Research Article

Journal of Medical Reviews
ISSN(Online): 2589-9074, ISSN(Print): 2589-9066
www.medicalreviews.info

Recevied Article: 05-03-2019 Accepted Article: 8-03-2019

MEDICAL STUPIDITY IN THE AGE OF REASON

James F. Welles, Ph.D.

1. Introduction

During the Age of Reason, biologist had to overcome folk and theological taboos against curiosity to extend "Wisdom" about life in order to learn about ourselves. The Church considered curiosity a sin to be resisted.[1] Further, accumulated folklore constituted a barrier to knowledge in general, and this was especially true in anatomy—a matter in which everyone had some first hand knowledge. Before the sixteenth century, professional ignorance in general was stored in learned languages and surrounded by an aura of the occult,[2] and in the field of medicine in particular, it was stored in the works of Claudius Galen (130?-201?), who was deified to the point that his works be-came obstacles to further learning. This happened to both Aristotle and Newton in the mechanics of motion and happened to Galen: For almost 1400 years, his work stood as a barrier to real knowledge of human anatomy.[3] This occurred despite his warning to readers of his works to be wary of pedantic medicine."If anyone wishes to observe the works of Nature, he should put his trust not in books on anatomy but in his own eyes...", he wrote, and he thought himself an experimen-tal phys-ician who constantly appealed to experience. Unfortunately, the Church thought humans should rise above the body,[4] so the customs of his day forbade the dissection of humans. Ergo, the main source of Galen's experience was not the human body but those of monkeys, pigs[5] and, in one grand case– the penis?[1]–an elephant.[6]

Not until about 1300 were human bodies dissected for learning and teaching anatomy. Around 1490, Leonardo turned his attention to anatomy,[7] althouh at that time, the world of medicine was dichotomic: Books were separated from bodies, knowledge from experience and healers from the ill. Actually, this was based on a happy cultural confluence: Professors had a vested interest in protecting traditional lore and accepted dogma while the public had a vested interest in assurance that they did not practice any of it. The situation could hardly improve while those on the inside who knew the trade secrets remained committed to the status quo. The profession could advance only when a pioneer would willingly defy convention and oppose the canons of his own guild. Such a person would have to be impassioned more for knowledge than popularity and be more daring than prudent. Such a person would have to be a reckless missionary who would shriek rather than speak. Such a person was Paracelsus.[8]

Aureolus Philippus Theophrastus Paracelsus (1493-1541) was a self-taught physician who succeeded in getting appointed to the medical fac-ulty at the University of Basel but failed in his efforts to use that position to become the Luther of medicine. On June 24, 1527, he threw a copy of Galen's works into a student bonfire and announced that his courses would be bas-ed on his own experience with patients and taught in the local Schweizerdeutsch dialect. Although the book burning was, in this instance, almost justified, the medical community regarded it as an act of blasphemy and turned on him as a heretic.[9]

And well they should, for Paracelsus chal-lenged everything that was academic–especially medicine.[10] Unfortunately, in turning against Paracelsus, the doctors and their hidebound al-lies were turning against progress in understand-

ing disease. Indeed, as bad and misleading as Galen's work in anatomy was, his impact on physiology was even worse. The prevailing notion of disease at the time was that Galen's imbalance of four "Humors",[11]–black bile, yellow bile, blood and phlegm, all of which have nothing to do with health[12]–could presumably be rectified by sweating, purging, bloodletting or induced vomit-ing. Into the 18th century, illness was attributed to an imbalance of these, and pregnancy was con-fused with rheumatism, consumption (TB) and pleurisy.[13] Paracelsus championed the radical theory that disease was caused by outside agents. However, it was unfortunate for everyone that he saw these outside agents not as living germs but as minerals and poisons carried in the atmosphere from the stars.[14]

