The Legitimation of Science in the Early German Enlightenment Leipzig, ca. 1687-1750

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ABSTRACT

The legitimation of science as the most authoritative form of human knowledge is the result of complex literary and socio-political processes. In the course of the eighteenth century, lay people came to see science as an authority beyond criticism, whose norms are value-neutral, self-evident and absolute. The cultural status that science acquired continued for centuries and, even though it has been challenged in our times, it still is one of the main providers of meaning for social life. It is true that contemporary scholarship has taken important steps to deconstruct such views by pointing out the social and political roots of the modern ideal of certainty and decontextualization. However, questions still remain as to how this popular image of science was established to begin with. A common view, suggested by the traditional emphasis on scientific practitioners and intellectuals, is that scientific ideas diffused to lay publics and informed them of the newly discovered truths. People then responded to the challenge by adjusting their lives according to the logical implications of science. However, more careful analysis of the sources indicates that the appropriation of science by these audiences occurred in a much more complex and interesting way.

A very common opinion at that early time was that "It is from Saxony that the light of science has spread through Germany and other countries." Leipzig was described as "the cradle of all arts and sciences," "the biggest journal-factory," "the Mecca of the European *book-lovers*," "the German Athens" (Diderot). This study explores the various forces that converged in the excitement and satisfaction of a public taste for and curiosity about scientific matters.

Although it is bound to the Saxon area with special emphasis on Leipzig as a major center of Enlightenment, the results of this study are of more general significance for Mid- and Northern Germany. It provides an illustration of the ways in which supra-regional and international networks centering in the Saxon area operated. Local developments, even when strictly bound to local conditions, signaled the general directions of the Enlightenment movement in Germany as a whole. The processes that allowed science to transcend the boundaries of academies and universities were not merely "transmission" of ideas to essentially passive and receptive audiences. Complex dynamics contributed to the promotion of broader Enlightenment interests in German culture. In spite of universalist claims, philosophers and popularizers did not grant women, as the emblem of the uneducated, nor the people in general, access to the sanctuary of science. Rather, the popularization of science functioned as an effective means for preaching the Enlightenment gospel to an educated laity. It emerges from this study not as a way of reaching out to other underprivileged social groups, but as an effective means for producing unity between elite groups in German society. Popular science works are fragments in the composition of a new human and social ideal, in which science plays a crucial part. They are key building blocks in the construction of a learned worldview shaped by Enlightenment ideals, tensions, and contradictions.

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students at the same time.

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PREFACE

I located most of the published materials discussed in this study at the *Göttingen University Library* and *the Herzog August Bibliothek Wolfenbüttel,* which is an oasis for anyone doing research on the eighteenth-century or earlier periods. I could not have completed this project without the professional help and friendliness of their staff, especially Mr. Christian Hogrefe, who not only seems to know the card-catalogues by heart but also always finds solutions to any bibliographical problem. The library of the Universities of Leipzig and Halle, and the *Sächsische Landesbibliothek* also proved very resourceful. The manuscript section of the Leipzig University library has the unpublished correspondence of Johann Christoph Gottsched and his wife Luise Adelgunde, which contains a wealth of materials relevant to the topic.[1] I also used the correspondence of Count Ernst von Manteuffel extant at the *Sächsisches Hauptstaatsarchiv Dresden.*

Anyone who has done research in Germany is painfully aware of the immense bureaucratic obstacles which are only now being eased somewhat. These obstacles not only have to do with restricted hours but also with manuscript card-catalogues that must be reproduced two or three times on order forms. In the past few years, there has been an immense automation effort, but I had to locate most of the published materials I discuss in this study through old-style search methods which made the process tedious and time-consuming.

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[1] The Leipzig University library owns twenty-two volumes (1722-1756), with about 4,750 letters, mostly to and from the Gottscheds, from about 900 correspondents.

The main difficulty I faced while conducting research for this project was the lack of materials for reconstructing the actual reception of the literature I discuss. I searched for personal papers of several actors, for personal diaries, correspondence of lay people that could throw some light on the materials. However, I was unsuccessful, partly due to the immense losses of records during the bombings of World War II. This has forced me to accept the charge that "Often the work on 'public science' extends no further than the immediate landscapes and mindscapes of the popularizers themselves."[2] This reality constrains my study and my initial hopes of providing not only an account of the ways in which science was portrayed to lay people, but also of the ways in which these people responded to these materials. I will focus on the social functions of popular writings on the basis of a historical study of genres as outlined below,[3] the information on the publishing history of texts, statements in prefaces, reviews, responses in later editions, the adoption or reference to some works in other materials, etc. In addition, personal testimonies of lay actors suggest the effectiveness of the "popularization of science." These actors conveyed an awareness of the importance of being acquainted with science and of the new social boundaries drawn as part of the process of popularization. They accepted their standing as outsiders in the new natural order and bowed to the claim that they did not have a privileged access to scientific truth.

Coffee houses were key sites for public science in the British context. I searched

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[2] Roger Cooter and Stephen Pumfrey, "Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture," *History of Science* 32 (1994): 244.

[3] See section 4, 43ff.

extensively for similar records in the Saxon area, mainly at the *Stadtgeschichtliches Museum* and the *Stadtarchiv Leipzig*. I was able to establish that people met at the *Coffeebaum* and other Saxon places, where they discussed literary and political issues. However, I was not able to determine what exactly was discussed, made available for reading --beyond statements that suggest that current papers and periodicals were available-- or actually read. Hamburg may prove more rewarding than Leipzig to the historian!

Another difficulty I faced relates to records on the publishing history of the works addressed in this study. I found that most records at the *Stadtarchiv Leipzig* were concerned either with theological or with post-1750 issues. I looked at several records of fights between publishers, between publishers and authors, between publishers and the public, and publishers and book dealers, but to my disappointment, none of these contained materials of scientific content. Although I initially perceived this as a negative result, I concluded that works of scientific content were either not considered dangerous enough to be censored or were sufficiently protected from censorship by a physico-theological rhetoric that gave the theological establishment its proper due. I tried then to gain access to the archives of the Breitkopf company, one of the leading Leipzig publishers, but soon found out that the Breitkopf family has not yet granted access to their records. For information on the publishing history of several of the materials used in my study, I therefore had to rely on Oskar von Hase's study of the Breitkopf and Härtel publishing house.[4] Even von Hase's study yielded little information beyond a reference to the impact of the publication of Fontenelle's *Conversations on the Plurality of Worlds* on his publishing business. I found

additional information in the Gottsched correspondence and published materials themselves.

Research on public displays of science was also constrained by archival losses at the *Sächsisches Hauptstaatsarchiv Dresden*. Relying on early twentieth-century studies, I can document the existence of public lectures on experimental physics, that these lectures faced opposition from theological authorities, that the lecturer persisted in his efforts and was aided by a well-known instrument maker, but I could not expand on what is already stated in these materials. This is why Chapter 6 is devoted primarily to the career of electricity in Leipzig. I then tried to locate relevant records at the *Universitätsarchiv Leipzig* but was denied access to the records, partly due to the fact that the University was in the process of renovating its buildings, partly because, despite several attempts, the director, Gerald Wiemers, refused to let me look at record-logs *(Findbücher)* because he asserted that there is nothing that could be of use to my study in these records. Well-established scholars have, in his view, exhausted these resources.[5] Historians' experiences suggest that a fresh look at old records might prove more rewarding!

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[4] Oskar von Hase, *Breitkopf & Härtel*, 2 vols. (Leipzig, 1917), 1 (1542-1827): 19ff.

[5] The results of these studies are published in Wolfgang Schreier, "Die Physik an der Leipziger Universität bis zum Ende des 19. Jahrhunderts," *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig*, Mathematisch-Naturwissenschaftliche Reihe 34/1 (1985): 5-8.

INTRODUCTION

The legitimation of science in early eighteenth-century Germany was to a large extent the result of popularizing efforts. Lay people needed to be convinced that science was not just the craft of certain people, but a universally important ideal, to which every educated person owed allegiance. Historians' neglect of "popular science" is the result of basic historiographic assumptions. Some scholars have argued that popular scientific works misrepresent, misunderstand, distort, simplify, vulgarize, corrupt, and defile the works of high science. Therefore, historians of science, with a few exceptions, have not deemed these texts worthy of serious study. I argue that "popular science" matters! A study of various forms of popular science is interesting, not because it illuminates the naive views of outsiders --or the views these outsiders were supposed to acquire, but because popular science is an integral part of the process by which science became central to western culture. The study of "trivial forms of entertainment" is interesting not only to the historian for whom the little people matter, but also to anyone who wants to know how science acquired the prominence it did. Popular science is important because it is a key to understanding how the modern enterprise of science rose to its status of unquestionable authority in the first place. The popularization of science was the price to be paid for public support and social recognition. The fact that Newton's conception of the universe became, within a generation, a part of the outlook of educated people had little to do with reading the *Principia*, which they did not. The "diffusion process" was the result of the active engagement of different

groups and individuals for a variety of reasons and purposes, in contexts which provided both resources and constraints for any given enterprise of "diffusion." Popular science matters because science was not the creation of a few selected minds. It was the common craft of poets and philosophers, instrument-makers and *littérateurs,* clergymen and women, printers and patrons who joined the Enlightenment with varying degrees of awareness and engagement.

This study challenges the view of popularization that contrasts pure, genuine scientific knowledge against popularized knowledge conceived as a distortion, degradation, or, at best, appropriate simplification, and, at worst, as pollution by the input of unqualified outsiders.[1] Instead, I argue that "popularizing" efforts neither "explain the facts of science to men and women who had no professional interest in it"[2] nor mark "the triumphal march of the Newtonian paradigm all over Europe."[3] This project is not about science as an additional factor in the social world and still less about social factors merely intruding in or contaminating an otherwise objective and rational activity. It is about science as a form of culture that claimed to make God's plan in nature accessible to an audience traditionally excluded from the world of learning. As a result of the spread of science throughout

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[1] Stephen Hilgartner, "The Dominant View of Popularization: Conceptual Problems, Political Uses," *Social Studies of Science* 20 (1990): 519-39.

[2] I. Bernard Cohen, *Album of Science. From Leonardo to Lavoisier, 1450-1800* (New York: Charles Scribner's Sons, 1980), 254.

[3] Marta Fehér, "The Triumphal March of a Paradigm: A Case Study of the Popularization of Newtonian Science," *Tractrix* 2 (1990): 93-110, 100.

German society, lay people did not become legitimate practitioners of science. They became adequately informed outsiders to the circle of learned scholars and yet appreciative spectators of their work. As in the case of other European contexts, lay people needed to be won over to the cause of science, at least for public support and recognition. The German case presents its peculiarities. The grip that the theological establishment had on eighteenth-century Saxony was an essential factor in the legitimation of science in this context. The spread of the Enlightenment gospel and the growing prestige of science in European culture produced increasing tensions regarding the legitimacy of previous theological frameworks of meaning. In an effort to make science palatable to German sensitivities, contemporaries argued that science was useful because it could help people become what Providence destined them to be. It could enhance the educational level of people and prepare them to fulfil their roles in a more efficient manner. As a result, it would make them useful members of an enlightened society. A taste for science, some acquaintance with important names and ideas, was considered to be an essential trait of an educated person. Yet the purpose of those in charge of making this knowledge available to broader circles was not to make of them "true scholars" or "professionals" but, to repeat, adequately informed outsiders to learned culture. As a result, the authority and credibility of science and its legitimate practitioners were established in German culture. "Popularization" is much more than the "distortion" or "simplification" of higher truths.

From beginning to end, every decade of the eighteenth century brought about an increase in the number of texts that portrayed scientific matters for a variety of purposes.

The reasons for this had to do as much with profit for the booksellers as with the public's growing fascination with things scientific. During the eighteenth century, physics came to be treasured as the best example of an emancipated form of human knowledge. But science was more than a mere literary enterprise. Since physics was said to be useful and entertaining, it therefore should be open to "everyone." "Everyone," however, despite optimistic overtones, should not be taken literally. One of the purposes of this study is to spell out to whom, indeed, "everyone" refers. To discern how the boundaries of the participation of the laity were drawn in German culture is one of the aims of this study. Despite all the efforts for making knowledge available to broader circles previously excluded from the world of learning, true access to science remained the privilege of a few. What knowledge and how much knowledge should be made available to lay people? These were highly contested topics. This study tells a chapter of the story of these conflicts in German culture. It presents a multiplicity of attempts at delimiting the participation of outsiders and, at the same time, it explores the many ways in which the tracing of these boundaries was accomplished. The creation of a lay reading public, the making of a "bourgeois" consciousness, and the spread of science in German society were interdependent processes.

Didactic poetry, popular science books, physico-theological tracts, and public displays of science were some of the media used for making science accessible to a growing lay audience. These media were embedded in the social tensions generated by the displacements that the new forms of knowledge were bringing about in the scholarly world.

Theologians were increasingly deprived of their central position in the world of learning. Literature began to loosen its commitment to theological concern and authority. Poets, in turn, attempted to wrest authority from science by writing didactic poems. The threats posed by the growing prestige of science during this period had to be effectively met. What was at stake was not the survival of a few theological statements but the stability of the social order.

Part I contains a discussion of the social, political, and cultural transformations in early Enlightenment German society that made a growing curiosity about scientific matters possible. It includes a description of the formation of the social and cultural structures that were a prerequisite for the spread of science in society and portrays the tensions created by a growing participation of lay people in the world of learning. The extent to which access to science should be granted to the laity emerges as a highly contested topic and involves processes difficult to constrain.

Chapter 1 shows how the growth of a lay reading public and the emergence of the "bourgeoisie" made the culture of the Enlightenment possible. It describes the Saxon area in some detail and offers an account of the status of lay people at this time. The main argument of this chapter is that the creation of a reading public and the making of the "bourgeoisie" as a new social and intellectual group were interdependent processes. The life of Leipzig as a fair-, university-, and publishing-town provides an ideal ground for pursuing these developments which, although bound to local conditions, are indicative of the German Enlightenment movement as a whole.

Chapter 2 focuses on changes in scholarship and education that led to a new world of learning. It discusses the various criticisms of old-style scholarship and the articulation of new educational ideals that served as a background for a growing interest in making science available to a lay public. Christian Thomasius (1655-1728) and Johann Christoph Gottsched (1700-1766) labored to end the exclusivity of learning and to create outlets for the discussion of new Enlightenment values and ideals. Despite claims to making knowledge available to "everyone," the extent to which knowledge should be accessible to the laity was highly contested. Saxony was the seat of a very combative Lutheran orthodoxy. Theological opposition to democratizing tendencies heightened the tensions. Thomasius was expelled from Leipzig, books were censored, scholars were silenced, but the power of the printed word enhanced by the new forms of sociability made possible by gatherings of all kinds could not be restrained. Women, as representatives of the uneducated laity, were granted access to the new learning, but the degree of their participation was set within clear boundaries. Authors of popular science works legitimate their writings on grounds of their utility in leading people to God.

