

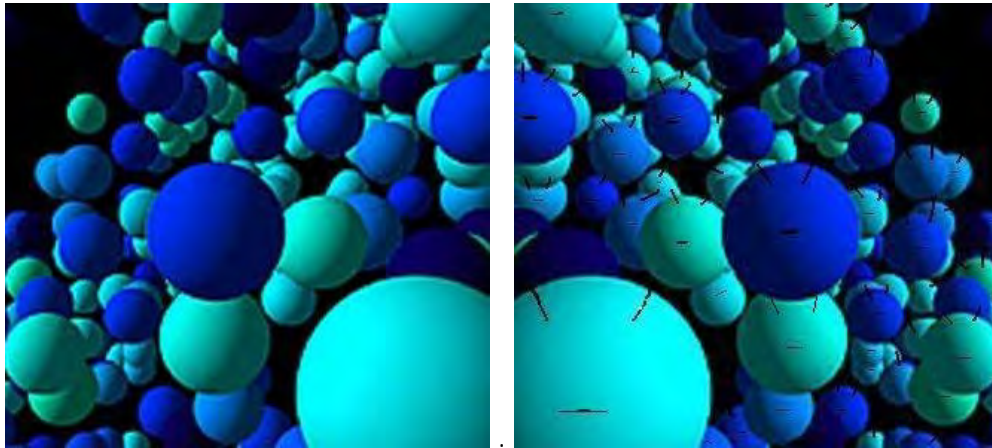
# ***New Science Theory***

***by Vincent Wilmot***

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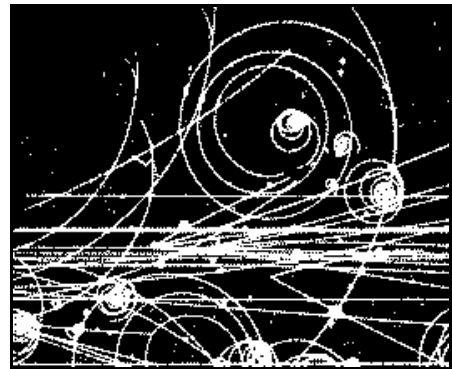
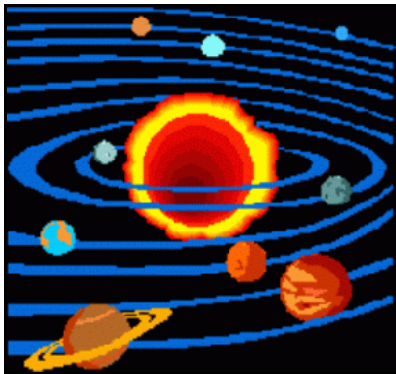
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This is basically the New-Science-Theory.com website as it was on 1/1/2012, when it concentrated on the theory ideas of four major physicists - Albert Einstein, Isaac Newton, Rene Descartes and William Gilbert.

And it also has good related sections on [Johannes Kepler](#), on [Galileo Galilei](#), on [The Standard Model](#), on [String Theory and physics now](#), on [Gravity](#), on [Light](#), on [Probability Science](#), on [History of Science](#), on [Science Philosophy](#) and the [General Image Theory](#) of science theories. The last was first published here from 2008 but dates from 1964/1965.





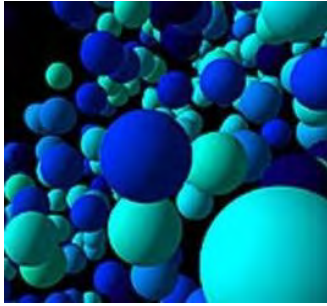
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January 1, 2012. - Hear briefly about this website >>

## ***New Science Theory - exemplified chiefly by physics theory***

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Science is basically the combination of good logical reasoning with good practical knowledge of actual natural phenomena. All humans do some logical reasoning and have some practical knowledge of some actual natural phenomena, but most have to busy themselves with feeding themselves and their families as best they can. Few have been able to devote much of their time to reasoning and/or gaining better knowledge of nature, and only some of these have made small or big contributions to science. In considering science theory, this site concentrates on physics theories from the now untaught ideas of William Gilbert, Rene Descartes and Isaac Newton to Albert Einstein and beyond - and we also have good related sections on [Galileo Galilei](#), on [Johannes Kepler](#), on [Gravity phenomena](#), on [Light](#), on [String Theory and physics now on The Standard Model](#), on [Probability Science](#) and on [Science Philosophy](#).

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PHYSICS NEWS. The most powerful electromagnetic charged-particle accelerator built to date was switched on at CERN on 10th September 2008, and despite startup problems the £5 billion Large Hadron Collider (LHC) is now smashing electrically charged protons and charged heavy atom nuclei into each other at energies much greater than any achieved before. The LHC machine is housed in an underground 27 kilometre (17 mile) tunnel straddling the borders of Switzerland and France for atom-smashing experiments that since the 1950's have somehow attracted the majority of modern funding for experimental physics. Charged particle beams are being electromagnetically accelerated in opposite directions through the ring-shaped machine, cooled to just 1.9 degrees above absolute zero (minus 271C), to velocities up to maybe 99.99% of the speed of light ?! The electrically charged particle beams 'collide' in four detectors, designed like giant microscopes but still not capable of observing any actual collision contact. Supporters of a variety of physics theories hope that its experiments may support their theory. [Initial analyses of early LHC experiments](#) seem to be ruling out some multi-dimension theories, some sub-quark particles theories, some string theories and some supersymmetry-particles theories. But more experiments and analyses are to come, and no doubt more 'physics theories'. Many of these modern physics theories are illdefined and some do not really cover electromagnetism and are varieties of push-physics only though it remains unproved if electromagnetism or 'collision' involve push-contact.

The CERN LHC has already produced mini-big-bangs and some hope that it may also produce mini-black-holes, but is said to have reached its maximum safe power running at 7TeV and soon it may be outdone by other atom-smashers like the T2K Neutrino Collider ? And you have to wonder if modern physics has been seriously dumbed-down as 2009 saw two physicists claiming that 'the LHC was disabled by a bird from the future' - discussed in our [Science History section](#).

The 2011 Nobel Prize in physics was awarded to three astronomers for their discovery of the apparent accelerating expansion of the Universe.

The 2007 Nobel Prize for physics went to Albert Fert and Peter Gruenberg for their excellent experimental work on magnetic signals that advanced Information Technology - and they like all modern physicists never considered a signal theory of physics. This surely made William Gilbert turn over in his grave, believing that experimental magnetism proved his signal theory physics. This 2007 Nobel Prize does support Gilbert's main argument on the value of experiment, but perhaps confirms the naivety of Gilbert's subsidiary view that experiment would also naturally lead to correct theory. The 2008 Nobel Prize for physics went to mathematical physicists Yoichiro Nambu, Makoto Kobayashi and Toshihide Maskawa for quantum mechanics theory work predicting a new family of quarks - their calculations fitted high-energy particle physics experiments indicating that elementary particles are composed of six types of quarks -- up, down, strange, charm, bottom, and top. Of course this might as well alternatively indicate six types of signal response for one particle along the general lines William Gilbert discussed in his signal response physics.

### **The basis of science theory.**

Those who have specialised only in logical reasoning have often been called philosophers, and some of the best of

these first emerged in Ancient Greece. The most rigorous logical reasoning, as with Euclid, has often been in the field of mathematics. Those who have specialised only in gaining better knowledge of nature have often been artisans or nature lovers, and their studies often have been concerned with their work or their leisure. Here metallurgy and astronomy were two fairly significant fields of study, with many others. The chief scientific advance in gaining better knowledge of nature came with the realisation that it chiefly needed the precise measurement of natural phenomena so that the rigours of number could replace vagueness and be better amenable to logical reasoning so that the two chief elements of science better combined.

Early ideas on the natural world generally took some vague magical or religious form of theorising, as that natural bodies had life forces or that god caused everything. In line with this, the widely accepted though entirely unproven explanation of gravity by the philosopher Aristotle was that all bodies had 'a natural tendency' to move to their 'natural place'. Such unproven opinion was to be challenged by the emerging experimental science method, chiefly in getting rigorous factual descriptions of more natural phenomena and then in developing all kinds of theories to try to explain the known facts. The many science theories came in two basic types - Black Box theories of laws of universe behaviour like gravity to explain what happens, but not trying to explain why things happen, and full-explanation theories that did seek to explain why things happen.

Human knowledge of natural phenomena has undoubtedly always been increasing to some extent since our species began, though often in accidental or ad hoc ways and some discoveries have been lost and re-discovered again later. Yet on average human history has involved progress in factual knowledge of nature and in technology deriving from that knowledge as in producing first farming and then industry. But theories of nature showed little or no progress in our early history, and indeed have struggled to show progress in modern times also.

