WILLIAM GILBERT AND THE SCIENCE OF HIS TIME*

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THIS four hundredth anniversary of William Gilbert's birth† offers an occasion for a brief review of his influence on the science of his time (apart from medicine), and of his researches and book on magnetism and electricity, the firm base of his enduring fame.

These researches, extending over about eighteen years**, might seem ample to occupy the leisure of so eminent and active a physician. But the Elizabethan physicians were notably versatile, as Bacon thus remarked:

"For in all times, in the opinion of the multitude, witches and old women and impostors have had a competition with physicians. And what followeth? Even this, that physicians say to themselves, as Solomon expresseth it upon an higher occasion, 'If it befall to me as befalleth to the fools, which should I labour to be more wise?' And therefore I cannot much blame physicians, that they use commonly to intend some other art or practice, which they fancy, more than their profession. For you shall have of them antiquaries, poets, humanists, statesmen, merchants, divines, and in every of these better seen than in their profession." ("On the Advancement of Learning", Book II, Section X, 2, 1605.)

Gilbert shared this versatility to an exceptional degree, while yet adorning his profession. In his early days he had given much time to experiments on chemistry, "attaining to great exactness therein"††: this indeed was a natural extension of his work as a physician. He was also an ardent student of astronomy, and the first Englishman to accept and propagate the revolutionary views of Copernicus (1473–1543) and Bruno (1547–1600) on the motions and the nature of the celestial universe.

Medicine, chemistry, astronomy, magnetism and electricity—indeed, his range of studies was wide; and although these sciences (except astronomy) were still in their rudiments, their literature was already great. The invention of printing by movable type, in 1453, had led by Gilbert's time to the appearance of printed copies of the principal ancient authors. Already booksellers had set up their trade in London. Gilbert was doubtless a good customer, eagerly buying and reading the classical, medieval and modern books as they appeared. Most of them, like Gilbert's own book, "de Magnete", were in Latin, either original or translated, thus obviating, for the learned men of that time, the curse of Babel, and making Europe a republic of learning.

To illustrate the wealth of Gilbert's learning, let us note a selection from the authors quoted in "de Magnete":

Among the Greeks, they include the fathers of

medicine, Hippocrates (c. 430 B.C.)* and Galen (A.D. 131–201); the philosophers Empedocles (c. 500–430 B.C.), Plato (427–347 B.C.) and Epicurus (342–270 B.C.); the historian Plutarch (c. A.D. 45–120); the astronomers Thales (c. 624–565 B.C.), Aristarchus (c. 310–230 B.C.), Hipparchus (c. 190–120 B.C.) and Ptolemy (c. A.D. 170); the mathematicians and scientists Pythagoras (born c. 582 B.C.), Anaxagoras (488–428 B.C.), Aristotle (384–322 B.C.) and Hero (c. A.D. 100)†. Among the ancient writers of Latin, he quoted Lucretius (c. 95–55 B.C.), Pliny (A.D. 23–79), Tacitus (A.D. 55–120) and St. Augustine (A.D. 354–430).

His medieval references include Geber the Syrian (c. 850), Rhazes the Persian (865–925), Avicenna of Bokhara (980–1037) and others who wrote in Arabic; Albertus Magnus (1206–1280), Roger Bacon (1214–1294), Thomas Aquinas (1227–1274) and Petrus Peregrinus (whose famous "Epistola" was written in 1269).

Among the moderns, as reckoned in Gilbert's time, he quoted Cardinal Cusa (1401–64), Copernicus (1473–1543), Fraçastor (1483–1543), Paracelsus (1493–1541), Agricola (1490–1555), Cardan (1501–76), Fallopius (1513–62), Ovidius (who wrote a "History of the East Indies", 1525), Stevinus (1548–1600), Tycho Brahe** (1546–1601), and three contemporaries, Robert Norman, William Borough and William Barlowe, who wrote on magnetism in English.

These authors were philosophers, physicians, theologians, mathematicians, astronomers, biologists, metallurgists, navigators and historians. Some were quoted only in the astronomical chapter with which "de Magnete" concludes, but most of them had something to say about magnetism. This is not surprising, because in the magnet Nature affords her simplest example of a field of force of notable intensity surrounding objects that are of moderate size, fairly available and widespread, and easy to handle. This was bound to attract notice and comment by writers of all kinds, and to be used by theologians, philosophers and poets as a basis for theories and analogies, by the early physicians as an ingredient of strange potions, and by magicians as a tool to impress the ignorant, as well as by navigators and landmen in the form of the compass.