Paracelsus's commitment to medical astrology undoubtedly detracted from his potential impact and distracted attention from his historic contributions to the medial profession. He recognized that the causes of disease lay outside the body and insisted on uniformity of causes and specificity of diseases. Further, he believed there were no incurable diseases—only ignorant physicians[15]—and diplomatically noted uneducated peasants cured more people than all of them with their books and gowns.[16] Irksome by nature, he hurt his cause somewhat when, after announcing he would reveal the greatest secrets of medicine, he produced a bowl of shit.[17]

His own books were not published in his lifetime,[18] and his colleagues (whose pedagogical practices he questioned), the druggists (whose excessive profits and ignorance he denounced) and students (who ridiculed his passion for his cause) all joined forces against him and drove him out of the medical establishment.[19] The profession was not to be reformed by emotional appeals to the ethical principles of practitioners.

A more effective professional reformer was Andreas Vesalius (1514-1564), who rewrote the books on anatomy. As a professor thereof, he dissected cadavers himself, thus departing from the custom of his day, which was to read to medi-cal students from Galen while a barber-surgeon pulled organs out of the body.[2] Students were told there were three chambers to the heart and that the liver had five lobes, but they were not close enough to the action to challenge such statements or question the authority of the teachers who were leading them[20] down the pathway of invalidity.

Vesalius introduced the use of drawings as study aids, thus engendering the opposition of professors who felt students should be reading rather than wasting time looking at pictures. For his part, Vesalius thought students could learn more anatomy at the butcher shop than from pro-fessors sitting in their high chairs talking about things they had never seen but simply memorized out of faulty books. He came to insist that stu-dents see, feel and learn for themselves what the human body really was, and it turned out that he was the greatest student of them all.[21]

At first, in his **Six Anatomical Tables**, Vesal-ius unwittingly continued the Galenic tradition of leaping from animal to hu-man anatomy. However, in 1538, while teaching from Galen's text, he realized that what he was reading was re-ally only a compendium of statements about ani-mal anatomy in general.[3] His greatest revelation was that "Anatomical dissection might be used to check speculation". His greatest work, **On the Structure of the Human Body** (1543—the same year as Copernicus's book) rectified Galen's most flagrant errors by honoring what he *actually saw.*[22] As he continued to learn from further dissections, he continually revised his own works, thus constantly upgrading his schema according to new discoveries and observations.

Unfortunately, one of his more pedestrian discoveries led him afoul of the Church. He found that, contrary to Genesis 2:22, all humans have the same number of ribs. According to the authoritative Bible, men have one less than women because Eve was created from one of Adam's. Not only may this sound like a rather dubious trade off–a whole rib for just a wife, but it does not happen to be true nor square with simple anatomi-cal observation. This sent the Church atwerking and accusing Vesalius of being a revisionist heretic for twisting infallible scriptures to serve his own end–the truth. He narrowly escaped with his life

for stating what anyone could have verified.[23] He was blasted not only for attacking the work of a revered, unerring God but for his irreverence toward the revered, if fallible Galen as well. Fortunately, his disciples carried on his com-mitment to produce accurate works on human anatomy.[24]

Although Galen's mistakes in anatomy were thus corrected, his errors in physiology remained. His physiological system was a *pneumatology*, built upon the three "Souls" which Plato had said governed the body: The rational brain, the emotional heart and the nutritional liver. The chief virtue of this system was that its vocabulary provided ample opportunity for debate among philosophically minded doctors. At its heart was the heart, and before doctors would discard their "Spirits" and *pneuma*, someone had to find something for it to do.[25] That someone was the king's physician William Harvey (1578-1657), an-other scientist who successfully coupled fact with reason albeit to the aggravation of the reigning cognoscenti.