It was maybe not until the 1500's that real planned science emerged first in Europe, with the chief requirement that both good logical reasoning and good practical knowledge of actual natural phenomena must be combined to try to produce valid descriptions of natural phenomena and valid science theories. Though there were earlier neo-science developments in different parts of the world, the real emergence of science was driven first by Europe wanting to explore and exploit the wider world, and then by Europe's developing industrial revolution. World exploring required use of the astronomer's stars and of the magnetic compass. After his death in 1543 Nicolaus Copernicus published an improved description of heavenly bodies where the Earth correctly orbited the Sun, and a basic compass was in some use from the 1200's. William Gilbert in 1600 (shortly before his death) published his many science experiments and his physics chiefly concerning magnetism and improved compass use but deriving a rarely understood full-explanation effluvia signal theory of physics relating to the Earth and bodies generally.

Like many other early scientists then, Galileo Galilei (1564-1642) experimenting in mechanics and astronomy had a lot of trouble from religion and government for that and for backing Copernicus, but William Gilbert (1544-1603) working mainly on magnetism openly dismissed Aristotle and all philosophising or theorising that was not directly substantiated by scientific experiment, and practised what he preached with his one early publication concentrating on his many experiments - and Johannes Kepler (1571-1630) working in mathematics, optics and astronomy developed a 'forcefield push' version of Gilbert's physics and also backed Copernicus.

But then the philosopher Rene Descartes (1596-1650) produced a different type of full-explanation mechanical push physics theory that impressed many as fitting with much of the emerging science - especially with that of the mathematician and physicist Isaac Newton (1643-1727) though he himself settled for a black-box physics theory like a few other physicists then. While advances continued in other sciences, physics theory had to wait about 200 years before Albert Einstein produced his new partial-explanation forcefield spacetime theory. One basic advance in physics then had been the discovery that the originally supposed elementary particles 'atoms' seemed basically mini-solar-systems with smaller particles and mini-action-at-a-distance. Strong evidence that solids are far from solid supported the conclusion that at least some 'pushes' may not be contact pushes and so maybe at least partly supports either a field type physics or a signal type physics where signals establish contact but do no pushing ?

After Newton, physics theory seems to have somewhat sidelined experimental study in favour of mathematical study, so that increasingly universities located theoretical physics in their mathematics departments rather than in physics departments. And certainly physics theory since Einstein, such as 'string' and 'loop' theory, seems to largely have been on the mathematics and structure of fields and/or of 'elementary' particles as possibly explaining everything somehow though it perhaps is muddy water - and 'fields' may yet be shown to not exist and/or the 'elementary particles' may yet be shown to be mini-mini-solar-systems themselves. In physics the big may be as reasonable a model of the small as vice versa, or not, and a signal physics may yet prove of some use also.

Many have been involved in the development of science, and many more in supporting or opposing it, covering all countries. But the key science theory ideas around physics can perhaps best be seen by going backwards from Einstein. Einstein considered that the theory that he chiefly had to face up to was Newton's, and Newton considered that the theories that he chiefly had to face up to were Descartes' and Gilbert's. Few understood Newton's evaluation of Gilbert, but I think the key physics theories were indeed those of Gilbert, Descartes, Newton and Einstein which this site examines further on other pages in an interrelated way rather than entirely separately. On this site you can start with William Gilbert and somewhat simpler early physics theories and journey on to rather more complex modern physics theories.

While Newton considered various possible explanations of gravity and other 'forces', he ended up supporting none and insisting that physics should support none. He concluded that black-box mathematical behaviour laws were enough for science, and that any explanation must involve untestable unseens and be 'outside science'. This basic conclusion of Newton can certainly be challenged, but Einstein and others ignoring it and claiming Newton's theory was a simple billiard ball push theory was one of the worst mistakes in physics theory history. It meant that no physicist has worked from or built on Newton's actual physics position - only on a simplified false 'Newton position' ?

And although Gilbert, Descartes and Newton took science as not allowing contradictions, Einstein and others later adopted 'duality physics' for light and for particles requiring them both to be 'wave' and be 'not-wave' and so allowing contradiction in their science. Not just allowing contrary interpretations and contrary mathematics, but allowing actual contradiction in experiments and in actual nature. This became possible by rejecting earlier strict definitions of 'wave' and 'particle' and basically using no strict definitions.

The interest of Gilbert and Newton in signal physics theory was perhaps before its time and has been developed by nobody since. And they were less interested in the physical nature of any signal emissions, be they particle emissions or energy emissions or wave emissions, than in how bodies experimentally responded to natural signals. But its possible relevance still is maybe suggested by a recent quote of Google on them letting application developers for their Android phones use C or C++ code "as in signal processing, intensive physics simulations, and some kinds of data processing". See [Google](#).

It is maybe of some small interest that Einstein was the only one of these four major scientists to marry, suggesting that having a family to feed or other major activities can hinder the development of substantial new science !? But more positive is the fact they all seem to have retained their mental capacities well in old age - maybe an old-age IQ fall from 100 to 95 gives poor mental functioning but an IQ fall from 165 to 160 still leaves excellent mental functioning when older ?

The ideas presented on this site are based on extensive studies of William Gilbert and of much of Descartes, Newton and Einstein and others relating to their theories. Currently the internet offers little of these four to read online, and much of their work has still not been translated, so this site will be trying to help with that over time. Science histories often have serious **weaknesses** , and for basic physics history this website's interpretations are the best and should be studied first, but you may also like a look at this mostly not too unreasonable summary [science history](#).

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## Good physics experiment and good physics theory.

Physics experiments and physics theories have at times come from very different types of sources, some good and some not. Early good physicists, like Galileo or William Gilbert, often had no physics training and some were hobby physicists or anti-establishment physicists.

Today some insist that every good physicist must have a physics degree, and that everybody with a physics degree is a good physicist (but we certainly do not have 900,000 Isaac Newtons today). It may seem more accurate to say that today a good physicist should probably have a physics degree, and that some with a physics degree are probably good physicists.

1. But this issue maybe needs clarifying somewhat to account for the fact that physics involves basically two different aspects - experiment and theory - and useful physics experiment seems to have somewhat less need of formal training than physics theory. Hence most technology advance has been independent of theory, so a computer engineer working for Google may produce some good physics experiments.

2. A further issue concerns the nature of formal physics theory training, in earlier times including substantial philosophy and history of science - but today seeming entirely confined to post-Einstein physics theory. This may suggest that most of today's formally trained physicists may have too narrow a focus to their physics theory ideas, so a philosopher or historian might be a better source.

We should of course still expect most good physics today to come from those with a physics degree, but should not be entirely surprised if some good physics ideas comes from a philosopher or engineer. A modern William Gilbert is possible.

## Great scientists and great skills

All great scientists do need to have some great skill or skills, but all great scientists do not need to have every possible great skill. But highly skilled people perhaps tend to be one of three skill types ;

### 1. Mathematicians and rule followers

Some great scientists like Isaac Newton have had great mathematical skill, and have been great at mathematical rule following reasoning. Of course some of them, maybe also including Isaac Newton, have also had some great artist-

artisans rule breaking experimenting skills.

## 2. Artist-artisans and rule breakers

Some great scientists like Galileo Galilei have had great artist-artisan skill, and have been great at rule breaking experimenting. Of course some of them, maybe also including Galileo Galilei, have also had great mathematical rule following reasoning skill.

## 3. All-rounders or multi-skilled

Some great scientists may have had great mathematical skill and great artist-artisan skill, but some of these may have employed one strength more than the other. These may have been great at rule following reasoning and great at rule breaking experimenting, but some of these employed one more than the other. This might depend on their own view of science and of its priorities at the time, and some great scientists have had different views on that.

Most of the big leaps in science has been the work of great individuals working alone, while many of the smaller advances have come from team collaboration maybe partly due to teams mostly being composed of too narrow a range of skill types ? But honest science has always been the more useful, as in not putting up a false simplified-Newton to knock down. Newton certainly never claimed that a light ray would not bend towards the sun, nor that a gyroscope some miles above Earth would hold a perfectly stable spin. And Newtonian physics does not imply either of these claims. Some modern scientists can seem to show a perhaps low regard for truth at times ?

While artist-artisan based skills often show culture differences - as in Egyptian, Roman and other art/science/technology - mathematics has generally developed as one mathematics involving the following of one set of rules. And while science does seem to require that there can be only one actual truth of anything, it can reasonably be claimed that science does not also require that there can be only one valid description of one truth. So modern physics dependence on mathematics only may be inadequate. Art often describes the same thing in different ways successfully, and a science with one mathematics may still validly allow of different image-theory explanations. But a one-truth science does not seem to really allow of contradictory explanations such as Duality Theory in current physics ?

