is shown in more detail in

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[19] This possibility is not diminished by the fact that Huygens, the leading mathematician of his day, was Dutch. As is shown in chapter ..., Holland was much the most important centre of subversion at that time. It was, for instance, in Holland where the overthrow of King James II was planned and organised, and from Holland that William of Orange arrived.

[20] The four basic laws to which Newton reduced all observable motion in the universe are: the law of inertia, the law of acceleration under an impressed force, the law of reciprocal action and reaction, and the law of gravity.

[21] Defenders of Newton can at first sight reasonably claim that Newton himself would not dispute this statement, since when he set out the four laws covering the universe in the *Principia* he called them not laws but propositions and theorems, and it can be suggested that it is only subsequent interpreters and commentators who have raised them to the status of laws. Nevertheless, while it is true that he avoided the word "law" in the

paragraphs 64-73 the purported law makes no attempt to say what gravity is, how it works, what causes it. It only attempts to give a basis of measurement; and a claim that a basis of measurement is a law about a thing would have been greeted by scientists of the Middle Ages with derision. They knew that one could never be truly certain of a theory until one knew its cause;[22] that mathematics was not an explanation – did not try to explain, did not even try to prove a thing's existence – but merely a method of calculation; and that quantity was only one attribute of things, and to them one of the least important.[23] They also well knew that it was very possible to make assumptions which could form the basis of accurate or nearly accurate calculation, and were therefore useful, but which were nevertheless entirely false.[24] The socalled Universal Law of Gravitation is a perfect example of the new scientific method that Newton gave to civilization. This method, of which the germ was contained in the scientific revolution initiated at turn of the seventeenth century by Francis Bacon[25] and which has since been adopted by every branch of science and by countless pseudo-sciences such as politics, economics, the social sciences, and even art, religion, ethics and psychology,[26] is as follows. Take. a phenomenon that can be observed, such as a weight falling to the ground, produce a mathematical measurement for it which fits, concoct a hypothesis which, however far fetched, could possibly account for the phenomenon, and finally

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*Principia,* it is certain from elsewhere in his writings that he regarded his propositions and theorems as laws. Indeed in a later addition to the *Principia* itself, the *General Scholium,* he says, in a discussion on planets and comets: "These bodies may indeed continue in these orbits by the mere laws of gravity." (My emphasis – N.M.G.)

[22] Aristotle said: "We suppose ourselves to possess unqualified scientific knowledge of a thing when we think we know the cause on which the fact depends." (*Posterior Analytics* by Aristotle: 71B)

[23] In the time of Aristotle it was considered beneath the dignity of a gentleman, whose business was to know what things were, to involve himself with calculating quantities. All making of calculations was therefore left to the slaves.

[24] An example of this is Ptolemy's cosmological system of cycles and epicycles described briefly in the last chapter. It enabled calculations and predictions to be made as accurately as was necessary for the purpose for which astromony was needed, of which much the most important was navigation, and without complicated mathematics. It was not supposed that this was necessarily how the universe was constructed, however. The function of the Ptolemaic system was that of a useful calculating tool. (See paragraphs 65 and its footnotes 1-4, and 66 in chapter "Galileo *versus* the Geocentric Theory of the Universe".

[25] See chapter...

[26] The apostle of reducing the study of human nature to various branches, each constructed on mathematical principles, was Jeremy Bentham (1748-1832). His system of ethics, for instance, was based on the principle that pleasure (which in some people can of course be caused by malevolence) promotes happiness, while pain provokes unhappiness; that since a particular act may please some and harm others, the greatest good of the greater number is the measure of right and wrong; and that since different acts cause different degrees of pleasure or pain, measures (i.e. mathematical values) must be assigned to each type of act. As a system it is a big departure from that of the Ten Commandments, which are based on the principle that God says so and that is all we need to know; but it is the system which is in use today, it is the whole basis of modern democracy, and it provides the justification for abortion, euthanasia and any other form of mass murder. A good description of the history and implications of the reduction of human affairs to various mathematical sciences is contained in chapter 21 of *Mathematics in Western Culture* by Morris Kline.

call the hypothesis and the mathematical formula a law and, regardless of whether or not there is any theoretical justification for it whatever, apply it throughout the universe.

That is all that the famous Fourth Law consists of. To this day, after more than two millennia of hypothesizing about possible causes of action at a distance, no-one knows what gravity is and why it should be that two bodies should attract each other and thus whether they do. Newton's theory enables certain calculations to be made with reasonable accuracy, however,[27] and despite the facts that some of the calculations are not subject to independent check, leaving merely Newton's theory as the sole authority on which we rely for belief in their accuracy, and that – as we shall see – some observations and calculations actually contradict the theory, the theory had become a law. "Hypothesis, my dear young friend, establishes itself by a cumulative process: or, to use popular language, if you make the same guess often enough, it ceases to be a guess and becomes a Scientific Fact." (*The Pilgrim's Regress* by C.S. Lewis)

Although proclaiming laws which have no logical justification is already unscientific enough to shock any reasonably well educated mind of the past, Newton went further still. lie promulgated the Law of Gravitation in spite of his own clear conviction that it had no possible theoretical justification whatever. The indoctrination that the theory of gravitation is an indisputable law has been so effective that for most people a person who questions it is providing evidence of his insanity. It will come as a surprise to many, therefore, that it is not long since intelligent people held that it was belief in the concept of the pulling force of gravity that provided evidence of insanity, and it will certainly come as a surprise to most that Newton was emphatically one of these people. This conviction of his is well evidenced, perhaps most clearly in two of the four well known letters on gravitation he wrote to the Rev. Richard Bentley, who had studied his work carefully and was using it extensively in lectures he was giving at the time. In his second letter to Bentley, Newton wrote:

> You sometimes speak on gravity as essential and inherent to matter. Pray do not ascribe that notion to me. (*Newton's Correspondence,* Royal Society edition, vol 3, p. 240 – Newton to Bentley 17th Jan, 1693)

66 In his third letter, Newton expounded his meaning more fully in this remarkable and much quoted passage:

> It is inconceivable that inanimate brute matter should, without the mediation of

[27] But the mathematics needed to make this calculation are greatly more complex than those needed for the Ptolemaic system and indeed without Newton's and Leibnitz' invention of Calculus it would not be possible to make the calculation. Newton in fact did the very reverse of simplifying the universe as will be seen later in this chapter.

> something else ¯*which* is not material, operate upon and affect the ¯atter without mutual contact; as it must do if gravitation, in the sense of Epicurus, be essential and inherent in it. And this is the reason why I desired you would not ascribe innate gravity to me. That gravity should be innate, inherent and essential to matter, so that one body may act upon another at a distance through a vacuum, without mediation of anything else, by and through which their action and force may be conveyed from one to another, is to me so great an absurdity that I believe no man who has in philosophical matters a competent faculty of thinking can ever fall into it. Gravity must be caused by an agent acting constantly according to certain laws; but whether the agent be material or immaterial I have left to the consideration of my readers. (*Ibid*. vol 3, p. 253 – Newton to Bentley 25th February, 1693)

Newton, it can be seen, went even further than Charles Darwin, who disbelieved his own theory of evolution[28]: he believed that his theory could not be held by anyone with a competent faculty of thinking in philosophical matters, which in plainer language means no more than a routine capacity to think straight.

The material agent which Newton proposed as an alternative to immaterial agents, such as Aristotle's "immaterial substances" or spirits, was the ether, the "material substances of a more subtle kind than visible bodies, supposed to exist in those parts of space which are apparently empty." (*Encyclopaedia Britannica*: "Aether") As mentioned in the last chapter there is no doubt as to the existence of the ether and until Einstein abolished it by decree no one ever did doubt it; but how the ether could possibly produce the effect which Newton ascribed to gravitation was something that remained unexplained – perhaps understandably when it is realized that, as Koestler points out, a steel cable of a thickness equalling the diameter of the earth would not be strong enough to hold the earth in its orbit and yet the gravitational force which is supposed to hold the earth in its orbit is transmitted from the sun across ninety-three million miles of space without any material medum to carry that force. (*The Sleepwalkers* by Arthur Koestler: p. 151) "Newton endeavors to account for gravity," *Encylopaedia Britannica* says, "by differences of pressure in an ether;" but he did not publish his theory, "because he was not able from experiments and observations to give a satisfactory account of this medium, and the manner of its operation in producing the chief phenomena of nature..." (*Encylopaedia Britannica* : "Aether")[29] Koestler expands this a little further.

> Newton's concept of a "gravitational force" has always lain as an undigested lump in the stomach of science... He in effect could only get round the "absurdity of his own concept by invoking either ubiquitous ether (whose attributes were equally paradoxical) and/or God in person. The whole notion of a "force" which acts instantly at a distance without an intermediary agent, which traverses the vastest

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[28] See chapter... ("Evolution or...", paragraph...)

