Fables of Communication: The Rhetoric of Investigative Methodology and Golden Age Literature

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In her contribution to this collection, María Luz López Terrada systematically documents a simple but important fact about the Tribunal del Protomedicato: legislation does not guarantee action. In other words, the daily reality of the exercise of medicine is frequently at odds with laws passed by Philip II and his successors to restrict or mandate medical practices. By uncoupling the discourses of control from the realities of practice, López Terrada implicitly suggests that language and action in the scientific arena should be understood independently from one another. This is more than a consideration of the Platonic distinction between linguistic and mechanical techne; instead, it is the recognition of an asymmetrical relationship between doing and talking in early modern Spanish science.

Although López Terrada is careful not to extend her argument beyond the institutional context of the Protomedicato, we find the same asymmetry in medicine generally. On the one hand, medical research experiences a tremendous decline during the seventeenth century; José María López Piñero notes that «el Barroco médico español es más bien la historia de cómo nuestra patria se queda fuera del nacimiento de esas fisiología y patología modernas, ignorándolo o reaccionando contra lo que significa.»¹ On the other, the figurative uses of medical language, especially in extra-scientific settings, expand considerably during the same period; José Antonio Maravall observes both the «preferencia que en el tiempo se tiene por el empleo de metáforas que se toman del lenguaje de la medicina» and the abundant «alusión a las técnicas curativas de la medicina.»² The popularity of medical metaphors is even more striking given the fact that, as José Pardo Tomás shows in Ciencia y Censura, medical books were precisely those that were most likely to be censored.³ Thus, experimental praxis largely disappears at the same time that medical rhetoric gains a new cultural currency; publishing books

¹ University of Colorado at Boulder.
² López Piñero (1963), 480.
³ Maravall (1975), 58.

³ Pardo Tomás (1991) notes that «[l]a medicina fue, sin duda, el área científica más afectada por la censura inquisitorial» (193). Much earlier, López Piñero had pointed out that the «disminución del peso relativo de la ciencia en el conjunto de actividades de la sociedad española» is directly reflected in the suppression of large numbers of scientific publications in Bernardo de Sandoval’s Index of 1612, and Antonio Zapata’s Novus Index of 1632; López Piñero (1979), 375, 373. These are facts beyond dispute, but it is my intention to distinguish between «el conjunto de actividades» themselves and the way they might be described in extra-scientific texts.
that are ostensibly medical becomes increasingly difficult, while talking about medicine becomes increasingly common.

As familiar as these observations may be, they point toward two historical circumstances that have yet to be fully explained. First is the development of literary, political, and theological uses of scientific language that is not discernibly tied to a contemporaneous experimental tradition; this circumstance in Spanish letters would seem to run directly counter to many studies of the relationship among the arts and sciences elsewhere in early modern Europe, studies that have tended to notice correlations, not incongruities, in the mechanisms of the acquisition of knowledge and its representation.\(^4\) Second is the absence of any widespread rejection of «modern» science on methodological grounds; restricting one's reading to works of poetry, theater, theology, politics and so on, Spain would appear to be a country that prizes careful observation, rigorous experimentation, and rational demonstration, even if many authors do not embrace the conclusions to which this methodology leads.\(^5\) If one casts a reasonably broad net, Spain sounds about like other countries, even if it does not act quite like them.

To begin to look at some of these questions more closely, it will be helpful to examine number works containing mythological fables that deal specifically with scientific knowledge and its representation. Although the results would be largely similar if we looked at political tracts, devotional writing, or lyric poetry, the fact that myth interpretation actively negotiates a fascination with the past and, as we shall see, an interest in progressive scientific tendencies, makes it a particularly useful kind of literary exercise for discerning attitudes toward contemporary science. Beginning with Francis Bacon's *On the Wisdom of the Ancients* (1609) as a point of departure, I will go on to examine Juan Pérez de Moya's *Philosophia secreta* (1585), Juan Eusebio Nieremberg's *Sigalton sive sapientia mytica* (1629), and Pedro Calderón de la Barca's *El verdadero Dios Pan*, an auto sacramental or Eucharistic allegory, first staged in 1670. For all of these authors, new forms of linguistic representation, a scientific kind of talking, are vital not only to the dissemination of natural philosophical discoveries, but also to the process of discovery itself. I will show that current models for understanding the state of science in Spain during the seventeenth century cannot account for the interest, widely expressed in Spain, in the investigative methodologies associated with the «Scientific Revolution».