Chapter 3 closes the first part of this study with a discussion of how the birth of German reference works indicates the greater inclusion of lay people in the educated readership. The growth of this genre bears witness to the success of earlier efforts at making knowledge available to broader circles and contributes to easing this process for their readers. Although Amaranthes' *Ladies Lexicon*, the first work of this kind explicitly intended for the ladies, is not about scientific matters, the circumstances of its production

and reception provide us with an excellent avenue for assessing how controversial the issues discussed in previous chapters were. At the same time, it suggests that acquaintance with science has become a common feature of an educated person's outlook. This *Lexicon* is no work for scholars, but one designed explicitly for lay readers. The limits of the participation of these readers becomes a pertinent topic of discussion. Should scholarship be made available to the ladies? To what extent? Amaranthes was aware of previous discussions of these topics and that their consequences were inflammatory. He devoted the preface to the second edition of his *Ladies' Lexicon* to settling these topics. Amaranthes recommended that science can become the most appropriate remedy for the squandering of time, for eradicating ridiculous superstitions, and for encouraging mothers to accustom their children from their earliest days to the knowledge of God. He especially recommended physics, while cautioning that "the experiments should not be taken too far."

Part II examines three vehicles or media used for making science available to the growing lay public: didactic poetry, dialogue writing, and public displays. The first two are literary means. I explore their history as genres and how writers used them in the European context and in Germany in particular and discuss the implications of grafting "science" onto them. I attempt to untangle the mechanisms of control incorporated in these texts as they contributed to shaping the boundaries of the scientific sphere in German culture. The third medium, however, forces us to move beyond a literary culture. Public displays of science took on a variety of forms in Leipzig, ranging from private lectures to fair entertainments. When science moved beyond the boundaries of traditional institutions of learning, serious

scholars lost their grasp of mechanisms of control. This loss had important consequences both for the laity and for the prestige of science in German culture. Chapters 4-6 are articulated on the basis of three tightly interwoven levels of analysis: the nature of the knowledge popularized; the interests of the actors involved in the popularization process; and the ways in which the audience is construed. Chapter 4 discusses the ways in which poets used didactic poetry as an effective medium for promoting new Enlightenment goals. Didactic poets portray Newton as the model scientist and the model of the pious man of science who embodies the new powers of enlightened knowledge. Poets use the peculiarly persuasive powers of this genre to convey a sense of the authority of science and the importance of lay people's awareness of these new developments. Didactic poems emerge as key building blocks in the making of a new "bourgeois" consciousness in which science plays a crucial part.

Chapter 5 describes the use of written dialogues as an appropriate genre for communicating science to the uneducated. It focuses on the discussion of the German version of Algarotti's *Newtonianism for the ladies.* Although Algarotti's work claims to make Newtonian science accessible to lay readers, it functions as a means for enhancing the authority of science and for establishing the boundaries of the participation of the laity. Science still remains a sacred preserve available only to a few and to which true access is denied to most people. Theological arguments present the natural order as God's order. This approach fits in nicely with the German view of the relation of science to the natural order.

Chapter 6 describes public displays of science, illustrated by the important case of

electricity. It presents the story of the career of electricity in Leipzig. It follows electricity to the various settings it manages to conquer, from the study of serious scholars to the marketplace, transgressing the boundaries between learned and uneducated, male and female, serious and trivial, elite and popular set by literary discourse.

These chapters show that the popularization of science is justified on the basis of the usefulness of science in leading people to God and in creating an enlightened human community. The usefulness of science is repeatedly tied to its entertaining nature. The actors involved in the popularization process emerge from this analysis not merely as disinterested observers but as mediators who create a participatory role for themselves in the new prestigious enterprise. These chapters also show that changes in knowledge bring about changes in the social roles of the people involved in producing and consuming this knowledge. The media employed are not merely external packaging of ready-made information but have essential consequences for the people and the knowledge involved in the communication process.

I conclude by suggesting that once the history of the popularization of science is restored to the matrix of eighteenth-century life, the history of science itself emerges no longer as the struggle of heroic individuals to force nature to reveal its secrets. The legitimation of science in the eighteenth century was an essential accomplishment of the growth of science in Enlightenment society. The creation of the educated "bourgeoisie" and the establishment of the authority of science were interdependent processes in German culture. As science spread through society, it functioned as a powerful means for drawing

the boundaries between insiders and outsiders in the world of learning. At the same time, it established the distinction between high and low science, between knowledge-makers and consumers of popularized knowledge. It is in this sense that popularizing efforts served as effective strategies and powerful means for drawing and reinforcing the boundaries of the scientific sphere in German culture. The Enlightenment gospel offered its carriers a new frame of meaning that provided them with a new sense of direction and cohesion, not only as individuals, but also, and more importantly, as members of the chosen flock. Texts, aided by practical forms of engagement with science, emerge as key building blocks in the construction of a learned worldview shaped by Enlightenment ideals, tensions, and contradictions. I hope that other investigators will take up the task of studying additional German Enlightenment centers. In this way, we will be able to restore the German scene to the European world of science during the first decades of the eighteent

Historiographic Issues

In a recent collection of essays Roy Porter has argued that the full history of the popularization of medicine still remains to be written.[4] A similar argument can be made for the history of science as a whole. If the "popularization" of science was an essential part of the scientific enterprise in the eighteenth century, why have historians of science not been

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[4] Roy Porter, ed., *The Popularization of Medicine, 1650-1850* (London and New York: Routledge, 1992), 2.

interested in this aspect of scientific history? These historiographic remarks are an attempt at articulating what I see as the most fruitful theoretical tools for addressing the richness of experiences and multiplicity of factors involved in the establishment and growth of science during the early decades of the eighteenth century. I draw on literature available on popularization and on literary and cultural studies that, in the past decades, have increasingly moved from an exclusive interest in texts to an understanding of their function and use in historical life.

In the first section I lay out the main lines of new cultural studies as they pertain to the history of science in other European contexts and set my project within their scope. In the second section I discuss the standard models of popularization of science and suggest what I see as the most helpful tools for analyzing the variety of factors and multiplicity of experiences involved in the spread of science throughout society. In the third section I outline the main directions of Enlightenment studies that have moved away from an exclusive interest in ideas to include the social carriers of those ideas (both human and material), with special emphasis on the German Enlightenment. I give special consideration to the history of German science and the intellectual status of women at this time. The fourth section discusses "Science and Literature" studies that have shown a growing interest in the transformations of science when placed in a literary context and of literature when science is grafted onto it.

1. Cultural Studies of Science

Recent cultural studies focusing on the relationship between texts as cultural artifacts conceived by the author, printed by the publisher, and read (or heard) by the reader have thrown into doubt some of the canonical conceptions of the history of culture. This is true particularly of the dichotomy between popular and educated or elite culture.[5] Historians of culture have begun to use literary techniques and approaches to develop new materials and methods of analysis. These cultural historians do not consider printed materials merely as sources for ideas and images but as carriers of relationships.[6] Culture is not over and above economic and social relations, nor can it be ranged beside them. All practices are "cultural" as well as social or economic, since they translate into action the many ways in which humans give meaning to their world.[7] These studies point to the need for a better understanding of the materiality of texts, their conditions of production and their reception. For this purpose, Natalie Davis suggests that three tightly interconnected levels of analysis must be attempted: (1) a study of printing practices; (2) the life of texts as cultural artifacts;

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[5] Lynn Hunt, ed., *The New Cultural History* (Berkeley: University of California Press, 1989).

[6] Natalie Zemon Davis, "Printing and the People," in *Society and Culture in Early Modern France* (Stanford: Stanford University Press, 1975), 189-226.

[7] Roger Chartier, *The Cultural Uses of Print in Early Modern France* (Princeton: Princeton University Press, 1987).

and (3) the history of reading practices.[8] As cultural artifacts, published materials had a social life that complemented and enriched the efforts of authors, printers, and readers. I therefore supplement thematic analyses with evidence about the readership that can provide contexts for the meanings and uses of such published materials. By looking at the "world behind the books" (Darnton), this study throws light on the dialectic of commercialization and the expansion of "enlightened reason."

Practitioners of cultural studies of science, in turn, have begun to investigate the practices through which scientific knowledge is articulated and maintained in specific cultural contexts and translated and extended into new contexts.[9] These studies suggest that we need to move away from an exclusive interest in texts toward a greater plurality of signifiers of scientific activity such as cabinets of curiosities, gender metaphors, patrons, instruments, and scientific "toys," among other things.

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[8] Chartier, *Cultural Uses of Print*; Robert Darnton, *The Business of Enlightenment, a Publishing History of the Encyclopédie, 1775-1800* (Cambridge: Belknap Press, 1979); Davis, "Printing and the People;" Elisabeth Eisenstein, *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early-Modern Europe* (New York: Cambridge University Press, 1977); Bernhard Fabian, "English Books and Their Eighteenth-Century German Readers," in Paul Korshin, ed., *The Widening Circle: Essays on the Circulation of Literature in Eighteenth-Century Europe* (Philadelphia: University of Philadelphia Press, 1976), 117-96; Donald F. MacKenzie, "Topography and Meaning: The Case of William Congreve," in Giles Barber and Bernard Fabian, eds., *Buch und Buchhandel in Europa im achtzehnten Jahrhundert* (Hamburg: Hauswedell, 1981); Paul Raabe, *Bücherlust und Lesefreuden: Beiträge zur Geschichte des Buchwesens im 18. und frühen 19. Jh.* (Stuttgart: Metzler, 1984); Roger E. Stoddard, "Morphology and the Book from an American Perspective," *Printing History* 17 (1987): 2-14.

[9] Joseph Rouse, "What are Cultural Studies of Scientific Knowledge?," *Configurations* 1 (1993): 1-22.

Recent cultural studies of science have focused mainly on the British context. Larry Stewart has argued that the rapid multiplication of the sites of science in the early eighteenth century meant the emergence of "public science" in coffee houses, printing ateliers, and mechanics' shops. Newton's popularity in the coffee houses could certainly not have followed from the public's judgement of the merits of his *Principia*. Therefore, Stewart argues, we need to pay more attention to Newton's popularizers and expositors, as well as to the new shape that Newtonianism acquired in order to fit a growing public interest. England's coffee houses, her "penny universities" rather than her military academies, colleges or universities, were the authentic source of the popularization of natural philosophy in the eighteenth century. For natural philosophy to become securely established as a pillar in the social order of enlightened Europe more than texts was required. Natural philosophy had to create its own public place, that is, its own credibility and its own audiences. Natural philosophy's most important achievement in the eighteenth century was a burgeoning public interest. In these terms, Stewart argues, the creation of scientific facts matters less than the manufacture of credibility.[10] Jan Golinski's thesis is that chemistry in Britain began to emerge as a distinct discipline around the middle of the eighteenth century as part of the Enlightenment project to improve the human condition and contribute to the

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[10] Larry Stewart, *The Rise of Public Science. Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge: Cambridge University Press, 1992).

progress of civilization through the diffusion of new knowledge to an educated public.[11] In her recent book on magnetism in eighteenth-century Britain, Patricia Fara complements and extends the expositions by Larry Stewart and Jan Golinski on the rise of a powerful public science. She argues that magnets are promising tools for dissecting the intricacies of cultural debates. Examining the location of magnets in eighteenth-century discourses allows her to reveal some of the countless negotiations which contributed to the construction of magnetism as one of the new public sciences governed by the *Royal Society*. Magnetism provides an excellent example illustrating how what people now recognize as scientific disciplines were often in the past diffuse collections of practices, whose future coherence was not readily apparent.[12]

In a recent article Jan C. C. Rupp argues that the New Science was a major constituent of the public sphere in the early modern era. In seventeenth- and eighteenth-century Western Europe the sphere of public experimentation, testing, and discussion related to the new science manifested itself as a highly diversified, contested, and complex social field. His paper includes a historiography of public culture in early modern Western Europe. Through the examples of public science in Italy, the Dutch Republic, England, Scotland, and France, Rupp demonstrates the diversification and complexity of the public

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[11] Jan Golinski, *Science as Public Culture; Chemistry and Enlightenment in Britain, 1760-1820* (Cambridge: Cambridge University Press, 1992).

[12] Patricia Fara, *Sympathetic Attractions. Magnetic Practices, Beliefs, and Symbolism in Eighteenth-Century England* (Princeton: Princeton University Press, 1996).

sphere and the major contests and problems regarding its constitution.[13] Germany is missing from this discussion.

The aim of these cultural studies is to provide insight into the processes through which science has come to play a powerful role in society. In becoming a public culture in Britain and France, natural philosophy achieved in the eighteenth century a greater sanction than the *Royal Society* or the *Académie des Sciences* could have dreamed. Bracketing scientific practices with other cultural activities in their local context has demoted the privileged nature of scientific knowledge. Nevertheless, one drawback of demystifying science is that it renders mysterious the processes by which it has become so powerfully prestigious.[14] One of my goals is to untangle some of these mechanisms in German culture.

Literary historian Walter Schatzberg[15] has been interested in charting the

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[13] Jan C. C. Rupp, "The New Science and the Public Sphere in the Premodern Era," *Science in Context* 8: 3 (1995): 487-507, 488.

[14] David Hull, "In Defense of Presentism," *History and Theory* 18 (1979): 1-15; John R. R. Christie, "Aurora, Nemesis and Clio," *British Journal for the History of Science* 26 (1993): 391-405; Peter Galison, "History, Philosophy, and the Central Metaphor," *Science in Context* 2 (1988): 197-212; Joseph Rouse, "Philosophy of Science and the Persistent Narratives of Modernity," *Studies in the History and Philosophy of Science* 22 (1991): 141-62; Jan Golinski, "The Theory of Practice and the Practice of Theory: Sociological Approaches in the History of Science," *Isis* 81 (1990): 492-505; Andrew Pickering, ed., *Science as Practice and Culture* (Chicago and London: University of Chicago Press, 1992); Roy Porter, "The History of Science and the History of Society," in *Companion to the History of Modern Science*, ed. Robert Olby, G. N. Cantor, J. R. R. Christie, and M. J. S. Hodge (London: Routledge, 1990), 32-46.

[15] Walter Schatzberg, *Scientific Themes in the Popular Literature and the Poetry of the German Enlightenment, 1720-1760* (Bern: Herbert Lang, 1973).

occurrence of scientific themes in the popular literature of the German Enlightenment and provides abundant source materials. However, his work is based on the assumptions that the popularity of the works he surveys can be measured in terms of the number of issues or copies of published materials. He also assumes that the processes which made science available to broader audiences were merely a matter of "diffusion" or "dissemination" of ideas, and that the layman became "enlightened" about science. Science is pictured as a matter of "new method" or a "new point of view." My study aims to provide a more refined assessment of who the readership for "popular science" works was. I also wish to establish why the authors of such works consider them relevant and how they intend them to function. In addition, I hope to determine what image of science emerges from these works, and what effect they had in the overall map of enlightened German culture.

