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Experimental Reporting and Networks of Political Information: Lorenzo Magalotti's Framing of Courts and Nature

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Experimental Reporting and Networks of Political Information:
Lorenzo Magalotti's Framing of Courts and Nature

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
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Dedication

This master's thesis is dedicated to my parents, Sharon and Todd L'Herrou, and to my partner, Yuki Carthy. Years of research and education precede this document. Without the support of my family, none of this would be possible.

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The Archivio di Stato di Firenze and the Biblioteca Nazionale Centrale di Firenze graciously granted me access to the documents necessary to complete this research. The scholars at the Medici Archive Project offered invaluable help in navigating and evaluating these documents. Credit is also due to the teachers of the Scuola Parola language school, without whom I could not have understood the relevant letters and manuscripts.

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This thesis is narrow in scope, and its deficiencies are the result of my own shortcomings. Much of its success can be traced directly to the input of those listed above, especially Professors Benadusi and Koenig.

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Abstract

This thesis explores changes in experimental reporting during the scientific revolution of the seventeenth century. In particular, I examine and compare some of the works of Count Lorenzo Magalotti, namely the *Saggi di Naturali Esperienza* or *Essays on Natural Experiments* and the *Relazione d'Inghilterra*. In 1667, as secretary of the *Accademia del Cimento* – the Tuscan experimental academy founded in 1657 – Magalotti (1637-1712) authored the *Saggi*, a collection of experimental reports. These reports included extensive written descriptions of experiments along with dozens of engravings depicting the instruments custom-made for the experiments. Magalotti also served as ambassador and agent of the Tuscan court and in the same year he traveled to England to offer a copy of the *Saggi* to King Charles II. While in England, Magalotti corresponded extensively with Prince Leopold and with the future grand duke, Cosimo III, reporting his observations of the English court: descriptions of political, military, and intellectual life at the court of Charles II. Magalotti's account of his experience was compiled as *Relazione d'Inghilterra* in 1669. My work shows that the *Saggi* and the *Relazione*, although different in their content, emerged from the same historical context. I argue that the way information was conceived and organized, whether it originated from experimental practices (*Saggi*) or diplomatic actions (*Relazione*), changed over the course of the seventeenth century. Experimental reporting, like political reporting, became parceled into small, discrete units suited for high rates of information exchange.

Introduction

This thesis explores changes in experimental reporting during the scientific revolution of the seventeenth century. In particular, I examine and compare some of the works of Count Lorenzo Magalotti, namely the *Saggi di Naturali Esperienza* or Essays on Natural Experiments and the *Relazione d'Inghilterra*. In 1667, as secretary of the Accademia del Cimento – the Tuscan experimental academy founded in 1657 – Magalotti (1637-1712) authored the *Saggi*, a collection of experimental reports. These reports included extensive written descriptions of experiments along with dozens of engravings depicting the instruments custom-made for the experiments. Magalotti also served as ambassador and agent of the Tuscan court and in the same year he traveled to England to offer a copy of the *Saggi* to King Charles II. While in England, Magalotti corresponded extensively with Prince Leopold and with the future grand duke, Cosimo III, reporting his observations of the English court: descriptions of political, military, and intellectual life at the court of Charles II. Magalotti's account of his experience was compiled as *Relazione d'Inghilterra* in 1669. My work shows that the *Saggi* and the *Relazione*, although different in their content, emerged from the same historical context. I argue that the way information was conceived and organized, whether it originated from experimental practices (*Saggi*) or diplomatic actions (*Relazione*), changed over the course of the seventeenth century. Experimental reporting, like political reporting, became parceled into small, discrete units suited for high rates of information exchange.

Since the 1990s, scholarship has focused on the social processes by which seventeenth-

century experiments were used to produce knowledge. For instance, in his 1994 monograph *A Social History of Truth*, Steven Shapin argued that English experimental philosophy grew out of gentlemanly values and social norms. Shapin departed from previous interpretations that focused on interactions between famous intellectuals and on the knowledge they produced through their experiments. Instead, Shapin – seeking to understand the processes that produced knowledge – turned his attention toward institutions, like the courts, academies, and universities that shaped experimental practices.¹ In line with this approach, scholars like Mario Biagioli have argued that the social context in which experiments were conceived shaped both the experiments and the knowledge they produced.² Scholarship, however, has not addressed how the form and dissemination of experimental reporting changed in the seventeenth century.

In the early seventeenth century, experiments were typically reported in disputational books or essays. That is, experiments were used to support larger arguments about the natural world. They were considered powerful evidence, and they were fit into a rhetorical system constructed around a particular argument. By the end of the seventeenth century, by contrast, early scientific academies, especially the Cimento and the Royal Society, organized their reports around individual experiments rather than arguments.³ The *Philosophical Transactions of the Royal Society* and the *Saggi* each comprise a series of short and descriptive entries: the experiment's purpose, the instruments, the method, and the results. In brief, experiments, rather than arguments, became the subjects of reports. This framing of experimental reports has

1 Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: The University of Chicago Press, 1994).

2 Mario Biagioli, *Galileo, Courtier: The Practice of Science in the Culture of Absolutism* (University of Chicago Press, 1993).

3 The Royal Society was the premier English academy of experiment. Their publication, *The Philosophical Transactions of the Royal Society*, was established in 1665, and is now the oldest continuously published scientific journal.

remained consistent in the West from the trans-European shift of the late-seventeenth century to today.

A similar form of reporting existed contemporaneously in politics and diplomacy. Since the fourteenth century ambassadors filed detailed reports about the government and the society of the countries and cities in which they were posted. Recent scholarship has examined information networks to understand how exchanges of political information and diplomatic communications changed over the early modern period. For instance, Brendan Dooley has focused on *avvisi*, or political newsletters, to argue that political information became commoditized in the early modern period.⁴ That is, *avvisi* comprised units of political information that were themselves objects for exchange within markets. More recently Filippo de Vivo has emphasized the subjective nature of Venetian ambassadorial *relazioni* arguing that they represented not only texts but also performances.⁵ Relying on this recent scholarship, I show that Magalotti's ambassadorial reports collected in his *Relazione d'Inghilterra* were deeply connected with his mode of experimental reporting as displayed in the *Saggi*.

In addition to his work reporting experiments in the *Saggi*, Magalotti participated extensively in diplomatic reporting and the exchange of political information. As the author of the *Relazione* and of the *Saggi*, Magalotti represents an ideal figure for investigating the close connection between the changing nature of political and experimental information exchanges. For Magalotti, science – that is, experimentation and empirically-based argumentation – was just one aspect of his position as a man of letters, courtier and diplomat. For Magalotti, science served courtly patronage relationships. In contrast with the relative independence of the fellows

4 Brendan Maurice Dooley, *The Social History of Skepticism: Experience and Doubt in Early Modern Culture* (JHU Press, 1999).