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While we do consider science theory generally, this site is the very best at examining the fundamentals of physics, and at considering the more important new discoveries in physics and physics projects. If you want to really learn physics then this website really helps people with mastering physics online, and can also point you to some of the best physics ebooks online.

PS. Some might say that the last 50 years has maybe seen no significant new science theory published. I am old enough to remember when lots of scientists and governments were saying that very cheap nuclear energy was about to greatly improve the world. And around the same time when lots of scientists and governments were saying that the emerging computer science was about to greatly improve the world also. But by now everybody should be aware that generally business and government hijack any new science to their own ends, maybe leaving little real value to any new science ? But I have been sitting on a new general science theory for the last 40 years developed after the first BSc degree I took. Then for a second BSc degree when I took year 1 Philosophy, I part ran it past the Professor of Philosophy who had been a Physicist, in a 1985 essay for him on the history of physics. He gave that top marks and promptly made several attempts to get me to switch to majoring in philosophy under him (which I would have done but at that time I could not see it as a practical career option for feeding my new wife and baby). But being satisfied that the basics of my new general science theory may possibly be worth at least a temporary publishing rather than just all dying with me, I have now put the basics of it on this website - in the hope that you may find it interesting (and this website is all interrelated so studying all of it should help you understand it). Additionally, this site simply tries to clarify some of the basics of science theory history to date as I see it - though many do interpret science history differently and often very wrongly. Some of the problems involved in the history of science are discussed in our [Science History](#), or you can check our [Site Map](#).

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Two websites to help inform you on what physicists and astronomers are up to lately are [Physics Web](#) and [Universe Today](#) - and for one about some of the weaknesses of Einstein's theory you could try [Relativity Collapse](#).

Or if you might want to buy science books in our [USA science books](#) or [UK science books](#) sections.

otherwise, if you have any view or suggestion on the content of this site, please contact :- [New Science Theory](#) - write Vincent Wilmot 166 Freeman Street Grimsby Lincolnshire DN327AT UK.

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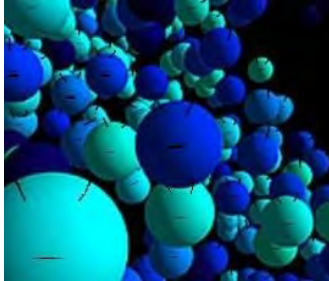
## William Gilbert - robot universe signal theory

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Unlike Einstein or Newton, William Gilbert (1544-1603) seemed to be no theoretician. His only physics work published in his lifetime, in 1600 in Latin, was "De magnete, magneticisque corporibus et de magno magnete Tellure, physiologia nova, plurimis et argumentis et experimentis demonstrata" ('A new natural science, with many proofs and experimental demonstrations on the magnet and magnetic bodies and on the great magnet the Earth.'). As physician to England's Queen Elizabeth the First and Royal College of Physicians president, he was eminent in medicine and a hobby-physicist (who published no medicine but put much into his physics). De Magnete was a new science work mostly on magnetism with much polemic against mere theory and for the new experimental science method. A new physics theory was repeatedly put, in a Latin that did not help clarify it, buried in pro-experiment polemic and detail and used unique terminology with

no approved translation.

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### **William Gilbert's science theory.**

When experimental science proper was first developing in Europe, the prevailing scholarly philosophy of nature based on mere thinking was that of Aristotle and was backed by governments and religion. In Aristotle's divine universe every thing was to some extent self-acting (or 'animate') and thinking, with divinely set motivations and knowledge - so that objects fell to the ground because they 'sought to move themselves to their natural place'. Gilbert saw this as involving too much irrational supposition and unable to describe the complex realities of actual natural phenomena shown in experiments to accord with invariant laws of behaviour. Gilbert chiefly promoted experiment and initially gave little prominence to the new physics theory that he had developed, though promoting this more in his 'De Mundo' published long after his death. Gilbert's 'attraction theory' did retain a form of Aristotle self-action for bodies though, unlike Aristotle, only as automatic invariant law responses to emitted signals with no divine involvement - so stones fell to the ground only with a specific acceleration in response to a specific strength and direction of gravity signals from the Earth. Gilbert postulated a robot signal-response universe basically, and allowed that physical causations might involve either material or non-material energy signals or physical pushings.

Of course Gilbert had grasped the nettle of 'action at a distance' - the most difficult theoretical problem for science to explain. How could bodies, separated and seemingly with nothing in-between them, influence each other? Besides magnetism, De Magnete did examine to some extent other 'action at a distance' phenomena including especially static electricity and mentioning gravity. It backed Copernicus on the Earth orbiting the Sun, developed more fully in his later De Mundo, adding the proposition that the Earth had a 24 hour spin probably due to its magnetism. But while Copernicus and other earlier scientists had not sought to develop any theory explaining the why / how of planetary motion or of any 'action at a distance', Gilbert did. Gilbert's Magnetical Science was an automatic-response-to-emitted-signals physics, involving different types of attraction and/or repulsion 'magnetical' signals to which different bodies responded - including for him at least 4 'magnetical' signal types being magnetic, electric charge, terrestrial gravity and inter-planetary attraction [Newton later concluded that the last two were the same gravity]. Gilbert termed such signal emissions generally as 'effluvia' or 'emissions' and Newton generally called gravity signal emissions 'spirits emitted' or 'energy emissions'. (Though such emissions may not be currently directly detectable, many detectable emissions show a decrease in intensity with the square of the distance from their source similar to some action-at-a-distance forces.)

Many early scientists were concerned with deriving improved description of natural phenomena, and afraid of or not at all concerned with trying to explain why nature acted as it did. Thousands of years of mere clever thinking had achieved little real, before the experimental science method emerged and produced quite different ideas on the universe. Gilbert's 1600 De Magnete was mostly just taken as being the most expert scientific work using experiments to describe magnetism and how it works, and only a few like Newton saw the significance of its physics theory. Gilbert saw action at a distance as based on signals that bodies emit (effluvia), and to which signals other bodies reacted automatically and invariantly as robots. Despite Gilbert producing the strongest disproofs of Aristotle's ideas and methods, his robotic response theory was commonly misinterpreted as an Aristotle animate universe theory, though it was really more an information-handling robot universe theory perhaps more advanced than the simpler mechanical universe theory that Descartes later produced and which won wide support. And Gilbert's universe had less requirement of gods or humans than Aristotle's and Descartes'.

Gilbert himself did many experiments, as did Galileo and Newton though not Kepler, Descartes or Einstein. Gilbert centrally claimed that his experiments proved that no inactive matter existed :- "Aristotle's 'simple element' - and that most vain terrestrial phantasm of the Peripatetics, - formless, inert, cold, dry, simple matter, the substratum of all things,

having no activity, - never appeared to anyone even in dreams, and if it did appear would be of no effect in nature." ("De Magnete...." Mottelay, Book 1.17 pp.69). Gilbert's 'no dead matter' physics was somewhat in line with the later 'no matter' philosophy of George Berkeley and opposed by the 'no mind' mechanical physics of Rene Descartes. Where Descartes mechanical physics required absolute properties of bodies in their occupying absolute space and not being able to occupy the same absolute space at the same time so that body motion must push, Gilbert physics had only relative requirements. Anything corporeal or non-corporeal might be a signal, relative to some observer that can respond to it - and anything might be an observer, relative to some signal to which it can respond. The theory also basically required that physical observers, unlike intelligent observers, always respond to signals in fixed predictable science-law ways.

Gilbert's basic physics theory reasoning was very soundly based as explained by him in De Magnete book 2 chapter 2. He saw action between 2 bodies as needing some form of 'contact', and so concluded that at-a-distance action must involve something being emitted by one body and contacting the other body. But he saw contact as not needing to involve pushing and concluded that the attraction, repulsion and other motions of magnetism could not be due to any form of simple pushing. Gilbert like Newton saw pushing as indiscriminate, so that light things like air should be pushed to a visible extent by any push-magnetism, push-electricity or push-gravity if they moved heavier things substantially, but Gilbert's experiments proved that was not the case. So he deduced that these at least were not indiscriminate push forces, but must be discriminating signal response forces - responses when signals touched bodies without pushing them.