Many of those who wrote of the magnet did so only by hearsay, and to the wonderful truth was added a fantastic growth of fable and error, such as that the loadstone's magnetic power was dulled at night; that when weak it is revived if bathed in goat's blood; that it has the power to reconcile husbands to wives, and brides to husbands; and that if pickled in the salt of a sucking fish it gains the power to pick up gold from the deepest wells.

In writing "de Magnete", the first substantial modern scientific treatise, giving a systematic account of magnetism, Gilbert wished to clear away the current errors as well as to establish the truth. He found, in fact, far more to condemn than to retain in his predecessors' writings on magnetism, and he did not scruple to castigate the errors and false theories even of the greatest among them. For example, he says that to the one sole magnetic property, attraction, known to the ancients††, "were added certain fragments and falsehoods: which in the earliest times, no less than nowadays, used to

* Address delivered at a commemorative meeting held by the Royal Society of Medicine on April 5.

† According to the reckoning (which is not certain) of the late Prof. Sylvanus Thompson.

** See p. xi of de Mottelay's introduction to his (the first) English translation of "de Magnete". The basis for the mention of eighteen years is presumably Edward Wright's statement, in his 'encomiastic preface' to "de Magnete", that the magnetic philosophy had been "kept back not till the ninth year only (as Horace prescribes) but already unto almost a second nine".

†† Quotation given by de Mottelay, in his introduction, p. xxv; the source is not stated.

* Most of the dates here given are taken from Singer's "A Short History of Science" (Oxford, 1941).

† Though neither Euclid (c. 330–260 B.C.) nor Archimedes (287–212 B.C.) were mentioned.

** But Gilbert's other famous astronomical contemporaries Galileo (1564–1642) and Kepler (1571–1630) are not mentioned.

†† In this and later quotations from "de Magnete", I follow (almost completely) the English translation published in 1900 for the Gilbert Club, and printed (250 copies only) by the Chiswick Press.

be put forth by raw smatterers and copyists to be swallowed of men. As for instance, that if a loadstone be anointed with garlic, or if a diamond be near, it does not attract iron. Tales of this sort occur in Pliny, and in Ptolemy's *Quadripartitum*; and the errors have been sedulously propagated, and have gained ground (like ill weeds that grow apace) coming down even to our own day, through the writings of a host of men, who, to fill out their volumes to a proper bulk, write and copy out pages upon pages on this, that and the other subject, of which they knew almost nothing of their own experience. Such fables of the loadstone even Georgius Agricola himself, most distinguished in letters, relying on the writings of others, has embodied as actual history in his book *De Natura Fossilium*. ("de Magnete", Book I, Chapter 1.)

"Almost nothing of their own experience," Gilbert here says, and it is the kernel of his criticism. The importance of experiment is expressed with equal clarity and firmness in his comments on the writings of those whom he revered, as in this passage:

"Thomas Aquinas, writing briefly on the loadstone in Chapter VII of his *Physica*, touches not amiss on its nature, and with his divine and clear intellect would have published much more, had he been conversant with magnetic experiments". (Book I, Chapter 1.)

Experiment, where experiment is possible, is the keynote of Gilbert's philosophy; thus, as he says in his preface:

"we have proposed to begin with the common magnetic, stony and iron material, and with magnetical bodies, and with the nearer parts of the earth which we can reach with our hands and perceive with our senses; then to proceed with demonstrable magnetic experiments. . . . For after we had . . . seen and thoroughly examined many of those things which have been obtained from mountain heights or ocean depths, or from the profoundest caverns and from hidden mines: we applied much prolonged labour on investigating the magnetical forces: . . . Nor have we found this our labour idle or unfruitful; since, daily during our experimenting, new and unexpected properties came to light".