[29] It is interesting that Newton actually hit upon Le Sage's theory to explain gravitation (see paragraphs 88-91) and then discarded it. Why he discarded it is by no means clear because Le Sage and the three most respected physicists of the nineteenth century – Kelvin, Helmholta and Maxwell – calculated that it was both in accordance with observed data and mathematically sound. A possible reason, that to me seems very probable, is that Newton, or the subversive forces associated with him, preferred to impose upon the world an occult and metaphysical explanation rather than an obvious and realistic one.

> distance in seconds, and pulls at immense stellar objects with ubiquitous ghost fingers – the whole idea is so mystical and "unscientific", that modern minds like Kepler, Galileo and Descartes, who were fighting to break loose from Aristotelian animism, would instinctively reject it as a relapse into the past... What made Newton's postulate nevertheless a modern law of Nature, was his mathematical formulation of the mysterious entity to which it referred. (*The Sleepwalkers* by Arthur Koestler: p. 344)

The fact is that, far from disbelief in the notion that objects pull at each other by virtue of their masses being evidence of insanity, "magnetism, gravity and action-at-a-distance," in the words of Koestler, "have not lost an iota of their baffling mystery since Dr. Gilbert..."[30] ( *Ibid.* p. 507) In the words of Professor Kline, the only sense in which gravitation has been accepted is as a "common unintelligibility." (*Mathematics in Western Culture* by Morris Kline: p. 244)

It should not, incidentally, be imagined that the concept of gravitation was a new one when Newton encapsulated it into a law. His immediate predecessors in this field of science had considered the possibility but had discarded it for reasons that are equally valid and applicable today. Koestler writes:

> Like Kepler who hit on the concept of gravity, then kicked it away, like Galileo who rejected even the moon's influence on the tides, Descartes' wide open mind boggled in horror at the idea of ghost arms clutching through the void – as unprejudiced intelligence was indeed bound to do, until "universal gravity" or "electro-magnetic field" became verbal fetishes which hypotized it into quiescence, disguising the fact that they are metaphysical concepts dressed in the mathematical language of physics. (*The Sleepwalkers* by Arthur Koestler: p. 508)

There is one more important objection to the notion of a gravitational pulling force. No less important a failing than the lack of logical support for it that has just

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[30] It was only thanks to Dr. Gilbert, who was court physician to Queen Elizabeth, that Newton's concept of gravitation was by his (Newton's) day capable of being even remotely acceptable to the human mind. Of his contribution Koestler writes: "Dr. William Gilbert increased the confusion with the sensational theory that the earth was a giant lodestone, which induced Kepler to identify the sun's action on the planet's as a 'magnetic force'. It was quite natural, and indeed logical, that the confusion between magnetism and gravity should arise, for the lodestone was the only concrete and tangible demonstration of the mysterious tendency of matter to join matter under the influence of a force which acted at a distance without contact or intermediaries. Hence the magnet, which demonstrated that the grappling by ghostly fingers was a fact, became the archetype of action-at-a-distance and paved the way for universal gravity. Without Dr. Gilbert, man would have been much less prepared to exchange the homely and traditional view that 'weight' meant the natural tendency of bodies to fall towards the centre for the adventurous notion that it meant the grappling of bodies at each other across empty space." (*Ibid.* p. 601) Some readers may at first wonder why, given the definite existence of magnetic attraction, the idea of gravitation as a pulling force should be so unacceptable. Why, in other words, should not magnetism and gravity be confused (if confusion is the right term for something that appears so reasonable)? The answer is that magnetism is very different in its action from what is conceived of as gravity. To take just one example of difference, magnetism is as much a repelling force as an attracting force: opposite poles attract. and like like poles repel, and there is no way in which this law can be fitted into gravitational theory.

been shown up is the fact that it does not account for all observed phenomena. Chief of a number of experiments which contradict the theory are those concerning pendulums, which exhibit many properties which cannot be reconciled with the view of gravity that Newton founded. During eclipses of the sun, for instance, they behave strangely, and swing -irregularly; and if other masses are placed near them they do not swing in the directions that the laws of gravity would lead a mathematician to predict. (I add in parentheses that although these inconvenient experiments are occasionally recorded and commented on in specialized scientific journals, they are never thought worth including in text-books on physics.)

It would not be right to conclude this criticism of Newton's gravitation theory without mentioning that it has one great triumph to its credit which does on the face of it give it experimental support. This is the story of the discovery of the planet Neptune.

In the nineteenth century it was observed that the orbit of Uranus deviates from the path that would be expected of it from the gravitational influences of the sun and the known planets. From this it was deduced that there must be some massive body beyond Uranus which causes these deviations from the calculated orbit. Two astronomer/ mathematicians J.L. Adams and U.J.J. Leverrier then used the observed irregularities and the general astronomical theory of Newton to calculate the orbit of the supposed new planet, and observers were instructed to search for the planet at the time and place which had been mathematically determined. In 1846 the planet, now called Neptune, was found, just one degree from its predicted position. Very reasonably, this was at the time "widely proclaimed as the final proof of the universal application of Newton's law of gravitation." (*Mathematics in Western Culture* by Morris Kline: p. 244)

What is the solution? Ruling out pure coincidence there are four possibilities.

The first and least likely is that despite what is said in this chapter and despite its offensiveness to common sense, Newton's theory is correct after all.

The second is that an alternative theory to Newton's, using very different forces but producing much the same mathematical effects, is correct, and that Newton's theory therefore produced the right answer for the wrong reason. Such a theory is that of Le Sage, which I shall shortly be describing.

The third theory, which will be rejected by most readers but is in fact the most likely, is that the existence of Neptune has long been known, presumably discovered by an earlier civilization which possessed advanced technology, has been preserved in occult tradition, and was released to support Newton's theory just as

missing link fossils have been concocted to support Darwin's evolutionary theory.

The fourth possibility is that the position of Neptune was revealed directly by Satan to his followers. This too is not improbable. Satan has limitations - he does not know the future and he cannot read our minds (except what he can guess from external observation) – but he certainly knows where the planets are.

The circumstantial evidence, both negative and positive, in favour of one or other of the last two possibilities is in fact surprisingly good. On the negative side the mathematics involved in the calculation that Adams and Leverrier are supposed to have made are virtually impossible. Not only were they working backwards – in other words instead of calculating the effects of a planet whose mass and path were (supposedly, in the case of the mass) known, they had to deduce the mass and path from its effects on Uranus – but since they knew neither the mass nor the path of their hypothetical planet they were dealing with two unknowns. Under those circumstances, let alone the impossibility of making really accurate calculations over the distance involved, it is not credible that they could make even a reasonably accurate prediction of time and place.[31]

The positive evidence is that we know for certain that there are occasions when bodies in the solar-system are known about well before they are officially discovered. Of this inside knowledge I give two examples.

The first concerns the two satellites of Mars, Deimos and Phobos. In the year 1720 Jonathan Swift's famous work of fiction *Gulliver's Travels* was published. In it Swift gave a remarkable description of two moons belonging to Mars, one of which he said was three diametres of Mars away from the centre of Mars and had a period of revolution of ten hours, and the other five diametres away with a period of revolution of twenty-one and a half hours. More than one hundred and fifty years later, in the year 1877, it was discovered that Mars, which until then was thought to be on its own, did indeed have two satellites, so small that they were not observed until long after those of other planets (even of Neptune) had been discovered. Their respective distances from Mars and orbiting periods were just over two diametres and seven and a half hours and four diametres and thirty and a quarter hours. Swift's figures are not quite correct but anyone who imagines that he plucked the number of moons, and their distances and orbiting times out of his imagination is living in a world of fantasy. It is worth adding that Kepler too predicted two

[31] Further evidence of the virtual impossibility of making such a prediction will be found in the Appendix to this chapter, in which I reproduce some extracts from *Gravitation Versus Relativity* by Professor Charles Lane Poor. In one of these extracts Professor Poor says: "So long as there are but two bodies in the system,... the actual position of the smaller body, (travelling) for ever and ever around and around its unvarying path, can be calculated at any time by a very simple formula. If, however, a third body be introduced into our universe,...the paths of the three bodies become so complicated as to defy mathematical description."

moons for Mars in 1610, his ostensible reason being that since the earth had one moon and Jupiter, at that time, was known to have four it was clearly logical that Mars must have two. Although this provides an excellent example of a phenomenon I mentioned earlier in this chapter – that of a wrong theory producing the right answer – once again we can suspect that what was published was not the real basis for Kepler's prediction.

The second example of inside knowledge, one that is even more analogous to the discovery of Neptune, concerns the discovery of the least known (so far) and most distant planet of the solar system, Pluto. After the discovery of Neptune there remained unexplained perturbations[32] in Uranus' orbit and in addition seemingly unexplainable perturbations were discovered in Neptune's orbit. This time some calculations were made by Professor Percival Lowell. A still more distant planet was hypothesized, and in 1930, situated in approximately the right place at the predicted time, the planet Pluto was located. So far so good; but pay attention to the sequel. It then discovered that the calculations of Lowell, who had died even before the discovery of the new planet, were based on bad data; and, as all are agreed, the discovery of Pluto in approximately the right position at the right moment was pure chance. Certainly pure chance is possible, though no one who took a glance at the night sky would wish to calculate the odds against such a coincidence; but in my view it is more reasonable to suppose that the predictions of Pluto, of the two moons of Mars, and of Neptune were the result of neither pure chance nor mathematics and that their existence was already known.[33]

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[32] A perturbation is the deviation of a heavenly body form its theoretically regular orbit. It is usually assumed that the cause of the perturbation of any given of planet is either the attractions of bodies other than the primary body which attracts it (in the case of the planets and the sun) or its imperfect spherical form. This of course adds strength to my suggestion that the pinpointing of the whereabouts of Neptune was not genuinely based on mathematical calculations. Had they been genuine the perturbations of Uranus that remained unexplained after the discovery of Neptune would have thrown them out.