5 Filippo de Vivo, "How to Read Venetian Relazioni," *Renaissance and Reformation* 34.1–2 (Winter-Spring 2011): 25–59.

of the Royal Society, Magalotti's position as secretary of the Cimento placed him in close proximity to the principal patrons of the academy: Prince Leopoldo, Grand Duke Ferdinand II and then Cosimo III. These figures participated extensively in Magalotti's activities as a Medici client. In particular, Prince Leopoldo supervised the activities and publications of the Cimento, while Cosimo III promoted Magalotti's ambassadorial reports. Court philosophers like Magalotti developed experimental practices and produced reports to create spectacles for court audiences and to entertain and inform patrons, courtiers and philosophers. The similarities of form between Magalotti's writing and that of the Royal Society cannot therefore be explained in terms of developments particular to an English context. An examination of Magalotti's reporting is an important step for placing the changes of the scientific revolution more firmly in the context of changing European societies.

In doing so, I will build on the historiography of Magalotti as well as the broader historiography of the scientific revolution. This thesis approaches Magalotti's work on the *Saggi* as a project that served the needs of the Tuscan court as it simultaneously helped to establish a new set of norms for reporting experiments. In this way, the *Saggi* as a project in reporting information was closely related to Magalotti's work on his *Relazione d'Inghilterra*, itself part of a genre of diplomatic reporting. By approaching these two documents, written by the same author within the span of a few years, as part of the same broad practice of information reporting, this thesis shows that key changes in experimental reporting did not arise only out of the intellectual programs of experimental philosophers like Robert Boyle. Rather, these changes were connected to methods of diplomatic and political reporting that were already well-established by the 1660s. In particular, new modes of scientific reporting – typified by the *Saggi* of the Cimento and the

Philosophical Transactions of the Royal Society – were characterized by discrete units of information suited for exchange within courtly networks or within international information marketplaces. This kind of modular information reporting can be found in two contemporary genres of diplomatic and political reporting: *relazione* and *avvisi*.⁶

Born in Rome to noble Florentine parents, Magalotti was educated at a Roman Jesuit seminary before studying law in Pisa. He left – without completing his legal education – to study for three years under the famed mathematician, experimenter and student of Galileo, Vincenzo Viviani. His apparently close relationship with Viviani seems to have led to Magalotti's appointment as the secretary of the Cimento in 1660. At that time he was a precocious young man of twenty-two. For the next seven years he would bring his education to bear on the first significant project of his intellectual life: the only publication of the Cimento, called the *Saggi di Naturali Esperienze*. His work as secretary of the Cimento and principal author of the *Saggi* put him in contact with academicians and their experiments, with printers and engravers, and with the important Medici patron, Prince Leopoldo. After a difficult period during which he had to write a book worthy of his patron and coordinate argumentative academicians to do so, the *Saggi* was sent to press in 1667. In the same year, Magalotti left to tour Europe. After an initial stop in Venice, he travelled around Europe, stopping in Vienna, Prague, Amsterdam and London. His time in England formed the basis for his *Relazione d'Inghilterra*.⁷

The main line of historiographic inquiry about Magalotti is a sustained debate about whether his writing should be considered scientific or not. Although he is now best known for his role in the *Saggi*, much of Magalotti's writing was explicitly diplomatic. He took several tours of

6 See recent work on *avvisi*, or political newsletters. In particular, Brendan Maurice Dooley, *The Dissemination of News and the Emergence of Contemporaneity in Early Modern Europe* (Ashgate Publishing, 2010).

7 Middleton, *Relazione*.

Europe – once accompanying Grand Duke Cosimo III – and produced extensive correspondence about each foreign court he visited. Efforts to pin down his writing in the *Saggi* and in correspondence as either scientific or unscientific assume that science is fundamentally different from, and incompatible with, diplomacy. I propose instead that scientific reporting and diplomatic reporting could be approached in the same way: as an effort to relay information in simple, discrete units. Magalotti's own work demonstrates this. In addition, both his diplomatic and his experimental reports closely resemble contemporary work. In the case of his diplomatic writing, he was participating in a widely-subscribed, well-established genre of *relazioni*. In the case of his experimental reports, he wrote in a form that greatly resembled that of the most prominent contemporary scientific publication: the *Philosophical Transactions of the Royal Society*. These connections mean that an examination of Magalotti's observational reports reflects on broader trends in information exchange within European networks.

Experimental Reporting in the Seventeenth Century and the *Saggi di Naturali Esperienze*

The specific meanings of the terms “science” and “scientific revolution” are important for this thesis. The scientific revolution as a concept has continued to captivate historians, even as we try to avoid presentism. This tendency can be observed in the way we have held on to the anachronistic term “science” to describe the work of those who would have called themselves “natural philosophers,” or “scholars,” or “virtuosi,” or even “literati.” The titles of important monographs use the term: Mario Biagioli's *Galileo Courtier: The Practice of Science in the Culture of Absolutism* and Steven Shapin's *A Social History of Truth: Civility and Science in Seventeenth-Century England*, for instance. More recently, the title of Holly Tucker's book, *Blood Work: A Tale of Medicine and Murder in the Scientific Revolution*, invoked the scientific revolution specifically. It is important therefore to acknowledge that science is a modern concept distinct from the concepts held by seventeenth-century people. Still, a discussion of how seventeenth-century communities used experiments to create new knowledge of nature must grapple with the practice of modern science that shares both a lineage and a form with early modern experimental philosophy.⁸

Thomas Kuhn defined “science” as a process of problem solving in which a community attempts to fit an agreed-upon understanding of nature – a paradigm – with direct experiences of

⁸ Biagioli, *Galileo, Courtier*; Shapin, *A Social History of Truth*; Holly Tucker, *Blood Work: A Tale of Medicine and Murder in the Scientific Revolution* (New York: W.W. Norton, 2011).

nature.⁹ Paradigms generally fit very neatly with the bulk of known experiential evidence. The process of normal science is therefore a kind of boundary policing; scientists inspect the edges of the paradigm, where experience is inconclusive or appears to contradict the paradigm.

Experiments are then devised to precisely determine how the paradigm and the evidence can be made to seamlessly fit together. This is how scientists use experiments to produce new knowledge. In order to collaborate on this project, scientists require standards for creating and disseminating the new knowledge they create using experiments. These standards are not generally codified, but are understood by members of the community. Nor is there generally an authoritative body dictating the standards. Instead, community members maintain and modify standards by consensus. This definition of “science” acknowledges that there is not one monolithic science, but that many communities can have their own sets of potentially incompatible or even incommensurable standards. Each of these communities is using science.