This method is now a commonplace of science, but in Gilbert's time ancient authority was the basis of truth for all but a challenging few, like Gilbert and Galileo. Hence Gilbert had no bright anticipations of the reception his book was likely to gain. Why should I, says he:

"expose this noble philosophy, which seems new and incredible by reason of so many things hitherto unrevealed, to be damned and torn to pieces by the malediction of those who are either already sworn to the opinions of other men, or are foolish corrupters of good arts, learned idiots, grammaticists, sophists, wranglers, and perverse petty folk". (Preface.)

His appeal was therefore, avowedly, to the few:

"But to you alone, true philosophizers, honest men, who seek knowledge not from books only but from things themselves, have I addressed these magnetical principles in this new sort of philosophizing. But if any see not fit to assent to these self-same opinions and paradoxes, let them nevertheless mark the great array of experiments and discoveries (by which notably every philosophy flourisheth), which have been wrought out and demonstrated by us with many

pains and vigils and expenses. In these rejoice, and employ them to better uses if you can". (Preface.)

The need for a much more active and extensive use of the experimental method was urged by Francis Bacon, in his "Advancement of Learning" and other books, published after Gilbert's death, but probably influenced by Gilbert's example. Thus, writing from the point of view of a man of affairs, regarding the steps that needed to be taken to advance learning, after noting that books, maps, globes, astrolabes, botanic gardens, and dead bodies for anatomy were among the needs for which there was already some provision, Bacon says:

"there will hardly be any main proficience in the disclosing of nature, except there be some allowance for expenses about experiments; whether they be experiments appertaining to Vulcanus or Daedalus, furnace or engine, or any other kind. And therefore as secretaries and spials of princes and states bring in bills for intelligence, so you must allow the spials and intelligencers of nature to bring in their bills; or else you shall be ill advertised.

"And if Alexander made such a liberal assignation to Aristotle of treasure for the allowance of hunters, fowlers, fishers and the like, that he might compile an history of nature, much better do they deserve it that travail in arts of nature". ("Advancement", 2, 10, 11.)

Gilbert, however, paid his own expenses for experiment, and was content to go his own way, in advance of his time. His independence of mind was shown in "de Magnete" and also in other ways. The title page gives *first* his own name, before that of the book. Then comes a preface to the "candid reader", written, as my quotations will have shown, in a proud confident tone. Contrary to the custom then and for two centuries more, he made no dedication to a patron. In this, as in his experimenting, he practised what Bacon afterwards preached but did not practice; for Bacon, in the "Advancement of Learning", addressed, rather fulsomely, to James I, wrote:

"Neither is the modern dedication of books and writings, as to patrons, to be commended: for that books (such as are worthy the name of books) ought to have no patrons but truth and reason. And the ancient custom was to dedicate them only to private and equal friends, or to entitle the books with their names: or if to kings and great persons, it was to some such as the argument of the book was fit and proper for: but these and the like courses may deserve rather reprehension than defence". (Book I, Sect. III, 9.)

Gilbert, indeed, almost reversed the custom of dedication, by publishing, next after* his own preface to the candid reader, an encomiastic preface "To the most eminent and learned man Dr. William Gilbert, a distinguished Doctor of Medicine amongst the Londoners, and Father of Magnetic Philosophy". This was written by Edward Wright (1558?-1615), a noted Elizabethan mathematician and teacher of astronomy and navigation.

As a scientific author Gilbert showed many virtues. Though "de Magnete" had no index of subjects or authors, Gilbert included an ample index of chapters (without page numbers). The treatise is divided into six books, comprising 115 chapters, so that the list of chapter titles gives a clear and full indication of

* In de Mottelay's English translation of "de Magnete", the order of the two prefaces is reversed; no reason for this erroneous order is given.

the contents and structure of the book. It is a substantial work containing about 120,000 words, and is well illustrated with ninety woodcuts (not numbered) of diagrams and pictures of loadstones and apparatus. It also contains a glossary of eighteen new scientific terms that Gilbert found it convenient to introduce. The book contains no footnotes, but an interesting innovation was the use of marginal stars, of two sizes, to indicate the discoveries and experiments described, "according to the importance and subtlety of the matter" (Preface); there were twenty-one large stars and two hundred small ones; most though not all of these starred experiments and discoveries were originated by him. This notably individual feature of the book is of great interest as showing Gilbert's estimation of the relative value of his experiments.