[33] After completing this chapter I noticed a major piece of circumstantial evidence adding weight to my insistence that the manner of the discovery of Neptune, as recorded by history up to the present, is false. In an important book called *The Case Against Einstein*, from which I quote in the next chapter ("Einstein and Modern Physics"), the author, Dr. Arthur Lynch, includes the following intriguing footnote on page 160. As evidence it is especially impressive in that Dr. Lynch is clearly at a complete loss as to what it could signify, and has no suspicions along the lines that I am suggesting. "The celebrated astronomer, Le Verrier, once showed to Wilfred de Fonvielle, who told me the story, the great mass of his "cahiers" (memoranda books) which contained the calculations that led to the discovery of the planet Neptune. He gazed for some time on these repositories of his genius and his patience, then suddenly remarked: '*Si tout cela n'etait que de blaguel*'. (What if all that were not mere humbug.) I have often meditated on the saying." The most obvious, but most shocking solution apparently did not occur to Dr. Lynch, and he continues: "I think it was a philosophic reflexion, in Jacobi's vein, of the perilous nature of a long series of deductions where any step may have lacked the necessary rigour. In any case Le Verrier – so M. de. Fonvielle assured me – burnt his book, though – as M. Escanglon has assured me – the calculations are preserved." The burning of the books, the alleged preservation of the calculations, together with the clear inference that no one has undertaken the appalling labour of checking their validity, are strong confirmation, given that grounds for suspicion already existed, of fraud. See Appendix for a further discussion of the improbabilities involved in the claim that these heavenly bodies were located by calculation.

## 5. Instead of the Law of Gravity?

If the so-called Law of Gravity has now been sufficiently criticized, the fact that people in the twentieth century are so accustomed to the idea of gravitation that they will find it difficult to conceive the possibility that it may not exist requires the raising at this stage of a new question. If gravity be not explicable, if it be not proved, and if, for the sake of discussion, we assume that it is not true, what is the alternative? The planets do move in relation to the sun, either the earth or the sun does move in relation to the other, satellites do orbit round the earth, the tides are affected by the moon. Something does happen. What is that something? If you are going to reject Newton's explanation, Newton's defenders may demand, you must produce a btter explanation.

It is, of course, not true that a better explanation must be produced before rejecting Newton's. In the first place, Newton's "explanation" itself is not an explanation. As we have alrady seen, it explains nothing but merely measures. In the second place, even if no alternative to the theory had been advanced there could be no excuse for describing it as a law. If in the days when it was held that things could be known for certain it was permissible to confess ignorance, and indeed it was permissible, it is clearly outrageous to refuse to confess ignorance in an age which no longer believes in absolute truth. Having made this proviso I shall try to answer the question nevertheless; for it is a little known fact that alternative theories that are a more rational than Newton's have been advanced and seriously considered.

The most appealing of these theories, and the only one I shall describe, is the collision theory of gravity put forward by the Swiss physicist, George Louis Le Sage (1724-1803).[34] It was first aired in 1782 in the Transactions of the Royal Berlin Academy in a paper called "Lucrece Newtonien" ("A Newtonian Lucretius") and was published in its final form posthumously in Geneva in 1818 in *Traite Physique Mecanique*. Le Sage's suggestion was that space was filled with a fluid – which of course was none other than the ether which, until Einstein, was generally held to exist (and undoubtedly does exist) throughout the universe[35] – consisting of minute particles (he called them "ultra mondane corpuscles") that traversed space in straight lines in all directions. They were so small that the collision between one particle and another was an event of rare occurence, but they did collide with any molecules of such other matter as lay in their path. Thus these corpuscles were physical agents which did not pull matter but pushed it.

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[34] The account of Le Sage's theory which follows is somewhat compressed because of limitations of space. The reader who finds it difficult to grasp is referred to a fuller and very easily comprehended account in the article "Atom" in the ninth and tenth editions of *Encyclopaedia Britannica*.

[35] See chapter "Galileo and the Geocentric Theory of the Universe", paragraphs 20-27.

The way in which Le Sage's corpuscles affected the various bodies in the universe can most easily be understood with the help of an example. If a single ball is assumed to exist, the particles will bombard the ball equally from above, beneath and from all sides, so that, like a balloon held in equilibrium in the atmosphere, it will not move. If, then, a second ball is brought into the picture, each ball will shield the other; so that the first ball is bombarded with particles from every side except that shielded by the second ball, creating an inequality of pressure and a net force in the direction of the second ball, and the second ball is similarly pushed in the direction of the first ball. For the two balls can be substituted the earth and the moon, the earth and the sun, and any other celestial bodies which affect each other's movement, and also any object on or near this planet which behaves as though it is attracted to it. The denser the materials are of which the matter under bombardment is composed, the less easily the particles will be able to penetrate the matter and therefore the greater the force that will be exerted on the matter, thus accounting for the variations in specific gravity between one material and another. The theory, already attractive, has a further outstanding feature. Not only has the magnitude of the force postulated by it been computed to be exactly the same force as that postulated by Newton, but the aberrations in pendulum behaviour which, as mentioned in paragraph 74, the Newtonian model could not account for – for instance during eclipses of the sun or when the pendulum is approached by other masses – become, when the Le Sage model is applied, explicable and predictable. What Le Sage produced, therefore, was an explanation for gravity which required no metaphysical ghostly fingers or mind-straining concepts of action-at-a-distance but instead was both physical and entirely reasonable.[36]

Mental habit, hypnotized into existence, as Koestler says, by twentieth century verbal fetishes, may make most people wish to dismiss Le Sage's collision theory as that of a crank. It was not thus dismissed in its day. Three of the leading and most reputed physicists of the nineteenth century, Lord Kelvin, Hermann Helmholtz and J.C.Maxwell, investigated the theory thoroughly and did considerable work on it. Each of them stated positively that it was the most satisfactory explanation for the phenomenon of gravity and that it explained all

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[36] As mentioned earlier Newton did in fact consider a theory along the lines of Le Sage's; but he discarded it because he was unable "to give a satisfactory account of the medium, and the manner of its operation in producing the chief phenomena of nature." (See paragraphs 69 and 69F) It is, incidentally, reasonable to ask why, if the Le Sage theory be true, we do not become lighter if we walk underneath a thick lead roof. The answer is that, although the effect is extremely small, we dol To give an example, if a person bends himself over a modern gravimeter, the gravimeter records a small reduction of the earth's gravity. The explanation for this of course is either, as Newton would assert, that the person's body "pulls" against the earth's pull; or, according to Le Sage, that the body "screens" a tiny bit of the universal . . .**((this line on EU paper size cut off at bottom of US paper))**

of gravity's observed effects.[37] The theory is reasonable, physical and was approved by leading physicists; and, it has been dropped. The reason officially given was that the amount of heat generated by the bombardment of the corpuscles would in a short space of time raise the temperature of the whole material universe to a white heat. "It does not appear to us that the theory can account for the temperature of bodies remaining moderate while these atoms are exposed to the bombardment,"(*ibid.*) wrote Professor Maxwell. It is doubtful whether much ingenuity would be needed to produce such an accounting.[38] A Professor James Hanson of Cleveland State University has suggested a much more likely reason why the theory was abandoned and has never been considered by establishment scientists since. (The only place I know of where this suggestion has been published is in a taped lecture given on April, 27th, 1979 in St. Thomas Church, Houston, Texas at the 16th Annual Conference on Teaching in Christian Schools. The tapes were sold by The Rose Enterprises, P.O. Box 308, Port Hueneme, California 93041.) Using the geocentric model of the universe and applying Le Sage's principle, the motions of the planets can be

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[37] An example of such approbation of the theory is to be found in the articles on "Atom" and "Attraction", in which the Le Sage theory is described, in the ninth and tenth editions of Encyclopaedia Britannica, the author of the articles in question being Professor Maxwell. For instance: "The force of attraction would vary directly as the product of the areas of the sections of the bodies taken normal to the distance between them. "Now the attraction of gravitation varies as the product of the masses of the bodies between which it acts, and inversely as the square of the distance between them. If, then, we can imagine a constitution of bodies such that the effective areas of the bodies are proportional to their masses, we shall make the two laws coincide. Here, then, seems to be a path leading towards an explanation of the law of gravitation, which, if it can be shown to be in other respects consistent with the facts, may turn out to be a royal road into the very arcana of science." (*Encyclopaedia Britannica*: 9th and 10th editions: "Atom") Moreover in the same article the account of the theory ends as follows: "We have devoted more space to this theory than it eems to deserve because it is ingenius and because it is the only theory of gravitation which has been so, far developed as to be capable of being attacked and defended."