In *On the Wisdom of the Ancients*, Bacon reinterprets a number of familiar myths for the purpose, as he says, of providing «help towards the difficulties of life and the secrets of science» (VI 689-90).\(^6\) He gives his two reasons for


\(^5\) This is particularly clear in López Piñero's discussion of the «intrasigent Galenist» Matías García who does not dispute Harvey's methodology—García goes to the trouble of reproducing each of Harvey's dissections—but solely rejects his conclusions. See López Piñero (1979) and (1994).

\(^6\) We might just as easily begin with other scientific interpretations of mythic language—Henry Reynolds' *Mythomystes* or even Athanasius Kircher's Egyptological studies would serve—but Bacon's taste for myth, evident in the entire concept of his *New Atlantis*, and his
employing myth interpretation in this effort. First, the myths contain valuable knowledge that can be recuperated by correctly interpreting them; «parables» are an ancient kind of story «in which the most precious portions of he sciences were deposited» (VI: 689). This encoding was intentional, «mediated from the first, and purposely shadowed out» (VI: 696). Second, the familiar language of the fables makes them a powerful didactic tool for imparting new knowledge: «if any one wish to let new light on any subject into men's minds, and that without offence or harshness, he must still go the same way and call in the aid of similitudes» (VI: 698). Through the fables, «inventions that are new and abstruse and remote from vulgar opinions may find an easier passage to the understanding» (VI: 698).

The tension between a desire to recover the knowledge of antiquity on the one hand, and the utility of communicating novel ideas in an unremarkable package on the other, is evident in Bacon's explanation of the marriage of Pan and Echo. In the fable, he couples the traditional allegory, rooted in etymology, of Pan as «the world» with a reading of Echo as the perfection of scientific language:

[It is well devised that of all words and voices Echo alone should be chosen for the world's wife; for that is the true philosophy which echoes most faithfully the voices of the world itself, and is written as it were the world's own dictation; being nothing else than the image and reflexion thereof, to which it adds nothing of its own, but only iterates and gives it back. (IV: 326-27).

It is certainly odd that Bacon would choose a myth, a veiled fable, in order to communicate this theory of perfectly transparent language. It would be more logical, and much more useful, if he were to demonstrate by example. Instead, the fable can be said to take the place of a demonstration. This is, of course, because the perfect language he pretends to intimate is itself a myth. In aspiring to a language that is unambiguous, Bacon creates an antagonistic relationship between the language he actually uses, the veiled language of «parabolical poesy,» and the language he desires, one of pure iteration; the existence of a discourse that functioned as «the world's own dictation» would undo altogether the language of fables.

As the title of On the Wisdom of the Ancients indicates, Bacon presents the new knowledge he interprets in the myths as if were their authentic meaning; the wisdom is ancient. He insists upon this point, criticizing others who, «wishing only to gain the sanction and reverence of antiquity for doctrines and inventions of their own, have tried to twist the fables of the poets» (VI: 695). But at the same time, as we have seen, he avows an interest in tea-

well-documented love of Virgil, make this the logical choice. On Bacon and Virgil, see Schuler (1992).

7 Curiously, Bacon argues that the myths are so preposterous, «so absurd and stupid upon the face of the narrative taken by itself,» that they «cry out that there is a parable below» (VI: 697). In other words, the very unnatural character of the fable indicates that they contain natural knowledge because «no man had ever a dream so monstrous and extravagant and out of all natural ways of thinking» (VI: 697).