2. "Popularization" of Science

The history of the "popularization" of science has begun to receive careful attention only very recently.[16] Before this, historians considered science the privilege of adult males specially trained to deal with it and no business of females, children or uneducated people in general. Historians of science have treated popular science as a stepchild of "high" science,

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[16] Roger Cooter Stephen Pumfrey, "Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture," *History of Science* 32 (1994): 237-267.

and its history has not been a part of the history of science proper. They have either ignored both the views propounded by popularizers and lay notions of scientific knowledge, or they have construed them in terms of a passive process of dissemination involving the transfer of knowledge from areas of "high truth concentration" to those of "low concentration."[17] From this vantage point, children's books[18] sit securely on the bottom rung of historical significance, because there truth is formed in the most dilute form possible.[19] Historians have invoked familiar names in intellectual history to explain developments throughout society. Thus, they claim that Newton, Descartes, Locke, and others "influenced" the less articulate into their particular patterns of thought. These scholars have conceived the relation between high science and low (or popular) science as a strictly asymmetrical causal relationship and not essentially an interaction. This has been one of the main reasons why historians have neglected popular science. Furthermore, since positivist historians construed science as progress toward increasing truth and validity, they considered the acceptance of scientific knowledge to be self-explanatory.

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[17] Steven Shapin, "'Nibbling at the teats of science': Edinburgh and the diffusion of science in the 1830s," in Ian Inkster and Jack Morrell eds., *Metropolis and Province, Science in British Culture, 1780-1850* (Philadelphia: University of Pennsylvania Press, 1983).

[18] Children's literature emerged as a genre in Germany in the latter part of the eighteenth century. I will pursue the study of works of scientific content addressed to this audience in a later project.

[19] James A. Secord, "Newton in the Nursery: Tom Telescope and the Philosophy of Tops and Balls, 1761-1838, *History of Science* 23 (1983): 127-151.

Steven Shapin has shown that what he calls the "illumination model" is based on major historiographic assumptions.[20] These include the notion that individuals in an esoteric sub-culture generate scientific knowledge by contemplating nature and 'rationally' assessing their findings. Scholars assume that the context in which science is produced and judged is separate from other contexts. Science, once produced, then sifts passively into the wider social and cultural arena where its manifest truthfulness is sufficient reason for its acceptance as an accurate account of natural reality. Once adopted, scientific accounts of "how nature is" become candidates for social and ideological "extrapolation." The context in which science is produced and judged is both discrete from and formally antecedent to the domain of social use. Alexander Pope is the epigrammatist of this "illumination" model: "God said 'Let Newton be,' and all was light." Furthermore, according to these views, social uses of science not only belong to a discrete domain and are separable from scientific contexts proper but also have a pernicious character to be deplored rather than described and explained. People not privy to the esoteric sub-cultures' 'rules' for finding and evaluating knowledge claims are liable to 'misunderstand' the 'real' (esoteric) meaning of scientific accounts. Or they may willfully introduce 'subjective,' 'ideological,' or 'irrational' components into the esoteric knowledge, thereby corrupting scientific objectivity. This corruption of scientific truth could not possibly be described as a passive process. Nor have

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[20] Steven Shapin, "Social uses of science," in Roy Porter and G. S. Rousseau, eds., *The Ferment of Knowledge: Studies in the Historiography of Eighteenth-Century Science* (Cambridge: Cambridge University Press), 93-139.

historians of science regarded it as a proper subject for serious study. Rather, historians of a positivist orientation have relegated popular science works to the study of 'error.' This dominant approach has actively discouraged the investigation of science as a popular phenomenon. Therefore, Shapin argues, "one can only speculate that such views are sustained not by a concern to describe science as an historically situated cultural enterprise, but by an interest in celebrating it and defending it from contamination."[21]

Historians of science need a model in which the relations between science and its publics are configured in a more dynamic interactive fashion. We should approach scientific culture as a human enterprise situated in concrete historical contexts, and actively made and deployed by social groups to serve a range of interests which cannot be specified in advance of empirical research. Shapin suggests that the cultural gulf between an esoteric scientific sub-culture and the public(s) was not a "natural" or "inevitable" feature of the place of science in the overall map of culture. In the early modern world, what belonged to "science" was poorly demarcated from other practices, just as the role of the man of science was scarcely discriminated from other social roles. Thus, historians should display the enormous labor expended by individuals in the past to construct the very categories of "science" and "the public" and to stipulate the proper nature of transactions between them. Since there was nothing "natural" or inevitable in the ways in which such boundaries were drawn in the past, we must seek to understand them as massive historical achievements. The demarcation

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[21] *Ibid.*, 95.

between "science" and "the public" was accomplished in specific historical settings for specific purposes.[22] The multiplicity of ways in which science and a variety of publics became involved with each other was historically specific. These relations were not wholly consistent. They embodied the tensions inherent in the growing prestige of science, broader cultural shifts related to its growing authority, and the consequent displacement of other groups in society. So the various ways in which the dialectic of secrecy and publicity was played out in European society requires detailed empirical studies.

In early modern Europe, the practice of science was not merely a literary enterprise. In a provocative paper on natural philosophy as public spectacle in the eighteenth century, Simon Schaffer presented the notion of scientific production as performance. As a form of entertainment, science took the form of public spectacles or a practice of public display that could be used as a device for extending the public appreciation of the new experimental philosophy.[23] Science also functioned as a commodity which many people could use; it won large markets, enrolling the interests of several sections of eighteenth-century society.[24]

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[22] Steven Shapin, "Science and the public," in Olby et al., eds., *Companion to the History of Modern Science*, 990-1007. The works of Larry Stewart, Jan Golinski, and Patricia Fara, among others, clearly illustrate these points (see nn. 10-12 above).

[23] Simon Schaffer, "Natural Philosophy and Public Spectacle in the Eighteenth Century," *History of Science* 21 (1983): 1-43. See also Jan Golinski, "A Noble Spectacle. Phosphorus and the Public Cultures of Science in the Early Royal Society," *Isis* 80 (1989): 11-39.

[24] Simon Schaffer, "The Consuming Flame: Electrical Showmen and Tory Mystics in the World of Goods," in John Brewer and Roy Porter, eds., *Consumption and the World of Goods in the Eighteenth Century* (London: Routledge, 1992), 489-526.

Richard Whitley's model of popularization also challenged and expanded the more traditional conceptions of popularization as a diffusion or dissemination of a simplified form of knowledge from the learned (high culture) to the uneducated (low culture). He claimed, for example, that by analyzing the forms and apparent functions of scientific exposition, one finds a variety of ways in which scientific knowledge has been popularized between different groups (e.g. teachers-students, specialists-generalists). Additionally, he claimed that the 'popularization process' is inseparable from the generation and development of scientific knowledge. As evidence, he has shown, in limited case studies, that 'feedback' generated from popularization has functioned both to challenge and to validate existing scientific knowledge, together with promoting the production of new knowledge.[25] Although other investigators have taken up Whitley's challenge with some success to explain the popularization of scientific knowledge in fields such as geology, relativity theory, and molecular genetics,[26] I find it problematic for earlier periods in which scientific disciplines did not yet exist.

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[25] Richard Whitley, "Knowledge Producers and Knowledge Acquirers: Popularization as a Relation Between Scientific Fields and Their Publics," in Terry Shinn and Richard Whitley, eds., *Expository Science: Forms and Functions of Popularization* (Dordrecht: D. Reidel Publishing Company, 1985), 3-28; and J. Bunders and R. Whitley, "Popularization within the Sciences: The Purposes and Consequences of Inter-Specialist Communication," in Shinn and Whitley, *Expository Science*, 61-77.

[26] Stephen Hilgartner has argued that in these cases, 'popularized' knowledge is fundamentally distinguishable from the whole bed of knowledge by a 'matter of degree.' Stephen Hilgartner, "The Dominant View of Popularization; Conceptual Problems, Political Uses," *Social Studies of Science* 20:3 (1990): 519-539, 528.

As the empirical natural sciences grew in prestige and ability to control substantial resources, their intellectual standards came to dominate general conceptions of knowledge and truth. At the same time, as the production of scientific knowledge was separated from the educated public, research became an esoteric activity. By successfully combining claims to universal validity and social utility through popularization, natural philosophers laid the foundation for the present domination and expansion of the sciences.[27] Although it is possible to document what knowledge is being propagated to the public, the reception of such knowledge and its effect are difficult to ascertain. A discussion of popularization without the feedback of so-called 'popularized knowledge' limits our use of the term to merely a form of dissemination. At this time, as Philip K. Wilson puts it, "the historiographic value in analyzing a popularization process appears to be much more useful in specific cases than using 'popularization' as a blanket term to hide our ignorance."[28]

3. Enlightenment Studies

Scholars often describe the Enlightenment as if it had crystallized at some particular moment, often identified with some key texts, from the general agency of prior "free thought" and "new philosophy." The essays collected in the volume entitled *Anticipations of*

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[27] Shinn and Whitley, eds., *Expository Science,* 25.

[28] Philip K. Wilson, "Acquiring surgical know-how. Occupational and lay instruction in early eighteenth-century London," in Porter, ed., *The Popularization of Medicine,* 42-71, 62.

the Enlightenment recognize the failure of Enlightenment studies to address adequately the phenomena and complexities of the late seventeenth and early eighteenth centuries. They stress several important points in this regard. First, these essays address the need to re-contextualize our understanding of certain ideas and forms in the milieux from which they first emerged. This approach will, in turn, allow a better understanding of the etiology and the dynamic of the Enlightenment. Second, they indicate the need to search more broadly for evidence and particulars than generally is done by eighteenth-century scholars, who too often have relied on a preestablished canon.[29] Dorinda Outram's recent book offers an excellent general overview of Enlightenment studies --both old and new-- in the broader European context.[30] Studies of the German Enlightenment in English have emphasized post-1750 developments.[31]

The German Enlightenment was mainly an urban movement and the "bourgeoisie" its representative stratum. Germany's political division had a constricting effect on intellectual life. The process of the Enlightenment took place in differentiated phases and

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[29] Alan Charles Kors and Paul J. Korshin, eds., *Anticipations of the Enlightenment in England, France, and Germany* (Philadelphia: University of Pennsylvania Press, 1987).

[30] Dorinda Outram, *The Enlightenment* (Cambridge: Cambridge University Press, 1995).

[31] Henry E. L. Lowood, *Patriotism, Profit, and the Promotion of Science in the German Enlightenment. The Economic and Scientific Societies, 1760-1815* (New York & London: Garland Publishing, Inc., 1991) and Jonathan Knudsen, *Möser in the German Enlightenment* (Cambridge: Cambridge University Press, 1986).

with changing central foci.[32] German scholars have studied some of these Enlightenment centers in great detail.[33] In recent years, several studies have appeared regarding German Enlightenment philosophy[34] as well as its social and cultural context[35] on which my project attempts to build. These investigations have found that the Enlightenment was a concrete historical process, involving patterns of communication, of social interaction, and a certain way of life in the public realm. As Martin Gierl shows in his book, theological controversy

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[32] Franklin Kopitzsch, ed., *Aufklärung, Absolutismus and Bürgertum in Deutschland* (Munich: Nymphenburger Verlagshandlung, 1976), 27-28ff.

[33] Wolfgang Martens, ed., *Zentren der Aufklärung III: Leipzig, Aufklärung und Bürgerlichkeit* (Heidelberg: Lambert Schneider, 1990); Norbert Hinske, ed., *Zentren der Aufklärung I: Halle. Aufklärung und Pietismus* (Heidelberg: Lambert Schneider, 1989).

[34] Werner Schneiders, *Hoffnung auf Vernunft. Aufklärungsphilosophie in Deutschland* (Hamburg: Felix Meiner Verlag, 1990).

[35] Rudolf Vierhaus, ed., Aufklärung als Prozeß, *Aufklärung* 2/2 (1987); Hans Erich Bödeker, "Reisen -- Bedeutung und Funktion für die deutsche Aufklärungsgesellschaft," in Woflgang Griep, Hans-Wolf Jäger, eds., *Reisen im 18. Jahrhundert* (Heidelberg, 1986), 91ff.;I idem, "Aufklärung als Kommunikationsprozeß," in R. Vierhaus, ed., Aufklärung als Prozeß, *Aufklärung* 2/2 (1987), 89-111; idem, "Das Kaffeehaus als Institution aufklärerischer Geselligkeit," in Etienne François, ed., *Sociabilité et Société bourgeoise en France, en Allemagne et en Swisse, 1750-1850* (Paris, 1987), 65ff.; idem, and Ulrich Herrmann, *Aufklärung als Politisierung - Politisierung der Aufklärung* (Hamburg: Meiner, 1987); idem, Gerald Chaix, and Patrice Veit, eds., *Le Livre Religieux et ses Pratiques. Etudes sur l'histoire du livre religieux en Allemagne et en France à l'époque moderne* (Göttingen: Vandenhoeck & Ruprecht, 1991); Gunther E. Grimm, *Literatur und Gelehrtentum in Deutschland, Untersuchungen zum Wandel ihres Verhältnisses vom Humanismus bis zur Frühaufklärung* (Tübingen: Max Niemeyer Verlag, 1983); and Martin Gierl, *Pietismus und Aufklärung. Theologische Polemik und die Kommunikationsreform der Wissenschaften am Ende des 17. Jahrhunderts* (Göttingen: Vandenhoeck & Ruprecht, 1997). I wish to thank Martin Gierl for kindly making an earlier version of this study available to me.

played an essential role in the religious sphere between 1670 and 1730. Enlightened communication structures did not merely replace the old ones. Religious forms of public dispute and exchange served as a transition for and influenced the growth of an enlightened public sphere.[36] This approach has critical importance for understanding the extension of knowledge in general and of scientific knowledge in particular throughout society at large.

3.a. History of German Science

In eighteenth-century Europe, the term *science* had not yet been coined.[37] What we now call "science" was more commonly called *natural philosophy.* The latter still struggled with philosophical questions such as those concerning the existence of the soul, the activity and passivity of matter, the freedom of the will, and the existence of God.[38] Its practitioners

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[36] The foundational study on the public sphere is Jürgen Habermas, *The Structural Transformation of the Public Sphere, An Inquiry into a Category of Bourgeois Society,* trans. Thomas Burger with Frederick Lawrence (Cambridge, Mass.: MIT Press, 1989). For a recent critical appreciation of Habermas, see Anthony La Vopa, "Conceiving of a Public: Ideas and Society in Eighteenth-Century Europe," *Journal of Modern History* 64 (1992): 79-116 and the collection of essays *Habermas and the Public Sphere*, ed. Craig Calhoun (Cambridge, Mass. MIT Press, 1992).

