Errors, False Opinions and Defective Knowledge in Early Modern Europe

edited by
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KNOWLEDGE AND ITS HISTORIES

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Introduction[1]

Marco Faini

In his *Iconologia*, Cesare Ripa described "Error" as a blindfolded wayfarer who tries to find his way with the help of a stick. "Blind error"—such as we see it portrayed in an allegorical drawing by Antoine Coypel (1661-1722)—is always accompanied by ignorance. Error means losing one's way, straying from the straight line; it is a condition that affects, in Ripa's words, both our intellect and our body during our pilgrimage to happiness. Ripa plays on the ambiguity of the word "error," which signifies both making a (moral) mistake and losing one's way, or wandering without a direction, just as the characters of chivalric novels—the errant knights—who in their wandering often stray from the path of virtue. The epistemic and moral dimensions of error are, in Ripa's words, clearly interdependent, as evident in his explanation of being blindfolded in symbolic terms: "when the light of intellect is darkened by the veil of worldly interest, one easily falls into error."[2] For Ripa, the stick represents the senses, a lower form of

[1] The editors would like to thank Luigi Perissinotto for generously funding this publication. This collection of essays stems from Marco Faini's project *Standing at the Crossroads: Doubt in Early Modern italy (1500-1560)*, which has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie Grant Agreement No 792225. It reflects only the author's view; the Agency is not responsible for any use that may be made of the information it contains.

[2] "Quando è oscurato il lume dell'intelletto con il velo de gl'interessi mondani, facilmente s'incorre negli errori." Ripa 2012, 165.

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knowledge than that of the intellect (symbolized by the eyes). Those who rely on the senses miss "the true causes of all things," hence the author's explicit connection between error and ignorance.[3] In fact, Ripa's depiction of "Ignorance" in the *Iconologia* depicts her as a blind woman walking barefoot through brambles, alongside the trodden path. Bypassing the many details of Ripa's rich allegory of ignorance, it suffices here to remember that the author is not just describing the lack of knowledge, but also "the vice of ignorance," which "is born out of contempt for knowledge."[4] A further, less explicit, but no less intriguing connection, can be made between error and doubt. In fact, "Doubt" is personified in the *Iconologia* as a young man walking in the dark carrying a stick and a lantern, objects that symbolize experience and reason respectively. These tools help the young and inexperienced man make his way through the darkness and overcome doubt, an "ambiguity of the mind concerning knowledge and, as a consequence, of the body concerning works."[5] While there are certainly multiple connections linking doubt, ignorance, and error, it is the lack of clear vision—an allusion to a want of clear intellect—that seems to be the common thread among these conditions.

If the connection between error and ignorance is so straightforward that it seems almost platitudinous to articulate, the interrelation between error and doubt is perhaps less self-evident, but no less crucial. Doubt, or the inability to decide between two equivalent options due to the lack of recognizing the right choice, easily leads to error. Such a connection is made explicit in the title page of the Italian translation of one of the staples of the early modern European genre of "popular errors:" Thomas Browne's *Pseudodoxia epidemica* (first published in 1646, lastly in 1672: see Paolo Cherchi's essay in this volume). The full title reads *Pseudodoxia epidemica, or enquiries into very many received tenents and commonly presumed truths*.[6] The Italian translation by Selvaggio Canturani (the Venetian Carmelite Arcangelo Agostini, 1660-1746), published in Venice in 1737, reads instead: *Saggio sopra gli errori popolareschi ovvero esame di molte opinioni ricevute come vere, che sono false o dubbiose*. Here error extends its realm from falsehood to doubt: everything that does not fall within the field of clear truth, in other words, appears to be potentially tainted by error. Yet it is also true that doubt and ignorance can correct an excess of dogmatic certainty, so that, as Montaigne writes in his essay *On the Lame* (*Essays*, 3, 11)—itself a veritable genealogy of error—"there is a sort of ignorance, strong and generous, that yields nothing in honour and courage to knowledge; an ignorance which to conceive requires no less knowledge than to conceive knowledge itself."[7]

3 "Chi procede per la via del senso facilmente può ad ogni passo errare." Ripa 2012, 165.

4 "Per la presente figura non si rappresenta il semplice non sapere, ma il vizio dell'ignoranza, che nasce dal dispreggio della scienza di quelle cose che l'uomo è tenuto d'imparare." Ripa 2012, 271.

5 "Dubbio è un'ambiguità dell'animo intorno al sapere, e per conseguenza ancora del corpo intorno all'operare." Ripa 2012, 146.

6 For an overview on the work see Phillips 2015.

7 Quoted from the 1686 translation by Charles Cotton, available at https://hyperessays.net/essays/on-the-lame/ (accessed on June 7, 2022).

François Rigolot has spoken of the "Renaissance fascination with error," noting how "most Renaissance humanists enjoyed themselves immensely in tracking down the incredible diversity of human and textual errors, before the seventeenth-century rationalist discourse clearly established the philosophical status of truth and falsehood." In Rigolot's view, "during the Reformation and Counter-Reformation theologians, philosophers, physicians, artists, and poets spent much of their time collecting, evaluating, denouncing, and celebrating various forms of misguided behaviour" (Rigolot 2004, 1221). Certainly the Middle Ages also recognized the ubiquitous presence of error in the various fields of learning and human behavior (Speer-Mauriège 2018). Undeniably, however, from the fifteenth century onwards one sees an explosion of philological *castigationes*, as well as lists of errors: religious, antiquarian, historiographical, and scientific. Examples include Giovanni Andrea Gilio's published dialogue (1564) on the errors and "abuses" of painters (although the conversation recorded in the text allegedly took place in 1561), and two years later, a text devoted to "military deeds, inventions, and errors" by Bernardino Rocca (1515-1587).[8]

The impact of the printing press on the perception of error can be hardly overestimated. There is virtually no early modern book that does not invoke the reader's cooperation in the correction of the many mistakes produced during the printing process, which served to heighten the perception of the diffusion of error. On the other hand, the press was a formidable instrument for the correction of mistakes. Such editorial power led Benedetto Altavilla to write in his *Breve discorso intorno gli errori de calculi astronomici* (A Brief Discourse on Errors in Astronomical Calculations, 1580) that the divine Majesty should be praised for granting authors countless privileges. Among them,

> Most great was the one he gave to Giovanni Lutemberg [*sic*] from Mainz in the year 1470, [that is] the art of the printing press, thanks to which all the deeds and ideas of men can be easily seen and understood by everyone […]. And now, thanks to this instrument, the inventors of the arts and the professors of sciences can share [their knowledge] with everyone. And those who read others' works can, with equal ease, discover the errors they contain so that, contrasting them with their virtue and resorting to reason one gets to know the truth.[9]

[8] On Gilio's *Dialogo de gli errori et abusi de' pittori* published in his *Due dialogi* (Camerino: Antonio Gioioso, 1564) see Maffei 2017; on Bernardino Rocca's *Imprese, stratagemi, et errori militari* (Venice: Gabriel Giolito' de Ferrari, 1566, 1567, 1568) see Cherchi 2017; Favaro 2021, 50–2.

[9] "Non è chi possa degnamente ringratiare e lodare la maestà divina de i beneficij e gratie che di continuo a gli huomini concede, fra i quali grandissimo fu quello che diede a Giovanni Lutemberg di Magonza l'anno 1470, dell'arte della stampa con cui i fatti e i concetti de gli huomini possono esser facilmente da tutti veduti e intesi […]. Et hora con questo mezzo ponno gl'inventori delle arti e professori delle scienze farne partecipi tutti. Et quelli che le altrui opere leggono ponno con la medesima facilità scuoprire gl'errori che in esse ritruovano. Onde poi col virtuoso contrasto e concorso delle ragioni si viene in conoscenza della verità" Altavilla 1580, 4.

Along with the printing press, global exploration also contributed to shape the early modern perception of "error," as Ian Smith suggests in observing how error intersected with discourses on race, eloquence, and grammar. "Barbarous" or "savage" people, in their barbaric utterances—thus situating themselves outside the male-centered world of grammar and eloquence—reveal their inherent proclivity to moral error and vice (see Smith 2009). From the perspective of religion, moreover, it is hard to overestimate the consequences of the European encounter with new beliefs and religions utterly at odds with Christian teachings. Such beliefs were considered "abuses" and "errors," and correcting them became imperative. From this vantage point, the letters or "avvisi" sent by Jesuit missionaries from the Americas or Asia that catalogued the "errors" of non-European people represent an invaluable source of these foreign practices, beliefs, and doctrines. We would be wrong, however, to think of this process as merely a missionary effort and ethnocentric projection of European values onto different cultures. Error becomes instead a propulsive force that prompts new knowledge; the correction of "errors" goes beyond the realm of faith and extends to philosophy, habits, and forms of civilization. Consider, for example, the case of the Benedictine Clemente Tosi and his *L'India orientale. Descrittione geografica, & historica* (Eastern India. A Geographical and Historical Description, 1676). In the printer's address to the reader, we read that providing geographical descriptions was not the author's main purpose in writing the book; it was, rather, a means to achieve a "most noble purpose," that is, the "conversion of people." This, argues the printer, speaking on behalf of the author (who had deceased before the time of publication),

> Cannot be achieved without first knowing their errors; nor would have we been able to spy on them hadn't we gone among those people discovering their ways of life; and therefore it was necessary, first of all, to research their countries, habits, religion, and other features to be able to discover their errors.[10]

Since the "errors" of non-European people are seen to fall under different categories, they require a treatment that accounts for this division within the larger work. Tosi's book is thus articulated in three main sections: scholastic theology (concerning "metaphysical" errors); moral theology (concerning practical behaviour), and finally, natural philosophy. Interestingly, the printer remarks that "these errors are not the same of those of the ancient Heathens."[11] We see here, in other words, a clear awareness of the historical and geographical nature of

[10] "Le descrittioni geografiche portate sul principio del volume non sono state lo scopo principale del nostro autore ma solamente un mezzo per giungere ad un fine nobilissimo, che è la conversione delle genti; che non si può fare senza prima conoscere i loro errori; né questi si potevano spiare se non si andava fra quei popoli rintracciando il loro modo di vivere: che perciò è stato necessario di ricercare avanti ogn'altra cosa i loro paesi, costumi, religione, e altre qualità per poter venire al conoscimento de' loro errori," Tosi 1676, p.n.n.

[11] "Sappi però, o lettore, che questi errori non sono i medesimi della gentilità antica," Tosi 1676, p.n.n.

error: Tosi's is not a work of antiquarianism, but is rather the result of careful ethnographic inquiry into the customs of Asian populations. As such, despite its ethnocentric gaze, it accumulates and makes available to Western Europeans a wealth of knowledge about its subjects.

Errors and abuses, however, were not specific to non-European people. In a confessional age marked by lacerating religious division, errors multiplied, with each confession accusing its competing "sects" (as different religious strands frequently labelled each other) of innumerable mistakes. "Errors" came to designate the beliefs of either the Catholic or the Reformed churches, and the books and treatises that named them were often printed (see Neveu 1993). This provides the subject for Giorgio Caravale's essay *Error of the Heretic, Error of the Controversialist. Error and Deception in Sixteenth-Century Religious Polemics*, devoted to Ambrogio Catarino Politi, the author of a *Compendio d'errori luterani*. As Caravale aptly summarizes, Politi's

> entire existence revolved around the concept of error: errors of which he accused Luther and his Italian followers in some of the most effective pamphlets of the time; errors of which he himself was repeatedly accused by his Dominican adversaries before and during the Council of Trent; but also errors of which Politi accused himself in some revealing and at time merciless autobiographical reconstructions.

Caravale points to the 1520 *Apologia pro veritate catholicae et apostolicae fides* (An Apology for the Truth of the Catholic and Apostolic Faith) against Luther, in which Politi equates the idea of error with that of deception. He then moves to Politi's *Speculum hereticorum* (The Mirror of Heretics) of 1540, wherein the author attacked Italian *spirituali* and their ideas concerning salvation through faith. Politi also found himself, at times, in conflict with members of his own order, such as Bartolomeo Spina; their debate encompassed among other crucial themes the Immaculate conception of the Virgin Mary. At the same time, Politi turned the category of error against himself, analyzing his youthful fascination with Savonarolan ideas. Through Politi's work we can see the semantic richness of error, whose meaning ranged "from presumption to credulity, from delusion to deception."

Philology was often instrumental in dismantling theological errors, as they often stemmed from inaccurate interpretations of the Scripture, a topic that has generated significant scholarly attention in recent times (see the essays in Cao-Grafton-Kraye 2019). In his contribution *Errors of Interpretation: Vincenzo Maggi and Sperone Speroni, Readers of Francesco Robortello*, Marco Sgarbi offers an insightful interpretation of how philological discussions of errors (whether true or perceived) had a crucial bearing on the development of fundamental categories of Western thought. Sgarbi focuses on Vincenzo Maggi's and Sperone Speroni's criticism of Francesco Robortello's interpretation of Aristotle's *Poetics*. In these discussions we do not find the desire for an improvement of society through the correction of errors; instead, we witness the keen desire to understand a crucial text of Western thought. Robortello published his *In Aristotelis*

poeticam explicationes in 1548, the first "critical edition" to include commentary on Aristotle's text. Although it provided a significant moment in the reception history of the *Poetics*, Robortello's edition was nonetheless flawed by errors in both the translation and the interpretation of the text. The way in which Maggi and Speroni scrutinize Robortello's translation of Aristotle's text, however, varies: while Maggi is more focused "on the philological restitution" of the text, Speroni appraises Robortello's translation and commentary with the eye of a playwright (Speroni was the author of a famous and controversial tragedy, *Canace*). For Speroni, at stake is the defining components of poetics, such as catharsis—the goal of tragedy—and the relationship between invention and truth. Not surprisingly, as Sgarbi point out, Robortello's commentary raised the interest of Torquato Tasso, who also reflected at length on similar issues, namely the fundamental connection between poetry and truth. Sgarbi considers the extent to which Robortello's "errors" stem from Maggi's and Speroni's loose interpretations of the *Poetics*, which reflect their own understanding of the text. In his conclusion Sgarbi suggests that "working on errors of interpretation rather than similarities, especially in textual criticism, can be extremely useful for reconstructing the reception of a text," for "errors are often very precise and circumscribed, and they allow for genealogical reconstructions, whereas similarities and loans, which are for the most part very vague, do not." As in Lachmannian philology, errors can thus put us in touch with the authentic meaning of a work.

Sgarbi's essay explores the world of high culture, providing a sample of the refined discussions that took place within the Italian academies (on this topic see Everson-Reidy-Sampson 2016 and, for a later period, Muir 2007). Such discussions were hardly accessible to most of the populace, who shared a different knowledge base often rooted in traditional beliefs, sometimes blended with badly digested or consciously manipulated morsels of knowledge imported from "high" culture—an ideal breeding ground for error, at least in the eyes of many haughty "learned" authors. A number of these beliefs, practices, and commonly held ideas sat at the crossroads between religion and medicine. These beliefs, which mixed elements of traditional or folkloric culture with notions derived from formal medical discourse, were increasingly discussed, debunked, and rebuked in print all over Europe starting in the second half of the sixteenth century. Paolo Cherchi, in his essay on *"Errori popolari:" How a Medical Notion Became an Aesthetic One*, explores the European diffusion of literature on "popular errors" from the sixteenth to the early nineteenth centuries. Although this micro-genre covered topics in medicine, religion, history, and physics (among other diverse subjects), its roots lay in attempts to eradicate false beliefs in the field of medicine. The rise of the Paracelsian tradition, in opposition to Galenic and classical medicine—based on notions such as "sympathy," "antipathy," and on quasi-alchemical and magical practices—gave rise to numerous reactions against "popular errors." As Cherchi suggests, however, the main issue was not that of making distinctions between "high" and "low" culture, since learned authors could also commit "popular errors." Instead, methodological and empirical questions were at stake. Commenting on Laurent Joubert's *Erreurs pop-*

ulaires, Cherchi suggests that "the notion of 'popular' defines not the beliefs of the lowest classes but a type of culture which is in sharp contrast with the 'university' learning which is based on the authority of the ancient scholars." Popular errors have to do with mentalities and can be spread over space and time, as well as across social classes. From medicine they can easily travel to religion, since the boundaries between magical or folkloric healing, medicine, and religion are porous and permeable throughout the early modern era. Cherchi traces the European circulation of these works, highlighting some key moments, such as Bacon's attempt at approaching popular errors from a new methodological viewpoint based on induction (the aforementioned Thomas Browne took full advantage of Bacon's perspective in his *Pseudodoxia epidemica*.) In the eighteenth century, authors increasingly traced the origins of popular errors to Antiquity, which lost much of its prestige as a result. We see this attitude at work in Giacomo Leopardi's *Saggio sopra gli errori popolari degli antichi* (An Essay on the Popular Errors of the Ancients, 1815, but posthumously published in 1846). In the *Saggio*, however, the relationship between the errors of the Ancients and those of his contemporary lower classes is complex. We see something new emerging from the pages of young Leopardi: an alliance between error and imagination that gives life to "beautiful fables." As Cherchi remarks, "in that atmosphere [i.e. of Romanticism], the popular errors lost much of the stigma placed on them by centuries of rationalism and scientific experimentation," thus reimagining them to comprise a positive aesthetic category.

Vera Keller (*Lost in the Woods: Francis Bacon's Errant Pathways in Knowledge*) further expands on Bacon's view of error, engaging current scholarship and showing how error and erring are, for Bacon, "valorized epistemic tool[s]." In fact error allows Bacon to liberate scientific investigation from the "imperatives to produce useful, timely, and certain results." Error is instrumental in building a form of science that consists of something beyond mere mechanical experimentation and the exploitation of nature. Instead, error allows for an immersive experience in the labyrinthine and metamorphic aspects of nature and natural creation. Error and erring in the labyrinths of nature, the delayed exit from its maze of possibilities—the outcomes of which the investigator can merely anticipate—enable "a greater degree of knowledge to be accessed." In linking the myth of Proteus to a particular state of nature—that of "erring nature"—Bacon offers meaningful insight into the processes by which we acquire knowledge: "counterintuitively, nature in error served greater epistemic ends; such error could either occur naturally, through matter running into the violence and 'impediments' on its own, or through the human vexing of nature;" the latter of which could engender metamorphoses and transformations that "reveal otherwise hidden 'passages and variations'." Thus, contrary to what many have argued, Bacon cherishes the productive nature of error. Bacon's error pushes knowledge toward the boundaries of possibility, argues Keller, resisting "the pressure to exit the labyrinth and to produce useful knowledge." The result consists less in "certain tabulations of knowledge" than in "provisional, fragmentary, and moveable forms of inscription." Error is thus perceived as a positive

force behind our acquisition of knowledge, and one that allows for a less violent relationship between man and nature.

Cherchi's and Keller's essays, while written from very different points of view, ultimately concur in providing a more nuanced view of error: one in which error does not deviate from or lacks true knowledge, and neither is it a force to be tamed. Error is instead an alternative approach to nature, an epistemic alternative to the constraints of reason, truth, and utility. In other words, error may be seen as a useful category that offers an escape from the excesses of mechanicism, experimental science, and the objectification of nature.

If the aforementioned Benedetto Altavilla is almost forgotten today, despite his best effort at correcting astronomical ephemerides, Galileo Galilei, by contrast, is a celebrated and well-known universal figure. While much of his fame can be attributed to the errors he corrected, Galileo, as presented in Viktor Blåsjö's essay on *Galileo's Mathematical Errors*, was no less prone to error than many of his fellow scientists, especially when it came to mathematical and geometrical demonstrations. Blåsjö reviews the many phenomena, including cycloids, planetary spheres, centrifugal force, projectile motion, and comets, in which Galileo's hypotheses and "demonstrations" proved erroneous. Moreover, as Blåsjö argues, several of Galileo's contemporaries, including some of his own followers and associates, were successful in correcting him while demonstrating their superiority over Galileo as mathematicians. Thus we are faced, according to Blåsjö, with the fact that "Galileo's celebrated use of experiments in science is not a brilliant methodological innovation but a reluctant recourse necessitated by his shortcomings in mathematical ability." Yet Galileo's reputation has somehow concealed such shortcomings, perhaps due in part to the famous astronomer's own rhetorical language, which has contributed to the shaping of his "mythology." In Blåsjö's words, "his accounts of his correct discoveries may sound very convincing and emphatic, but knowing that he was equally sure of a long list of errors gives us reason to suspect that some of the things he got right are to some extent guesswork propped up with overconfident rhetoric in the hope that readers will mistakenly think his case is stronger than it is."

The example of Galileo introduces us to the intricate overlapping of the freedom of conscience, intellectual freedom, and error (i.e. theological error). As already suggested, error was a crucial category that shaped European spirituality well beyond the realm of religious disputes between supporters of "orthodoxy"—whether Catholic or Protestant—and "heretics" or "Papists." The notion of "erroneous conscience" played a fundamental role in spiritual dialectics as early as Thomas Aquinas. Authors of confessors' manuals revived this notion, which found its place alongside other similar but competing categories, such as "doubtful" or "scrupulous" conscience. Each of these definitions referred to a particular condition of individual conscience, and each of them implied a number of consequences for one's moral choices. Jean-Pierre Cavaillé, in his chapter on *The Notion of Erroneous Conscience in Pierre Bayle*, shows how reflection on erroneous conscience was instrumental in overcoming confessional struggles and even shaping religious toleration. Cavaillé points to Bayle's assertion that error is nearly inev-

itable; even orthodoxy may retain beliefs that are—or have been at some point in history—"heretical" or erroneous. This is illustrated by the impossibility of imagining the true nature of Jesus Christ, which is often reduced to Christ's mere humanity even by the most pious and orthodox devotees of the Christian faith. Bayle concludes, therefore, that in matters of religious belief there are seemingly no criteria for distinguishing between truth and error. What is troubling for Bayle is not the committing of religious error (and the potential to correct such beliefs), but rather the practical consequences of orthodoxy, which had the power to coerce people to commit morally wrong actions in the name of "truth." The notion of erroneous conscience finds its importance precisely within this theoretical frame. According to Thomistic thought, one should always follow what their conscience dictates, since acting against one's conscience is the gravest of sins. "Heretics," whose consciences tell them that what they believe is true, do not commit a sin, thereby advocating for the toleration and dispelling of doubt and scepticism about "heretical" belief. In a paradoxical twist, the traditional Catholic category of sin is thus used to undermine not only "orthodoxy," but also the very idea of religion. Bayle carries this line of thought to its logical end, arguing that since we lack an objective criterion to distinguish between competing truths, all opinions and beliefs should be accepted for the sake of civic harmony.

As mentioned, the printing press had a significant impact on the perception of error, and, accordingly, almost all the contributions in this volume deal with the printed word. The rise of the print market did not erase, however, oral and manuscript communication (see, for example, Richardson 2009). As Martin Mulsow's essay *Positive and Negative Error. A Debate in the Illuminati Order* demonstrates, error also served as a subject for discussion that circulated in manuscript form within academic circles well into the eighteenth century. Mulsow explores the cultural production of the Illuminati, a German secret society founded in 1776 by Adam Weishaupt, thus bringing us back to the world of academies, institutions so instrumental in shaping early modern European learning. Within the lodges and chapters of the society, members read and discussed essays on different topics, giving rise to discourses "shaped by personal acquaintance and benevolence," which allowed for "the creation of protected discussion spaces." Among these discussions was one that took place in 1785 on the nature of error, prompted by Prince August of Saxe-Gotha. Mulsow carefully reconstructs the thesis expounded by the Prince as well as the objections raised by other Illuminati members. Pivoting from Fontenelle's view of "myth-making as a compensation for ignorance," August attempts to define error according to an amalgamation of two conceptually unrelated frameworks. One is Voltaire's distinction between active and passive imagination, while the other comes from contemporary theories of electricity and the distinction between positive and negative charges. Negative (or repellent) errors are produced by a lack of knowledge, while positive (or attractive) errors result from attempts to fill gaps of knowledge with irrational explanations and other "epistemic vices." Other Illuminati built on August's thesis; but it was Rudolph Zacharias Becker who realized that all errors are, in fact, negative. He therefore reformulated August's thesis by suggesting

that "some errors keep the mind in its imperfect, undeveloped state: but others push it in developing and working on its store of materials, deeper back into the state of obscure and confused concepts." Despite the competing views on error within the Illuminati, their attempt to build a taxonomy of error cannot be underestimated, nor can their underlying purpose for engaging with error, which was to eradicate "prejudice, ignorance, and credulity."

This volume dialogues with the rich corpus of scholarship on early modern error, offering a selection of essays that reflect on the intermingling of religion, science, and learning in early modern Europe. Spanning geographically from Italy to France, England, and Germany, the essays gathered here encompass a timeframe between the mid-sixteenth and mid-eighteenth centuries. While the aim of this volume is not to offer a systematic overview of error, it provides, nonetheless, a stimulating glimpse into one of the most fascinating, multifaceted, and controversial aspects of early modern culture.

References

Altavilla, Benedetto. 1580. *Breve discorso intorno gli errori de calculi astronomici*. Turin: appresso gli heredi del Bevilacqua.

Cao, Gian Mario, Anthony Grafton, and Jill Kraye (eds.). 2019. *The Marriage of Philology and Scepticism: Uncertainty and Conjecture in Early Modern Scholarship and Thought*. London: University of London Press.

Cherchi, Paolo. 2017. "Bernardino Rocca: dallo stratagemma alla novella." *ArNovIta-Archivio Novellistico Italiano* 2: 25–48.

Everson, Jane E., Denis V. Reidy and Lisa M. Sampson (eds.). 2016. *The Italian Academies 1525-1700: Networks of Culture, Innovation and Dissent*. Oxford: Legenda.

Favaro, Maiko. 2021. *La virtù del nobile. Precetti, modelli e problemi nella letteratura del secondo Cinquecento*. Città di Castello: I libri di Emil.

Maffei, Sonia. 2017. "Giovanni Andrea Gilio e il *Dialogo de gli errori et abusi de' pittori tra licenza e sprezzatura*." *Annali di Critica d'Arte* n.s. 1: 25–48.

Muir, Edward. 2007. *The Culture Wars of the Late Renaissance: Skeptics, Libertines, and Opera*. Cambridge, MA: Harvard University Press.

Neveu, Bruno. 1993. *L'erreur et son juge. Remarques sur les censures doctrinales à l'époque moderne*. Napoli: Bibliopolis.

Phillips, Harriet. 2015. "Hereditary Error and Popular Culture in *Pseudodoxia epidemica*." *Renaissance Studies* 31: 6–24.

Richardson, Brian. 2009. *Manuscript Culture in Renaissance Italy*. Cambridge: Cambridge University Press.

Rigolot, François. 2004. "The Renaissance Fascination with Error: Mannerism and Early Modern Poetry." *Renaissance Quarterly* 57: 1219–34.

Ripa, Cesare. 2012. *Iconologia*, ed. Sonia Maffei-Paolo Procaccioli. Turin: Einaudi.

Smith, Ian. 2009. *Race and Rhetoric in the Renaissance: Barbarian Errors (Early Modern Cultural Studies 1500–1700)*. New York: PalgraveMacmillan.

Speer Andreas und Maxime Mauriège (eds.). 2018. *Irrtum – Error – Erreur*. Berlin-Boston: De Gruyter.

Tosi, Clemente. 1676. *L'India orientale. Descrittione geografica, & historica. Volume primo dove si tratta della parte intra Gangem […] con la confutatione dell'idolatrie, superstitioni, & altri loro errori*. Rome: Felice Cesaretti.

Error of the Heretic, Error of the Controversialist. Heresy and Deception in Sixteenth-Century Religious Polemics

Giorgio Caravale

Abstract: In a confessional age in which Catholics and Protestants accused each other (and for a long time) of misinterpreting the Holy Scriptures and deceiving the faithful, some churchmen made religious controversy their life's mission. One of the most famous among them was Ambrogio Catarino Politi, a Dominican polemist from Siena who lived in the first half of the sixteenth century. His entire existence revolved around the concept of error: errors of which he accused Luther and his Italian followers in some of the most effective pamphlets of the time; errors of which he himself was repeatedly accused by his Dominican adversaries before and during the Council of Trent; but also errors of which Politi accused himself in some revealing and at time merciless autobiographical reconstructions. Through the figure of the Sienese controversialist, this essay highlights all the semantic nuances assumed by the idea of error in sixteenth-century confessional controversy: from presumption to credulity, from delusion to deception.

Keywords: Ambrogio Catarino Politi, Lutheranism, justification by faith, religious controversy, immaculate conception.

In a confessional age in which Catholics and Protestants accused each other (and for a long time) of misinterpreting the Holy Scriptures and deceiving the faithful, some churchmen made religious controversy their life's mission. One of the most famous among them was Ambrogio Catarino Politi (1484-1553), also known with his latinized name Catharinus, a Dominican polemist from Siena who lived in the first half of the sixteenth century.[1] His entire existence revolved around the concept of error: errors of which he accused Luther and his Italian followers in some of the most effective pamphlets of the time; errors of which he himself was repeatedly accused by his Dominican adversaries before and during the Council of Trent; but also errors of which Politi accused himself in some revealing and at time merciless autobiographical reconstructions. Catharinus' first test as a controversialist was the writing, between the late summer and December of 1520, of his *Apologia pro veritate catholicae et apostolicae fidei ac*

[1] For an intellectual biography of Catharinus, in addition to Schweizer 1910 see Caravale 2017.

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doctrinae, directed against Martin Luther (Politus 1956). It was the occasion for him to sharpen the rhetorical and polemical arguments that he would then use extensively in the following decades, in particular the theme of the deception and the artifices with which the monster of Saxony, as he was called in Rome, had tried to deceive the unwitting faithful. The concept of doctrinal error appears from the outset to be closely intertwined in his polemic with that of deception. According to Catharinus, the Saxon reformer had lied to conceal his persistent error in his recent letter to Leo X (Politus 1956, 11 et seq.). Luther had invoked "a council of diabolic vanity," implicitly eulogizing Christian schism (Politus 1956, 16–7) not hesitating to use the moral weakness of church leaders in order to cast disdain upon them for having introduced doctrinal errors (Politus 1956, 26 et seq.) spreading dispute everywhere and with everyone without even discussing the principal issues at stake (Politus 1956, 31 et seq.). He had flaunted a lofty vocabulary full of words like "Christ," "Paul," and "Pauline," a clever stratagem to capture the attention of the weakest people (Politus 1956, 36) using aggressive, acrimonious, or the most satirical tricks of speech sure to attract the attention of "perverse human nature." This was a semantic artifice to hide his intention of introducing new heretical blasphemies (Politus 1956, 40 et seq.; see also Preston 2003, 371–2). He continually referred to Saint Augustine, distorting his doctrine to defend his own errors,[2] or exaggerating divergences between interpretations furnished by the ancient doctors and by some of the more recent, such as Thomas Aquinas (Politi 1956, 51 et seq.), thus betraying the profoundest teaching of the church. Luther chose a passage from one of the Fathers to set against another, in this way obliging the faithful to choose one church father rather than another, disrupting the consensus that Rome had created among their interpretations of the sacred scriptures.[3]

Several years later, in 1540, in his *Speculum hereticorum*, he resumed the thread of that anti-Lutheran polemic by directing his attacks against Italian *spirituali* (on Italian spirituali, it is suffice here to refer to Firpo 2015). It was very easy, he wrote, to fall into error. The "ignorant crowd" is easily deceived by the many pseudo-prophets who usurp the duty of leading their faith and who are totally "vacuous" (Politi 1540, 44). The "learned men" (among whom it is easy to imagine that Politi included himself) should have guided them, teaching them how to make good judgments (Politi 1540, 35). The grossest error committed by "these heretics," he wrote in *De perfecta iustificatione* (1541), is their belief that after this first justification by faith nothing else is required of man to reach salvation—as if this first "grace" does not soon become "vain and vacuous" without the constant nourishment of good works (Politi 1541, 197). He traced the origin of this con-

[2] To this end, Ralph Keen emphasized that, like other controversialists at the time, Politi "saw a distortion of the catholic tradition in the exclusive use of one Father," that is, Luther's exclusive reference to Saint Augustine. Keen 2001, esp. 710.

[3] Keen 2001, 100–19. To this end, see also the considerations by Keen 2001, 721, underlining the centrality of the Petrine authority of the papacy in Roman ecclesiology.

fusion to an error committed by Luther. Wishing to demonstrate that the sinner can be redeemed with faith in Christ alone, without any works, Luther invented an "unheard-of distinction between gospel and law" (Politi 1541, 208–9).

The error originated in an invention or, as we have said, in a deception artificially constructed to confuse the minds of simple people. Just as the Catholic controversialist used the category of error to refute the doctrine of his religious opponents, the latter returned the accusation to sender. In the anonymous *Apologia del Beneficio di* Christo attributed to Marcantonio Flaminio and written in response to Politi's *Compendio degli errori et inganni lutherani* (1544), we read that Politi was the real deceiver, an ignorant one who had fallen into error even before ensnaring his readers in the same mistakes (Flaminio 1996, 84). Politi had centered the accusation of deception and mystification of the truth that he flung at the Viterbo group on the question of faith and works. To such a defamatory accusation it was necessary to respond, beginning with returning to the sender an updated list of accusations. "The origin of his error," emphasized Flaminio, "is that he doesn't understand what justification by faith means" (Flaminio 1996). The term "to justify," Flaminio continued provocatively, "is judicial language and signifies to absolve and to judge someone just and innocent and to oppose his condemnation" (Flaminio 1996, 85). But Politi,"having regard to the composition of the Latin word," was unable to imagine that this word might "signify other than having been made just and good, as if to say from intemperate to temperate, from miserly to generous." In other words, he thought "that to be justified by faith meant only having been made good and just by the gift of charity God infused in our hearts by means of the disposition of faith" (Flaminio 1996, 86). Instead, faith cannot grow "by means of the frequent exercise of good works" until a "perfection" such that "man with his innocence and saintliness can expose himself to and satisfy God's judgment,"[4] and this for the simple reason that "the infirmity and imperfection of our flesh" does not allow it (Flaminio 1996, 86). To be "justified by faith" thus means only that "if not by the means of faith, which receives the justice and merits of Christ freely offered to us by the preaching of the gospel, we are absolved in God's judgment for all our iniquities," and consequently "we are accepted as just and innocent and made heirs of the eternal life." All this, Flaminio emphasized, notwithstanding the fact that "in ourselves we are worthy of punishment, not rewards" (Flaminio 1996, 85). Thus, it is "imputed justice," that is, that justice "imputed to all the faithful by God's misericordia," not the "inherent justice" Politi defended in his writings, that guarantees eternal salvation (Flaminio 1996, 92, 95). Flaminio returned to the sender the accusation of deception, as well as the one of error.

The religious history of the early modern age is full of internal controversies between members of different religious orders, usually competing with each other to win the favor of the pope and the most influential cardinals. Even within

[4] The reference here is to the second level of justification identified by Politi, on which see Caravale, 2017, 112.

single religious orders there were often heated disputes. Usually, the recommendation that came from the echelons of the order was to not let the controversy come out of the convent walls: the risk to damage the reputation of the order was too high. In the case of Catharinus, however, this unwritten rule was not respected. In the summer of 1542 Politi left France precipitously to return to Italy. During the Dominicans' last chapter meeting, held at the Church of the Minerva on May 27, 1542, after the death of Dominican General Agostino Recuperato of Faenza, Bartolomeo Spina had unleashed a harsh attack against him, constraining Politi to return to Italy to defend himself (Mortier 1911, 372–4) Some years later he recalled those difficulties in a letter to Cardinal Carafa.[5] Spina's hostility to Politi was traceable to their profound divergence of opinion on the Immaculate Conception. Where Politi had strongly attacked Cajetan for not taking an explicit position in favor of that doctrine, Bartolomeo Spina had written two tracts accusing Cajetan of exactly the opposite, insinuating an excessive acquiescence to those Immaculist theses.[6] In the early months of 1542, Politi had sent to the press a new *Disputatio pro immaculate divae Virginis conceptione*,[7] forcefully reaffirming his ideas on the subject, and Spina decided at that point to open a broad offensive to expose the doctrinal deviations with which Politi had stained Thomist orthodoxy. Fifteen "principal errors of the books of Ambrosio Catarino on prescience, providence and predestination of God and the predestination of Christ" were set down in black and white by Spina and most likely presented to the general chapter of the order.[8] In the accused work, the *De praescientia, providentia, et praedestinatione Dei*, published in Paris in 1541, Politi had set forth the theory that God has predestined few to salvation. The Virgin, Christ, and some of the apostles are among the elect and for them salvation is certain. God has not predestined any of the rest, although he has foreseen their future. God wishes all to be saved, Politi had written, but everyone will be saved. Some will reach eternal salvation; others will be saved or damned to the extent that they are able to receive divine grace and increase it with their good works. Bartolomeo Spina, claiming also to be a tutor of Thomist orthodoxy, fundamentally contested the basis and the thesis of Politi's writing (Caravale 2017, 97).

We do not know if the clash between Spina and Politi had more profound repercussions within the order, if Politi's "heretical" theses had met with support from some of the chapter, in sum, whether the personal polemic between Spina and Politi had developed into a broader encounter. The question, it seems, was

[5] Politi's letter of 1549 was published by Schweizer 1908: 8–9.

[6] This was the *De universali corruptione generis humani ab Adam seminaliter propagati* (1525) and the *Tractatus contra opusculum Caietani de conceptione Beatae Virginis* (1533); both were republished in Spina 1535, on cc. 58v–88v.

[7] The complete title is *Disputationis pro immaculata divae Virginis conceptione libri tres, similiter hac nova editione recogniti ab illo ac reconcinnati*, published in Spina 1535; see Schweizer 1910, 294.

[8] The fifteen "errores" were published by Politi in his *Enarrationes* as part of a list that also included the errors added by Spina in 1546 and subsequently republished by Schweizer in an appendix of his monograph.

filed away. The rendering of accounts, however, was only put off for a few years. Four years later, in the midst of the council of Trent, when the promotion to bishop for Politi was in process, Bartolomeo Spina returned to his task, lengthening his list of Politi's "errors" in an effort to block the nomination of Politi to bishop (Caravale 2017, 142). What better occasion than the likelihood of the episcopal promotion of his bitter adversary and from what better position than the censor, the master of the sacred palace, official provost for the doctrinal control of writings published in the city of Rome? He consigned into the hands of the pope a long list of fifty "errors" taken from the works published by Politi in recent years.[9] Spina's hostility, as already indicated, was rooted in the question of the Immaculate Conception. One of the criteria used by Spina in 1542 in the selection of "errors" was how congruent Politi's texts were with those of Thomist fundamentals. He now continued in the same way. This time, however, Spina increased the range of errors: on his list he specified Politi's theses that identified in the Virgin, in Christ, and in a few other apostles the members of that very restricted circle who were certain of predestination to salvation (Conclusio 18; Schweizer 1910, 276); and also Politi's original theory of a covenant according to which the transmission of Adam's sin to all humanity was to be traced back to Adam's transgression of the strict covenant between God and Adam; and further, Politi's affirmation on the transmission of the sin (Conclusio 37, Schweizer 1910, 280–1; see also Conclusio 26; Schweizer 1910, 278).

Catharinus indignantly rejected all of Spina's insinuations. According to Politi, the errors that Spina accused him of were not such. On the contrary, Politi went even further, those who embraced the point of view of his accuser were easily chargeable of Pelagianism or of falling into the "error of the Jews:" "I have been sent the errors noted by Your Reverence and presented to the pope. I have considered them and don't recognize a single one of them, seeing that some of them have been imputed to me and some I do not consider errors; whoever wishes to maintain the opposite I think is either a Pelagian or a Jew."[10]

The accusations made against him by Bartolomeo Spina were not the only ones Politi received while he was in Trent. Spina's implicit accusations of Lutheranism against the Sienese controversialist were in the same register used by the theologian Domingo de Soto. "This opinion," Paolo Sarpi would recount, referring to the doctrine of the absence of merit in works preceding justification that Politi defended before the council, "was impugned by Soto with much acrimony. He went on to cry heresy because it inferred that man was not free

[9] The list of the "errores" published by Politi in his *Defensio doctrinae auctoris in quondam magistrum falso et calumniose deferentem ad S.D.N. Paulum III pontificem maximum* [1546], in Politi, *Enarrationes*, 353–64, was republished by Schweizer in the appendix of his book (1910), 271 et seq., without the text of Politi's defensive comments. There is a manuscript copy of the same list in BNFi (Florence, Biblioteca Nazionale), Conv. Soppr. I.IV.14, unnumbered pages; and another in AAV (Vatican City, Archivio Apostolico Vaticano), Cart. Farn. Est. 14, fols. 95r–105r.

[10] The letter is published in Schweizer 1910, 254–6. There is also a copy of the letter in BNFi, Conv. Soppr. I.IV.14, fols. not numbered (but 1r–2r).

to do good and could not follow his natural objective, [and] thus, with the Lutherans, denied free will" (Sarpi 1974, vol. I, 332). By a kind of historical retribution, the most noted Catholic controversialist, the most praised adversary of the "Lutheran plague," found himself for the second time the object of the same accusations that for decades he had hurled from the pulpits. The paradox was only apparent. In the "inexorable logic of the final encounter" (the expression is used by Prosperi 2000, 65) that soon would be imposed at Trent, anyone who pronounced the word faith too emphatically would be silenced for conniving with the enemy. Anyone carrying a doctrinal patrimony diverging from that of the traditional theological schools, anyone who had ever employed a vocabulary dissonant from scholastic language, risked being accused at the criminal bench. In the course of that first phase of the Tridentine debates the accusation of Lutheranism had fallen on the heads of prelates close to reformed ideas, such as Tommaso Sanfelice, bishop of Cava, but also on religious who had nothing in common with the reform vision, the Benedictine Luciano degli Ottoni above all. In fact, what brought Politi into harmony with the Benedictines was a common, profound aversion to rigid schemes of scholasticism and a common attitude of freedom in the study of theological questions, as well as strong admiration for the works of the theologian Duns Scotus, and, not least, a sincere aversion to Lutheran doctrine (Caravale 2013). In various times and ways these attitudes drew the censure of such strenuous defenders of scholastic theology and Thomist language as Bartolomeo Spina against Politi, and Domingo de Soto against the representatives of the Benedictine order at Trent and against Politi as well. The charges shifted in character. Sometimes their writings and remarks were taxed with Pelagian error; other times, with Lutheran deviations. This is because the object of the censors was not to comprehend the coherence and the complexity of their doctrinal thought in order to criticize its theological basis or dominant register. The censors instead chose single instances, sentences, or affirmations to determine their dissonance from Thomist orthodoxy.