[38] Maxwell himself did not regard his objection on the grounds of overheating as the final word on the subject, as he admitted subsequently in the Philosophical Maqazine and other journals of that period. This difficulty with Le Sage's theory that Maxwell has raised is that although energy can be turned into another form it is never lost. Therefore it would be expected that when the corpuscles struck. a solid object either they would bounce off with exactly the same velocity as that with which they struck it, which would push the two objects apart again and result in no net "gravitational attraction" and thus destroy the theory, or the energy, which must go somewhere, would be converted into heat (which is what happens in normal collisions - the collision of two billiard balls warms up the balls). It is, however, purely an assumption that the energy released by the. conversion must be converted into heat, and it is certainly not beyond the power of God to produce an alternative which solves the problem. In other words, if the Le Sage fluid exists, God could easily have endowed it with properties that allowed such disastrous effects on the universe not to take place, anyway within a time span of under ten thousand years. One solution, suggested in Maxwell's own article in the *Encylopaedia*, is that the particles might some how acquire a spin on collision, and there are doubtless many other ways in which the energy might be stored.

calculated showing not only their orbits but also their perturbations; and indeed every celestial phenomenon which needs Einstein to explain it becomes explainable on physical grounds and therefore without the help of Einstein. Geocentricity, however, according to the modern scientific mind which denies absolute knowledge, is as absolutely untrue as evolution is absolutely true; and if Le Sage's theory implies geocentricity it "cannot" be right.

In concluding the specific examination of gravitational theory on which I have engaged I emphasize strongly that I do not put forward Le Sage's collision theory as proven fact. I put it forward only to demonstrate that in respect of Newton's unquestioned "law" of gravitation there is at least one alternative theory which supplies a physical and reasonable explanation which Newton's lacks and which accounts for observed phenomena better.

## 6. Newton's Legacy

Now I shall turn from the particular to the general and look at the world which Newton has bequeathed us both directly in his own writings and also, by logical extension of Newtonian theory, indirectly in the writings of those who followed him.

I shall ask two questions: first, has the Newtonian system, as is claimed for it, simplified the universe and made it more comprehensible? Secondly, do we have reasonable grounds for believing that the Newtonian picture of the universe is the true one?

The question about simplicity and comprehensibility is a resounding "no".

Speaking about the heliocentric system in general, Professor Harold L. Armstrong, a professor of physics, wrote in 1977:

> Incidentally, the common theory nowadays is not the Copernican theory, nor the Keplerian. It is the Newtonian. For neither Copernicus nor Kepler really described the state of affairs all that well. It was not until Newton made it possible to consider the perturbations, the effects of one planet on another, that the theory could be really satisfactory. But, then, the statement often made, that the heliocentric theory is so much simpler than the geocentric, is false. For when the perturbations are adequately taken into account, the theory is as complicated as the geocentric ever was with its fullest glory of epicycles, etc ...(*Bulletin of the Tychonian Society*, October 1977. Letter to the editor, Professor Harold L. Armstrong, Department of Physics, Queen's University, Kingston, Ontario.)

It is not merely as complicated: it is very considerably more so. As Professor James Hanson[39] wrote in August 1980 *Bulletin of the Tychonian Society:*

[39] Professor James Hanson, professor of computer Science Department, Cleveland State University.

Ptolemy's model is a comparatively simple geometric-kinematical model, while Newton's requires the whole of the calculus, the theory of differentials and an elaborate theory of perturbations.

To many people calculus and differentials are little more than words. In order to gain a better idea of the complexity of the system let us therefore look at it throuyh the eyes of a student who is introduced to it for the first time. If the following makes some demands on the reader's concentration he can be assured that they are nothing compared with the demands made on the student.

In celestial mechanics, the "two-body problem" concerns the conjugate path of two heavenly bodies moving in a vacuum with no other bodies present, each held in an elliptical orbit by the other, such that at all times the gravitational and inertia forces on each are in blance. It was essentially this problem which Isaac Newton solved in 1684 using the postulated law of gravity, $F = GMm/r^2$. Assuming the planets insensitive to each other, and the sun a fixed body at one focus of their ellipses, he was thus able to show that the square of the period of each planet (i.e. the number of days in its year) is proportional to the cube of its mean radius from the sun. In due time, of course, slight error was perceived.

The problem is first introduced to the high school student in its simplest form. He is told to think of the sun as anchored in space, and each of the planets as revolving around it in circular orbit while in no way acting on each other. Likewise, he is taught to think of the moon circling a fixed earth. Putting gravity equal to centrifugal force at every point, the law of gravity reduces to: $r^3 = GMT^2/39.5$ where

r = radius of rotation
M = mass of central body
T = period of revolution, say, in days
G = universal gravitational constant

Our student perceives that, if this model is correct, once we know the distance from earth to sun (93,000, 000 miles), and the number of days in the earth's sidereal year (365.26), the mass of the sun can be determined (332,488 x earth mass). Likewise, knowing the distance from earth to moon (238,860 miles), the synodic month of 29.53 days and the value of **G** gives the mass of the earth. Similarly, the mass of every other planet, assuming a circular orbit and a fixed sun, is found from its radius and period around the sun.

Naturally, if the model is not correct – and there is no way in which it can be tested – any attempt to determine the masses by the method is a waste of time.

Later on, either in college mechanics or in books, our student is told that the model of the real solar system is not so simple, because:

a) the sun is not fixed in the heavens but is attracted toward each of its planets with a force equal to its attraction on that planet;

b) the earth is not fixed in its orbit around the sun, but is attracted toward the moon first to the left and then to the right of its orbital path every month, by a force equal to that which it exerts on the moon;

c) none of the planets (nor the moon around the earth) move in exactly circular orbits, but rather in ellipses, so that the speed and gravitational force between sun and

given planet changes from day to day. (Nevertheless, by Newton's brilliant deduction[40] without the aid of modern calculus, if the sun were fixed at one focus, each planet "sweeps out" an equal fraction of its ellipse in a given unit of time!);

d) none of the planets revolve about the sun in exactly the same plane, even though all the orbital planes lie within 3.4 degrees of the earth's orbital plane, except for Mercury (+7°) and Pluto (-17°) .

With respect to mass, mean distance from the sun, and eccentricity of orbit, he is then given certain measured data. With this data before him our student is then taught to think of each sun-planet pair, or earth-moon pair, as a "dumb-bell" with unequal weights at each end of the bar, spinning in space. about a fixed point in the connecting bar, called the "barycenter", located by the relationship: **rm = RM**, in which **r** is the distance from center to center of the two masses. Thus, and only thus (he is told) can two masses maintain a fixed orbital relationship in space over eons of time.

Thus, considering the Sun-Jupiter pair, the sun must revolve about a point 440,000 miles from its center once every 11.86 years (one Jupiter-year) in order to maintain its spacing from Jupiter, if no other planets were present. Likewise the earth must revolve about a barycenter (with respect to the moon) 2,900 miles from the center of the earth in order to maintain its spacing from the moon.

In short, no two proximate bodies exerting mutual gravitational attraction could exist indefinitely in the heavens, unless (1) one of them is "anchored", and the other given an initial velocity and distance satisfying r3 = GMT2/39.5; or (2) both must revolve about their barycenter with the same period **T**, while at the same time satisfying the above equation with respect to the total distance **r** that separates them.

Furthermore, if the path of any planet, or of the sun, about the barycenter, which is obviously much more irregular than a pure mathematical conic, is not recursive – i.e. does not repeat itself in due time – then it must be a random function which sooner or later will diverge or converge to destroy the system as we know it.

Suddenly our student may perceive the awesome implications of the solar system as we see it today. (Article by Robert L. Whitelaw, published in *Bulletin of the Tychonian Society,* February 1980, p. 17)

No, the Newtonian universe is not simple.

It should not be thought that the argument of simplicity is any evidence either for or against the Newtonian universe's being true. We have a right to assume that God constructed it on rational, logical and harmonious lines, but no right to assume that He made it simpler rather than more complex or vice versa. In order to try to assess whether or not this picture is realistic, therefore, we must strip away all our preconceptions and our inclinations to believe in it based on habit of mind, and critically examine and how much is based on solid and objective evidence and how much is mere assumption. If we find that it is entirely based on assumption and call to mind Newton's immorality and occult involvement we should be wise to reject

[40] I think this in an error, possibly a misprint, by the writer of the piece. As far as I am aware this "brilliant deduction" belongs to Kepler and not Newton. – N.M.G.

it.

The following passage by Walter van der Kamp, putting together a number of quotations by highly respected modern scholars, brilliantly shows up the extent to which many unquestioned Newtonian assumptions about the universe lack justification. The article was in the January-February 1979 issue of his *Bulletin of the Tychonian Society*.

## A Card Castle Built on Quicksand?

That the light from the stars and the galaxies needs years and years of highest-possible-speed traveling time to reach the Earth we do not doubt. The astronomers have told us this. And since they ought to know what they are saying, it is surely not necessary to verify or check the thousands of parsecs and millions of light years they dish out.