[37] This was a coinage of the nineteenth century. See Sydney Ross, "'Scientist': The Story of a Word," *Annals of Science* 18 (1962): 65-86.

[38] Thomas L. Hankins, *Science and the Enlightenment* (Cambridge: Cambridge

could not be readily distinguished from practitioners of other forms of intellectual inquiry. Science was neither a defined body of knowledge, with its own subject matter, separate from other bodies of knowledge, nor was it divided into sub-disciplines such as 'physiology' or 'geology'. The study of what we now call "science" still took place in the eighteenth century within other disciplines, linked together under the heading of "natural philosophy." The whole point of 'natural philosophy' was to look at nature and the world as created by God, and thus as capable of being understood as embodying God's powers and purposes.[39]

The German scene, however, presents a special case. Very early in the century Johann Jakob Scheuchzer used terms such as *Physica* and *Naturkunde* in the title of his books *Physica, oder Naturwissenschaft* (1703); *Kern der Natur-Wissenschafft* (1711); *Jobi Physica Sacra, oder Hiobs Natur-Wissenschaft* (1721). In 1720, Christian Wolff used the terms *Natur-Wissenschaft, Physik,* and *Naturlehre* as synonyms.[40] By 1740 Johann Heinrich Zedler, in his famous *Universal Lexicon* incorporated these terms and added other

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University Press, 1985), 10ff. "The Categories of Science."

[39] A. Cunningham and P. Williams, "De-centering the Big Picture," *British Journal for the History of Science* 26 (1993): 407-32, cited in Outram, Dorinda, *The Enlightenment*, 49.

[40] "Derjenige Theil der Weltweisheit, darinnen man erkläret, was durch die Kräffte der Geister möglich ist, wird die Pneumatologie oder Geister-Lehre genennet: und der andere hingegen, darinnen man zeiget, was durch die Krafft der Cörper möglich ist, bekommet den Namen der Physick, oder Natur-Wissenschaft, oder Natur-Lehre." Christian Wolff, *Vernünftige Gedanken von den Kräfften des menschlichen Verstandes und Ihrem richtigen Gebrauche in Erkänntnis der Wahrheit*, (3rd. ed., 1722), #12. See also his *Vernünftige Gedanken von Gott, der Welt und der Seele des Menschen, Auch allen Dingen überhaupt*, 1720, ##631.385.

synonyms: *Natur-Kunde*, *Physick*, *Physica*, and *Philosophia naturalis.*[41] In 1747, Johann Christoph Gottsched (1700-1766) a prominent literary theoretician, philosopher, theater reformer, and rhetorician, translated Pieter van Muschenbroek's *Elementa physicae* (1734) into German as *Grundlehren der Naturwissenschaft.* Gottsched and his wife Luise Adelgunde (1713-1762) were leading figures of Leipzig cultural life (Fig. 1). Gottsched dedicated this work to Count Ernst Christoph von Manteuffel whom he addressed as "connaisseur and lover of the knowledge of natural things as they are examined today in and outside of Germany." Manteuffel (1676-1749) was a politician and adventurer known among his friends as *le diable.* Prussian by birth, he became Polish State Minister at the court of August the Strong and later his Cabinet Minister (*Kabinettsminister*). He was one of the most influential men at the Dresden court where he was counted as an experienced advisor. He lived in Leipzig from 1740 until his death in 1749, the same city where he had studied.[42] Before Manteuffel moved to Leipzig both Gottscheds were in close epistolary contact with him. Johann Christoph Gottsched remarked that Manteuffel's unusual love of a thorough physics was not only known in Dresden and Leipzig, but also in Wälschland, Holland, and England.[43] The purpose of this translation of Muschenbroek's work was to

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[41] Johann Heinrich Zedler, *Großes vollständiges Universal-Lexicon aller Wissenschaften und Künste...*, vols. 1-64 (1731-1750), 23, 1147, cited as *Zedler.*

[42] Thea von Seydewitz, *Ernst Christoph Graf Manteuffel Kabinettsminister August des Starken, Persönlichkeit und Wirken* (Dresden, 1926).

[43] "Wären entweder Dieselben nicht ein so großer Kenner und Liebhaber von der Erkenntniß natürlicher Dinge, so wie sie heute zu Tage von den berühmtesten Männern in

Fig. 1 Gottsched, Johann Christoph (1700-1766) and Luise Adelgunde Victoria (1703-1762) Painting ca. 1730
Source: Berlin, Nationalgalerie, Bildungssammlung
Sächsische Landesbibliothek, Deutsche Fotothek

make this work known to the local lovers of natural science *(Liebhaber der Naturwissenschaft)*.[44] Gottsched then praised Muschenbroek for making experience

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[44] *Ibid.*

make this work known to the local lovers of natural science *(Liebhaber der Naturwissenschaft)*.[44] Gottsched then praised Muschenbroek for making experience (*Erfahrung*) the sole basis of his teaching and for having the integrity of not becoming a mere follower of "the great Newton:"

"He adopted many of his [the great Newton's] well-founded teachings, as long as he considered them simple and true, but he was far removed from the superstition of those who, when they begin to treasure a man highly, immediately worship all his thoughts and conjectures. No, Mr. Muschenbroek was faithful to a noble philosophical freedom and when he considered it necessary he had no scruples in departing from the teachings of this profound Englishman."[45]

Muschenbroek was, in Gottsched's view, "neither a mere Newtonian, nor a Cartesian, Gassendist or Peripatetic; even though he made use of these philosophers' thoughts and discoveries....he also notes the gaps and limits of our insight and ignorance."[46]

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[44] *Ibid.*

[45] "Er nahm viele von deßen gegründeten Lehrsätzen, sobald er sie einfach, und wahr befand, selber an; war aber sehr weith von dem Aberglaube derer entfernt, die, wenn sie einen Mann hoch zu schätzen anfangen, gleich alle deßen Gedanken und Muthmaßungen anbethern. Nein, Herr Muschenbroek behielt sich eine edle philosophische Freyheit vor; und wenn er es nöthig befand, trug er auch kein Bedenken, von den Lehrsätzen dieses tiefsinnigen Engeländers abzugehen." *Grundlehren*, Preface of the translator, n.n.

[46] "Er behauptet aber darinnen weder den Character eines bloßen Neutonianers, noch eines Cartesianers, Gassendisten oder Peripatetikers; ungeachtet er sich bisweilen aller dieser Weltweisen Gedanken und Entdeckungen zu Nutze machet....merket aber auch...die Lücken, und die Schranken unsrer Einsicht und Unwißenheit an." *Ibid.*

This appreciation of Newton could not possibly be described as "the triumphal march of the Newtonian paradigm all over Europe."[47] Gottsched then justifies the need of a translation of Muschenbroek's work on the basis of a "growing love of the natural sciences in Germany" and explains what this Dutch work will add to the existing original German works of Scheuchzer and Wolff: not only is Muschenbroek's expository style laudatory and unheard of in Germany, but it also contains the new discoveries of the physicists of contemporary times, which cannot be said of the German works mentioned. In Germany, the narrowing of physics was begun independently of the Dutch Newtonians by Christian Wolff himself. His *Generally Useful Researches for Attaining to a more Exact Knowledge of Nature and the Arts*, completed in three volumes in 1720/1, described demonstrations given in his lectures on physics, and every detail "to within a hair" as he says, needed to build the instruments to repeat them. Wolff argued that "We must spare no effort and no expense to permit nature to reveal to us what she usually hides from our eyes."[48] As Heilbron points out, by 1740 only five per cent of physics textbooks were devoted to plants and animals.[49] Physics had been reduced to general principles, astronomy, and the usual branches of experimental physics. When I use the term "science" in this study, I refer to this restricted meaning of physics used by eighteenth-century actors.

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[47] See n. 3 above.

[48] Cited in John L. Heilbron, *Elements of Early Modern Physics* (Berkeley: University of California Press, 1982), 7, his translation..

[49] *Ibid.*

Historians of science have only paid marginal attention to the reception of Newtonian science in Germany,[50] except for a Dutch study on Newton's optics.[51] The works of Henry Guerlac, Margaret Jacob, and Betty Jo Teeter Dobbs omit the German scene.[52] Historians have paid little attention to the role of Christian Wolff as physics teacher, his treatment of experimental philosophy and his role in the foundation of the Academy of St. Petersburg. [53] The works of John L. Heilbron and Willem D. Hackmann on electricity are an exception to this omission.[54] The study of Hans Schimank is still the most comprehensive treatment of scientific matters in the earlier phases of the eighteenth

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[50] Andreas Kleinert, *Die allgemeinverständlichen Physikbücher der französischen Aufklärung* (Sauerländer: Aarau, 1974); Fritz Wagner, *Isaac Newton im Zwielicht zwischen Mythos und Forschung* (Freiburg, 1976).

[51] Casper Hakfoort, *Optica in de eeuw van Euler, Opvattingen over de natuur van het licht, 1700-1795* (Amsterdam, 1986).

[52] See the recent book by Betty Jo Teeter Dobbs and Margaret C. Jacob, *Newton and the Culture of Newtonianism* (New Jersey: Humanities Press International, 1995) for a discussion of other European contexts and bibliographical references and Henry Guerlac, *Newton on the Continent* (Ithaca, N.Y. : Cornell University Press, 1981).

[53] Ecole, Jean, "De la notion de philosophie expérimentale chez Wolff," *Etudes philosophiques* 4 (1979): 397-406; Alexander Vucinich, *Science in Russian Culture* (California: Stanford University Press, 1963). For brief mentions of Wolff's relationship to Newton see Gustav Zart, *Einfluss der englischen Philosophen seit Bacon auf die deutsche Philosophie des 18. Jahrhunderts* (Berlin, 1881) and A. Bissinger, *Die Struktur der Gotteserkenntnis. Studien zur Philosophie C. Wolffs* (Bonn, 1970).

[54] John L. Heilbron, *Electricity in the Seventeenth and Eighteenth Centuries* (Berkeley and Los Angeles: University of California Press, 1979) and Willem D. Hackmann, *Electricity from Glass, The History of the Frictional Electrical machine 1600-1850* (Alphen aan den Rijn: Sijthoff & Noordhoff, 1978).

century,[55] and Karl Hufbauer provides an important study on the formation of the chemical community.[56] Rudolf Vierhaus recently edited a collection of essays that attempted to correct the neglect of scientific matters by German scholars, but the essays in this collection focus mainly on the second part of the eighteenth century.[57] This study fills a significant gap that exists in the study of the period 1687-1750.

Science in Germany cannot be understood without an understanding of the role of physico-theology. This was a movement that had a vast following in Germany. The central physico-theological argument is that receptiveness to God's miracles in nature will lead the reader to a recognition of God's omnipotence and grace. Adequate perception will lead to an awareness of who God is, and therefore of humans' obligation to praise him for his love and omnipotence. The first compiler of physico-theological poems, the journalist and *littérateur* Christian Friedrich Weichmann (1698-1769), referring to the purpose of these poems, stated that they point to "the true knowledge, on one side of the divine omnipotence and love, and, on the other, of our own nothingness, with as much charm as learning."[58] Attempts to

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[55] Hans Schimank, "Stand und Entwicklung der Naturwissenschaften im Zeitalter der Aufklärung," *Lessing und die Zeit der Aufklärung* (Göttingen: Vandenhoeck & Ruprecht, 1968).

[56] Karl Hufbauer, *The Formation of the German Chemical Community (1720-1795)* (Berkeley and California: University of California Press, 1982).

[57] Rudolf Vierhaus, ed., *Wissenschaften im Zeitalter der Aufklärung* (Göttingen: Vandenhoeck & Ruprecht, 1989).

[58] "...die wahre Erkäntniß eines Theils von der Göttlichen Allmacht und Liebe, andern Theils von unserer eigenen Nichtigkeit...Gegenwärtige Gedichte aver weisen uns darauf mit

harmonize natural philosophy with faith issues was not new in the eighteenth century. In a recent study on Melanchton's natural philosophy, Sachiko Kusukawa argues that Melanchton transformed a traditional natural philosophy into a peculiarly Lutheran one whose chief goal was to attain a knowledge of the Providence of God.[59] The main difference between Melanchton's pursuits and the physico-theological tradition peculiar to the eighteenth century is that the latter was written in German and addressed a lay public whereas Melanchton wrote his works in Latin for scholars. Physico-theological tracts of the eighteenth century did not attempt to provide philosophical proofs of basic truths. Their purpose was to lead readers to praise of and devotion to the Creator.

Wolfgang Philip has presented overwhelming evidence that the physico-theological orientation inspired a popular literature that contributed extensively to the diffusion and acceptance of the new sciences.[60] Lois Westen in her dissertation on bee literature in the

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eben so vieler Anmut als Gelehrsamkeit." *Irdisches Vergnügen in Gott*, reprint of the 4th edition (Bern: L. Herbert Lang, 1970), 6-7.

[59] Sachiko Kusukawa, *The Transformation of Natural Philosophy. The Case of Philip Melanchton* (Cambridge: Cambridge University Press, 1995).

[60] Wolfgang Philip, *Das Werden der Aufklärung in theologiegeschichtlicher Sicht* (Göttingen, 1957). See also the work of Otto Zöckler, *Geschichte der Beziehungen zwischen Theologie und Naturwissenschaft,* 2 vols: vol. 1: *Von den Anfängen der Christlichen Kirche bis Newton und Leibniz;* vol. 2: *Von Newton und Leibniz bis zur Gegenwart* (Gütersloh, 1877-1879) which analyzes the relations between science and religion in Germany and provides a thorough survey of the efforts to harmonize science and religion in the eighteenth century; and more recently Sara Stebbins, *Maxima in minimis. Zum Empirie und Autoritatsverständnis in der physikotheologischen Literatur der Frühaufklärung* (Bern, 1980).

eighteenth century offered a bibliography of physico-theologies including poems, essays, books, and sermons in which natural phenomena are used for the glory of God.[61] Besides translations of British sources such as Derham's *Physico-Theology* (1713) and *Astrotheology (1715)*, this type of literature flourished in Germany as in no other nation. Popular scientific works, written with the didactic intent of communicating instruction in both science and religion, played a crucial role in the spread of science in Germany. Most of the texts I discuss in this study are embedded in physico-theological rhetoric. This suggests the importance of making science come to terms with theological concerns in this context.

3.b. "Woman" as the Uneducated

During the early eighteenth century, public disputations at the University of Leipzig not only debated whether women should be granted an academic degree, but even whether they could legitimately be considered human beings. The inflammatory nature of the topic of learned women is nicely illustrated by a definition contained in a contemporary dictionary (ca. 1745): "Learned woman is a problem."[62] The authors of the literature I

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[61] Lois Armour Westen, *"Melitto-Logia" the Mythology of the Bee in Eighteenth-Century German Literature* (Ph.D. dissertation, University of Illinois, 1952).