What makes the figure of Catharinus particularly suitable for studying the different semantic uses of the category of error within the religious disputes of the early modern age is that in his intellectual biography error does not appear only in the form of an accusation made against his lifelong adversaries (Luther and the Italian *spirituali*) or as an accusation (of heresy) made against him by his adversary Dominican brethren. The centrality of the category of error emerges also and above all from the fact that Catharinus uses it to accuse himself. On 5 April 1517, he entered the Dominican convent of San Marco, where he took the habit at the hands of fra Filippo Strozzi, choosing the name of Ambrogio Catarino in honor of the blessed Ambrogio Sansedoni of Siena and of St. Catherine.[11] A

[11] Florence, Archivio del convento di S. Marco, *Liber vestitionum conventus Sancti Marci de Florentia*, fol. 9r: «Fratrus Ambrosius Bernardini de Politis de Senis, prius Dominus Lancilottus in seculo dictus, accepit habitum clericorum a reverendo priore fratre Philippo Stroza, nostro generali, 5 aprilis circa horam vigesimam quartam»; Cf. also Faldi 1994, 562, note 51. On fra Filippo Strozzi cfr. Verde 1983, 181; Ughelli 1720, VI, 620–1.

few years later, in a letter dated 5 May 1520 and addressed to the young Marcello Cervini, the future Pope Marcellus II, Catharinus gave a first account of his momentous decision. He had been disgusted by the moral corruption, the pride and vainglory he had frequently observed in the world of the Curia, and this had encouraged him to abjure his previous worldly life and to seek out the spiritual and contemplative dimension that he felt his profession lacked and that would guarantee his eternal salvation.[12] The works of Savonarola he had chanced upon gave voice to a sense of unease and dissatisfaction that he had long felt to be growing within him (Politi 1548, fol. 8v). Over twenty years had gone by since the zenith of Savonarola's influence in Florence and over twenty-five since the Ferrarese friar had first preached the need for a spiritual rebirth of Christianity, but the revolutionary charge of his message remained intact, capable of attracting those restless spirits who remained intolerant of corrupt times: nothing, or hardly anything, had changed in the corruption and abuses that Savonarola had so vehemently denounced.

But there was more. Alongside these feelings and behind his sudden and belated religious conversion lay another layer of motivations, one less easily ascribable to the sphere of spirituality or to his inner struggle, but nonetheless equally decisive in orienting his decisions. To enter the order of St. Dominic through the influence of Savonarola's message meant for Catharinus that he could participate in the project of reforming the Church from a privileged position. Catharinus was irresistibly attracted by Savonarola's presumption of possessing the truth, by his certainty of belonging to the community of the elect. Savonarola's "teaching of the articles and dogmas of the faith" appeared to him "good, holy and without error;" also, there was "the opinion and fame of his good and holy life," that is, the moral example of his life to which everyone who had known him could confidently give witness (Politi 1548, fols. 3v, 5v). In particular, the "intrinsic belief that Savonarola had in his own innocence," that "serenity of conscience" and "that great certainty of his prophecies," in other words "that testimony he gave of his own self," had appeared to Catharinus "excessive," but they had also made him timorous and "credulously willing to receive them" (Politi 1548, fol. 3v). An ambitious man like him, dominated by "an innate curiosity about human pride," so bold as to wish "to know the things of the future, usurping what is proper only to God," could not fail to be almost hypnotically attracted by the allure of that "little man" from Ferrara, by the force—and, as we shall see, the illusion—of his prophecy (Politi 1548, fol. 6v).

That doctrine, which initially appeared to be "without error," seemed to him with the passing of the years to be increasingly illusory and deceptive. About thirty years after he entered the Dominican Order, Politi gave an account of the long and troubled journey that led him to rethink his youthful choices, an account in which error once again played a central role. In fact, the *Discorso contro*

[12] Politi's letter to Marcello Cervini, Firenze 5 maggio 1520, in ASF, *Carte Cervini* 49, cc. 32r sgg., in Schweizer 1910, 245–8: 247.

la dottrina di fra Girolamo Savonarola, published in 1548, was not only one of the most famous manifestos of sixteenth-century anti-Savonarolism, but also a strongly autobiographical text, one that marked the culmination of a long personal travail. "In the first [part]," Politi began, "I will give all the reasons that persuaded me to believe, and for a long time nourished me in that faith" (Politi 1548, fol. A2r). The first fifty pages were entirely devoted to reconstructing the motives that had brought him to commit what in retrospect he considered the greatest mistake of his life, that is, his decision to enter the lists on the side of the friar of Ferrara (Politi 1548, fols. 1r–25v). "I am not so indignant toward him as toward myself. What a wretch, what a fool I am!" (Politi 1548, fol. 24r). In conclusion he added, "Everything I have written I have written against myself because I don't forgive myself anything, and I want to imitate the just man of whom it has been written 'The just man is the first to accuse himself'" (Politi 1548, fol. 25r). It was an act of personal liberation rather than an exercise of controversial polemic that as the pages unfolded became an increasingly tormented discourse on self-knowledge and self-purification before God's severe tribunal (Politi 1548, fol. 25r). That same "foolish credulity" that had convinced him that he had earned "the light of grace and … our salvation," Politi confessed, was also the greatest obstacle to be removed on the road to recovering reason (Politi 1548, fol. 19r). The fear of losing that ardently desired "salvation" had "held him bound" for "a long time": "I believed that he who freed himself from that faith would fall back into darkness, would lose the Grace of God, would be reprobate, ruined, publicly indicted and left to perish in the flood far from the safety and the shelter of the arc" (Politi 1548, fol. 23r; cf. also Politi 1548, fols. 17v–18r).

The process of emancipating himself from the Ferrarese friar's yoke, then, was a long and difficult one, necessitating a gradual demystification of Savonarola's character and prophecies, a task that claimed every moment of his thought and activity. The memory of, or rather, we might say, the obsession with what he soon identified as a strong delusion would shape his mental universe. The exposure of this early mistake would become, in the years that followed, his daily mission, as his personal experience soon overlapped with the spread of heretical doctrines in Italy. Just as he himself had been deceived by Savonarola when he was yet "simple and ignorant" (Politi 1548, fol. 7v), so many other "idiots and simpletons" now ran the risk of being deceived by the new Lutheran word. Politi therefore set himself a dual agenda. If on the one hand he pursued his emancipation from the illusory nature of the Savonarolan prophecies that had tricked him in the past, on the other he aimed to prevent other believers from getting entangled in the Lutheran deceit. The category of deceit, in other words, became for him the interpretative key with which he came to read not only his own biography but also the danger represented by the emerging heresies.

What most alarmed Politi was the power of suggestion that Savonarola and the Lutherans held, their ability to captivate the masses of the simple and the unlettered—just as had happened to him when he first entered the Dominican order. Politi saw this as a characteristic of Bernardino Ochino, the great Capuchin preacher who was also the other true protagonist of his *Discorso*, shared with

Savonarola (on Bernardino Ochino, see now Camaioni 2018). In 1542, Ochino, the esteemed general of the newly-founded Capuchin order, had shocked both friends and enemies by dropping the mask he had worn up to then, fleeing beyond the Alps and revealing to everyone his supposedly true religious beliefs. Ochino had repeatedly referred to a "new light," an inner brightness to which he appealed to lend strength and forcefulness to his doctrines. This same light, Politi was convinced, animated those passages in which Savonarola boasted of possessing "a celestial doctrine, a new light descending from Heaven" (Politi 1548, fols. 27v and 39v). Savonarola, Politi maintained, attributed to himself "the power to give new articles of faith," which he did not hesitate to "consider equal to the Sacred Books and the Catholic faith" (Politi 1548, fol. 39v). So Politi was able to trace in Savonarola's writings the same arrogance and presumption that Ochino was currently displaying in affirming the validity of his own doctrines. Like the Capuchin general, Savonarola had "exalted his doctrine above that of the Church," affirming that "true spiritual salvation laid in the belief in this doctrine:" "As if the Christian doctrine were not in itself sufficient to produce every Christian effect, he wished to prove that his axioms were indeed superior to those of the Church" (Politi 1548, fols. 27r–v). It was, in other words, that very "haughtiness and pride, common to all heretics and schismatics" (Politi 1548, fol. 4r), that in his eyes rendered the doctrines of Ochino (and of the Lutherans) as dangerous as those of Savonarola. Furthermore, Politi underscored, it was nothing other than "his presumption" that inspired "brother Girolamo" to "mock the Canons of the popes, and it was for this reason that Luther later dared to burn them publicly" (Politi 1548, fols. 18r–v).

In the central years of the religious crisis of the sixteenth century, these two aspects of Politi's spirit—anti-Lutheranism and anti-Savonarolism—grew in parallel until they found a unitary interpretative key in the *Discorso* of 1548. It was only then, therefore, that the many different meanings in which the category of error had been declined in the course of his biographical story—from presumption to credulity, from delusion to deception—found an unprecedented convergence.

References

Camaioni, Michele. 2018. *Il Vangelo e l'Anticristo. Bernardino Ochino tra francescanesimo ed eresia (1487-1547)*. Bologna: Il Mulino.

Caravale, Giorgio. 2013. "Tra benedettini e domenicani. Ambrogio Catarino Politi nella prima fase del Concilio di Trento," In *Cinquecento Monastico italiano*, ed. by G. Spinelli, 211–22. Cesena, Badia di Santa Maria del Monte: Centro Storico Benedettino Italiano.

Caravale, Giorgio. 2017. *Beyond the Inquisition. Ambrogio Catarino Politi and the Origins of the Counter-Reformation*. Notre Dame: Notre Dame University Press.

Faldi, Luca. 1994. "Una conversione savonaroliana. Ambrogio Catarino Politi: Il suo ingresso e i primi anni nell'ordine domenicano." *Vivens homo* 5: 553–74.

Firpo, Massimo. 2015. *Juan de Valdés and the Italian Reformation*. Farnham: Ashgate.

Flaminio. Marcantonio. 1996. *Apologia del Beneficio di Christo e altri scritti inediti*, ed. by D. Marcatto. Florence: Olschki.
Keen, Ralph. 2001. "The Fathers in Counter- Reformation Theology in the Pre-Tridentine Period." In *The Reception of the Church Fathers in the West from the Carolingians to the Maurists*, ed. by I. Backus. 2 vols. Vol. 2: 701–73. Leiden: Brill.
Mortier, Daniel-Antonin. 1911. *Histoire des maîtres généraux de l'Ordre des frères prêcheurs*. 8 vols. 1903 [1902]–20. Vol. V. Paris: A. Picard.
Politi, Ambrogio Catarino. 1540. *Speculum haereticorum*. Cracoviae: per Ioannem Haeliz neochristianum.
Politi, Ambrogio Catarino. 1541. *De perfecta iustificatione a fide et operibus*. Lugduni: apud Antonium Vincentium.
Politi, Ambrogio Catarino. 1548. *Discorso contro la dottrina di fra Girolamo Savonarola*. Venice: Giolito.
Politi, Ambrogio Catarino. 1956. *Apologia pro veritate catholicae et apostolicae fidei ac doctrinae adversus impia ac valde pestifera Martini Lutheri dogmata* (1520), herausgegeben von J. Schweizer. Münster in Westfalen: Aschendorffsche Verlagsbuchhandlung.
Preston, Patrick. 2003. "Catharinus versus Luther." *History* 88: 364–78.
Prosperi, Adriano. 2000. *Il concilio di Trento. Un'introduzione storica*. Turin: Einaudi.
Sarpi, Paolo. 1974. *Istoria del concilio tridentino*, ed. by C. Vivanti. 2 vols. Turin: Einaudi.
Schweizer, Josef. 1908. "Ambrosius Catharinus Politus und Bartolomeo Spina." *Römische Quartalschrift* 22: 3–16.
Schweizer, Josef. 1910. *Ambrosius Catharinus Politus (1484-1553), ein Theologe des Reformationszeitalters: Sein Leben und seine Schriften*. Münster in Westfalen: Aschendorffsche Verlagsbuchhandlung.
Spina, Bartolomeo. 1535. *Opuscula edita per reverendum Magistrum Bartholomeum de Spina pisanum*. Venetiis: in aedibus Stephani Sabiensis.
Ughelli, Ferdinando. 1720. *Italia sacra*. Vol. VI. Venezia: Sebastiano Coleti.
Verde, Armando. 1983. "La congregazione di San Marco dell'ordine dei frati predicatori. Il 'reale' della predicazione savonaroliana." *Memorie domenicane* n.s. 14: 151–237.

Errors of Interpretation: Vincenzo Maggi and Sperone Speroni, Readers of Francesco Robortello

Marco Sgarbi

Abstract: This paper considers errors of interpretation in textual criticism in Renaissance Italy. It focuses on the reading of Francesco Robortello's *In Aristotelis poeticam explicationes*, published in Florence by Lorenzo Torrentino in 1548, and the readers in question were Vincenzo Maggi and Sperone Speroni. The paper shows how errors of interpretation can relate either to a misunderstanding of the original text or of its translation. It is a significant case because it concerns the first "critical edition" with commentary of one of Aristotle's most neglected works, the *Poetica*.

Keywords: errors, interpretation, Aristotle, *Poetics*, Renaissance.

1. Reading Aristotle's *Poetics* in the Renaissance

This paper considers errors of interpretation in textual criticism in Renaissance Italy. A very specific case is featured: the reading of Francesco Robortello's *In Aristotelis poeticam explicationes*, published in Florence by Lorenzo Torrentino in 1548, and the readers in question were Vincenzo Maggi and Sperone Speroni (on Robortello see Sgarbi 2020). The paper shows how errors of interpretation can relate either to a misunderstanding of the original text or of its translation. It is a significant case because it concerns the first "critical edition" with commentary of one of Aristotle's most neglected works, the *Poetica*.

The history of the reception of Aristotle's *Poetics* is well-known (Kappl 2006). The work was transmitted through a partial translation in Averroes' *Middle Commentary* (see Minio-Paluello 1968; Butterworth 1986). In 1278, the *Poetics* was translated into Latin by William of Moerbeke, but the translation remained lost until 1895, and thus had no bearing on the subsequent Aristotelian tradition. The history of the *Poetics*' reception thus really begins in 1498 with Giorgio Valla's Latin translation. Aldo Manuzio's edition of the Greek text was published in 1508, not in the Aldine edition but in the first volume of the *Rhetores graeci*. The first great impulse in the study of the *Poetics* came with the posthumous 1536 publication of Alessandro de' Pazzi's edition and translation, which had the effect of making the Aristotelian text more intelligible than the Valla edition.

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Robortello himself narrates the story of his epic enterprise to edit, translate and comment Aristotle's work:

> The book has remained unknown until our times, and no one, among either the Latins or the Greeks, has had the strength to clarify it with interpretations. Firstly, Averroes captured some of what he [Aristotle] wrote, but I cannot praise his as a great work, nor can I criticize it, because [the texts] are badly translated into Latin and obscure passages of the original have not been clarified. Secondly, the book was translated into Latin by Giorgio Valla, an erudite man who is well-versed in all things ancient. But, as usually happens to those who walk on ice, he slipped frequently while trying to render even the simplest terms. There was great relief when Alessandro de' Pazzi retranslated the book. […] He too slipped, but he must not only be pardoned but also heaped with praise, because it is always dangerous to attempt to interpret such difficult matters […] I, too, cannot promise to have avoided making mistakes.[1]

In his edition, Robortello promises to correct the many mistakes of previous editors, especially with "the lesson on manuscript books and the utterances of the most erudite authors" (Robortello 1548). He uses four books, three of which are manuscripts. Two of these were available in the Biblioteca Medicea. One, *Laurentianus* 60.14, claims to have been described by Angelo Poliziano, whereas the other, an apograph, "multo vetustior," could be the *Laurentianus gr.* 60.21, written by Francesco Filelfo on the basis of *Parisinus gr.* 1741. Similarly difficult to identify is the third manuscript, which Robortello appears to have obtained with the help of Paolo Bevilacqua, who was summoned to teach Latin in Lucca around 1541 by Peter Martyr Vermigli. It might have been *Riccardianus gr.* 46, used once previously by Alessandro de' Pazzi. The Greek edition of the printed book, on the other hand, was most certainly by Vittore Trincavelli, and was published along with the Latin translation of Alessandro de' Pazzi. Even Robortello, therefore, represents a splendid case of the identification and correction of errors, especially those committed by de' Pazzi. Nonetheless, these errors were confined to the philological and codicological level, of the kind that the reading of a new manuscript tends to generate.

It would be wrong, however, to believe that Robortello was the first Renaissance scholar to seriously engage with Aristotle's text. Indeed, between 1535 and 1536 Vincenzo Maggi and Bartolomeo Lombardo began their own exegetical work, criticizing Gian Giorgio Trissino's *Poetica* (1529), perhaps using a manuscript version of de' Pazzi's translation before its publication, as Guglielmo de' Pazzi seems to testify.[2] In 1541, at Alessandro Piccolomini's invitation,

[1] Robortello 1548, letter to readers. I quote from Speroni's own copy of Robortello's *Explicationes*, which was the very first edition.

[2] The testimony does not make clear in any definitive way whether Maggi was teaching Aristotle's *Poetics* at the university before 1536 or using Pazzi's manuscript translation. See Morsolin 1882-1883, 244–6.

Bartolomeo Lombardo—with some reluctance on account of bad health—gave the first public lecture on the *Poetics* at the Accademia degli Infiammati. Vincenzo Maggi was scheduled to teach the text at the Accademia too, but the death of his nephew obliged him to leave Padua (Vianello 1988, 52). Lombardo and Maggi's project to translate and comment on Aristotle's *Poetics* as a joint venture was realized only in 1550 with the *In Aristotelis librum De Poetica communes explanationes*, and so following the publication of Robortello's masterpiece. In the Accademia degli Infiammati, therefore, a new interest in Aristotle's *Poetics* arose, but Robortello was the first to publish a new edition of the text, causing resentment in Maggi, who in the meantime, after Lombardo's death, was continuing the hard work of the commentary on his own. Not by chance were both the authors considered in this paper—Maggi and Speroni—notable members of the Accademia degli Infiammati, and Speroni probably its last *principe*.

The errors of interpretation that this essay considers were those made by Robortello in reading Aristotle's words and flagged up by Maggi and Speroni. Of course, the "errors" in questions are mistakes dependent on their own interpretations of Aristotle's text and expose their disagreement with Robortello's reading. Scholarship has paid scarce attention to Maggi and Speroni's annotations to Robortello's edition. Indeed, Enrico Bisanti published an Italian translation of Maggi's *Obiectiones quaedam adversus Robortelli explicationem in primum Aristotelis contextum*, but with no further investigation. Déborah Blocker, in contrast, has the merit of having discovered Speroni's personal edition of Robortello's text containing his marginal notes, and outlines his general attitude as a reader (see Bisanti 1991; Blocker 2020). Among these notes, on the first two pages of this personal copy, Speroni lists a detailed series of errors committed by Robortello.

2. Vincenzo Maggi's *Obiectiones*

The *Obiectiones quaedam adversus Robortelli explicationem in primum Aristotelis contextum* was published in 1550 as a para-textual element of Maggi's *Explanationes*.[3] It documented the fact that Maggi had carefully read Robortello's work and had intended to compose a much larger confutation of Robortello's every last word. However, he had abandoned this extensive task because so many mistakes needed correcting, and limited himself to reviewing Robortello's commentary on Aristotle's *Poetics* 1447 a 8-11:

> περὶ ποιητικῆς αὐτῆς τε καὶ τῶν εἰδῶν αὐτῆς, ἥν τινα δύναμιν ἕκαστον ἔχει, καὶ πῶς δεῖ συνίστασθαι τοὺς μύθους [10] εἰ μέλλει καλῶς ἕξειν ἡ ποίησις, ἔτι δὲ ἐκ πόσων καὶ ποίων ἐστὶ μορίων, ὁμοίως δὲ καὶ περὶ τῶν ἄλλων ὅσα τῆς αὐτῆς ἐστι μεθόδου, λέγωμεν.

[3] The *Obiectiones* are published along with Lombardo's lecture at the Accademia degli Infiammati, with an announcement to experts of poetic art, and also three letters from Maggi to Madrucci, from Gugliemo de' Pazzi to Francesco Campano, and from Alessandro de' Pazzi to Nicolò Leonico.

In the standard English translation, the passage is rendered as follows:

> Let us here deal with poetry, its essence and its several species, with the characteristic function of each species and the way in which plots must be constructed if the poem is to be a success; and also with the number and character of the constituent parts of a poem, and similarly with all other matters proper to this same inquiry.

Robortello's commentary on Aristotle's words can be summarized as follows:

1. Aristotle's *Poetics* has no proem;
2. The absence of the proem is evidence of the authenticity of the text;
3. The presence of long proems in other works like the *Rhetoric to Alexander* makes the authorship uncertain;
4. Instead of a proem, in the *Poetics* Aristotle immediately explains the subject;
5. Aristotle indicates his method beginning with "what comes first," just as he does in the exordium of the *Physics*;
6. The *Poetics* can be divided into three parts: a. definition and parts of poetics; b. tragedy; c. epic;
7. To the specific elements of poetics Aristotle adds plot (*fabula*), considered to be the soul of every poetic work;
8. Aristotle deals with plots both quantitatively and qualitatively.

According to Maggi, Robortello commits several kinds of errors, ranging from mistakes of interpretation to crucial omissions. First of all, Maggi disagrees with the idea that Aristotle's *Poetics* has no proem or introduction on the spurious basis that his authentic works lacked these (Maggi-Lombardi 1550, 17). Indeed, many important commentators such as Alexander of Aphrodisias, Simplicius, Philoponus, and Averroes believed in the existence of proems in Aristotle's writings like the *Physics* or *On the Soul*. Maggi points out that Aristotle himself explains the scope and importance of proems, which is to make clear the goal of the composition. Since Aristotle at the beginning of the *Poetics* explains the scope of his writing, it is an error, therefore, to maintain that there is no proem. Furthermore, if one compares the beginning of the *Poetics* with that of the *Physics*, which is clearly a proem, there are many similarities. Finally, Robortello would seem to be contradicting himself in stating that at the beginning of the *Poetics* Aristotle deals with the essence of poetics, its parts, etc., because these are exactly the sort of elements that constitute a proem. Maggi and Robortello evidently have two different conceptions of proem. Robortello had in mind the long initial letter written to Alexander in the pseudo-Aristotelian *Rhetorics*, in which the author of the work—perhaps Anaximenes of Lampsacus—does not immediately deal with rhetorical topics. Maggi's essential criticism is that Robortello is applying non-Aristotelian expectations to Aristotle.

Another mistake made by Robortello in Maggi's view concerns the division of the work, leading to many sub-errors and mis-interpretations (Maggi-Lombardi 1550, 18–9). Maggi contests Robortello's view that after providing a definition of poetics that is useful for determining the various distinctions that constitute

the parts of a work, Aristotle deals directly with one of its forms, tragedy. Indeed, after the definition of poetics Aristotle would have considered its origin, which according to Robortello is part of the investigation of the definition itself and not a separate section. Maggi also criticizes Robortello's idea that the definition of poetics is discovered by division, namely through examining genus and specific differences. This is not the case according to Maggi, because Aristotle provides different criteria for classification of the various types of poetical works—epic, tragedy, comedy, etc.—and these categorizations refer to the medium, the subject, and the manner or mode of imitation. These aspects are not specific differences, and therefore Robortello's interpretation does not stand up. Yet Robortello never claims that definition is discovered by division. He simply states that Aristotle "seeks and provides the definition of poetics after having found the genus and after having distinguished it through differences to that extent that the definition may be applied to every part of poetics" (Robortello 1548, 5). Every definition is composed of a genus and a specific difference, but this does not mean that the definition is discovered through division.

Maggi criticizes Robortello's statement that "Aristotle deals with tragedy and with its parts and then with plot" as if plot were a subdivision of poetics like tragedy, comedy, and epic, etc. Indeed, it is quite clear that plot is one of the key elements in assessing individual poetic works, and thus it cannot in itself be a specific type. However, Robortello does not say that plot is a kind of poetic work, but rather that Aristotle deals with plot after the definition of tragedy (Maggi-Lombardi 1550, 19).

Maggi then objects to Robortello's claim that for Aristotle, after presenting the subject of investigation, it is necessary to examine "the constitution of the plot and of its parts, etc." (Maggi-Lombardi 1550, 20). Maggi sees "of its parts" in Robortello's text as clearly referring to plot, whereas his own view is that Aristotle's intention was to deal with the constitution of the plot and the parts of poetics. This leads Robortello to err in maintaining that the characters, the language, the thought, the spectacle, and the music are parts of the plot, yet for Maggi they were parts of every poetic work and among these parts plot should be included too. In Latin, Robortello's sentence reads: "sibi esse dicendum etiam de fabulae constitutione, & eius partibus." (Robortello 1548, 5). Maggi's interpretation is correct, but Robortello's explanation is that the plot is the essential element—the soul—of every poetic composition, and therefore all the other parts refer to it. This error led Robortello to consider the prologue, episode, exodus, and chorus as inherent in every plot, while Aristotle attributed them only to tragedy. Indeed, these parts are not characteristic of epic, according to Maggi. Philologically speaking, Maggi's observation is correct, and Robortello is providing a very personal interpretation of Aristotle, which is not close to the text.

Maggi goes on with his objections, passing from errors of interpretation to omissions. The first omission is the lack of a proper explanation of what the subject of the *Poetics* actually was—namely whether by "poetics" Aristotle meant "poetry" (*poesi*) or "poetical art" (*arte poetica*), the art of composing poetical work. Then there are several omissions in the translation. For instance, Robortello does not translate "αὐτῆς τε," which in Maggi's view should have been translated for Maggi

with "*ipsaque*." Robortello does not explain the real meaning of "δύναμις," which he translates with "*facultate*," that is whether it means the "nature" of poetics or something different that belongs to nature, so at a secondary level of investigation (Maggi-Lombardi 1550, 21). Maggi finds this objection particularly relevant considering that Robortello had written in the preface of his *Explanationes* that "the poet applies his true force in making meaningful and describing the characters of human beings" (Robortello 1548, 3). If this is the true faculty of the poet, then Maggi finds it to be in contradiction with the purpose of poetics that Robortello has established, that "poetics applies its force for delight" (Maggi-Lombardi 1550, 22). But here Maggi is confusing method with purpose, which for Robortello is delight and utility (though Maggi conveniently omits to mention utility). The real point for Maggi is that Robortello is contradicting what Aristotle says:

> But most important of all is the structure of the incidents. For Tragedy is an imitation, not of men, but of action and of life, and life consists in action, and its end is a mode of action, not a quality. Now character determines men's qualities, but it is by their actions that they are happy or the reverse. Dramatic action, therefore, is not with a view to the representation of character: character comes in as subsidiary to the actions (Maggi-Lombardi 1550, 23).

According to Aristotle's words, therefore, poetics should imitate actions and not characters, and Robortello is wrong in stating otherwise.

Other important omitted explanations are those concerning the words "πῶς" and "μύθους," which are fundamental and which according to Maggi deserve detailed examination. But the most striking omission and error concerns Aristotle's method. What Robortello writes in the introduction is not sufficient for Maggi:

> Aristotle needed to deal methodically (*ordinatim*), that is μεθοδικῶς with poetics, but he could not do so if, having given the definition, he had not explained the τὸ τί ἐστι. But the definition was not known [...] First the genus must be investigated, then the difference; indeed, without them definition cannot be constituted. The genus cannot be investigated other than with an ἀναλυτικῶυ method (Robortello 1548, 5).

Thus for Maggi there was no other way for Aristotle to deal with poetics if not methodically, but he never explained its τὸ τί ἐστι once the definition was given, since no hint of a real definition is found in his work. Furthermore, Maggi observes, the analytic method is inappropriate for this kind of enquiry and not even the method adopted by Aristotle's himself in his *Posterior Analytics*. Robortello's sentence is therefore meaningless (Maggi-Lombardi 1550, 23).

These then are the scattering of errors and omissions that Maggi found in Robortello's edition. By his own account, his aim in highlighting Robortello's failings was not to "calumny" his adversary, but rather to reveal truth in such a way that young scholars would not be deceived in reading Robortello's book, and not consider it gospel. Furthermore, he maintained, Robortello himself would have accepted the criticism for the sake of the advancement of knowledge.

In general, Maggi's reading of Robortello is by no means as neutral as the author says. While he correctly points out a number of omissions in the transla-

tion, he intentionally stretches aspects of interpretation, putting into Robortello's mouth and pen what the intellectual from Udine had never uttered or written.

3. Sperone Speroni's Marginal Notes

Speroni's reading of Robortello is heavily influenced by Maggi's, as frequent reference to the 1550 *In Aristotelis librum De Poetica communes explanationes* makes clear. However, Speroni is not always in agreement with Maggi, and in amending Robortello presents his personal interpretation of Aristotle's *Poetica*. Speroni's list of errors shows also that either he read Robortello's text starting at the back—that is, from the short treatises in the appendix of the 1548 edition—or that he read and commented at least twice on Robortello's edition, going back and forth with cross-references. It is impossible to ascertain when and how often Speroni read this book, but a series of marginal notes show that at least one reading of Robortello's work took place after the publication of Pier Vettori's edition of Aristotle's *Poetics* (1560).

Speroni's list of errors is meticulously annotated at the beginning of the book with an exact note of the page number.[4] The errors he identifies in Robortello are mainly in connection with the interpretation of Aristotle's text, and more generally about the task of poetics. They are strongly influenced by Speroni's very personal conception of tragedy, and by the debate provoked by the publication of the *Canace.*

Speroni finds the first error at the very beginning of Robortello's proem, where poetics is categorized among the various language arts according to their relation or closeness to the truth. Herewith Robortello constitutes the hierarchy of the language arts:

1. *apodictic logic*, that is demonstration, which deals with what is true;
2. *dialectics*, which deals with the probable;
3. *rhetoric*, which deals with the persuasive;
4. *sophistry*, which focuses on the verisimilar;
5. *poetics*, which is concerned with the false or the fabulous (Robortello 1548, 1).

Speroni contests Robortello's idea that "as far as the more the oration departs from the truth, the nearer it gets to the point that it is false" (Robortello 1548, 1). He emphasizes how Robortello is wrong in this classification because there is no medium point between what is true and what is false. Therefore, the difference between the various language arts should be unrelated to truth and pertain to the function of language. In the *Dialogo della istoria* Speroni writes

> Poetry does not narrate the fact; it is an imitation and semblance of the fact, like the mirror for the one reflected; rhetoric is no ambassador for senators or judges, but it persuades of the truth. The truth is tested in a higher way by dialectics; and this is proved by the sciences, which treat the general, where the feelings go not (Speroni 1740, vol. 2, 314).

[4] In this paper I will consider only the major errors identified by Speroni.

It falls to dialectics and demonstration to show the truth by abstracting it from all those particular feelings which are aroused by poetry and rhetoric. In other words, one can say that poetics invents facts, while rhetoric persuades that something is true, even though it may be false. Their goal, therefore, is not the truth, but respectively delight and persuasion. About truth, Speroni says that "poetry paints it, rhetoric uses examples and enthymeme to substantiate it; syllogism and induction giving general proofs yield uncertain knowledge, but demonstration makes it certain" (Speroni 1740, vol. 2, 314).

Speroni contests the idea of a direct relationship with the truth and finds qualitative differences between the various kinds of oration. Hence, even if Speroni shares with Robortello this classification of language arts—coming traditionally from Averroes—the principle according to which they are grouped is different. For Speroni, it is not their relationship with the truth that distinguishes them, but rather the instruments that they employ. In reading Robortello, Speroni likely had in mind his fierce opponent Giambattista Giraldi Cinzio, who made of truth and verisimilitude the cornerstone of tragedy and who in his *Giudizio* charged the *Canace* with inverisimilitude.

Speroni then attacks one of the cardinal ideas of Robortello's interpretation of Aristotle's poetics, namely catharsis. Indeed, according to Speroni, Robortello supported the conception that tragedy purges the audience of pity and fear by means of pity and fear. The criticism against Robortello is based on a simple reading of the following Latin passage: "Quod si quis roget, qualis sit Aristotelis sententia de tragoedia. Respondeo, existimare illum; eius recitatione, & inspectione purgari perturbationes has duas, commiserationem, & metum" (Robortello 1548, 53).

Robortello is clearly referring to the famous passage "δι' ἐλέου καὶ φόβου τεραίνουσα τὴν τῶν τοιούτων παθημάτων κάθαρσιν," which is translated in the standard English edition as "arousing pity and fear, wherewith to accomplish its catharsis of such emotions" (Aristotle, Poetica, 1449 b 27-28). In identifying this error, Speroni explicitly endorses Maggi's criticism of Robortello. Maggi writes:

> A spectator at a tragedy undergoes feelings of pity and of fear: of pity, due to his recognition that the evil events that have happened to the individuals in the tragedy have come about because of some ignorance or misjudgment on their part, not because of their malevolence; of fear, due to his recognition that the same sort of thing could happen to himself, no matter how good his intentions. The goal of this experience is the purification of emotions; the aim is not that of liberating the spectator's soul from pity and fear. If the spectators witness tragic actions on stage (which are in fact crimes that originate in ignorance), they will find themselves moved by compassion and fear, the fear that the same could happen to them. […] If tragedy were to free this dictator from fear, the fear of themselves committing the same kind of crime, then tragedy would make human beings all too ready to commit heinous crimes. And this is clearly absurd (Robortello 1548, 97).

In contrast to Robortello, therefore, for Maggi and Speroni, tragedy purges all other perturbations, emotions and passions of the soul by means of pity and fear. Speroni is quite explicit on this in a manuscript passage of a preliminary draft of his *Apologia* of 1554. He openly confesses that tragedy "with fear (*terrore*) and pity (*misericordia*) delighting purges the chest of the listener" (Biblioteca Capitolare, Padova, Ms. Speroniani, VIII, c. 203v). The word "delighting" plays a crucial part in Speroni's conception.

A much clearer exposition of Speroni's criticism of Robortello can be found in a letter to Alvise Mocenigo, dated 26 February 1565. Here he opposes two possible interpretations of *Poetics* 1449 b 27-28, one truly Aristotelian and the other labeled "Stoic." The passage, which in some texts reads "*ut purgemur*," and in others "*ut liberemur*," or "*ab hujuscemodi*," or "*ab hujusmodi affectibus*" can be understood in two very different ways. One is completely false, taking the text to read "*ut purgemur ab hujusmodi affectibus*:" through pity and fear, tragedy purges negative affects, among which are pity and fear. The second and more correct interpretation reads the passage as "*ut liberemur ab hujuscemodi fascinoribus*"—in other words, that through pity and fear tragedy purges the passions represented on the stage.

Speroni focuses on the incorrect way of reading Aristotle, the stronger interpretation that sees tragedy as purging fear and pity through exposure to fear and pity ("*ut purgemur ab iis affectibus*"). This seemingly contradictory position is characterized as Stoic and not Aristotelian in Speroni's eyes and it is clearly the position that he and Maggi attributed to Robortello. In the context of this letter, Speroni seems particularly to criticize the ethical and political importance of catharsis for Robortello, a position endorsed also by his great archenemy Giambattista Giraldi Cinzio. He saw the position of both as being that catharsis was a means of strengthening the moral virtues of justice (*giustizia*) and fortitude (*fortezza*) and, though a positive outcome, this was not Aristotle's true and original thought. Indeed, "the poet because of his nature aims at nothing other than delight" (Speroni 1740, vol. 5, 178). There was no directly ethical objective in tragedy, whose final purpose was to deliver delight or pleasure, rather than moral edification. The latter pertained not to the poet, or to tragedy, but to political government, whose final goal was to educate its citizens.

According to Speroni, therefore, Aristotle's opinion is that catharsis does not purge pity and fear, but the passions represented on stage. Interpreting him otherwise, Speroni says, would make of "Aristotle a Stoic rather than a Peripatetic." But it is clear that "Aristotle does not want to free [the human soul] from the affects, but that we rule them, because in themselves are not free" (Speroni 1740, vol. 5, 178). According to Speroni, Robortello would have rendered the passage more aptly with "*ut eos purgemus*." Speroni's criticism of Robortello is, however, tendentious, since Robortello himself explains that

> when people see stage productions […] they become accustomed to suffering (*dolore*), being afraid (*timere*) and feeling pity (*commiserari*), and so, should it come about that they have the same experience, they would suffer and fear less (*minus doleant, & timeant*) (Robortello 1548, 53).

For Robortello, catharsis does purge pity and fear but it limits all excessive passions of the soul. Indeed, in another passage, which was annotated and underlined by Speroni, Robortello explains that

> Aristotle did not agree with Plato, who did not wish the passions and perturbations of the soul to abound in poems; for Aristotle thought of an imitation in entirely different terms than did Plato. Such passions do not at all corrupt the characters of human beings or become more abundant in their souls, but rather purge them of all kinds of perturbations (Robortello 1548, 166, translated by Weinberg).

Pity and fear do not purge pity and fear, but rather all the other perturbations which produced excessive emotions and passions in the soul. In doing this, catharsis leads to delight (ἡδονή). Robortello clearly distinguishes ἔλεος and φόβος from παθήματα. The former are generated in the soul, the latter are put on the stage during tragedy. The generation of pity and fear in the soul limits the excesses of all passions.

Catharsis was not alone in being at the center of Speroni's criticism of Robortello's interpretation of Aristotle, but also the goal of tragedy. Indeed, on page 58, Robortello wrote that "the primary goal of tragedy is the imitation of the habits of the soul and the characters of human beings" (Robortello 1548, 58). In contrast, Speroni correctly emphasizes how for Aristotle the goal of tragedy was first and foremost the imitation of human actions. Speroni is perhaps too severe with Robortello, who, on many occasions, says precisely this. However, not all human actions must be imitated according to Robortello, but only those pertinent to a moral education, and for this reason the imitation of habit and character is so crucial for him.

On page 65 Speroni identifies an error of precision made by Robortello in characterizing the faculty of *dianoia*. Indeed, according to Robortello *dianoia* or the faculty of thinking "composes, divides, ratiocinates, contemplates, simply apprehends, affirms, denies, argues, demonstrates" (Robortello 1548, 65). Among these actions, for Robortello, simple apprehension pertains to the intellect and not to *dianoia*, which is a discursive faculty. In this respect Robortello is therefore in error.

Page 87 is particularly dense in marginal annotations. Indeed, after noticing that it is false that "all that is possible is probable" because what is possible may appear very seldomly and therefore not be at all likely, Speroni criticizes Robortello's idea that the poet cannot invent because imitation must relate to true action. Robortello's thesis seems to be in contradiction with poetical tradition, but Speroni counters this by saying that there are two modes of invention, one beyond nature (*praeter naturam*) and the other according to nature (*secundum naturam*). In the first instance we are faced with a lie, which for Robortello must be expunged from poetics. In the second, poetics follows what is either probable or necessary, which in other words is something in relation to what is true, and which can convey an ethical message. Since Speroni does not conceive of poetics in relation to truth, then in imitating the poet is free to invent whatever

is able to evoke pity and fear, even unbelievable and preternatural things (Robortello 1548, 87).

The problem of the relationship between invention and truth in poetics returns on page 93 where Robortello comments as to why according to Aristotle one should retain true names in tragedy. According to Speroni, who does not accept Robortello's idea that poetics has a strict relationship with the truth, in the commentary no real explanation or reason is given for why tragedians do not and cannot invent names, while comedians create names at will. Robortello here emphasizes once again that tragedy must imitate the truth in order to move an audience to pity and fear, and for this reason its capacity to evoke these two emotions is more effective if the names used are real or verisimilar.

Speroni, then, shows how Robortello overinterprets Aristotle in saying that in tragedy it is better to imitate the actions of famous or important persons because their characters, deeds and mistakes are so extraordinary that they arouse the various passions with greater intensity. Furthermore, only illustrious and noble men can achieve the highest happiness as well as the deepest sorrow. Imitation of plebeians, according to Robortello's interpretation of Aristotle, should be avoided in tragedy. For Speroni, however, all kinds of actions befit imitation, not only those of noble and illustrious men, because—following what Aristotle says in his *Ethics*—every human being, according to their own nature, can be happy. Once again, Speroni tends to go beyond Robortello's thesis or make it stronger. And indeed in this case too, Robortello simply states that the imitation of such men and women arouses the various passions more forcefully, but he does not exclude the representation of common people's actions. Nonetheless, Speroni believes that Robortello's conception is methodologically flawed, and this is particularly clear in the *Lettioni in difesa della Canace del medesimo*. Here, Speroni maintains that tragedy should imitate common people, because the spectators at the theatre were plebeians, and in imitating them their feeling of pity and fear would be much stronger.

Finally, in commenting on *Poetics* 60 a 19-26, Robortello explains Aristotle's statement that Homer is a master of paralogism by making the point that this kind of argumentation is employed by rhetoricians. Thus Robortello is arguing for an affinity between poetics and rhetoric, both of which would use the same type of inference. Speroni, who differentiates the language arts according to the mode of inference they employ, cannot accept this kind of connection or affinity, and he adds, considering in this instance the two disciplines in relation to truth, that in any case rhetoric cannot be considered akin to poetics because the former deals with the verisimilar, and the latter with the false. In this respect, Robortello was right and Speroni wrong, since Aristotle himself establishes this connection when speaking of pity in *Rhetorics* II.8 and fear in *Rhetorics* II.5.