The scientific revolution, then, was an extended period of European history during which science gained an institutional presence in European society. Two main social developments made this possible. First, experience became widely accepted as a legitimate way to investigate nature. Among artisans, artists, and medical practitioners, experiential methods were in heavy use since at least the Medieval period.¹⁰ However, these methods for producing experiential knowledge were not generally aimed at investigating nature, but at developing a craft. Scholars who did investigate nature – natural philosophers – privileged textual knowledge until the

9 Thomas S Kuhn, *The Structure of Scientific Revolutions*. (Chicago: The University of Chicago Press, 1962). This is Kuhn's definition of “normal science,” as opposed to the less common “scientific revolutions.”

According to this view, the real work of science occurs in periods of normal science. Scientific revolutions occur only when the disunity between a paradigm and the available evidence becomes so great that it causes a crisis. The revolution is the process by which a scientific community adopts a new paradigm.

10 Pamela H Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004); H. C. Erik Midelfort, *A History of Madness in Sixteenth-Century Germany* (Stanford, Calif.: Stanford University Press, 1999), Chapter 2, especially page 12.

seventeenth century. Second, communities of scholars adopted standards for reporting their experiential evidence. These standards were not fully – or even largely – codified, but they allowed scholars to report observations and experiments in a way that was open to only a very narrow range of interpretations. That is, the reports were straightforward and easily understood by someone familiar with the standards.

By the mid-seventeenth century, experience was widely accepted as a legitimate way to investigate nature. Galileo's career in the early seventeenth century captures one moment in the growing acceptance of experiential methods.¹¹ Galileo, like many successful mathematicians, held a university appointment.¹² He also designed mathematical instruments and supplemented his modest income by teaching students how to use them in private lessons. He aspired, however, to be considered a natural philosopher. Unfortunately for his aspiration, mathematicians held a social status much lower than did natural philosophers. Galileo used his discovery of the moons of Jupiter – or the Medician stars – to gain a position as philosopher at the Medici court. Thus his acceptance as a natural philosopher was tied to acceptance of his observational methods. His gift of the Medician stars was potentially very valuable to Cosimo II, but only if Galileo was using a legitimate methodology for producing knowledge. By accepting Galileo's offering of the Medician stars, and by appointing him court philosopher, the Grand Duke legitimated experience as a way to investigate nature. This was not, of course, a sudden transition. Vesalius, for instance, made strides in legitimating experiential methods nearly seventy years earlier, in 1543.¹³

Although his methods of producing knowledge were provocative, Galileo disseminated knowledge in conventional ways. His experiments and observations were generally published in

11 Biagioli, *Galileo, Courtier*.

12 At Pisa, then at Padua.

13 Andreas Vesalius, *De humani corporis fabrica libri septem...* (per Joannes Oporinus, 1543).

disputational books, when they were published at all. In 1632, his famous book, *Dialogue Concerning the Two Chief World Systems* was published as one salvo in Galileo's larger argument with his Aristotelian contemporaries. In this case, the subject was the universe. Galileo argued that Copernicus' heliocentric model was correct, in contrast with Aristotelian thinkers who maintained that the earth was the center of the universe. Here is an example of Galileo's rhetoric in *Dialogue*:

In the long run my observations have convinced me that some men, reasoning preposterously, first establish some conclusion in their minds which [...] impresses them so deeply that one finds it impossible ever to get it out of their heads.¹⁴

This kind of rhetoric was the context for his observational reports. Further, the book is called *Dialogue* because it consists of a fictional dialogue with "Simplicio," a figure who argued for the ideas of Galileo's Aristotelian rivals. Although his choice to put arguments the Pope had made into Simplicio's mouth caused Galileo some problems, the rhetorical choice was common at the time – and it worked well when it targeted a rival scholar instead of the Pope. This genre of disputational essays significantly predates Galileo, including the use of experiential evidence to support an argument.

Rhetoric-laden disputational books, however, were not Galileo's only means for sharing the results of his observations and experiments. Many times, experiments were not published at all, but were performed live, in front of an audience. This was the case in a different dispute Galileo had with Aristotelians, this time over the nature of buoyancy. He and a rival put various objects in a tub of water in an effort to convince the watching Medici court of their respective

14 Galileo Galilei, Trans. Stillman Drake, *Discoveries and Opinions of Galileo: Including The Starry Messenger (1610), Letter to the Grand Duchess Christina (1615), and Excerpts from Letters on Sunspots (1613), The Assayer (1623)* (Doubleday, 1957), 322.

interpretations. It is worthwhile to note that Aristotelians were actively seeking out opportunities to perform experiments supporting their positions, as they did in this case. This is another reminder that changes to the legitimacy of different methods for producing knowledge about nature did not happen in one moment or because of one figure. In the middle of the 17th century, then, experiments were generally accepted as a legitimate means for generating knowledge, and they were performed live as spectacles, or published as part of larger disputational essays.

By the end of the 17th century, however, something had changed. Galileo's ways of reporting his experiments were still around, but organizations like the Cimento and the Royal Society were using a new framework for reporting. This new genre of experimental reporting was characterized by short, experiment-focused entries and a rhetoric of disinterest. Steven Shapin, in *A Social History of Truth*, offers a useful interpretation of this shift in experimental reporting.¹⁵ He takes the position that trust is the central problem for developing scientific communities. For Shapin, experimental reports are therefore windows into the ways a scientific community organized itself to maintain trust within the community. To explain new norms of experimental reporting, Shapin examines the Royal Society as a community. He therefore locates changes in reporting within that particular community. For Shapin, methods for evaluating trust grew out of pre-existing genteel cultural norms. For instance, English gentlemen of the time valued disinterest. This norm was centered on political and economic concerns, but it became central to the epistemic norms of the budding scientific community. This resulted in reports being broken down into discrete "matters of fact," ostensibly presented without interest in larger disputations about theory.¹⁶

¹⁵ Shapin, *A Social History of Truth*.