8 On Bacon's interpretation of Pan and Echo, see also Schuler (1992), 56-60.
ching novel ideas. Bacon is caught between a «reverence for the primitive time," a desire to rescue antique learning from the «veils and shadows» of classical fable, and his dreams of a future that would supersede the past, through «inventions that are new» (VI: 696).9

The middle ground of Bacon’s present, between the mythic past and an insubstantial future, shows some ambivalence. On the one hand he affirms the continued reliance on philology as crucial to scientific progress and on the other, a belief in what we might call methodological teleology: that after a process of continual improvement, bookish learning will ultimately be trumped by the direct acquisition of knowledge through the senses. In other words the recovery of old knowledge is key to advancement while at the same time advancement will make old knowledge obsolete.

These same concerns are apparent in Pérez de Moya’s Philosophia secreta. Readers with an interest in the natural historical and natural philosophical value of myth will initially find this book quite conventional. The author maintains that one of the levels of meaning, or «sentidos» a literary work can have is the «Físico, o natural» (10).10 In this stratum of meaning, «Poe tas» inscribe in their works, «principios y preceptos, y orden de la Filosofía natural [...] fuerzas y secretos de medicina y propiedades de cosas» (8-9).

However, just as Bacon uses the language of fable as a strategem to talk about a kind of discourse antagonistic to that of the parables, Pérez de Moya finds the myths’ generally comprehensible «sentido moral» to be in direct conflict with the value of their «sentido natural.» Both Carlos Clavería Laguarda and Consolación Baranda note the frequency with which the stories of the gods are used as negative examples. For Clavería, this moralizing trend is the most conspicuous feature of the work: «Los dioses antiguos no son ejempo de nada que no sea acto impuro y castigable» (28). It is difficult, however, to square this view with the obvious importance Pérez de Moya places on the «sentido natural.» There must be something valuable, as well as damnable, in the myths if the multivalent system of interpretation is to be justified at all. Baranda’s view is quite different than Clavería’s; she notes two contrary impulses in the work, «una científica, de tipo exilicato, objetiva, y otra de carácter moralizador, subjetiva» (xxviii). Thus we can understand two tendencies in Pérez de Moya’s work; one that rejects the

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9 Funkenstein (1986) is to my mind the best demonstration of the widespread desire, which he argues is characteristic of the seventeenth century, to reconcile the inheritance of the past to the scientific understanding of the day. His contention that «[n]ever before nor after were theological and physical arguments so intimately fused together as in [the seven teenth] century» has received too little attention. I extend this model somewhat to include the entire classical tradition, both sacred and profane. The practical reasons for doing so, as in the case of the «fábula moralizada» become clear in the cases of Nieremberg and Calderón below. Early Modern intellectuals also claimed that the Greeks received a corrupted form of Mosaic knowledge, providing a historical justification for treating this as a consolidated body of knowledge.

10 Pérez de Moya includes five «modos se puede declarar una fábula,» including «Literal, Alegórico, Anagórgico, Tropológico, y Físico o natural» (10). Of the final three, he notes, «puesto que sean nombrados con diversos nombres, todavía se pueden llamar Alegóricos,
immorality of the gods and their actions—a concern principally with the surface meaning of the myths—and another that seeks to affirm and elucidate the myths' hidden, frequently natural meanings.

In other words, the only good things in the myths are secret; the «face» of the parables he finds appalling. This is certainly different than the attitude of the mythographers he cites, which include Boccaccio, Varro, Alexander of Naples, and Natale Conti. Logically enough, Pérez de Moya's discussions of the secret information in the fables vastly overshadows his underdeveloped explanations of their literal meanings. «La preferencia por la filosofía escondida en los textos de los poetas, señalada por el título,» notes Baranda, «es el rasgo que distingue esta obra del resto de los manuales mitológicos contemporáneos» (xxiv-xxv). Baranda later observes: «La ‘originalidad’ de Pérez de Moya consiste en que la lógica interna no está vinculada a las fábulas mitológicas, sino a su significado, es decir, para encontrar una cierta coherencia en la estructura del libro hay que tener en cuenta las interpretaciones, pues el orden del material mitológico está al servicio de la interpretación de las fábulas, en particular de su sentido físico» (xxxi; emphasis mine). In this way, Pérez de Moya teases apart the two aspects of his ambivalence about myth particularly clearly: everything about the surface is to be rejected and abhorred while everything about the secret meaning is wholesome and needful.