4. Conclusion

Maggi and Speroni identify different kinds of errors in Robortello's commentary on Aristotle's *Poetics*. While Maggi has more of a focus on the philological restitution of Aristotle's text and thought, Speroni is driven more by a

personal interest in tragedy. Their criticisms testify to the relevance and significance of Robortello's enterprise and show how personal readings of Aristotelian texts could lead to divergent interpretations and be the origin of different exegetical traditions.

Interestingly enough, coming from a totally different conception of poetics, a close family friend of Speroni—Torquato Tasso—read and commented on Robortello's text, signalling the same errors, but reaching totally different interpretative conclusions (see Bettinelli 2001). When Tasso was a student in Padua between 1561 and 1566, he had the opportunity of frequenting Speroni's house: a long-lasting friendship had created a strong bond between his father Bernardo and the Paduan Intellectual. Tasso probably had recourse to a manuscript copy of the *Lezioni sui personaggi*, itself published posthumously only in 1597, but in Speroni's possession at the Accademia degli Elevati in Padua in 1558, and which would have inspired the young scholar in composing the *Rinaldo*. Looking at Tasso's marginal annotations to Robortello's commentary—the subject of a detailed study by Andrea Bettinelli—it is evident how the same passages that caused problems for Speroni also piqued Tasso's interest.

In the pages in which Robortello explains the ethical value of imitation but at the same time emphasizes that poetics is concerned with falsehood, Tasso notes "si recitatio et imitatio virtutum fit etc.: sibi contradicit" (Bettinelli 2001, 294). In Tasso's mind either the subject is falsity or imitation generates virtue, but the two together are impossible. And it is quite clear which Tasso himself would opt for. Indeed, he writes that it is "Robortello's error that the false is the subject-matter of poetry" (Bettinelli 2001, 309). Tasso was probably convinced by Speroni's reading of Robortello that the Pisan intellectual was defending the idea that the false was central to poetics, while, as we have seen, this is a misinterpretation. But while for Speroni falsehood was part of the remit of poetics—thus detaching it from a direct relationship with truth—for Tasso poetics should constantly engage with the truth, unwittingly following the footsteps of Giraldi Cinzio and Robortello. That Tasso endorsed Speroni's misinterpretation of Robortello is evident in the *Discorsi dell'arte poetica e in particolare sopra il poema eroico* (1594), where he writes that

> Robortello is wrong in assigning the false to the poem as its subject matter. Indeed, according to Plato and Aristotle's opinion, the false is the subject matter of the sophist, who struggles around what is not. But the poet bases himself on some true action and considers it as verisimile. Therefore, his subject matter is the verisimile, which can be either true or false, but is more often true (Tasso 1594, 26).

But Tasso's conception echoes Robortello's, and the fact that he believed himself to be at odds with him suggests that he is following Speroni's view.

In relation to the false, Tasso makes a marginal note where Robortello speaks of the possibility of including subjects that are *praeter naturam* in poetics. Whereas, as we have seen, for Robortello this option is not to be considered common, according to Speroni it was a central feature of poetics. Like Speroni,

Tasso believes that this is a negative aspect of Robortello's interpretation of Aristotle. However, unlike Speroni, he corrects Robortello explaining better how even beyond nature subjects may still serve poetry in relation to the truth. Indeed, some of these subjects can be the logical consequences of a story, without which it would be understood as mere fantasy.

These are only two instances of particular passages that were commented on and annotated in different directions by Speroni and Tasso, both of them signalling errors in Robortello's reading, but many more could be cited. For instance, both criticize Robortello's interpretation of the passage in which Aristotle states that Homer taught that a poetical lie is a paralogism, and likewise the reading of Aristotle's distinction between a simple and complex plot. A further, much more detailed investigation is clearly needed.

Working on errors of interpretation rather than similarities, especially in textual criticism, can be extremely useful for reconstructing the reception of a text. By juxtaposing the annotations of Maggi, Speroni, and Tasso against Robortello's commentary, and drawing out a comparison helps us to understand better, not only how a critical text was read, but also how Aristotelian ideas were received—much more informatively, in fact, than concentrating solely on similarities and points in common. Indeed, errors are often very precise and circumscribed, and they allow for genealogical reconstructions, whereas similarities and loans, which are for the most part very vague, do not. Histories of error in textual criticism could thus lead to a new way of interpreting the incremental rise of a specific literary and philosophical tradition.

References

Bettinelli, Andrea. 2001. "Le postille di Bernardo e di Torquato Tasso al commento di Francesco Robortello alla *Poetica* di Aristotele." *Italia medioevale e umanistica* 42: 285–335.

Bisanti, Enrico. 1991. *Vincenzo Maggi interprete tridentino della* Poetica *di Aristotele.* Brescia: Ateneo di Brescia.

Blocker, Déborah. 2020. "Lire et commenter la Poétique d'Aristote en Italie dans la seconde moitié du Cinquecento: du commentaire érudit à l'élaboration d'une réflexion sur les arts." In *Francesco Robortello. Réception des Anciens et construction de la modernité*, 65–90. Rennes: PUR.

Butterworth, Charles E. 1986. *Averroes' Middle Commentary on Aristotle's Poetics*. Princeton: Princeton University Press.

Kappl, Brigitte. 2006. *Die Poetik des Aristoteles in der Dichtungstheorie des Cinquecento.* Berlin: De Gruyter.

Maggi, Vincenzo and Lombardi, Bartolomeo, 1550. *In Aristotelis librum de poetica communes explanationes*. Venezia: Valgrisi.

Minio-Paluello, Lorenzo. 1968. *Aristoteles Latinus XXXIII. De arte poetica cum Averrois Expositione*. Leiden: Brill.

Morsolin, Bernardo. 1882-1883. "Esame d'uno scritto recente intorno all'Italia liberata dai Goti." *Atti del reale Istituto Veneto di Scienze Lettere ed Arti* 6: 244–6.

Robortello, Francesco. 1548. *In librum Aristotelis de arte poetica explicationes: qui ab eodem ex manuscriptis libris, multis in locis emendatus fuit, ut iam difficillimus, ac obscurissimus liber a nullo ante declaratus, facile ab omnibus possit intelligi. Cum Indice rerum et uerborum locupletissimo. Francisci Robortelli Vtinensis Paraphrasis in librum Horatii, qui uulgo De Arte poetica ad Pisones inscribitur. Eiusdem explicationes de satyra, de epigrammata, de comoedia, de salibus, de elegia. Quae omnia addita ab authore fuerunt, ut nihil quod ad poeticam spectaret desiderari posset: Nam in iis scribendis Aristotelis methodum seruauit: et ex ipsius libello de Arte poetica principia sumpsit omnium suarum explicationum*. Firenze: Torrentino.

Speroni, Sperone. 1740. *Opere*. Venezia: Occhi.

Tasso, Torquato. 1594. *Discorsi del poema heroico*. Napoli: Venturini.

Vianello, Valerio. 1988. *Il letterato, l'accademia, il libro. Contributi sulla cultura veneta del Cinquecento*. Padova: Antenore.

"Errori popolari:" How a Medical Notion Became an Aesthetic One

Paolo Cherchi

Abstract: The notion and the linguistic coinage of "errore popolare" is not as old as it is commonly believed, but comes from the history of medicine when in the late 16th Century, the Sorbonne's professors labelled as "erreur populaire" the paracelsian therapies. The definition became common in Italy and England. Another area where the idea of "errore popolare" was widespread is that of religion, where the notion of "error" borders with that of heresy, superstition and magic. However, the "scientific revolution" did not identify the mistakes with a social class or discipline but in the way knowledge was acquired: only the criteria of proof and evidence dispelled erroneous notions. Thus the "scientific knowledge" discredited the beliefs of the ancients, considered to be their major source, and confined them the sphere of imagination which was to be highly appreciated in the Romantic age. Such a change in perception and evaluation was favored by the new vision of the popular culture, folklore, seen as an autonomous cultural system.

Keywords: vulgus, paracelsian medicine, ciarlatani, secrets, popular errors.

The notion of "error" is quite problematic if even ancient Sophists, countering all common experience, denied its existence, and still today thinkers like Gilbert Ryle try repeatedly to find a "category of mistake." Its difficulties grow if we combine it with the notion of *popolare*, an attribute quite ambiguous and covering a vast range of meanings and nuances.[1] Yet the topic of our study will be precisely the combination of these two terms tinged both by a varying degree of ambiguity. But readers can rest assured that we are not creating a problem just to show our daring, but we are merely studying a combination created in the culture of premodern history. The formula "errori popolari" or "erreurs populaires" far from being of our making, pops up with remarkable frequency in many titles of works regarding different disciplines, particularly in books of medicine, religion, and even in other disciplines, such as physics and history. Its frequency is confined to the period that spans approximately between the late sixteenth and the end of the eighteenth centuries. Thus, taking into account these two factors of the repeated documentation and timing, it is clear that the

[1] The notion of "popolare" has generated a real debate in modern days, especially in the light of Gramsci's theories on the "nazional popolare" culture, which is not the one that interest us in this study. On the debate see at least Benigno 2013.

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formula "errori popolari" is based on history and it should be studied in historical terms, that is with an approach that requires concrete data rather than abstract reasoning. So our readers will be spared from disquisitions on Logic and Science and should expect a more accessible but not less interesting survey of a historical debate.

Nonetheless, both terms require some qualification, if not a precise definition, to maintain our research within clear limits and to specify its goals. "Errore" in the most empirical sense is any action that departs from the truth, yet its quality and level of gravity are not stated by a dictionary but rather by its impact or effects. A grammatic mistake is different if made by a child or by a writer, and a wrong understanding of a sacred text is different if it is made by a simple person or by the creator of heresy or a schism. We will take into consideration only errors of cultural relevance, and whose "correction" implies major scientific changes or even switches in mentality. It is important to remember that the evaluation of what must be considered a mistake is also a historical one in the sense that expresses the judgment of those who see the wrong and suggest ways of correcting it. In most cases, any belief or statement that lacks proof or evidence will be considered a mistake. This criterium already tells that the difference between right and wrong must be decided by a "method" of research.

As to their "popular" nature, the question is somewhat more complicated given the wide range of meanings of the adjective, positive at times, debasing at others, and neutral in most instances. In English, the primary sense of "popular" is that of "broadly liked," or "admired by the people." In Italian, as well as in French and Spanish, this meaning is only a secondary one, whereas the primary one remains that of "belonging to the folkish sphere," something "of a simple or lower quality:" essentially the *vulgus prophanum* hated by Horace and, a millennium and a half later, by writers like the Spanish Cosme Aldana, author of a *Discorso contro il volgo*.[2] Neither of these well-established meanings will match precisely the one used by the authors who created the formula of "errori popolari" because the errors of their concerns were indeed widespread among common people but they were also found among learned persons and in a bookish tradition. Perhaps the best English equivalent of Italian "errori popolari" is found in the title *Pseudodoxia epidemica or Vulgar Errors* of the book by Thomas Browne. In that learned title is implied the notion of *doxa* which means "common opinion or knowledge," which happens to be also *pseudo* or "fake" because it appears "learned" but is all wrong; moreover its notions are *epidemica* which indicates that this type of pseudo-knowledge is contagious and spreads like a pandemic. Browne's title seems to allude not so to many single mistakes as to a set of general beliefs amply held by the folk or the *vulgus*. This latitude proves, once more, that the problem lies in the way of knowing things rather than in the knowledge of single things: so it would seem once again that there is a problem of method.

[2] Aldana 1578, and then in Spanish, *Invectiva contra el vulgo*, Madrid 1591, and later in *Biblioteca de Autores Españoles*, Madrid, Ribadeneyra, vol. XXXVI, 1886, 495–514.

In modern times, in the post-Romantic period, the meaning of "popolare" will undergo a profound change and in the most recent decades, it defines the culture of the "subaltern" classes. We will return to this latest concept.

From what we just said it should be clear that only the "historical research" will clarify the meaning of "errori popolari," a meaning that cannot be extrapolated from the context in which it was born. Indeed if we remove the dyadic formula from its original context the meaning of each term will change: "popolo" takes the meaning of "folk," and consequently "popular mistakes" may enter in a sphere akin to that of "myths," of the unquestioned imaginary truths. The earliest signs of this change occur at the waning of the period encompassed by our study when the concerns on the problems of "methods" begin losing their dominance and urgency. At that point, *popolare* acquires the connotation of "belonging to the vulgus," and the *vulgus* begins to acquire the sacred aura of "nation." For the time being, we concentrate on the period that coined the formula "errori popolari" by which it indicates mistakes that have an impact on the culture of the moment. The idea that special "errors" could mark in negative ways entire generations or even ages is not new, as proven by expressions like that by Thomas Aquinas who speaks of the "errores gentium," faulting the entire pre-Christian civilization; and where Dante speaks of "le genti antiche nell'antico errore" (*Par.* VIII, 6), he means the whole civilization that preceded the Revelation. However, such isolated instances do not represent a cultural trend similar to the one we are going to study when some entrenched "errori popolari" became the target of the attack that a new age and a new culture were ready to carry out to dismantle a whole system of beliefs, and to impose a new method of pursuing knowledge.

Medicine was the first and most industrious discipline in identifying and repelling "errori popolari." Such primacy should not be a surprise since medicine is a discipline that touches everyone regardless of class and age. Moreover, it is a very old one, perhaps the oldest, and has, therefore, a long tradition of notions and cures and preventions; it also constitutes a body of knowledge open to individual opinions and remedies. In its long history medicine underwent several epochal changes: the Hippocratic type of medicine—innovative in its becoming separated from religion and theology—was revolutionized by Galen's anatomy and humoral theories; then it was lost to the West together with the loss of Greek; then it was recovered through the Salerno School and the Arabic influence. By the end of the fifteenth century, it was to undergo a new major change, announced, as in most cases, by denouncing the mistakes made by a previous school. Niccolò Leoniceno can open our inquiry with a short work bearing a manifesto-sounding title: *De Plini et plurium aliorum medicorum in medicina erroribus* (1492). Leoniceno was a doctor from Ferrara,[3] and his pamphlet corrects many botanical data found in Pliny's *Naturalis Historia*. Leoniceno spots Pliny's mistakes by checking his Greek sources (Theophrastus, Dioscorides, Galen,

[3] Ferrara was a cradle of Humanistic medicine: see Nutton 1997.

etc.), often misunderstood by the Latin author. Leoniceno's work had an impact not foreseen or not fully intended. One of the consequences was a philological debate involving Politian, Ermolao Barbaro (with his *Castigationes plinianae*), Pandolfo Collenuccio and the likes, showing that philology could take an active role in establishing the authentic "science" of the ancient authors. Even more interesting was the confirmation of the importance of herbs and plants for "pharmacology," but their value was strictly guaranteed by texts scrupulously edited and representative of the real ancient medicine. This restrictive criterion established the superiority of the Greek authors, gave a secondary role to the Latin ones (Pliny, Celsus), and rejected completely the "erroneous" Arabic authors, including Avicenna who for centuries was held as one of the highest authorities. It was an innovation but not yet a revolution since it "returned" to the tradition deemed lost for a long time. Even so, the scrutiny of the ancient doctor was constant, and their mistakes were exposed, as we can infer from the title *De erroribus veterorum medicorum* (1553) by Giovanni Argentiero.

A real revolution took place a few decades later when Paracelsus, a student in Ferrara and later a professor of medicine in Basle, where, according to a legend, on his inaugural lesson he burned the books of Galen and Avicenna, the two pillars of Western medicine. Paracelsus abandoned the guide of all the *auctores*, both ancient and Arabic, and decided that the only way to practice medicine was to observe the patients rather than read the authoritative tomes of ancient doctors. But he did much more and with greater consequences. He rejected the Galenic view that the human body was regulated by four humors (blood, black bile, yellow bile, and phlegm) and health depended on their perfect temperature and balance. Paracelsus substituted the galenic humors with three bodily elements, namely salt, sulfur, and mercury. Organic life and health were determined by the combinations and separation of these metallic elements, and all therapies would aim at assuring the stability of their vital combination. It was an alternative medicine that was based essentially on a "chemical" or "alchemic" understanding of the body. Consequently, its pharmacological counterpart had to abandon its herbal or vegetal basis in favor of a metallic one. That meant relying on completely new factors, and instead of using concoction and decoction of herbs and plants, medicines were prepared through processes of distillation, sublimation, and the grinding of minerals. Given that minerals were "sublunary" elements, that is natured by astral influences, medicine tied its contact with astrology. It was indeed an ancient notion that stars and constellation had an impact on medical and physiological matters, from the moment of conception to the hours of expiration; but Paracelsian medicine was innovative in that it specifically considered the astral influence on the metals that were chosen on this base to create *pharmaka* or "secrets" or pharmaceutical mixtures. This distinguishing feature represented a great innovation in the field of medicine. A powerful wave of occultism flooded the medical art, and notions like those of "sympathy" and "antipathy" among the elements took medicine close to magic. Understandably Paracelsian medicine became quite fashionable and at the same time, it aroused strong suspicions of magic and a vivid reaction in doctors tradi-

tionally trained. This is not the place to discuss that immense phenomenon called "Paracelsian medicine;" but what matters the most for us is that this new type of medicine favored the development of "spagyric," a process of extraction of "essences" and all sorts of chemical combination that gave life to the literature of the "secrets," which in turn nourished the phenomenon of charlatanism with its armies of practitioners of medicine who served kings as well as humble people.[4]

The clash between these two different schools of medicine created for the first time the notion of "errori popolari." The older one considered them utterly dangerous for private and public health and called for some official action to contain the practice of this "wrong" medicine; the new one alerted against the errors of the adversaries but did not call them popular. The alarm was sounded by a book, but the awareness of these mistakes and their danger had been felt for quite some time. The book in question is by André du Breil, which conveys the idea of the "political" nature and dimensions of containment of a kind of widespread mistake with strong cognitive and moral implications. The title betrays a sense of urgency: in 1578, the date or its appearance, a pest was raging in France and it was necessary to find a cure for the pest of "coqueluche," perhaps a kind of catarrh or some other respiratory disease. The high number of deaths demanded the intervention of all the science the university could provide, and emitted a *Consilium facultatis medicinae contra pestem*.[5] The title and subtitle of Du Breil's treatise is *La police de l'art et science de medicine, contenant la refutation des erreurs, et insignes abus qui s'y commettent pour le jourdhuy: très utile et necessaire à toute personnes, qui ont leur santé et vie en recommendation. Ou sont vivement confutez tous sectaires, sorciers, enchanteurs, magicians, deuins, pythoniciens, souffleurs, empuisonneurs, et tout racaille de theriacleurs, et cabalistes: lesquel en tous lieux et pays, sans aucun art ne science, approbation ou authorité, font et exercent impudemment, et malheuresement la medicine, au grand interest de la santé et vie des hommes, et detriment des Republiques.* Published in Paris (Cavallat, 1580) and dedicated to the King, this book has the modest dimensions of a polemical essay, but the intensity of outrage against the herd of fake doctors is unrestrained. Today's reader can identify just a few of them: certainly the magicians and the divines, but must look for help to identify the *theriacleurs* and the *pythoniciens*, because they are "specialists," we may say, who practiced a type of medicine who had an "official" literature that legitimatized their practice. The *theriaca*, for example, was an ancient concoction that had a homeopathic power, and was largely used against the pests (see Nockels Fabbri 2007); *pythociens* are

[4] On Paracelsus see: Bianchi 1995, e Bianchi 1987; Meier 2000; Miotto 1971; Pagel 1989; Stahl 1995; Webster 1984.

[5] The occasion for this book is a celebrated episode involving the school of medicine of the Sorbonne and a doctor from Ruen, Roch le Bailiff, who had published a book *Le demonstration … auquel sont contenue trois cens Aphorismes Latins et François. Sommaire veritable de la Médicine Paracelsique, extraict en la plus part, par le dict Bailiff,* Renne, Pierre Bret, 1578. This book prompted André du Breil to publish his book. On the all episode see Kahn 1998. On Paracelsism in general, see Debus 1991.

the bewitchers who cure patients with charm. As we can see, the lists of doctors who never set foot in the Sorbonne are varied and numerous. Du Breil is particularly hostile to the Paracelsians:

> Quant aux Paracelsistes, ou autres plus subtils inventeurs de leur secte, ils ne me feront quiter les bons, et approuvez autheurs pour suivre leurs nouvelles inventions: par lesquelles ils pervertissent tout ordre divin, et humain, de tout temps, et ancienneté, et par toutes nations, iusques icy tenu, gardé, et observé en la Medecine, ny moins d'approuver leur nouveaux secrets ou entrent toute sortes de mortiferes poisons: l'experience desquels a faict mourir une infinité de peuple, comme ils continuent chacun iour. (*Epistre à Messieurs de Roven*, with no page signatures).
> [As for the Paracelsians or others more subtle inventors of their sect, they would not cause me to abandon the good and approved authors in order to follow their inventions, by which they pervert all divine and human order of all times, their antiquity and in all nations which have been upheld, defended and observed in Medicine. Nor will they cause me to approve their new "secrets" where all kind of mortal poison are mixed, and whose use has caused death to an infinite number of people, and continues to do so today.]

The book begins by sketching a history of the schools or "sects" of medicine in antiquity and considers that the best one is that of the doctor called "dogmatic and rationalist," operating along the lines signed by Hippocrates and Galen. All that has come to subvert the teachings of this illustrious tradition is ill-conceived, poisonous, and nefarious. Du Breil excoriates the pretended doctors who never took the Hippocratic oath, who flood the market with products like "quintessences," "potable gold" and all sort of potions unknown to "dogmatic and rational" doctors. Just one excerpt suffices to give us the tone and the gist of the entire treatise:

> Le faux medicins de nostre temps, desquels nous entendons icy parler, se peuvent aussi diviser ou rapporter à trois sects ou manières, lesquels tous se couvrent du manteau d'Empirique, qu'ils s'attribuent faulcement, ce que facilment croient ceux qui ne sont pas versez en l'art de Medicine, et qui n'y prennent pas assez de pres garde. Et non seulement le pauvre peuple ignorant, mais aussy plusiers des mieux apprins et advisez, par curiosité ou nouveté, s'y entremeslent. Et par licence, et faux donner à entendre au Prince, et à la Iustice, sans reprehension, ne punition aucune, leur est permis d'abuser et prendre tel accroissement qu'en fin ils seront cause de la totale ruine, non seulement de l'art et science de Medicine, mais de tuote la Republique: si en brief l'on n'y remedie, et si on n'y donne empechment. Car non seulement ils adulterent les metaux par leurs subtiles poisons et mixtion, mais aussy alterent par iceux, et font perir les corps, et bien de la terre, et qui pis est, comme harpyes diaboliques, infectent, et contaminent les autres choses de si pernicieuse consequence, qu'on ne sçavroit estimer. A raison dequoy sont plus à reprendre que vrays homicide, et assasinateurs; et doivent estre expulsez, et dechassez des pays, forbanis, et fuis comme une peste de la republique Chrestienne (Du Breil 1580, 27–8).

> [The false doctors of our times, of whom we intend to speak here, can be divided or be assigned to three sects or ways which are all included under the common brand of "Empirics" which they falsely attribute to themselves and which is something easily believed by those who are not versed in the medical art, and who are not cautious at all. And not only poor and ignorant people, but also many cultivated and wise get involved with them out of curiosity. And because of a license, and their fake "make believe" presented to the Prince and to the Authorities, they are allowed to operate without any reprehension or punishment, and to grow so wide that ultimately they will be a total ruin not only for the art of Medicine, but for the entire Republique, unless a fast remedy is found and they are impeded. They not only adulterate metals by their subtle poisons and mixtures, but with them they cause the human and earthly bodies to die, and even worse, as diabolical harpies, they infect and contaminate other things with such pernicious consequences that one would not be able to estimate. Therefore they deserve to be condemned as true murderers and assassins, and should be expelled and pushed out of the countries, banished and avoided like a pest of the Christian Republique].

Medical mistakes are in fact crimes that deserve severe punishments. This notion of "erreur" runs through the book and if one learns very little about the "correct" science defended by the Sorbonne professor, he learns plenty about the notion of "mistake" in a field where life and health were at stake. To give an idea of the flood of books and booklets circulating in the year before the publication of *La police de l'art*, that is in 1579, two very successful works were published in France, one was by the Italian Gerolamo Ruscelli (Lyon), *Les secrets*, and the other was by the Suisse Conrad Gessner, *Quatre livres des secrets de medicine et de la philosophie chymique* (Paris), works that had been running through endless numbers of editions. *La police de l'art* did not extinguish the genre, because other books of "secrets" (for ex., Etienne Ydely, *Des secrets souverains et vrais remedes contre la peste*, Lyon 1581; Nicolas Bonfon, *Le blazon des fleurs ou sont contenuz plusiers secrets de medicine*) kept appearing because they were obviously in great demand. Du Breil harps on this kind of medicine ("Agripistes [that is, the followers of Cornelius Agrippa von Nettesheim], Paracelsistes, Piedmontistes [the readers of Alessio Piemontese, *alias* Gerolamo Ruscelli], Margretistes, Acomistes et tels autres sectateures") that impresses on ignorant people who see in their potions and abstruse jargon some magic power (Du Breil 1580, 43). Indeed he blames the fake doctors but also finds the patient at fault (*Les fautes des malades*) for being so gullible (Du Breil 1580, 119–29).

The attention we paid to Du Breil's treatise sheds light on the context in which the "gravity" of the medical mistakes is evident, which are not limited to a single and isolated case, but to an entire way of understanding the human body and its diseases. Some false notions have penetrated vast areas of people with the endangerment of entire populations. Any "dogmatic and rational" doctor must be aware of the level of information of his patients to apply his cures at the best level. There is no question that a new kind of medicine is competing

with an established one, therefore the battle takes epochal dimensions. *La police* shows that the errors are widespread, especially among the ignorant people who do not generate such mistakes but simply receive them as truths. To undo the teaching of these impostors it is important not only to destroy their books but to correct the ideas that they have spread, that is to go directly to "the errori popolari" and to rebuff them.

A few years before *La police*—a sort of treatise born out of an emergency situation—Laurent Joubert published *Erreurs populaires au fait de la medicine et regime de santé* (Bordeaux, 1578), a book destined to be successful because it was timely and did not show Du Breil's bitter grunt. Probably Joubert foresaw that this would have been the case because he was preparing a follow-up volume that he was unable to complete due to his death. He spells out his purpose in clear terms. Doctors must instill good "real" medical science into the minds of people who have been fed wrong notions by bad doctors:

> Or les erreurs et fausses opinions sont si vulgaires et communes en l'ame, que rien plus. Il faut donc qu'elles viennent d'ailleur, et s'insinuent de par dehors: sçavoir est, de mauvaise doctrine et fausse persuasion. […] C'est le devoir des medecins de luy dissuader ces fausses opinions et procedures, et l'instruire de faire mieux ce que luy concerne: comme de servir et garder les malades, leur assistant fidellement soubz la conduite et gouvernement des doctes medecins. Aussi faut il, que d'où est venu le mal, procede le remede. La mal, (c'est à dire, l'erreur engendré en l'ame du people ignorant) est venu de ce qu'il à ouy dire, ou veu faire aux medecins, lesquelz il veut contrefaire, sans aucune fundament. Car ignorant plusieurs et diverses considerations requises, il fait son discours, et syllogissant mal, il se forge de fausses conclusions et erreurs, qu'il tient pour choses vrayes, tirees (comme il cuide) et confirmees de l'experience. Voyla un mal tres-dangereux, duquel les medecins en sont cause, pour avoir trop divulgué et communiqué leurs regles et ordonnances, que le vulgaire prend cruément, et n'en sçait disposer bien à propos. C'est donc aux medecins de remedier à ce mal: à la guerison duquel ie me suis peiné assez longuement, le remonstrant à plusieurs: mais cela n'à guieres servi: d'autant que la plus part, est incapable de raison et discours. Dont en fin ie me suis resolu de remonstrer au people ainsi desvoyé, ses erreur par escrit (Joubert 1578, fol. a3r–a8v).
>
> [Errors and false opinions are so popular and common in the soul that nothing matches them. Therefore they must come from somewhere else, and creep in from the outside, that is from bad knowledge and false persuasion. […] It is the doctor's duty to dissuade him (that is: the Paracelsians) from these false opinions and to instruct him to do his best of what may concern him: to serve and protect the sick persons, to assist them faithfully under the guidance and ruling of learned doctors. Also, the remedy should proceed according to the origin of the sickness. The disease (that is the mistake generated in the soul of ignorant persons) has come from what one has heard said, or seen to be done by doctors whom he wants to imitate, without any basis. This is so because, ignoring many different and required considerations, he makes his own reasoning and

> using poorly some syllogism, he draws some conclusions and mistakes that he considers to be truthful, drawn (so he thinks) and confirmed by the experience. Thus, you can see a very dangerous disease, of wich doctors are the cause, having divulged and communicated their own rules and arrangements, which ordinary people take in a crude sense, without knowing how to apply them properly. So it is up to the doctors to remedy this evil: the process of hailing on which I have dwelled at length, showing it to many people, but with little use, since the majority of people are incapable of reasoning and dialoguing. Thus, in the end I have decided to show in writing their mistakes to such misguided people].

These declarations—found in the dedication letter to Marguerite of France, Queen of Navarre—give in essence the cause and the purpose of the work. Joubert writes primarily against the so-called "empiric doctors" who disregard the traditional medicine taught by the *auctores* and draw their knowledge from the direct observation of their patients. They follow no general or systematic principles, and their empirical doctrine percolates to the ignorant people. These doctors—who we may identify with the Paracelsians and the charlatans—speak the language of common people and compete fiercely with the traditional doctors, who sounded the alarm as we saw in the case of Du Breil, and did their utmost to protect their guild. Joubert, however, differs from Du Breil, in that he intends to correct the mistakes spread by the new practitioners of medicine, and to do it efficiently he surveys a high number of "erreurs populaires," resulting from the misinformation originated by poorly informed doctors.

The book is hefty and neatly structured. It contains six parts, the first of which is dedicated to the doctor's social duties and status; then follows the conception; the pregnancy; the cure of infants; the milk, and the nurture of children. The second book deals with physical needs: complexion, clothing, hair, meals, and digestion. The third talks about eating and drinking habits. Part four is devoted to diseases. Part five deals with cures; and the last part talks about evacuations of all types and purges and laxatives, and finally death. This scheme covers all phases of life and is profusely filled with all sorts of "errors." Most interesting among them are those concerning conceptions because the origin of life and the quality of the products are often mixed with all sorts of magic beliefs: for example, copulating when the moon is full produces male offspring; a hat put on the stomach of a woman giving birth, eases the delivery; eating a left testicle of animals results in the birth of a female … Fighting these popular beliefs, means to combat the midwifery that was invading the profession of doctors, as was the case of barbers who often substituted the surgeons. Another aspect of this book is its language that, besides being in French—that is in a language understood by everybody—, names the sexual organs and their functions without using any metaphors: a fact that caused some scandal but Joubert defended his language usage invoking the principle that he was speaking the "truth" to correct people's mistakes and had no intention of titillating any fancies.

The book enjoyed remarkable success in France and it was translated into Italian and English. Death prevented Joubert from adding a second part, which we

know only partially. But even in this incomplete form, it remains a very important work. It coined and gave legitimacy to the notion of "erreur populaire" which was to acquire currency. It was also given a strongly negative and combative connotation, so what before appeared as new and marvelous, now was considered a mistake and was to be reproved. Take for example the belief that the woman's womb can contain nine fetuses: this is a strange enough fact to be reported in books of *mirabilia*. A serious doctor should discredit such wrong popular beliefs. It is very important to notice that the notion of "populair" defines not the beliefs of the lowest classes but a type of culture which is in sharp contrast with the "university" learning which is based on the authority of the ancient scholars.

The importance of Joubert's work is proven by the controversies it aroused and in different directions. Dominique Reulin wrote a *Contredicts aux erreurs populaires de Laurent Joubert* (Montauban, 1580) in which he reproaches Joubert for having "revealed" medical secrets that can corrupt the morality of people (for instance, by disproving the belief that girls cannot become pregnant before the age of nine, he may tempt some girls to make love before that age); doctor B. Cabrol defended Joubert's language in a lengthy *Epistre apologetique* added as an appendix to the 1601 edition of the *Erreurs populaires*. Half a century later Gaspard Bachot, pretending to fulfill a desire of Joubert himself, updated his work: *Erreurs populaires touchant la medicine et le regime de santé. Oeuvre nouvelle, desirée de plusieurs, et promise par feu M. Laurent Joubert* (Lyon, 1626), departing somewhat from his model by emphasizing the divine intervention on the "complexion" and life of the body. A surprising notion of "erreur populaire" is presented by J.D.T. de Bienville, who wrote *Des erreurs populaires sur la santé* (The Hague, Gosse 1775), maintaining that some mistakes are caused by medical books when they end up in the hands of readers that read them without using some judgment, so that an excess of medical cures may produce harm. De Bienville wrote treatises on nymphomania and onanism, subjects which may explain what kind of "excesses" he had in mind; but without pursuing this theme any further, it is interesting to see that those mistakes are not exclusive to lower classes. In any case, medicine is an area where "erreurs populaires" persist even in modern days.[6]

Let us turn our sight to the Italian scene, the primary area of our interests where Joubert's work found a congenial situation. Here medical science, including the fields of anatomy and pharmacopeia, was more advanced than in other parts of Europe. France, for sure, had some renowned medical centers like Paris and Montpellier, and had exceptional doctors, like Jean Fernel (Fernelius Ambianus), who followed the Galenic tradition but contributed remarkably to enlarging its field; yet Italy made multiple and remarkable advances in a wider area and had prestigious universities such as Padua, Bologna, and Naples where students from all over Europe came to study. But most of all Italy was the land where the Paracelsian tradition in the version of the "ciarlatani" had its birth-

[6] See Coste 2002. Medical literature is so vast that is not even thinkable to indicate the main surveys. Nonetheless we have consulted some of them: Grmek 1997.

place and the strongest presence. The charlatans, still present in today's imagination, thanks also to the caricatures found in the theatre (Molière's Tartuffe) constituted a category of alternative medicine regulated by state agencies that released licenses to practice it. Long before other nations, Italy was flooded by booklets of "secrets," or formulas for all sorts of cures (worms in children, colds, skin diseases) as well as for erasing spots of grease, for dying hair, whitening teeth, and so forth, all based on some chemical mixture, thus gravitating towards the field of iatromedicine.[7] The invention of the press produced best-sellers such as *I segreti* by Alessio Piemontese (1555) that went through innumerable and constantly updated editions, many translations, and imitations.[8] Most books of secrets were just trash but some were elaborated works by authors who enjoyed a good reputation by all sorts of persons, in some cases even kings. Some charlatans were respected scholars, like Cardano author of a well-known *Libro di segreti*. The most famous charlatan was Leonardo Fioravanti, who enlisted the king of Spain among his patients. He traveled the peninsula throughout and was famous for his "Elixir Fioravanti" and his many "capricci medicinali" or medical recipes. This vast literature constituted a patrimony of "errori popolari" in the eyes of doctors with a university background. And for sure, the hordes of charlatans, midwives, and barbers practicing phlebotomy and minor surgery, represented serious competition for doctors as we saw in France. In Italy, the campaign against these "empirical" doctors started a bit later than in France perhaps because charlatans enjoyed legal protection and the traditional doctor occasionally shared some of their secrets. A famous doctor like Girolamo Fracastoro flirted with the magic tradition, spoke often of the "quintessentia" and the "corpuscular physics" of Epicurean-Lucretian tradition, and theorized about the existence of a dynamics of *simpatia* and/or *antipatia* among the elements of the universe. But he remained primarily a rational or dogmatic doctor and a practitioner of a pharmacy based on the "semplici," or vegetal elements. This celebrated doctor, who studied syphilis and the reasons for the contagious diseases, was also a believer in the role that astrology played in medical science.[9]

This balance, however, was not the norm. In the same town Verona, Fracastoro's birthplace, an admirer of Fracastoro but much more of Fioravanti's, took a fierce stand against the "rationalistic" doctors and advanced the cause of the empirical medicine inspired by Paracelsus. This un-academic doctor was Tomaso Zefierele Bovio who took the name of Zefierele, the angel of fecundity and serenity, which fitted quite well with the mission he undertook in helping poor patients, rather than charging them with heavy bills as academic doctors did. Greed was just one of the "errori" of which he accused the traditional doctors.

[7] On this category of quacks, suffice to consult two major works: Eamon 1996, and Gentilcore 2006.

[8] Eamon (1996, 282) lists all the known books of "segreti" published in Italian and in translation, and they amount to 104.

[9] The literature on Fracastoro is vast. Some indication on Fracastoro and in general on the historical role of the astronomy in the medical science, see Riva 2018.

He attacked them in a series of works whose titles leave no doubt on the *animus* that inspires them. Here are some: *Flagello contro i medici communi detti rationali* (Venezia, 1583); *Melampigo overo confusione de' medici sofisti che s'intitolano rationali* (Verona, 1585), and *Fulmine contro de' medici putatitii rationali, nel quale non solo si scoprono molti errori di questi ma s'insegnano ancora il modo di emendargli et correggerli* (Verona, 1602, firstly published in 1592 with a shorter title). In these works, he promotes his medicines, particularly one he called *Hercules* good for killing worms and curing syphilis or the French pest.[10] In his "empirical medicine" he made large use of herbs known to simple people and recommended particularly those grown locally, which increased their efficacy. He defended the use of magic and astrology. His attacks aroused strong reactions, like the one by Claudio Gelli, *Risposta dell'Eccellente Dottor Claudio Gelli, ad un certo libro contra medici rationali* (Milano, Gio. Battista Bidelli, 1617).

In Italy, the opposition among the schools of medicine was as intense as the one seen in France. But there were some differences: Italy did not have a King to impose general guidance; the presence of charlatans was by far more visible, and the discipline's advancements were greater by far, especially in anatomy (Vesalius, a professor in Padua, Gabriele Falloppio), in embryology (Fabrizio D'Acquapendente, Fortunio Liceti), and pharmacology (Pietro Andrea Mattioli). During the Renaissance "rational" medicine made great strides in areas that were bound to change many notions learned in the traditional works of Galen and Avicenna. Their knowledge was based increasingly on direct observation and it was acquired through "experiments" and confirmed by "evidence," terms which began to accompany the new findings. Rational doctors showed great concern about the competing medicine that had no traditions, no *auctoritates*, nor revered reference books. Sure of their science, they began to speak of the "errori popolari" spread or perpetuated by the "empirical" adversaries. By that definition, they meant all the beliefs not validated by any academic analysis, beliefs held by large strata of the population, and acquired through the senses and superstitious traditions. Rejecting the "errori popolari" the "rational or dogmatic" physicians attacked the charlatans or Paracelsian who were the major source of wrong notions in diagnostic and therapeutic matters. Combatting these trends, indeed a whole culture became a kind of crusade for the academic doctors. They intended to crush a school of different principles and to save the lives of people from the charlatans *segreti* while at the same time perfecting their knowledge of the body, of diseases, and cures. The fight was not meant to correct or modify specific mistakes but rather to change the way of considering natural phenomena, the very role of knowledge, and the means of acquiring it. It was not a small enterprise to dismantle a set of assumptions, some of them based on the principle that the body is related to the composition and the laws of the cosmos: it required a whole modification of a "mentality." So we need to see

[10] On Bovio see: Ingegno 1983. Gadebusch Bondio, 2003; Pia Vannoni, 2011; Ernesto Riva, "Zefirele Bovio e la magia al servizio della natura" chapt. XV in Riva 2018, 173–8.

the historical role and the function that the "errori popolari" may have played in the so-called "scientific revolution."

Italy, imitating the French model, produced literature against the "errori popolari." Joubert's work through the translation by Alberto Luchi (*La prima parte degli errori popolari*, Florence, Giunta, 1592), paved the way for this kind of literature. Soon after Luchi's translation, a Roman doctor, Scipione Mercurio—as a friar, he took the name of Girolamo Mercurio—, wrote *Gli errori popolari* (1603), which was quite successful. Previously he had written *La commare*, "The midwife," a book on obstetrics, a rather "popular" subject since it deals with pregnancy and child delivery. From time immemorial midwives substituted doctors, and their area of expertise was the conception and the delivery of children, so it frequently dealt with superstitious beliefs and magic practices. Mercurio's book is quite interesting as attested by its great international success and it shows its author's attention to popular medicine which he finds prone to errors and open to the influence of the charlatans. This subject is fully developed in a lengthy book inspired by Joubert's work.

Degli errori popolari d'Italia was published in 1603 (Venezia, Ciotti) and reprinted several times.[11] It is structured in the following way: the first two books deal with the mistakes doctors and other practitioners make in curing sick persons; the following four books deal with the wrong diagnosis due to wrong notions and general ideas on the constitution of the human body and its diseases; the seventh and last book gives some hygienic rules by which to live a healthy and long life. The structure reminds that of Joubert's *Erreur populaires*, but there are original points and insights. For Mercurio, one of the original mistakes is the hostility towards the doctor, a hostility that has historical roots, first in the negative attitude by the Romans towards the doctor and then in early Christianity. Then there are kinds of mistakes made by people such as changing doctors and talking against their science. At the same time Mercurio blames some doctors for exercising their profession poorly: among these untrustworthy doctors are the Jews and the charlatans and the Paracelsians. Other typical mistakes made by doctors are: "servirsi di cirugici, empirici, et Barbieri nelle infirmità gravi de' suoi amalati," thus entrusting one's health to "empirici" rather than to "rational" doctors (Mercurii 1645, II, 8, 205–8). The "errori popolari" concern the notions relative to the body and its diseases, and these are the errors that commoners share with the "empiric" doctors. The list of their wrong beliefs is quite lengthy and this makes it quite difficult to choose good examples. A good one, which is also present in Joubert, concerns the cleanliness of the bedsheets. It is worthy to transcribe some sentences:

> Strano humore è questo che regna in Italia, quasi appresso ogni popolo, che il mutare gl'ammalati di lenzuola [e] le camice gl'indebolisca. Io per me, quantunque sopra di ciò habbi spesso fissato il pensiero, confesso nondimeno non aver gia mai saputo ritrovare la causa da cui un cotale errore prendesse sua

[11] We consult it in a later edition which is fairly close to the *princeps*: Mercurii 1645. The work had been reprinted in 1615 and in 1621.