Physics objections to objects touching-pushing come both from some supporters of 'field' forces and from supporters of signal forces, though some supporters of field forces did see 'fields' as themselves basically touching-pushing things if not objects - while others have avoided specifying what their 'fields' actually are at all. The zero distance required by Cartesian contact-physics is actually unmeasurable and so unprovable, while the finite distances of 'at-a-distance' physics are measurable and provable. And the differing abilities of Neutrons and Photons to penetrate bodies now suggests maybe that, unlike macroscopic objects, the ability of microscopic objects to penetrate other objects is less affected by 'pushability' or 'massness' properties of the objects than by some 'reactivity' properties. And this maybe backs doubts on pushability existing, though smaller Neutrinos having better penetration than larger Neutrons might give some little support to pushability ? Modern claimed differences in space-occupancy and other properties of 'matter' and 'energy packets' at the microscopic level are maybe doubtful. And for another modern physics argument that things generally do not touch or contact, based on evidence that the outside of atoms generally have electrons which electrostatically repel each other, see [No Touching](#). Of course there is more to atoms and to matter generally.

Some saw Gilbert 'animate' motion as Aristotlian, especially as he of course often used the scholar Aristotlian words of the time he was writing in - though with new scientific meanings. This has been noted by some like [Gad Freudenthal, ISIS 1983](#) and Stephen Pumfrey, CUP 2002. Some strangely saw Gilbert as in line with Jean Buridan (1300-1358), though Gilbert's motion is distinctly his own in concluding that his experiments proved his new theory of active bodies responding automatically in proportion to different emission signals they receive. Gilbert had studied widely and referenced all technologies and ideas of any relevance to his science - both current and from early Chinese, Arab, Greek and other societies. But later physicists were to largely confine their studies narrowly to only what were current local science-journal issues.

Gilbert basically took all bodies as being simple robots that emitted signals and responded to signals, and this was understood at least by Newton who developed it for gravity especially, but religion saw this as their thinking-spiritual arena needing to be dismissed as alchemist. The key to Gilbert's theory was bodies automatically responding to whatever, and Kepler concluded that the heavenly machine is a kind of mechanical clockwork whose motions are caused by magnetic force threads. Kepler claimed in Epitome of Copernican Astronomy (1618-21) to have built his astronomy "on the Copernicus hypotheses, Tycho Brahe's observations, and the Magnetical Science of William Gilbert" - with Gilbert's magnetical science misunderstood or misrepresented as a push-forcefield threads science. Of course in 1600 Gilbert's ideas were alien and generally not understood correctly as there were no signal response robots built then - the most advanced machines being perhaps the mechanical clock and the compass.

Gilbert had delayed publishing anything till late in life, partly like Copernicus who delayed publishing till on his deathbed just days before his death to try to avoid persecution. Soon after publishing De Magnete, Gilbert died of the Black Death and his younger brother took responsibility for publishing his manuscript for a second book putting his wider Magnetical Science or Attraction Science. His brother could not get De Mundo published, seemingly due to its suppression by Sir Francis Bacon, but soon after 1603 did manage to provide a few people with a manuscript copy, apparently including Galileo and Kepler, and in 1651 long after his death it did get published. Gilbert, like Galileo and Newton, held a low opinion of the majority of his peers and just trusted that his own proofs and experiments would sufficiently demonstrate the correctness of his theory whatever most of his peers concluded. Gilbert's Attraction Science did gain some backing, but Descartes supporters were soon to discredit Gilbert's theory without any disproof of it, and the later 1651 publication of Gilbert's 'De Mondo' was too little too late. The only known 17th century English university teaching of Gilbert was at Clare college Cambridge between 1658 and 1678 and that may well have been little. Descartes 'dead-matter' science generally prevailed over Gilbert 'robot-matter' theory by name-calling and without disproving it to Newton at least. Newton's disgust at Gilbert attraction theory being dismissed by merely calling it 'occult' was shown in him saying that in that case all theories involving unseens should be called occult including Descartes' (and logically also including Einstein's theory since nobody has directly seen a spacetime continuum).

Gilbert's physical universe had two types of fundamental things ;

1. Various types of robot observer particles that emitted and responded to effluvia force signal emissions, which might mean atoms or parts of atoms and maybe photons etcetera. The internal structure if any of these 'blackbox' things mattered little in Gilbert's theory, only their emission and response to effluvia signals.
2. Various types of effluvia force signal emissions, causing eg electrical, gravitational and proximity responses in some or all of the above particles.

The latter seem currently less easily directly detectable than the former.

Two main conclusions of Gilbert were that different types and strengths of signal had different ranges - which for magnetism could be less than an inch for a weak magnet to some miles for the Earth's magnetism - and that signal strength diminished with distance. He deduced from experiments comparing magnetism and static electricity that different types of effluvia signal emissions also had different abilities to penetrate matter, seeing low-penetration electric charge signals as material particles and high-penetration magnetic signals as non-material energies or 'spirits' - so his effluvia signal emissions were perhaps in modern physics terms 'quanta' that could be mass or could be energy. Some have interpreted his signal range in terms of a force field, though the idea of force fields is a quite different idea requiring all space to be filled with something like an energy version of Descartes material ether. From our atmosphere attenuating with altitude, Gilbert concluded that just a few miles above the Earth was empty space containing nothing - but through which his signals including gravitation effluvia 'gravitons' could pass. Planet orbits not having drag made Newton support Gilbert's empty space, though Descartes like Aristotle and perhaps Einstein thought empty space was not possible largely on theoretical grounds.

It is to be noted that Gilbert did not conclude that magnets or magnetic signals contained contrary properties because they attracted iron and did not attract ice. Gilbert like Newton taking science as not allowing actual contradictions, saw the difference as being in iron and ice having different responses, without any contradiction, to the same unitary thing. Einstein and others unfortunately later made what is maybe an anti-science mistake of taking light (and particles) as both being wave and being not-wave, and adopted the self-contradictory self-disproved 'Duality Theory' instead of accepting that different responses as to light do not imply different source properties as of light.

One substantial problem for Gilbert's theorising came from magnetism being one the most complex of the physical forces, so his many measured experiments could not yield him the simple mathematical laws that Newton was to later develop in applying Gilbert's theory to gravity. While the other physical forces are simpler central attraction or repulsion forces, magnetism involves poles and includes turning or partial-rotation responses. Though Gilbert had been an examiner in mathematics, he distrusted mathematical deduction as being mere logical philosophising as against being experimental proof science, and so stood by minimal logic and minimal mathematics. And a bigger problem to developing his theory further was the fact that his knowledge of mechanics and motion being pre-Newton and pre-Galileo was limited. A couple of bits of Gilbert were disproved by later experiments, but were entirely inessential to his theory. Kepler unintentionally showed that good mathematics could be successful even within a poor explanation physics, but not until Newton was Gilbert's 'attraction theory' properly mathematised.

The old legal joke "There are three types of unreliable witnesses : simple liars, damned liars, and experts.", was made a statistics joke as "There are three kinds of lies : lies, damned lies, and statistics." But some supporters of experimental 'real' science might prefer "There are three types of doubtful science : hypotheses, science fiction, and mathematics."

While Gilbert produced his useful working mini-magnetic-planet models ('Terrellas'), nobody has made useful working mini gravitational planet models as gravity seems insignificant for normal small bodies and atomic repulsions prevent substantial object compression. (Strangely perhaps it has not yet proved possible to use the fact that neutrons and neutrinos should be more easily compressible.)

Despite Gilbert disproving Aristotle many times in his works and having no place for gods, Gilbert's theory was labelled by many physicists as 'Aristotelian' god-derived - and was rejected in favour of the god-separate Descartes mechanical-robot science (fully published by 1644) but maybe akin to throwing out the baby with the bath water ? Information handling robots are a more modern technology than mechanical robots, and modern information theory is now doing much work that is basically along Gilbert signal theory lines, though without any great impact on physics theory as yet. Despite the almost universal use now of televisions and mobile phones all acting in response to remote emitted signals, which perhaps at least partly confirms Newton's view that Gilbert signal theory was at least plausible ? But the majority of physicists still claim that action at a distance is impossible - when most people know it IS possible and works by SIGNALS emitted and responded to as Gilbert concluded that magnetism, electric charge and gravity work. Gilbert termed those natural emitted signals 'effluvia' - from Latin at the time generally taken as meaning 'non-visible characteristic emissions from bodies such as their smells'. But in his preface to De Magnete did clearly state that his use of words often involved new scientific meanings for them. While his natural signals emitted by objects causing magnetism, gravity etcetera were termed 'effluvia' by Gilbert, they were generally referred to by Newton as 'spirits emitted'. But Gilbert saw the evidence as indicating that some 'effluvia' natural signals emitted were corporeal particles and that only some were non-corporeal non-particle energies or 'spirits'.