The popularity of the Philosophia secreta lasted throughout the seventeenth century—subsequent editions were published in 1599, 1611, 1628, and 1673—and we find some of the conventions established by Pérez de Moya very much alive in 1629 when Nieremberg published his Sigalion. The Sigalion does little of the moralizing so prevalent in the Philosophia secreta. In fact, as I will explain, the Olympian gods of the Sigalion teach the same lessons as Genesis. Like Bacon, Nieremberg significantly transforms the meaning of the myth he interprets. In fact, «interpretation» or even «reinterpretation» probably underestimates the extent to which Nieremberg transforms the fable of Sigalion, or Harpocrates, the god of silence. Whereas for Alciati, a single emblem is space enough to encapsulate the Harpocrates'

porque, como hemos dicho, Alegoría dicen a lo que es diverso del sentido histórico o literal» (11).

11 Senzec remarks that the «names of the Fathers and encyclopedists (that of Isidore in particular) come constantly to [Pérez de Moya's] pen; he quotes Albricus several times, and follows Boccaccio in establishing the genealogy of the gods. He even utilizes more recent sources, like Alexander of Naples and Natale Conti.» (317).

12 Baranda calls attention to the «escasa importancia que en el desarrollo de cada uno de los capítulos se concede al cuerpo de la fábula» and observes that a reader «que no conociera los textos mitológicos al uso no podría hacerse una idea completa de las distintas fábulas con la lectura de este libro» (xxv).

13 Clavería, who characterizes the work impoverished by its moralizing tendency (34), comes to a very different conclusion. He is generally dismissive both of the work's originality and Pérez de Moya's attempt to encode secret information: «Con tanta tela prestada, la originalidad del tejido mitológico de la Philosophia secreta se ha de buscar en la facilidad para el engarce de tanto material, porque la originalidad, si acaso la buscaba el autor, no puede sobrepasar el listón convertido en tope de barrera que es la intención moralizadora» (28-29).
conventional lesson—as Diego López summarizes, “el necio ninguna diferencia tiene de los sabios cuando calla”—Nieremberg’s *Sigalion* is overwhelmingly prolix about the virtues of silence. The book runs to nearly three hundred pages.

Alciati, for his part, dedicates three emblems to silence, the first of which, emblem eleven, shows Harpocrates, the son of Isis and Osiris, with his fingers to his lips. The next two, emblems twelve and thirteen, show a minotaur and a lioness; the meanings of all three are generally consistent: talking can get you into trouble, and reticence is generally a virtue. Nieremberg is after something entirely different. His Sigalion visits the Olympian gods—who are in a state of total confusion, having neglected Minerva—in order to resolve problems of learning and communication:

*Minervae fuerunt officia minora, vel erat modestia maior. Robur corporis censebatur tessera Diuum, vis mentis inhospitata exulabat. Multis claua, iugula, hasty instrumentum divinitatis fuerat; Graphium, philosophia, oleum nec paucis forsitan.* (1)

Sigalion’s lesson, rather than concerning the prudence of *keeping* secrets, is about the *revelation* of secrets: the silent god instructs though gestures, and his divine pupils learn through observation; «Sapientior omnium Sigalion erit ex agesta sapientie copia prolixa taciturnitate» (164). The act of visually acquiring information is conspicuously presented as novel, revolutionary, and transformative.

Nieremberg’s book is punctuated with anecdotes about plants and animals. For example, it explains the exemplary behavior of the elephant, a creature that is pious, given to fasting, chaste, and studious (120). Strikingly, many of the same anecdotes, frequently exact translations, are included in Nieremberg’s contemporaneous *Prolusión* (1629), an address on moral philosophy he delivers upon his nomination to the chair of natural philosophy at the Jesuit Colegio Imperial. The nature of Nieremberg’s ideas concerning observation, nature, and scientific knowledge become even more apparent in the context of the *Prolusión*, a work that is overtly devout. The central Biblical story that he retells is that of Eve’s temptation in the Garden of Eden. Nieremberg explains that «Porque ignorante Eva de las naturalezas de los animales, se dexó engañar de la serpiente» (3). In other words, because Eve was not created at the naming of the animals, she had no knowledge of the nature of snakes and she was not alarmed when the snake spoke to her. Quite simply, she did not know that snakes cannot speak. Therefore, the Bible serves as a *fable*, warning us to observe nature for ourselves.