Experimental Work on Magnetism

Gilbert's "*de Magnete*" made three great contributions to science; the first was the ordering and extension of magnetic knowledge, on the basis of experiments originated or verified by himself. The second was the ordering and extension of electric knowledge, in the same way. The third, and in my opinion the greatest, was his conception of the earth itself as a great magnet.

Gilbert had a great predecessor among writers on magnetism, Petrus Peregrinus, who in 1269 wrote a famous letter to a friend, of which many manuscript copies were made, until it was printed in 1558. In this letter Petrus clearly stated that the loadstone has two unlike poles, and showed how to find and recognize them by means of small auxiliary needles laid on the loadstone. Petrus had a fancy to shape his loadstones spherical, like the earth and the celestial bodies, and to mark on them lines of magnetic direction like meridians joining the two poles. At either pole a small needle will stand perpendicular. One pole seeks the north, and the other the south. Like poles repel, unlike poles attract each other. Iron can be magnetized by the touch or stroke of the loadstone, thus acquiring the loadstone's attractive, repulsive and directive properties. When a loadstone is cut in two, a pair of opposite new poles appears, one on each part, so that each becomes a complete magnet, with two opposite poles.

This letter by Petrus, firmly based on experiment, is a magnificent scientific classic, despite some fallacies of perpetual motion in its second part, of which the author himself seemed doubtful.

Petrus wrongly thought that the magnetic compass pointed to the *true* north. He ascribed this to celestial influences exerted from the whole heavens, not only from the celestial poles; he did not attribute it, as many others did, to the 'nautical' or pole star, for he knew that this was not at the true celestial pole.

After his time, it became known that the magnetic compass does not point to the true north, and gradually knowledge was accumulated about the distribution of this magnetic declination, which varies from place to place. The first discoverers of the magnetic declination are not known.

Then in 1581, Robert Norman, a maker of compasses at Limehouse, discovered the magnetic dip of a magnetized needle perfectly balanced before magnetization. He examined and studied this discovery with great ability; in particular, he concluded from it that the earth, not the sky, controls the direction of the magnet, and he showed that the earth did not attract the magnet but only *turned* or directed it.

These were the foundations on which Gilbert built. He mentions Petrus and Norman several times, though more often to condemn their few errors than to praise their great merits. He refers to "a little work, fairly learned for the time, going under the name of one Petrus Peregrinus, which some consider to have originated from the views of Roger Bacon, the Englishman of Oxford" (p. 5): Norman he described as "a skilful seaman and ingenious artificer, who first discovered the dip of the magnetic needle" (p. 8).

Of Gilbert's twenty-one big-star experiments, two were electric and nineteen magnetic; of the two hundred with small stars, twenty-nine were electric and a hundred and seventy-one magnetic.

My time permits only brief mention of even the big-star experiments. Gilbert experimented with loadstones and magnets of many shapes, but like Petrus he specially favoured the spherical form, which he called a *terrella*. On this, again like Petrus, he marked the lines of magnetic direction from pole to pole; these he named "magnetic meridians". He also marked the "magnetic equator" midway between the poles, and intermediate circles of "magnetic latitude", such as the arctic and tropical. Whereas Petrus he had merely *laid* little magnetic needles on his round loadstone, Gilbert *pivoted* his, each on a little stand, and showed that between the equator, where they lie parallel to the surface, and the poles, where they stand perpendicular, the needles rest inclined. In this he saw a parallel to the magnetic dip on the earth, discovered by Norman; with bold imagination, overstepping an enormous disparity of size, he leapt to the conclusion that the compass needle turns northward, and dips, because to the earth it is what his pivoted needles were to the *terrella*, and hence that the earth itself is simply a great spherical magnet. To quote his own words (in translation): "The magnetic dip (which is the wonderful turning of magnetic things to the body of the *terrella*) in systematic course, is seen in clearer light to be the same thing upon the earth. And that single experiment, by a wonderful indication, as with a finger, proclaims the grand magnetic nature of the earth to be innate and diffused through all her inward parts". (Book VI, Chapter 1.) This conclusion, which is the foundation of the science of geomagnetism, has never been seriously contested, though we still do not know *why* the earth is magnetic.