¹⁶ For more on the political and economic dimensions of genteel disinterest, see David Kuchta, "The Making of the Self-Made Man: Class, Clothing and English Masculinity, 1688-1832" in *The Sex of Things: Gender and Consumption in Historical Perspective*

Shapin's argument is convincing, but it does not account for the international changes in experimental reporting. The gentlemanly norms of the fellows of the Royal Society surely shaped the format and the rhetoric of their experimental reports. However, very similar changes in reporting were present in the *Saggi*, a document constructed in a very different social context from the publications of the Royal Society. The Cimento was overseen in a very direct way by Prince Leopoldo, while the Royal Society was run directly by its members with very little involvement from the court.¹⁷ Many of the Cimento's members, including its secretary, Magalotti, were nobles – and certainly not genteel. Additionally, these organizations were independent. There was some limited correspondence between members of the Cimento and members of the Royal Society, but not enough to indicate any coordination of experimental programs, nor of their reporting.¹⁸ Given the social differences between these two academies, and given their lack of coordination, their adoption of similar new modes of experimental reporting must be at least partly attributable to factors other than specifically English and specifically genteel social norms.

In “Placing the View from Nowhere,” Shapin proposes that the main historical question about scientific knowledge is how it traveled so well. In this way, he acknowledges Bruno Latour's view that standardization imposed by empires can explain some of the unusual transferability of scientific knowledge.¹⁹ However, he remains concerned that this is not the

17 W. E. Knowles Middleton, *The Experimenters; a Study of the Accademia Del Cimento* (Baltimore: Johns Hopkins Press, 1971). Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton University Press, 2011). The most significant administrators of the Royal Society were Henry Oldenburg, Robert Boyle, and Robert Hooke.

18 It is of course conceivable that further archival research will contradict this judgment. However, what correspondence I have been able to locate offers no reason to suspect any kind of intentional coordination. This conclusion is supported by Middleton's extensive archival research, recorded mainly in Middleton, *The Experimenters*.

19 Bruno Latour and Steve Woolgar, *Laboratory Life: The Social Construction of Scientific Facts* (Beverly Hills: Sage Publications, 1979).

entire story, though he only gestures toward a solution using a personal anecdote. I propose that a convergence of different European experimenters on a single mode of reporting was the key feature for establishing a standardized language of science that allowed scientific knowledge to travel so well. This perspective supports Shapin's intuition that the coercive force of empires is not sufficient to explain how well scientific knowledge has survived transmission. It also offers an additional mechanism by which standardization was established: converging modes of reporting. This standardization facilitated the transmission of knowledge.²⁰

Shapin comes to his conclusions about the scientific revolution by examining a community of scholars. Biagioli's analysis of early modern science centers on the relationships between a scholar and his patrons. Other work has taken different approaches – examining science through books, or through artisans or apothecaries.²¹ Notwithstanding methodological differences, these other approaches generally fall along the axis spanning between Shapin and Biagioli: examining science through communities of scholars, or examining science by analyzing scholars and their patrons. This spread of scholarship can be further characterized by sorting it according to which factor of the scientific revolution it engages: the legitimation of experiential methods for examining nature, or the standardization of experiential reporting.

In this chapter, I engage the second concern: the standardization of observational and experimental reporting. This study differs, however, by working outside the historiographical spectrum set up by Biagioli and Shapin. That is, I do not center my investigation on a scholar and

20 Shapin, "Placing the View from Nowhere: Historical and Sociological Problems in the Location of Science," *Transactions of the Institute of British Geographers*, New Series, 23, no. 1 (January 1, 1998): 5–12. In this article, he acknowledges the validity of Bruno Latour's argument that scientific knowledge moves insofar as its dissemination is standardized and institutionalized.

21 Adrian Johns, "History, Science, and the History of the Book: The Making of Natural Philosophy in Early Modern England," in *Publishing History*, 1991, 5–30; Smith, *The Body of the Artisan*; Evelyn Welch, "Space and Spectacle in the Renaissance Pharmacy," *Medicina & Storia* 8, no. 15 (2008): 127–58.

his patron, but neither do I center it on a community of scholars. Instead, I examine how a single scholar approached two genres of observational reports. Experimental reporting and diplomatic reporting have so far been considered separately by historians concerned with different aspects of early modern thinking. Magalotti, as a figure who wrote both genres within only a few years, provides an opportunity to understand how standards of experimental reporting were related to standards of reporting in the diplomatic genre of *relazioni*.

The *Accademia del Cimento* was a Tuscan experimental academy founded in 1657. Their motto was “*provando e riprovando*,” or “test and test again.” Their membership was small, including only ten academicians, all of whom were Medici clients before the founding of the academy.²² Prince Leopoldo personally oversaw the work of the academy, and participated in some of their experiments. The involvement of such a high-status patron may have contributed to the Cimento's lack of public meetings or demonstrations.²³ In fact, the academy had no official meetings at all. Their experimental program seems to have been entirely ad hoc, determined by the preferences or needs of Leopoldo and the academicians. This seems to have worked for them, because the Cimento recorded nearly 300 experiments during their ten years of operation from 1657 to 1667. The bulk of those experiments were conducted in the academy's first three years.

Of course, Magalotti did not work in isolation: the experiments were recorded by Cimento academicians, and they had a continuing role as editors of the book. He also worked with printers and engravers to design the final product. His patrons at the Medici court exerted their influence as well. In the end, the product of all these factors was a book of experimental

22 The members of the Cimento were Giovanni Alfonso Borelli, Candido del Buono, Paolo del Buono, Alessandro Marsili, Francesco Redi, Carlo Rinaldini, Antonio Uliva, and Vincenzo Viviani. Alessandro Segni was the academy's secretary from 1657 through 1660, when he was replaced by Lorenzo Magalotti. For a detailed discussion of peripheral figures, see Middleton, *The Experimenters*, 26-27.

23 A patron with social status as high as that of Leopoldo would lose face if he were seen to be working. This necessarily restricted any project with which he was intimately involved. Biagioli, *Galileo Courtier*.

reports very different than what had come before. It was a book that presented itself as a dispassionate “just the facts” report. Any disputations of political or theological significance were avoided or addressed only by implication. By stripping out disputational rhetoric, the Cimento could still present themselves as cutting-edge experimenters while avoiding the political implications that surrounded many scientific topics at the time. But stripping the disputational rhetoric meant stripping the disputational structure. Magalotti’s replacement structure changed experiments from supporting proofs of concept into primary subjects.

Magalotti was representative of a certain kind of noble and very successful courtier. He served the Medici as an envoy, an ambassador, and an advisor to Cosimo III. Like many such courtiers, he did not limit his writing to a narrow genre. In 1666 and 1667, he finished a book of experimental reports, the *Saggi di Naturale Esperienze*. In 1667 and 1668 he took notes that would become his *Relazione d'Inghilterra*, a diplomatic report on the English court. Both of these books used an approach shaped by the state of diplomacy and markets in the seventeenth century. They both presented discrete units of information, arranged in short, subject-specific entries. This format resembled that of the *Philosophical Transactions* a great deal. Yet the changes reflected in the *Saggi* and the *Transactions* have been explained by historians mainly in terms of the internal workings of princely courts or in terms of the social norms of scholarly communities. These explanations, while convincing, are incomplete. They do not account for the international nature of this new, information-centric reporting. Changes that appeared contemporaneously in London and in Tuscany cannot be fully explained by recourse to any phenomenon restricted to one of these places – like the development of a particularly English experimental culture. Rather, these changes in experimental reporting must be related to some

trans- or pan-European factor.