Nieremberg is emphatic on this point. Adam learned from the animals, but his knowledge was lost. The Holy Spirit «nos renueva este conocimiento» by means of the Bible. We are *reminded* of the truths of nature through reading the Bible. Hence the Bible is not in itself a means of instruction, but a methodological system for acquiring natural historical knowledge, the basis, according to Nieremberg, of moral philosophy. Even more astounding,

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14 For a recent overview of Nieremberg’s scientific work, see Navarro (2003), 334-336. Nieremberg was, however, better known during the seventeenth century as a writer of
is the fact that Nieremberg says much of this natural knowledge can be found in the manuscript produced by Francisco Hernández during his scientific expedition to the Americas in the late sixteenth century, a point to which he returns repeatedly.\textsuperscript{17}

The editions of the \textit{Prolusión} and the \textit{Sigalión} that I have consulted were bound together at some point after their initial publication.\textsuperscript{18} This physically reproduces the duality I find so often present in these works. Both demonstrate a profound methodological ambivalence. Reading, even reading the Bible, is useful because it instructs us to observe the behavior of animals. Thus the activity of reading the fables themselves —and Nieremberg largely treats Genesis as a fable— is undercut by his injunction that true knowledge is to be found in nature. We read Sigalion’s story to learn the language of observation. We read the Bible to learn to be like Adam, whose knowledge was acquired directly. However, there is a third tension here, which is the fact that none of the reports of animal behavior or of the nature of the New World is the byproduct of Nieremberg’s own observation. He of course has no certain knowledge that elephants are chaste. Like the language of Bacon’s Echo, direct observation is a myth; the closest Nieremberg comes is to reading Hernández’s manuscript.\textsuperscript{19}

So, on the one hand, we see through Nieremberg’s eyes a perfect correspondence in the sacred and profane works of Antiquity; the lessons of the Bible and of mythological fable are consistent in their insistence that we go beyond merely reading. On the other hand, we see a typically Early Modern display of philological scholarship, a tacit endorsement of bookish learning. While the Spanish tendency to «moralize» profane literature —not only myths, but also classical histories, emblems, and so on— has been widely recognized, the extent to which these texts are reinterpreted to make them compatible with modern scientific methodologies has not.

Like Nieremberg, Pedro Calderón de la Barca shows an interest in fusing myth and Christian theology, modern science and traditional philology. This is most evident in his \textit{autos sacramentales}, Eucharistic plays staged for the feast of Corpus Christi. As I argue elsewhere, these plays share with Santorio Santorío’s weighing chair, Otto von Guericke’s Magdeburg hemispheres, and Robert Boyle’s bell jar an interest in making spectacle of the insensible.\textsuperscript{20} Rate...
her than the existence of a vacuum, it is for Calderón the imperceptibility of the real presence of Christ in the Eucharist that in many of his plays becomes the subject of exposition. To do this, the playwright suggests that the end times have come, that Madrid is the New Jerusalem, and therefore in the Imperial capital both the righteous and wicked are about to see God in judgment and directly perceive the mysteries of faith revealed. 21 This conception of the apocalypse, to paraphrase Steven Shapin, affords for the constitution of new perceptual objects. 22 By staging many of his plays at the moment of judgment, Calderón grants his audiences proleptic vision.

Many of Calderón’s autos contain detailed explanations for interpreting myth, Biblical parable, and allegory correctly. In the introductory skit, or loa, to El Verdadero Dios Pan, the characters Historia, Poesía, and Fábula discuss their relationship to Verdad. Fábula explains that she contains philosophy, which although seen «de mal comprendidas luzes» is not «sin fundamento.» As with Bacon’s interpretations, we find that the truth of the fables is intentionally hidden; Fábula says, «yó en mis vanos Escritos / voluntariamente yerro.» This is done because it leads to an increase of didactic efficacy. When Poesía asks what good Fábula might possibly serve in «el Festín, / que Sacra Historia ha dispuesto,» Verdad answers:

De mucho, si advierto
quanto a vista de las sombras
luze mas la Luz, y espero,
que a vista de mi Verdad,
al la Mentira huya.