It isn't? Allow me a covey of quotes-with-notes. "When it was conceded that the earth is in orbital motion … it was realized that the stars are thousands of times more distant than the planets." (*Exploration of the Universe* by George Abell, Holt, Rinehart and Hinston, New York, 1969: p. 375) But, "What evidence is there that it is the earth,, not the sun, that moves? As in discussing the earth's rotation, we can only prove that the earth revolves if we are willing to accept certain postulates. If we adopt Newton's laws of motion, it follows, simply and directly, that the earth must revolve about the sun, and not vice versa." (*Ibid.* p. 125) However, "classical mechanics, with its principle of inertia and its proportionality of force and acceleration, makes assertions which not only are never confirmed by everyday experience, but whose direct experimental verification is fundamentally impossible: one cannot indeed introduce a material point all by itself into an infinite void and then cause a force that is constant in direction and magnitude to act on it; it is not even possible to attach any rational meaning to this formulation. And of all the experiments by means of which textbooks of mechanics are wont to prove the fundamental law of mechanics not a single one has ever been carried out in practice." *The Mechanization of the World Picture* by E.J. Dijksterhuis, London, Oxford University Press, 1969: p.30-31) Indeed, "the Newtonian scheme contains arbitrary elements" (*The Unit of the Universe* by D.W. Sciama, New York, Doubleday & Company, Inc., Anchor Books, 1961: p.125) and there are "serious questions of logic that can be raised." (*Physics for Students of Science and Engineering* by David Halliday and Robert Rensnick, New York-London, John Wiley & Sons Limited, 1963: p.89) "Heinrich Hertz writes: 'It is exceedingly difficult to expound to thoughtful hearers the very introduction to mechanics without being occasionally embarrassed, without feeling tempted now and again to apologize, without wishing to get as quickly as possible over the rudiments and on to the examples which speak for themselves. I fancy that Newton himself must have felt embarrassment.' In a similar vein F.A. Kaempffer writes: 'Newton's second law is certainly one of the most obscure of all the understandable relations underlying our description of the physical world in which we find ourselves. Anyone. who has ever tried to explain this law to a person who insisted on asking questions will know the difficulty of giving good reasons for the...facts embodied in it.' '…Newton was aware of these difficulties, as were others, but could find no satisfactory answer to them.'"(*Ibid.* p. 88-89) Last and not least, over and above the foregoing we must "assume that our observations give us information that applies to the whole universe, not just to our part of it. In other words, we must assume that the part of the universe that we actually observe is representative of the entire cosmos, and that we are not located in some very unusual place, fundamentally different from the rest of the universe." (*Exploration of the Universe* by George Abell: p. 651.) – the so-called "cosmological principle".

Having thus "established" the "fact" that the Earth revolves on the solid ground of

postulates which can neither be tested, nor adequately explained, and discarding all experimental evidence to the contrary with the logical clincher that "scuttling the whole Copernican theory" is "unthinkable", (*Einstein, The Life and Times* by Ronald W. Clark, New York and Cleveland, World Publishing Co., 1971: p. 80.) and staking this all on the unverifiable cosmological principle... having done this we see at our disposal the concepts we need. We are now able to measure the distance to the countless suns so far out in space that they are just pin-pricks of light. You ask how we know that those little luminosities are suns? We don't know it, strictly spoken, but assume it. But let us not get side-tracked: observing one particular bright spot in the firmament, e.g. Barnard's star, on Midwinter Night and Midsummer's Eve, that is: "shooting" it from two points in space, $3.10^8$ km. apart, we can determine our object's parallax and after that by triangulation the distance, in this case 1.83 parsecs, or circa 6 light years.

"Parallaxes have been measured for thousands of stars. Only for about 700 stars, however, are the parallaxes large enough...to be measured with a precision of 10 percent or better. Of those 700 or so stars within 20 parsecs (65 light years – v.d.K.) most are invisible to the unaided eye and actually are intrinsically less luminous than the sun. Most of the stars visible to the unaided eye on the other hand, have distances of hundreds or even thousands of parsecs and are visible not because they are relatively close, but because they are intrinsically very luminous... The vast majority of all known stars are too distant for their parallaxes to be measured, and we must resort to other methods to determine their distances. Most of these methods are either statistical or indirect." (*Exploration of the Universe* by George Abell: p.377-378.) The author of these lines then presents a summary of some of the more important procedures. I am not going to quote them, yet cannot but make the observation that within the space of about half a page I find three times the verb "to estimate", three times the adjective "apparent", one time the adjective "approximate", and further the verbs "to infer", "to assume", "to indicate", and last but not least the expression "an intelligent guess".

It cannot have escaped the perceptive reader that the whole reasoning leading up to, for instance, all of us accepting the fact that the Orion Nebula is 1800 light years away starts from two unproven assumptions. The first one is that of the Earth's revolution around the Sun, contradicted by all experiments ever performed, the second one that of the cosmological principle, which has about the same logical status as the view of an Indian in the Amazon jungles, who concludes that, since he sees parrots in the palms, there must be parrots at the Poles.

"Go out on any starry night and walk alone for half an hour, resolutely assuming that the pre-Copernican astronomy is true." (*Studies in Medieval and Renaissance Literature* by C.S. Lewis; collected by Walter Hooper, Cambridge University Press, 1966: p. 47.) Yes, reader, do that! From childhood on you and I have been beguiled in accepting a cosmological card castle for which there is not a shred of common-sensely "solid proof". The whole post-Copernican kit and kaboodle is a rickety structure of assumptions based on extrapolations gained from theories built on postulates distilled from observations susceptible to alternative interpretations. Allow me to end with one more quote.

"Once on a trip to a Southern state,. the Cicada Man encountered two entomologists who argued interminably over hypothetical questions. Davis suggested in his quiet voice: 'Why don't you say "may be so" when you are defending ideas that you can't absolutely prove?' " [59] – **((lost 59 at bottom of an EU size paper, cutoff during photocopy to US paper))**

If there is one sentence, or rather part of a sentence, in the foregoing passage that it is more important to grasp and meditate upon and remember more than any other, it is that comprising the last few words of paragraph 117: "The second' (assumption), that of the cosmological principle, which has about the same logical status as the view of an Indian in the Amazon jungles, who concludes that, since he sees parrots in the palms, there must be parrots at the Poles." This, the assumption that one phenomenon that you can observe in a very limited field, must apply everywhere even if you have no evidence that conditions are the same elsewhere, indeed even if you know for certain that they are not, is, as I have mentioned before in this chapter, the essence of Newtonian science. It is not scientific; it is not even sane; and yet almost the whole of modern astronomy and the sciences related to it are based on that assumption.

## 7. The Modern Universe

In the last part of this chapter, therefore, it is appropriate to take a few facts that we believe we know about the universe and see which of them are based on solid evidence and which are based on unsupported assumption. If we then take the latter out of the category in which they now reside, that of undisputable fact, and place them into their correct category, that of interesting hypothesis, we shall see that the universe may well be, and indeed probably is, very different from what we believe it to be.

Let us start with the speed of light.

"The determination of the speed of light," pronounces *Encyclopaedia Britannica* ("Light") "may be regarded as definitely settled, a result contributed to by A.H.L. Fizeau (1849), J.B.L.Foucault (1850-62), A.Cornu (1874), A.A. Michelson (1880), James Young and George Forbes (1882), Simon Newcombe (1880-82) and Cornu again in 1900." It reads impressively; it is also completely untrue. The same article provides the information that the only practicable method of determining the speed of light is to reflect a ray back to the point of observation and to determine the time which the light requires to go and come. Various experiments have been designed to accomplish this and the speed of light has been measured in these experiments at approximately 186,000 miles or 300,000 kilometers per second. This measurement validly shows the speed of light through the earth's atmosphere over the comparatively short distances that measurements are possible given the obvious limitations of the practicability

of measuring any greater differences.[41] What is invalid, however, is the assumption, on no better grounds than that if there are parrots on the palms there are parrots at the Poles, that light continues to travel at this speed throughout space (adjustments were always made to the experimental results to show the velocity of light in a vacuum, but, as *Encyclopaedia Britannica* admits, "the reduction to a vacuum was derived from theory alone") and over any distance. There are at least three other possibilities. The first is that the earth's atmosphere may slow down the speed of light drastically and that in outer space it may be many times greater and even almost instantaneous. It would in fact be very surprising if this were not so. We know for certain that light travels through air more quickly than through water – the Airy experiment described in the last chapter, for instance, depends on this fact – and much the most logical extrapolation from this is that it travels even more quickly when there is no air to slow it down. The second is that, inside or outside the earth's atmosphere light may accelerate. Again, it may be thought quite surprising if it does not: falling bodies do and there is no reason why they should be unique. The third possibility is a combination of the two possibilities already mentioned.

Some other completely basic assumptions on which modern astronomy rests are the conclusions drawn from optical stellar effects such as parallax, aberration and the Doppler effect.