Experiments must always result in representations of nature. They can represent it physically through spectacle or textually in the form of publications. By producing knowledge about nature, experiments produce representations of it as well. These experimental representations can also be analogous to these other ways of representing nature. Like paintings and natural history illustrations, they can represent a selected part of nature. Although a great deal of work has gone into producing a given experiment, an audience is able to directly observe the phenomenon being demonstrated. The spectacle of a court experiment can therefore serve to create the illusion of an unmediated experience of nature, as can paintings or illustrations. As conducted by the Cimento, however, experiments were one step removed or mediated from these kinds of spectacles. Their experiments were experienced by most people through their publication, the *Saggi*. This is what Shapin and Schaffer call “virtual witnessing.”²⁴ Unlike experiments witnessed as court spectacles, the Cimento’s representations of nature were mediated by the work of writers, instrument-makers, and engravers in addition to the work of the experimenter performing the experiment.

The *Saggi* included 28 unique engravings illustrating more than 60 different instruments.²⁵ One experiment described and illustrated in the *Saggi* provides an opportunity to examine the Cimento's representations of experimental practices. Under the heading of “Experiments Pertaining to the Natural Pressure of the Air,” Magalotti offers a rare description of a disagreement within the Cimento. Some academicians, we are told, devised an experiment to

²⁴ Shapin and Schaffer, *Leviathan and the Air-Pump*, 60-65

²⁵ Some surviving drawings of the instruments show very elaborate, formally symmetrical supports. These artistic pen-and-wash drawings give no more context than the engravings of instruments alone because they have no relation to how these utilitarian instruments may have actually been supported or used. They float in the air or rest on the edge of the image frame just like the engravings in the *Saggi*, with no table, room, or experimenter in sight. Middleton, *The Experimenters*, 78-79.

show that atmospheric pressure was not affecting barometers. This was contrary to the growing consensus in experimental communities. In the mid-seventeenth century, the successor to Galileo's position at the Medici court and designer of the barometer, Evangelista Torricelli, argued that the barometer reflected changes in atmospheric pressure. The device in question was a glass tube, closed at one end and filled with mercury. Once filled, it was turned vertically so that the open end rested in a bowl of mercury. The tube's mercury would fall partway down the tube, leaving a vacuum or near-vacuum at the top of the tube. The length of this vacuum would shrink or expand, Toricelli believed, based on changes in atmospheric pressure on the mercury in the bowl. If the atmospheric pressure was reduced to zero, the mercury would presumably evacuate the tube entirely.

The *Saggi* tells us that, in order to demonstrate that atmospheric pressure was not operative on the barometer, some of the Cimento academicians conducted two versions of an experiment. The simpler one consisted of placing a large bell jar over the barometer and cementing the jar to the table. If the weight of the atmosphere was keeping the mercury partway up the tube, then protecting the instrument from all but the small quantity of air under the bell jar should cause the mercury to drop lower. If it did not, this could be taken to indicate that atmospheric pressure did not affect the instrument. Indeed, when the experiment was carried out, the experimenters found no difference in the mercury level from the barometer without the protective bell jar.

In writing about the experiment, Magalotti maintained a descriptive approach. This is true even when he wrote about the social process by which the academicians designed the experiment.

They persuaded themselves, then, that if it were true that it was the weight of all the region of air above that drove the quicksilver up the tube, and if it was in equilibrium with this, then, if the stagnant quicksilver were protected by a glass wall from such great pressure, the imperceptible weight of what little air is included under the bell jar ought to remain unable to keep the mercury at the same height as that to which the weight of such a vast region of air had pushed it. But in spite of this it was seen not to fall in the least from its usual height *EG*.²⁶

Magalotti described how the academicians' reasoning led them to an experimental design, and how the results of that experiment surprised them. Although the entry was largely a descriptive timeline, it included at least some narrative elements. For instance, by writing that “they persuaded themselves” (*si persuadevano*), Magalotti implied that their reasoning would later prove faulty. He built on this implication by showing how the results of the initial experiment surprised the academicians. He ultimately confirms this foreshadowing later in the entry.

After the surprising result of the first experiment, another experiment was conducted using a modified barometer. This time the entire device was submerged in water. This way, the pressure of the atmosphere on the mercury was replaced with the pressure of a tank of water. When the academicians put the barometer underwater, higher pressure forced mercury higher up the tube. Knowing that pressure from the new water “atmosphere” was affecting the barometer, the original experiment was run again. The result remained the same: there was no change in the mercury level when only a small amount of water was allowed to contact the mercury. If sealing the mercury off from the water did not change the reading of the barometer, observers could not expect it to change when sealed off from the atmosphere. The *Saggi* concludes that the pressure of both the air and water was being exerted due to the compression of the fluid, not directly by the weight of the fluid above the mercury. At the very end of this entry, Magalotti wrote:

²⁶ *Saggi*, page XXXIV

From all these experiments it seemed to them that they could believe with greater probability that this suspension of fluids derives, not absolutely from the weight of the air, but rather from the compression caused in a very small portion of it by that weight.²⁷

The academicians are represented as evaluating the true nature of a phenomenon exclusively with reference to their experiments, and completely without reference to theoretical models of pressure. They certainly were not depicted as part of a discussion between larger philosophical or cosmological positions (e.g. mechanistic vs Aristotelian). These representations are not strictly accurate. The experimental design reveals expectations on the part of academicians regarding the nature of pressure, which in turn implies a theoretical model of pressure, formal or informal. These experiments also had implications for broader scholarly discussions about the nature of pressure, air, and the composition of the world. Historians have therefore argued that this apparent disinterest in theory was a rhetorical device, rather than genuine disinterest.²⁸

Nevertheless, such rhetoric required Magalotti as the author of the *Saggi* to abandon the conventional disputational format. Such a format relied upon explicit arguments about theoretical models of nature. Experiments and other evidence were organized by the arguments they supported. Instead, the *Saggi* uses a modular format. In this format, the experiments themselves are discrete entries by which the book is organized. These are the *saggi*, or essays, to which the title refers. The *saggio* above displays the characteristics of the format with which Magalotti replaced the disputational organization. In particular this passage is a discrete part of a modular whole. If the six-page *saggio* describing these experiments were removed from the book, it would still contain everything a reader would need in order to understand the purpose of the

27 *Saggi*, page XXXX

28 Luciano Boschiero, "Natural Philosophizing inside the Late Seventeenth-Century Tuscan Court," *The British Journal for the History of Science* 35, no. 4 (December 1, 2002): 383–410.

experiments, their design, the instruments used, and the results observed. Two key features can therefore be observed about this new format for experimental reporting: entries are discrete units, and they are structured around experiments themselves, rather than around arguments.