Not only, then, was the truth «pruposely shadowed out» as Bacon says, but these «sombras» are ultimately a helpful contrast to its illumination.

The action of El verdadero Dios Pan takes place both during the reign of Charles II—it was first staged for the Corpus Christi festival of 1670—and at the end of time. Historia explains that the third chapter of Habakkuk—the «Cantico de Abacuc» that prophesies the terrible defeat of the enemies of Judaism through natural disaster, plague, and fire—«se repite el cumplimiento / oy en el Segundo Carlos.» In other words it is Charles II who is the «Rey, / que ha de dominar Imperios» foretold in the Old Testament. The story of the very visible king is thus fused to the «fábula moralizada» of the god Pan, who represents both the living Christ and the «pan» or transubstantiated bread of the Eucharist.

This may seem to have almost nothing to do with science, but Historia emphasizes Pan’s skill as an astrologer:

creció en efecto,
con el Nombre de Dios Pan,
y entre otros muchos desvèlos,
à la Astrología se diò...

20 My article «Sacramental Instrumentality,» a comparison of the dramatic representation of the autos sacramentales to the scientific demonstration, especially Boyle’s experiments with the bell-jar, will appear shortly in the Bulletin of the Comediantes.
21 On the temporal characteristics of Calderón’s autos sacramentales, see Kurtz (1991) and Paterson (1998).
When the *auto sacramental* itself begins, Pan describes astrology as «leyendo en esse azul Campo de yelo / caractéres...» The night sky is itself a character in the play, Noche, who is described by Pan as not only beautiful but:

quien, Naturál Philosophia,
también la aclame, al vér quanta alabanza
en tus Vigilias el estudio alcança...

Furthermore, Noche knows the story of Pan’s birth because she was there «como testigo / de vista» and because she reads about him; the god reminds her:

Yà sabes también, que varias
plumas à este fin dixerón;
vnas, que el Grano es palabra,
otras, que en pajas el Grano
se hallò...

In this way, Pan constructs both himself and Noche as objects to be studied through observation and as opportunities for reading. Pan reads the «caractéres» of the night sky, describing Noche as the object of «Naturál Philosophia,» and later of «Judiciaria Astrologia.»23 Conversely, Pan himself is the subject of ocular witness, «testigo / de vista,» but whose nature is revealed in the «varias plumas» of the Evangelists.

As an alloy of reading and direct observation, between textual hermeneutics and natural philosophy, the fable proceeds to tell of Pan’s love for the moon —the character Luna who symbolizes the human soul— and his defeat of the devil. As Pan explains, the play like the fable is a composite of what is and what only appears to be:

la Alegoria no es mas,
que vn Espejo que traslada
lo que es, con lo que no es,
y está toda su elegancia
en que salga parecida
tanto la copia en la tabla,
que el que está mirando a vna,
piense que está viendo a entrambas...

Calderón describes allegory here in terms that recall Bacon’s definition of scientific language. Neither Echo’s speech nor the play staged on «tablas» are «lo que es.» Instead, one echoing the other reflecting, both communicate an experience of Pan, the world. Of course, Echo’s language might seem more properly «scientific,» but Pan’s allegory has the advantage of actually existing.

Calderón’s definition of allegory prepares the audience for the resolution of the play, in which the veil of fable is removed to reveal truth. Tellingly, faith, the character Fe, appears only briefly in the play as a minor character.

22 Calderón’s *auto sacramental*, as the urban drama of Madrid and the transcendent story of humankind, is best seen as in light of contemporaneous museums, such as Kircher’s,
Rather than relying on faith, the characters gaze upon a complicated series of nichos that open and close to «descubrir» the true nature of the Christian mysteries. Through a series of stage directions —«Descubrese el Sacrificio del Cordero.» «Descubrese en la Nube...»— and recited lines —«Aora mira / la Nube que traxo al suelo...» «Mira lo que significan...» — *El verdadero Dios Pan* constructs its ending not as an affirmation of faith —a belief in things unseen— but as a visual experience to be corroborated. The temporal context is again invoked by Luna, the human soul, who returns to idea that things can be perceived, as Historia says «principalmente en España,» because of the end of time:

Dichosa Naturalèza
Humana, que mira abiertos
sobre el Orbe de la Luna,
los Palacios de otro Imperio.