> origine. So io benissimo che molti errori popolari hebbero il suo principio da qualche radice buona, ma per la mala intelligenza o ignoranza del popolo diventò un errore (Mercurii 1645, III, 12, 217).
> [Strange belief is this one found in Italy and spread in almost all of its regions: the belief that changing of bed sheets and gown makes sick people weaker. As far as I am concerned, although I had often expressed my thinking on this matter, I must confess that I was never able to find the origin of this mistake. I am very well aware that many popular mistake originated out of some good roots, but by the wrong understanding or ignorance of the people they became mistakes].

The popular notion that white linen is unhealthy stems from ignoring that filth closes the skin pores and impedes the secretion of bad humors; thus this popular error causes damage rather than a cure. The same argument is found in Joubert (1578, II, 5: "Qu'il faut souvent changer le linge aux febricitans," 63 ff).

Other frequent mistakes depend on requesting the help of witches and magicians. There are mistakes like washing one's swollen legs before going to sleep (Mercurii 1645, IV, 19, 326–9). Some others are frequently done by pregnant women, like retaining the feces or taking laxatives after giving birth. Others still are done in the choice of the physical ambiance in which to live, in the dietary and social habits, in exercising, and sleeping, and so forth. Among the mistakes, Mercurio mentions one made by a respected doctor who gave wine to cure a case of diarrhea, and later the same therapy was used by quacks to cure any type of phlegmatic irregularity: it is a case of how good and "rational" medicine can become "popular and wrong."

In closing his book Mercurio summarizes the purposes that motivated him in writing it. He wanted to write a useful book for the health of his readers. And he wrote it in vernacular because common readers are accustomed to finding vernacular books that retell stories of love and seduction, work of pure entertainment. In this book they will find useful matters for the physical and mental health; moreover, they should know that its author wanted to show that Italian is by far superior to other modern languages (that is French and Spanish) because its writers are superior to anyone. Mercurio is aware of being imitating a French author, but above all, he wants to reassure his readers that he did not waste any time in a superficial effort.

The book is of course very rich but for us is above all the book of an author who wants to dispel "popular errors" in the medical field. Common people, of course, are not to be blamed for their mistakes whose origin and longevity depends to the highest extent on the work of the "empirical" doctor and the charlatans who are their closest collaborators. They are ever-present in Mercurio's work and constantly blamed for fostering wrong beliefs. Correcting the work of these impostors is an urgent task, one which may change the way of seeing an entire discipline. Mercurio is engaged in an epochal battle in defense of academic medicine and the health of mankind. This high purpose does not allow any benevolence when it comes to mistakes. Mercurio is aware that mistakes in the field of medicine are most often lethal and must be avoided at all costs. But

it is not an easy goal to achieve because popular beliefs have the depth, width, and obstinacy of mentalities, which have no clear beginnings and no one can foresee when they end.

One thing is certain. The notion of "errore popolare" with the meaning described in the works of Joubert and Mercurio acquired currency and was well established in Latin as well as in the vernaculars of Europe. Here are some titles: Jacob Primerose, *De vulgi erroribus in medicina libri IV* (London, 1631); in French: Gaspar Baschot, *Erreurs populaires touchant la medecine et regime de santé* (Lyons 1626); Bienville, *Traité des erreurs papulaires sur la santé* (The Hague 1775); Luc d'Iharce, *Erreurs populaires sur la médecine* (Paris, 1783): these are just some titles of works which are similar but also different because medical science progresses in time. However, we mention them here because they keep the notion of popular error alive till the end of the eighteenth century. We are not able to provide any titles from Spain, although the Iberian cultures experienced the clash between traditional and empirical medicine.[12]

Medicine is such a universal field that any of its profound changes would affect the general understanding of the body's structures and functions and it may even change an entire mentality. Any correction of "popular mistakes" in areas like nutrition or children's care could bring real cultural changes. Another area very similar in amplitude and vital importance was that of religion. There are important differences between the two areas since "right" and "wrong are clearly distinguished because the Truth is dogmatically asserted by the Scriptures and by the Churches and "mistake" is anything that differs from these two authorities. Mistakes in matters of religion may lead to heresies, and so it was common to speak, for example, of the "errors" of Lutheran, as does the Dominican Ambrosius Catharinus in his pamphlet *Compendio di errori et inganni luterani* (Rome, Cartolari, 1544) and in so many other books that it is pointless to record them here. Theoretically in the Western religions or in the "religions of the Book," there should not be a "popular mistake," since religious creeds are shared by a multitude of believers who collectively constitute the "populus." Yet books and scriptures are subjected to interpretations that can be more or less accurate, more or less simplistic, thus it is possible to incur into some level of approximations that borders erroneousness. One illustration of this phenomenon is provided by Jean d'Espagne (1591-1659), a French priest who became a Calvinist, lived in Holland and England, and authored *Les erreurs populaires dans les poincts generaux: qui concernent l'intelligence de la religion; rapportez à leurs causes, & compris en diverses observations*, published in 1639 and repeatedly printed and translated. We learn that "popular" is essentially an intense but primitive way of approaching the divine, of understanding through the senses what in fact must be understood with reason. The Scriptures are understood literally because popular interpreters do not know how to read a metaphor and use the criteria of "analogy" rather than their intellectual powers to grasp the revealed

[12] On the subject see Salinas Araya 2016, especially the section "Publicaciones de medicina popular."

truths. So they believe in what their senses suggest and as a result, they have a set of "opinions" rather than a set of truths. This is the gist of all the demonstrations by D'Espagne. His book does not put one creed over another but maintains that religions, as preached by the Christian Church, are "popular," always looking at the effects without ever inquiring about the causes.[13] Understood in this way, the Christian religion is popular in that it sees only the surface of things, the forms rather than the substance, thus it is wrong and popular, and its mistakes are widespread. But since this view is shared by theologians and thinkers, it is wrong to consider "popular" as the equivalent of low class. It is a sort of epistemic problem, a way of thinking. Consequently correcting such "popular errors" represents an immense task: only by overcoming this "sensual" or superficial way of understanding the truths of religion, it is possible to attain the salvation that religion promises.

But leaving aside this "libertine" position, which is useful to us only insofar as it provides another nuance to the adjective "popular," we can understand that the official representatives of our monotheistic religions were not concerned with these kinds of errors. Other mistakes were considered truly insidious and dangerous because they questioned or misrepresent the divine power. These were the beliefs in "magic" which could control reality and offer an alternative to the divine power. What is magic? The subject is immeasurably vast because it embraces many phenomena and was quite alive in that century when the notion of "popolare" began to emerge. To see how vast and insidious magic was to the official religion, let us consider a simple question: what is the difference between a miracle and a magic act? Theologians and philosophers could answer this question, but to commoners, the difference was not obvious, except that in miracles they saw a divine power while in magic they saw a diabolic power. Magic power, witches, and burning stakes were an obsessive presence in the Centuries of the Renaissance and the Reformation. The Church put a check on that obsession by distinguishing black from white magic, the first one being practiced with the help of diabolic forces while the second was just a natural phenomenon that seemed to have supernatural causes. For example, a sweating statue could be interpreted as a miracle or a magic event; it was neither one but just a natural fact: the statue may be built out of a porous material that absorbs humidity which exudates as soon as the external temperature increases. This would be a case of "white magic" explainable by science. It has been noticed endless times that the pre-modern mentality was imbued by magic beliefs, fomented by the neo-platonic and hermetic traditions; it was a mentality that believed that alchemic and occult powers could win the battle against hostile nature, a belief that explains why the Paracelsian medicine had such great fallowing. But as rational explanation gradually changed the understanding of many natural

[13] The treatise should be read in its integrity, but not being able do so, one should read at least the chapter VII, of section II: "Des raisons populaires, tant en la Religion Romaine, que parmi le vulgaire des Eglises Ortodoxes," d'Espagne 1649, 134–7.

mysteries these notions were discredited. So many works were written to bring under control the presence of magic and bring a better understanding of the laws of Nature and the real divine presence in the miracles. The apparent "marvels" produced by Nature—"monsters" are an example—were slowly explained by natural laws, although they tended to survive longer among people of the lower cultural level, that is among the "people." In time those beliefs formed a kind of culture, a patrimony of "errori popolari." So much literature was deployed to explain the apparent fruits of magic work that it finally had the impact of creating two layers of culture, one prone to seek for a rational explanation, and another convinced that hidden powers were behind the marvel of this world. We can remember works such as *Il serraglio di tutti gli stupori del mondo* by Tomaso and Bartolomeo Garzoni (1613), which is a kind of encyclopedia of para-natural phenomena such as the one of the sweating statue. Although we have not found any explicit mention of "errori popolari," these works comb a high number of authors who indicate the "causes" of events and facts that seem generated by invisible and unusual forces. In most of them, the prevailing criteria for deeming "popular" a belief (we just saw it in Jean d'Espagne) was the fact that it ignored the causes of the phenomena and trusted the superficial or sensual knowledge. One can remember the Charles Sorel with his encyclopedic *La science des choses corporelles, première partie de la Science humaine, où l'on connoist la vérité de toutes les choses du monde par les forces de la raison, et l'on treuve la réfutation des erreurs de la philosophie vulgaire* (Paris, Billaine 1634) which is only the first of four parts, published all between 1634 and 1644.

France and Italy were not the only places where the "errori popolari" were brought to light and rejected. By the end of the sixteenth century in England Francis Bacon was already engaged in a majestic operation that he called *Instauratio Magna*, which established new principles (a *Novum Organum*) of acquiring knowledge and demonstrating its validity. Bacon was engaged in an epochal battle against all errors which, insofar as they departed from the principles of evidence and experimental proof, were "popular." These new principles are not "logical," which are often the root of mistakes and are the principles on which traditional and particularly Scholastic philosophy ascertained the truthfulness of natural phenomena and historic events. "Vulgar notions" often spring from logical reasoning which does not prove any truth but most frequently reinforce the wrong notions. See the following axiom:

> Logica, quae in usu est, ad errores (qui in notionibus vulgaribus fundantur) stabiliendos et figendos valet, potius quam ad inquisitionem veritatis; ut magis damnosa sit, quam utilis.
> [Common logic is better suited to correcting and establishing errors which are found in vulgar notions, rather than for searching after truth; so it turns to be more prejudicial than useful] (Bacon 1878, part I, sect. I, aphorism 12, 193).

Bacon promoted the idea of creating a "Kalendarium falsitatum et errorum popularium vel in historia naturalis vel in dogmatibus grassantium" (*De augmentis scientiarum*, III, 4, p. 212, ed. Amsterdam, 1662), thus leaving no doubt as to

the programmatic commitment of clarifying knowledge from popular mistakes. At the end of his work ("Novus orbis scientiarum desiderata") Bacon leaves a list of such mistakes that posterity must correct. Logic proceeds by deducing consequences from supposed causes while a new science must proceed "inductively" going from the phenomena to their causes. Only this way of reasoning is capable of doing away with the *idola* which constitute much of the popular knowledge.

The author who systematically applied Bacon's method to "popular mistakes" was the already mentioned Thomas Browne in his *Pseudodoxia epidemica*, first published in 1646 and then revised several times until its sixtieth and the last edition of 1672, which carries the subtitle *Enquiries into very many received tenents and commonly presumed truths*. It is a sort of encyclopedia of popular mistakes arranged in seven books under the following topics: 1. General; 2. Minerals and Vegetables; 3. Animals; 4. Man; 5. Pictures; 6. Geography and History; 7. Scriptural and Historical. We have no way to go over this immense survey of mistakes, but as an example, we may mention the belief that glass is poisonous (2, 5), that "bitter almonds are a preservative against ebriety" (3, 7), that "an elephant hath no joints" (3, 1) that "Jews stink" (4, 10) and the likes. Fundamental is the inquiry on what causes popular mistakes. Besides the natural imperfection of man and his dispositions, the "most immediate causes of popular errors, both in the wiser and common sort, [are] misapprehension, fallacy, and false deduction, credulity, supinity, adherence unto Antiquity, tradition, and authority" (1, 4) which are all causes examined in the first book. Popular mistakes are all notions acquired through the senses without any rational filtering and received without ever questioning their origins. They are ingrained in the tradition and overall they reveal a way or system of thinking and knowing, an episteme or a scientific paradigm or a mentality, a sort of cultural subconscious very difficult to grasp and to shake.

The battle took reiterated engagements and from different angles. Just to remain in England, authors like Meric Casaubon (*On Credulity and Incredulity in Things natural, civil and divine*,1668, and *A Treatise Concerning Enthusiasme*, 1655) vacillated between the classic beliefs and the new science conquests; or authors like Joseph Glanvill who defended skepticism and attacked Scholastic philosophy (*The Vanity of Dogmatizing, or Confidence in Opinions*, 1661) and yet believed in witchcraft (*Saducismus triumphatus*, 1668). In these and many other works, the notion came up constantly that there is a kind of mistake which is rather a belief based on a primitive or sensual knowledge or even on a never questioned tradition. These types of beliefs are widely spread at the low-class level but also among philosophers of certain schools. We have limited our research mostly to the medical where these types of mistakes are ingrained in the culture and are very difficult to correct. But we know that the same types of mistakes are common in the areas of superstitions and magic. Space does not permit us to move into other areas like meteorology and to see how many "imaginative" explanations were given for phenomena like earthquakes and winds and tides. But we must recall at least one case of a wrong belief universally held and simply corrected by an "experiment," a keyword in the scientific revolution.

Francesco Redi, intending to dispel the notion of "spontaneous generation," is aware that he must face the common opinion, that is learned persons and "il volgo:" "Gli antichi e i novelli scrittori e la commune opinione del volgo vogliono dire, ogni fragidume di cadavero corrotto, ed ogni sozzura di qualsisia altra cosa putrefatta, ingenera i vermini" (Redi 1810, 16). His experiments, as is well known, demonstrate that there is not such a thing, and the generation of insects depends on other animals rather than by the simple process of putrefaction. This notion was shared by all sorts of people before Redi proved it wrong, and whoever kept it alive thereafter committed a popular mistake. Another example can shed light on the nature of such mistakes. It concerns the phenomenon of magnetism known from antiquity. The only explanation given for this unusual phenomenon of attraction was a magic one, and only in the seventeenth century this explanation was substituted by physical law, although the magic cause persisted, as we are reminded by Vico who reminds us that in the popular mind magnetism is seen as a form of attraction better known as "love."[14] Vico points out that "imagination" is often behind the creation of popular mistakes, and this idea was later used by Leopardi, as we shall see.

We have limited our inquiry to the field of "natural sciences" but we could find parallel endeavors in the historical and religious fields. Historical research, using a new kind of critical philology, became engaged in correcting scores of wrong data and turned history into a rigorous discipline based on ascertained facts. The area of religion was in great turmoil not only for doctrinal questions but because the popular cult had filled the churches with so many fake saints that the Bullandists worked systematically to eradicate them from the Catholic calendar (for this house cleaning and for the historical researches, see Cherchi 2020).

The changes sought by the scientific revolution did not happen overnight nor were they homogeneous. They moved along the discoveries which in that century were so numerous as to determine a revolution. The new findings in anatomy promoted many strides in the medical field, so did the cosmological ones, so did the invention of the microscope, and many others in the fields of mechanics, of mining and transportation, and even warfare. They did not come all at one time, but the fact that most of them took place in about a century explains why historians call it the century of the scientific revolution. It must be added that not all innovations had the same cultural impact even when the magnitude of the discoveries would seem to be a decisive factor. We know that the cosmological discoveries remained confined to the academic sphere before reaching the "people," who were much more affected by the ideas on the effects on bloodletting or by the biological discussions on the generation of the monsters.

One change, however, took place across all disciplines: it was the loss of prestige of antiquity which supposedly harbored the origin of many "errori

[14] Vico 1952, Elementi, XXXII, 259: "Gli uomini ignoranti delle naturali cagioni che producono le cose, ove non le possono spiegare nemmeno per cose simili, essi danno alle cose la propria natura, come il volgo, per esempio, dice la calamita esser innamorata del ferro."

popolari." Remember that Thomas Browne saw in the "supinity" to ancient authors one of the main causes of the wrong notions that hampered the new science. Slowly that dependence on the ancients was shaken as many of their *tenents* were proven wrong. It took a long campaign of publications to promote a detachment from the teachings of the *antiqui*, a campaign that is collectively known as the *La querelle des anciens et des modernes.* The pick of this polemic was marked by Charles Perrault's *Parallèle des anciens et des modernes*, but it had forerunners in some French historians like Luis Le Roy,[15] followed by La Popelinière.[16] Their comparison between ancients and moderns was echoed by Alessandro Tassoni, in his *Pensieri diversi*, and by Secondo Lancellotti, in his *Hoggidì, overo il mondo non peggiore né più calamitoso del passato* (1623). In this long comparative process, many "errori popolari" were discovered and rejected along the way. The authority of the Ancients was slowly eroded, and not just because their teachings were antiquated but because they were utterly wrong. Some, like Fontenelle, attributed the modern superiority to the progress of time—human nature cannot change—but others explained it with a different, rational, and experimental approach to reality. Compiling lists of the mistakes made by the revered ancients and repeated by their humanistic admirers was a way of establishing a distance from a long tradition. Error after error and list after list created a divide between ancient and moderns. The notion of "error" had become a keyword also in historical research, and as the light was shed on many aspects of the past events, it became clear that many of them were fabricated by legends or "popular creations," close to the "fairy tales." Take for instance the story of Clodia, the Roman virgin captured by Epirote (Albanian) soldiers, who, according to Livy, remained virgin for all the decade of her captivity, and when she escaped with ten other girls, crossed the Tiber wearing full armor and then victoriously fought the enemies. Lancellotti reports this story to prove that ancient had no sense of truthfulness and perhaps made up from scratch the story of Clodia's, and in any case, they did not reject any manipulation that showed the fantastic heroism of the virgin girl. Lancellotti laughed at this "farfallone," as he calls this sort of strange mixture of facts and fantasy. But was it a deranged notion of the truth, similar to those myths that a school of thought accepted them as a fantastic way of veiling a truth? The evemeristic interpretations of the myth were as old as the ancient mythographers whose teaching had many followers among the Renaissance mythographers. Could it be possible to find a similar explanation for the "errori popolari?" It was too early to reach that interpretation: for the time being, it was imperative to remove anything that could not be explained with the meter of reason, evidence, experiment, and philology.

[15] *De la vicissitude et varieté des choses en l'univers*, whose last book has the title "*Comparaison de ce siècle avec les precedens plus illustres, pour sçavoir en quoi il leur est supérieur, inférieur, ou égale, et premièrement touchant la militie moderne avec l'ancienne, grecque et romaine*" (1575).

[16] In his *l'Histoire des histoires* and his *L'idée de l'histoire accomplie* (1599).

The eighteenth-century brought some changes. For one thing, science was moving away from literature, and the humanistic heritage was not in question anymore or was not with the same urgency. It had also moved away from the vulgar horizon which had a much lower speed of change. Certainly, it was not conceivable any more than a medical textbook would recommend a whispering of the words *Gasper fert mirrham, thus Melchior, Baltashar aurum*, in the ears of an epileptic in crisis to have him jump back on his feet: this recommendation found in the *Lylium medicinalis* (II, 25) by Bernard Gordonius, a leading figure in medieval medicine, was so obviously superstitious that no doctor of the post-Renaissance age would ever use it. Still, popular mistakes persisted, but listing and discrediting them did not seem as important as it was in the previous century. They did not appear to represent any more an impediment for the scientific research since this had neatly separated from the "discorsi popolari" as Galileo said.[17] Perhaps the fiercest hunter of popular mistakes was Benito Feijóo, a Spanish friar who analyzed and ridiculed hundreds of "errori popolari" in his *Teatro crítico universal*. He was active in the first half of the eighteenth century and was living in Spain which in those days was not at the vanguard of European scientific research. Much more interesting from that point of view was the work of Joseph-Maria Lequino, a French revolutionary and author of *Le préjugés détruits* which attacks la "credulité vulgaire"[18] identified as the religious beliefs and the notion of nobility which the previous detractors of "errori popolari" had never criticized. The "errori popolari" had taken a political meaning which was never intended by any of the previous observers of this particular kind of mistake.

One becomes aware that a real change had occurred when one sees the *Saggio sopra gli errori popolari degli antichi* by Giacomo Leopardi. It was written in 1815 when the author was just 18 years old, but it was published posthumously in 1846. It is a product of the "erudite period" of Leopardi's youth, and in many respects belongs to the tradition we have described. Leopardi quotes many of the authors we have analyzed—in the preface he quotes Joubert, Browne, Feijóo, Lequino, and Denesle—but he also was aware of having treated it differently.[19] Indeed he begins by with using their premises, namely that "Il mondo è pieno di errori, e prima cura dell'uomo deve essere quella di conoscere il vero." However, he differs from them in that he believes that there is no way of correcting man's tendency to fall into errors. Man tends to believe what he sees and what he hears, so the causes and possibilities and of perpetuating and transmitting mistakes are endless. Popular mistakes occur when rational thinking—that is

[17] Galilei 1874, where Salviati, one of the three interlocutors, speaks about "discorsi popolari" filled of mistakes and "vanità" (Giornata I, 60).

[18] Lequinio 1793, chapt. II, 10: "Qu'est-ce que la noblesse, par exemple, pour l'home qui pense? Sont tous ces êtres abstraits, enfans d'une imagination exaltée, qui n'ont d'existence que dans la crédulité vulgaire, et qui cessent d'avoir été sitôt que nous cessons d'y croire?"

[19] "Chi mi opponesse Joubert, Browne, Feijóo, Denesle, Lequinio, mostrerebbe di non aver vedute le loro opere, o di non aver letta la mia," Leopardi 1997, 60. All quotations are from this edition.

inquiring about the causes of phenomena—is not applied and the primitive or sensual imagination provides the explanation of the perceived reality. This approach is intrinsic in human nature, thus is not possible to change it. In concluding the first chapter "Idea dell'opera," he states:

> Una volta si venerava superstiziosamente tutto ciò che venia dagli antichi; ora si disprezza da molti senza distinzione tutto ciò che loro appartiene. Dei due pregiudizi l'uno non è minore dell'altro. Si vedrà in questo Saggio che gli antichi non andarono esenti dagli errori i più grossolani; ma agevolmente si comprenderà che il volgo dei moderni non cede loro quasi in verun conto. Non pochi anzi dei pregiudizi che regnavano un tempo sono anche al presente in tutto il loro vigore. Dopo queste riflessioni, il rispetto, non altrimenti che il disprezzo per l'antichità, viene a moderarsi, le età si ravvicinano nella mente del saggio, e si comprende che l'uomo fu sempre composto degli stessi elementi (Leopardi 1997, 66).
> [In the past it was normal to hold in veneration all that came from the ancients; now all that pertained to them is despised without making any distinction. Of the two prejudices one is not smaller than the other. In this essay one will see that the ancients were not free from the most gross mistakes; however one will also easily understand that ordinary persons of our days are not better in any way. Actually, many of the prejudices that reigned in the past are still alive in the present and at their full strength. After the present considerations, the respect as well as the disrespect for the ancients became more moderate, the ages have come closer one another in the mind of wise men, and one understands that man was always made by the same elements].

Interestingly, Leopardi documents these "errors" using poetical sources:

> Mio intendimento fu di presentare un quadro delle false idee popolari degli antichi, e di descrivere colla possibile esattezza qualcuno dei loro errori volgari intorno all'Ente Supremo, agli esseri subalterni e alle scienze naturali. Per eseguire questo disegno, giudicai di dovere attenermi alla scorta dei poeti. È facile distinguere quando questi scrivono a norma delle opinioni dei filosofi, o seguono un sentimento particolare. D'ordinario essi parlano il linguaggio più communemente inteso, che è quello del popolo (Leopardi 1997, 65).
> [My goal was to present a picture of the false and ordinary ideas held by the ancients, and to describe with the utmost precision some of their popular mistakes about the Supreme Being, the subordinate beings and the natural science. In order to pursue this plan, I thought to follow the path marked by the poets. It is easy to see when they write following the ideas of the philosopher or when they follow their own feelings. Usually they speak the most commonly understood language, that is the language of the folks.]

Leopardi analyzes 18 of such mistakes, starting, as he says, with the goods, going to their messages (oracles, dreams, sneezing, etc.) then passing to the cosmos (stars, comets, thunders, etc.), and finishing up with the animal world (pygmies, centaurs, links, etc.). As he promises, his sources are classical poets, and he does so with amazing control of such material, with a magistery that recalls

giants of erudition like Politian or J. J. Scaliger, and he was just 18 years old! This choice was not without consequences. A few years later, Leopardi considered poetry as an alternative to philosophy in conveying truths, a different kind of truth that soothes the soul: the illusion which is born from imagination and fantasy.

With this conversion, Leopardi was moving closer to the Romantic view of the imagination, the faculty that creates beautiful fables. In that atmosphere, the popular errors lost much of the stigma placed on them by centuries of rationalism and scientific experimentalism. Even the notion of *vulgus* was undergoing an important change and was becoming the *Volk* or *Folk*. The pre-romantic culture in Germany and England was re-evaluating the body of persons who represented the "nation," a sacred notion defined by its values, its ways of thinking, with its beliefs that could not be judged anymore with the meter of "correctness" or rationality. It was a major change that removed from the dictionary of ideas the entry "popular mistakes" and moved them all into the area of "folklore." It was a new classification, a completely new way of viewing cultural phenomena, and where the old "errori popolari" clearly become one of the many categories belonging to a mentality. The simple fact that Leopardi chose to deal with "gli errori popolari degli antichi" rather than "gli errori popolari" *tout court*, places them, perhaps unconsciously, in that remote age where truths often took the form of myths.

Our brief survey of an important aspect of our culture, which can be seen as a contrast between ignorance and learning, requires a much more detailed study than was possible to do in this limited space. But for the time being, it would please this author if it stimulates further research. Sometimes words and formulas that seem to be plain and uninteresting turn out to contain complex histories that shed light on the changes that keep our cultures moving along in the long duration of their cycles.

References

Aldana, Cosimo. 1578. *Discorso contro il volgo in cui con buone ragioni si riprovano molte sue false opinioni*. Firenze: Marescotti.

Aldana, Cosimo. 1591. *Invectiva contra el vulgo*. Madrid: Luis Sanchez.

Aldana, Cosimo. 1886. "Invectiva contra el vulgo." In *Biblioteca de Autores Españoles*, vol. XXXVI, 495-514. Madrid: Ribadeneyra.

Bacon, Francis. 1878. *Novum Organum scientiarum*, ed. by Thomas Fowler. Oxford: Clarendon.

Benigno, Francesco. 2013. "Cultura popolare." In *Parole nel tempo. Il lessico per pensare la storia*, 79–114. Rome: Viella.

Bianchi, Massimo Luigi. 1987. *Signatura rerum. Segni, magia e conoscenza da Paracelso a Leibniz*. Rome: Edizioni dell'Ateneo.

Bianchi, Massimo Luigi. 1995. *Introduzione a Paracelso*. Bari: Laterza.

Cherchi, Paolo. 2020. *Ignoranza ed erudizione. L'Italia dei dogmi di fronte all'Europa scettica e critica (1500-1750)*. Padua: Libreriauniversitaria.it.

Coste, Joël. 2002. *La littérature des "erreurs populaires:" une ethnographie médicale à l'époque modern*. Paris: Champion.

Debus, Allen George. 1991. *The French Paracelsians, The Chemical Challenge to Medical and Scientific Tradition in Early Modern France*. Cambridge: Cambridge University Press.

Du Breil, André. 1580. *La police de l'art et science de medicine, contenant la refutation des erreurs, et insignes abuse qui s'y commettent pour le jourdhuy: tres utile et necessaire a toute personnes, qui ont leur santé et vie en recommendation. Ou sont viuement confutez tous sectaires, sorciers, enchanteur, magician, deuins, pythoniciens, souffleurs, empuisonneurs, et tout racaille de thericacleurs, et cabalistes: lesquel en tous lieux et pays, sans aucun art ne science, approbation ou authorité, font et exercent impudemment, et maleheuresement la medicine, au grand interest de la santé et vie des hommes, et detriment des Republiques*. Paris: Cavallat.

d'Espagne, Jean. 1649. *Les erreurs populaires dans les poincts generaux: qui concernent l'intelligence de la religion; rapportez à leurs causes, & compris en diverses observations*. Le Haye: Maistre.

Eamon, William. 1996. *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture*. Princeton: Princeton University Press.

Gadebusch Bondio, Mariacarla. 2003. "Paracelsismus, Astrologie und ärtztliches Ethos in den Streitschriften von Tommaso Bovio (1521-1609)." *Medizin Historisches Journal* 38: 215–44.

Galilei, Galileo. 1874. *Dialogo dei massimi sistemi*. Livorno: Vigo.

Gentilcore, David. 2006. *Medical Charlatanism in Early Modern Italy*. Oxford: Oxford University Press.

Grmek, Mirko D. (ed.). 1997. *Histoire de la pensée médicale en Occident (History of Medical Thought in the West)*. 3 vols., 1995-1999. Vol. 2., *De la Renaissance aux Lumières*. Paris: Seuil.

Ingegno, Alfonso. 1983. "Il Medico de' disperati e abbandonati: Tomaso Zefiriele Bovio (1521–1609) tra Paracelso e l'alchimia del Seicento." In *Cultura popolare e cultura dotta nel Seicento*, ed. by Lucilla Borselli, Giancarlo Carabelli, Chiaretta Poli, Paolo Rossi, 164–74. Milan: Franco Angeli.

Joubert, Laurent. 1578. *Erreurs populaires au fait de la medicine et regime de santé*. Bordeaux: Millanges.

Kahn, Didier. 1998. "La faculté de medicine de Paris en échec face au paracelsisme: enjeux et dénuement reel du procès de Roche Le Bailiff." In *Paracelsus und seine internationale Rezeption in der Frühen Neuzeit,- Beiträge zur Geschichte des Paracelsismus*, herausgegeben von Heinz Schott und Ilana Zinger, 146–221. Leiden-Boston-Köln: Brill.

Leopardi, Giacomo. 1997. *Sopra gli errori popolari degli antichi*, ed. by Giovanni Battista Bronzini. Venosa: Edizioni Osanna.

Lequinio, Joseph-Maria. 1793. *Le préjugés détruits*, séconde edition. Paris: s.e.

Meier, Pirmin. 2000. *Paracelso, medico e profeta*. Roma: Salerno.

Mercurii, Scipione. 1645. *Degli errori popolari d'Italia*. Verona: Rossi.

Miotto, Antonio. 1971. *Paracelso, medico e mago*. Milano: Ferro.

Nockels Fabbri, Christiane. 2007. "Treating Medieval Plague: The Wonderful Virtues of Theriac." *Early Science and Medicine* 12: 247–83.

Nutton, Vivian. 1997. "The Rise of Medical Humanism: Ferrara, 1464-1555." *Renaissance Studies* 11: 2–19.

Pagel, Walter. 1989. *Paracelso. Un'introduzione alla medicina filosofica nell'età del Rinascimento*. Milano: Mondadori.

Redi, Francesco. 1810. "Esperienze intorno alla generazione degl'insetti." In *Opere*, vol. III. Milan: Società de' Classici Italiani.

Riva, Ernesto. 2018. *Astrologia e magia nella medicina dei secoli XV e XVI*. Rome: Aracne.
Salinas Araya, Augusto. 2016. "Tradición e innovación en la medicina española del renacimiento." *Ars médica. Revista de ciencias médicas* 30: 14–53.
Stahl, Eva. 1995. *Paracelso, medico, filosofo, mago*. Genova: ecig.
Vannoni, Maria Pia. 2011. "Il 'medico della spada:' Tomaso Zefiriele Bovio." *Bruniana & Campanelliana* 17: 81–96.
Vico, Giambattista. 1952. *Scienza nuova*, ed. Nicola Abbagnano. Turin: Utet.
Webster, Charles. 1984. *Magia e scienza da Paracelso a Newton*. Bologna: Il Mulino.

Lost in the Woods: Francis Bacon's Errant Pathways in Knowledge

Vera Keller

Abstract: Recovering Bacon's valorization of error illuminates the history of research. A scientific method directing reliable and useful inquiry is often attributed to Bacon. Yet household experimentation in his period was already efficient and useful. Bacon extended investigation in ways that deferred immediate use and consumed resources by encouraging investigators to wander in the pathways of error. Bacon develops this view of error in his reading of the myth of Proteus in which the investigator provokes matter (Proteus) into a state of error. Bacon's reading of the myth of Proteus did gender experimentation, as Carolyn Merchant has argued, but not in the ways that Merchant claimed. By valorizing error, Bacon distinguished his approach to experimentation from heterosocial practices.

Keywords: research, Francis Bacon, gender, labyrinth, Proteus.

1. Research as Error

1.1 Vital Matter, Gender, and Experimental Labor

This essay explores erring as a valorized epistemic tool in the early modern effort for humans to come to grips with inconstancy. In so doing, it engages long-standing debates concerning the degree to which science attempts to dominate the world, and relatedly, the degree to which scientific rhetoric seeks to fix knowledge into normative taxonomies and methods. These debates, particularly in the discussion of Francis Bacon's treatment of errant nature in his interpretation of the myth of Proteus, have involved feminist arguments concerning Bacon's view of experiment as a masculine torture or constraint of a passive, feminized Nature. In this essay, I suggest that such views of science's attempt to dominate through fixity and constraint are based in misconceptions of the significance of the mechanical arts in the Scientific Revolution. With "new science" and "mechanical philosophy" treated as synonyms in these older debates, experimental science is seen from a perspective that naturalizes mechanical objectivity and mathematical certainty as presumed objectives in science. However, the recent history of alchemy, vitalism, and perfective views of nature decenters the presumed dominance of mechanical philosophy in the history of experimentalism. Thus, other values can come to the fore, such as adaptive emergence, immersion, and transformation both of experimenter and of the experimental object. These, rather, that fixity, clarity, and certainty, are the

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experimental values at play in Bacon's interpretation of Proteus, and in Bacon's somewhat idiosyncratic interpretation of the myth, they are related to error as a valorized epistemic stance. Bacon, I argue here, distinguished error as a significant stage in the human intervention into nature via experiment.

Erring, or continual departure from a predetermined pathway, was deployed both in the quick-changing, adaptive manipulation of metamorphic nature through experiment as well as in the development of purposefully tentative, open-ended, and haphazard forms of inscription of the period, such as the experimental essay and the wish list (Keller 2014, 2020a). As Pamela Smith has discussed, a "cycle of trial, failure, replication, and a responsive, adaptive approach to unexpected outcomes," is a central experimental epistemology of the period (Smith 2020). Feminist science scholars have championed error as an epistemic stance premised upon deviancy rather than upon an adherence to norms (Thylstrup 2020, 194). However, in highlighting error in the work of Francis Bacon, I do not mean to act as an apologist for his gender politics. In fact, I ultimately agree with scholars such as Carolyn Merchant (Merchant 1980) that Bacon intended to gender experimental practice, by (in his view) elevating experiment from a domestic, heterosocial practice to an act of power and to an endeavor of public significance on a par with the imperial conquest of territory. He gendered experiment, however, not by casting it as the mechanical domination of passive Nature. Rather, immersive, transformative error that provoked Nature into ever more lively metamorphoses could serve a gendering role.

Aiming for error was itself a way to distinguish between the common household manipulation of nature and the more sophisticated, risk-taking, and resource-intensive forms of experimentation that Bacon intended primarily for epistemic ends rather than for use. Instead of the shortcuts, clear directions, and claims to efficacy that one might find, for example, in the genre of the domestic recipe (Leong 2018), Bacon developed a labyrinthine approach that indulged lengthy, circuitous and oblique routes, multiple iterations, and an intensive consumption of intellectual, material, and temporal resources, that, in the end, only ever arrived at knowledge of a probabilistic sort (Cf. Werrett 2019). Labyrinths were luxuries. In his bid for greater support for experimental knowledge Bacon made the case that funds were a necessity for those who "not only wandered [*pererrant*] in those of nature, but also opened a path in the labyrinths of art" (Bacon 1623, 71).

Thus, distinct from the pressing needs of useful, household experimentation, Bacon identified a zone of experimental investigation into nature that was intensive in resources, time, and effort, which did not aim to exit the process of experimentation as efficiently as possible in order to yield useful results. Rather, it separated experimental labor from its product, involuting effort in cycles of investigation which resulted not in an exit to use, but in further investigation, in a manner comparable to the medieval folk etymology of the labyrinth as "*labor intus*" or inner labor (Doob 1990, 97). The chymical *laboratorium* of the period always aimed to produce simultaneously both knowledge and power. The labyrinth, by contrast, had no [immediate] use.

Bacon, I argue, distinguished stages of experimental investigation. He thus demarcated some experimental labor specifically to wandering around in the pursuit of errant nature. Error serves Bacon as a means of freeing investigation from imperatives to produce useful, timely, and certain results. In a manner that adumbrates basic science research today (in contrast to technology), Bacon identifies a realm of intensive, slow, difficult, iterative, cyclical, uncertain, unending, and fundamentally not immediately useful experimental labor. This is the path of erring in knowledge.

1.2 Wandering as a Strategic Deferral of Truth

As embodied by the classical labyrinth, error in the European tradition was never entirely a negative phenomenon. Knights in romances such as Spenser's *Faerie Queene* had to find their way out of the Labyrinth of Error, but what enabled them to do so in the first place was their status as a knight *errant*, that is, one that broke free from a predictable place or path in life in order to quest further afield. Thus, error is not simply a lie or the antonym of truth.[1] Rather, as a personally transformative wandering through complexity, error "has never been wholly determined by an epistemological structure of truth but has always enjoyed a certain conceptual independence" (Thylstrup 2020, 194).

David William Bates has seen this orientation towards error as particularly characteristic of the eighteenth-century Enlightenment's founding of a "probabilistic process of discovery" and of "novel epistemologies" in contrast to the seventeenth-century Scientific Revolution (Bates 2002, vii). Bates argued that the eighteenth century saw a "frank admission that error is an important aspect of human understanding," an admission that allowed for an infinite deferral of truth, thus continually expanding the horizon of knowledge and forming an ideology of unending progress based on the continual error and future discovery (Bates 2002, ix). However, work on probabilism and the nature of facts in the seventeenth century shed light on the valorization of error in this earlier era (Shapiro 1983, 1994).

As I have argued elsewhere, the probabilistic deferral of ever arriving at a final destination for knowledge typifies the approach of Francis Bacon. Here, I reinterpret that probabilistic approach as one that valorizes error, in contrast to many views of Bacon. Julianne Werlin describes the late nineteenth-century disappointment with Bacon when readers began to understand that he had constructed "an ingenious maze of words that was not, in the end, so different from the intellectual systems he denounced" (Werlin 2015, 236). According to such critics, things were straightforward in the world and they become twisted

[1] Cf. Steadman 1961, who interprets Spenser's personification of truth, Una, and the labyrinth as "logical contraries" because truth is unitary and the labyrinth is multiplex. Unitary falsehood would be the logical contrary of unitary truth. The multiplex labyrinth operates in a different epistemic landscape altogether.

through sophistic intricacies. Werlin has recuperated Bacon's labyrinthine rhetoric and defended "the potential for failure, for error and misunderstanding" as occupying "an important place in Bacon's thought." Like Werlin, but from a rather different lens, I see error as a strategy that Bacon deploys in order to effect a multi-perspectival, adaptive approach to an inconstant world. Bacon discusses erring as a desirable state to provoke in nature and to enter into as an inquirer. Such errant pathways to knowledge differ markedly from the notion of method (or "path through") so often erroneously highlighted in the work of Bacon.

Bacon often stressed the need to lengthen and complicate investigation. In *Valerius Terminus* (circa 1603), he contended that, in contrast to anticipations of the mind, senses were more reliable "not because they err not, but because the use of sense in discovering of knowledge is for the most part not immediate" (Bacon 1857, "Valerius Terminus" in *The Works of Frances Bacon*, vol. 3, 244). In the *Novum organum,* he described how a very powerful form of experiment was that of the "alternation and ups and downs" of six other modes of operations in natural bodies. Such a "series or chain of alternations of this kind [. . .] is a thing very hard to grasp but very powerful for producing works. However, men are prey to and held fast by their colossal impatience both in the investigation and practice of things of this kind, even though this is like the thread of the labyrinth as far as major works are concerned" (Bacon 2004, "Novum Organum," 441). In other words, impatience held men back from applying the extremely time-intensive chain of experiments with which they might bind nature, even though this chain could thread them through the labyrinth. This attitude explains one posthumous anecdote associated with Bacon: "The lord St. Alban, who was not over-hasty to raise theories, but proceeded slowly by experiments, was wont to say to some philosophers, who would not go his pace, 'Gentlemen, nature is a labyrinth, in which the very haste you move with, will make you lose your way'" (Bacon 1859, "Apophthegms from Baconiana" in *The Works of Francis Bacon* vol. VII, 177). Bacon worked to delay investigators and to make them circle about the object of inquiry in multiple ways.