[62] G. W. Rabener, "Versuch eines deutschen Wörterbuchs," *Sämtliche Schriften* (Leipzig, 1777), vol. 1.

discuss in this study sometimes address females explicitly. However, when popular works addressed their readers as "woman," the authors often felt compelled to clarify that "woman" actually is a blanket term for all the uneducated *(ungelehrte, unstudierte)*, the "illiterate," that is, those who did not know Latin and were therefore not members of the scholarly elites. This pattern does not appear exclusively in works of philosophical or scientific content.[63] This is why "women" and "the people" are often lumped together as outsiders to scholarly elite culture. "Learned woman is a problem" would more appropriately read "Learned lay people are a problem," a problem that, as we will see, caused many people severe tensions and conflicts as they attempted to maneuver within fluid social and intellectual boundaries. Women did not just live as a silent mass but challenged the status quo. Several studies have addressed different aspects of women's lives in Germany, but to my knowledge, the only studies that discuss the topic of German women and gender issues in science are those of Schiebinger.[64]

4. "Science and Literature" Studies

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[63] Gabriele Beck-Busse, "Les 'femmes' et les 'illitterati'; ou la question du latin et de la langue vulgaire," *Histoire, Epistémologie, Langage* 16/2 (1994): 77-94.

[64] Londa Schiebinger, *The Mind has no Sex? Women in the Origin of Science* (Cambridge: Harvard University Press, 1989); idem, *Nature's Body. Gender in the Making of Modern Science* (Boston: Beacon Press, 1992). For general studies on German women, see Chapter 1, n. 48.

"Science and Literature" studies have shown the growing interest of scholars not only in the transformation science undergoes when placed in a literary context, but also in the transformations literature undergoes when science is grafted onto it.[65] Several studies have also looked at literary genres--including scientific discourse.[66] A growing awareness of the fundamentally interactive (and indeterminate) nature of the relationship between textual and other practices in scientific activity emerges from these studies. Science not only provides "sources" for literature but emerges as having a cultural and social history that needs telling. A theory of literary influence that assumes the text is a source-field to be strip-mined at will consequently proves limited. The study of genres of scientific writing is a device for situating ideas in their historical context. Genres serve identifiable social functions and act to structure the material they present in characteristic ways. These twin properties allow genres to link what is produced in the mind with the world in which those products find their place.

In the past two decades, the blurring of the demarcation lines between the various academic disciplines and a renewed interest in rhetoric have opened the way for a more

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[65] Stuart Peterfreund, *Literature and Science: Theory and Practice* (Boston: Northeastern University Press, 1990), Introduction, 17-58, 115-138. George Levine, ed., *One Culture: Essays in Science and Literature* (Madison: University of Wisconsin, 1987); Frederick Amrine, ed., *Literature and Science as Modes of Expression* (Boston: Kluwer Academic Publishers, 1989) and Mark Greenberg, "Eighteenth-Century Poetry Represents Moments of Scientific Discovery. Appropriation and Generic Transformation," in Peterfreund, ed., *Literature and Science: Theory & Practice*, 115-138.

[66] Peter Dear, ed. *The Literary Structure of Scientific Argument* (Philadelphia, University of Pennsylvania Press, 1991).

sensitive appreciation of the use of literary genres in scientific writings. The literary form of a scientific or philosophical work is not mere "verbal dressing," but an essential part of its message.[67] Language is not simply a transparent medium of communication but a shaper of thought and an embodiment of social relations. Tom Broman argues that genres of scientific writing are more than either conventional packaging for extratextual reasoning or reflections of the social practices of a scientific community. They also actively shape and constrain the kind of knowledge they purvey. Genres of scientific writing provide a device for situating ideas in their historical context. They not only serve identifiable social functions but also act to structure the material they present in characteristic ways.[68] This study will explore the implications of using specific genres to present science to a lay audience in the German culture of the early Enlightenment.

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[67] Mark Jordan, Mark, "A Preface to the Study of Philosophical Genres," *Philosophy and Rhetoric* 14/4 (1981): 202, 206. See also Alan G. Gross, *The Rhetoric of Science* (Cambridge, Mass. and London: Cambridge University Press, 1990), 2-20.

[68] Thomas H. Broman, "J. C. Reil and the 'Journalization' of Physiology," in Dear, Peter, ed. *The Literary Structure of Scientific Argument*, 13-42.

PART I: MAKING KNOWLEDGE PUBLIC

CHAPTER 1

SETTING THE STAGE: THE EARLY GERMAN ENLIGHTENMENT

1. In the Aftermath of War

The German Enlightenment began chiefly as the reaction of educated Europeans to the bloodshed and persecution of the wars of the seventeenth century. The devastations of the Thirty Years War (1618-1648) were not spread equally throughout the Holy Roman Empire. With its complete fragmentation into territorial states (Figure 2), it was difficult to construct a central location of political power, wealth, culture, and taste. Except for the few spared or revitalized trading cities such as Hamburg or Leipzig, only courts had managed to survive. In the midst of decline, the ruling groups and the educated sought to participate in the most progressive developments in Europe by adapting themselves to the standards of French civilization.

Germany fell into a state of developmental backwardness with respect to western Europe. Yet, the number of states and state-like forms within the Empire, the coexistence of large, small, and tiny states, of secular and clerical states, of imperial cities and the minifundia of imperial knights, of Catholic, Lutheran, and Reformed regions, contributed to the cultural pluralism and richness of regional and local differences that still shape the reality of life in Germany.

After the war, foreign trade had recovered slowly and unevenly. By the eighteenth century, it was vigorous again, although mercantilist economics continued to hinder

Fig. 2 Europe in 1648

Source: The Western Heritage, 5/e by
Kagan, Ozment, and Turner, Prentice Hall, 1995

expansion because of its commitment to territorialism and autarchy. Yet population growth and the need for raw materials and equipment led the way to international markets. As a result, the German textile industry became competitive. Leipzig was one of the most important fairs for eastern and southeastern Europe and soon utilized the advantage of these connections for the development of the book trade. Hamburg was the center for overseas trade because of its links to the Elbe river traffic and its ties to the Oder by way of the Brandenburg canal system. This trade was especially directed toward England, Spain, and France. Germany proved incapable of economic or political penetration into the maritime trade or colonial rule of the great powers. Consequently, it remained predominantly centered on inland trade, taking part in world trade for all practical purposes only indirectly.[1]

The confessional split, in turn, was of enormous general significance. Multiple Christian confessions had been legally and politically recognized since the seventeenth century. The three confessions supported by the secular authorities created a body of teaching that fostered doctrinal distinctiveness, distrust, and misunderstandings instead of a sense of a common Christian community. The general populace often accepted only its own rituals and festivals, while seeing others as filled with heresy and superstition. Protestants thought the cult of Mary and the saints idolatrous, while Catholics saw Protestants' rejection of most of the sacraments as blasphemous. Both groups abandoned conversion efforts in favor of theological, educational, and political

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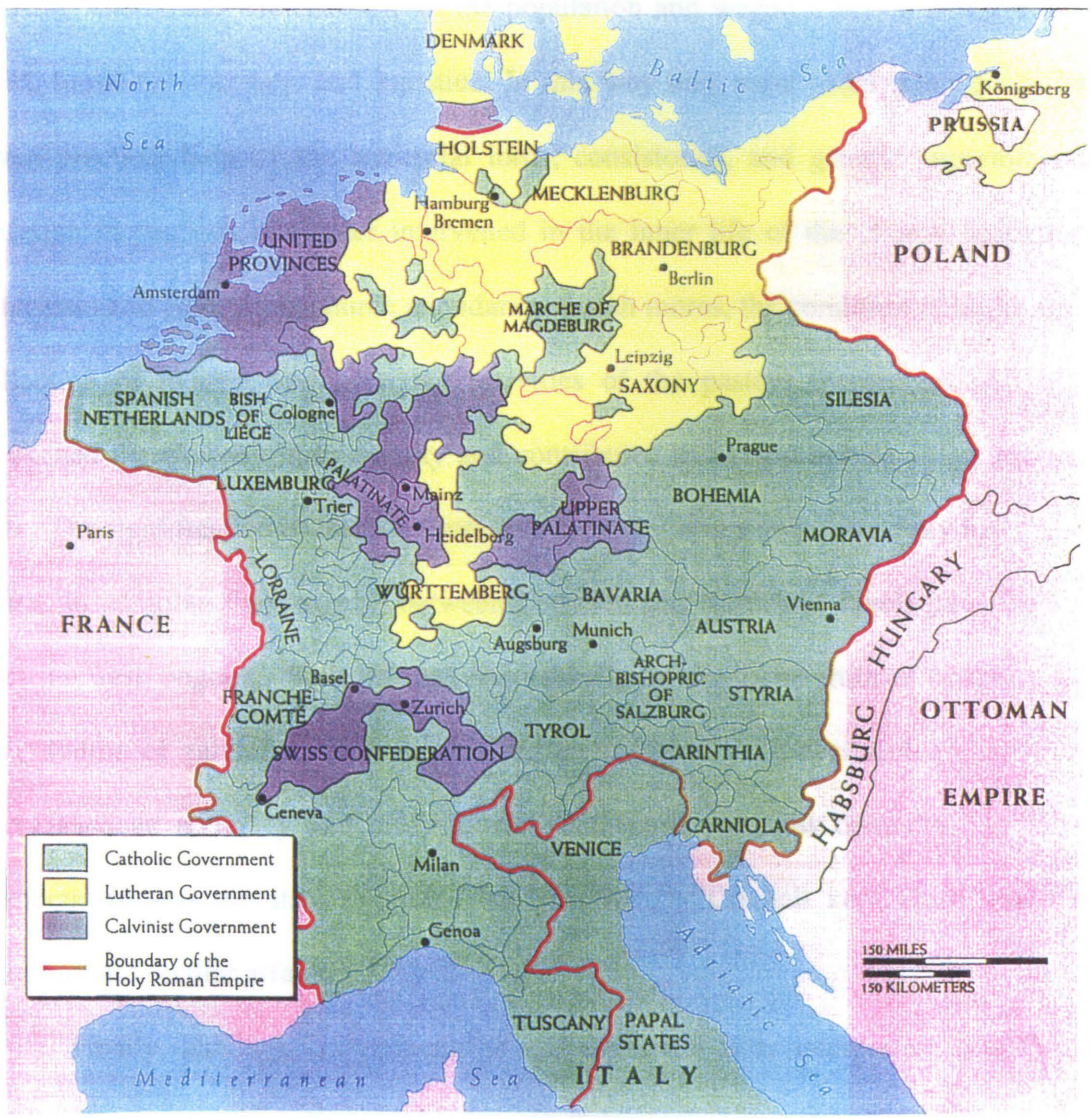
[1] Rudolf Vierhaus, *Germany in the Age of Absolutism*, trans. Jonathan B. Knudsen (Cambridge: Cambridge University Press, 1988), 25-26.

Fig. 3 The Holy Roman Empire
Source: The Western Heritage, 5/e by
Kagan, Ozment, and Turner, Prentice Hall, 1995



separation.[2]

In Protestant Germany the territorial rulers reestablished religious institutions wherever necessary after the war. The pastorate, often living in collapsed or decayed housing, shared the wretched life of the population and waged a heroic struggle against need, brutality, illiteracy, and injustice. In this way they were often more goaded than given practical help by the territorial lords, consistories, and general superintendents. Through inspections, the latter intervened in the inner life of the church, teaching the catechism and controlling church attendance, parish mores, the condition of buildings, the collection of money, and even the activities of the pastors themselves. All of this weakened the church's inner vitality and contributed to its appearance as an arm of the state. The rigidification of learned Protestant theology into a new orthodoxy had a similar effect. In addition, the struggles between Lutheran and Reformed theologians for a pure doctrine were ongoing. Both insisted dogmatically on the literal truth of scripture as the only source of salvation; both equated religious belief with ecclesiology, mistrusting every Pietistic tendency and effort toward subjective religious certainty.[3] In Saxony, Lutheranism was the state religion. The Saxon Privy Council kept close watch over religious and secular affairs.

Finally, although contemporaries and especially later interpreters often viewed

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[2] Vierhaus, *Germany,* 62.

[3] On Pietism, see Martin Brecht et al., *Pietismus und Neuzeit* (Göttingen, 1979); Mary Fulbrook, *Piety and Politics. Religion and the Rise of Absolutism in England, Württemberg, and Prussia* (Cambridge: Cambridge University Press, 1983); Wolfgang Martens, *Literatur und Frömmigkeit in der Zeit der frühen Aufklärung* (Tübingen: Max Niemeyer Verlag, 1989); and Gierl, *Pietismus und Aufklärung.*

rationalism and Pietism, enlightenment and sensibility, as opposites, they were closely related. Both emancipated and empowered the individual to independent thought and feeling. Pietism acted as a ferment both within the established churches and in the cultural life of the period. As an educational movement, it exerted a powerful influence on the educational system. Emerging from Lutheranism, it strove to rekindle the Reformation. Religious life was to supplant rigid dogma, and spirit was to infuse the sense of office. With its emphasis on individual piety and the abandonment of the official church in favor of gatherings of small groups of the like-minded, Pietism contributed to increased secularization.

2. The Enlightenment: an Urban Movement

The cultural transformation we call the Enlightenment took place almost exclusively in the cities.[4] After the war, cultural and social life became narrower and more provincial. Since eighty-five per cent of the population lived in rural areas,[5] the social transformations did not immediately reach them. The cultural and linguistic differences among territories were marked; dialects varied sometimes from village to village.

The distance between the courts --as poverty-stricken as they were compared to

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[4] Franklin Kopitzsch, ed., *Aufklärung, Absolutismus und Bürgertum in Deutschland.*

[5] On changes in town and country during the second half of the seventeenth century and the eighteenth century, see Eberhard Weis, *Gesellschaftsentwicklung in der frühen Neuzeit*, in Karl Bosl, and Eberhard Weis, *Die Gesellschaft in Deutschland,* I (München, 1976), 221ff.

other European courts-- and the life of people in city and countryside increased; social differences rigidified. A "bourgeoisie," that is, an economically dynamic burgher class of both supraregional and political significance, did not appear in Germany until far into the nineteenth century. Furthermore, it is not meaningful to speak of the "bourgeoisie" as a class or estate or to view it as a clearly definable part of the social system. Nor can we assert that it rose as a collectivity and that its social significance as a whole increased. It is much more important to name those particular groups within the middle orders of society whose role and significance increased.[6]

The middling and lower elements of the burgher classes, the small merchants and artisans with their conservative and provincial mentality, remained the dominant and characteristic feature of German society. Employees and officials from the middle social orders who served the territorial rulers, the churches, and the large lords had different expectations, because they, and especially their own educated elite, were the most upwardly mobile group in this society. The entrepreneurs were also among the most dynamic elements in this society, though they still functioned as individuals and not yet as a group.[7] Mack Walker calls this group "movers and doers," since they left their fixed place in life to join the comparatively "rootless" class of professionals, civil or ecclesiastical, who belonged to another world wherever they lived. Intellectuals were deeply convinced of their cosmopolitanism: "The true fatherland of a true philosopher, and to which he should be solely devoted," writes Count Ernst Christoph von Manteuffel

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[6] Vierhaus, *Germany*, 322.