As we learned from Historia, this «otro Imperio» is in fact the Spanish Empire. In this world, one in which present and future are simultaneous, faith and reading are only brief stages on the way to direct witness. Calderón therefore presents the classical tale of Pan in such a way that the value of fable is both affirmed —myth is, after all, the most salient feature of the plot and characterization— and rejected: reading, with the past, is superceded in the spectacular, millenarian present.

Calderón, like Nieremberg, equates the meanings of Biblical texts and ancient myth. Just as the *Prolusión* and the *Sigalión* treat sacred and profane «parables» as instruction in the methods of systematic observation, *El verdadero Dios Pan* —by claiming both the fulfillment of Habakkuk’s Biblical prophesy in the reign of Charles II and the triumph of spectacle over the veil of classical fable— suggests that «testigo / de vista» is both presently available and superior to faith. It is beyond the scope of this study to suggest a sweeping evolutionary trend in the scientific interpretation of myth, but there is an interesting chronological development: Pérez de Moya shows how science should read; Bacon, how science should sound; Calderón and Nieremberg, how science should act.\(^\text{24}\)

In the case of Pérez de Moya’s *Philosophia secreta*, we find an emphasis on natural philosophical knowledge at the expense of the surface meaning; this is fable without reverence for the past, a pragmatic attitude toward acquiring scientific knowledge. Fable is treated as so much dross to be cleared away; but as with Bacon’s *On the Wisdom of the Ancients*, the act of interpretation itself foregrounds myth while it claims to reject its language. For his part, Nieremberg uses fable to teach about an activity destined to supercede reading; mythological and Biblical fables become conduits to modern

which, as Findlen (2003) describes, was «theater of the city and the world» (231-39).

\(^\text{23}\) On the distinction between «astrología judiciaria» and «astrología científica,» as well as a discussion of their status as «science» see Lanuza (2005), 32-38.

\(^\text{24}\) It is important to emphasize that I am not concerned here with the activity of science itself, but with how that activity is represented in literature. In tracing a trajectory from Pérez de Moya to Calderón, I find the same development in literary descriptions of of the acqui-
scientific practices. We have noted in Calderón's use of fable two characteristics. First, the reading of myth is modeled on natural philosophical inquiry; peeling back the veil of fable is conspicuously likened to direct observation and astrology. Second, temporal framing that permits for the apprehension of new perceptual objects encourages the play's audience to consider their own experience a direct witness of fact, even if we now might agree that this is not the case. In every one of these cases myths are seen as subject to Bacon's methodological teleology; reading is an activity that will ultimately become obsolete, through learning the lessons of the fables themselves.25

An awareness of the popularity of this kind of talk about science, spectacle, and observation should lead us to consider a small but significant change in the way we have understood the collapse of scientific investigation in Spain during the seventeenth century. It seems clear, for example, that there was relatively little bias against modern methodologies in the literature of the period. To the extent that the history of science tells the story of any culture's engagement with these methodologies, historiographical models that cannot account for this absence of bias will never be particularly useful for Spain. Furthermore, the success or failure of any particular institution to promote or limit scientific activity would seem to have relatively little to do with the status of scientific belief on the peninsula during the seventeenth century.26 Whether they be court politics, censorship, economic crisis, or

sition of knowledge that Hannaway (1986) notes in the development of science itself: «science no longer was simply a kind of knowledge (one possessed scientia); it increasingly became a form of activity (one did science)» (39).