The actual observed difference between magnetic behaviour and gravitation behaviour is substantial, so that producing

one simple theory to cover both is a substantial problem to any physics. Hence magnetism involves attraction, repulsion and orientation affects, while gravity involves only one simple attraction affect. Gravity being basically simple could easily seem to suit a simple Descartes mechanical push theory, which was very difficult to apply to magnetism. But magnetism being more complex perhaps more suits a Gilbert signal response theory, which also was easy to also apply to gravity as attraction theory as Newton showed. And notably gravitational and electromagnetic forces have some common aspects that Gilbert signal response theory handles well. They both have directionality though it may be only directionality relative to another object, and their action also seems to involve a mutuality relative to another object. In fact these forces may well have no objective existence for one object alone, in line with William Gilbert's signal-response theory of forces ?

Some like Einstein followed Descartes basically by taking gravity as being fundamental, and taking magnetism as being an inessential of less importance to physics theory. Though in science all well confirmed facts are basically equal, Newton did little to oppose the magnetism-does-not-matter position. But the fact that magnetic and electric charge forces give BOTH attraction AND repulsion behaviour, does strongly suggest that the 'force' of these forces at least is NOT in the force itself but in bodies responses - as in Gilbert's signal response theory. A big problem for any push-physics explaining is that pushing is basically indiscriminate but the actual universe includes different attractings including some discrimination attractings as well as different repulsions including some discriminating repulsions.

For comparison with other physics theories, Gilbert's three laws of motion would be ;

1. Every observer body will remain at rest, or in a uniform state of motion unless effluvia signal emissions act upon it.
2. When effluvia signal emissions act upon an observer body, it accelerates itself proportional to the signal strength and inversely proportional to the mass of the body and in the direction required by the signals.
3. Every effluvia signal action evokes an equal and opposite effluvia signal emission reaction.

Gilbert's theory might maybe be strengthened with a few additions that would basically make it a gauge bosons particle exchange theory such as some modern particle physicists favour ;

1. Observer bodies emit various effluvia with speed of light velocity in response to various effluvia being received by them.
2. All motion and other natural phenomena are caused by this process (including seemingly causeless radioactive decay).
3. Effluvia are conserved.
4. All observer bodies are aggregates of effluvia.

Then we might have the basis of a relativistic quantum mechanics physics without fields or continua, or of a no-ether Descartes particle push physics without fanciful corkscrew-particle-push or boomerang-particle-push attractions ? Maybe a high-reaction graviton causing the emission in the same direction of a particle pair of a similar low-reaction graviton plus another high-reaction particle (normally multi-directional) giving the gravity momentum effect ? Whatever it would mean, that physics would be about how many different types of effluvia exist and their properties, how many different types of effluvia-aggregates exist and their properties including what influences effluvia aggregation and dis-aggregation ? And maybe unlike mass, charge and spin could be just signal response properties ?

One apparent difference between Gilbert-Newton signal attraction theory and Descartes push theory is on 'action and reaction are equal and opposite'. Though Gilbert and Newton proved that this did hold for attractions, it may seem that a push must give an equal effect while a small signal might give a big effect. But this apparent problem can also occur in mechanics and can be fully resolved with lever, trigger and conversion (eg  $E=mc^2$ ) effects. And if particles like neutrons are themselves complex systems, then a graviton signal might trigger a series of events including eg neutrino emission that actually produce motion responses ?

The supposedly separate two processes of force-production and acceleration-by-force, may actually be basically one process - ie. bodies in Gilbert theory terms maybe basically respond to external forces by **accelerating themselves by producing their own forces as maybe by emitting small particles in response to received signals like remote-controlled rocket engines**. This could give a natural 'equivalence' of forces and acceleration having a wider cover and making more sense than Einstein's little Equivalence Principle applying only to gravity. Supporting this is Gilbert and Newton often positing the mutuality of forces between multiple bodies, and as we are in a multiple body universe there can maybe be no proof that one single isolated body would have any force of gravity or any other force ? This mutuality seems clearly related to the 'entanglement' property in quantum information theory (from experiments suggesting that atoms can split one photon into two mirror 'entangled' photons of eg opposite spin polarisation and half the energy with some claiming that these remain somehow linked or 'entangled' even when distantly separated). A signal physics can more naturally handle multiple-signal emissions having related information and/or separate mutual signal emissions having related information, without requiring any mystical 'entanglement'.

A static electric charge stationary on the moving Earth, produces NO magnetic response from a detector compass that is also stationary on the Earth - but DOES produce a magnetic response from a detector compass that is moving relative to the Earth. This fits poorly with most forms of field physics theory, and better fits a Gilbert style theory where no 'magnetic

fields' exist but electric charge signals are emitted and detectors simply respond electrically and/or magnetically to such signals motion relative to themselves. A stationary permanent magnet does produce magnetic responses from another stationary permanent magnet, but the absence of macroscopic relative motion can still allow of their microscopic atoms or elementary particles having some relative spin or other motions. A 'stationary' electric wire can carry a moving electron current, and generally 'rest' can include motion and vice versa..



'De Magnete' title page :-

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GILBERT mainly saw himself firstly as a chief advocate of new experimental natural science examining everything, as against the mere dogmatism and philosophising of old natural philosophy and religion. He experimented and he talked with miners, sailors and others before writing his *De Magnete* somewhat in the style that Karl Marx was to later write his *Das Kapital*. Gilbert further saw himself the originator of a new signal response physics theory covering magnetism, electricity, gravitation and mechanics - which he sought to prove chiefly through his experiments on magnetism. And finally he saw his lesser role as establishing some of the real facts of magnetism and electricity - though commonly only this role got properly acknowledged.

While there should be freely available some English or translatable online versions of Gilbert's two major publications, his 1600 '*De Magnete*' and his 1651 '*De Mundo Nostro Sublunari Philosophia Nova*' ('A Philosophy of our Sub-lunar World, or A New Science of everything under the moon'), somehow neither seem available online. We will try to put more of it online on this website soon, but for now our Gilbert sections have only English extracts and full online Latin image versions or links.

Gilbert's strongly anti-philosophising/reasoning and pro-experiment/experience position was maybe reflected around 1670 in '*Satire Against Reason And Mankind*' by John Wilmot Earl of Rochester though that interesting work was perhaps just anti-science, anti-religion and anti-government ?

Or for now you can maybe read online or download free '*Alice's Adventures in Wonderland*' by Lewis Carrol, 0.28mb PDF - up to 3 minutes to load.

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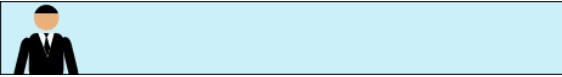
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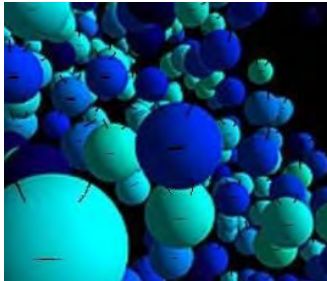


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## William Gilbert - De Magnete

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translation was originally planned for 2005)

The two available English translations of William Gilbert's 'De Magnete' are poor science translations - but below are key extracts from the Mottelay translation and more [here](#). Machine translations, such as offered for convenience on this site, also give poor science translation. You can read the full original Latin 1600 De Magnete, through the excellent Google Books - [Google De Magnete](#) . We hopefully await an improved English translation by Dr Stephen Pumfrey and Dr Ian Stewart of Gilbert's other posthumously published 1651 Latin work "De Mundo Nostro Sublunari Philosophia Nova" (A New Philosophy of our Sublunar World, or A New Science Theory of Everything Under the Moon, or A New TOE ?) - and to quote Steve Pumfrey (Lancaster University science historian) ; "Gilbert's uniqueness in both natural philosophy and cosmology stems from his conviction that he had empirical proof of his theory of active matter." in 'Cambridge Scientific Minds' CUP 2002. (but their intended

### William Gilbert's 'De Magnete' translated by P.Fleury Mottelay.

From 'De Magnete' Book 1, Chapter III :

"But inasmuch as the spherical form, which, too, is the most perfect, agrees best with the earth, which is a globe, and also is the form best suited for experimental uses, therefore we purpose to give our principal demonstrations with the aid of a globe-shaped loadstone, as being the best and the most fitting. Take then a strong loadstone, solid, of convenient size, uniform, hard, without flaw; on a lathe, such as is used in turning crystals and some precious stones, or on any like instrument (as the nature and toughness of the stone may require, for often it is worked only with difficulty), give the loadstone the form of a ball. The stone thus prepared is a true homogenous off-spring of the earth and is of the same shape, having got from art the orbicular form that nature in the beginning gave to the earth, the common mother; and it is a natural little body endowed with a multitude of properties whereby many abstruse and unheeded truths of philosophy, hid in deplorable darkness, may be more readily brought to the knowledge of mankind. To this round stone we give the name microge, or Terrella (earthkin, little earth)."

and,

"The terrella sends its force abroad in all directions, according to its energy and its quality. But whenever iron or other magnetic body of suitable size happens within its sphere of influence it is attracted; yet the nearer it is to the loadstone the greater the force with which it is borne toward it."