[7] Mack Walker, *German Home Towns: Community, State and General Estate, 1648-1871* (Ithaca, N. Y.: Cornell University Press, 1971), 119.

to Johann Christoph Gottsched,[8] "is truth; and as for truth herself is from all countries."[9] A Frenchman, writing to Gottsched a few years later, thanks him for having called him a compatriot (*Landsmann*), to which he replies that "to tell the truth, I don't belong to any country, I am a citizen of the world, a cosmopolite." And in a little note he adds that he forgot to share with Gottsched the unexpected honor he has been granted of membership in the Academies of St. Petersburg and Stockholm.[10]

This branch of the "bourgeoisie" placed itself at the disposal of the expanding professions and, above all, the new territorial bureaucratic states. In training, language, clothing, life expectations, life-style, and function, the academic "bourgeoisie" was far removed from the traditional world of the German *Bürger*. Those who at one time were the burghers (*Bürger*), townspeople (*Stadtbürger*) par excellence, namely retailers and artisans, were no longer reckoned among the "bourgeoisie" by those properly "bourgeois." Their criterion was education (*Bildung*); the "bourgeois" belonged to the cultivated (*gebildet*) classes--businessmen and university-trained men, university professors and school teachers, doctors and clergymen, civil servants, and merchants. Thus, a new urban group formed within the corporately ordered social system of the seventeenth and eighteenth centuries. It consisted not only of state officials but also of the educated who

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[8] For biographical information see Introduction, 27-28.

[9] "La veritable patrie d'un Philosophe; et a laquelle il doit s'etre uniquement voue, c'est la Verité; et la Verité, elle meme est de tout pays." *Gottsched Correspondence* VIa, 1740, 74.

[10] "Pour dire vrai, je n'apartiens a aucun pays, je suis citoyen du monde, un Cosmopolite...J'oubliois de vous faire part de l'honneur tres inespere que m'ont fait les Academies de Petersbourg et de Stockholm de m'associer moi indigne a leur illustr. Corps." *Gottsched Correspondence* XII, 1747, 227.

sought a place within the corporate order. These educated groups were the "public" of writers and readers who through the pursuit of common Enlightenment interests began to expand beyond narrow territorial and religious boundaries.

The German noble estate was as little a class in the modern sense as the "bourgeoisie." It is difficult to include all those with noble parents and family background in one term. Consequently, historians have found it hard to say anything precise about the German nobility. Their geographic, political, religious, and economic differences were probably greater in Central Europe than anywhere else. Scholars disagree on the size of this social group, although most would grant that it was larger than the British and smaller than the Polish or Hungarian. Nobles ranged anywhere from working farmers to courtiers. Seigneurs collecting rents and members of princely bureaucracies were also nobility. The German language richly reflects the complexity of the German nobility, with such prefixes to the term "nobility" as "old," "new," "imperial," "territorial," "court," "country," "high," "low," etc. Furthermore, the court aristocracy of the seventeenth century was, for the most part, not a reading public. It kept men of letters as it kept servants, but literary production based on patronage was more a matter of a kind of conspicuous consumption than of serious reading by an interested public.[11]

The rigid division of German society into three clearly distinguishable groups was a creation of the new educated members of society. According to popular philosopher[12]

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[11] Habermas, *Structural Transformation*, 38.

[12] "Popular philosophy" refers to the third stage of German Enlightenment philosophy. which developed in four stages: the early Enlightenment or Thomasius and his generation; the first, essentially school-phase of the high Enlightenment or Wolff and his generation; the second, essentially popular stage or generation of Meier, Mendelssohn, Garve, and

Christian Garve (1742-1798), for example, society could be divided into three blocks since "In France just as in Silesia, there is such a distance between the habits of the nobles, the *Bürger*, and the peasants, that this becomes obvious to anyone as soon as one moves from one class to another one."[13] Although Garve referred to Silesia, his comments are applicable to Germany as a whole. The new educated elite, which understood itself as middle-class, had created a society of three orders. By doing this, they also superseded the distinction between learned and uneducated characteristic of the old feudal society.[14] The cultural manifestations of these educated groups also overcame the regionalism of the older society. Their new organizational and communication networks contributed, in turn, to their being able to transcend the actual social-political-confessional fragmentation . The new middle classes shared the Enlightenment criticism of the absolutist order of estates with varying degrees of commitment. They were up in arms against the nobility's inherited privileges and rebelled against repression by an authoritarian state. They argued that the liberation of the individual from the fetters of birth, tradition and the despotism of sovereign rulers would release vast productive forces

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others; and the late Enlightenment or Kant's epoch. See Werner Schneiders, "Der Philosophiebegriff des philosophischen Zeitalters, Wandlungen im Selbstverständnis der Philosophie von Leibniz bis Kant," in Vierhaus, ed., *Die Wissenschaften*, 58ff.

[13] "Zwischen den Sitten des Adlichen, des Bürgers, des Bauern ist, in Frankreich sowohl als in Schlesien, ein Abstand, der jedem in die Augen fällt, sobald er von der einen Classe zu der anderen übergeht." Christian Garve, "Über den Charakter der Bauern und ihr Verhältnis gegen die Gutsherrn und gegen die Regierung. Drey Vorlesungen in der Schlesischen Ökonomischen Gesellschaft gehalten von Christian Garve," Breslau 1786. New improved edition, reprinted in *Popularphilosophische Schriften*, ed. Kurt Wölfel, vol. 2, 1974, 5.

[14] Wolfgang Ruppert, *Bürgerlicher Wandel. Studien zur Herausbildung einer nationalen deutschen Kultur im 18. Jahrhundert* (München, 1977), 35.

and induce unstoppable advances in economics, culture and social harmony.[15] But the same groups adhered to tradition when it came to the roles and rights of women and ordinary people.

The unfolding of the Enlightenment and the emancipation of the middle class were interdependent processes. Numerous organizations, circles, and societies provided an important focal point of and forum for progressive and reformist discourse and activity from the early eighteenth century onwards. The societies of the Enlightenment provided its champions with the best outlets for their extensive interests. They were the most tangible form of the socio-cultural process of the Enlightenment.

In Germany, both science and literature were closely tied to these institutional developments. As Richard van Dülmen argues, historians for a long time failed to recognize that the wide range of societies, clubs, and organizations in the eighteenth century constituted a unified movement.[16] Table societies (*Tischgesellschaften*) and language societies were fewer and more removed from practical politics than the London or Paris coffee houses and salons. Like the coffee houses, the table societies recruited their public from private people engaged in productive work, from the dignitaries of the principalities' capitals, with a strong preponderance of middle-class academics. Sustained by the spirit of Enlightenment and emancipation, this movement made a significant

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[15] M. Riedel, "Gesellschaft, bürgerliche," in O. Brunner et al., eds., *Geschichtliche Grundbegriffe*, vol. 2 (Stuttgart, 1975), 719-800; W. Ruppert, *Bürgerlicher Wandel: Studien zur Herausbildung einer nationalen deutschen Kultur im 18. Jahrhundert* (Frankfurt, 1984).

[16] Van Dülmen, *The Society of the Enlightenment, The Rise of the Middle Class and Enlightenment Culture in Germany*, transl. by Anthony Williams (New York: St. Martin's Press, 1992), 51. Habermas, *Structural Transformation*, 24ff.

contribution to middle-class society and culture. A multitude of societies emerged under similar circumstances with various names. First on the scene were language societies and the learned academies; then Freemasonry and the public-spirited societies; and lastly, secret societies, reading circles,[17] and literary clubs. There were so many kinds of political organizations that it is no longer possible to estimate their number. These societies were the focus of articulation for a great variety of interests, depending on the respective phase of the Enlightenment and the social status of its champions: learned and academic and practical reformist interest, intellectual education and middle-class and reformist social intercourse, free self-determination and classless exclusivity. However, the Enlightenment's claim to universality, and the achievement of social reform through the dissemination of knowledge and self-education were common to them all. This is what distinguishes the societies of the Enlightenment from the traditional feudal communities and from the middle-class organizations of the nineteenth century. To a certain extent, the primary objective of the societies of the Enlightenment was to facilitate the formulation and propagation of common interests through the creation of such an institutional framework. Literary and philosophical activity and debate played a uniquely forceful emancipatory role in the eighteenth century: they were the media of middle class self-realization. Emancipation in Germany was achieved through education. Yet this does not mean that there had been a retreat on the political front. Acquiring knowledge and developing a sense of self-realization were social processes with deep political significance.

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[17] On these, see Otto Dann, ed. *Gesellschaften und bürgerliche Emanzipation. Ein Europäischer Vergleich* (München: C. H. Beck, 1981).

At this time, writers and critics conceived literature as fulfilling an important social mission: the moral, social, and/or intellectual improvement of their readers. The literary societies were both a complement and an addition to the learned societies and the academies of science. Although their primary goal was the cultivation of High German, they stimulated reflection upon spiritual and mundane issues. For the first time, all aspects of professional and domestic life became public issues. The literary societies focused more on emancipatory concerns and the concerns of the early period of the Enlightenment than the learned societies did. At the beginning of the eighteenth century there were many attempts to found literary societies under a variety of designations. The rational debate of educated males represented a threat to the ruling authorities. This explains, in Habermas' view, the proliferation of secret societies of various kinds, which protected such debates from becoming public. As Habermas puts it, "As long as publicity had its seat in the secret chanceries or the prince, reason could not reveal itself directly; its sphere of publicity had still to rely on secrecy; its public, even as public, remained internal. The light of reason, thus veiled for self-protection, was revealed in stages."[18] Literary societies followed the model of the learned societies and were intended as the mouthpiece of the Enlightenment for the educated classes. The so-called moral and patriotic societies were the fruit of friendship circles whose objective was to influence public opinion, primarily through the publication of moral weeklies.[19] These periodicals

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[18] *Structural Transformation*, 34ff.

[19] For a comprehensive treatment of this literature, see Wolfgang Martens, *Die Botschaft der Tugend: Die Aufklärung im Spiegel der deutschen Moralischen Wochenschriften* (Stuttgart, 1977).

spread early Enlightenment ideals among the educated. Johann Christoph Gottsched (1700-1766) and his wife Luise Adelgunde were leading figures of Leipzig cultural life. Prior to his appointment to the chair of Logic and Metaphysics at the University of Leipzig in 1734, Gottsched had been a freelance journalist who made his mark as the founder of various successful moral weeklies in which he attempted to contribute to "the eradication of irrationality and vice among my compatriots and the furtherance of reason and virtue."[20] Nineteenth- and early twentieth-century literary critics have often dismissed the weeklies for their poor literary or artistic merits, or have reduced them to a poor adaptation of the British.[21] During the last three decades more positive views have emerged. Critics have attempted to place the moral weeklies in a historical or social perspective by emphasizing their value in educating certain segments of the population, promoting an awareness of literature and literary criticism, improving morals and manners, and even developing a new German prose style.[22]

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[20] "Mein vornehmster Zweck ist gewesen, die Unvernunft und das Laster auszurotten; hingegen Verstand und Tugend unter meinen Landesleuten zu befördern." *Der Biedermann*, 200, 100, April 3, 1729, cited in Gerhard Sauder, "Moral Weeklies," in *Hansers Sozialgeschichte der deutschen Literatur* (München: Carl Hanser Verlag, 1980), vol. 3, 278.

[21] Many of the negative evaluations of the moral weeklies in the nineteenth and early twentieth centuries stem from Lessing's famous condemnation of the genre in the "Mylius critique." Writers of the German weeklies are said to be "wisecrackers who don't have a good command of the German language, who have read a few things here and there, and, what is mostly disturbing, who have to make their papers into a type of pension." ("Witzlinge, die ungefähr der deutschen Sprache gewachsen sind, hier und da etwas gelesen haben, und, was das betrübteste ist, ihre Blätter zu einer Art von Renten machen müssen.") Later literary historians perpetuated and reinforced this attitude.

[22] Eric A. Blackall, *The Emergence of German as a Literary Language, 1700-1775* (Cambridge: Cambridge University Press, 1959).

In the German states the reading public was still small, and these periodicals tried to instill their "bourgeois" public with confidence and self-respect. The weeklies offered advice on issues ranging from child-rearing and housekeeping to education and religion. Roughly speaking, their number ranged in the hundreds. The strongholds of the weeklies were the cities of Leipzig, Zürich, and Hamburg, in other words, commercial centers beyond court influence.