1.3 Clues and Labyrinths

In *Science and the Secrets of Nature*, William Eamon argued that Francis Bacon and his followers developed an epistemology of the "hunter, who follows clues to an unseen quarry" (Eamon 1994, 9). Eamon's argument was inspired by two articles about clues published by Carlo Ginzburg (Ginzburg 1979, 1980). Although Ginzburg noted that hunting for clues was an ancient practice, he also suggested that following clues offers the roots of a modern "scientific paradigm." Eamon argued that what typified Bacon's epistemology—and that adopted by his followers in the Royal Society—were such clues or guiding threads leading out of the thickets of error. However, seeing the following of clues as a novel early modern intervention in scientific method undercuts the longstanding history of the clue. It also pays insufficient attention to new ways that labyrinthine error appealed as a way of knowing.

Since the ninth century, a "clue" or "clew" meant a ball of thread; since the fourteenth, this "clue" was often used to denote a thread that might lead one out of a labyrinth of error, based on such popular accounts of the Cretan myth as Bersuire's *Ovidius moralizatus* in which Daedalus advises the use of string to unfold (*explicare*) or unravel (*extricare*) the deceptive passages or *ambages* of the labyrinth. The unbroken, unravelling clue led the inquirer step by step from ignorance and doubt into certain knowledge (Keller 2020b). For centuries, the labyrinth co-existed alongside the clue as an epistemological structure that escaped the binary fixities of truth and falsehood (Thylstrup 2020, 194). Different approaches to knowledge could valorize the clue as an efficient means out of error or could valorize the labyrinth itself as a remarkable, multiplex work of art. The position one took related to one's perspective upon the labyrinth, which was "convertible and relative," changing its nature dynamically with changes in perspective (Doob 1990, 1). As Penelope Doob has written, for "maze-treaders" "vision ahead and behind is severely constricted and fragmented." On the other hand, "maze-viewers, who see the pattern whole, from above or in a diagram are dazzled by its complex artistry" (Doob 1990, 1). The ability of a labyrinth to lead one into error could thus be a praiseworthy quality to be much admired. George Sandys described the "Labyrinth" at Alexandria (which he claimed was the model for Daedalus' at Crete) as "full of winding paths as darke as hell, and rooms within one another, having many doors, to confound the memory, and distract the intention; leading into inexplicable errour [. . .] not possible to thred, or ever to get out without a conducter" (Sandys 1615, 113).

Bacon deploys the trope of the labyrinth many times throughout his writings. Occasionally he does so in ways that seem to promise the offering of a clue. In particular, the clue appears to be a method of investigation that leads through the woods of particular experience towards more universal and certain axioms. In the *Novum Organum*, he criticizes those who entirely erred (*"aberrauerint"*), "either by leaving and deserting experience entirely, or by getting caught up in it and running up and down as in a labyrinth; whereas a properly established order leads by a direct road through the woods of experience to the open ground of axioms" (Bacon 2004, "Novum Organum," 130–1). The title of his early and abandoned unpublished manuscript, *Filum Labyrinthi sive Formula Inquisitionis*, promises a precise textual technology to lead inquiry out of the labyrinth of error through a process of decrypting nature. Like a few of Bacon's other works, this fragment is addressed "ad filios," that is, to the true sons of learning, or a population of adepts (Jalobeanu 2008, 205). However, upon closer examination, Bacon's promise of transmitting a clue to his select audience proves to be a red herring, as this text, like so many others, was left in a fragmentary form. Rather than clues, what Bacon actually offers are errant forms of knowledge.

1.4 Fragments as Errant Forms of Knowledge

Bacon did not offer clues as constricted shortcuts to knowledge that offered efficient, certain pathways out of a labyrinth of error and into truth. Instead, he

loosened knowledge in provisional, incipient, and fragmentary forms. These allowed knowledge greater latitude, in terms of its temporal framework, in terms of means of participating and of numbers of participants, and in terms of risk-taking, speculation and an expanded conceptualization of possibility. He did this not least in the *Valerius Terminus* itself. He ingeniously composed the *Valerius Terminus of the Interpretation of Nature: with the Annotations of Hermes Stella*, as the work of a pseudonymous author (Serjeantson 2017). This endowed his text with an air of great wisdom and authority, as the work of an ancient sage guiding the ignorant into the greatest mysteries. This was precisely the knowledge dynamic upon which the concept of a clue was based; an authoritative adept transmitted a secure path of knowledge to an initiate. Bacon's choice of pseudonym, *Valerius Terminus*, connoted definition, fixity, and certainty, as a reference to the ancient god of the boundary, *Terminus*. Yet, this text that promised such defined access to knowledge did not pass on an unbroken clue to its readers, as it was merely fragmentary. These fragments played upon the period desire and curiosity to see ancient lacunae of knowledge filled in. In this case, these lacunae were not actually lost pieces of knowledge, but were entirely constructed by Bacon. In short, he cut the ancient clue into fragments in order to destroy the bounds of ancient, defined, discipline and authority and to open empty spaces for knowledge to come.

Bacon deployed the aesthetics of ancient fragmentary manuscripts in order to create lacunae in his account of knowledge. In so doing, he was clearing space for future work that remained unwritten because it was not yet known. Already in this early writing, he anticipated that he would not live to see the completion of the great future work he was envisioning.

> For the time present, in case I should be prevented by death to propound and reveal this new light as I purpose, yet I may at least give some awaking note, both of the wants in man's present condition, and the nature of the supplies to be wished; though for mine own part neither do I much build upon my present anticipations, neither do I think ourselves yet learned or wise enough to wish reasonably: for as it asks some sense, to make a wish not absurd (Bacon "Valerius Terminus," 233).

Bacon gave the text the form of an initiatory guide proffered by an ancient sage, whose guiding thread to certain knowledge had been broken by time. In reality, he never possessed such a clue. Rather than clues to knowledge, he could only offer hand-waving or uncertain hints at future knowledge (what he calls an "awaking note"); at this early stage, he did not even feel himself "learned or wise enough to wish reasonably."

2. Bacon on Proteus and the Torture of Nature

2.1 Liberty, Error, and Bonds

As Bacon had no direct path to offer to truth, he sought to fill in the gaps with various stopgaps. He sought to delay and extend inquiry over time. Multiplying approaches to knowledge and delaying the moment when the labyrinth was ex-

ited might allow a greater degree of knowledge to be accessed than was possible when specious forms of truth were rapidly sought. Bacon thus broadened the straightforward line of inquiry or clue into a multiplex approach that struggled with a continually transforming nature, as he discussed in his interpretation of the myth of Proteus in his *Wisdom of the Ancients*. His interpretation of the myth treated human intervention into matter as a lengthy process with multiple stages.

In Bacon's re-telling of the myth, every day Proteus would "count his flock of seals and then go to sleep. And if anyone wanted his help in any matter, the only way was first to secure his hands with handcuffs, and then to bind him with chains. Whereupon he on his part, in order to get free, would turn himself into all manner of strange shapes—fire, water, wild beasts, etc., till at last he returned again to his original shape" (Bacon 1858, "Translation of the de Sapientia Veterum," vol. 6, 725). Proteus was matter, according to Bacon, and Proteus with his flocks can be interpreted as "the universe with its several species according to their ordinary frame and structure," that is, "the face of matter unconstrained and at liberty, with its flock of materiate creatures." A skillful "Servant of Nature" could "bring force to bear on matter" and "vex it and drive it to extremities" until it transforms "itself into strange shapes, passing from one change to another till it has gone through the whole cycle and finished the period; when, if the force be continued, it returns at last to itself" (Bacon 1858, 726).

The question is how much, in his interpretation of this myth, Bacon valorized the act of struggle in experiment. Did Bacon seek to quell struggle as soon as possible, aiming to silence and dominate matter? Or, did Bacon see mutual struggle with Proteus itself as the process through which knowledge could be gained? This question has become embroiled in a debate between Peter Pesic and Carolyn Merchant (and other feminist science scholars) concerning the extent to which experimental science should be identified as a violent and misogynist form of domination of Nature. For Merchant, wrestling with Proteus aims to dominate Nature (gendered female) and render her passive, an interpretation that rests upon a view of Bacon as a proponent of mechanical philosophy. Pesic disagrees with Merchant, as well as with Evelyn Fox Keller and Sandra Harding on this question. He argues that feminist science scholars paint too stark of a divide between an active male experimenter and the passive, female object of experiment, that Nature is also powerful, and that the struggle between Man and Nature also transforms Man.

My interpretation of the myth finds that both Pesic and Merchant are correct in some respects and incorrect in others; neither, I argue, attend sufficiently carefully to the role of error in Bacon's formulation of Proteus nor to the various stages that appear in this myth (Pesic 1999, 2000, 2001, 2008, 2010; Merchant 1980; Fox Keller 1985; Harding 1986). My interpretation differentiates between stages and ends of experimentation in ways that Pesic and Merchant do not. The stage that is most greatly valorized for experimentation, I argue, is that of error.

In *Wisdom of the Ancients*, Bacon did not refer explicitly to error. However, his account of Proteus there and elsewhere maps onto many other discussions in which he regularly differentiated between nature in three states: free, in er-

ror, and in bonds. Across many works, Bacon likewise distinguished the history of nature of three kinds, that is: nature in her ordinary course, nature erring, and nature wrought.[2] The first, which involved no manual intervention or experiment, he argued, commonly served as the basis upon which axioms were falsely developed. Counterintuitively, nature in error served greater epistemic ends; such error could either occur naturally, through matter running into the "violence of impediments" on its own, or through the human vexing of nature; "For like as a Mans disposition is neuer well knowen, till hee be crossed, nor *Proteus* ever changed shapes, till hee was straightened and held fast: so the passages and variations of Nature cannot appeare so fully in the libertie of Nature, as in the trialls and vexations of Art."[3] Attempting to hold nature fast with "handcuffs" as though she were Proteus did not, however, lead to the fixation of knowledge, but rather to continual metamorphosis as nature struggled to escape this hold. The series of transformations that ensued revealed otherwise hidden "passages and variations." It was a means to artificially induce the sorts of changes through which marvels appeared. Thus, while pretergenerations are metamorphoses of nature that occur naturally, experimental history records metamorphoses that are only revealed with the aid of the arts (Bacon 2004, "Parasceve," 463).

Merchant applied the three states of nature (at liberty, in error, and in bonds) to Bacon's Proteus myth of the *Wisdom of the Ancients*. However, in my view, she conflates vexing nature with binding nature, whereas these are two separate stages.

[2] Bacon 1605, Book II, 8. Bacon 1996, "Descriptio globi intellectualis," 100–1. "But I shall set up the partitions of natural history on the basis of the force and condition of nature itself, which we find existing in a triple condition and subject, as it were, to three kinds of government. For nature is either *free* and left to go its own way and unfold itself in its usual course, that is, nature advances by itself without being interfered with or worked on in an way [. . .] *or again* it is quite forced and ripped from its state by the crookedness and arrogance of defiant and rebellious matter, and by the violence of impediments, as in the monsters and heteroclites of nature; *or finally* it is restrained, moulded, complete transformed and as it were made new by art and human agency, as in artificial things. For in artificial things nature seems as it were made up, and we see bodies in an entirely new guise and a kind of alternative universe of things. Therefore natural history deals with either the *liberty* of nature, or its *errors* or *bonds* [. . .] I intend and mean only that nature, like *Proteus*, is forced by art to do what would not have been done without it: and it does not matter whether you call this forcing and enchaining, or assisting and perfecting." Bacon 1623,79. "Aut enim libera est Natura, & cursu consueto se explicans [. . .] Aut à prauitatibus, & insolentiis Materiae contumacis, & ab Impedimentorum violentiâ, de statu suo detruditur [. . .] Aut Denique ab Arte, & Operâ humanâ constringitur, & fingitur, & tanquam nouatur, ut in Artificialibus." Bacon 2004, "Parasceve," 455.

[3] Bacon 1605, Book II, 10. See also Bacon 1623, 84. "sed porrò ad caussas rerum indagandas, & Artium Axiomata deducenda, lucidiorem Facem accendet, quàm hactenùs vnquàm assulsit. Quemadmodùm Ingenium alicuius, haud benè nôris, aut proabâris, nisi eum irritaveris; neque Proteus se, in varias rerum facies, vertere solitus est, nis Manicis arctè comprehensus; similiter etiàm Natura Arte irritate, & vexata, se clariùs prodit, quam cùm sibi Libera permittitur."

> Bacon's three states of nature were implicitly reflected in the 1609 Proteus myth […]. Here Proteus (matter) 'unconstrained and at liberty' or 'the universe with its several species according to their ordinary frame and structure' (i.e. nature at liberty); matter which 'turn[s] and transform[s] itself into strange shapes' is nature in error; while the 'force [brought to bear on matter] by vex[ing]' it is nature in bonds (Merchant 2013, 557, footnote 14).

Elsewhere, Merchant allocates Bacon's Pan, Proteus and Prometheus myths separately "to frame his idea of the three states of nature (free, erring, and in bonds)" (Merchant 2008, 760).

Bacon's interpretation of the Proteus myth does in fact implicitly cover three states. However, what Merchant does not acknowledge is that vexing nature is a process that starts at the beginning of Bacon's treatment of nature in error, and as a means to bring nature into the state of error. The three states that appear in the myth according to my interpretation are nature at liberty, vexed (that is in error; a state that can be brought about either naturally through the violence and impediments of matter or through human experiment), and in bonds (that is, held fast through continued force in a single, artificial state). Bacon differentiates the stages of vexing nature and binding nature when he says that those who approached Proteus would "first" "secure his hands with handcuffs" and "then" "bind him with chains" (cited above). The handcuffs meant pushing matter to extremities in order to provoke motion; binding meant quelling matter's motions through artificial force.

The reason why Merchant conflates vexing with binding is that Merchant's interpretation of Bacon rested on the assumption that Bacon viewed Nature mechanically and that the goal of experiment was to dissect a dead, passive, experimental object. As a result, her interpretation of Bacon's myth of Proteus does not engage the valorization of error as a way of visualizing vital processes of metamorphosis. The goal of vexing nature was to reveal the "passages and variations" that occur already invisibly within the labyrinths of nature. Experiment is thus, as it were, a process of adaptive labyrinth construction in real time. As matter attempts to move one way or another, the experimenter throws up another barrier, thus sticking fast to matter in its twists and turns. As those intricate adaptations to the experimental setup are made responsively to observed processes in nature, the complex structures that they trace and reveal build an observable labyrinth.

It is difficult to understand why matter that had gone through a series of transformations should of necessity return to its beginning, natural state when force is maintained (as cited above, "when if the force be continued, it returns at last to itself"). In fact, I argue, Bacon does not say this. Rather, his original Latin states that it only appears to return to its original state ("*quasi* se restituat, si vis continuetur" [emphasis added]) (Bacon 1609, 52). Based on other discussions of Proteus throughout Bacon's corpus, I interpret the final, fixed identity of matter that obtains when force is maintained past the period of metamorphosis not as a return to an original natural identity, but as an imposition of an artificial state. Humans could bind nature by artificially imposing a desired static form upon

nature. This was the third state to which Bacon referred in his myth. Nature became still again, as she had been when at liberty. However, she was maintained in this stable state through the forceful imposition of human power. This third state could offer humans much power, but little knowledge. The apparent stability, passivity, and fixity of Nature in this stage was deceptive, as it required human power to maintain. Such an imposition of an artificial state would obscure, rather than reveal, the inner passages and variations of nature. It would create "a kind of alternative universe of things" (Bacon 1996, "Descriptio globi intellectualis," 100–1). Through "violent motions," bodies "do not obtain any new stable and steady consistency from them, but a transient one which is always struggling to restore itself and break free" (Bacon 2004, "Novum Organum," 423).

2.2 Chymical and Mechanical Arts in Bacon's Interpretation of Proteus

Here, Bacon steps back from one of the arguments frequently made in the chymical tradition about the epistemic value of experimentation. Opponents of chymistry argued that art, as a forceful human intervention in nature, could not lead to knowledge about nature, but rather, knowledge of art. Chymists countered that their art was not contrary to nature. They distinguished *chymia* from the mechanical arts. The latter did not engage the qualities of matter and instead sought to quantitatively force nature against its will; *chymia*, by contrast, perfected nature, assisting it in fulfilling its will, and merely revealed its true, hidden qualities (Moran 2005, 2007). It thus did not produce objects that were artificial, but rather were the acme of perfected nature.

In his discussion of Proteus, Bacon engages this debate in a complicated way. Proteus, as a chief personification of metamorphosis, often recurred in chymical literature. However, Bacon drew on the violent struggle of the myth in order to take issue with the chymical interpretation of human art as assisting and perfecting Nature.

> But if anyone gets annoyed because I call the arts the bonds of nature when they ought rather to be considered its liberators and champions in that in some cases they allow nature to achieve its ends by reducing obstacles to order, then I reply that I do not much care for such fancy ideas and pretty words; I intend and mean only that nature, like Proteus, is forced by art to do what would not have been done without it: and it does not matter whether you call this forcing and enchaining, or assisting and perfecting (Bacon 1996, "Descriptio globi intellectualis," 100–1).

In fact, according to period debates over experimentation, it did matter very much whether art was assisting and perfecting nature, or going against it. By thus denying a period distinction between forcing and perfecting nature, however, Bacon does not deny the epistemic efficacy of experiment, nor does he attempt to replace chymical means of intervening in nature with mechanical ones. Rather, he pointed out that the chymical tradition also made interventions that would not have occurred outside of a laboratory setting. However, vexing nature in the

laboratory served the purposes of rendering visible those metamorphoses that also occurred when nature erred through the production of monsters. These purposeful instigations of change could be distinguished from the imposition of an artificial state that obtained when nature was forcefully held fast; the former pertained more to what were generally called the chymical arts and was more epistemic, and the latter pertained more to what were generally called the mechanical arts and was more operative.

Thus, whereas the chymical tradition continually intertwined the search for knowledge and for use, Bacon disaggregated different stages and ends of human intervention into Nature. He cleared a space for what we would call research or basic science, that is, an area in which humans, through laboratory means, can follow nature in its erring paths, without attempting immediately to apply that investigation to use. Even that epistemically oriented stage of vexing nature could make use of practices that were traditionally deployed for the purpose of use in arts. However, in redeploying those arts, Bacon's goal at that stage was primarily epistemic. As he specified, his main aim was not to bring "the several arts to greater perfection" but to make "all mechanical experiments" "as streams flowing from all sides into the sea of philosophy" (Bacon 2004, "Parasceve," 465). Bacon does not here differentiate the "chymical" and the "mechanical" arts; "mechanical" here comprises both arts that seek to qualitatively transform matter and those that seek to move matter quantitatively through weight and measure. However, he did distinguish between two sorts of arts, one more epistemic and one more operative; these two sorts map onto traditional divisions between the chymical and the mechanical arts. As arts that could most serve as the "bonds and handcuffs of Proteus" he identified those that transformed the substance or quality of materials by engaging natural processes of change, such as "agriculture, cookery, chemistry, dyeing: the manufacture of glass, enamel, sugar, gunpowder, pyrotechnics, paper and the like." In their transformation and perfection of specific materials, these would have been classified by many at the time as chymical processes. Of less epistemic use for the struggles of Proteus, argued Bacon, were the arts that applied force to bodies via what were considered at the time mechanical means; these included "weaving, woodworking, building, the work of millwrights, clockmakers, and so on" (Bacon 2004, "Parasceve," 463).

2.3 The Underemphasized Role of Error in the Debate over the Torture of Nature

Neither Pesic nor the feminist authors that he criticized treat error as the desirable state for knowledge production. Pesic is more correct than his opponents when it comes to the more mutual and active relationship between the provoker and the one being brought to a state of error during the struggle with Proteus. Nature is a powerful opponent with which the human must struggle. However, he is also not fully correct on this score, in at least three ways. First, based on Bacon's interpretation of the myth, at issue is not just that human and nature must heroically struggle together. It is rather that the human inquirer must adopt an erring approach in order to keep up with an erring Nature. Furthermore, the

language that Bacon chose to describe the interaction of Man and Nature was more oppositional than it had to be. Bacon explicitly elected to deploy an idea of vexation and force rather than assistance, liberation, and perfection. Finally, in the case of the final stage of Nature held fast, Bacon delineates a relationship between human and nature that does dominate Nature more than Pesic admits by violently fixing matter into a stable, artificial form for human use.

More recent interpreters of Bacon likewise undercut the role of error in his view of experiment. Dana Jalobeanu, for example, discusses Bacon's myth of Proteus without raisiraising the issue of error (Jalobeanu 2015). Sophie Weeks, rather than emphasizing the role of error in the myth of Proteus, stresses the role of the clue in Bacon's version of the myth of Daedalus, which is then extrapolated from a discussion of mechanical arts to a discussion of experiment in general. According to Bacon, Daedalus's simultaneous building of the Labyrinth and invention of the clue symbolized how "the mechanical arts" "have power for the most part to dissolve their own spell" (Bacon 1905, *De sapientia veterum*, 843). Weeks concludes that through the "interpretation of the Daedalus fable, Bacon explains why mechanics plays such a significant role in inquiry. The difference between nature free and nature constrained by art (mechanics) is that whereas the former affords no clue to inquiry, mechanical contrivances are themselves clues" (Weeks 2008, 138). However, Bacon's identification of Daedalus' discovery of a clue out of a labyrinth with mechanics does not necessarily mean that mechanics provides the clue for the unravelling of nature, but only for the unravelling of mechanical things. They do not hold similar power over Nature whose labyrinths are far more subtle.

When it comes to knowing multiplex nature, the pertinent myth is not Daedalus, but Proteus. In Bacon's interpretation of that myth, we find no clue out of the labyrinth, but rather, an epistemically powerful deployment of error itself. Weeks' relation of the Daedalus myth to a contrast between nature free and nature constrained ignores Bacon's third category of nature in error. It thus also overrides the distinction Bacon draws between vexing nature for epistemic ends and constraining nature in order to impose an artificial form upon it for human use (primarily in the mechanical arts).

It is not surprising that Weeks does not relate Daedalus to nature in error because Bacon does not do so—and that is a very surprising move on his part. Daedalus' labyrinth had long symbolized error, a relationship canonized by classical sources such as the descriptions of Daedalus' labyrinth by Ovid and Virgil.[4] Despite his extensive development of the idea of "nature in error" across many works, Bacon does not mention error in relation to Daedalus (Bacon, "De Sapientia Veterum," 843). Instead, Bacon interpolates error into the myth of Proteus, rather than into the myth of Daedalus, where it properly belongs. This surprising location of error serves as a rejection of the ways that the myth of Daedalus

[4] Ovid, *Metamorphoses,* book 8, "Ducit in errorem variarum ambage viarum" and Virgil, *Aeneid,* book six, "hic labor ille domus et inexplicabilis error" (discussed in Doob 1990, 237).

more typically functions in relation to knowledge, that is, as symbolizing the straightforward following of clues out of a labyrinth of error. The myth of Proteus has no clue, only an immersive and adaptive struggle. Rather than following a clue out of the labyrinth, Bacon redeploys the twisting and turning ways of the labyrinth into its own epistemic approach, personified by a vexed Proteus.

3. Handcuffing Proteus as Experiments off the Beaten Path

Bacon's idiosyncratic interpretation of these common myths sought to differentiate his approach to experiment from approaches of his time and to push experimental efforts off the beaten path. The "handcuffs" of the myth meant, according to Bacon, pushing nature to an extremity. This aiming for extremes is apparent in an example he gave of "a handcuffing this Proteus of nature" that was an experiment of which, he claimed, "no man has yet made trial." This was "close distillation," the prime example that Bacon offered of the "*sortes*" or "Chances of Experiment." This form of experimenting was "irrational and as it were mad." It purposefully aimed to depart from commonsensical approaches to experimentation since the wonders (*magnalia*) of nature typically "lie out of the common roads and beaten paths, so that the very absurdity of the thing may sometimes prove of service."[5]

The chances of experiment were one means by which Bacon attempted to distinguish his approach from common household experimentation. By heating matter to a degree previously unheard of through new technological setups—unbreakable vessels, more highly regulated fire, inescapable material, extremities of temperature—close distillation, Bacon imagined, might forcibly prevent the parts of distillation from separating from one another or from escaping through smoke or steam. The aim here was not to force an artificial state but to mimic the power of natural processes beyond what traditional laboratory vessels had previously been able to achieve. Bacon compared "close distillation" to the development of the fetus in the womb, "where the heat works, and yet no part of the body is either emitted or separated" (Bacon 1623). Bacon's comparison of close distillation to the development of the fetus in the womb challenges the gendered readings of his experimental approach as a masculine torture of a feminized Nature. It shows how much that reading has been shaped by an assumption of the centrality of mechanical philosophy that treated Nature as a dead object to be manipulated and controlled. A historical lens informed by the more recent history of alchemy might lead to very different interpretations of the handcuffs of Proteus. The examples that Bacon provides, such as "close distillation" recall

[5] Bacon 1623, 245. "At *Destillationem Clausam,* (ita enim eam vocare possumus) nemo mortalium adhùc tentauit [. . . .] tùm demùm hunc Materiae Proteum, veluti Manicis dententum, ad complures transformations adacturam [. . .] ." Bacon 1858, "De Augmentis Scientiarum," vol. 4, 420.

laboratory ambitions not to act against nature, but to intervene in nature and recreate life (as in the case of *homunculi*) (Newman 2004).

Chymical laboratory apparatus already aimed to recreate natural circuitous routes of transformation but did so imperfectly, according to Bacon. In his *History of Dense and Rare* he offered further examples of "how we carry out distillations as in a cell enclosed on all sides," yet matter still escaped into its regular cycle of transformations. If this could be prevented, "perhaps this will keep the Proteus of matter in handcuffs and force it to act the contortionist and get free that way." He offered various suggestions ("Mandata") for how experiments tending toward close distillation might be set up, although close distillation was not something that had ever been achieved (Bacon 2000, "Historia densi et rari," 101).

The point of such laboratory setups serving as the handcuffs of Proteus was to recreate the labyrinths that ordinarily trace intricate routes deep within the bowels of nature, beyond the view of the human observer. Matter twisted and turned, seeking an easy escape from the experimental setup, such as in the form of smoke or steam. It found none, hemmed in by glass walls or by relentlessly rising temperatures. Instead, as the experimenter wrestled with it, continually blocking its course, matter took circuitous routes, channeling into further cycles of distillation or into greater reactions to heat (such as melting or calcination). Sometimes this struggle meant preventing matter from more ordinary transformations (such as condensation) in order to provoke more unusual or radical ones (such as the development of a fetus).

These experimental strategies allowed the human observer to witness the processes of metamorphosis that ordinarily occurred in the much finer, more hidden and otherwise inaccessible reticulations of nature. Humans usually relied upon "the shapes and positions of vessels" to check, repel, release, or direct the motions of bodies, as in alembics of various forms. Nature was far subtler and did not rely upon such gross structures for the shaping of matter. Bacon, for instance, denied Telesio's view that the shaping of creatures in the womb occurs because of "channels and compartments" that mould matter. Eggs, Bacon pointed out, have no such interior folds yet still shape bodies (Bacon 2004, "Novum organum," 435). Rather, the transformation of the fetus occurs through series of changes of matter on such a fine level that they are ordinarily invisible. Folds existed in matter on levels that were not ordinarily visible; in his *History of Dense and Rare*, Bacon suggestively proposed that between the two limits of dense and rare there was a fold of matter, through which it can fold in upon itself without a vacuum.[6] Through the notion of "close distillation," Bacon sought to imagine new experimental setups that could better mimic and visualize these subtler structures of nature, identifying the folds of matter that could only be discovered at the very extremities of natural states.

[6] Bacon 2000, "Historia densi et rari," 163. "Inter terminos densi et rari est plica materiae, per quam se complicat et replicat absque vacuo." On the *"plica materiae,"* see Jalobeanu 2020.

4. "Coming to grips with nature" in Experimental Inscriptions

In a series of recent works, Dana Jalobeanu has stressed how Bacon oriented his experimental investigations towards "research" in his normative natural histories. I agree that the way Bacon mobilizes experimental investigations often distinguishes them from his source material in a way that could be called research-oriented. However, I disagree in the nature of that distinction. Jalobeanu places Bacon in the context of the Neostoic disciplining of the mind, an effort to curb it of vitious tendencies and to reduce error in knowledge (Jalobeanu 2015, 2016). Jalobeanu and other members of the Bucharest school of Bacon studies have worked to identify Bacon's "medicine of the mind" or the method of his "experiential literata" that could be extricated from his natural histories (Corneanu 2011, Georgescu 2011, Dima 2011). This effort represents a newer and much more sophisticated version of attempts to see Bacon as the author of experimental method through the disciplining of subjective passion.

In contrast to this disciplining view of Bacon, elsewhere I place Bacon in the context of a culture of undisciplining knowledge, including a rejection of method and an abrogation of traditional epistemic divides and categories (Keller 2023). Here, I have challenged the idea that Bacon aimed to avoid error and to fix knowledge by looking at Bacon's discussion of ways to provoke nature into a state of error through experiment. Alongside a mutable form of experimentation that continually deferred the ultimate access to truth, Bacon developed forms of experimental textual inscription, I argue, that were tentative, contingent, and open to varying interpretations.

Bacon's general literary practices fit this view. He wrote, Julianne Werlin has argued, in a style that intentionally opened his work up to multiple interpretations and slippage into error (Werlin 2015). He continually shifted the meaning of words away from accepted usage (Bacon 1605, Book Two, 75-60). His use of terms was highly labile. Rather than fixing knowledge, Bacon "was an inveterate reviser of his writings" (Serjeantson 2013, 1101). For instance, Bacon returns to the myth of Proteus in many different works, subtly altering the emphasis and even the subject (such as matter or Nature). In each iteration of his treatment of Proteus, Bacon constantly shifted and transformed his deployment of the myth, as he did so often with other leitmotifs that thread through his writings. His Protean rhetoric makes his approach to Proteus itself difficult to pin down.

This view of Bacon's mutable rhetoric runs counter to long-standing accounts of scientific textuality in general and of Bacon in particular as representing an effort to fix knowledge to a straight-and-narrow pathway or method in order to avoid error. Bruno Latour influentially related the fixing of knowledge into two-dimensional graphic form, as "immutable mobiles," in order for the European human to accumulate and dominate global knowledge (Latour 1986, 1987). Scholars have linked Latour's discussion about the relationship between fixing and circulating objects of study, observation, and domination back to accounts of Bacon as establishing "the progressive accumulation and collection of data" (Langman 2011, 63) and the "circulation of knowledge" (Lightman 2013, 10).

Entire genres, from questionnaires to natural histories, have been termed Baconian precisely due to their means of direction attention and fixing inscription into generic forms that can be circulated among multiple knowledge workers and recombined into larger sets of knowledge. Peter Pesic has described Bacon's prescription that "testing must not be 'blind and stupid [...] wandering and straying as [men] do with no settled course,' for which he provided Learned experience or the Hunt of Pan, including "his reformulation of the inductive method and the 'tables of instances' he proposed to organize the fruits of observation and experiment" (Pesic 1999, 83). Indeed, Bacon describes his "Table of the Coition and Expansion of Matter in relation to Space in Tangible Bodies," an impressive spread of many types of matter and specific experimental measurements, as a means of coming "to grips with nature as if in a wrestling match" (Bacon 2000, "Historia densi et rari," 49). Yet, many areas of doubt remained in connection with this subject, and he confessed that the findings in his table remained continually provisional and the wrestling continued (Jalobeanu 2015, 303). Furthermore, this was one of the easier subjects to visualize and measure; as Bacon noted, the inquiry grew tricky when it came to comparative bulks of pneumatic matter (Bacon 2000, 65).

In his natural histories, rather than fixing and disciplining knowledge, Bacon made considerable space for provisional knowledge, subjective struggle, and the deployment of passions. He cautioned that he only rarely proposed "certain imperfect attempts at the interpretation of causes." These served "more to suggest what could be than to define what is" (Bacon 2007, *Historia naturalis et experimentalis*, 14).[7] In order to mobilize knowledge, Bacon deployed a strategy he had advertised since his 1605 *Advancement of Learning* of extending knowledge towards the new. This entailed awakening desire in individuals to join the advancement of learning by pairing much sought-after things deemed impossible (which he categorized as "optatives"), with the closest things to them that had been achieved, which would inflame his audience with possibility of realizing much desired goals and hint at possible directions for further investigation. As he specified as part of the "norm" ("*Norma*") of his history, "I set out works and things deemed impossible, or at least so far undiscovered which fall under the individual titles; and together with them I subjoin things already discovered and lying within human power, which are closest and most akin to those things deemed impossible and undiscovered, so that human industry may be stimulated and souls fired" (Bacon 2007, 17). In the gap he set up between the desired thing and the approximation lay an invitation for others to join in, often paired with an incentive to do so. For example, one optative he listed in the history of winds was a way "to forecast abundance or dearth of corn and fruit every year." Bacon suggested that this knowledge could be deployed in "speculative buying and selling" in order to corner the market on comestibles (Bacon 2007, 131).

[7] "tanquam Rudimenta quaedam, Interpretationis de Causis [...] magis suggerendo quid esse possit, quam definiendo quid sit." I translated this more literally than Graham Rees did.

Such examples speak to the risk-taking, subjectively motivated, and imperfect forms of knowledge with which Bacon endowed his natural histories.

Pace Latour, we might call Bacon's forms of inscription "mutable mobiles." He idiosyncratically termed the provisional general statements that he developed out of his experimental histories "*canones mobiles*," not because they were fixed statements that could move among a wide readership, but because they were themselves moving targets (Bacon 2007, 124 and 346). Rather than presenting knowledge as codified and completed, Bacon's wandering, mutable style encouraged participation in an infinitely receding horizon when the advancement of learning would end and the struggles of Proteus would cease.

5. Conclusion: On Not Having a Clue

Bacon never performed a "close distillation," one of his examples of what a handcuff of Proteus might be. This was an entirely imagined experiment. In fact, one might say the same for the struggle of Proteus as a whole. The "vexations of art are indeed like the chains and manacles of *Proteus* which betray the ultimate strivings and exertions of matter," wrote Bacon (Bacon 2004, 463.) Yet, how could one ever know if such "ultimate strivings" had been reached? For example, among the "*canones mobiles*" or provisional rules that Bacon attached to his *History of Dense and Rare* was the statement, "There is a boundary or *non ultra* of dense and rare, but not in any entity known to us" (Bacon 2000, "Historia densi et rari," 163). As one endeavored to push Nature to an extremity, it could never be known where that terminus lay. With the edges of possibility unknown, the struggle with Proteus continued always *plus ultra*.

The rhetoric of Bacon advancing knowledge *plus ultra* is often interpreted as his provision of a clue for humankind to follow in order to escape the labyrinth of error found in the maze of words into an open realm of more certain knowledge, grounded in experience, and offering useful knowledge to all. This essay has offered a very different interpretation, one which depicts Bacon as clearing a space for labyrinthine investigations that tended towards, but never reached, the ultimate boundaries of possibility. These investigations resisted the pressure to exit the labyrinth and to produce useful knowledge. They did not offer certain tabulations of knowledge, but provisional, fragmentary, and moveable forms of inscription. In the myth of Proteus, Bacon imagined an interplay between humans and knowledge goals whose conclusion could only ever be in a deferred future.

This brings us back full circle to circuitous routes as a tactic of delay and deferral. This essay suggests that, pace Ginzburg, clues that efficiently cut through to knowledge production were not particularly early modern. What was novel in the early modern period was a rejection of attempts to escape from the labyrinth of the world and instead to appreciate the *ambages* themselves as a site and practice of knowledge. In so doing, Bacon offers a new perspective on error. As the struggle with matter builds an observable labyrinth, forcing Nature's twists and tuns to become visible, the experimenter does not have fore-knowledge of what that structure will be. The experimenter does not view the maze

from above. Nor does the experimenter possess any clue that can act as a certain guide to unravel all the complexities of nature. At most, the experimenter possesses an uncertain "anticipation" about what might transpire. Bacon could only suggest what might be, rather than define what was. Thus, in contrast to prior distinctions between internal "maze-treaders" who felt lost in the labyrinth and external "maze-viewers" who praised its intricacies, Bacon delineates a new perspective on the labyrinth by reformulating labyrinth construction as a dynamic, adaptive struggle. The experimenter was both within the labyrinth and constructing the labyrinth, as human and nature erred together.

References

Bacon, Francis. 1605. *Twoo bookes of the proficience and advancement of learning, divine and humane to the King.* London: Tomes.

Bacon, Francis. 1609. *De sapientia veterum liber.* Robert: Barker.

Bacon, Francis. 1623. *De dignitate et augmentis scientiarum libros IX.* London: Haviland.

Bacon, Francis. 1857-9. *The Works of Frances Bacon*, ed. by J. Spedding, R. L. Ellis and D. D. Heath. 7 vols. London: Longman and Co.

Bacon, Francis.1996. *Philosophical Studies, c. 1611–c.1619*, ed. by G. Rees. The Oxford Francis Bacon, vol. 6. Oxford: Oxford University Press.

Bacon, Francis. 2000. *Instauratio magna: Last Writings*, ed. by G. Rees. The Oxford Francis Bacon, vol. 13. Oxford: Oxford University Press.

Bacon, Francis. 2004. *The Instauratio magna, Part II: Novum organum*, ed. by G. Rees with M. Wakely. The Oxford Francis Bacon, vol. 11. Oxford: Oxford University Press.

Bacon, Francis. 2007. *The Instauratio magna, Part III: Historia Naturalis and Historia Vitae*, ed. by G. Rees with M. Wakely. The Oxford Francis Bacon, vol. 13. Oxford: Oxford University Press.

Bates, David William. 2002. *Enlightenment Aberrations: Error and Revolution in France.* Ithaca: Cornell University Press.

Corneanu, Sorana. 2011. *Regimens of the Mind: Boyle, Locke, and the Early Modern* Cultura Animi *Tradition.* Chicago: University of Chicago Press.

Dima, Teodore. 2011. "Francis Bacon, initiator of modern heuristic method." *Balkan Journal of Philosophy* 3:163–70.

Doob, Penelope Reed. 1990. *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages.* Ithaca: Cornell University Press.

Eamon, William. 1994. *Science and the Secrets of Nature: Books of Secrets in Medieval and early Modern Culture.* Princeton: Princeton University Press.

Georgescu, Laura. 2011. "A New Form of Knowledge: Experientia Literata." *Society and Politics* 5:104–20.

Ginzburg, Carlo. 1979. "Clues: Roots of a Scientific Paradigm." *Theory and Society* 7:273–88.

Ginzburg, Carlo. 1980. "Morelli, Freud and Sherlock Holmes: Clues and Scientific Method." *History Workshop* 9:5–36.

Harding, Sandra. 1986. *The Science Question in Feminism.* Ithaca, NY: Cornell University Press.

Jalobeanu, Dana. 2008. "Bacon's Brotherhood and its Classical Sources: Producing and Communicating Knowledge in the Project of the Great Instauration." In *Philosophies of Technology: Francis Bacon and his Contemopraries*, ed. by C. Zittel, et al., 197–230. 2 vols. Leiden: Brill.

Jalobeanu, Dana. 2015. *The Art of Experimental Natural History: Francis Bacon in Context.* Bucharest: Zeta.

Jalobeanu, Dana. 2016. "Disciplining Experience: Francis Bacon's Experimental Series and the Art of Experimenting." *Perspectives on Science* 24: 323–412.

Jalobeanu, Dana. 2020. "Experiments in the Making: Instruments and Forms of Quantification in Francis Bacon's Historia Densi et Rari." *Early Science and Medicine* 25: 360–87.

Keller, Evelyn Fox. 1985. *Reflections on Gender and Science.* New Haven, Conn.: Yale University Press.

Keller, Vera. 2014. "Nero and the Last Stalk of Silphion: Collecting Extinct Nature in early modern Europe." *Early Science and Medicine* 19: 424–47.

Keller, Vera. 2020a. "'Everything depends upon the trial (*Le tout gist à l'essay*)': Four Manuscripts between the Recipe and the Experimental Essay." In *Secrets of Craft and Nature in Renaissance France. A Digital Critical Edition and English Translation of BnF Ms. Fr. 640*, ed. by P. H. Smith, et al. New York: Making and Knowing Project. https://edition640.makingandknowing.org/#/essays/ann_320_ie_19. DOI: https://www.doi.org/10.7916/vj69-8h20

Keller, Vera. 2020b. "Into the Unknown: Clues, Hints and Projects in the History of Knowledge." *History and Theory* 59: 86–110.

Keller, Vera. 2023. *Interlopers: Early Stuart Projects and the Undisciplining of Knowledge.* Baltimore: Johns Hopkins University Press.

Langman, Pete. 2011. "'I Give Thee Leave to Publish': New Atlantis and Francis Bacon's Republic of Knowledge." In *Centres and Cycles of Accumulation in and Around the Netherlands during the early modern Period*, ed. by L. Roberts, 53–72. Berlin: LIT Verlag.

Latour, Bruno. 1986. "Visualisation and Cognition: Thinking with Eyes and Hands." *Knowledge and Society: Studies in the Sociology of Culture Past and Present* 6: 1–40.

Latour, Bruno. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.

Leong, Elaine. 2018. *Recipes and Everyday Knowledge: Medicine, Science and the Household in Early Modern England.* Chicago: Chicago University Press.

Lightman, Bernard, Gordon McOuat, and Larry Stewart. 2013. "Introduction." In *The Circulation of Knowledge between Britian, India and China: The Early-Modern World to the Twentieth Century*, ed. by Id., 1–20. Leiden: Brill.

Merchant, Carolyn. 1980. *The Death of Nature: Women, Ecology, and the Scientific Revolution.* San Francisco: Harper & Row.

Merchant, Carolyn. 2008. "The Violence of Impediments": Francis Bacon and the Origins of Experimentation." *Isis* 99: 731–60.