Of course Gilbert does discuss his theory ideas in various parts of his works often using different terms capable of different interpretation and translation - physics did not yet have an accepted technical jargon then, so that eg Gilbert himself had to invent some terms like 'electricity'. In another bit of latin innovation, he coined a term for mutually-attracting bodies coming together as 'coition' instead of 'attraction' - but, unlike his new 'electricity', that term did not catch-on in physics.

The latin term 'effluvia', meaning approximately 'emissions', was used by many before and after Gilbert but often in quite different and in some cases unscientific theories. Hence atomists used 'effluvia' as proposed emissions of particles said to push bodies about - including an early theory of magnetism in which magnetic particle effluvia from magnets were supposed to push away the air between a magnet and a piece of iron so that the resulting vacuum sucked iron to magnets. Descartes' physics also involved particle effluvia. Others have used 'effluvia' with a different sense, as either emissions of energy or of 'soul' or 'spirit' that left one body and if entering another body energised, enlivened or motivated it.

In all of these uses, proposed 'effluvia' directly caused actions in bodies. Gilbert's theory was quite different in involving a variety of effluvia some of which he reasoned were probably particles and some not - and his effluvia signal emissions did not directly cause any actions but acted as signals to bodies receiving them and bodies themselves responded automatically as information response robots. Gilbert maybe should have invented a new term for his effluvia signals, but a term that covered a thing being both an automatic emission and acting as a received automatic signal did not exist in latin (and in English now might need something like 'emission signal quanta' ?) - making the understanding and translating of Gilbert physics with its robot-matter difficult. Uniquely his physics theory's ultimate particles are basically nanorobots as the basis of all physics - including electricity, magnetism and gravity.

NOTE. Gilbert's effluvia signal emission explains gravitational and electric charge attraction decreasing as the square of

the distance from a body, as his effluvia signal emissions spread and dilute evenly and the surface of spheres increases as the square of their radius. Inverse square force necessarily follows from any theory involving emissions of particles or of waves, excepting possibly when travelling through a medium ( eg gas, liquid or solid ) when losses might be expected to involve actual attenuation being somewhat greater than the square of the distance. Hence such forces, like light, following the inverse square law over astronomical distances would seem to involve either 0% interaction, 100% propagation and/or no medium ? (magnetism is a somewhat more complex effect that does not simply follow the inverse square rule anyway).

Non-emission physics theories, like Maxwell's field theory and Einstein's continuum theory, include inverse square action perhaps non-necessarily and even arbitrarily ? Also in a Gilbert type theory a constant signal-response time, a signal saturation level and/or a maximum response level might replace Einstein's perhaps anomalous constant velocity of light ?

Collision push-theories of forces like gravity are assumed to work something like 'billiards averaged' - where the typical collision is glancing-collision where a ball from one direction collides causing another ball to move away at some angle, but the average being exactly head-on causing the other ball to move away in the same direction though happening much less often. However, signal response systems may always respond precisely to the directionality of incoming signals - as some plants and animals respond to a light source, moving directly towards or directly away or eg spiralling towards like moths. Of course individual 'force events' may perhaps never be detectable, only average responses ?

When a beam of light hits a sheet of glass, a wave theory or a particle theory may seem to require that the light be entirely reflected or entirely refracted - but in fact at least normally some of BOTH happens. While either light theory can be elaborated to explain such double-happening, it seems maybe simpler to take it as not being down to either form of mechanical contact but as down to marginal attraction/repulsion responses Gilbert-Newton theory fashion ? Of course Gilbert, Descartes, Newton and Einstein all supported determinist theories where if you know the full details then any event will involve single determinate outcomes though a multi-event event might have multiple single determinate outcomes. They all rejected probabilistic or indeterminate events in physics as being 'uninformed' or 'inadequately experimented' events only. Yet for some kinds of 'probabilistic' events mathematical laws have been produced that some see as giving an alternative type of. or elaboration of, physics theory.



'De Magnete' page 155 :-

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### Gilbert's 'De Mundo....' :-

Gilbert was rightly afraid to publish his ideas on astronomy and gravity in his lifetime, and it was nearly 50 years after his death that they were published in his De Mundo.

That work showed that Gilbert concluded that there must be some force natural to planetary bodies, which was proportional to their mass, mutually attractive and decreased with distance. An attractive force that was emitted from the sun making planets orbit it, that was emitted from the Earth making the moon orbit it, and that was emitted from the moon making Earth tides. Basically just what astronomy needed. He did not specifically link that either with magnetism or with earths gravity, though saying that objects weight consist only them responding to attractions from another body like the earth.

Kepler did learn of these astronomy ideas of Gilbert, as least in general, long before their posthumous publishing. He did acknowledge Gilbert but developed an unworkable mechanical-field vortex modification as his own theory (akin to the later Descartes fluid-ether vortex theory) which he wrongly thought better than Gilbert's theory. Newton later disproved Kepler's theory.

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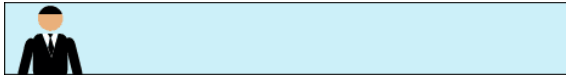
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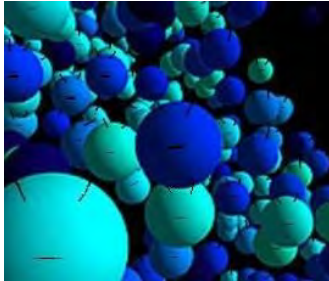


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## William Gilbert - De Magnete, De Mundo and selected extracts

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William Gilbert's 'De Magnete' was written about 1583 when there was little if any science and anything half scientific risked imprisonment or execution, so its publication was delayed until 1600 and many copies were sold with riskier parts like Book 6 cut out. Its two english translations were not done till about 300 years later, and even the translators admitted were very problematic. Some carefully selected extracts from the P.Fleury Mottelay translation can be read below - and more will be on here soon.

Gilbert's 'active matter' physics with its robot atoms emitting and responding to signals is very unlike other physics theories - and Newton successfully used its basics so maybe it is still not quite dead. (but it was bare-bones, and needing some addition)

### William Gilbert's 'De Magnete' - P.Fleury Mottelay translation extracts.

That attractions are responses to signals and are not any form of pushing. (Book 2.2 pp.89-92)

And that amber does not attract the air is thus proved : take a very slender wax candle giving a very small clear flame ; bring a broad flat piece of amber or jet, carefully prepared and rubbed thoroughly, within a couple of fingers' distance from it ; now an amber that will attract bodies from a considerable radius will cause no motion in the flame, though such motion would be inevitable if the air were moving, for the flame would follow the current of air. The amber attracts from as far as the effluvia are sent out; but as the body comes nearer the amber its motion is quickened, the forces pulling it being stronger, as is the case also in magnetic bodies, and in all natural motion ; and the motion is not due to rarefaction of the air or to an action of the air impelling the body to take the vacated place ; for in that case the body would be pulled but not held, since, at first, approaching bodies would even be repelled just as the air itself would be: yet in fact the air is not in the least repelled even at the instant that the rubbed amber is brought near after very rapid friction. An effluvia is exhaled by the amber ..... A breath, then, proceeding from a body that is a concretion of moisture or aqueous fluid, reaches the body that is to be attracted, and as soon as it is reached it is united to the attracting electric; and a body in touch with another body by the peculiar radiation of effluvia makes of the two one: united, the two come into most intimate harmony, and that is what is meant by attraction. This unity is, according to Pythagoras, the principle, through participation, in which a thing is said to be one. For as no action can be performed by matter save by contact, these electric bodies do not appear to touch, but of necessity something is given out from the one to the other to come into close contact therewith, and be a cause of incitation to it.

and later (Book 2.2 pp.96-97)

The effluvia spread in all directions..... hold and take up straws, chaff, twigs, till their force is spent or vanishes; and then these small bodies, being set free again, are attracted by the earth itself and fall to the ground. The difference (distinction) between electric and magnetic bodies is this: all magnetic bodies come together by their joint forces (mutual strength); electric bodies attract the electric only, and the body attracted undergoes no modification through its own native force, but is drawn freely under impulsion in the ratio of its matter (composition). Bodies are attracted to electrics in a right line toward the centre of electricity: a loadstone approaches another loadstone on a line perpendicular to the circumference only at the poles, elsewhere obliquely and transversely, and adheres at the same angles. The electric motion is the motion of coacervation of matter ; the magnetic is that of arrangement and order. The matter of the earth's globe is brought together and held together by itself electrically. The earth's globe is directed and revolves magnetically; it both coheres and, to the end it may be solid, is in its interior fast joined.