3. Leipzig: Fair, University, Publishing Industry

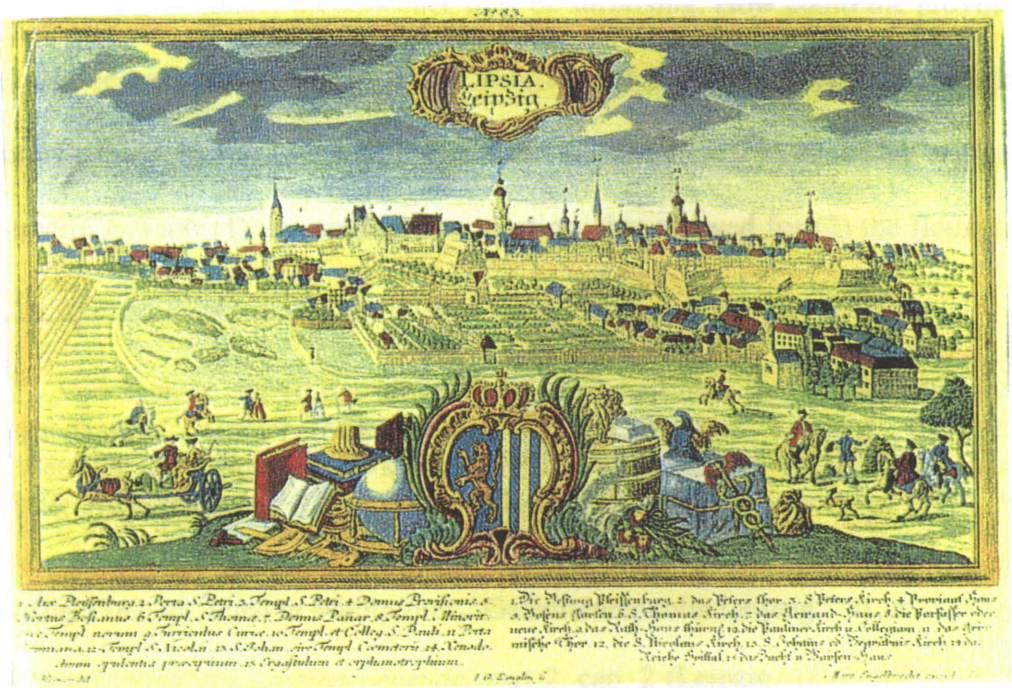

Fig. 4 Leipzig, ca. 1750, F. B. Werner
Source: Stadtarchiv Leipzig

Saxony was a major cultural center of Germany: "It is from Saxony that the light of science has spread through Germany and other countries"[23] was a common contemporary opinion. Leipzig was described as "the cradle of all the arts and sciences."[24] "The University of Leipzig was at the top of all German institutions of higher learning (during the Enlightenment)."[25] "If you want to learn good German, study in Leipzig!" (old student saying)[26] "More than a town, Leipzig is a world."[27] Leipzig was politically a second class place: it was neither a free city nor a court seat, it lacked a navigable river, and, on top of this, it was the seat of a belligerent Lutheran Orthodoxy. Thus, the city's economic and scholarly preeminence may be surprising. How could the provincial city of Leipzig become the guiding-star and mediator of the Enlightenment? Four interrelated factors explain its rise to a stronghold of the Enlightenment in education and scholarship, literature and art: (1) its geographical location, that allowed for (2) the flourishing of the

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[23] "Von Sachsen aus ist das Licht der Wissenschaft über Deutschland und andre Länder ausgeegangen." Günter Mühlpfordt, "Gelehrtenrepublik Leipzig. Wegweiser- und Mittlerrolle der Leipziger Aufklärung in der Wissenschaft, in Wolfgang Martens, ed., *Leipzig, Aufklärung und Bürgerlichkeit* (Heidelberg: Lambert Schneider, 1990), 39-101.

[24] Deutschland seit der Reformation an, *Lehrgebäude der deutschen Sprache,* vol. 1, Leipzig 1782, 4f., cited in Mühlpfordt, "Gelehrtenrepublik Leipzig," 91, n. 2.

[25] Franz Mehring, *Lessing-Legende*, part 2, cap. 2 (Leipzig, 1893), 3r ed., 216, cited in Mühlpfordt, "Gelehrtenrepublik Leipzig," 91, n. 4.

[26] Günther Mühlpfordt, "Die 'sächsischen Universitäten' Leipzig, Jena, Halle und Wittenberg als Vorhut der deutschen Aufklärung" in *Wissenschafts- und Universitätsgeschichte in Sachsen im 18. und 19. Jahrhundert,* Karl Czok, ed., (Berlin/DDR, 1987).

[27] Johann Hübner, *Kurze Fragen aus der neuen und alten Geographie*, 6th ed. (Leipzig, 1716), Vorrede, #31.

fair; (3) the university; and (4) the book trade.

Owing to its geographical location, Leipzig became an important center of trade.[28] Before roads were constructed, Germany was divided into two main areas of trade, one in the north and one in the south, connected only by the Rhine in the west. Since central Germany was a neutral area, when the colonization of the east began, it became necessary to find a route through this region to allow the exchange of western manufactures with eastern raw materials. The new cross-connections joined the most conveniently situated of these towns. Leipzig was the meeting point of these two important roads. Changes in international trade routes also encouraged Leipzig's ascendence. For contemporaries Leipzig was as great a wonder as Hamburg. In this 'little Paris' (*klein Paris*), as Goethe tells us in *Poetry and Truth (Dichtung und Wahrheit)*, one met at fair-time foreigners from all quarters, Polish Jews, Russians, even Greeks in their strange garb, as well as Englishmen and Dutchmen. By 1700 the Leipzig fair, held three times a year, had quite outstripped the one at Frankfurt, its great rival.[29]

Frankfurt lost its leadership in the book trade to Leipzig early in the seventeenth century for a number of reasons-- the falling-off of the Italian trade since the Index of Pius IV (c. 1570), the strict censorship of the Imperial Book Commission, the high-handed behavior of the Frankfurt booksellers against foreigners, the increase in the number of German publications as against Latin which reduced the number of books

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[28] Karlheinz Blaschke, "Die kursächsische Politik und Leipzig im 18. Jahrhundert," in Martens, ed. *Leipzig,* 23ff.

[29] W. H. Bruford, *Germany in the Eighteenth Century: The Social Background of the Literary Revival* (Cambridge: Cambridge University Press, 1965), 185.

printed abroad. It had been possible of course to print Latin books anywhere, but German could only be printed well in Germany, and in those days, when publishers went to the fair in person, Leipzig was a better center for the home trade. The tendency of the southern trade to avoid Frankfurt and the Rhine in favor of Leipzig and Hamburg, and the competition of Basle, Nürnberg, and later the new town Mannheim, the distribution center of the English and Dutch, all contributed towards Frankfurt's decline, but its geographical position and old connections enabled it to retain more of its old glory than most of the south German free cities.

At fair-times, there might have been up to seven thousand visiting merchants. The fairs were as much social as business events. In the fifteenth and early sixteenth centuries the town had acquired extensive privileges, reducing Halle and Erfurt to dependence. A textile industry was started by Dutch refugees, but on the whole Leipzig was far more important as a trade center than as an industrial site. It was the market for the products of Saxony, the chief industrial province, with its widespread domestic industries, its porcelain at Meissen (Dresden china) and cotton at Chemnitz. Trade with the northern ports grew, especially from the second half of the seventeenth century on.

The university of Leipzig, a medieval foundation, remained one of the largest throughout the first half of the eighteenth century and attracted Protestant students from as far away as Transylvania and Lithuania.[30] Most students were clerics and scholastics and the great majority came from the lower middle class and peasantry. Hardly any came

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[30] See Lothar Rathmann, ed., *Alma Mater Lipsiensis,* Geschichte der Karl-Marx-Universität Leipzig (Leipzig, 1984); Friedrich Paulsen, *Geschichte des gelehrten Unterrichts an den deutschen Schulen und Universitäten vom Ausgang des Mittelalters bis zur Gegenwart* (Leipzig: Verlag von Veit & Comp., 1919), esp. 465ff. and 599ff.

from the nobility or the families of higher civil servants, but an increasing proportion were the sons of pastors themselves. Students of theology, most of them poor, were particularly numerous at Leipzig, because as a big town and the center of the publishing trade, it offered more opportunities for part-time employment than other German universities.

Around 1700, the book market began to experience a transformation that had occurred in France and England half a century earlier. Learned works for scholars, written for the most part in Latin, began to be displaced by German works, written with the aim of making knowledge accessible to the educated classes. Theological and devotional literature, in turn, gave way to a secular literature of entertainment, predominantly narrative in character.[31] Consumption of literature spread from the ruling circles of a feudal society to include portions of the much larger middle orders of society. The reading public as such arose from these transformations during the earlier decades of the century. The publisher now replaced the patron as the author's commissioner and organized the commercial distribution of literary works.[32] The publisher took the patron's place; public subscription, which has aptly been called collective patronage, was the bridge between the two. Patronage is the purely aristocratic form of the relationship between author and public; the system of public subscription loosened the bond, but still maintained certain features of the personal character of the relationship. The publication of books for a general public, completely unknown to the author, was the first form of the

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[31] Albert Ward, (1974) *Book Production, Fiction, and the German Reading Public 1740-1800 (Oxford: Clarendon Press)*, 31f.

[32] Albert, *The Social History of Art* (New York: Vintage Books, 1959), vol. 2, 548.

relationship to correspond to the structure of a middle-class society based on the anonymous circulation of goods. In absolute figures, the reading public was still small and encompassed but a minority of the middle class.[33] The audience began to change in terms both of number and of social makeup; the literary world became more and more a literary marketplace: increased demand resulted in increased production. New magazines and learned periodicals made knowledge available to the curious,[34] learned and lay readers. New book types emerged that replaced the old Latin tractates and compendia. Christoph Friedrich Nicolai (1733-1811) reports from his experience as a publisher, "that from most books in the German book trade around five hundred copies and at most a couple of thousand are printed and rarely that many sold, even though more than thirty million people speak the German language."[35] In another place, he shows that the ratio between inhabitants and books published is one of twenty million to two thousand.[36] The actual number of readers is difficult to establish. The existence at this time of "reading societies"[37] further complicates the task of assessing the size of the audience that could have been reached by this medium. The superimposition of an oral culture to a literate

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[33] See Jochen Greven, "Grundzüge einer Sozialgeschichte des Lesers und der Lesekultur," in *Lesen-ein Handbuch*, ed. Alfred C. Baumgärtner (Hamburg: Verlag für Buchmarkt-Forschung, 1973), 126.

[34] On curiosity, and the curious people, see Chapter 2.

[35] "daß von den meisten Büchern im deutschen Buchhandel etwa fünfhundert und höchstens ein paar tausend Exemplare gedruckt und selten sämtlich verkauft werden, und doch reden an die dreißig Millionen Menschen die deutsche Sprache." Friedrich Nicolai, *Leben und Meinungen des Herrn Magister Sebaldus Nothanker*, reprint of the 4th edition of 1799 (Berlin, 1960), 98.

[36] Ibid., 106.

[37] Martens, "Bürgerliches Lesen," 66-67.

one renders an assessment virtually impossible. Moreover, although contemporary observers ranked Germany high on the scale of literacy in Western Europe, the number of readers was still limited. According to modern estimates no more than ten per cent of the population over the age of six could read in the earlier and middle part of the century. By 1770 fifteen percent were literate and by 1800 the percentage had increased to twenty-five. Since the ability to read does not automatically make a person a reader, the number of actual readers was apparently much smaller.[38] Therefore, the number of circulating copies of certain pieces does not offer enough evidence to establish conclusively the size of the audience. As a result, the assessment of the actual influence of didactic poetry, as of any other reading materials at the time, leads us to a paradoxical situation: listeners would enlarge the numbers, and they cannot be counted; but readers, which potentially could be counted, do not necessarily enlarge them.

It was in Leipzig that the first scholarly periodical, the *Acta Eruditorum* (1682) was published, and a few years later, Christian Thomasius (1655-1728), a famous philosopher and jurist from Leipzig,[39] inaugurated one of the first German-language periodical, his *Monatsgespräche* (1688). The eighteenth century witnessed the proliferation of general, popular, and specialized publications of all sorts. Again in Leipzig, the first newspaper began to appear thrice weekly by 1660. Several moral weeklies, periodicals that were crucial in the propagation of Enlightenment values to a non-scholarly audience, came from Leipzig. These trends reveal the formation and growth

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[38] Bernhard Fabian, "English books and their German readers," 166.

[39] See Chapter 2.

of a broader reading public within the urban educated classes.

Leipzig was also a center for translations and editions. Hobbes, Locke, Bayle, Fontenelle, Montesquieu, Rousseau, Adam Smith, and many others became known in mid- and eastern Europe through Leipzig. Between a fourth to a third of the German publications came from Leipzig.[40] Baroque encyclopedic knowledge had to be mastered and transmitted in handy and readable fashion. Book dealers and publishers captured the signs of the times and encouraged the production of literature for scholars and merchants, women and even peasants. Lexicons of all kinds flooded the market.[41] As a result of these processes, some uneducated people of the seventeenth century would become the educated (*gebildete*) of the mid-eighteenth century. These observations should suffice to show that in the eighteenth century printed materials made a considerable impact on cultural life in every field.

Members of the book trade were people engaged in commerce who played a significant role in the production of ideas. During the first half of the century, there were only between 100 and 120 publishers in Germany. Thus, the profession of book dealer was a privileged one, taking into account that there were about twenty-four million people in Germany.[42] A contemporary observer writing in 1690 on the *Nützliche und Fürtreffliche Buch-Handlung* points out the difference existing between the book dealer

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[40] Paul Raabe, *Bücherlust und Lesefreuden. Beiträge zur Geschichte des Buchwesens* (Stuttgart, 1984), 75f., 82f.

[41] A detailed discussion of the birth of these reference works and the first Lexicon for the ladies follows in Chapter 3.

[42] Paul Raabe, "Der Buchhändler im achtzehnten Jahrhundert," in Barber and Fabian, eds., *Buch und Buchhandel in Europa*, 275.

and the cloth-dealer: "The cloth-dealer, like most merchants, has both producers and consumers, he gets his wares straight from the looms and sells them again to princes and lords, ladies and cavaliers, and also to artisans and peasants, whereas the common herd hardly ever contaminate the bookshop."[43]

Commenting on the German book trade, a contemporary critic, Johann Stephan Pütter, pointed out that Germany possessed in this respect an advantage over every other European nation. In Holland, England, France and Italy bookshops had trade as a rule only within their own publishing firm. There were no book fairs, and publishers usually dealt only in cash or at most with mutual accounts and ultimate cash settlement. Potential customers had first to find out who the publisher of the work wanted was, which was difficult enough, and then buy it from him for cash, or else they could find a book dealer who had an account with the publisher concerned and ask him to order it for them, all without seeing the work and with no possibility of returning it if they were dissatisfied. In Germany, instead, any work that appeared at the fair was within a matter of weeks circulated through all Germany, listed in numerous printed catalogues, and announced in many journals, newspapers, learned and political magazines, and the like. The customer did not first need to seek the publisher, but simply walked into a bookshop where books were always on show no matter where or by whom they were published. So Pütter says, "This whole organization of the German book trade is as convenient for the public as it could possibly be and such as no other country in Europe can boast of."[44] Book dealing

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[43] Cited in Ward, *Book Production*, 29.

[44] "Diese ganze Einrichtung des Teutschen Buchhandels ist für das Publikum so bequem, als es nur möglich ist, und als kein ander Land in Europa sich rühmen kann." J. S. Pütter,

became a meeting point for the enlightened educated classes. At the fairs, one could meet like-minded people and learn about new books. As Raabe puts it, "The book dealer became an *Aufklärer*, a benefactor of the nation. Without him, the Enlightenment would be unthinkable."[45] He had become a key figure of German intellectual reform that made a revolution no longer necessary.[46] The fact that the process of emancipation in Germany was achieved through education, strengthened by a massive production of literature was by no means an indication that the Enlightenment was "apolitical" as many have claimed.[47] The acquisition of knowledge instigated by transformations in society was a political process. The challenge to traditional society, the cultivation of common reformist interests, the process of self-organization and public (literary) political agitation were fundamentally new factors in the history of German culture.

Der Büchernachdruck nach ächten Grundsätzen des Rechts geprüft (Göttingen, 1774), 143, cited in Ward, *Book Production*, 39.

[45] "Der Buhchändler wurde zum Aufklärer, zum `Wohltäter der Nation.' Ohne ihn ist Aufklärung nicht denkbar." Raabe, "Der Buchhändler," 272.