Merchant, Carolyn. 2013. "Francis Bacon and the 'vexations of art': experimentation as intervention." *The British Journal for the History of Science* 46: 551–99.

Moran, Bruce. 2005. *Distilling Knowledge: Alchemy, Chemistry and the Scientific Revolution.* Cambridge, Ma: Harvard University Press.

Moran, Bruce. 2007. *Andreas Libavius and the Transformation of Alchemy: Separating Chemical Cultures with Polemical Fire.* Sagamore: Watson.

Newman, William R. 2004. *Promethean Ambitions: Alchemy and the Quest to Perfect Nature.* Chicago: University of Chicago Press.

Pesic, Peter. 1999. "Wrestling with Proteus: Francis Bacon and the 'Torture' of Nature." *Isis* 90: 81–94.

Pesic, Peter. 2000. *Labyrinth: A Search for the Hidden Meaning of Science.* Cambridge: MIT Press.

Pesic, Peter. 2001. "Proteus unbound: Francis Bacon's successors and the defense of experiment." *Studies in Philology* 98: 428–56.
Pesic, Peter. 2008. "Proteus rebound: reconsidering the torture of Nature." *Isis* 98: 304–17.
Pesic, Peter. 2010. "Shapes of Proteus in Renaissance art." *Huntington Library Quarterly* 73: 57–82.
Sandys, George. 1615. *A Relation of a Journey begun An. Dom. 1610.* London: Barren.
Serjeantson, Richard. 2013. "The Philosophy of Francis Bacon in early Jacobean Oxford, with an Edition of an Unknown Manuscript of the Valerius Terminus." *The Historical Journal* 56: 1087–106.
Serjeantson, Richard. 2017. "Francis Bacon's *Valerius Terminus* and the Voyage to the 'Great Instauration.'" *Journal of the History of Ideas* 78: 341–68.
Shapiro, Barbara J. 1983. *Probability and Certainty in Seventeenth-Century England: A Study of the Relationships between Natural Science, Religion, History, Law, and Literature.* Princeton: Princeton University Press.
Shapiro, Barbara. 1994. "The Concept 'Fact': Legal Origins and Cultural Diffusion." *Albion: A Quarterly Journal Concerned with British Studies* 26: 227–52.
Smith, Pamela H. 2020. "Making the Edition of Ms. Fr. 640." In *Secrets of Craft and Nature in Renaissance France*, ed. by P. H. Smith, et al. New York: Making and Knowing Project. https://edition640.makingandknowing.org/#/essays/ann_329_ie_19. DOI: https://www.doi.org/10.7916/zdaf-cv31
Steadman, John. 1961. "Spenser's Errour and the Renaissance Allegorical tradition." *Neuphilologische Mitteilungen* 62: 22–38.
Thylstrup, Nanna Bonde (ed.). 2020. "Error." In *Uncertain Archives: Critical Keywords for Big Data*. 191–9. Cambridge, MIT: MIT Press.
Weeks, Sophie. 2008. "The Role of Mechanics in Francis Bacon's Great Instauration." In *Philosophies of Technology: Francis Bacon and his Contemporaries*, ed. by C. Zittel, et al., 133–95. Leiden: Brill.
Werlin, Julianne. 2015. "Francis Bacon and the Art of Misinterpretation." *PMLA* 130: 236–51.
Werrett, Simon. 2019. *Thrifty Science: Making the Most of Materials in the History of Experiment.* Chicago: University of Chicago Press.

Galileo's Mathematical Errors

Viktor Blåsjö

Abstract: Galileo's abilities as a mathematician were far below that of many of his contemporaries. He made numerous technical mistakes — including several high-profile, mathematically erroneous applications of his own law of fall — that were swiftly spotted and corrected by the leading mathematicians of the day. Many aspects of Galileo's work can be viewed as consequences of this limited technical proficiency in mathematics. For example, he ignores Kepler's work and dismisses comets as a chimerical atmospheric phenomena: decisions that are difficult to justify on scientific grounds but which make sense if we grant that Galileo wanted to avoid technical mathematics at all costs. Instead he drops rocks, looks through tubes, rails against Aristotelian philosophers, and expounds at length about basic principles of scientific method: all of which can be seen as dwelling on precisely those parts of the mathematician's worldview that do not require any actual mathematics.

Keywords: Galileo, cycloidal area, orbital speeds, extrusion by terrestrial whirling, atmospheric theory of comets.

1. Cycloid

The cycloid is the curve traced by a point on a rolling circle, like a piece of chalk attached to a bicycle wheel. Many mathematicians were interested in the cycloid in the early 17th century, including Galileo. What is the area under one arch of the cycloid? That was a natural question in Galileo's time. Finding areas of shapes like that is what geometers had been doing for thousands of years. Archimedes for instance found the area of any section of a parabola, and the area of a spiral, and so on. Galileo wanted nothing more than to join their ranks. The cycloid was a suitable showcase. It was a natural next step following upon the Greek corpus, and hence a chance to prove oneself a "new Archimedes."

There was only one problem: Galileo just wasn't very good at mathematics. Try as he might, he could not for the life of him come up with one of those clever geometrical arguments for which the Greek mathematicians were universally admired. All those brilliant feats of ingenuity that Archimedes and his friends had blessed us with, it just wasn't happening for Galileo.

Perhaps out of frustration, Galileo turned to the failed mathematician's last resort since time immemorial: trial and error. Unable to crack the cycloid with his intellect, he attacked it with his hands. He cut the shape out of thick paper and got his scales out to have this instrument do his thinking for him. As best as he could gather from these measurements, Galileo believed that the area under the

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cycloid was somewhere near, but not exactly, three times the area of the generating circle (Drake 1978, 19, 406).

This was no way to audition for the pantheon of geometers. Galileo was left red-faced when mathematically competent contemporaries solved the problem with aplomb while he was fumbling with his cutouts. These actual mathematicians proved that the cycloid area was in fact exactly three times the area of the generating circle, even though Galileo had explicitly concluded the contrary on the basis of his cardboard diorama. (The correct result was proved by Roberval in 1634. See Struik 1969, 232–8, Whitman 1943, Kline 1972, 350.)

When Galileo heard of others working on the cycloid challenge, he sought help on this "very difficult" problem from his countryman Bonaventura Cavalieri, a competent mathematician. "I worked on it fruitlessly," lamented Galileo. "It needs the mind of a Cavalieri and no other," he pleads, tacitly acknowledging his own unmistakably inferior mathematical abilities. (Galileo to Cavalieri, 24 February 1640, Drake 1978, 406. Cavalieri did not take up the problem—"I too left it aside" (Freguglia and Giaquinta 2016, 34)—but Torricelli solved it soon thereafter.)

It is interesting to contrast this with the very different reaction to the same problem by Galileo's contemporary René Descartes, the famous philosopher who was also a vastly better mathematician than Galileo. When Descartes heard of the problem he immediately wrote back to his correspondent that "I do not see why you attribute such importance to something so simple, that anyone who knows even a little geometry could not fail to observe, were he simply to look." (Descartes to Mersenne, 27 May 1638, AT.II.135, Jullien 2015, 171.) He then immediately goes on to give his own proof of the result composed on the spot. Descartes is not famous for his humility, but the fact of the matter is that a number of mathematicians solved the cycloid problem with relative ease, while Galileo was fumbling about with scissors and glue.

In the case of the cycloid, it is an unequivocal fact that Galileo used an experimental approach because he lacked the ability to tackle the problem as a mathematician. If Galileo could have used a more mathematical approach he would unquestionably have done so. I suggest that what is so glaringly obvious in this case holds for Galileo's science generally. Galileo's celebrated use of experiments in science is not a brilliant methodological innovation but a reluctant recourse necessitated by his shortcomings in mathematical ability.

The cycloid case also makes it clear *why* the mathematically able prefer geometrical proofs to experiments: the latter are notoriously unreliable. By relying on experiments unchecked by proper mathematics, Galileo got the answer wrong, and not for the first time nor the last. "Do not think that I am relying on experiments, because I know they are deceitful," said Huygens (*Oeuvres*.XI.115, Palmerino and Thijssen 2004, 189), and all other mathematicians with him. It had always been obvious that mathematics and science can be explored using experiment and observation. As Galileo says: "You may be sure that Pythagoras, long before he discovered the proof [...], had satisfied himself that the square on the side opposite the right angle in a right triangle was equal to the squares on the other two sides" (Galileo, *Dialogue*, OGG.VII.75, Wootton 2010, 85)—presumably by making nu-

merical measurements on various concretely drawn triangles. But able mathematicians had always known that haphazard trial and error had to be superseded by rigorous demonstration for a treatise to be worth the parchment it is written on. It is this—and not ignorance of "the scientific method"—that explains why you don't see experimental and numerical data defiling the pages of masterpieces of ancient mathematics and science such as those of Archimedes.

2. Planetary Speeds

Galileo stated the correct law of fall, as every high school physics student knows. However, he made numerous fundamental mistakes when trying to apply this law in a range of situations. One such error is what has been called Galileo's "Pisan Drop" theory of planetary speeds (Heilbron 2010, 116). The planets orbit the sun at different speeds. Mercury has a small orbit and zips around it quickly. Saturn goes the long way around in a big orbit and it is also moving very slowly. Galileo imagines that these speeds were obtained by the planets falling from some faraway point toward the sun, and then being somehow deflected into their circular orbits at some stage during this fall (Figure 1). That supposedly explains why the planets have the speeds they do.

Galileo expounds on this hypothesis in the *Dialogue*, and claims to have checked it mathematically and found that empirical orbital data "agree so closely with those given by the computations that the matter is truly wonderful" (Galileo 1953, 29). Galileo was so proud of this erroneous argument that he repeated it in his second major work, the *Discourse*, as well (Galileo 1974, 233, OGG.VIII.284). In both places he omits the details, however. Galileo has one of the characters in his dialogue say that "making these calculations [. . .] would be a long and painful task, and perhaps one too difficult for me to understand," whereupon Galileo's mouthpiece in the dialogue confirms that "the procedure is indeed long and difficult" (Galileo 1953, 30).

Mathematically competent contemporaries did not find it too "difficult" to check Galileo's theory, however. Mersenne immediately ran the calculations and found that Galileo must have messed his up, because his scheme doesn't work. (Marin Mersenne, *Harmonie Universelle*, II.103–7, Galileo 1974, 233, note 22. Later Newton made the same observation; Newton 1999, 144.) There is no such point from which the planets can fall and obtain their respective speeds. Galileo's precious idea is so much nonsense, which evidently must have been based on an elementary mathematical error in calculation.

3. Centrifugal Force

Galileo wished to refute the following ancient argument: "The earth does not move, because beasts and men and buildings" would be thrown off (Galileo 1989, 220). Picture an object placed at the equator of the earth, such as a rock lying on the African savanna. Imagine this little rock being "thrown off" by the earth's rotation. In other words, the rock takes the speed it has due to the rotation of the earth, and shoots off with this speed in the direction tangential to its motion.

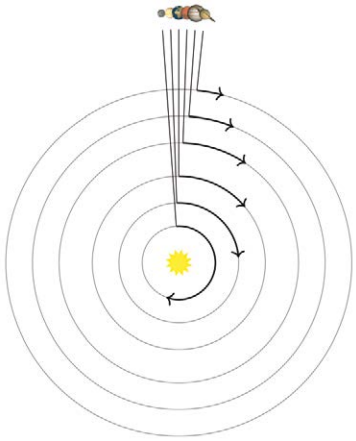

Figure 1 – Galileo's erroneous theory that the orbital speeds of the planets are equal to the speeds they would have acquired through free fall if dropped from a common height.

This is not what happens to an actual rock, because gravity is pulling it back down again. The rock stays on the ground since gravity pulls it down faster than it rises due to the tangential motion. How can we compare these two forces quantitatively? Since we know the size and rotational speed of the earth, it is a simple task (suitable for a high school physics test) to calculate how much the rock has risen after, say, one second. This comes out as about 1.7 centimeters. We need to compare this with how far the rock would fall in one second due to gravity. Again, this is a standard high school exercise (equivalent to knowing the constant of gravitational acceleration g). The answer is about 4.9 meters. This is why the rock never actually begins to levitate due to being "thrown off:" gravity easily overpowers this slow ascent many times over.

But this conclusion depended on the particular size and speed and mass of the earth. We could make the rock fly by spinning the earth fast enough. For example, if we run the above calculations again assuming that the earth rotates 100 times faster, we find that, instead of rising a measly 1.7 centimeters above the ground in one second, the rock now soars to 170 meters in the same time. The fall of 4.9 meters due to gravity doesn't put much of dent in this, so indeed the rock flies away.

These things were calculated correctly in Galileo's time (by Mersenne; Bertoloni Meli 2006, 113). But Galileo, alas, gets all of this horribly wrong. Even though we are supposed to celebrate Galileo as the discoverer of the law of fall, it is apparently too much to ask that he work out this basic application of it.

In fact, Galileo claims to "prove" that the rock will never be thrown off regardless of the rotational velocity. "There is no danger," Galileo assures us, "however fast the whirling and however slow the downward motion, that the feather (or even something lighter) will begin to rise up. For the tendency downward always exceeds the speed of projection." Thus Galileo proudly offers "a geometrical demonstration to prove the impossibility of extrusion by terrestrial whirling." (Galileo 1953, 197–8.)

Galileo's so-called "demonstration" is shown in Figure 2. (Galileo 2001, 231–4. The errors in Galileo's argument have been analysed by Chalmers and Nicholas 1983, Hill 1984.) It is indeed a qualitative argument that ostensibly rules out all possible cases of centrifugal projection, regardless of the rotational speed of the earth *V*, the radius of the earth *R*, or the magnitude of gravitational acceleration *g*. It is true, as Galileo says, that the ratio

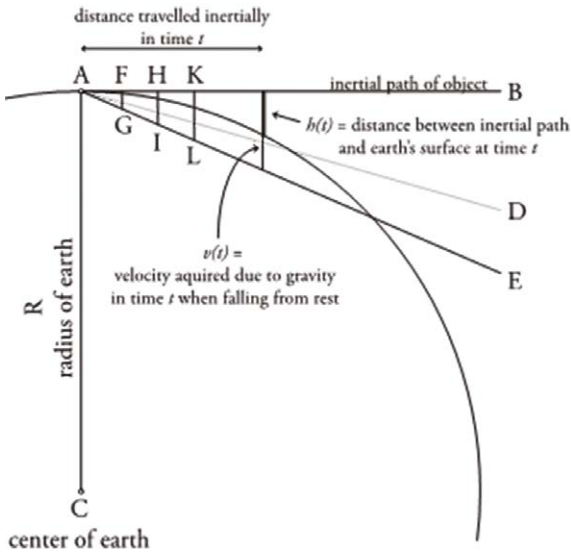

Figure 2 – Galileo's "proof" that centrifugal projection can never hurl objects off the earth. If gravity stops acting on an object at *A*, it would move inertially in the tangential direction *AB*. Since inertial motion has uniform speed, it would reach the equally spaced points *AFHK* in equal time intervals. If the object had instead been dropped from rest, it would have acquired a certain downward speed in those same time intervals. These speeds are represented in the diagram by *FG*, *HI*, *KL*. Since the velocity acquired in free fall is proportional to time, *AGILE* is a straight line. The slope of the line depends on the magnitude of gravitational acceleration, but for the purposes of this argument this value does not matter; in other words, we could just as well consider the speeds to be determined by some other line *AD*. The impossibility of centrifugal projection follows, according to Galileo, from the fact that as we consider smaller and smaller time intervals (that is to say, as we zoom it at *A*), the distance $h(t)$ required to catch up with the earth shrinks very rapidly to zero, while the speed $v(t)$ acquired from fall shrinks only linearly to zero. Therefore, says Galileo, the speed of fall $v(t)$ will, for some small enough *t*, be more than enough to cover the distance $h(t)$ and then some. In other words, the object will never get off the ground.

$v(t)/h(t)$ goes to infinity as t goes to zero. But this is obviously comparing apples to oranges, namely a velocity with a distance. The relevant comparison is between $h(t)$ and the distance $d(t)$ covered by free fall in this time. Galileo evidently felt that since in small time intervals $v(t)$ is overwhelmingly larger than

$h(t)$, then $d(t)$ must surely be larger than $h(t)$ as well. But this is false. Instead, the limit of $d(t)/h(t)$ as t goes to 0 is gR/V^2. In other words, $d(t)$ does not always overpower $h(t)$, as Galileo mistakenly believes. Rather, whether $d(t)$ is greater or smaller than $h(t)$ for small t depends on the specific parameters of the situation in question. A strong gravitational acceleration g, or a big radius of the rotational path R, makes it easier for the object to "catch up" with the surface of the earth, while a big rotational speed V makes it harder. Whether the object catches up with the surface or flies away depends on the relation between these parameters.

4. Circular Path of Fall

A rock dropped from the top of a tower falls in a straight line to the foot of the tower. But its path of fall is not actually straight if we take into account the earth's rotation. Seen from this point of view—that is to say, from a vantage point that doesn't move with the rotation of the earth—what kind of path does the rock trace? Galileo answers, erroneously,

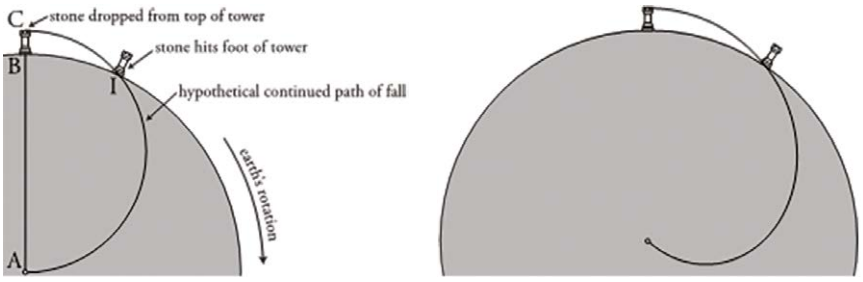

Figure 3 – Left: Galileo's erroneous conception of the path of fall of a rock dropped from a tower. "*AB* [is the radius of] the terrestrial globe. Next, prolonging *AB* to *C*, the height of the tower *BC* is drawn. The semicircle *CIA* […], along which I think it very probable that a stone dropped from the top of the tower *C* will move, with a motion composed of the general circular one [due to the rotation of the earth] and its own straight one [due to gravity]." Galileo 2001, 192, OGG.VII.191. Right: From Galileo's assumptions it follows that the path should be a spiral rather than a semicircle.

that it will be a semicircle going from the top of the tower to the center of the earth (Figure 3):

If we consider the matter carefully, the body really moves in nothing other than a simple circular motion, just as when it rested on the tower it moved with a simple circular motion. […] I understand the whole thing perfectly, and I cannot think that […] the falling body follows any other line but one such as this […]. I do not believe that there is any other way in which these things can happen. I sincerely wish that all proofs by philosophers had half the probability of this one (Galileo 2001, 192–3, OGG.VII.191).

This is "so obviously false (and besides incompatible with his own theory of uniformly accelerated motion of falling bodies) that one may wonder that Galileo

did not see it himself" (Koyré 1955, 335). Once again Galileo doesn't understand basic implications of his own law. Mersenne readily spotted Galileo's error, whereupon Fermat observed that the path should be a spiral, not a semicircle (Koyré 1955, 336, 342, Engelberg and Gertner 1981, Galileo 2001, 556). This would be the right answer given Galileo's assumptions, namely that the path is generated by composing uniform angular motion with uniformly accelerated radial motion toward the center of the earth. (As stated in Galileo 2001, 192, and again later when he admitted Fermat's correction (Koyré 1955, 343).) This implies that the path of fall is $r = r_0 - a\theta^2$ in polar coordinates, which is indeed a spiral. This is still not the true path of fall, since Galileo's assumption that his law of fall remains unchanged in the interior of the earth is itself false. But I am not concerned here with criticising Galileo on such anachronistic grounds. Much worse is the fact that he got the wrong answer even if we grant his own assumptions.

When his embarrassing error was pointed out to him, Galileo replied that "this was said as a jest, as is clearly manifest, since it is called a caprice and a curiosity." (Galileo to Pierre Carcavy, 5 June 1637, OGG.XVII.89, Shea 1972, 135.) But in reality "it is hard to believe that Galileo had really meant his solution of the trajectory of the falling body to be merely a joke" (Koyré 1955, 343). If Galileo truly meant his argument to be taken merely in jest, then why did he say that he "considered the matter carefully" and "sincerely wished that all proofs by philosophers had half the probability of this one" and so on? Many of Galileo's errors come with these kinds of bombastic claims where Galileo is editorialising about how remarkably convincing his own arguments are. It is advisable and sobering for any reader of Galileo to always keep this in mind.

5. Projectile Motion

Pick up a rock and throw it in front of you. The path of its motion makes a parabola. Galileo is famous for this result but in fact he only asserts it—he does not offer a proof. Even Galileo's own follower Torricelli acknowledged this: the

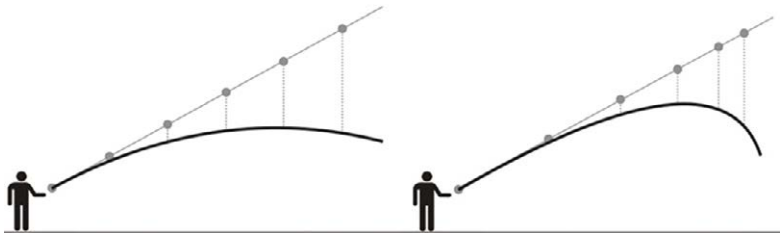

Figure 4 – Left: Correct conception of projectile motion. The dots indicate uniform inertial motion in the firing direction. Right: Erroneous conception of projectile motion, as drawn by Galileo in unpublished manuscripts. The dots indicate a decelerating motion in the firing direction, as if the projectile was struggling to ascend the incline. In both cases the rectilinear motion is composed with an independent vertical motion according to the law of fall. Based on Schemmel 2012, 94, 96.

result is "more desired than proven," as he says, very diplomatically (Torricelli, 1644, Damerow et al. 2004, 275). And the reason why Galileo doesn't prove this result is a revealing one. It is due to a basic misunderstanding.

The right way to understand the parabolic motion of projectiles like this is to analyse it in terms of two independent components: the inertial motion and the gravitational motion. If we disregard gravity, the rock would keep going along a straight line forever at exactly the same speed. That's the law of inertia. But gravity pulls it down in accordance with the law of fall. The rock therefore drops below the inertial line by the same distance it would have fallen below its starting point in that amount of time if you had simply let it fall straight down instead of throwing it. A staple fact of elementary physics is that the resulting path composed of these two motions has the shape of a parabola.

Galileo does not understand the law of inertia, and that is why he fails on this point. If the projectile is fired horizontally, such as for instance a ball rolling off a table, then Galileo does prove that it makes a parabola. He proves it the right way, the way just outlined, by composition of inertial and gravitational motion (Galileo 1989, 217, 221–2, OGG.VIII.269, 272–3).

But if you throw the rock at some other angle, not horizontally, then Galileo doesn't dare to give such an analysis. "Although [Galileo's] *Discorsi* takes it for granted that the trajectory for oblique projection is a parabola, no derivation of this proposition is presented." "At the point in the systematic treatment of projectile motion in the *Discorsi* where oblique projection is actually dealt with and correctly stated to yield a parabolic trajectory, there is simply a gap in the argumentation, and no derivation is offered for this claim." (Damerow et al. 2004, 237.)

Galileo's failure is quite clearly due to his not daring to believe in uniform inertial motion in any other direction than along the horizontal. He seems to fear that the law of inertia is perhaps not true for such motions. He is worried that the rectilinear component of the projectile's motion should be seen not as uniform but rather as gradually slowing down, like a ball struggling to roll up a hill or an inclined plane. In the latter case the trajectory is still a parabola, though not an "upright" one. See Figure 4. Indeed, more generally, "neither in the *Discourses* nor in the *Dialogue* does Galileo anywhere assert the eternal conservation of rectilinear motion" (Koyré 1978, 175). On the contrary, he explicitly rejects it: "Straight motion cannot be naturally perpetual." (Galileo 1953, 32.) "It is impossible that anything should have by nature the principle of moving in a straight line." (Galileo 1953, 19.)

In his final account, Galileo correctly "postulated upright parabolas for all angles of projection. Galileo's reasoning for this shape is, however, untenable in classical mechanics. What is more, Galileo was unable to derive it from the consideration of two component motions." "Galileo was [...] confronted with a contradiction between the inclined-plane conception of projectile motion and his claim that the trajectory is an upright parabola for all angles of projection, a contradiction he was never able to resolve." (Schemmel 2008, 234.) Since he only trusted the horizontal case, Galileo tried to analyse other trajectories in

terms of this case. To this end he assumed, without justification, that a parabola traced by an object rolling off a table would also be the parabola of an object fired back up again in the same direction (Galileo 1989, 245, OGG.VIII.296. Schemmel 2008, 234, Damerow et al. 2004, 227, 236). In other words, "he takes the converse of his proposition without proving or explaining it," as Descartes—a mathematically competent reader—immediately pointed out (Descartes to Mersenne, 11 October 1638, AT.II.387. Drake 1978, 391.)

Figure 5 – Left: The catenary, or shape of a hanging chain, which Galileo erroneously believed to be a parabola. Right: The catenary (dotted) compared to a parabola (solid) of equal arc length between the same endpoints.

Instead, "it was Galileo's disciples who first derived the parabolic trajectory for oblique projection, although they present it merely as an explication of Galileo's *Discorsi*," which it is not (Damerow et al. 2004, 7). Indeed, "even before Galileo's *Discorsi* appeared in print, Bonaventura Cavalieri published a derivation of the parabolic trajectory that is consistent with classical mechanics and is not restricted to horizontal projection." (Damerow et al. 2004, 284). Cavalieri was Galileo's countryman and in some sense disciple, and was very generous in deferring credit to Galileo.

The failures of Galileo's treatment of projectile motion confirms his misconception that inertia is limited to horizontal motion, which, as we have seen, was already independently suggested by other passages. Some have tried to argue that "if Galileo never stated the law [of inertia] in its general form, it was implicit in his derivation of the parabolic trajectory of a projectile" (Drake 1964, 602). This would have been a good argument if Galileo had treated parabolic trajectories correctly. But he didn't, so the evidence goes the other way: Galileo's bungled treatment of parabolic motion is yet more proof that he did not understand inertia.

Even apart from the above errors and omissions, the mathematical details of Galileo's presentation of projectile motion are very clumsy. Galileo's "calculations are unnecessarily complicated, and were greatly simplified by Torricelli in […] 1644, a complete revision and enlargement […] which […] makes Galileo's demonstrations and procedures obsolete" (Buchwald and Fox 2013, 53). Once again Galileo's text bears the marks of an amateur mathematician, in other words. And once again his followers almost immediately cleaned up his mess in

more mathematically able works that were full of deference to Galileo. "While […] inspired by veneration of Galileo, Torricelli is more logical in his treatise." (Hall 1952, 91.) Hence later mathematicians who used Torricelli's better but reverential account rather than Galileo's original for the mathematical details could easily be left with a much more flattering impression of the mathematical quality of "Galileo's" theory than if they had studied Galileo's own treatise in detail. Perhaps it is not so strange, then, that posterity got a bit confused and attributed much more to Galileo than he actually earned.

6. Catenary

The shape of a hanging chain (Figure 5) looks deceptively like a parabola. It is not, but Galileo fell for the ruse: "Fix two nails in a wall in a horizontal line […] From these two nails hang a fine chain […] This chain curves in a parabolic shape." (Galileo 1974, 143, OGG.VIII.186). More competent mathematicians proved him wrong: Huygens demonstrated that the shape was not in fact parabolic (Bukowski 2008; Truesdell 1960, 45). Admittedly, Huygens's proof is from 1646, four years after Galileo's death. So one may consider Galileo saved by the bell on this occasion, since he was proved wrong not by his contemporaries but only by posterity. It is not fair to judge scientists by anachronistic standards. On the other hand, Huygens was only seventeen years old when he proved Galileo wrong. So another way of looking at it is that a prominent claim in Galileo's supposed masterpiece of physics was debunked by a mere boy less than a decade after its publication.

In any case, Galileo thus ascribed to the catenary the same kind of shape as the trajectory of a projectile. He considered this to be no coincidence but rather due to a physical equivalence of the forces involved in either case (Galileo 1989, 256, OGG.VIII.309). Indeed, Galileo made much of this supposed equivalence and "intended to introduce the chain as an instrument by which gunners could determine how to shoot in order to hit a given target" (Renn et al. 2001, 118).

Galileo also tried to test experimentally whether the catenary is indeed parabolic. To this end he drew a parabola on a sheet of paper and tried to fit a hanging chain to it. His note sheets are preserved and still show the holes where he nailed the endpoints of his chain (Renn et al. 2001, 39). The fit was not perfect, but Galileo did not reject his cherished hypothesis. Instead of questioning his theory, he evidently reasoned that the error was due merely to a secondary practical aspect, namely the links of the chain being too large in relation to the measurements. Therefore he tried it with a longer chain, and found the fit to be better. In this way he evidently convinced himself that he was right after all (Renn et al. 2001, 92–104).

The catenary case thus undermines two of Galileo's main claims to fame. First it brings his work on projectile motion into disrepute. The composition of vertical and horizontal motions that we are supposed to admire in that case looks less penetrating and perceptive when we consider that Galileo erroneously believed it to be equivalent to the vertical and horizontal force components

acting on a catenary. Secondly, Galileo's reputation as an experimental scientists par excellence is not helped by the fact that his experiments in this case led him to the wrong conclusion, apparently because his pet hypothesis led him to a biased interpretation of the data and a sweeping under the rug of an experimental falsification.

7. Moons of Jupiter

The moons of Jupiter were probably the most surprising new discovery made when telescopes were first pointed at the sky. An anecdote related by Kepler conveys some of the excitement: "My friend the Baron Wakher von Wachenfels drove up to my door and started shouting excitedly from his carriage: 'Is it true? Is it really true that he [i.e., Galileo] has found stars moving around stars?' I told him that it was indeed so, and only then did he enter the house." (Kepler to Galileo, 1610, Santillana 1955, 10.) It seems Galileo was indeed the first to observe the moons of Jupiter, but only by the smallest possible margin: Simon Marius independently observed them the very next day (Gaab and Leich 2018, Chapter 5, Pasachoff (2015)).

Galileo's mathematical ineptitude is on display in this case as well. "Galileo's first calculations [of the orbital periods of Jupiter's moons] were geocentric, not heliocentric. Galileo was treating Jupiter as if it revolved around the Earth, not the Sun. How he ever came to make such an error is an interesting question." (Drake 1999, 421. See also Shea 2009, 35. Galileo eventually realised his error when his calculations didn't match observations.)

Kepler and Marius, meanwhile, understood the matter perfectly and realised at once that this was another good argument against the Ptolemaic system (Drake 1999, 422). One Galileo supporter offers a very charitable interpretation: "this throws in doubt the view that by 1611 Galileo was already a Copernican zealot anxious to find every possible argument for the Earth's motion" (Drake 1999, 429). A more plausible explanation, in my opinion, is that Galileo was simply not very competent as a mathematical astronomer. It was not lack of desire to prove the earth's motion that made Galileo miss the point, it was lack of ability.

8. Comets

"Have you seen the fleeting comet with its terrifying tail?" (Drake and O'Malley 1960, 4.) This was the question on everyone's lips in 1618, following the appearance of a comet "of such brightness that all eyes and minds were immediately turned toward it." "Suddenly, men had no greater concern than that of observing the sky [...]. Great throngs gathered on mountains and other very high places, with no thought for sleep and no fear of the cold." (Drake and O'Malley 1960, 6.) "That stellar body with its menacing rays was considered as a monstrous thing" (Drake and O'Malley 1960, 4, 6), and, according to many, surely a cosmic omen foretelling imminent disasters.

Some urged a more dispassionate approach, arguing that "the single role of the mathematician" is merely to "explain the position, motion, and magnitude of those fires." (Drake and O'Malley 1960, 6–7.) Indeed, "the mathematician" had been so engaged for generations. Tycho Brahe, for instance, had worked extensively on comets, and in Galileo's time the task was taken up in depth by Kepler and others.

But entering this game would have required more mathematical skill and dilligence than Galileo was used to displaying. Not coincidentally, Galileo offered an argument for why one should ignore the serious mathematical astronomy of comets, namely that such accounts are hopelessly inconsistent:

Observations made by Tycho and many other reputable astronomers upon the comet's parallax [...] vary among themselves [...]. If [...] complete faith [...] be placed in them, one must conclude either that the comet was simultaneously below the sun and above it, [...] or else that, because it was not a fixed and real object but a vague and empty one, it was not subject to the laws of fixed and real things (Galileo, *Assayer* 1623, Drake and O'Malley 1960, 257–8).

Kepler was flabbergasted that someone calling himself a geometer could be so dismissive of the excellent work of mathematically able astronomers such as Tycho:

> Galileo [...], if anyone, is a skilled contributor of geometrical demonstrations and he knows [...] what a difference there is between the incredible observational diligence of Tycho and the indolence common to many others in this most difficult of all activities. Therefore, it is incredible that he would criticize as false the observations of all mathematicians in such a way that even those of Tycho would be included (Kepler, appendix to *Hyperaspistes* 1625, Drake and O'Malley 1960, 351).

This paradox disappears if one recognises that Galileo is not a skilled geometer after all.

Unlike serious mathematical astronomers (and perhaps precisely in order to avoid having to engage with their mathematically advanced works), Galileo maintained that comets were not physical bodies travelling through space at all, but rather a chimerical atmospheric phenomenon. (It happens that Aristotle too had held that comets were sublunary, but tradition was clearly not the reason for Galileo to adopt his theory, as Galileo argues vehemently against the Aristotelian theory and the principles on which it is based (Galileo (1957), 263, 266, 270–3).)

According to Galileo's theory of comets, "their material is thinner and more tenuous than fog or smoke" (Galileo, *Assayer* 1623, Galileo 1957, 254). "In my opinion," says Galileo, comets have "no other origin than that a part of the vapour-laden air surrounding the earth is for some reason unusually rarefied, and [...] is struck by the sun, and made to reflect its splendour" (Shea 1972, 81, OGG.VI.94).

Galileo's vapour theory of comets is inconsistent with basic observations, as he himself admits. If comets are nothing but "rarefied vapour"—that is to say, some kind of pocket of thin gas—then you'd imagine that their natural motion would be straight up, like a helium balloon. Indeed Galileo does propose that comets have such paths. But then he at once admits that this doesn't fit the facts:

"I shall not pretend to ignore that if the material in which the comets takes form had only a straight motion perpendicular to the surface of the earth […], the comet should have seemed to be directed precisely toward the zenith, whereas, in fact, it did not appear so. This compels us either to alter what was stated, […] or else to retain what has been said, adding some other cause for this apparent deviation. I cannot do the one, nor should I like to do the other." (Shea 1972, 82–3, OGG.VI.98.) Bummer, it doesn't work. But Galileo sees no way out, so he just leaves it at that.

Galileo's contemporaries were not impressed. "[Grassi's] criticism of Galileo is on the whole penetrating and to the point. He was quick to spot Galileo's inconsistencies. Grassi produced an impressive array of arguments to show that vapours could not explain the appearance and the motion of the comets [as Galileo had claimed]." (Shea 1972, 84.) For instance, the speeds of comets do not fit Galileo's theory. According to Galileo's theory, the vapours causing the appearance of comets rise uniformly from the surface of the earth straight upwards. Therefore the comet should appear to be moving fast when it is close to the horizon, and then much slower when it is higher in the sky. Just imagine a red helium balloon released by a child at a carnival: it first it shoots off quickly, but soon you can barely tell if it's rising anymore, even though it keeps going up at more or less the same speed, because your distance and angle of sight is so different. But comets do not behave like that. Detailed observations of the comet of 1618 showed a much more constant speed than Galileo's hypothesis requires.

Galileo also offered another poorly considered argument against the correct view of comets as orbiting bodies, namely that their orbits would have to be unrealistically big: "How many times would the world have to be expanded to make enough room for an entire revolution [of a comet] when one four-hundredth part of its orbit takes up half of our universe?" (Galileo, Shea 1972, 77.) This is a poor argument, because the universe must indeed be very big and then some according to Copernican theory, in order to explain the absence of stellar parallax. Since the earth's motion is observationally undetectable, the orbit of the earth must be minuscule in relation to the distance to the stars. That means there is plenty of room for comets. But Galileo conveniently pretends otherwise in his argument against comets. Evidently, Galileo "was so intent on refusing Tycho that he failed to notice that he was pleading for a universe in which there would be no room for the heliocentric theory" either (Shea 1972, 88).

In sum, Galileo's completely erroneous theory of comets was roundly and rightly criticised by contemporaries. It is difficult to see why Galileo nevertheless found it so attractive, except perhaps for the fact that it conveniently alleviated him of having to do any actual mathematical astronomy of comets.

9. Conclusion

Galileo made numerous mistakes that were corrected by his mathematically superior contemporaries. It is time to abandon the persistent myth of "Galileo's mathematical genius" (Costabel and Lerner 1973, I.41). Historians will never

see Galileo's true colours as long as they keep taking it for granted that Galileo was "the greatest mathematician in Italy, and perhaps the world" in his time (Heilbron 2010, 303). In reality, tell-tale signs of mathematical mediocrity permeate all of Galileo's works.

Galileo's mathematical shortcomings can be seen as a consistent theme intertwined with many aspects of his career. Galileo's celebrated adoption of empirical experiments and the telescope are grateful avenues of research for someone ill equipped to make a contribution on mathematical grounds. Likewise, it is easier to rhapsodise about the mathematical design of the universe and expound the basic principles of scientific method than to engage with advanced mathematical science ("those who can't do, teach"). In physics, as Descartes put it, Galileo "did not need to be a great geometer" for the purposes that he set himself: "he is eloquent to refute Aristotle, but that is not hard" (Drake 1978, 390). In astronomy, the very title of Galileo's *Dialogue Concerning the Two Chief World Systems: Ptolemaic and Copernican* reveals how antiquated and irrelevant to mathematical astronomers his framing of the issue of heliocentrism was, since "the Ptolemaic system already had been set aside, at least among mathematical astronomers" (Magruder 2009, 208), because, as Kepler said, there was "practically no one who would doubt what is common to the Copernican and Tychonic hypotheses" (Jardine 1984, 147) already well before Galileo had entered the picture. Regarding his conflict with the church, "if Galileo spoke only as a mathematician he would have nothing to worry about" (Drake 1978, 249), he was told by church authorities in 1615. Perhaps things would have turned out differently if Galileo's ability to advance science "as a mathematician" had not been so limited.

Galileo's errors also call for reassessing his good points. Apollo 15 astronauts performed an experiment on the moon. They dropped a hammer and a feather and found that they fell with the same speed. "Galileo was correct," they concluded in a famous video recording still often shown in science classrooms today. Lucretius was correct, they could have said instead, since he predicted that this would happen in the absence of air well over a millennium before Galileo (*De rerum natura*, II: 225–39). Meanwhile, Galileo was wrong, because he considered it "obvious" that the moon had an atmosphere (Shea 2009, 93). If the astronauts wanted to test Galileo's theory they should not have dropped a hammer and a feather. They should have taken off their helmets and suits and tried to breathe. That would have showed you how "right" Galileo really was. It is easy to be a hero of science if you are allowed a hundred guesses and people only remember the few that worked. If there had been air on the moon, the astronauts would have hailed Galileo for this "discovery" instead.

Posterity has chosen to remember only Galileo's successes while forgetting his numerous errors. Galileo made many erroneous claims that would have earned him not a little credit if they had been correct. It is dangerous to start with what we know and ask of history only who was the first to say it. Such selective retrospection is bound to reward careless scientists who made a hundred wild guesses instead of those who weigh evidence carefully before making any rash judgements. Galileo is indeed excessively and erroneously assertive where he should

have been much more cautious and aware of the limitations of his evidence in many cases. In this way Galileo is undermining his right to claim credit for the things he did get right: his accounts of his correct discoveries may sound very convincing and emphatic, but knowing that he was equally sure of a long list of errors gives us reason to suspect that some of the things he got right are to some extent guesswork propped up with overconfident rhetoric in the hope that readers will mistakenly think his case is stronger than it is. Only by paying attention to Galileo's errors can we gain a sound perspective on his truths.

References

OGG: *Le Opere di Galileo Galilei*, Antonio Favaro (ed.), 20 volumes, Florence, 1890-1909, later reprinted with additions.

Bertoloni Meli, Domenico. 2006. *Thinking with Objects: The Transformation of Mechanics in the Seventeenth Century*. Baltimore, MA: Johns Hopkins University Press.

Buchwald, Jed Z. and Robert Fox (eds.). 2013. *The Oxford Handbook of the History of Physics*. Oxford: Oxford University Press.

Bukowski, John. 2008. "Christiaan Huygens and the Problem of the Hanging Chain." *College Mathematics Journal* 39, 1: 2–11.

Chalmers, Alan, and Richard Nicholas. 1983. "Galileo on the Dissipative effect of a Rotating Earth." *Studies in History and Philosophy of Science* 14, 4: 315–40.

Costabel, Pierre, and Michel Pierre Lerner (eds.). 1973. "Introduction." In *Les nouvelles pensées de Galilée*, 2 vols., Paris : J. Vrin.

Damerow, Peter, Gideon Freudenthal, Peter McLaughlin, and Jürgen Renn. 2004. *Exploring the Limits of Preclassical Mechanics: A Study of Conceptual Development in Early Modern Science: Free Fall and Compounded Motion in the Work of Descartes, Galileo, and Beeckman*. Second edition. Berlin: Springer.

Drake, Stillman, and C. D. O'Malley. 1960. *The Controversy on the Comets of 1618*. Philadelphia: University of Pennsylvania Press.

Drake, Stillman. 1964. "Galileo and the Law of Inertia." *American Journal of Physics* 32, 8: 601–8.