Magnetism is by speed of light or faster signals with some effective signal range or distance. (Book 2.7 pp.123-124)

The magnetic force is given out in all directions around the body; around the terrella it is given out spherically; around loadstones of other shapes unevenly and less regularly. But the sphere of influence does not persist, nor is the force that is diffused through the air permanent or essential; the loadstone simply excites magnetic bodies situate at convenient distance. And as light - so opticians tell us - arrives instantly in the same way, with far greater instantaneousness, the magnetic energy is present within the limits of its forces; and because its act is far more subtle than light, and it does not accord with non-magnetic bodies, it has no relations with air, water, or other non-magnetic body; neither does it act on magnetic bodies by means of forces that rush upon them with any motion whatever, but being present solicits bodies that are in amicable relations to itself. And as a light impinges on whatever confronts it, so does the loadstone impinge upon a magnetic body and excites it. And as light does not remain in the atmosphere above the vapors and effluvia nor is

reflected back by those spaces, so the magnetic ray is caught neither in air nor in water. The forms of things are in an instant taken in by the eye or by glasses; so does the magnetic force seize magnetic bodies. In the absence of light bodies and reflecting bodies, the forms of objects are neither apprehended nor reflected ; so, too, in the absence of magnetic objects neither is the magnetic force imbedded nor is it again given back to the magnetic body. But herein does the magnetic energy surpass light, - that it is not hindered by any dense or opaque body, but goes out freely and diffuses its force every whither.

Magnetism and gravity involve signals that are more penetrating than electric charge signals. (Book 2.16 pp.135-136)

On the other hand, in all the bodies that have a material cause of attraction (eg. amber, jet, sulphur) action is hindered by interposition of a body (as paper, leaves, glass etc.). and the way is obstructed and blocked so that that which is exhaled cannot reach the light body that is to be attracted. But coition and movement of the earth and the loadstone, though corporeal hinderances be interposed, are shown also in the efficiencies of other chief bodies that possess the primary form. The moon, more than the rest of the heavenly bodies, is in accord with the inner parts of the earth because of her nearness and her likeness of form. The moon causes the movement of the waters and the tides of ocean ; makes the seashore to be covered and again exposed twice between the time she passes a given point of the heavens and reaches it again in the earth's daily rotation : this movement of the waters is produced and the seas rise and fall no less when the moon is below the horizon and in the nethermost heavens, than when she is high above the horizon. Thus the whole mass of the earth, when the moon is beneath the earth, does not prevent the action of the moon; and thus in certain positions of the heavens, when the moon is beneath the horizon, the seas nearest to our countries are moved, and, being stirred by the lunar power (though not struck by rays nor illumined by light), they rise, approach with great impetus, and recede. Of the reason of this we will treat elsewhere : suffice it here just to have touched the threshold of the question. Hence, here on earth, naught can be held aloof from the magnetic control of the earth and the loadstone, and all magnetic bodies are brought into orderly array by the supreme terrene form, and loadstone and iron sympathize with loadstone though solid bodies stand between.

Magnetism involves signals similar to light. (Book 5.11 pp307)

As in many other demonstrations, so in this most indisputable diagram of the forces magnetical effused by the form, we grasp the true efficient cause. And this (the form), though it is subject to none of our senses and is therefore less perceptible to the intellect, now appears manifest and visible before our very eyes through this formal act, which proceeds from it as light proceeds from a source of light.

Bodies respond to magnetic signals automatically and not by temperament (Book 2.3 pp.102)

For of what use can temperament be in magnetic movements that are calculable, definite, constant, comparable to the movements of the stars

Bodies need no senses or thoughts to respond to signals (Book 5.12 pp.311-312)

The human soul uses reason, sees many things, investigates many more ; but, however well equipped, it gets light and the beginnings of knowledge from the outer senses, as from beyond a barrier - hence the very many ignorances and foolishnesses whereby our judgments and our life-actions are confused, so that few or none do rightly and duly order their acts. But the earth's magnetic force and the formate soul or animate form of the globes, that are without senses, but without error and without the injuries of ills and diseases, exert an unending action, quick, definite, constant, directive, motive, imperant, harmonious, through the whole mass of matter .... Yet these movements in nature's founts are not produced by thoughts or reasonings or conjectures, like human acts, which are contingent, imperfect, and indeterminate, but connate in them are reason, knowledge, science, judgement, whence proceed acts positive and definite from the very foundations and beginnings of the world

Planets rotate and orbit in response to signals (Book 6.4 pp.333-334)

The earth therefore rotates, and by a certain law of necessity, and by an energy that is innate, manifest, conspicuous, revolves in a circle toward the sun; through this motion it shares in the solar energies and influences; and its verticity holds it in this motion lest it stray into every region of the sky. The sun (chief inciter of action in nature), as he causes the planets to advance in their courses, so, too, doth bring about this revolution of the globe by sending forth the energies of his spheres - his light being effused .... So the earth seeks and seeks the sun again, turns from him, follows him, by her wondrous magnetical energy. .... And such are the movements in the rest of the planets, the motion and light of other bodies especially urging. .... Thus each of the moving globes has circular motion, either in a great circular orbit or on its own axis or in both ways.

Bodies mutually attract in proportion to their mass (De Mundo....)

"The force which emanates from the moon reaches to the earth, and, in like manner, the 'magnetical virtue' of the earth pervades the region of the moon: both correspond and conspire by the joint action of both, according to a proportion and conformity of motions, but the earth has more effect in consequence of its superior mass ; the earth attracts and repels the moon, and the moon, within certain limits, the earth ; NOT so as to make the bodies come together as magnetic bodies do, but so that they may go on in a continuous course."

You can read the full original Latin 1651 *De Mundo* online, through the excellent Max Plank Institute and ECHO (European Cultural Heritage Online) - [Gilbert's De Mundo](#).

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### ***Translating Gilbert's 'De Magnete' and 'De Mundo'.***

At school myself having English as a first language and moving to concentrating on science, the other languages that I was taught were Gaelic, French, Scientific German, Scientific Russian, Scientific Greek and Scientific Latin.

Translating fiction literature must prioritise an attempt to conserve writing style as well as meaning, and for old literature this will often involve conserving the flavour of the period in which that fiction literature was written. But translating original scientific work has to prioritise conserving its science meaning, so that writing style and period flavour must then be a very secondary concern.

The few late translations of Gilbert's two Latin works to date have unfortunately been done more as translations of fiction literature, losing much of the science meaning. Even their titles are poorly translated as in *De Magnete's* *physiologia* being translated as 'philosophy' or 'physiology' when it should translate as 'natural science'.

Gilbert noted in its preface that he was assigning new specific scientific meanings to some words, and one of the chief words of his science is the word 'effluvia'. The only use of the word *effluvia* in science today is as meaning 'waste emissions', but Gilbert certainly never used it with that meaning. It is generally not translated, but in translating Gilbert's science 'effluvia' does need to be translated as 'signal emissions' since natural magnetic, electric and gravitational signal emissions is clearly what Gilbert uses 'effluvia' to signify in his physics.

Translations of Gilbert also do not seem to consistently translate his 'magnetic' and 'magnetical' correctly, it seeming that *magnetum* and *magnetis* are 'magnetic' while *magneticum*, *magneticis* and *magnetica(e)* are 'magnetical'. The only recorded English known of Gilbert is one letter to William Barlow that included calling mathematician Giovanni Francesco Sagredo (1571-1620) "a great magnetical man" though Sagredo was not made of iron but seemingly had studied *De Magnete* and supported its attraction theory, and chiefly was a friend and maybe patron of the young Galileo for a time. (and whom Galileo made one of his characters in his 'Dialogues concerning Two New Sciences', 1632) While Gilbert's use of 'magnetic' is simple as involving actual magnetism, his use of 'magnetical' seem to cover a broader range of meanings from 'magnetism-related' to 'magnetic-like' as including magnetism, electricity and gravity at least - to maybe 'attraction-science-like' or 'physical-science-like'. A clear example of its use as 'magnetic-like' is seen in the last *De Mundo* quote given above here, which many wrongly took as Gilbert claiming that Earth's tides and planetary orbits were caused by magnetism.

Gilbert coined the science term Electricity which stuck in physics and so needs no translation, but some of his terms like 'coition' have not stuck and so have no physics meaning now but still are not translated. Gilbert's 'coacervationis' gets translated as the meaningless 'coacervation' when it should be 'aggregation', and his 'coition' should be 'mutual aggregation'. Gilbert is almost impossible to study for any modern physics student or physicist, and does really need some much improved science translation.