The *Saggi* were Magalotti's first major writing project, so he could not draw on a previously-completed work to inspire the format of this book of experiments. He did, however, begin writing another report almost immediately after the publication of the *Saggi*. And this work, his *Relazione d'Inghilterra*, not only shared a number of key similarities with the *Saggi*, but it was also written within an established genre of diplomatic reporting. It is impossible to state with certainty that Magalotti consciously adapted the format of *relazioni* for the Cimento's book of experiments. It is nevertheless clear that the *Saggi* bear a greater organizational resemblance to this ambassadorial genre than they did to many other notable scientific publications of the seventeenth century.

***Relazioni* and *Saggi*: Discrete Observational Reports**

Lorenzo Magalotti's *Relazione d'Inghilterra* was part of a genre of diplomatic reports in which envoys compiled politically relevant information about the state to which they had been deployed. *Relazioni* served many purposes for envoys and other state actors. For instance, they provided the state with detailed information about the internal affairs of other important European and Mediterranean states. They could improve the reputations of their authors when these documents were delivered to heads of state. Such diplomatic reports also served the court by providing resources for future ambassadors and envoys, who would read *relazioni* in preparation for their missions. The reports were in demand among the *litterati* as well, some of whom boasted libraries including multiple volumes of *relazioni*. Accordingly, these various uses corresponded with the various forms that a *relazione* could take. As with Magalotti's *Relazione*, manuscript copies were often made of the original document. Reports were also printed, sometimes alone, but often in volumes that collected many *relazioni* together. Finally, it was common for envoys to deliver their reports orally rather than in writing.²⁹

Each iteration of a *relazione* bore the marks of its intended purposes. In the case of Magalotti's *Relazione d'Inghilterra*, the original manuscript has not survived, but a contemporary manuscript copied in an unknown hand has survived in the *Archivio di Stato* of Florence.

Another manuscript copy was made for a Tuscan diplomat some thirty years later. This copy was

²⁹ See Filippo de Vivo, "How to Read Venetian *Relazioni*," *Renaissance and Reformation* 34.1–2 (Winter-Spring 2011): 25–59.

heavily edited, with much of the original content omitted. Additionally, Magalotti's *Relazione* has been printed at least once, in a volume that included another report. There is no available evidence regarding Magalotti's verbal presentation, if he gave one.

The specific differences in content between these versions could potentially provide some insight regarding Magalotti and his position within the Medici court and within the republic of letters. For now, however, rather than content, I would like to address the format of the report as Magalotti initially composed it – to the degree that available evidence allows, of course. Further, I would like to compare those formatting choices – that is, the way Magalotti chose to organize and present information – with the formatting choices Magalotti made when he reported experiments in the *Saggi*. By examining the ways that Magalotti's diplomatic and experimental writing were similar in form, it may be possible to shed light on the changes in how information was conceived and presented over the course of the seventeenth century. In particular, I hope to show that key changes in experimental reporting during the scientific revolution were consistent with contemporary forms of diplomatic reporting.

The historiography of Lorenzo Magalotti has been characterized by a tension between Magalotti-as-scientist and Magalotti-as-man-of-letters. That is, historians have generally viewed Magalotti as possessing a basically 'scientific' temperament or they have viewed him as a poet or diplomat at heart – and therefore fundamentally unscientific in his approach.³⁰ One common way to resolve this tension was presented by Eric Cochrane in his 1973 monograph, *Florence in the Forgotten Centuries*. Here Cochrane presents Magalotti as a young man trying to find his place in the world. After his difficult years writing the *Saggi* for the Cimento, Magalotti turned away

30 Stefano Miniati, "Lorenzo Magalotti (1637-1712): Rassegna Di Studi E Nuove Prospettive Di Ricerca," *Annali Di Storia Di Firenze* V (2010).

from science and toward poetry and diplomacy.³¹ This view is commendable for acknowledging that one perspective does not necessarily dominate an individual's decades-long lifespan. Indeed, people change and it is dangerous to attempt to explain a lifetime of work by articulating a single intellectual approach.³² In making his argument, however, Cochrane assumes diplomacy to be a basically different category of human endeavor from science. According to this view, it may be possible to be both scientist and diplomat at once, but maintaining that status would require the simultaneous pursuit of two essentially unrelated activities.

More recent historiography has continued past trends: Maglotti's work is either basically scientific, basically unscientific, or his work changed from scientific to unscientific over the course of his lifetime. This kind of categorization reflects the siloed nature of the history of science – and of intellectual history more generally. Since the 1990s, a great deal of work has been done by scholars like Paula Findlen, Mario Biagioli and Pamela Smith to break down the professional walls between the history of science and the histories of society and culture.³³ Their work has shown how scientific knowledge is constructed within the context of individual lives, institutions, and societies. This work has not yet been brought to bear on the connections between experimental and diplomatic reporting generally, or on the writing of Magalotti specifically.

The role of scientific or mathematical knowledge for diplomats has been understood by

31 Eric Cochrane, *Florence in the Forgotten Centuries, 1527-1800; a History of Florence and the Florentines in the Age of the Grand Dukes* (Chicago: University of Chicago Press, 1973).

32 Quentin Skinner, "Meaning and Understanding in the History of Ideas," *History and Theory* 8, no. 1 (January 1, 1969): 3–53. Skinner argues against attempts to extract a single coherent worldview from a thinker's decades-long body of work.