Drake, Stillman. 1978. *Galileo at Work*. Chicago: University of Chicago Press.

Drake, Stillman. 1999. *Essays on Galileo and the History and Philosophy of Science*. Volume 1. Selected and introduced by N. M. Swerdlow and T. H. Levere. Toronto: University of Toronto Press.

Engelberg, Don, and Michael Gertner. 1981. "A Marginal Note of Mersenne Concerning the Galileian Spiral." *Historia Mathematica* 8, 1: 1–14.

Freguglia, Paolo, and Mariano Giaquinta. 2016. *The Early Period of the Calculus of Variations*. Birkhäuser: Springer.

Gaab, Hans, and Pierre Leich (eds.). 2018. *Simon Marius and His Research*. Berlin: Springer.

Galilei, Galileo. 1953. *Dialogue Concerning the Two Chief World Systems*, translated by Stillman Drake. Berkeley: University of California Press.

Galilei, Galileo. 1957. *Discoveries and Opinions of Galileo*, translated with an introduction and notes by Stillman Drake. New York: Anchor Books.

Galilei, Galileo. 1974. *Two New Sciences*, translated by Stillman Drake. Madison, WI: University of Wisconsin Press.

Galilei, Galileo. 1989. *Two New Sciences*, translated by Stillman Drake, second edition, Wall & Emerson. Toronto, University of Toronto Press.
Galilei, Galileo. 2001. *Dialogue Concerning the Two Chief World Systems*, translated by Stillman Drake. New York: Modern Library.
Hall, A. Rupert. 1952. *Ballistics in the Seventeenth Century*. Cambridge: Cambridge University Press.
Little Heath, Thomas (ed.). 2002. *The Works of Archimedes*. Mineola, NY: Dover Publications.
Heilbron, J. L. 2010. *Galileo*. Oxford: Oxford University Press.
Hill David K. 1984. "The Projection Argument in Galileo and Copernicus: Rhetorical Strategy in the Defence of the New System." *Annals of Science* 41, 2: 109–33.
Jardine, Nicholas. 1984. *The Birth of History and Philosophy of Science: Kepler's A Defence of Tycho against Ursus with Essays on its Provenance and Significance*. Cambridge: Cambridge University Press.
Jullien, Vincent (ed.). 2015. *Seventeenth-Century Indivisibles Revisited*. Birkhäuser.
Kline, Morris. 1972. *Mathematical Thought from Ancient to Modern Times*. Oxford: Oxford University Press.
Koyré, Alexandre. 1955. "A Documentary History of the Problem of Fall from Kepler to Newton." *Transactions of the American Philosophical Society* 45, 4: 329–95.
Koyré, Alexandre. 1978. *Galileo Studies*, translated by John Mepham. Hassocks: Harvester Press. [First published as *Etudes Galiléennes*, 1939].
Magruder, Kerry V. 2009. "Jesuit Science After Galileo: The Cosmology of Gabriele Beati." *Centaurus* 51, 3: 189–212.
Montesinos, José, and Carlos Solis (eds.). 2001. *Largo campo di filosofare: Eurosymposium Galileo 2001*. La Orotava: Fundación Canaria Orotava de Historia de la Ciencia.
Newton, Isaac. 1999. *The Principia: Mathematical Principles of Natural Philosophy*, translated by I. Bernard Cohen and Anne Whitman, preceded by "A guide to Newton's Principia" by I. Bernard Cohen. Berkeley: University of California Press.
Palmerino, Carla Rita, and J. M. M. H. Thijssen (eds.). 2004. *The Reception of the Galilean Science of Motion in Seventeenth-Century Europe*. Berlin: Springer.
Pasachoff, Jay M. 2015. "Simon Marius's *Mundus Iovialis*: 400th Anniversary in Galileo's Shadow." *Journal for the History of Astronomy* 46, 2: 218–34.
Poupard, Paul C. (ed.) 1987. *Galileo Galilei: Toward a Resolution of 350 Years of Debate*. Pittsburg, PA: Duquesne University Press.
Renn, Jürgen, Peter Damerow, and Simone Rieger. 2001. "Hunting the White Elephant: When and How did Galileo discover the law of fall?" In Jürgen Renn (ed.), *Galileo in Context*, 29-149. Cambridge: Cambridge University Press.
de Santillana, Giorgio. 1955. *The Crime of Galileo*. Chicago: University of Chicago Press.
Schemmel, Matthias. 2008. *The English Galileo: Thomas Harriot's Work on Motion as an Example of Preclassical Mechanics*, Volume 1: Interpretation. Berlin: Springer.
Schemmel, Matthias. 2012. "Thomas Harriot as an English Galileo: The Force of Shared Knowledge in Early Modern Mechanics." In Robert Fox (ed.), *Thomas Harriot and His World: Mathematics, Exploration, and Natural Philosophy on Early Modern England*, 89-112. Farnham: Ashgate, Surrey.
Shea, William. R. 1972. *Galileo's Intellectual Revolution*. London: Macmillan.
Shea, William R. 2009. *Galileo's Sidereus Nuncius or A Sidereal Message*. Translated from the Latin by William R. Shea. Introduction and notes by William R. Shea and Tiziana Bascelli. Sagmore Beach MA: Science History Publications.

Struik, Dirk Jan. 1969. *A Source Book in Mathematics, 1200-1800*. Cambridge, MA: Harvard University Press.
Truesdell, Clifford. 1960. *The rational mechanics of flexible or elastic bodies 1638-1788*. In *Leonhardi Euleri Opera Omnia*, Series II, Volume XI, Part 2. Zürich: Füssli.
Whitman, E. A. 1943. "Some Historical Notes on the Cycloid." *American Mathematical Monthly* 50, 5: 309–15.
Wootton, David 2010. *Galileo: Watcher of the Skies*. New Haven: Yale University Press.

The Notion of Erroneous Conscience in Pierre Bayle

Jean-Pierre Cavaillé

Abstract: This essay explores the reciprocal contamination of the notions of error and erring at the beginning of the early modern time in Latin and Romance languages, through the example of the concept of "erroneous conscience". This concept, for Pierre Bayle and those who followed him at least on this point, allows for the decriminalization of religious beliefs, and even those that challenge religion(s), by recognizing the "rights of the erroneous conscience". This right is a right to error and to erring/wandering limited to religious convictions and apparently aimed solely at "tolerance" (supporting and excusing erroneous/wandering opinions). However, it did not escape contemporaries that it radically challenged the very idea that a universal truth could be universally known and established in this field.

Keywords: erroneous conscience, pyrrhonism, moral rationalism, atheism, intolerance.

This essay considers Pierre Bayle's treatment of one of the most established notions of moral theology: "erring" or "erroneous consciousness" (as he translated from Latin "*errans*" and "*erronea conscientia*"), which he argues is inseparable from the theological notion of "invincible error" or "invincible ignorance." Bayle's explicit goal in invoking "the Rights of an erroneous Conscience" is to establish a doctrine of the broadest possible toleration in matters concerning the freedom of conscience and worship. Among the numerous studies dedicated to this particular doctrine of Bayle's—which culminates in his *Philosophical Commentary* (1686)[1]—interpretations diverge about his peculiar philosophical approach, which can be detected on both the surface level as well as the deeper layers of his doctrinal texts. This is particularly the case concerning the extent and limits of his radical interpretation of Pyrrhonism,[2] a seemingly con-

[1] *Commentaire philosophique sur ces paroles de Jésus-Christ contrain-les d'entrer: où l'on prouve par plusieurs raisons démonstratives qu'il n'y a rien de plus abominable que de faire des conversions par la contrainte, et l'on réfute tous les sophismes des convertisseurs à contrainte, et l'apologie que S. Augustin a faite des persécutions*, Cantorbery, Thomas Litwel (Amsterdam, A. Wolfgang), 1686. Throughout this esssay I refer to the 1708 English edition revised by John Kilcullen and Chandran Kukathas: Bayle 2005. See also the critical edition of Jean-Michel Gros: Bayle 2006.

[2] See the works of Labrousse 1963/1964, of Richard H. Popkin (above all: Popkin 1979) and more recently of Frédéric Brahami (2001; 2005). The theologian, atheist and Pyrrhonian Bayle has a special place in Cantelli 1969.

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tradictory position against his defence of an unfailing moral rationalism, which is more likely to foster resolutely atheistic thought (see McKenna 2012; 2018; Gros 2002; Mori 1999).

My aim in returning to these well-known texts, however, is not to solve the paradoxical aspect of Bayle's Pyrrhonism. Instead, I revisit the philosopher's work to demonstrate the lasting impact of his conception of error throughout the seventeenth and eighteenth centuries (above and beyond the artificial distinctions and oppositions between the two aesthetic categories of "Baroque" and "Classicism"). I pay close attention to Bayle's semantics of "erring" (wandering),[3] which is not only etymologically linked to "error," but also to "heresy," the theological notion of making the wrong choice or taking the wrong road. According to Bayle, the circuitous path of heresy diverges from the straight path of dogmatic truth and leads to loss, which is itself conceived as the metaphorical model of spatial bewilderment, the death of the soul, and eternal damnation. This is diametrically opposed to "orthodoxy," that is the sound path to truth and salvation. As Furetière simply states in his *Dictionary*: "taken absolutely, [error] means error in faith, heresy." In the second edition of the *Dictionary*, however, the editor Basnage de Beauval incorporated numerous citations from Bayle in the definition of error, wherein readers find an interesting juxtaposition of two examples: "we also call the erring peoples, who have no fixed habitation […]. Heretics are also called our poor erring brothers" (Furetière 1701, entry "erreur"). Following this line of reasoning, when Jews are presented as an (or the) "erring nation," it means to say that they wander through the world and are obstinate in their error.[4]

Nevertheless, Bayle—equipped with the theoretical means to refute these very notions of heresy and orthodoxy (as well as their opposition)—meticulously demonstrates how in matters of religion, the human mind is condemned to wandering and error, even and above all when it is convinced of the absolute truth of its beliefs.

1. Unwillingly Heretics

To get to the heart of the subject, it is helpful first to return to an extraordinary chapter of the *Various Thoughts,* entitled: *That some errors are not criminal.* In this section, Bayle's entire argument is based on the distinction between the moral faults and "errors" of opinion and belief: "it has never been permitted a man to give in to vice, whereas there is an infinite number of things one

[3] *L'errance* 2017.

[4] The Roma ("Gypsies," "Bohémiens," etc.) are described in an even more negative fashion (if that is possible) as an "erring" or "wandering nation." [for example Lieber 1859: 123] Through this formula, they are targeted on the basis of their incessant movements, their erratic customs and practices (theft, palmistry), and their fundamental irreligion (the Roma always conform to the dominant religion, which "proves" that they have no real one, reasons for which they are victims of invincible ignorance).

can submerge oneself in with impunity."[5] Bayle is quick to note that he is not interested in discussing the harmlessness of errors in philosophy, for that goes without saying. He is, however, fiercely critical of censorship, especially of the "most reasonable" philosophers: "For it is fairly manifest that there is nothing more innocent before God than being mistaken, with the Scholastics, about the nature of *Universale a parte rei*, about substantial forms, and so on." "Errors," or anything that can be considered errors in philosophy, are innocent before God and should be innocent also before men. Bayle allows his readers to draw the consequences that necessarily follow, because, of course, what is at stake is not only the abstruse notions of scholasticism, but those of entire philosophical systems, including those that are hardly compatible with established religions.

Accordingly, he is an heir to the claim of *libertas philosophandi*. Yet, while his predecessors justified this freedom as the search for truth, Bayle considers it, above all (and not without irony) as justified by the harmlessness of errors in philosophy. Moreover, the freedom to philosophise is itself justified by the claim that it refrains from intruding into the reserved domain of religion; philosophers had even invented a so-called "doctrine of double truth" in an attempt to protect their theoretical elaborations from the wrath of theology and ecclesiastical censorship. Bayle, on the other hand, follows an entirely different course, admitting that although the errors in philosophy are certainly legion, even a truth of the most impudent nature does no harm to anyone. He maintains, furthermore, that this also happens in theological discourse, and, more generally, in every matter of religious opinion and belief. As a result, this notion of error can thrive in both philosophy and theology: theological errors are, in fact, no more serious than the wanderings of philosophy: "I maintain that we all form a thousand judgments, concerning both the nature of God and his decrees, as false as falsity itself" (Bayle 2000, 248).

In order to demonstrate this point, Bayle does not find it necessary to directly question the truth of the dogmas of the "orthodox" Christian faith (apart from differentiating the orthodoxy between Catholics and Protestants); it is enough to note that, with regard to the fundamental dogmas shared by Protestants and Catholics, error—that is to say heresy—is everywhere, and in fact, in all minds:

> I maintain that our people are anthropomorphites and Nestorians and that every peasant who, after having learned by heart both that God is a spirit and that Jesus Christ is God and man together in a unified person, forms ideas wholly contrary to what he repeats in the manner of a parrot. As a result—errors consisting in judgments of the mind—a man may be orthodox in the phrases he recites by heart, but he does not fail to be a Nestorian if he believes that Jesus Christ, as man, is a person as properly and perfectly as himself. Now, it is assuredly in this way that a peasant conceives of him, for he is not concerned to grasp the necessary distinction (Bayle 2000, 248).

[5] Bayle, *Pensées diverses sur la comète,* 1683, cap. CC. The citations provided are from the English translation: Bayle 2000, 248.

Behind the appearance of orthodox Christians reciting their creed hide "Nestorians" who ignore themselves and conceive of the human and divine natures of Jesus Christ as entirely separate. He goes so far as to call these Christians anthropomorphites and even heretics; those who represent God in the image of the man.

But several questions arise concerning the "Peasants" under discussion; namely, to what extent is calling out the discrepancy between the memorised creed and the commonly-held view of a "person" shockingly counter-intuitive (to use the "cognitive" parlance of our contemporary language)? Does not the orthodox image of Jesus Christ (the hypostatic union of divinity and man) concern most, if not all, Christians, including those learned doctors capable of grasping the subtleties of orthodox theology? Is it possible, in other words, not to be heretic? And what of the difficulty, if not the impossibility, of truly conforming to the demands of orthodox theology? Is not the omnipresence of "error" and "heresy" in people's minds proof enough that orthodoxy itself is a web of "errors?" And finally, what about the Church fathers and theologians who the Church did not retain as heretics, who themselves multiplied the errors regarding the "truths" declared orthodox?:

> How many errors there are concerning the nature of the angels and of reasonable souls! Several church fathers did not hesitate to place them among the corporeal beings and to say that the soul of the father engenders the soul of the son. In recent times, Cardinal Cajetan did not hesitate to teach that angels are material, hardly troubling over the authority of the Lateran Council held under Innocent III at which, several famous theologians say, the spirituality of the angels was asserted. One went so far as to say that God was corporeal (Bayle 2000, 248).

The choice of these "so crude errors" is not insignificant, since they reduce all spiritual entities to corporeal beings, which not only ironically aligns great theologians with anthropomorphite peasants, but moreover demonstrates the difficulty of the human spirit to conceive spirits absolutely separated from all qualities and attributes of matter. Thus, this text shows us how Bayle exploits the notion of error not only to call into question the category of orthodoxy (and the division that it presumes between truth and errors in matters of religion), but also to undermine the Christian religion and even religion itself, which is inextricably bound to error and erring (wandering).

2. Equality Between Erroneous and Enlightened Consciences

As we dive deeper into Bayle's discussion of error, it becomes evident that his aims are much more limited and much less corrosive than what we might have thought at first. In the following passage, Bayle contrasts errors in philosophy and theology with moral faults to argue that, in relation to the latter, the former are innocent, provided that those who profess them consider them to be true:

> our anthropomorphite, Nestorian people, and those who believe that all minds have extension, and the philosophers who form so many imperfect conceptions about the nature of God, and the theologians who distinguish so many varieties of the will of God, so many sciences, and so many decrees; all these, I say, err

> without offending God, and there is no calumny, however small, that is not a greater crime than all these lies. The reason for this is that theses and? errors are altogether involuntary and that one forms these shadowy judgements without malice as well as without liberty, whereas there is no moral vice, from the greatest to the smallest, that we do not come to freely and with the knowledge of the evil we are to commit (Bayle 2000, 248–9).

In these involuntary errors without malice we may recognize the notion of invincible error or invincible ignorance of the theological tradition. This notion plays a central role in Bayle's elaboration on the nature of error, not least because he associates it with that of erroneous conscience in his texts on toleration. Yet here he only defends the idea that this type of error, unlike moral fault, does not offend God. In the *Philosophical Commentary,* Bayle raises the issue with more significant consequences, asserting that the censorship of (so-called) erroneous religious opinions and practices and, *a fortiori,* the persecution of heretics cannot be justified in any way; they are in fact crimes, pure and simple.

Bayle had already clearly established this argumentative strategy in the ninth of *the New Letters by the author of the General Critique of the History of Calvinism by Mr Maimbourg*:[6] "Where is spoken of the right of erroneous conscience, and *bona fide* errors." The conceptual background of this reflection is based on a paradox well known to theologians and casuists,[7] supported by the authority of Thomas Aquinas, who already used the double formulation *conscientia errans / erronea*.[8] In practical judgments the will must imperatively follow what reason presents as true, so that "the will which does not obey reason, even when it is mistaken, is bad. So the will which obeys reason, even when the latter errs, is good."[9] This doctrine is consistent with Pauline teaching: "everything that does not come from good faith is sin" (Romans 14. 23), which is to say, as Aquinas explains, "against conscience." Therefore "the will which opposes the erroneous reason is bad". Bayle, however, points to the contradiction and gross error of condemning heretics who are forced by violence to convert, a practice carried out in the name of orthodoxy since Saint Augustine.[10] Bayle relies on a somewhat questionable

[6] Bayle 1685, t. I, 244 ff. (we translate ourself all the quotations).

[7] "A man can never act against the lights of his erroneous conscience without committing a crime […] [This] is the common opinion of the Casuists, and if [this proposition] is false, I do not know what the principle of Morality of which we could be assured," Bayle 1704, 592 (author's translation).

[8] *Summa Theologiae,* Ia-IIae, q. 19, art 5 et 6 and *De veritate, q*u. 17 art. 3. It is also the case for modern casuists writing in Latin. See for example Rossell 1660, chapt. XXXV, where the author quotes many predecessors, including Azor, Vasquez etc.

[9] *Summa Theologiae,* Ia-IIae, q. 19, art 5 et 6. On the link between Bayle and Thomas Aquinas, see Turchetti 1991, 289–367. On this point of doctrine in Thomas Aquinas, see de Finance 1974, and Vigo, 2013.

[10] Augustine of Hippo, Letter 185: "There is an unjust persecution, which the ungodly do to the Church of Christ; and there is a righteous persecution, which the Churches of Christ do to the ungodly […]. The Church persecutes out of love, and the ungodly out of cruelty." See Brown 1964.

interpretation of a short phrase from the parable of the rich man who marries his son in the Gospels—"*Compelle intrare: Compel them to come in*"—to fault those who persecute others they regard as heretics and convert them by force.

Similarly, in *The Nouvelles Lettres*, Bayle notes: "God compels us to love and respect the truth as long as we know it; it is evident that as soon as the truth is unknown to us, it loses all its right with regard to us, and that as soon as the error is known to us under the form of the truth, it acquires all the rights with regard to us" (Bayle 1685, 253). What truth demands of us, error too, when we take it to be true, requires. Indeed, if "all the rights of truth depend on this condition: *provided it is known*[11] [...] by virtue of this right, error disguised as truth obliges us to the same things as truth" (Bayle 1685, 263).

To provide evidence of this proposition, which is somewhat difficult to accept, Bayle offers several comparisons. A janitor who must only allow people with an entry ticket to enter the house of his absent master, will refuse to welcome those who have lost their ticket, but will inevitably let in an undesirable person who has found a ticket on the way, or who has provided himself with a counterfeit ticket impossible to distinguish from the genuine ones. Thus the understanding (*entendement*) of truth appears to the janitor of the soul, which must let in only that "which presents itself clothed with the characteristics of truth." Bayle continues: should not the guardian of a fortress receive someone who presents himself as having been sent by his prince with all the required dignity, even if it is learned later that he was an impostor or a spy? Does not a son owe all respect and filial duties to his presumed father, even though he was unknowingly born of adultery? And are not all paternal rights, in this situation, granted to the presumed father?

To make an even stronger case, Bayle quotes at length Molière's famous comedy *Amphitryon*. No one doubts Alcmene's innocence when she is seduced by Jupiter, who has taken on the features of her husband Amphitryon (Bayle 1685, 280–1). The themes on display here—travesty, imposture, error taking on the appearance of truth—were undoubtedly familiar to Bayles' contemporaries, whose entire literary, theatrical and philosophical culture was haunted, even possessed by what one might call a "metaphysical illusion," that is the extreme difficulty or even impossibility of distinguishing appearances from reality, dreams from awoken experience, actors from the characters they represent, and of course true opinions from errors and wanderings of the mind. In other words, Bayle's citations have a remarkable disruptive effectiveness, which goes well beyond the letter of the text, where the divergence between error and truth in matters of religion is not questioned precisely because it should not be in order to reach an explicit objective: to place persecutors face to face with their own contradictions without ceasing to concede to them that they live in truth while the accused heretics live in error. But how can they avoid facing the implications of doubt? Could it not be that they are themselves, at the very moment when they

[11] N.B.: Italics in quotations are in the original text.

claim with passion and sincerity their orthodoxy, victims of a "comic illusion?" Are they all not as Alcmène deceived by Jupiter, as fortress guardians cheated by the enemy, as bastard sons ignorant of their illegitimate birth?

But Bayle does not find it necessary to dwell excessively on such horrors; it is enough to establish the equality of rights between heretics and the orthodox:

> This is nevertheless a picture of the Heretics and the Orthodox: these are the children of the truth and believe to be such; others believe him to be such, and are not such. The destinies of these two kinds of people are very different, but with regard to the right to respect and cultivate what they take to be truth, they are quite equal (Bayle 1685, 273).

Nonetheless the lesson is clear: for heretics, the orthodox are nothing but heretics themselves, whose truth consists only of error and lies:

> Nothing is gained by maintaining that error disguised as truth does not participate in the rights of truth, for as each sect convinces itself that it is the only one who takes for truth what is effectively so, each applies all that is said in favour of the truth and rejects on others all that is said against falsehood; and this is the means of having no longer any common Principle of reasoning, and of reducing the destiny of Religions to the laws of the strongest, and to these ridiculous maxims: *this is very good when I do it, but when another does the same, it is a detestable action* (Bayle 1685, 291).

The persecution of heretics is good and pleasing to God for those who possess the conviction of both being in the truth and acting in accordance with the truth, but in reality this is only the exercise of the "law of the strongest," since no reciprocity is granted to heretics. Heretics, nevertheless, believe that they hold the truth just as much, and, accordingly, should be able to act in the same way to impose it on those they judge to be in error. For there, as we shall see, lies the crucial question for Bayle: it is not one that concerns religious opinions, which in themselves—as aberrant as they appear—do no harm to anyone, but rather of the actions that they command or those that are justified by them: "error disguised in truth in our soul acquires the right to make us do the same actions, which the truth would command us" (Bayle 1685, 294). From here it follows that the relations between "the sects," that is to say all religions, can only be regulated by political power that either favours a religion and supports it in its fight against all the others (e.g. "toute catholique" France versus the Protestants), or that which understands that civil peace has more to gain by establishing the freedom of conscience and of worship.

3. Freedom of Conscience as the Right to Error

The arrival at this political situation is the goal that directs Bayle's entire argument in the *Philosophical Commentary,* which fully confronts a crucial question concerning the extreme yet practical effects of religious conscience; namely, the abolition of any objective criterion for distinguishing between truth and er-

ror in religious matters, a position that comes to be confused with the erroneous or erring conscience. In the *Philosophical Commentary,* under an assumed name (Jean Fox de Bruggs), Bayle affirms to have read the ninth letter against the Catholic apologist Maimbourg (another letter that Bayle did not sign) and to have been convinced by its thesis: "Error in the guise of Truth, enters upon all the Rights and Prerogatives of Truth." As he readily admits:

> This sounds somewhat harsh and extravagant; and I own I have met with other Expressions of this kind in the same Author, which to me appear'd somewhat crude and undigested at the first reading: but upon better thoughts I am clearly of his Opinion, to wit, that when Error is dress'd out in the Vestements and Livery of Truth, we owe it the same Respect as we owe to the Truth itself (Bayle 2005, 250).

Bayle further cites several examples from the letter that stand out on account of their particularly enlightening and bold nature, such as the one "of a onvinc'd Father, who exercises all the Rights and Functions of paternal Authority as rightfully as any true and real Father" (Bayle 2005, 233). He also reuses, with some modifications, the example of the fortress protector, who in this case is a "Servant" of a Master who unknowingly lets a spy into his Master's house. Here, a Crook (*filou),* acting as a "faithful Messenger" warns that if the servant does not let him in, he would be, in truth, betraying his master. But Bayle points out a "remarkable Difference:" the crook and the servant are two different people, since the crook, "conscious he has no right to come with the Master's Orders, can't do this without a Sin (*sans crime).*" The heresy, however, "being nothing distinct from the Heretical Soul in which it exists (for the Modifications of the Mind are not Entitys distinct from the Mind) is no way conscious of its being only the fantom to Truth, and consequently the Heretical Soul knows not that it either deceives or is deceiv'd. Now fully persuaded of her being in a good State, she has quite another Right of imposing such and such Acts on herself, which in the eternal Order of Morality are to follow upon such and such Persuasions; she has, I say, much a better right in this respect than the Sharper" (Bayle 2005, 251).

The heretic soul, unlike the crook's, is perfectly innocent and acts in good faith, however erroneous it may be, and therefore, has "the Right" to dictate to itself the acts that its errors command. Thus, in no way does Bayle temper his own doctrine in the *Philosophical Commentary;* he actually goes far beyond the limits he claims to give himself by advocating for the toleration of the most consensual moral theology, and in particular, for a "Principle" that embodies a truth that no one will be able to deny him: "*Whatever is done against the Dictates of Conscience is Sin.*" Bayle's definition of conscience is a nominal one, which no one can seriously question: "*Conscience is a Light dictating that such a thing is good or bad*" (Bayle 2005, 220). But Bayle, surreptitiously so, moves from moral goodness, which leaves no room for doubt (since it is wrong to act against one's conscience),—to the truth. Everyone knows that anybody can accept falsehood as the truth in all conscience, that is with the sincere conviction of being right. Such is the proper or "actual" state of an erroneous or erring conscience: it is a

deluded conscience, one hijacked by what the theological tradition calls invincible ignorance or invincible error.

The consequence is obvious, and Bayle, sure of the force of his argument, does not hesitate to formulate it in a provocative way: "the erroneous Conscience challenges all the same Prerogatives, Favors, and Assistances [*secours, et caresses*] for an Error, as an Orthodox Conscience can challenge for the Truth" (Bayle 2005, 226). The heretic is thus justified in all conscience and therefore in all moral innocence to cherish his errors, just as the orthodox cherishes his truths. When reading these lines, however we cannot be fooled: these truths are truths only for the self-declared orthodox, who has neither more nor less good reason for holding and in declaring them such than the heretic in believing and professing his errors. Bayle's example of transubstantiation, which is a dogmatic truth for Catholics while a sovereign error for Protestants, is enlightening in this respect (Bayle 2005, 266–7, 273). He adds other examples, even more troubling (if that is possible):

> As to the Distinction of Persons and Nature in God, there's reason to believe, that a Turk or a Jew wou'd find it as hard to frame their Minds in such a manner as to be entirely onvince'd of these Truths, as to discover the Intrigues [*infidélités*] that their Mother might have had (Bayle 2005, 273).

The fundamental theological concepts of Christianity are just as difficult for infidels to accept as for a son to accept the idea that he might have been the product of adultery (a rather salacious comparison, to say the least.) And on the topic of belief, Bayle professes: "I even believe there are a great many Orthodox Peasants, who are no otherwise Orthodox with regard to these Mysterys, than as they are honestly resolv'd not to believe any thing tant destroys the Doctrines of the Church: for any thing further, they have not the least Idea of 'em, that's conformable to the Truth" (Bayle 2005, 273–4). Bayle, in this passage, is referring to the invincible ignorance by which the Church excuses the errors about the mysteries of Christianity into which simple and uneducated minds almost infallibly fall, provided that these *idiotes* content themselves with saying that they believe what the Church commands to believe.[12]

Here we find Bayle taking up the same lesson of his *Various Thoughts:* in matters of religious opinions, no truth is based on anything other than the subjective conviction of those who profess it. It is, in fact, only a question of "putative truth." But Bayle lets his readers think either that the truth, at least in religious matters, is unattainable (the philosopher from Rotterdam would then be Pyrrhonian, beyond an apparent fideism; see Brahami 2001; 2005,) or that any form of religion is erroneous (moving Bayle toward atheism; see especially Mori 1999).

[12] "The subtle *Scotus t*eaches, there's an invincible Ignorance with relation to these Points, in a Man of a very mean Understanding, who comprehends not what is meant by the Terms Person or Nature; and that it's sufficient for this sort, if they believe in gross as the Church believes," Bayle 2005, 274.

He even goes so far as to make it a matter of personal taste, comparing it to the taste for food!

> It's sufficient, in like manner, that the Conscience of every particular Person shew him not what Objects are in themselves, but their relative Natures, their reputed Truth. Every one will by this means discern his own Nourishment. He must, 'tis true, endeavour to find the best, and employ his utmost diligence in the Search; but if when fairly offer'd, his Conscience kecks, finds an utter disrelish for it, and a longing for some other thing, let him in God's name leave the one, and cleave to the other (Bayle 2005, 271).

In his *Various Thoughts,* Bayle endeavoured to analyse the shapes and contents of what he calls "taste:" the opinions that one holds concerning strictly religious duties ("the way of serving God") depend on education and habit, and vary as much as "the laws of propriety" (we could no doubt speak of culturally or socially constructed taste), but also—on the contrary—of the dominant passions and temperaments of individuals that are more or less the same in all human societies.[13]

Despite his purpose for writing the *Philosophical Commentary,* which was to nullify all justification for religious persecution and to establish freedom of conscience, Bayle nevertheless emphasises the innocence of those who err in matters of religion. He also mutes the strong temptation to show that error and wandering are consubstantial with any religion. He thus strategically insists on the obligation "to follow the Suggestions of an erroneous Conscience," as one would of an "enlightened Conscience," noting that the actions that result from these errors proceed "often without crime," such as when they do not violate moral laws (or "fundamental condition," which we will return to). For, whether erroneous or enlightened, conscience compels action, and moreover, according to Bayle, nothing would be worse than suspending this imperative voice of conscience for the sake of doubting whether it is truly enlightened or not, which is always a possibility:

[13] "Whence comes it, I beg you, that although there is among men a prodigious diversity of opinions bearing on the manner of serving God and of living according to the laws of propriety, one nonetheless sees certain passions consistently ruling in all countries and in all ages? Why are ambition, avarice, envy, the desire to avenge oneself, shamelessness, and all the crimes that can satisfy these passions seen everywhere? Why are Jew and Mohammedan, Turk and Moor, Christian and Infidel, Indian and Tartar, the inhabitant of the firm earth and the inhabitant of the isles, nobleman and commoner, all the sorts of peoples who in other respects have as it were nothing in common except the general notion of man-why are they so similar in regard to these passions that one might say they copy one another? Whence comes all this, if not from the fact that the true principle of the actions of man (I except those in whom the grace of the Holy Spirit is deployed with all its efficacy) is nothing other than the temperament, the natural inclination toward pleasure, the taste one contracts for certain objects, the desire to please someone, a habit gained in the commerce with one's friends, or some other disposition that results from the ground of our nature, in whatever country one may be born, and from whatever knowledge our mind may be filled with?," Bayle 2000, 169. See the commentary on this passage in Brahami 2005.

> If what I here advance were not true, Man wou'd be reduc'd to the strangest state of Pyrrhonism that e'er was heard of: for all our Pyrrhonists hitherto have contented themselves with barring all Affirmations and Negations upon the absolute Natures of Objects; they left our moral Actions uncontested, nor ever disapprov'd Mens proceeding in the Dutys of civil Life, upon the Judgment of Conscience. But here's a Pyrrhonism which deprives us of this Liberty, and changes us into so many Stocks or Statues which can never venture to act for fear of eternal Damnation. This I prove, because the only certainty we have that all the Acts which to us appear righteous and well-pleasing to God, ought to be practis'd, is our perceiving interiorly in our Consciences that we ought to practise 'em (Bayle 2005, 270).

Bayle, as has often been observed, has a gift for "retortion," for slinging such irrational Pyrrhonism at those who, like his adversary Jurieu, refuse the erroneous conscience to let itself be guided by its own convictions, and who therefore affirm that "his Certainty is no Criterion [*marque*]," and that we have to practise "the Acts which to us appear righteous and well-pleasing to God." Thus, according to such a doctrine, "there is not a Man in the world who ought not to apprehend [*croire*] that he risks eternal Damnation, by practising what his Conscience suggests as necessary in order to Salvation" (Bayle 2005). The fear, even the perpetual terror, of being in error when one follows one's conscience would make any form of moral action impossible. But this is the case insofar as pleasing or displeasing God is considered the touchstone for weighing the morality of actions. This is precisely the core of the problem, even though it is not explicitly raised in *Various Thoughts*. The important thing here is to prove "that a sincere Heretick, even an Committeenfidel, committees accountable to God only for his evil doings committeed under the Conscience of their being evil" (Bayle 2005, 273). On the other hand, he is innocent before God of the bad deeds he believes to be good, an assertion that Bayle does not dodge, writing that while "an erroneous Conscience gives a Right of committing Evil," it can also be difficult to accept (Bayle 2005, 250).

3. The "Right of Committing Evil"

Certainly our philosopher makes a crucial distinction—on which rests his radical refutation of any justification of religious persecution,—between *doing* evil, in the sense of, for example, teaching a false religious doctrine (which is "evil" therefore if we think that the heretic is erring, but not the orthodox), and *doing* evil, in the sense of transgressing the moral commandments of "natural light." The very content of religious revelation cannot legitimately emancipate itself from the laws of universal moral reason. Thus Bayle upholds the principle that any literal meaning of Scripture "which carries an Obligation of committing Iniquity," is false.[14] On this basis he refutes the interpretation of *Compel them*

[14] In another formulation: "all particular Doctrines [dogme], whether advanc'd as contain'd in Scripture, or propos'd in any other way, are false, if repugnant to the clear and distinct Notions of natural Light, especially if they relate to Morality," Bayle 2005, 370.

to come in by the supporters of the persecutions, whatever their confession (in other words, whether they are orthodox or heretical).

It is also on this basis that he defends religious freedom against the "public disorder" caused by the formation of new "sects." In effect, if expressions of religious freedom cause "mighty Combustions and Revolutions," it can only be "accidental," "or in this case Jesus Christ and his Apostles had bin justly reputed Disturbers of the State, as they attack'd the establish'd Religion, and set up Altar against Altar, from which infinite Disorders must of necessity originate in human Society" (Bayle 2005, 289). The "Disturbers of the publick Peace" are "only those who scour the Country, plunder Villages and Towns, and rob upon the Highway; they who stir up Seditions in a City; they who smite and buffet their Neighbor, as soon as they have got an advantage of him." Jesus, the Apostles and first Christians, on the contrary, "contented themselves with shewing Men the Falseness of certain Opinions, and the Iniquity of certain Actions; they whom they converted became more dutiful and more obedient to the Laws of the Empire than ever" (Bayle 2005, 289).

Here again, the opposition between orthodoxy and heresy is worth nothing:

> seeing Error therefore and Truth have this in common, that when they make their first appearance in a Country where People are settled in a contrary Religion, they equally occasion Stirs and Disturbances; 'twere absurd to maintain, that they who come to preach an erroneous Doctrine are punishable,

otherwise one would have to justify the persecution of the early Christians, who preached the truth in the Empire still shrouded in the errors of paganism (Bayle 2005, 289–90). This point is obviously crucial to make in order to demonstrate the civil benefits of toleration, in opposition to the more commonly voiced argument for public disorder: if the Multiplicity of Religions prejudices the State, it proceeds purely from their intolerance of one another,

> but on the contrary endeavouring each to crush and destroy the other by methods of Persecution. […] Did each Party industriously cultivate that Toleration which I contend for, there might be the same Harmony in a State compos'd of ten different Sects, as there is in a Town where the several kinds of Tradesmen contribute to each others mutual Support. All that cou'd naturally proceed from it wou'd be an honest Emulation between 'em which shou'd exceed in Piety, in good Works, and in spiritual Knowledge [science] (Bayle 2005, 415).

Such reciprocal toleration is only possible, of course, if the believers of these religions either submit their beliefs according to the principles and rules enacted by the "natural light," or if they are restricted and constrained by positive law and the authority of the prince. Otherwise, how does one ensure that the conscience—whether erroneous or (so-called) enlightened—does not lead to transgressing the limits of natural morality and lapsing into intolerance and crime? Cannot the persecutor himself be absolutely convinced that he is conscientiously obeying, that is, in good faith, what he believes to be the divine commandments? The interpretation of *Compel them to come in* held by so many theologians after

Saint Augustine (the great light of the Church)—such as the Catholic doctors who inspired the revocation of the Edict of Nantes,[15] or even Protestant authors like Jurieu[16]—demonstrates that this was very ordinarily the case.

Bayle makes a very disturbing concession in asserting that "Natural Reason and Scripture are so express against Murder, and the Doctrine which maintains it has something so horrible and even hazardous, that few are capable of being so much beside themselves as really to take up this Persuasion from a Principle of Conscience" (Bayle 2005, 245). He goes on to say

> This is never to be apprehended, except from Minds over-run with Melancholy, or flaming Zealots, into whom their Directors of Conscience, flagitious Men, may possibly inspire a King-killing Principle, where the Prince is of a different Religion from theirs; whereof *France* and *England* have memorable Examples (Bayle 2005, 246).

To these two sorts of people (fanatics ready for anything and their villainous leaders) must be added at least all the examples, *en masse,* of pious souls calling for the persecution and slaughter of heretics and infidels. Moreover, customs and education—what we would call "culture"—are decisive agents in the undeniably existent persecution of societies. Bayle goes so far as to make the following hypothesis, which all but rejects the autonomy of the human mind:

> Tis very probable, shou'd People agree in making all the Children of a City believe, that 'twas the Will of God they shou'd kill all the Inhabitants of another City, they wou'd firmly believe it, and never come off of this belief, unless they went thro a new course of Instruction (Bayle 2005, 275).

Finally, doubt is no longer permitted: in truth, any religious conscience, beyond the (decidedly) pointless distinction between erroneous and enlightened, is capable of obscuring the natural light and of acting against what Bayle calls "universal reason" (see on this topic Mori 1999, chapt. 6). In other words, religious opinions or beliefs are not only rationally unfounded and therefore all likely to be errors, but because of their ambiguous and unstable relationship with natural light, they are all potentially dangerous and may prove to be criminal errors. Only their submission to the positive law of sovereign political authority can compel them to respect civil peace and prevent them from engaging in the persecution of believers of other religions.

In considering the framework of this extremely pessimistic anthropology of religious error, contemporary readers may be able to make sense of what might

[15] See for example the reuse of the *Letters* of Saint Augustine against the Protestants, to which Bayle in fact responds directly in the *Commentary: Conformité de la conduite de l'Église de France pour ramener les protestants avec celle de l'Église d'Afrique pour ramener les Donatistes à l'Église catholique*, Paris, 1685.

[16] See Pierre Jurieu's answer to the *Philosophical Commentary: Des droits des deux souverains en matière de religion, la Conscience et le Prince pour détruire le dogme de l'indifférence des religions et de la tolérance universelle Contre un livre intitulé Commentaire philosophique*, Rotterdam, 1687.

at first appear in Bayle to be scandalous or egregious paradoxes. His acknowledgment of the "virtue" of atheists (Bayle 2000, par. 122, 129, 144) for example, emerges not as problematic in this context, but rather logical and enlightening, since the atheist's moral conscience is unaffected by the errors of religion. So much can be said of the viability of an atheist society (Bayle 2000, par. 172,) perhaps even its superiority—from the point of view of promoting peace and harmony—over "real" societies (that is to say societies currently existing) where religious zeal is both the cause and pretext for so many social crises. This context reveals, moreover, how religious error, admittedly on a completely theoretical and abstract level for Bayle, is correctable, since, if its control by political authority renders it entirely inoffensive and negligible, it will always remain susceptible to criminality. This possibility exists because the religious conscience, which always considers itself enlightened, encounters the supernaturalism of its "lights" precisely by going beyond the bounds of natural light, even if only by declaring any dissenting religious opinion as false, erring, erroneous and pernicious (in other words, all that encompasses the notion of heresy). Thus the commandments of erroneous conscience, which is none other than religious conscience itself, are always liable to result in acts of intolerance, injustice and persecution.

References

Bayle, Pierre. 1685. *New Letters by the author of the General Critique of the History of Calvinism by Mr Maimbourg. A* Villefranche: chez Pierre le Blanc.

Bayle, Pierre. 1704. *Addition aux Pensées Diverses…,* in *Pensées Diverses….* Amsterdam: Reinier Leers.

Bayle, Pierre. 2000. *Various Thoughts on the Occasion of a Comet,* ed. Robert C. Bartlett. New York: State University of New York Press.

Bayle, Pierre. 2005. *A Philosophical Commentary,* ed. by J. Kilcullen-Chandran Kukathas. Indianapolis: Liberty Fund.

Bayle, Pierre. 2006. *De la tolérance. Commentaire philosophique,* ed. by J.-M. Gros. Paris: Honoré Champion.

Brahami, Frédéric. 2001. *Le travail du scepticisme: Montaigne, Bayle, Hume.* Paris: Presses Universitaires de France.