Stellar parallax, it will be remembered from the last chapter, is the slight shift in the apparent position of one star in relation to another during the year. In heliocentric theory this is ascribed to the apparent change in position of a foreground star against a background star (just, as when one walks along a road, nearby trees appear to move in relation to more distant ones) as the earth moves along its orbit. Stellar aberration, which was also mentioned in the last chapter, is another shift in a star's position that varies throughout the year and is normally ascribed to the. velocity of the earth round the sun. In the Doppler effect (also known as the Doppler shift), which was discovered by the German mathematician Christian Doppler in 1842, stars appear a little redder than expected at some times of the year and a little bluer (more violet) at others. The assumed explanation for this is that when an object is moving towards us (or us towards it) we perceive the light at a slighty higher frequency of energy than we should if the object and we were standing still, thus making a normally white star appear bluer; and correspondingly when an object is moving away from us (or us from it)

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[41] In fact even the validity of this is not completely certain as is shown in the following passage taken from *The Economist*. "How to measure the one-way velocity of light has been the problem for centuries. You need synchronized clocks at both ends, but at the same time you have to make assumptions about the velocity of light in order to synchronize them." (Article "Einstein Challenged" in *The Economist*, February 5, 1977.)

it appears redder.

This is what Professor Armstrong, whom I have quoted before, says about these three effects:

> It is seldom realized what an extrapolation is being made in the usual explanation of these things. There is direct experimental evidence about the behaviour of light, and optics, over distances extending to something like the diameter of the earth. There is other evidence, not quite so direct, over distances comparable with the extent of the solar system. But the behaviour determined by this evidence is extrapolated over the distances to the stars, which by the hypothesis are enormously greater. It seems quite conceivable that light may behave quite differently over such great distances; and of course there is no check independent of optics. (Professor Harold L. Armstrong in *Bulletin of the Tychonian Society,* October 1977.)

Nor is unwarrantable extrapolation the only problem. When we start investigating the nature of these phenomena more closely far greater grounds for suspicion arise – for we find that the parallax and aberration effects are never observed separately but always in combination. There is but one shift that takes place and that shift is then "divided up", part of it being ascribed to parallax and part to aberration according to the theory. The description of the effect, in other word, is purely arbitrary. The Doppler effect becomes equally difficult to pin down on closer examination. We find that the colour change, such as it is, is not measured at all, for almost invariably it is too small to see. What is measured instead is the shift of the spectral lines[42] of the light-emitting object. Moreover even if the three effects were based on genuine observation, what is read into them remains based on pure assumption. To give one assumption which would be no less valid, all three effects could be explained by the simple refraction of light, such as might take place if the sun dragged the ether with it during its orbit round the earth (which of course would give inconvenient support to the geocentric theory); and there are many other possible explanations also.

Let us now look at some further assumptions which rest mainly on these opening assumptions. One assumption is that the universe beyond the solar system must be vast in age, because some of the stars are so far away that it has taken millions of years for the light sent out by them to reach us. It is even claimed that the light from some stars takes so long to reach us that by the time it reaches us the stars no longer exist. These rest on two unproven assumptions. The first is as to the speed of light through space: as has already been

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[42] Astronomers, by using **a** spectroscope (which is **a** sophisticated version of a prism), split the light from a star into its spectrum, in other words separating the component parts of the light according to their wavelength and energy. From an analysis of these spectral lines, astronomers believe that they can tell in what direction a star is moving, what elements it consists of, how abundant the different elements are, what the surface temperature of the star is, whether or not it is spinning,, how big its magnetic field is, and many other wonderful things.

shown if the stars were indeed as far away as is suggested it is only a hypothesis that the light would not reach us in seconds. The second assumption is as to the distances themselves. How do we know that the stars are so far away. If we knew the size of a star and its brightness at its source we might be able to make some judgement as to its distance (but even then only if we knew for certain how light behaved outside the earth's atmosphere), but knowing neither we have no indication whatever.

How do they measure stellar distances? According to the astronomy books, photographs of the heavens taken six months apart show some of the brighter stars apparently to have moved against the background of the fainter ones. To this observation is added the assumption that the reason for the faintness of the fainter stars is that they are further away, the possibility that they might simply be intrinsically less bright being ignored, and the distances of the nearer stars are computed. There is not a shred of evidence supporting the validity of these computations. Even if the measurements that can be taken can be relied on as accurate, even if stellar parallax were only **ex**plainable as the astronomers choose to explain it and one star could be shown to be further away than another, there is no possible way to tell which of the two stars it was.[43] And now we must remember that stellar parallax is <u>not</u> only explainable as the astonomers choose to explain it; from the fact just mentioned there arise possibilities that will startle the reader, if he does not simply close his mind in disbelief. The claim that any one star is further away than another is only an assumption. The claim that stars consist of huge bodies is only an assumption, for if they are closer than assumed they need only be small points of light. The claim that the universe is infinite in size is only an assumption.[44]

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[43] It appears measureements cannot be relied upon as accurate – there is a certain amount of wobble in the sun's orbit round the earth (or vice versa in heliocentric theory) which makes accurate calculations impossible. E.A. Fath in *Elements of Astronomy* admits that parallax is only relative to the presumably distant stars behind and that no method is known to correct for this.

[44] It is worth mentioning that even within the solar system it is only fairly recently that sizes and distances could be measured with any certainty. The size and distance of the moon are no problem because of its closeness. All that is necessary is to select two observatories as widely apart as possible, but nearly in the same longitude (such as Berlin and the Cape of Good Hope) and to have an observer in each place determine the position of the moon in the sky (i.e. in relation to the other stars) at the same instant. Taking the moon and the two observatories as three corners of a triangle, we thus know two angles of the triangle plus of course the length of the included side (the measurable distance between the two observatories) and from this information all the other parts of the triangle can be found by trigonometry. This cannot be done with the sun and other planets, which are too far away to throw up the necessary parallax against the background stars when observed from different parts of the earth. All that could be measured were ratios, which, so to speak, provide a correct map of the solar system without giving the scale of the map. Thus the astronomers could call the distance between the sun and the earth one Astronomical Unit (abbreviated to A.U.) and accurately measure the distance between the sun and Venus as 0.723 A.U.s, but the length of an A.U. cannot be measured. In other words, given the information, for instance, that in an eclipse of the sun the sun and moon appeared to be exactly the same size (which they do), it is impossible to know whether the sun is two hundred times the size of the moon and two hundred times as far away, or four hundred times in each case, or some other multiple. So the astronomers started to look for other

The upshot of all this is that, difficult though it is to accustom oneself to the fact, there is no scientific or theological reason whatever why the earth should not be the central object of a finite universe at whose periphery was a finite number of stellar bodies, set in a spherical shell and emitting gravitational waves in the same way that they emit light. The suggestion sounds facetious but it is not. It is a suggestion which may be true or which may be false, but it is not one iota less soundly based than the assumptions about the universe which are almost universially regarded as definite reality.

It is worth pausing for a moment to consider the statement that the universe may well be finite, because. a finite universe is a concept which the reader may find most difficult of all to accept as a possibility. The problem with trying to imagine a finite universe is that we cannot picture a universe without some space outside it and the mind tends to reject as impossible what the imagination cannot picture. There is, however, an equal problem in trying to imagine an infinite universe, for the infinite refuses to be limited in any way either by the imagination or by the intellect. In fact, neither difficulty is a valid basis for rejecting whichever concept we are considering; for our imagination is far from perfect and the fact that we cannot imagine something does not prove that that something does not exist; and thus it is not to the imagination that we should look in order to assess the truth about anything, but to the intellect. Let us ask ourselves, therefore, whether we can discern' with our intellect any reason to prefer a finite universe as more probable than an infinite one or vice versa.

In no sense do I claim to be giving the last word on the subject, but there occur to me two reasons why the finite universe is more likely: one of them is theological and the other scientific. The theological reason is that it has been argued,

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methods of measuring the sun's distance and size. One method makes use of the phenomenon of aberration, which is suspect because, as has been shown, the data derived from aberration are based on unproved assumption. Another makes use of the tiny planet Eros, which comes sufficiently close to the earth (about fifteen million miles) for it to be apparently possible for parallax to be observable and measurable in relation to it – thus giving the key to the scale and allowing the measurements of the rest of the solar system to be derived. Well, maybe! I do not feel competent to decide. And what about the masses attributed to the sun and the planets. These are purely hypothetical and, obviously when one comes to think about it, unprovable. "The determination of the mass of a planet without a satellite is one of the most difficult problems in celestial mechanics," (*Gravitation Versus Relativity* by Professor Charles Lane Poor: p. 163.) wrote Professor Clarles Lane Poor delicately about a problem whose attempted solution could never be checked anyway. It is worth adding too that no attention is paid to mass when making calculations concerning planets in their orbits. The assumption is simply made that the planetary orbits are relative to the mass of the sun only, the only part that planetary mass plays being in relation to some minute effect of one planet on another. (For further elaboration by Professor Charles Lane Poor on the problems of calculating planetary mass, see Appendix.) Finally, to question one more unquestioned assumption, do the planets really orbit round the sun in ellipses, as we believe? How do we know that Ptolemy's cycles and epicycles are wrong and that the planets do not travel round the world in eccentric paths. The answer is that we do <u>not</u> know. All that observation shows is that, taking the earth as a hypothetical central point, the sun and planets move in approximate accordance with Ptolemy's system and that **in** relation to the sun they move in approximate ellipses. And it must be emphasized that although other phenomena, such as varying brightness and size of planets at different times, <u>tend</u> to support the viewpoint of ellipses in relation to the sun, they by no means do so perfectly, additional explanations being always needed. So, while, as I have made clear in the last chapter, I favour the Tychonian model of the universe, it should not be forgotten that the Ptolemaic model is by no means disprovable.

notably by St. Bonaventure, that Almighty God, although infinite Himself, cannot create something infinite. Is this a restriction on His omnipotence? It seems that such a restriction is only apparent, in that it is as intrinsic to the definition of infinity that it be uncreated and uncreatable as the definition of square prevents Him from making a square that is circular, and it is in harmony with the obvious fact that even He cannot count up to infinity since every number can be added to so as to produce a greater number.