Isaac Newton's *Principia* also suffered some similar Latin translation problems, especially in many places where he refers to Gilbertian attraction physics. Hence his *Principia* use of the term 'virtus' in Definition V11 was translated reasonably by Andrew Motte in 1729 as the science term 'force'. But Newton's use of the same term 'virtus' in Book 2 Section V Scholium was translated reasonably for 1729 by Motte as the term 'virtue' which in science was later displaced by the term 'power', both meaning the ability to generate a force. But both Newton and Gilbert did at times stretch their use of Latin. Where Gilbert's term 'effluvia' is always untranslated remaining 'effluvia', Newton's use of a Latin equivalent is always untranslated also but as the non-science term 'spirits emitted'.

(Gilbert used some philosophy words of his time problematically, like maybe form, anima and spirit, sometimes maybe as new science terms but sometimes maybe with their philosophy meanings, so translation of some terms in Gilbert's works must remain uncertain. Few clarifications exist from Gilbert outside his two published works, and his contemporary Francis Bacon was maybe unhelpful with his 'clarification' in *Advancement of Learning* 1605 - "When we speak of forms, we mean nothing else but those laws and determinations of the pure act which sets in order and constitutes a simple nature. The form of heat and the law of heat are the same thing.")

The word 'form' in Gilbert most often means simply 'shape', and in noting that physical forces are spherical he is making a real scientific point and not being mystical as some have claimed. While most of the physical forces are spherical and produce only rectilinear motion towards or away from their centre of force, he noted that magnetism has poles and produces partial-rotation motions also. It may be of some interest that only the sphere and the disc can have motion without it changing the space location that they occupy, and that uniform rotation/spin motion cannot itself be distinguished from rest by an external observer if the parts of the sphere or disc are not distinguishable. But Descartes and other physics theory largely proceeded to ignore non-rectilinear motion, though any snooker player would see ignoring spin as a big mistake.

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## SOME QUESTIONS.

When some assign eg 'gravitational potential energy' to a body, it may be asked what is the gravitational potential energy of a stationary body half way between two planets of equal mass ?

In any gravity theory where bodies are accelerated by external particle momentum being added to them (as from Descartes ether motion) or by external field energy being added to them (as from Maxwell/Einstein fields) then assigning 'gravitational potential energy' to bodies seems purely notional and not actually existing in the body but only existing externally ? An external energy source might or might not then add such energy as kinetic energy, and itself lose some energy to the body ?

But in a gravity theory where bodies accelerate themselves by emitting or converting part of their own mass in response to signals (as a William Gilbert style active-matter theory) then gravitational potential energy actually does exist in the body itself and none exists externally ? Then gravitational acceleration would involve a body losing some energy to its environs, unless signals triggered an endothermic reaction drawing energy from the environs ?

And if total energy is given by  $E=mc^2$  then body mass when a body is gravitationally accelerated, increases with an external energy theory but decreases with an active-matter theory ?

### What are signals ? Related definitions ;

Basically, physical signals are any physical properties of (or physical emissions from) an entity that some other entity can be in any manner affected by - and originating entities can be termed emitters and affected entities can be termed receivers or detectors. Emitters that have mental abilities may send intentional signals that may be termed messages, and receivers that have mental abilities can view signals as being intentional messages or as being unintentional information or data.

Any signal emitter or receiver that has mental abilities may also be able to produce and respond to non-physical or mental signals (as 'ideas'), and produce or respond to physical signal representations of such (as 'words').

William Gilbert's signal physics theory is concerned with only physical emission signals, chiefly physical force signals, though it could maybe be extended to deal with more than that. If light was a physical force signal then Gilbert-Newton physics would be as concerned with light's emission and detector responses to light as with light itself. If physical objects can respond to gravity signals then they are physical observers of gravity, but only if an object has mental ability can it be a mental observer. Einstein's relativity physics of course failed to consider physical observers at all, maybe making it only a mental relativity physics.

It can be taken that a Gilbert-Newton physical observer uses itself as its only reference frame.

A programmed mental observer may be programmed to use any one reference frame, or be programmed to conditionally choose from some set of reference frames.

A free-will mental Einstein observer can itself choose to use any alternative reference frames.

(But it may be difficult to distinguish some conditional choosing from free-will, and so some programmed observers from free-will observers.)

NOTE. Electrically charged bodies, in addition to producing charge signals or fields, produce electromagnetic radiation when absolutely accelerated but not when only relatively accelerated. Hence charged-body electromagnetic radiation is produced only by acceleration in the reference frame of the particle itself - which is predicted properly only in a Gilbert-Newton signal physics theory or a valid image-theory of such theory. It seems necessary to conclude that every physical signal radiation event has a unique reference frame, and this can be called the Reference Frame Exclusion Principle.

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## ***New Science Theory, sitemap + basic universe facts and physics history***

SITE MAP : ( Updated since 1.1.2012 = '1 )

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The universe is estimated to have at least about 70,000,000,000,000,000,000 stars, and to have a diameter of at least about 30,000,000,000 light years. It is split up into various types of galaxies and other components.

Our Milky Way galaxy is estimated to contain about 200,000,000,000 stars, and to have a diameter of about 100,000 light years with our sun about 26,000 light years from its centre. If even 1 star in a million allows the evolution of intelligent life, then humans should be far from alone.

### ***Knowledge and physics***

Knowledge of the universe has grown and continues to grow, but currently we can basically say ;

1. We have quite a lot of experience of our own planet, with quite a lot of experiments having been done regarding it.
2. We have a bit of experience of our own solar system, with some experiments having been done regarding it.
3. We have very little experience beyond our solar system, with very few experiments having been done regarding it.

Classic physics was built on 1 and 2, but modern physics ideas tend to rely more on 3.

Modern physics is fragmented and contains some real problems, as ;

- A. Though the centres of galaxies are clearly very bright, it is claimed that they surround a large black hole ?
- B. Though space looks clearly empty, it is claimed that it is full ?
- C. Despite strong disproofs of Descartes push-physics, we have push-physics claims of physics with no actual push ?

And there are certainly other issues being strongly debated, and what are the real priority issues for physics now is far from agreed.

### ***Space and Orbits***

One of the most common forms of motion in the universe is orbital motion, mainly of smaller bodies orbiting around more massive bodies. Orbits of bodies in space can generally be taken as being determined chiefly by gravitation and so by Newton's laws of motion and gravitation.

Orbits around a massive body of some mass M require some speed that is below Escape Velocity  $v_E$  but above Circular Velocity  $v_C$ . For a distance r from the centre of gravity of a mass M, where r also needs to be larger than the radius of the massive body,  $v_E^2=2GM/r$  and  $v_C^2=GM/r$ . At the Earth's surface  $v_E = 11.2$  km/sec (40,300 km/hr) and  $v_C = 7.9$  km/sec (28,400 km/hr).

The factor M/r means required velocities are bigger for orbits around more massive bodies, and for a particular massive body required velocities are smaller for farther orbits.

The same considerations apply to orbiting for all massive bodies, as to orbits around the Earth, the Sun or Black Holes. The greater mass of a Black Hole means that only the fastest bodies will orbit close to a Black Hole, though slower bodies will orbit farther from it.

So generally objects passing a massive body at a speed between Escape Velocity  $v_E$  and Circular Velocity  $v_C$  will be pulled into orbit around it. But objects passing at a speed below Circular Velocity  $v_C$  will be pulled into the body, and objects passing at a speed above Escape Velocity  $v_E$  and Circular Velocity  $v_C$  will continue past the body. The required speeds are set by the mass of the body and the pass distance. Of course at any speed a direct collision course means collision.

And if an orbiting body has a mass insignificantly small relative to the massive body then,

1. If its (orbital) speed is exactly the circular speed  $v_C$  at  $r$ , the orbit will be a Circle passing through  $r$ , around the centre of the massive body.
2. If its (orbital) speed is slower than the circular speed  $v_C$  at  $r$ , the orbit will be an Ellipse smaller than the circle that passes through  $r$ , with the massive body at its far focus.
3. If its (orbital) speed is faster than the circular speed  $v_C$  at  $r$ , but less than the escape speed at  $r$  ( $v_E$ ), then the orbit will be an Ellipse larger than the circular orbit that passes through  $r$ , with the central body at its near focus.

If orbit velocities and distances are known to some accuracy then massive body mass can be estimated to some accuracy. Of course these considerations cannot be applied to massless zero-inertia objects, even if somehow attracted by gravity.

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
Two websites to help inform you on what physicists and astronomers are up to lately are [Physics World](#) and [Universe Today](#).

For imperfect free online Latin translation see [here](#).

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