Brahami, Frédéric. 2005. "Le Dieu de Bayle est-il relativiste?" *Dix-septième siècle* 57: 135–44.

Brown, Peter. 1964. "St. Augustine's Attitude to Religious Coercion." *Journal of Roman Studies* 54: 107–16.

Cantelli, Gianfranco. 1969. *Teologia e ateismo. Saggio sul pensiero filosofico e religioso di Pierre Bayle.* Firenze: Nuova Italia.

de Finance, Joseph. 1974. "Sens et limites de l'objectivisme moral chez Saint Thomas: A propos du problème de la conscience erronée." *Revista Portuguesa de Filosofia* 30: 107–26.

Furetière, Antoine. 1701. *Dictionnaire universel,* Seconde édition revue, corrigée et augmentée par Monsieur Basnage de Beauval. La Haye: A. et R. Leers.

Gros, Jean-Michel. 2002. "Bayle: de la tolérance à la liberté de conscience." In *Les Fondements philosophiques de la tolérance,* ed. by Yves-Charles Zarka-Franck Lessay-John Rogers, t. I, *Études,* 295–311. Paris: PUF.

L'errance au XVII^e siècle 45e Congrès de la North American Society for Seventeenth-Century French Literature, Québec, 4 au 6 juin 2015, ed. Lucie Desjardins-Marie-Christine Pioffet-Roxanne Roy. 2017. Tübingen: Narr.

Labrousse, Élisabeth. 1963 (2e éd. 1985). *Pierre Bayle.* Vol. 1: *Du Pays de Foix à la cité d'Érasme*. La Haye: M. Nijhoff.

Labrousse, Élisabeth. 1964. *Pierre Bayle.* Vol. 2: *Hétérodoxie et rigorisme*. La Haye: M. Nijhoff. (2e éd., Paris: A. Michel, 1996).

Lieber, Francis. 1859. *Encyclopaedia Americana…* Boston: Bazin & Ellsworth, vol. 6.

McKenna, Antony. 2012. "Introduction." In *Pierre Bayle et la liberté de conscience*, 1–15. Toulouse: Anacharsis.

McKenna, Antony. 2018. "Pierre Bayle, les vérités évidentes et les vérités particulières." In *Libertinage et philosophie à l'époque classique (XVI^e-XVIII^e siècle). 15 (Pierre Bayle and the Libertins)*: 147–66.

Mori, Gianluca. 1999. *Bayle philosophe.* Paris: Honoré Champion.

Popkin, Richard H. 1979. *The History of Scepticism from Erasmus to Spinoza.* Berkeley: University of California Press.

Rossell, Josep. 1660. *Tractatus sive praxis deponendi conscientiam in dubiis…* Lyon: Bordes.

Turchetti, Mario. 1991. "La liberté de conscience et l'autorité du magistrat au lendemain de la Révocation. Aperçus du débat touchant la théologie morale et la philosophie politique des Réformés: Pierre Bayle, Noël Aubert de Versé, Pierre Jurieu, Jacques Philipot et Élie Saurin" In *La liberté de conscience (XVI^e-XVII^e siècles),* ed. by H. R. Guggisberg, F. Lestringant et J.-C. Margolin, 289–367. Genève: Droz.

Vigo, Alejandro G. 2013. "La conciencia errónea. De Sócrates a Tomás de Aquino." *Signos Filosóficos* 15: 9–37.

Positive and Negative Error. A Debate in the Illuminati Order

Martin Mulsow

Abstract: That error could be of interest to Freemasons and Illuminati as a topic becomes evident when one sees it in the context of concepts such as prejudice, ignorance, and gullibility. The perfection of the human being was understood as the detachment from prejudices – from errors –, as overcoming ignorance and as a fight against gullibility. In 1785 there was a discussion among the Illuminati of Gotha about how one should understand error. Prince August of Saxe-Gotha transfers Voltaire's two types of imagination to two types of errors, using the distinction made by the physicist Charles Du Fay, who distinguished resin electricity (*électricité résineuse*) with its negative charge from glass electricity (*électricité vitreuse*) with its positive charge. So August suggests that there are positive and negative errors: the positive errors are attractive, they attract. In this case the cause of error lies on our side, on the side of the subjects: because of certain defects in the knower, facts are not correctly recognized. The negative errors, on the other hand, repel: there it is due to the nature of the representations of the facts themselves, which have pitfalls or are distorted by hallucinations, that we go wrong.

Keywords: Illuminati order, August von Gotha, German Freemasonry, electricity, imagination

1. Error as a Subject in Freemasonry

The Illuminati were a secret society of the German late Enlightenment, which took up the cause of the improvement of individuals and society.[1] Founded in 1776 by Adam Weishaupt, it was initially called the "League of Perfectibilists" before the name was changed to "Illuminati." For the first few years, the order played only a local role within Bavarian politics with its infiltration tactics, but after 1780 it expanded, mainly through the promotional activities of Freiherr von Knigge, and after 1782, when German Freemasonry was in a crisis, it exploded almost and expanded in a very short time all over Germany with almost 2000 members. All this happened in the greatest possible secrecy, with aliases, secret meetings and undercover information on place and time. In 1784, however, the activities in Bavaria were exposed, the order was banned there, so that its center

[1] On the Illuminati order see Engel 1906; Le Forestier 1914; Van Dülmen 1977; Rachold (ed.) 1984; Agethen 1987; Neugebauer-Wölk; Hammermeyer 2003; Gregory 2009. On the ideal of perfection see Pawlowski 2004.

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now shifted to central Germany, especially to Thuringia, where in Weimar and Gotha Johann Joachim Christoph Bode and Duke Ernst II pulled the strings.[2] However, the crisis widened into a crisis of legitimacy when it became public in 1787 that Adam Weishaupt himself, who had set out with the highest moral ideals, had acted morally reprehensible when he fathered a child with his sister-in-law, then wanted to have it aborted and also use his secret society connections. The order, which had recruited the most promising, cleverest and most socially committed young men everywhere, whether in Heidelberg, Frankfurt, Munich, Vienna, Göttingen or Gotha, then imploded as quickly as it had expanded: by 1788 at the latest, communication with the order was stopped, and the networks that had formed only continued to work for themselves and informally.

In the few years of its heyday, however, the Illuminati order represented, so to speak, a supra-regionally active early form of a progressive party, which went beyond the visible institutions, but used them, for enlightenment, reforms and moral improvement of the people. And it formed an internal public, organized according to local chapters—called Minervalkirchen—in which the members read essays to each other and discussed them at meetings every three or four weeks. These essays were partly suggested by the group leaders, but partly also by the members themselves. Occasionally several members wrote about the same problem, which makes it possible to compare the proposed solutions.

About 150 of these handwritten essays have been preserved for the Illuminati settlements in Gotha, Erfurt, Rudolstadt and Jena in the so called Schwedenkiste (on the Schwedenkiste see Endler 1990.) Together with minutes and letters, they make it possible to reconstruct the exact context of the discussion in a way that is almost impossible to find anywhere else.[3] And one of the subjects discussed was that of error.

That error could be a subject of interest to Masons and Illuminati becomes evident once it is seen in the context of concepts such as prejudice, ignorance and credulity. For the perfection of man was understood as breaking away from prejudices—from errors—as overcoming ignorance and as a fight against gullibility. All these qualities are the negative of epistemic virtues: they are epistemic vices. We shall see that contemporaries themselves, like Gaston Bachelard later, spoke of obstacles to knowledge.

But typical for the Illuminati is not just epistemic virtue education. That would have something purely methodological and pedagogical about it. In clinging to Freemasonry as an invisible elite extension of it, the Illuminati Order also inherited a certain pathos of "Truth" and "Wisdom" (with a capital T and W) not entirely distant from the theological pathos of the One True. But theolo-

[2] On the later phase of the order see Wilson 1991; Schings 1996; Müller-Seidel and Riedel 2002.

[3] Geheimes Staatsarchiv Preußischer Kulturbesitz, Freimaurer, 5.2. G39 Nr. 111ff. I am grateful to the Große National-Mutterloge „Zu den drei Weltkugeln" for their friendly permission to use these documents. For the sake of clarity and simplicity I cite the documents with the abbreviation SK [=Schwedenkiste], the number of the volume and the number of the document (e.g. SK13-034).

gy has its own tradition of addressing errors. Since Lactantius and Augustine, idolatry and heresy have been regarded as "errors," as deviations from the truth of faith. In the 17th century people spoke of "fundamental errors" when they wanted to characterize the basic wrong decisions in intellectual history such as Manichaeism or materialism. Accordingly, some theosophically oriented Freemasons such as the Frenchman Louis Claude de Saint-Martin called their books *Des erreurs et de la verité*—the title of Saint-Martin's work of 1775. There he explains his highly speculative principles and states "that it consequently there can be no true knowledge other than these principles" ([Saint-Martin] 1775. See Schmidt-Biggemann 2004). Everything else is a multitude of opinions and sects, all of which err. The book was also widely discussed in Illuminati circles after the Freemason Matthias Claudius translated it in 1782. Anton Kreill, Illuminati member in Vienna, discussed it extensively in the *Journal für Freymaurer.* Ignaz von Born, the director of the Vienna Minerval Church, sent the review to his friend Karl Leonhard Reinhold, who now lived in Weimar, and Reinhold forwarded it to Bode.[4]

All this happened at the turn of the year 1784/85. One might think that the discussions about error, which began in January 1785 among the Central German Illuminati, were triggered or shaped by this lead. But that is not the case. These Illuminati were anything but theosophical.

2. Prince August's Proposal

On Friday, January 21, 1785 there is a long Minerval Church session in Gotha in the house of the court gardener Wehmeyer on the edge of the Mystery Garden in front of the castle (the minutes of the meeting are in SK15-016.) A total of six lectures are read out, plus a letter, as the neatly written minutes show. The head of the lodge, Castle Captain von Helmolt (code name "Chrysostomos"), first reads a passage on "Prudence" from a Book of Wisdom to the people, then allocates essay topics for future meetings and collects money for charity. The texts, which are read out and discussed, deal with topics as diverse as self-love, friendship, the Bohemian school system and the question of whether there are more bad people than good people. At the end of what must surely be a good three hours, the eleven brothers besides Helmolt are sent home with the motto "Be careful not to complain too much in misfortune." And right in the middle: August von Gotha on "two main classes of errors."

August bore the code name "Walter Fürst" based on the Swiss Confederation legend of freedom. He was the brother of the reigning duke, and while the duke was running his affairs of state, the always ailing August had little choice but to pursue his aesthetic interests. He was an intelligent and educated man, a

[4] Kreill 1784; Reinhold to Bode, without date (about 1784/85), SK06-207: „Ich erinnere mich, daß Sie mir einst erlaubten, Ihnen das Stück des wienerischen Maurerjournals das den Aufsatz über das Buch Des erreurs liefern würde, mitzutheilen. Hier ist es."

friend of Wieland, Herder and Goethe, but extremely reserved, without much self-confidence. "It would be too daring of me, my brothers," August begins in his modest way, "if I wanted to talk about enlightenment at this meeting, since some of you already have dealt with this important subject with much insight and acumen" (SK13-004: Von zwey Classen der Irrthümer). He alluded to Schack Hermann Ewald and Rudolf Zacharias Becker, two of the brightest minds in the Gotha group, who read essays on the subject "What is Enlightenment?" in June and December of the previous year—the same year, in which comments on this topic were also made in the *Berliner Monatsschrift*.[5] August, however, wants to set a new accent: "Allow me to entertain you at present only about the obstacles of the same, namely about the errors, which I would like to make myself more comprehensible for the time being, by dividing them into two main classes." The "for the time being" reflects August's reserved manner, but at least he is attempting a very peculiar and original classification here.

"Methink, my brethren, we should be looking too generally at errors if we ascribed them no source other than ignorance, and the outbursts of a raging imagination, the explanations unsupported by experience or evidence, and at last the credulity so peculiar for an eternal childhood not included in it." Imagination is the key word that really drives August. But how is imagination related to ignorance? There is a theory that did this very powerfully at the beginning of the 18th century; it comes from Fontenelle. August does not name him, but the expression of "eternal childhood" points strongly to him. In *De l'origine des fables*, published in 1724, Fontenelle interpreted myth-making as a compensation for ignorance: "The more ignorant one is and the less experience one has, the more miracles one sees. The first men therefore saw many miracles; and since fathers, of course, tell their children what they saw and did, only miracles occurred in the tales of those times."[6] If mankind does not overcome this, it remains in a kind of eternal childhood.

Error is something specifically earthly, human, according to August:

> Of course we would have to be angels or gods if we were never to run the risk of making mistakes, or in other words if we had such vivid insight into everything that the case of error would become a completely impossible case for us. Then, and only under such a condition, would our fluttering imagination be utterly silenced, all craving for explanation would cease of itself, and credulity would disappear from our moral nature. However, as long as we inhabit our planet, such an ennobling of human powers remains impossible, because from all sides we are confronted with deception of the senses, with secret desires of passionate hearts, with a tendency to slumber in the mind and have to fight a thousand kinds of spiritual enemies in combating which we commonly succumb.

[5] On Ewald and Becker on this topic see Mulsow 2015; on the debate in the Berliner Monatsschrift see the documentation in Hinske 1990.

[6] Fontenelle 1932. On the enlightenment debate on imagination see Dürbeck 1998; Schings 1977.

These are all still quite traditional considerations about the human inclination to explanations in Fontenelle's sense. But now comes August's actual thesis: "Just as electricity is usually divided into a positive and a negative type; so I should be inclined to accept positive and negative errors; which certainly, like them perhaps, finally flowed together into one." That is August's central suggestion. How did he come up with the idea of seeing errors as analogous to electricity? When rubbing a glass tube and a rod made of resin or sealing wax, different electrostatic charges—as we would say today—are created. Charles Du Fay had distinguished resin electricity (*électricité résineuse*) with its negative charge from glass electricity (*électricité vitreuse*) with its positive charge. Let's take a closer look at August's choice of words. The semantics of the "confluence" of the two "kinds" of electricity point to the debates as to whether it is one fluid or two that make up electricity. Men like Jean-Antoine Nollet had advocated the two-fluid theory, but many now accepted the criticisms of it from Benjamin Franklin and William Watson, who argued that there was only one fluid and that what mattered was where that fluid was, whether a body be positively or negatively charged (see Bragatto Boss 2006; Torlais 1954; Cohen 199; on the debate about electricity in Germany, see Hochadel 2003). In Gotha it was quite natural to come up with such analogies, because August's brother, Duke Ernst II, was very interested in physics and promoted natural sciences at court. While classical literature flourished in Weimar, Gotha was the "Weimar of the natural sciences." Ludwig Christian Lichtenberg, the older brother of the physicist Georg Christoph Lichtenberg from Göttingen, worked here. He was an assistant councilor at Gothaer Hof and responsible for the physical cabinet. From 1781 he published the magazine for the latest in physics and natural history, introduced the lightning rod in Gotha and developed an electrifying machine as early as 1773 (see Schmidt-Funke, Berg, and Mulsow 2021) Prince August could talk to him about positive and negative charges and even look over his shoulder during the experiments. It struck him that the distinction between the "effluvium" and the "affluvium" in Nollet, namely the active transition of a positive fluid to another when two bodies touch intimately, and the passive release of the negative fluid of the second body to the first, had a certain similarity to a classification by Voltaire, which also deals with active and passive forces.

August was not a natural scientist, but much more a man of letters, and he loved Voltaire more than anything. It was he who, together with the Gotha publisher Ettinger, organized the first complete edition of Voltaire, which was printed in south-west Germany, in Kehl, but to which the Gotha publisher Ettinger contributed (Gil 2018). In the article "Imagination" of his *Questions sur l'Encyclopédie*, as August later reconstructed his chain of associations, Voltaire

> divides imagination into active and passive […]. The latter, when touched from without, becomes the source of all superstition, just as the former becomes the muse of poetry, painting, and music, etc. In short, the one adopts everything that has been invented, the other invents it herself, with the knowledge that she is doing it voluntarily. At least that's how, August qualifies, "the memory of this Voltarian treatise still lies in my soul (August to Becker, 19.2.1785, SK14-005).

In fact, Voltaire divides the imagination into two types: "Il y a deux sortes de l'imagination, l'une qui consiste à retenir une simple impression des objets; l'autre qui arrange ces images reçues, et les combine en mille manieres. La premiere a été appellée imagination passive, la seconde active" (Encyclopédie, vol. VIII (1765), 561). In his *Encyclopédie* article, as in his other epistemology, Voltaire oriented himself to Condillac's philosophy, which Condillac took basicly from Locke. With Voltaire the point of the distinction was that the passive imagination is determined solely by the impression of sensory data, while the active imagination combines memory with reflection and accomplishes a feat of combination. Spontaneity and freedom play a role in her, and she combines cognitive and aesthetic qualities (Zwinck 2006, 71ff).

But how did August transfer this Voltairean way of thinking to electricity on the one hand and to the classification of errors on the other? "Some" errors, he says, "would attract us, as it were, so that we would have to err through self-deception and our own fault; the others, on the other hand, push us away from the truth and into darkness through inner defects of knowledge and outer deceptions of the senses" (SK13-004). Positive errors have power of attraction: they attract. The fault lies with them, the cause lies on our side, the side of the subjects: due to certain defects of the recognizer, facts are not recognized correctly. The negative errors, on the other hand, repel: there it is due to the nature of the representations of the facts themselves, which have pitfalls or are distorted by hallucinations, that we go wrong.

August's metaphor is not entirely consistent: on the one hand, he speaks of the subjects being repelled by the truth through errors; the other time about the attraction of subjects to errors. So the parallel is not complete. We will come back to that later. In 1763, Kant demonstrated that one could deal with "positive" and "negative" at all in epistemology, when he introduced "the negative magnitudes into world wisdom" as real repugnance, in which one magnitude is the opposite of the other (Kant 1763). And that one could make the error the object of a quantifying calculation was suggested by Ernst Adolph Westhof in 1772 in an article in the *Hamburger Magazin* on the "rules according to which the importance of an error can be judged:" "The more obvious an error is, the welfare of individual people or entire peoples destroyed, the more it deserves to be feared and loathed" (Westhof 1772, 367). This was a pre-utilitarian calculation, taking into account, so to speak, the common costs of error.

August also relates error and society to one another, but only to the extent that it would be desirable for "a society whose noblest purpose it is to control error and prejudice as much as possible, to make serious business out of it, the border lines to draw between the two classes; which I think I can only see, as if behind a twilight cloud." Of course, the "society" August is talking about here is what Reinhard Koselleck described as the social interior (*gesellschaftlichen Innenraum*) of the 18th century, namely the secret society (Koselleck 1959).

As an example of how his classification works, August uses the fallacy of geocentrism. Assuming the earth to be the center of the world was due to incorrect measurements and calculations (which, by the way, is not necessarily the case)

and has now been overcome. That was just a negative mistake. "But when the fabulous art of the astrologer was joined to false astronomy, did not a new error arose on the wings of a sick imagination? Didn't the weakness of wanting to explain and prophesy the destinies of men and empires take its share? And didn't the foolish astrologer grasp the credulity of the deceived and the self-deceiving deceivers eagerly with both hands?" Here August quite clearly follows Voltaire's concept of an active imagination and therefore determines the situation as a positive error: on the basis of the negative error of astronomy arose the positive error of astrology. While the first, to put it in modern terms, is based solely on cognitive epistemic vices, the second is based on ethically problematic characteristics: desire for explanation, lust for power, deceit—and self-deception. We shall see that Johann Benjamin Koppe elaborates on this point in his contribution.

Can different types of errors build on each other? So is positivity of error a superaddendum, contrary to what the charge opposition in the electrostatic analogy suggests? Geocentrism seems to have been a cardinal example of a basic scientific error in human history (Westhof also invokes it), and Lorraine Daston has shown that such basic errors could inspire a collective sense of shame when looking back from the eighteenth century (Daston 2005, see also Blumenberg 1975). August relates this fundamental error to the nature of astrology.

At the end of his short lecture, the Gotha prince suggests that the characteristics of the positive errors, which he considers far more dangerous, should be worked out more precisely in the circle of the Illuminati: "so that at least the sum of such errors, which are not just based on a lack of human knowledge, does not still grow daily like a water that devastates fields and huts" (SK13-004). That is the practical benefit that is to be striven for here.

3. The Discussion in the Gotha Minervalkirche

It is the advantage of the source situation through the dense documentation of the Schwedenkiste that the internal discussion triggered by August in the Illuminati order can be followed closely. Was the prince able to convince his confreres of his conceptual differentiation? In the debate on January 21, there were doubts as to whether the terms "positive" and "negative" were really appropriate for what August had wanted to say. It was suggested that it would be better to talk about "subjective" and "objective" errors. August reports this in a Quibus Licet (the Reports to the Superiors of the Order), which he wrote four days later, on the 25th (Quibus Licet from August. 25.1.1785. SK 11-005). But there were also more detailed, subsequent reactions.

It seems that the question about the errors was, taking up August's suggestion, also presented to other members of the order for an answer. August writes in the Quibus Licet, modestly as ever: "May I ask that my name be completely ignored if the question is asked?" (Quibus Licet from August. 25.1.1785. SK 11-005). He was simply interested in initiating a debate, similar to what he had done before, not about profiling himself. And Bode or Helmolt, his superiors in the order, implemented the suggestion. In the Schwedenkiste we have two of

the response texts submitted at the time, one by Johann Benjamin Koppe (code name "Acacius") and one by Johann Christian Ernst Haun (code name "Jacob Thomasius"), both members of the Gotha local group, the latter in the January meeting, in which August had presented, also present. A third essay by the archive registrar Johann Carl Hess ("Rapin Thoyras") has not survived (see Session of the Minerval Church Gotha, 22. 9. 1786; SK SK15-152). And even the duke himself, Ernst II, who otherwise did not get involved in what was happening in the lodge, seems to have wrestled a few sentences from himself on the subject. But finally—and above all—there was the direct reaction of Rudolf Zacharias Becker ("Henricus Stephanus") to August's advance.

Most of the contributions are affirmative—which may not only have been due to the stimulating distinction, but also to the authority that a member of the princely family possessed even when he was completely withdrawn in the circle of the Masonic "brothers." Haun, who taught at the Gymnasium in Gotha, reproduced the division into negative and positive and contributed an example of his own, this time from the medical field:

> So it was a negative mistake that the Jews did not know the true cause of the convulsive nervous diseases, and therefore had an incomplete, erroneous notion of them. Subsequently it was reinforced by a doubly positive one, firstly, that to fill the gap caused by the negative they falsely ascribed the origin of the disease to certain invisible malevolent spirits. [And secondly:] Through credulity the positive error spreads to others (SK13-112).

The error is doubly positive, because initially—in Fontenelle's sense—the gap of ignorance is actively overcompensated by superstition, but then the spread from one people—the Jews of the Old Testament—to all others takes place. Here Haun is following a widespread anti-Judaism of the Enlightenment, which in particular separated the morality of the New Testament from the irrationality and the belief in demons of the Old (see Sutcliffe 2005).

Haun uses the old metaphor of the "medicina mentis," which has been popular since the 17th century for connecting logic on the one hand and criticism of prejudice on the other. It would be about "making a sick mind healthy, namely when I am among its curable diseases, such as cheap, gullible, ignorance, too fleeting contemplation and excitement occurring objects, or even carelessness, inertia, excessive sensuality, hasty judgment, stubbornness, pride and lust for genius." Haun thus enriches the list of epistemic vices with a number of additional vices.

Johann Benjamin Koppe, a professor of theology who moved from Göttingen to Gotha and an important eminence in the leadership of the Illuminati order, also takes an affirmative stance on August's proposal, even if he does not explicitly adopt its terminology. He first reformulates the negative error by saying that it is "the result of a natural weakness of the head and a total lack of opportunities and tools for enlightenment" (SK14-012). Children, the common people, but also non-specialists in special regions of knowledge suffer from this ignorance. Koppe sees the positive error—which he does not name as such—in connection with various affects such as sloth, pride and desire.

However, in his assignment to the confreres, August had asked how the characteristics of positive errors should be determined more precisely, i.e. how the relationship between various epistemic vices should be understood. Here Koppe's contribution brings some progress: "General characteristics of these different sources of errors," he says, "may be difficult to state: and it requires an exact knowledge of the erring one himself, in order to be able to determine with him whether from the one or from another source, whether from one source alone or from several combined?" A differential analysis of error thus presupposes an analysis of the erring subject, not just a general enumeration of vices.

> But in general, perhaps this much can be shed light on: in errors about subjects that are very closely connected with our inner and outer happiness, e.g. about religion, about the morality of certain actions to which our temperament drives us; about people who are so close to us that we can expect harm or judgment from them; with these errors, in most cases, it is not actual ignorance that is the cause, but some of the other sources; on the other hand, errors, either about quite abstract matters or about things that lie too far outside our circle to ever touch us, tend to arise more often from actual ignorance (at most from indolence alongside this) than from pride and passion.

In August's terminology, this would mean: negative errors usually occur when it comes to abstract and formal things that have no existential relevance. But whenever one's own happiness comes into play, i.e. the affective and ethical self-reference, then this self-reference creates a source of error of its own kind, so to speak, an affective sphere of love, hate, power and pride that produces positive errors. Koppe does not use the theory of compensation, which allows positive errors to fill the gaps left by negative errors, but rather favors the juxtaposition of epistemic situations remote from affect and close to affect.

The short statement that Duke Ernst makes on his brother's question reads almost like a comment on Koppe and his statements about happiness. Ernst confines himself—in accordance with his position—to an ethical-political perspective: "Most human errors," he says, "may well have arisen from the fact that the middle ends of bliss and tranquility are seen as the end ends of our existence, and over them the whole thing have forgotten what they now serve" (SK13-002 and SK13-003). This is a terminology that was used in Wolffianism, also in cameralistic considerations of the gradation of purposes. Middle ends like prosperity and peace are taken for ends, but for Ernst there are higher and final goals like the enlightenment and perfection of mankind. Gottlieb Hufeland, Illuminati member in Jena, described this as a material principle of morality in his natural law (Hufeland 1790). Ernst's argument is analogous to the classical one about idolatry: there, too, the "primitive" peoples are accused of taking middle causes for final causes and therefore worshiping trees, animals or winds instead of God as the final cause. Ernst, however, sticks to the statement of a mix-up, i.e. a cognitive defect, and does not arrive at a theory of affective subjectivity like Koppe.

4. Becker's Criticism

The various ways in which the question of error is approached sometimes reveals more about the authors than about the problem itself. This was precisely one of Adam Weishaupt's ulterior motives when he made essay question-answering (as "Pensa") a cornerstone in the practices of his order: the texts reveal the character traits of the members and at the same time they help to advance them in their character formation (see Meumann and Simons 2017).

But the Gotha debate on errors would have been stale if it had consisted of nothing more than approving extensions of Prince August's suggestion. After all, we have already seen that August's imagery was quite shaky and vulnerable. It took a bright and independent mind like Becker to turn the wobble into a fall.

Becker, the popular educationalist, philosopher and theologian, editor of the *Deutsche Zeitung* in Gotha, shows in his contribution—which we know from a report by August of February 25—that he understands the electricity analogy that August used very well, yes, that he might have mastered the theory of electricity better than the latter. "The attraction and repulsion in electricity happens from the center," he specifies, "and depends on the nature of the object that is brought into the electrical sphere of action. In the application of this phenomenon to errors, therefore, these take the place of electrical matter, and the mind is the object which is attracted or repelled. The direction which the positive and negative errors give to the mind would therefore have to be exactly the opposite if the comparison were to be correct."[7] Now comes Becker's astute objection: "But it seems as if nothing else could be done about the effect of the error on the mind to think of as a point of direction, except for the imperfection, the lack of development of it; and to this point the mind is driven, according to the treatise, by both types of error, albeit in different ways." Becker takes August's imagery seriously and states that actually both errors are negative in the sense of repulsive. A point of direction is a point of aim and orientation, and that in error is something far removed from spirit and truth. "The division gives therefore," Becker sums up dryly, "considered in this respect, probably not a true species of error."

But he allows his criticism only for the choice of words and metaphors. As far as the matter is concerned, he thinks August's suggestion makes sense if worded differently: "Some errors keep the mind in its imperfect, undeveloped state: but others push it in developing and working on its store of materials, deeper back into the state of obscure and confused concepts." The guiding difference is now undeveloped/developed: the active process of development of the mind can go astray, so that the repulsion in confusion is even stronger than in missteps by pending development. August's example of geocentricity and astrology makes better sense then.

Becker goes even further in order to define the concept of error more precisely.

[7] SK 13-04: August Prinz von Sachsen-Gotha-Altenburg: Auszug eines Schreibens von Heinricus Stephanus [R.Z. Becker] an Walther Fürst [Prinz August von Gotha], Gotha, 25.2.1785. On Becker, see Siegert 1978; Tölle 1994.

> Error is nothing else than incorrect connection of a predicate with a subject. The inaccuracy lies either in not knowing their true relationship, or in ascribing something to them that they do not have. In the first case, the mind will not work on the idea any further: that is, with regard to the idea, it will remain in its imperfection and be kept alive. Otherwise, the more it develops the wrong thought and associates it with others, the deeper it will sink into confusion and darkness through his operation itself, since it gives the subject a wrong predicate.

In this way Becker reformulates what August tried to express through Voltaire's passive and active imagination, in a more basic way, namely through predicate logic. The undeveloped mind with its ignorance only errs insofar as it does not ascribe a specific predicate to a subject (one can ask here, however, whether this really is already an error); the evolved, more complex mind sometimes assigns a wrong predicate to subjects. This is worse than admitting one's ignorance. From this Becker can say: "The first [type of error] arises from the natural and accidental limitation of the limitedness of the mind and its scope: the other from its drive for effectiveness." Unlike Koppe, Becker explains this kind of error not through the clouding of the judgment through affect in self-reference, but through a drive to be effective, through the activity of the mind itself. "The former type is actually just a lack, the absence of truth; this type of error is really existing untruth." And Becker transfers the difference from the individual to the species: "The first is found among rude peoples: the second most frequently among cultivated people."

Becker had been a pedagogue and teacher at the Philanthropin in Dessau. Observing young people in their development, in their urge for self-development, is close to his heart. And he sees that sometimes the wrong paths have been taken. Activity can go wrong. His pedagogical perspective leads him to talk about "procedures" for avoiding both forms of error: "The former would require instruction, the expansion of knowledge, the awakening of the thirst for knowledge: the latter, on the other hand, the healing of curiosity, the correction of insights, the restraint of imagination and government of the mind. In the case of youth, the former is the object of instruction: the latter is the actual education."

The reasoning about mistakes has suddenly mutated from electrical metaphor to a pedagogical lesson. Becker dropped the "positive" and "negative." But he wants to build a bridge for August, showing how—in a modified form—positivity and negativity, together with the analogy to electrostatics, could be maintained. If he had to defend his proposal in a university disputation, he says, he would stick aggressively to his proposed terminology. According to this, August should quietly

> [commit to] the Franklinian theory of electricity. According to this, the negative is as much as—deprivation, lack of natural measure; the positive—overcrowding of electrical matter: almost like the positive and negative magnitudes, or like plus and minus in arithmetic. The former deny the existence of a reality; these establish it. But according to the narrated and admitted characteristics of my two classes of errors [Becker puts himself in August's place] the first gives a real

> minus in the sum of knowledge; that's why I call it negative: the other, where a wrong predicate is assigned to the subject, gives plus, that's why I call it positive. Negative errors are therefore based on ignorance and limitations of the mind and are defects in the system of thought: positive ones are based on incorrect application of the power of thought and are errors in the system of thought.

Becker thus introduces the difference between defect and error, in order to name the deficient, in the other case additive, but incorrect character of "thought systems." "In this sense," concludes Becker, "the expression seems quite appropriate to the matter," and he has another punch line ready: "And if the gentleman opponent doesn't notice that I've turned the tables and now call it negative, what above was positive: so he must admit that he has been overcome. But the faculty will be [issuing] me the master's degree, even if he discovers the fraud; provided I only pay the fees."

The harsh criticism ends on a humorous and forgiving note. While with August and also with Becker, positivity was initially meant as an attraction to an error, and in Becker's dialectical gimmick it has now become negativity and mere deficiency. And August? He acknowledges the criticism: "For my part, I also confess that I have been overcome, and here I publicly express my heartfelt, warmest thanks to our beloved brother for the corrections, which he means with as much frankness as sagacity [and] thorough insight knew how to give wavering concepts" (SK13-064). In the end, August is even happy that his initiative has brought about so much meaningful differentiation in the discussion process.

Was this whole process really typical for the Illuminati? Or could it have taken place in other contexts as well, at a university, at an academy, in an urban environment or in the context of magazines? In a way yes—as the debate in the *Berliner Monatsschrift* on enlightenment shows; So "illuminatic" cannot mean: in any way esoteric and different from public thought. On the other hand, even at universities there were seldom such intense, carefully controlled discussions shaped by personal acquaintance and benevolence as those in Illuminati circles. And hardly ever one that we can understand as precisely as this one. Illuminatism could therefore be defined positively as the creation of protected discussion spaces.

It is a coincidence that the debates took place in the very year when Coulomb's law was formulated, in which the relationships of electrostatics were first formulated. And it is a further coincidence that the long article "Irrtum" in Volume 30 of Krünitz's *Economic Encyclopedia* appeared in the months when people in Gotha were thinking so intensively about errors. The article, which I suspect was written by the aforementioned Ernst Adolph Westhof, who presented his pre-utilitarian theory of error in 1772, gives an amazingly broad panorama, from scientific and legal error to political and theological error.[8] In this he is ahead of the Gotha discussions. But he presents results, not the formation of thoughts like the Gotha papers. If we want to use the analogy of the electric

[8] Westhof 1784. There Westhof's theory is outlined prominently.

again, then Westhof presents a charged medium, but the Gotha papers the intellectual electricity still floating freely in the field.

References

Agethen, Manfred. 1987. *Geheimbund und Utopie. Illuminaten, Freimaurer und deutsche Spätaufklärung.* München: Oldenbourg.

Blumenberg, Hans. 1975. *Die Genesis der kopernikanischen Welt.* Frankfurt: Suhrkamp.

Bragatto Boss, Sérgio Luiz. 2006. "Concepts of Vitreous Electricity and Resinous Electricity According to Du Fay." *Revista Brasileira de Ensino de Fisica* 29: 635–44.

Cohen, I. Bernard. 1990. *Benjamin Franklin's Science.* Cambridge, Mass.: Harvard University Press.

Daston, Lorraine. 2005. "Scientific Error and the Ethos of Belief." *Social Research. An International Quarterly of the Social Sciences* 72: 1–28.

Dürbeck, Gabriele. 1998. *Einbildungskraft und Aufklärung Perspektiven der Philosophie, Anthropologie und Ästhetik um 1750.* Tübingen: De Gruyter.

Endler, Renate. 1990. "Zum Schicksal der Papiere von Johann Joachim Christoph Bode." *Quatuor Coronati Jahrbuch* 27: 9–35.

Engel, Leopold. 1906. *Geschichte des Illuminaten-Ordens. Ein Beitrag zur Geschichte Bayerns.* Berlin: H. Bermühler Verlag.

Fontenelle, Bernard le Bovier de. 1932. *De l'origine des fables* (1724). Édition critique avec une introduction, des notes et un commentaire par Jean-Raoul Carré. Paris: F. Alcan.

Gil, Linda. 2018. *L'Édition Kehl de Voltaire. Une aventure éditoriale et littéraire au tournant des Lumières.* 2 vols. Paris: Champion.

Gregory, Stephan. 2009. *Wissen und Geheimnis: Das Experiment des Illuminatenordens.* Frankfurt: Stroemfeld.

Hammermeyer, Ludwig. 2003. "Entwicklungslinien, Ergebnisse und Perspektiven neuerer Illuminatenforschung." In Alois Schmid, Konrad Ackermann (ed.). *Staat und Verwaltung in Bayern. Festschrift für Wilhelm Volckert zum 75. Geburtstag*, 421–63. München: Beck.

Hinske, Norbert. 1990. *Was ist Aufklärung? Beiträge aus der Berlinischen Monatsschrift.* Darmstadt: Wissenschaftliche Buchgesellschaft.

Hochadel, Oliver. 2003. *Öffentliche Wissenschaft. Elektrizität in der deutschen Aufklärung.* Göttingen: Wallstein.

Hufeland, Gottlieb. 1790. *Lehrsätze* des *Naturrechts und der damit verbundenen Wissenschaften.* Jena: Christ. Heinr. Cuno's Erben.

Kant, Immanuel. 1763. *Versuch den Begriff der* negativen Größen in die Weltweisheit *einzuführen.* Königsberg: Kanter.

Koselleck, Reinhard. 1959. *Kritik und Krise. Eine Studie zur Pathogenese der bürgerlichen Welt.* München: Karl Alber.

Kreill, Anton. 1784. "Über das Buch Des erreurs et de la verité." *Journal für Freymaurer* 1, 4: 55–164.

Le Forestier, René. 1914. *Les Illuminés de Bavière et la franc-maçonnerie allemande.* Paris: Hachette.

Meumann, Markus and Simons, Olaf (eds.). 2017. *Aufsatzpraktiken im 18. Jahrhundert (= Aufklärung vol. 28).* Hamburg.

Müller-Seidel, Walter and Riedel, Wolfgang (eds.). 2002. *Die Weimarer Klassik und ihre Geheimbünde.* Würzburg: Koenigshausen-Neumann.

Mulsow, Martin. 2015. "Diskussionskultur im Illuminatenorden. Schack Hermann Ewald und die Gothaer Minervalkirche" In *Gelehrtenrepublik (=Jahrbuch Aufklärung vol. 26)*, ed. by M. Füssel and M. Mulsow, 153–203. Hamburg: Meiner.

Neugebauer-Wölk, Monika. 1995. *Esoterische Bünde und Bürgerliche Gesellschaft. Entwicklungslinien zur modernen Welt im Geheimbundwesen des 18. Jahrhunderts*. Göttingen: Wallstein.

Pawlowski, Peggy. 2004. *"…sich begnügen, im Geheimen für das Gute zu wirken." Der Beitrag Johann Adam Weishaupts zur Pädagogik des Illuminatismus*. Dissertation Jena.

Rachold, Jan (ed.). 1984. *Die Illuminaten. Quellen und Texte zur Aufklärungsideologie des Illuminatenordens (1776-1785)*. Berlin: De Gruyter.

[Saint-Martin, Louis Claude de]. 1775. *Des erreurs et de la Vérité, ou Les hommes rappelés au principe universel de la science par le Philosophe inconnu*. Edimbourg: s.e.

Schings, Hans-Jürgen. 1977. *Melancholie und Aufklärung, Melancholiker und ihre Kritiker in Erfahrungsseelenkunde und Literatur des 18. Jahrhunderts*. Stuttgart: J.B. Metzler.

Schings, Hans-Jürgen. 1996. *Die Brüder des Marquis Posa. Schiller und der Geheimbund der Illuminaten.* Tübingen: Niemeyer.

Schmidt-Biggemann, Wilhelm. 2004. *Politische Theologie der Gegenaufklärung. De Maistre, Saint-Martin, Kleuker, Baader.* Berlin: Akademie Verlag.

Schmidt-Funke, Julia, Berg, Gunhild and Mulsow, Martin (eds.). 2021. *Das Schloß als Hörsaal. Ludwig Christian Lichtenbergs „Vorlesung über die Naturlehre" und die residenzstädtische Wissensproduktion um 1800*. Stuttgart: Franz Steiner.

Siegert, Reinhart. 1978. *Aufklärung und Volkslektüre. Exemplarisch dargestellt an Rudolph Zacharias Becker und seinem »Noth- und Hülfsbüchlein«*. Frankfurt: Buchhandler Vereinigung GMBH.

Sutcliffe, Adam. 2005. *Judaism and Enlightenment*. Cambridge: Cambridge University Press.

Tölle, Ursula. 1994. *Rudolph Zacharias Becker. Versuche der Volksaufklärung im 18. Jahrhundert in Deutschland*. Münster: Waxmann.

Torlais, Jean. 1954. *Un physicien au siècle des lumières: L'Abbé Nollet 1700-1770.* Paris: Sipuco.

Van Dülmen, Richard. 1977. *Der Geheimbund der Illuminaten*. Stuttgart: Frommann-Holzboog.

Westhof, Ernst Adolph. 1772. "Einige Regeln, nach welchen die Wichtigkeit eines Irrthums beurtheilt werden kann." *Neues Hamburgisches Magazin* 1767-1781. Vol. 11. Part 64. 365–69.

[Westhoff, Ernst Adolph?]. 1784. "Irrtum." In *Ökonomischen Enzyklopädie*, ed. by J. G. Krünitz. Vol. 30: 798–808. Berlin: Pauli.

Wilson, W. Daniel. 1991. *Geheimräte gegen Geheimbünde. Ein unbekanntes Kapitel der klassisch-romantischen Geschichte Weimars*. Stuttgart: Springer.

Zwinck, Christian. 2006. *Imagination und Repräsentation: Die theoretische Formierung der Historiographie im späten 17. und frühen 18. Jahrhundert in Frankreich*. Tübingen: De Gruyter.

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Knowledge and its Histories

This volume offers a series of insights into the fascinating topic of errors and false opinions in early modern Europe. It explores the semantic richness of the category of 'error' in a time when such category becomes crucial to European thought and culture. During decades of increasing normativity in the social and religious sphere as well as in the epistemological status of disciplines, recognizing and correcting error becomes an imperative task whose importance can hardly be overestimated. The efforts at establishing religious, political, and scientific orthodoxy led philosophers, doctors, philologist, scientist, and theologians, to reconsider the very foundations of knowledge in the attempt to dispel errors. Spanning geographically from Italy to France, England, and Germany, the articles here gathered provide stimulating glimpses into one of the most fascinating, multifaceted, and controversial aspects of early modern culture.

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