Like any great student of life, Harvey sought his own unifying vital phenomenon. For Galen, it had been Plato's *pneuma*; for Harvey, it was the circulation of the blood. His conclusion that the heart pumped the blood in a circular movement throughout the body[26] was based not on biblical, Aristotelean, metaphysical or emotional argumentation but on reasoning from a number of crucial anatomical and physiological observations not all of which were his own.[27] These suggested Galen's notion that blood ebbed and flowed from both the heart and liver with a kind of tidal motion in the vessels was incorrect.[28] Circa 1615, Harvey finally freed him-self from this idea by posing a simple quantitative question—i.e., how much blood flows through the heart (in a given time period)? The answer in, **De Motu Cordus** (1628), was "So much that it could not possibly be synthesized new from ingested food but had to be the same blood continually recycled in a circulatory system".[29]

Harvey correctly anticipated hostility from orthodox Galenists so was not surprised when he was denounced for overturning accepted dogma. He suffered the fate of any genius who, having overcome some fool idea, then was forced to endure violent opposition for having done so.[30] However, it is noteworthy he was criticized not because of his observations but because he reasoned and cal-culated from measurements. He was accused of sullying his reputation as an anatomist by playing mathematician. His pettifogging, quantitative approach was regarded as an attempt to pursue facts which could not be known by investigating things which were incalculable and inexplicable. Worse yet, he was charged with accusing Nature[4] of stupidity.[31]

Although Harvey's temper was as sharp as his views were original, he was almost modest in in-sisting what he described was only simple fact. If he was on firm ground scientifically in relying on observations rather than ancient writings as the starting point for reason, and despite the fact that his efforts to quantify medicine seemed as absurd to his colleagues as Newton's misguided efforts to quantify religion seem to us, he was vulnerable on one point: He failed to close the circle. Blood went from the veins to the heart and thence (after a refreshing side trip to the lungs) to the systemic arteries.[32] However, Harvey deduced a link between the arteries and veins would eventually be found,[33] and it was, three years after his death,[5] when microscopist Marcello Malpighi (1628-1694) discov-ered capillaries.[34]

Malpighi not only squared Harvey's circle but discovered a vast array of anatomical details invisible to the naked eye. With his "Flea glass", he viewed taste buds on the tongue and the infrastructure of the brain and put his name on parts of the skin, spleen and kidney. As he did so, he founded microanatomy and checked the assertions of Aristotle and Galen by "Sensory criteria". Fur-ther, by studying insects and other animals (his work on the capillaries had been done on frogs and confirmed in turtles), he converted compara-tive anatomy from the field of errors it had been into a source of knowledge for everyone.[35]

Of course, those committed to errors did not give up without a fight, so Malpighi encountered resistance to the use of his microscope similar to that Galileo had encountered to the use of his

telescope. In 1689, he found his works condemned and himself formally indicted by the same Church that had condemned Galileo and his works fifty-six years earlier. In this case, Malpighi's works were declared useless and false according to four criteria devised by one of his own open-minded students: 1.) His work was on so small scale as to be useless to physicians—so microscopes were out; 2.) humors were not separated by sieve-like structures—meaning capillaries and lungs did not exist; 3.) comparative anatomy would not help physicians—so it was unnecessary; and 4.) the *only* useful study of anatomy was directed toward learning about pathology—so general anatomical research was not necessary.[36]

Critics who did look through the microscope objected to the distortions of shapes, additions of colors and general counterfeiting of reality.[37] Although some of these criticisms were perhaps justified, they did not mean that all microscopic observations were false but just that care and caution were needed to promote accuracy when using such instruments.

Much of this medieval opposition to interjecting man-made devices between objects to be observed and God-given senses was overcome by Anton van Leeuwenhoek (1632-1723). A successful cloth merchant turned microsleuth, he made a 500X microscope with the power to resolve many disputes. Like Malpighi, he had no research program except to look at everything he could. It was a decided loss to science that, in the worst spirit of alchemy and instrument making, he kept his best microscopes and techniques to himself.[38]

2. Note

[1]. Dolnick, E. **The Seeds of Life**. Basic Books; New York 2017. p. 40.

[2]. Boorstin. D. 1998. **The Seekers**. Vintage; New York. p. 338.