The scientific evidence in favour of the hypothesis that the universe is finite and, another assumption underlying the Newtonian universe, contains a finite number of stars, is that if this hypothesis is fact, the famous Olber's Paradox ceases to be a paradox. Heinrich Olber (1758-1840), a German astronomer, had reasoned that the infinity of stars, which by then had been postulated by science as an indisputable fact, should cause the whole night sky to be as bright as the surface of the sun; and the fact that the night sky is clearly rather less bright than the sun is what constituted the paradox. His reasoning was impeccable and since the obvious solution that the number of stars might be finite was unacceptable for dogmatic reasons, a number of insane theories had to be advanced to explain the contradiction.[45]

To the above it is perhaps also worth adding, even though few people will regard it as admissible as evidence, that the Fathers and Doctors of the Christian Church never thought the universe to be infinite and that it was not until the belief was propagated by Newton and his disciples that it took hold. Well, admissible or not, anyone who has some acquaintances with the writing of the Fathers and Doctors will know that they were not fools. It is not certain that they were right, but it is at least far from impossible.

In this chapter we have seen how, again and again, assumptions are made by scientists,, transformed into facts, and then used in turn to provide the base for further assumptions. Let us now accompany the scientists as they take the process one step further. I invite you to follow with me the Newtonian system to its extreme – not to the extreme limits of our imagination but to the extreme which modern science has actually reached – and see how the process must continue, erecting further assumptions on assumptions on assumptions until insanity is reached. I shall use for the purpose a modern text-book on astonomoy, *Astronomy Made Simple*, by Meir H. Degani. Beginning with some of the items that I have already questioned, let us look at some of the things that science has established "beyond doubt", and let us marvel.

Stars are large globes of intensely heated gas, shining by their own light.(p.5)

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[45] The most widely held of the theories purporting to explain Olber's Paradox is the mind destroying one of a universe which is both infinite and also expanding (how something infinite can be also getting bigger is not **ex**plained) so that the light from all the stars has not yet reached us.

There are methods of measuring heat, of measuring size, of ascertaining whether or not a substance is gaseous, and of discovering how something is illuminated, but they all require the object under investigation to be rather more conveniently placed for access than are the stars.

> Stars, even with the largest telesocpe, appear only as points of light. Even in the 200-inch telescope they appear as mere points, having no measurable diameter.(p.5)

And why should they not be points of light? Once upon a time scientists were capable of saying that while it is possible for man to know some things for certain, so limited are his capacities that there are many things which he cannot know for certain and about which he can only wonder and, to the extent that it is useful, humbly suggest possible theories. Modern science in its various branches has reversed this reality, denying the certainty of many things which common sense tells us are absolutely and infallibly knowable, and making us hold as certain a multitude of theories for which there is no objective evidence whatever. In effect, the human intellect has been simultaneously reduced to the status of that of the animal and raised to the level of God. If science were sane it would tell us that at least three alternative hypotheses could explain the stars' appearance as points of light with no measurable diameter. The stars might be large globes, brilliantly lit in various possible ways at varying distances from the earth, but all of them so far distant as to appear to be mere points; or they might be little more than mere points of light, all of them equidistant from the earth and close enough to be visible, possessing diameters of varying size and/or brightness of varying degrees so that some stars are visible to the naked eye, some only through telescopes and some, perhaps, not at all, and all of them possibly emitting gravitational waves (Le Sage's corpuscles) in the same way that they emit light; and a third hypothesis might lie anywhere between the first two. Modern science, it can never be repeated sufficiently often, is not sane. It makes an assumption which atheists can accept, conforms its interpretation of all observed data with this assumption and, on the occasions where observation and the assumption cannot be reconciled, either denies the observation or finds a metaphysical reason for giving the observation an interpretation contrary to what is indicated by it.

> At their surface they reach temperatures thousands of degrees; in their interior, temperatures are much higher.(p.5)

Later on, the book describes methods of measuring temperatures. The methods provide remarkably precise results, examples of which are stated with encouraging confidence. Typical temperatures of stellar surfaces are about 5,000 to 7,000°A.[46]

[46] Stellar temperatures are usually stated in the Absolute or Kelvin scale, denoted by °**A** or °K. To obtain the

> Extremely hot stars, like Zeta-Puppis, have a temperature of 30,000ºA. On the other extreme, the coolest known star, Chi-Cygni, a variable star, at the time of its brightness has a temperature of a mere 1,800º. (p. 81... It is repeated here that these are the temperatures of the surface layers emittting stellar light. The temperatures in the interior of the stars are of an entirely different order of magnitude. Interior temperatures range not in the thousands but in the millions of degrees. (p. 829)

To measure the temperature of the exterior of a star without the help of any form of thermometer can be considered an admirable achievement; to measure the interior must be judged miraculous.

> Stars move about in space, although their moton is not immediately perceptible... Even in a thousand years, the stars will seem not to have moved substantially. Their pattern is now almost exactly that of a thousand years ago.

Why "almost"? We must ask.. There is not a shred of evidence that they have changed at all?

> This seeming fixedness is due to the vast distances separating us from them...
>
> Unless we disallow the assumption of vast distances.
>
> At these distances it will take many thousands of years for the stellar pattern to undergo a noticeable change: this apparent (Degani's underlining) constancy of position accounts for the popular name "fixed stars". (p. 5)

How, without taking observations over many thousands of years, does science know that the constancy is not real rather than apparent and the popular name not also the correct name?[47]

One more extract will suffice.

> Stars emit not only visible radiation (light) but also shorter wavelengths (X-rays) and longer (heat, radio)... The earth's atmosphere, however, is transparent only to light and radio waves. All

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Absolute scale 273° is added to the centigrade scale. The method by which temperature, and much else, are purportedly measured, is by analysing spectral lines (see footnote to paragraph 128).

[47] It is of course assumed by astronomers that the universe contains countless other solar systems similar to our own. Occasionally, however, admissions are made in scientific journals that the evidence for this assumption is depressingly non-existent. Here are two extracts from an article by Dietrick Thomson in an American publication called *Science News* (26th June 1982): "Our planetary system should not be unique, but proving it is difficult. If the sun can have other planets it seems that other quite ordinary stars can have them too. Right now astronomers do not have any generally accepted evidence for extra solar planets... The feeling of most astronomers is that the solar system ought not to be unique. Unique phenomena are difficult if not impossible for sciences to handle." No chance of scientists adjusting their theories to take account of what they do see of course: the search for evidence in support of their "feelings" continues, however long it remains elusive. Near the end of the article he adds: "Current theory of star formation regards the formation of planets as a by-product of star formation, so, if we cannot find a lot of other planetary systems ... we will have to revise our whole theory of star formation." Well, that is Mr. Thomson's opinion. Mine is that he is naive if he imagines that a theory is going to be revised merely because the evidence contradicts it.

> the other radiations emitted by stars do not reach us, as they are absorbed for the most part by the atmosphere. (p.74)

How, if these radiations never reach us, do we know that the stars emit them?

It is time to lose patience. Let me re-emphasize the real unvarnished truth about modern scholarship in general and the particular discipline we are examining in this chapter. Mr. van der Kamp has described modern astronomy as nothing but a collection of "conclusions concocted from assumptions based on interpolations deduced from theories built on postulates distilled from observations allowing many alternative interpretations, (*Bulletin of the Tychonian Society*, Jan/Feb, 1979.) and I have said the same thing more briefly with the help of the convenient word "insane". Am I simply presenting the uneducated opinion of two laymen? Not so ...

"Most astronomers today," wrote T. Theokaris of the Mathematics department of the London Imperial College of Science and Technology in a letter to *The Listener*, published in April, 1979.