33 Biagioli, *Galileo Courtier*. Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley: University of California Press, 1996). Pamela H Smith, *The Business of Alchemy: Science and Culture in the Holy Roman Empire* (Princeton, N.J.: Princeton University Press, 1994).

historians in terms of conventional diplomatic tasks: negotiation, information gathering, and reporting. In 1626, Gasparo Bragaccia argued that geometry and arithmetic were useful skills for ambassadors. For Bragaccia, these skills were useful to understand the workings of taxes, subsidies, administration, and other common factors in governance. Daniela Frigo notes that these were skills not expected of earlier ambassadors. Only in the seventeenth century did mathematical knowledge become part of the ideal ambassador's diplomatic toolbox. So 17th-century ambassadors were expected to be capable of thinking in ways that sixteenth-century ambassadors were not.³⁴

These changes reflected broader epistemic changes in the early seventeenth century. Such changes, including the changing expectations of ambassadors, reflect a shift in what constituted legitimate knowledge among elite Europeans. By the end of the seventeenth century, mathematical and experiential knowledge were firmly entrenched alongside textual knowledge as fully legitimate ways of knowing. It is therefore unsurprising to see that shift reflected in diplomatic writings as well as the writings of court intellectuals.

There is, however, more to the story of ambassadors and science than this. Bragaccia argued that ambassadors must be selected for specific assignments based on the skills required. For instance, ecclesiastical negotiations require a theologian, while legal negotiations require an ambassador trained in law.³⁵ Neither Bragaccia nor Frigo note the following explicitly, but international communication relating to experiential knowledge – including but not limited to natural philosophy – was increasingly common over the course of the seventeenth century.

With regard to Magalotti, for instance, there have been no significant attempts to

34 Daniela Frigo, "Prudence and Experience: Ambassadors and Political Culture in Early Modern Italy," *Journal of Medieval and Early Modern Studies* 38, no. 1 (December 21, 2008): 15–34.

35 Frigo 27, Bragaccia 118

investigate the continuities between his work as the secretary of the Cimento and his later work as an ambassador for Cosimo III. This paper will show that Magalotti's shift from scientific writing to diplomatic writing was not a dramatic about-face that requires explanation. In fact, it was not necessarily a shift at all. Within the context of Magalotti's life as a noble and courtier, his position as the secretary of the Cimento offered important diplomatic training.

Magalotti was in England not as an ambassador with an extended mission, but as an envoy as part of a longer tour of Europe. During this trip, he maintained extensive correspondence with Leopoldo, Vincenzo Viviani, and Cosimo's secretary Appollonio Bassetti.³⁶ He also wrote Prince Cosimo at least one letter from Venice, which Cosimo praised, writing:

If the few steps that you have taken outside of Tuscany provide you with the material to furnish me with such a fine collection of delightful and beautiful items of news, how will it be when you discover the provinces of the north?³⁷

Cosimo, with courtly flourish, emphasized here his expectations for Magalotti: provide a stream of interesting and useful news from Northern Europe.

It seems that Magalotti compiled his *Relazione* from that stream of news a year or two after he completed his trip in 1668.³⁸ Some of the content of the report likely overlaps with that of the letters he wrote during his time there, especially those to Bassetti. The report provided a comprehensive account of England, especially the court of Charles II. The *Relazione* is divided into eighteen sections, each with thematic titles like “Intrigues at the Court of England,” “The Naval Forces,” “On the Nobility of England in General,” and “The City of London.” These

36 *Relazione*, 9.

37 Middleton, *Relazione d'Inghilterra*, 2. Originally from ASF, Med d. Pr. 1572, 736r.

38 W. E. Knowles Middleton, ed., *Lorenzo Magalotti at the Court of Charles II: His Relazione D'Inghilterra of 1668* (Wilfrid Laurier Univ. Press, 1980), 13-14.

sections are further subdivided into dozens of short entries, each devoted to a single person or topic. Within those entries, he wrote his observations of the given subject in much the way he might write a letter.³⁹

At times, this organizational scheme can result in information that appears in multiple sections. For instance, Magalotti writes in his first section about a duel in which the Duke of Buckingham killed the Earl of Shrewsbury. In the very last section of the report, he writes about the same duel – but neither mentions the other. Yet this organizational scheme provides for the sort of modularity that allowed less relevant sections to be omitted in later copies and prints. In short, Magalotti transformed observations of the English court into units of information. This was very similar to the way he turned natural observations, or experiments, into information in the *Saggi*. Magalotti, by creating discrete units of information, understandable without reference to each other, transformed his knowledge of the English court into a commodity that he could offer to his Medici patrons.

Magalotti, in his *Relazione d'Inghilterra*, was mainly concerned with describing the people of the English court: their visages, their actions, and especially their relationships. Like a reporter of today, he had an eye for scandal. He wrote about affairs and intrigues. However, he also had an ambassadorial eye for matters of state. In particular, he was careful to record everything he could about the status of the English navy. This was especially salient during his trip, because England had recently finished a war with the Dutch. The part of his *Relazione* concerning the naval forces of England features section headings such as “list of vessels that the English admit losing in the recent war,” “list of warships taken from the Dutch in the recent

³⁹ The separation of topics into sections with titles, however, is quite different from the common format of contemporary letters. See for instance *Lettere Scientifiche ed Erudite del Conte Lorenzo Magalotti*.

war,” and “list of the English fleet, according to the description issued at the end of March, 1668.”⁴⁰

This list format is also present in a number of other sections. For example, in addition to listing warships, Magalotti provided a list of 83 “exceptional books by English authors.”⁴¹ He listed significant figures of all kinds: “professors at the University of Oxford,” “English poets,” “famous artists of London,” and even “beautiful ladies of London.” In fact, nearly every section of the *Relazione* is framed in terms of a list of discrete units, whether he is cataloging standing regiments or possessions of the English Crown.⁴² Some lists, like those of books, poets, and professors, include only names with perhaps a line of description. Others, like lists of intrigues at the court or the nobility of England, include full subsections for each entry, with extended descriptions. In particular, he was careful to describe resources – military, financial, or interpersonal – and to evaluate the temperament and character of important players in the English court. None of this was unique to Magalotti. Rather, it was consistent with the way *relazioni* were generally framed in the seventeenth century.

Magalotti described Sir Samuel Morland as something of a double agent. He served Oliver Cromwell during the Protectorate, and was in line to become Secretary of State. However, he became an informant to the King. In particular, he warned the King and his brother away from a plot to kill them. Strangely, he seems to have been contacted in his role as a Cromwell supporter by a man ostensibly in league with the King. This man was to secretly house the King and his brother. However, he offered to turn them over to Cromwell for a price. Morland

40 *Relazione*, 93-106.

41 *Relazione*, 145-149.