[3]. Saladin, K. **Anatomy & Physiology**. 6th Ed. McGraw-Hill; New York. 2012. p. 4.

[4]. Dolnick. **op. cit.** p. 40.

[5]. Boorstin. **op. cit.** pp. 344-348. Throw in some gladiators, although the great anatomist remained unconvinced that athletes had brains. (Claxton. p. 17.)

[6]. Dolnick. **op. cit.** p. 38. Something of a carnival barker/showman, Galen often performed dissections in public in front of swarms of gawkers.

[7]. **Ibid.** p. 42.

[8]. Boorstin. **op. cit.** pp. 338-339.

[9]. **Ibid.** pp. 339-340.

[10]. Bronowski, J. **The Ascent of Man**. Little, Brown & Co.; Boston, MA. 1973.p.141

[11]. Cantor, N. **In the Wake of the Plague**. Harper; New York. 2001. p. 119. Francis. **op. cit.** p. 2.

[12]. Johnson, Steven. **Wonderland**. Riverhead Books; New York. 2016. p. 134.

[13]. Kerrison, C. **Jefferson's Daughters**. Ballantine; New York. 2018.p. 322.

[14]. Boorstin. **op. cit.** p. 342. As far fetched as it seems, this idea has been echoed in **Diseases From Space** (1979) and **Our Place in the Cosmos** (1993), both by Fred Hoyle and Chanadra Wickramasinghe.

[15]. Boorstin. **op. cit.** p. 342.

[16]. **Ibid.** p. 344.

[17]. Ball, P. **The Devil's Doctor**.London.2006.

[18]. Boorstin. **op. cit.** p. 344.

[19]. **Ibid.** p. 340. (See also Durant, W. **The Reformation**. Simon & Schuster; New York. 1957. pp. 875-881.)

[20]. Mortimer. I. **Millennium**. Pegasus; New York. 2016.p. 135.

[21]. Boorstin. **op. cit.** pp. 351-355.

[22]. Francis. G. **Adventures in Being Human**. Basic Books; New York. 2015. p. 134.

[23]. Hilton, B. Undated citation on page 337f of McWilliams, P. **Ain't Nobody's Business If You Do**. Prelude Press; Los Angeles, CA. 1993.

[24]. Boorstin. **op. cit.** pp. 359-360.

[25]. **Ibid.** pp. 361-362. While names and labels are necessary for verbal communication, they can be misleading if not useless. The Greek pneuma corresponds roughly to the Chinese *qi*, the Nigerian *ase*, the Polynesian *mana* and the Algonkien [i.e., North American] *manitou*. All mean life or spirit of life. (C. Mann. p. 164.)

[26]. Dolnick. **op. cit.** p. 1.
[27]. Boorstin. **op. cit.** pp. 364-365. Likewise, Watson and Crick were led, in 1953, to their model of DNA by an X-ray defraction photo taken by Rosalind Franklin. She was working at the time with a Maurice Wilkins, who, without her permission, showed Watson and Crick the picture. For that indiscretion, he shared a Nobel Prize with them. She got nothing except end notes like this and a fatal dose of cancer probably induced by her work with X-rays. (Saladin. p. 117.)
[28]. Durant, W. and Durant, A. **The Age ofReason Begins. Simon & Schuster; New York. 1961. p. 168.**
[29]. Boorstin. **op. cit.** p. 366.
[30]. Einstein, A. Undated quotation on page 774 of McWilliams. **op. cit.**
[31]. Boorstin. op. cit. p. 368.
[32]. Doby, T. Discoverers of Blood Circulation. Schuman; NY. 1963. p. 194.
[33]. Dolnick. **op. cit.** p. 86.
[34]. Durant and Durant. **op. cit.** p. 169.
[35]. Boorstin. **op. cit.** pp. 380-381.
[36]. **Ibid.** p. 382.
[37]. **Ibid.** p. 381.
[38]. **Ibid.** p. 330.