> ...do not realize that what they are talking about is increasingly becoming imaginative speculation, with hardly any reasonable evidence to support it. Unfortunately masquerade is presented to the public as genuine scientific knowledge by the uncritical popular science programmes. The trouble not only with modern astrophysics, but also with physics generally, is that wild theorizing and wild speculating (but necessarily accompanied with complex mathematics) has leaped far beyond what the capabilities of present-day experimental and observational techniques can cope with. Moreover, the great majority of physicists fail to appreciate the scarcity or complete absence of empirical data and the tentative nature of their weird theories. As a result, the criterion for distinguishing sense from nonsense has, to a large extent, been lost.
>
> Instead of worrying about remote and probably unreal figments of the imagination such as "big bangs" or "black holes" – the latter by definition impossible to observe and derived from a highly suspect theory but now firmly established in the mind of physicists and the consciousness of the public – it might be wiser...

And so on.

The Big Bang and Black Holes**!** It. would be unwise to assert positively that the degeneration of the science of astronomy has now reached its final stage – there may be unplumbed depths of depravity as inconceivable to us as today's would have been in an earlier period – but it is difficult to see what remnants of real science are left that can be lost. Newton, although in such men as Bacon, Galileo, Descartes and Leibnitz he had precursors and contemporaries who made their contributions, can be given the credit for leading the retreat from science into mathematics. In modern astronomy can be seen an advanced stage of the retreat from mathematics into language. Such is the depravity of modern science that science is inviting us to believe – without recourse to the supernatural and without any authority other than that which scientists claim for themselves – not merely in things which have not been observed but in things which by their very definitions

cannot be perceived by any sense organ or scientific instrument; indeed in things – Black Holes, space-time continuum, four-dimensional curved space-time, time dilation Riemannian curves,[48] quarks[49] – which cannot even be imagined. That a writer of science fiction should ask his readers to suspend their powers of reason for a short period and allow themselves to half-believe in such things for the purpose of enjoying his novel is no more unreasonable than that a writer of fairy tales should request the same mental exercise of his readers; but that such an invitation, and involving not half-belief but total belief, should be taken seriously and even accepted enthusiastically when issued in the name of science – in the name of that human activity which purports to deal not in fairy tales but in knowledge of demonstrable reality – is evidence of a depravity of the human race which may be without precedent.[50]

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[48] Space-time continuum, four-dimensional curved space time and Riemannian curves: the following explanation may be helpful. In chapter... it was mentioned that the first attack made on Euclidean Geometry, the securest of all the sciences, was on Euclid's fifth postulate, which – not that it mattered, for it was sufficiently self-evident not to need proof – neither he nor his successors over twenty centuries ever managed to prove. This postulate amounts to the assertion that parallel lines never meet. In the nineteenth century, not only did the postulate of parallel lines become one which "must" be doubted, but George Friedrick Riemann (1826-66) considered another of Euclid's postulates, that of the straight line, to be equally unsuitable for acceptance and substituted for Euclid's unlimited line his own notion of a finite but unbounded line. He ascribed to space a constant curvature: hence the limits of space were curved so that each line would return to its point of origin. Thus we were given the Riemannian curve. Minkowski, who was approximately a contemporary of Einstein's, went one step further in the developmentt of non-Euclidean geometry by introducing a fourth dimension into geometry, that of time. In this conception, space is nothing and time is nothing, but events take place in a combination of both called space-time. He grafted his conception on to the space conception of Riemann to give to the world the theory of "four dimensional curved space time", and, to quote the words of the distinguished mathematician, J.J. Callahan, it is this "Riemann-Minkowski geometry (that) is the foundation of the theory of Einstein." (*Euclid or Einstein* by J.J. Callahan: p. 76.) It need hardly be said that a child of five does not confuse time and space: to be able to do so requires very sophisticated training indeed in warped metaphysics. The three dimensions of geometry are to do with measurement; and time, which is a function of motion in distance or space, is nothing to do with geometry at all, but is an element of mechanics.

[49] A quark is a supposed component of an atom. It is said that they combine in triplicate to make the protons and neutrons of atomic nucleus.

[50] The comparison made with science fiction is perfectly apt and not even really a contrast. To take one example, one of the books of Jules Verne, *Journey to the Moon*, transports us to the moon in a gigantic bullet with the help of a deluge of scientific terms and of arguments which as we read them seem to us to have some sort of scientific reasoning behind them and mentally bludgeon us into suspending our critical faculties and accepting the fiction as a possibility. It is precisely in this manner that we are bludgeoned by modern books that purport to explain features of modern astronomy. It would incidentally be interesting to know the extent to which science fiction writers have played an important role in conditioning people's minds to accepting what common sense might otherwise have led them to reject. Certainly there is irrefutable evidence from his own pen that one of the leading science fiction writers of this century, H.G. Wells, was also one of the more important conspiratorical enemies of society. (He was a member of the Fabian Society.)

## 8. At the Heart of the Matter

We must not be surprised at such depravity, however, for it is inevitable. It is an inevitable result of the fight against religion. If religion is rejected, it is reality that is being rejected and in place of reality there can only be illusion; and once illusions are believed the extent to which such illusions are believed is merely a matter of degree, for it is the initial break with reality that is the decisive point.

It is appropriate, therefore, to end this chapter with a summary of Newton's contribution seen against a religious background; and to do so I reproduce the following from a book called *The King James Version Defended*[51] by Edward *F.* Hills.

> Modern scientists know many facts, but because they ignore God's revelation of Himself in and through these facts they fall into many inconsistencies. For example, they say that the universe has been expanding into infinite space from all eternity. Why then has it not disappeared long ago? Some try to answer this question by supposing that the universe is being constantly replenished by hydrogen atoms which come from nothing. Others say that the universe is alternately expanding and contracting like an accordion. They admit, however, that this oscillation could not have gone on from all eternity but would have eventually "damped out" and come to a halt…

In spite of many marvelous achievements the history of modern science has been one of apostasy and rebellion against God. Newton, the father of modern science, was led by his rationalism to give first place in his thinking to four independent, disconnected absolutes which he had set up, namely, time, space, inertia and gravity. To God, creation, providence and the *Bible* Newton only gave second place in his thinking. These religious concepts were not retained, even in second place, by later scientists, who kept only Newton's rationalist absolutes. Hence the contradictions which we have noticed.

For "contradictions" he might have substituted the term "outrages to common sense", but never mind. He has reached the very core of the matter.



[51] By quoting from this book I do not wish to imply that I agree with what the title implies, that the King James Version deserves to be defended. Although written in English of justly praised beauty, it contains a vast number of hopelessly incompetent, or alternatively very competently malicious, mistranslations.

## APPENDIX

## The Calculation of Planetary Mass and the Orbits of Undiscovered Planets

In paragraph 82 and more particularly in footnote of 130 I made reference to the practical impossibility of calculating the masses of the sun and the planets. In order to justify this assertion, which is certainly not accepted by the scientific fraternity in general, I quote two extracts from *Gravitation Versus Relativity* by Professor Charles Lane Poor, one of the leading astronomers of his day and author of a number of standard textbooks on astronomy. Page 163:

> The mass of a planet that has a satellite, as Jupiter for example, can be very accurately determined; but the determination of the mass of a planet without a satellite is one of the most difficult problems in celestial mechanics. (I question whether it is even true that the mass of a planet that has a satellite can be accurately determined. In order to calculate the mass of the satellite you need to know the mass of the planet and vice versa. To assume, for instance, that they were the same would be a worthwhile hypothesis for certain purposes but useless for the purpose of obtaining a fact on which to base calculations from which a definite answer was required. – N.M.G.] The masses of Mercury and Venus can only be found through the effects of their attraction upon other bodies; that of Venus through the perturbation caused in the motions of Mercury. The mass of Venus is a direct factor in the computed value of the annual motion of the perturbation of Mercury, and this mass is uncertain.

And on page 170:

> There is one element of uncertainty in all these conclusions [He has earlier given the conclusions to which he is referring but it is unnecessary to reproduce them here – N.M.G.] and that is the mass of Venus. The size of the perturbations of Mercury depend on the mass of Venus, and the mass itself can **. . . ((next bottomline of EU paper size lost here when photocopied to US paper size))**

Now we have some background against which to examine further the question of whether the discoveries of Pluto, of Neptune and of the two moons of Mars were accomplished, as is claimed, by calculating where they ought to be if deviation from the "correct" orbit were to be satisfactorily explained. It may be remembered that the question was raised in paragraphs 76-85. Here is Professor Poor on the calculation of planetary motions (*Ibid.* p. 120):

> There are six elements which determine the motion of a planet about the sun: the semi-major axis of the ellipse, the eccentricity of the orbit, the longitude of the perihelion, the longitude of the mode, the inclination of the orbit, the time of the perihelion passage.

> Now so long as there are but two bodies in the system, these six elements are constant, and the smaller body will travel for ever around and around in its unvarying path. From these elements the actual position of the body at any time, past, present and future, can be calculated by a very simple formula. If, however, a third body be introduced into our universe, then the motions of the bodies are no longer so easily calculated. In fact the paths of these three bodies become so complicated as to defy any mathematical description… The beautiful method devised by Newton to solve the problem of two bodies, fails completely when applied to a system of three or more bodies. (Emphasis added)

It fails completely even with as few as three bodies**!** And there are rather more than three bodies in the universe.

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