25 I believe these cases to be characteristic of the tenor of their time, although my reading of them may be somewhat unconventional. For example, Aurora Egido, one of the most erudite scholars of Golden Age literature, maintains quite the opposite: «Calderón predicaba a convencidos, empleando un lenguaje nada dado a demostraciones. El conceptismo que impregnaba los sermones y el teatro estaba lleno de marañas dialécticas que favorecían el juego analógico y la utilización de exempla» (96). In El verdadero Dios Pan, Luna even complains of this, stating, «Los Argumentos / dexad para las Escuelas.» However, this only emphasizes what is the most significant aspect of the play's resolution: that it is visual and spectacular, rather than rhetorical or discursive.

Also, as been exhaustively documented both in the history and philosophy of science, the conditions for demonstration are generally predicated on some preexisting faith or belief; Peter Galison notes: «Philosophers have long argued that no finite set of facts will ever suffice to prove a general assertion; others, including Duhem, Quine, and Putnam, have emphasized that experiments confront no single hypothesis, but a web of interrelated beliefs» (2). In explaining experimental practices contemporary with the literary works I examine, James J. Bono explains that for William Harvey, «observation was only a 'tool' serving a model of scientific speculation and theoretical explanation that itself had acquired legitimacy independently of any specific use of empirical evidence; rather that model was based upon, and legitimized by, philosophical and, one might almost say, theological convictions» (109). To ask that literary texts do the work of science is to place undue burden upon them; however, it is not too much to examine the extent to which they proceed from «philosophical» or «theological convictions» to engage a «web of interrelated beliefs» about the methodologies for acquiring knowledge. Again, by uncoupling the rhetoric of science from the work of experimentation, it is clear that the kind of science encouraged in Spanish literary works, while largely unpracticed on the peninsula, is altogether contemporary.

26 I am tempted to make an exception for the Jesuits. Clearly, what we see in all of these authors' works is a process that Navarro (2002) describes as characteristic of the Jesuits, who
otherwise, the factors that contributed to the decline of scientific research should be seen as largely independent from the factors that encouraged the spread of the rhetoric of scientific methodology.

This leads me to three conclusions. First, that there is little correlation between the actual practice of scientific investigation and the popularity of the language of medicine, natural philosophy, and natural history. As I noted at the beginning of this article, talk should not be taken to imply the coexistence of action; but the converse is also true: an absence of scientific activity does not imply a paucity of scientific talk, interest, or preoccupation. Second, the rejection of the conclusions, theories, and laws associated with the «Scientific Revolution» does not indicate a lack of interest in the methodologies that inspired them. Given that similar attitudes toward methodology and modernity are nearly commonplaces in studies of the scientific traditions in other European countries, this fact should factor more importantly in discussions of Spanish science. Third, if we want to measure the diffusion and popularity of modern scientific ideas in Spain, scientific publications are frequently not the best place to start.

strove when possible to «reformular las ideas de la ortodoxia para adaptarlas al espíritu del nuevo orden» (53). Calderón and Nieremberg were both students at the Jesuit Colegio Imperial—which Navarro shows was one of «the only institutions that displayed any vitality in scientific studies»—and both Nieremberg and Calderón vigorously endorse the spectacles that were one of the distinguishing features of Jesuit science. See Navarro (2003), 332. In this sense we can understand them both as energetically promoting the kind of activity described in Findlen (2003). The list of Golden Age authors who were either educated by the Jesuits or Jesuits themselves—Francisco de Quevedo, Lope de Vega, Juan de Mariana, and so on, includes many of the most important writers of the period.

Findlen (2003) maintains that this is characteristic of the Jesuits: «By appropriating the tools and techniques of the adversaries, Jesuit natural philosophers reminded their audience that experimental knowledge was a universally valid approach to learning» (257). I note the similar example of Matías García above. There is very little evidence that contradicts belief in this universal validity in Spanish literature.

27 Nieremberg best illustrates this. His scientific publications continue to be nearly curiosities, a bit like the marvels that so fascinated him. But his devotional writings, most notably Aprecio y estima de la divina gracia and De la diferencia entre lo temporal y eterno, were much more widely translated, published and republished both in Spain and abroad; the English adaptation of Aprecio y estima de la divina gracia is still in print. As I suggest above, his devotional writings show the same natural historical commitments that his scientific writings do. Thus, to gauge the broader influence of his scientific ideas I think one must consider the possibility that his devotional writings are the best place to begin.