Gilbert's further developments of geomagnetism were not so successful. He ascribed the compass declination, or departure from the true meridian, to the inequalities of the earth's solid surface on land or under the sea, and he concluded that near either coast of a great ocean the needle should turn somewhat landwards. This was disproved nearly a century later by Halley (1656-1742). Further, Gilbert concluded that without cataclysmic changes, such as the submergence of the fabled continent of Atlantis, the magnetic declination at each place must remain for ever constant; this was disproved in 1635 by Gellibrand, a Gresham professor, from fifty years of compass observations in London.

Gilbert, though a great reader and a devoted experimenter, was no recluse. His friends included not only physicians, astronomers and mathematicians, but also sailors, to whom there are many references in "*de Magnete*"; for example, in Book III, Chapter 1, on the compass direction, he writes that certain facts "have been pointed out to me and confirmed by our most illustrious sea-god, Francis Drake, and by

another circumnavigator of the globe, Thomas Candish". Gilbert hoped that his experiments and discoveries would add to the already great usefulness of the magnetic needle to mariners. The Dutch scientist Stevinus had pointed out that when the distribution of the magnetic *declination* had been well observed in many parts of the earth, it should conversely be a help to mariners (knowing their latitude) in determining their *longitude*; Gilbert shared this hope, though he knew that the distribution was not simple, and he added the new proposal that the magnetic *dip* would enable mariners to find their *latitude* when astronomical observation was impossible. But both these ideas proved fruitless, owing to the irregular distribution of the earth's magnetism, and its constant slow change. Before this became clear, Briggs, the introducer of *common* logarithms (to the base 10), had spent much wasted labour on calculations of the magnetic dip in different latitudes, on the basis of a rather fantastic geometrical construction proposed by Gilbert, with no real foundation either in experiment or theory.

Passing from these, Gilbert's faulty additions to his most brilliant discovery, let us consider briefly his experimental work in pure magnetism and pure electricity. In these he greatly extended the range of substances known to be magnetic or electric. He also distinguished very clearly between magnetic and electric actions, and added many important details, some of them quantitative, to our knowledge of both.

He attained to the conception of what we now call the magnetic field surrounding a magnet, or, in his words, its "orb of virtue". He attained also to the conception of what we call uniform intensity of magnetization, showing that the magnetic influence of a terrella is not something emanating only from the poles, but is an aggregate effect of all its parts. He disproved the asserted anti-magnetic influence of the diamond by assembling no less than seventy excellent diamonds, in the presence of many witnesses, around loadstones and magnets, without any observable magnetic change. (Book III, Chapter 13.)

He found that the magnetization of a body can be destroyed by heating it to redness, but that heated iron, in cooling, acquires a small intensity of magnetization in the north-south direction, from the earth's magnetic field. He observed that soft iron, even without heating, becomes slightly magnetized by the earth's field, either slowly, over many years, or more rapidly if it is hammered while lying north and south. He showed also that a sheet of iron can partly screen the space on one side of it from the magnetic field or action of a loadstone on the other side.

He showed that a magnet could support a much greater weight of iron if soft iron caps were put over its poles.

He improved instruments of magnetic observation, including Norman's dip needle; and he collected data as to the compass direction* in different regions.

Work on Electricity

Gilbert's work on electricity is given, almost as a digression, in one chapter (Book II, Chapter 2), entitled "On the Attraction of Amber, or more truly, on the Attaching of Bodies to Amber"; this chapter also describes various experiments on what we now know

as surface tension. Silvanus Thompson, who was an enthusiastic reviver of Gilbert's memory, summed up his experimental discoveries in electricity as follows:

- (1) The generalization of the class of *Electrics*.
- (2) The observation that damp weather hinders electrification.
- (3) The generalization that electrified bodies attract everything, including even metals, water and oil.
- (4) The invention of the non-magnetic versorium or electroscope.
- (5) The observation that merely warming amber does not electrify it.
- (6) The recognition of a definite class of non-electrics.
- (7) The observation that certain electrics do not attract if roasted or burnt.
- (8) That certain electrics when softened by heat lose their power.
- (9) That the electric effluvia are stopped by the interposition of a sheet of paper or a piece of linen, or by moist air blown from the mouth.
- (10) That glowing bodies, such as a live coal, brought near excited amber discharge its power.
- (11) That the heat of the sun, even when concentrated by a burning mirror, confers no vigour on the amber, but dissipates the effluvia.
- (12) That sulphur and shell-lac when aflame are not electric.
- (13) That polish is not essential for an electric.
- (14) That the electric attracts bodies themselves, not the intervening air.
- (15) That flame is not attracted.
- (16) That flame destroys the electrical effluvia.
- (17) That during south winds and in damp weather, glass and crystal, which collect moisture on their surface, are electrically more interfered with than amber, jet and sulphur, which do not so easily take up moisture on their surfaces.
- (18) That pure oil does not hinder production of electrification or exercise of attraction.
- (19) That smoke is electrically attracted, unless too rare.
- (20) That the attraction by an electric is in a straight line toward it.

Few substantial advances on Gilbert's work in pure magnetism and electricity were made for more than a century. The quantitative laws of magnetic action, sought by Halley in 1687 and later without much success, were first established by Coulomb (1736-1806) by means of his torsion balance (1785). The first notable advance beyond Gilbert in electrical knowledge was made by Otto von Guericke (1602-86), burgomaster of Magdeburg, the inventor of the air pump; he constructed the first electrical machine, namely, a globe of sulphur, which when rotated, while a hand was pressed upon it, became electrically charged. He also showed that there are two kinds of electricity, and that bodies charged with the same kind repel one another, whereas Gilbert knew only of electric *attraction*.

Astronomy

The last Book (VI) of "de Magnete" is mainly astronomical, and is of great interest for its long serious argument in favour of the Aristarchean and Copernican hypothesis that the earth rotates, rather than that the sun, moon, planets and stars all revolve daily round the earth. Gilbert supplied an additional argument of his own, finding in the geomagnetic axis a real terrestrial feature with which the daily rotation is associated, whereas in the common view the axis of rotation was not terrestrial but celestial. He asserted that the magnetic axis remains invariable in the earth, but that, with the earth, it turns round the pole of the ecliptic, thus causing the precession of the equinoxes. He makes only brief mention of the earth's orbital motion (see "de Magnete", p. 232, Gilbert Club edition, 1900). He seems to attribute the daily and precessional motions partly to the earth's magnetism. Since his day it has become clear

* S. P. Thompson, in "Gilbert of Colchester" (*J. Inst. Elec. Eng.*, 1903), states that Gilbert also collected observations of dip, but I know of no authority for this statement. "de Magnete" appears to contain not one numerical value of the dip, not even quoting Norman's observation of it, in London.

that the geomagnetic axis does not coincide with the earth's axis of rotation, and is not quite constant; we incline nowadays to attribute the earth's magnetism partly to its rotation, rather than vice versa. Newton later showed that the precessional motion of the earth's axis is due to gravitational and dynamic causes, independent of geomagnetism.

Despite his advanced philosophic outlook, Gilbert was not free from the then prevailing belief that the stars influence mundane affairs (Book VI, Chapter 8). He believed that just as "Nature has taken care, through the earth's soul or magnetic vigour", to incline its axis to the pole of the ecliptic, so that the orbital motion produces the succession of the seasons, so also "the stars shift their rays of light at the surface of the earth through this wonderful magnetical inflection" (or precession) of the earth's axis. "Hence", he said, "come new varieties of the seasons of the year, and lands become more fruitful or more barren; hence the characters and manners of nations are changed; kingdoms and laws are altered, in accordance with the virtues of the fixed stars as they culminate, and the strength thence received or lost in accordance with the singular and specific nature of each. . . ."

Gilbert's interest in astronomy was shown by his authorship of a second considerable treatise, left in manuscript at his death, and not published until by the care of a brother it was printed in Amsterdam in 1651. Its title, translated from the Latin original, was "On our Sublunary World, a New Philosophy". Though it contains several references to "de Magnete", it made no further contributions to magnetism. It expounded the then revolutionary astronomical views of Bruno, whom it cites, and is largely an anti-Aristotelian discussion on astronomy, meteorology and the tides.