42 *Relazione*, 83-92

negotiated a price of £40,000 on behalf of Cromwell. Morland then informed the king of the looming betrayal. Only then did he inform Cromwell of the deal he had struck to capture the King. The King, of course, did not come to the man's house, and so avoided the danger. Here is the passage in question:

[...] from that time on nothing ever came to his notice with which, at infinite risk, he did not acquaint the King, up to the point of saving his life and that of his brother, the Duke, who were to be killed in the house of a traitor near London. This man had been won over by partisans of the King, to receive him secretly in his house in company with the Duke; but considering the high price he could get for these two princes, he called on Sir Samuel and when a price of forty thousand pounds had been agreed upon, disclosed the matter to him. Sir Samuel at once sent off information about this to the King, who had not as yet crossed the sea, and then went to inform Cromwell of his negotiation with this fine fellow. This was very well received, but the caution of the princes, who had been warned in advance, caused the expectations of the protector to be deceived.⁴³

This section of the *Relazione* reveals a number of things about Magalotti's role as an envoy and about his understanding of information. For Magalotti, this kind of political intrigue was extremely relevant. It would be very useful for the Tuscan state to have information readily on file describing exactly who in the English court was likely to double-cross whom, and under what circumstances. It also reveals that in the world of courtly politics inhabited by Magalotti, information could be the difference between life and death. The circumstances in the Tuscan court were not as volatile as those in the English court at the time, but information was similarly valuable for Magalotti in a less dramatic way. Indeed, to spend a lifetime as a diplomat – as Magalotti did – was to be a full-time broker of information.

Additionally, as with passages from the *Saggi*, this section of the *Relazione* stands

43 *Relazione*, 61

completely independent from the rest of the report. It is focused entirely on relevant information about Sir Samuel Morland, the passage's eponymous figure. Magalotti began with a description of Morland's abilities, writing that “Sir Samuel Morland is a man who because of a certain extraordinary ability in arithmetic, in mechanics, and in cryptography is held in some esteem by the King.”⁴⁴ He then went on to describe Morland's role in the important intrigue during which he saved the King's life. Magalotti then finished the section with an evaluation of Morland's temperament and position in the court:

His temperament is melancholy and a little queer, and his machines have given room to his competitors to discredit him with the King, making him pass for a philosopher, so that apart from being amused by these curious things, the King holds him in little esteem. In truth his talent for politics is not wonderful.⁴⁵

The complete section stands alone. In its context as part of Magalotti's *Relazione*, this passage on Morland stands alongside other descriptions of court players to provide readers with a gestalt view of the English court at the moment Magalotti was there. This section – or any other – could just as easily be placed in a new context, however. For instance, it could stand alongside other evaluations of Morland to offer a broader view of this particular figure in the English court. In this way, sections of the *Relazione* share an important attribute with *saggi* of the *Saggi*: they are discrete units that combine to form a modular whole.

Magalotti's *Relazione* also shared organizational attributes with other genres of reporting, including *avvisi*, or political newsletters. Outside the inner circle of state actors who delivered and received *relazioni* was a class of politically aware elites and even merchants who were excluded from governance by their birth or social station. For these people, there were thriving

44 *Relazione*, 60

45 *Relazione*, 62.

markets for political news. This news was traded in the form of periodicals called *avvisi*. They were distributed sometimes in print, but often in manuscript form. In Italy, these periodicals were originally derived from merchant correspondence and news networks in the fifteenth century.⁴⁶ By the seventeenth century, such networks were well-established, sophisticated, and more focused on political news. The *avvisi* disseminated through these networks were organized by reports received from different locations. Each report in an *avviso* had its own section, or *capitolo*, which was generally headed with a date and the location from which the report originated. Each *capitolo* was itself a unit of information, and therefore an individual commodity. Different buyers of *avvisi*, for instance, required different kinds of information. They would receive only the *capitoli* relevant to their needs. Different buyers also paid larger or smaller fees in return for a greater or smaller number of *capitoli*.⁴⁷ This modular structure reveals that each *avviso* was not one commodity, but was a package of *capitoli*, which were themselves the commodities. In other words, the commodity being exchanged was not paper – a physical object – but information.⁴⁸

Magalotti's *Relazione* was not an exceptional entry into the genre of diplomatic reporting. This chapter does not therefore seek to intervene in the history of diplomacy. Rather, it situates the format of Magalotti's *Relazione* in the context of changing formats for experimental reporting during the scientific revolution. The changes in experimental reporting were new only in their application to experiments. In the genre of diplomatic reporting, short, modular entries describing observations were a well-established norm by the late seventeenth century. In

46 Mario Infelise, "News Networks Between Italy and Europe," in *The Dissemination of News and the Emergence of Contemporaneity in Early Modern Europe*, ed. Brendan Dooley (Ashgate Publishing, Ltd., 2010).

47 Infelise, "News Networks Between Italy and Europe."

48 For information as a commodity, see Dooley, *The Social History of Skepticism*. Particularly useful is chapter one, "News Unfit to Print."

particular, Lorenzo Magalotti contributed to both these genres. By comparing the diplomatic and the experimental reporting of a single author, we erase the anachronistic separation of scientific and diplomatic thought that often appears in works of intellectual or scientific history. Instead, Magalotti's work shows how experimental reporting was deeply connected with genres of diplomatic reporting.

Conclusion

The work of Lorenzo Magalotti demonstrates that the same social forces within the republic of letters that shaped seventeenth-century diplomatic reporting also played a role in transforming experimental reports. For a courtier like Magalotti, reporting observations of court dynamics and reporting observations of natural phenomena were essentially the same task. Both kinds of reporting were best carried out with a matter-of-fact tone in a form composed of discrete, easily-separated units of information.

This approach was standard practice in seventeenth-century *relazioni*, or ambassadorial reports. It was even more prominent in *avvisi*, or political newsletters. These periodicals constantly mixed-and-matched their *capitoli*, or sections, so that different units of information could be sold to different clients. This form of reporting was therefore familiar to Magalotti. It also allowed him to sidestep the sort of political pitfalls that had plagued prominent Tuscan experimenters like Galileo. A format organized around experiments and not arguments was a format that did not require its authors to pick fights with other thinkers or political figures. This was a significant advantage over the disputational format.

Other advantages of modular, experiment-focused scientific reporting would not be experienced by Magalotti or by the Cimento, as the Tuscan Academy closed its doors in 1667, the same year in which the *Saggi* was published. Among these advantages, perhaps the most significant was the establishment of a simple mode of reporting that scientists could converge upon. The journal of Magalotti's contemporaries in the Royal Society, the *Philosophical*

Transactions, has been continuously published from 1665 until today. In that time, the format of experimental reports has remained basically consistent with that of the *Saggi*, published in 1667. Scientists report the purpose of their experiments, the methods and tools required to carry them out, the results they observed, and perhaps an interpretation of those results. In this way, they build knowledge at an astonishing pace, and it travels surprisingly well across cultural lines. And this arose – at least in part – from the needs of seventeenth-century diplomats.

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