Gilbert did not live long enough after the appearance of his masterpiece, "de Magnete", to learn fully whether its reception was better than he had pictured in his preface. On the whole it was well received, though the astronomical part was disclaimed by some who accepted the magnetic discoveries; among these were Gilbert's friend Barlowe, and also the Jesuits, by whom the last Book (VI) was regarded as heretical. But greater men, including Gilbert's younger contemporaries Kepler and Galileo, wrote of "de Magnete" with high praise. This judgment has been endorsed by posterity, and as the centuries have rolled on, the fame of Gilbert has stood firm, as a great pioneer of magnetic and electric experiment, and as the father of the sciences of geomagnetism and electricity.

WILLIAM GILBERT: HIS PLACE IN THE MEDICAL WORLD*

By SIR WALTER LANGDON-BROWN

FULLER'S "Worthies" has a charming account of William Gilbert. He did not know him personally, for Gilbert had been dead five years when Fuller was born. But he had talked to people who had known him. This prompted him to write as follows: "William Gilbert was born in Trinity Passage in Colchester, his father being a Counsellour of great Esteem in his Profession, who first removed his family thither from Clare in Suffolk, where they had resided

in a gentile Equipage some Centuries of Years. He had (saith my informer) the clearness of Venice glass without the Brittleness thereof, soon ripe and Long Lasting in his Perfections. He commenced Doctor in Physick, and was Physician to Queen Elizabeth who stamped on him many Marks of her favour, besides an Annual Pension to encourage his Studies. He addicted himself to Chemistry attaining to great exactness therein. One saith of him that he was Stoicall, but not Cynicall, which I understand; Reserv'd but not Morose, never married, purposely to be more beneficial to his Brethren. Such was his loyalty to the Queen that as if unwilling to survive, he dyed in the same year with her 1603. His stature was Tall, Complexion Cheerful, an Happiness not ordinary in so hard a Student and Retired a Person. He lyeth buried in Trinity Church in Colchester under a plain Monument. Mahomet's tomb at Mecca is said strangely to hang up, attracted by some invisible Loadstone; but the Memory of this Doctor will never fall to the ground, which his incomparable book 'de Magnete' will support to Eternity."

It is difficult to enlarge this admirable miniature without spoiling it. Also it is difficult to make use of Silvanus Thompson's excellent account of Gilbert without shameless plagiarism. This was written for the tercentenary of Gilbert's death celebrated at Colchester in 1903. Mr. Purver White, of St. John's College, kindly lent me the copy belonging to the late Sir Robert Scott, formerly Master of the College, which is enriched with notes by the Master's hand, drawn from the College records concerning Gilbert's career. From these it is clear that he matriculated in May 1558. If the commonly accepted date for Gilbert's birth of 1540 is correct, this would make him eighteen when he entered, which would be rather old for those days. Hence, doubts have arisen, and dates ranging from 1540 to 1544 have been given; hence also, our justification for celebrating the quatercentenary of his birth in 1944. After graduation he was elected to a fellowship, his name being spelled Gylbert on the roll. Here again, we meet with a discrepancy in the record. Sir Robert Scott states that he was admitted on Sympson's foundation, but Bass Mallinger, a former learned if eccentric librarian and historian of the College, states "Fisher's statutes of 1530 had relieved all 'physic fellows' from the obligation of taking orders, but the statutes of 1545 had limited such exemptions to two, a proviso which continued in force until 1860. Notwithstanding this restriction, however, the sixteenth century saw three successive Presidents [of the Royal College of Physicians] elected from such 'physic fellows' of St. John's. These were—Richard Smith 1585; William Baronsdale 1589, and the eminent William Gilbert 1600. The last representative of this group was Dr. Henry Thompson, Consulting Physician to the Middlesex Hospital, who died in 1897." The present Master of St. John's College, Mr. E. A. Benians, tells me that the list of distinguished physicians who studied there in the sixteenth century was due to Bishop Fisher's insistence on encouraging the study of Greek in the College, which, despite Erasmus, encountered opposition elsewhere; and on Greek the revival of medicine was believed to be based from Linacre onwards.

The probable explanation of the apparent discrepancy is that Gilbert was elected in the ordinary way, but as he did not take orders, had to become 'physic fellow' or resign his fellowship within the stated time.

* Address delivered at a commemorative meeting held by the Royal Society of Medicine on April 5.