[46] "Die Aufklärung in Deutschland wurde im Gegensatz zu Frankreich der Ansatz zu einer friedlichen Reform des Denkens und Handelns unter spätabsolutistischen Herrschaftsform in einer gewandelten Welt, in der von den Bürgern in den Städten und auf dem Lande nicht mehr von den Fürsten und Landständen die neuen Impulse kamen." *Ibid.*, 271.

[47] Contra Thomas P. Saine, in "Scholarship on the German Enlightenment as Cultural History," *Lessing Yearbook* VI (1974): 140: "Unavoidably German Enlightenment culture became, in large part, an apolitical culture, because it was the creation of citizens who played no part in government affairs of state and had no reason to aspire to do so." He adds in a footnote: "How apolitical this culture was of necessity constrained to be is documented adequately for the case of the moral weeklies by Martens, *Botschaft der Tugend*, 321ff.

4. Women and "the People" (Figs. 4-5)

In the eighteenth century, women were legally and economically dependent on their husbands (or their male relatives).[48] According to the norms of the era, their role as wife and mother had no public or political function. Their work and their production were always geared to the benefit of their families. This had the effect of rendering women "faceless" and of depriving them of history and individuality by default. This is why they require separate treatment. Scholars approved women's contributions to any field only if they had fulfilled their "predestined" profession as wives and mothers. Those who had "strayed" from this role in some way remained merely industrious students who failed to further knowledge itself.[49] Nineteenth-century cultural historian Gustav Friedrich Klemm (1802-1867), for instance, contends that women should not delve into some literary fields. Poetry, however, is generally acceptable, for it can express the innate, sensitive, and emotional nature characteristic of women. He maintains, however, that all literary attempts by unmarried women, regardless of the genre, are destined to be futile. While he admits that some men also have not been successful writers, he excuses them, believing

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This judgement is based on what I see as a very limited understanding of power and politics.

[48] On German women, see Barbara Becker-Cantarino, ed., *Die Frau von der Reformation zur Romantik* (Bonn: Bouvier, 1987); Jeannine Blackwell & Susanne Zantop, eds. *Bitter Healing. German Women Writers 1700-1830, An Anthology* (Lincoln & London: University of Nebraska Press, 1990); Adalbert von Hanstein, *Die Frauen in der Geschichte des deutschen Geisteslebens*, 2 vols. (Leipzig, 1899).

[49] Gustav Friedrich Klemm, *Die Frauen: Culturgeschichtliche Schilderungen des Zustandes und Einflusses der Frauen in den verschiedenen Zonen und Zeitaltern*, vol. 6 (Dresden: Arnold,1854-59), 106ff.

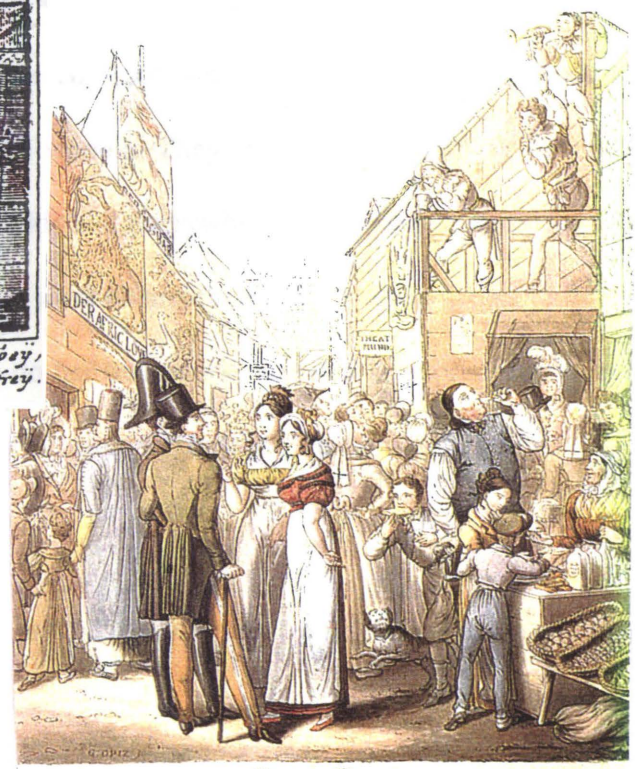
Fig. 5 A Reading Woman

Source: Einleitung zu der Welt=Weißheit oder Philosophie eines galanten Frauenzimmers, Clisander, Leipizig, 1720

Fig. 6 The People at a Fair Booth

Source: The BoothsSource: Leipzig Historische Messeszenen, Schmiedecke Kustverlag, 1987

Witz, Klugheit u. Verstand schreibt man den Männern bey,
Doch ist das Frauenvolk hievon nicht bloß und frey.



Die Buden.

their failure to write convincingly was intentional. Never does he suggest that women had not had equal educational opportunities or that they had not been allowed to participate in society as men had. Moreover, no single woman, since she disobeys her "calling," had any potential for the arts or sciences, regardless of her intelligence and capabilities. At best, learned women are seen as a curiosity, but never as role models.[50]

The new cultural world created by the intelligentsia and professional middle-class no longer belonged to the aristocracy. The new world was theirs, and it was a decidedly male world. At a time when philosophers still debated whether women should be considered human beings or not, women clearly had no role in the new culture.[51] Emphasizing the difference of male and female, "bourgeois" observers were irritated by the similarity of men and women of the "common people." According to contemporary economist J. G. Krünitz: "the wives of the common man, who very often have to do the heaviest of work, are more like men than women. They can be seen mingling with their menfolks in the market places, in the fields and everywhere. They buckle under just the same loads and when they go home more work awaits them. The woman seems to belong to both sexes and does not just have to do her own work, but also very often has to take on the work of the man."[52] To "the people" belonged, besides the rural population and the

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[50] So, Carl Ramshorn, *Geschichte der merkwürdigsten deutschen Frauen,* 2 vols. (Leipzig: Einhorn, 1842-43).

[51] See Chapter 3.

[52] J. G. Krünitz, *Oeconomische Encyklopädie oder allgemeines System der Staats- Stadt- und Haus- Landwirtschaft*, vol. 14 (Berlin: Pauli, 1788), 807, entry on "Frauenzimmer."

lower class proper (day laborers, soldiers, and servants), the shopkeepers, artisans and workers. To stand behind a shop counter or do manual labor was a reason for exclusion from the genuine "bourgeoisie." The "bourgeoisie" was even more critical of family life among the nobility, however. Noble women did not obey their sacred duties since they showed not the slightest interest in their offspring. Instead of caring for and bringing up their children, they preferred to dance the night away at sumptuous parties and to sleep or idle away the days with trivial visits to friends and acquaintances. Their husbands, meanwhile, pursued their business and interests and squandered feudal rents on their mistresses. Noble men and women shirked their family responsibilities, engaging servants, governesses and tutors for their children.

Religious interests further added to heightened class suspicions. August Hermann Francke, a Pietist, was forced to leave Leipzig because of the social implications of his activities: mingling with common people, he had preached in the fields and had called a linen weaver 'brother in Christ.' What effect would such notions of spiritual brotherhood with the lower ranks have on the maintenance of the social hierarchy?[53] Educated men had good reasons to make sure they were not confused with other ranks. And this meant they had to ensure that women and "the people" stayed out of the world that was their accomplishment. It was their world, and they did not want any women or common people in it.

Women were excluded from all formal, institutionalized higher education and with it from the cultural and literary life associated with these institutions: the Latin

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[53] See Erich Beyreuther, *August Hermann Francke 1663-1727: Zeuge des Lebendingen Gottes* (Marburg and der Lahn: Verlag der Francke-Buchhandlung, 1956), 68-71.

schools or academies, and the universities. Women were limited to private tutoring in the home when and if economic and familial circumstances were favorable. In 1643 Hans Michel Moscherosch, a seventeenth-century satirist, aptly summarized the educational goals for women: "In a woman's hand belong these two things: a prayerbook and a spindle."[54] The purpose of education for women was a Christian life and efficient housework: the "Christian housekeeper." More than a hundred years later, in 1789, Johann Heinrich Campe still merely elaborated this austere concept when describing the educational goal for middle class women. The education of women had to serve the threefold destiny of the female: "children, church, kitchen" (*Kinder, Kirche, Küche*).[55] His ideal of the Christian housekeeper had changed little from Luther's except that the mother's role received more consideration: her duties in the service to the family, to her husband and the children are more clearly defined, but females' destiny --what Moscherosch termed "the spindle"-- had remained virtually unaltered. Until the end of the eighteenth century the vast majority of women (whose families lacked the means for private tutors) received at best instruction in the catechism and in the so-called "female" handicrafts (spinning, knitting, embroidering, and so on) for a couple of years at a local private or parish school. Most women were relegated to being at best recipients of, but primarily total strangers to, the literary culture of Absolutism. Yet, women were undermining the seemingly rigid exclusion from within. With the "prayerbook" came

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[54] Hans Michel Moscherosch, *Insomnis Cura Parentum*, Neudrucke deutscher Litearturwerke des xvi. und xvii. Jahrhunderts (Halle: Niemeyer, 1893), 63, cited in Barbara Becker Cantarino, "'Outsiders': Women in German Literary Culture of Absolutism," *Jahrbuch für Internationale Germanistik* 16.2 (1984): 147-57, 150.

[55] See Chapter 2 for a detailed discussion of this topic.

reading, and with reading, if there was interest, leisure, and with opportunity came writing, self-development and desire for literary expression.[56]

After mid-century anatomists began to define sexual difference by "nature."[57] This new orientation contrasted with older statements about man and woman preserved in sermons and almanacs (*Hausväterliteratur*) in which authors had emphasized status, social position, and the corresponding virtues and duties.[58] In 1735, Johann Heinrich Zedler, in his famous *Universal Lexicon* stated the following:

> "The female or woman is a married person, who, subject to her husband's will and rule, runs the household, and in the latter is the servant's superior."[59]

Krünitz as well, in 1778, listed under the heading 'woman' (*Frau*) not character traits, but the rights and duties of the housewife, and specified that his remarks were meant for artisans' and merchants' wives.[60] The change to a definition in terms of polar character traits coincided with the transition from the household or "whole house" to the

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[56] Becker-Cantarino, "Outsiders," 145-50.

[57] See Schiebinger, *The Mind has no Sex?*, Chapter 7, "More Than Skin Deep: The Scientific Search for Sexual Difference."

[58] See J. Hoffmann, *Die 'Hausväterliteratur' und die 'Predigten über den christlichen Hausstand* (Weinheim/Berlin, 1959).

[59] In 1739, Amaranthes incorporated this definition literally in the second edition of his *Ladies' Lexicon*, "Frau oder Weib," col. 497.

[60] Krünitz, *Ökonomisch-technologische*, vol. 14, 789-95.

"bourgeois" family.[61] Statements about males and females in this period hardly referred to peasants. Their living and working conditions were quite adequately covered by traditional role assignments and continued to be so for a long time afterward. Quite clearly, the polarization of the sexes only coincided with social phenomena associated with the educated groups.[62]

Yet eighteenth-century women did not just live as a silent mass. Regional, social, and even confessional differentiation shaped their lives, too. Although we know little about the lives of the lower strata, some information has become available. Contemporaneous with the preindustrial peasant work unit were the households of weavers, spinners, nail- and scythe-makers, and potters, to mention but a few work tasks that were performed in the home.[63] This labor was neither urban nor organized along guild lines. Rather, beginning in the mid-seventeenth century, economic development and the evolving world market stimulated rural production outside the guilds. These home-industry households, producing for a distant market, shared with peasants a rural setting.

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[61] See D. Schwab, "Familie," in O. Brunner et al. eds., *Geschichtliche Grundbegriffe. Historisches Lexikon zur politisch-sozialen Sprache in Deutschland* (Stuttgart, 1975), vol. 2, 253-301; Gerhard Wilke and Kurt Wagner, "Family Household: Social Structures in a German Village between the two World Wars," in Evans, Richard J. and W. R. Lee, *The German Family: Essays on the Social History of the Family in Nineteenth and Twentieth-century Germany* (London: Croomtel, 1981):120-147.

[62] Ute Frevert, *Women in German History, From Bourgeois Emancipation to Sexual Liberation*, trans. Stuart McKinnon-Evans, Terry Bond and Barbara Norden (Oxford: Berg, 1988), 68.

[63] Jean H. Quataeret, "Teamwork in Saxon Homeweaving Families in the Nineteenth Century. A Preliminary Investigation into the Issue of Gender Work Roles," in Ruth-Ellen B. Joeres and Mary Jo Maynes, eds., *German Women in the Eighteenth and Nineteenth Centuries, A Social and Literary History* (Bloomington: Indiana University Press, 1986), 3-23.

However, in marked contrast to peasant labor, work patterns broke the bonds of gender role divisions. The couple shared productive functions, and housekeeping tasks were exchanged as well. Historians call this preindustrial rural production of goods for the international market "protoindustrialism." It is described as a major transition phase of feudal society that has been analyzed in terms of population growth and density, fertility strategies, household formation, and family labor.[64]

Older manufacturing downplayed gender work roles in favor of family "teamwork," although these families lived and worked in a patriarchal legal setting that enhanced men's positions. The husband represented the family unit to the outside world: the small business typically appeared in his name in municipal registers, as did account books, and the joint family wage usually was paid directly to him. To the public world, then, the "team" had a head. But among these rural weavers roles were interchangeable and fluid. Role sharing should not be equated with familial harmony. These arguments are preliminary and designed to stimulate discussion of the economic, demographic, technological and even political reasons that may account for the extent of gender role assignments in a given society. Furthermore, the growing economic disempowerment of women was a long process with several intermediate stages and different regional manifestations. Female peasants could draw, therefore, even up to now, a certain degree

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[64] Hans Medick, "Haushalt- und Familienstruktur als Momente des Produktions- und Reproduktionsprozess," in Heidi Rosenbaum, *Seminar: Familie und Gesellschaftsstruktur* (Frankfurt/M., 1978), 295-96. See, for example, Peter Kriedte, Hans Medick, Jürgen Schlumbohn, *Industrialisierung vor der Industrialisierung. Gewerbliche Warenproduktion auf dem Lande in der Formationsperiode des Kapitalismus* (Göttingen, 1977).

of social prestige from their work.[65]

An aspect of Pietism for the most part ignored by students of Pietism should also help us beware of making hasty generalizations about gender-roles. Since the beginnings of the Pietist movement, around 1670 up to the middle of the eighteenth century, women played an important role. As prophets and agitators, benefactors and leaders, Pietist congregations valued women not only as wives. Women, not men, embodied the ideal of Pietist devotion.[66] Thus, the stereotypic image of women, according to which they are more emotional than men, was rather more liberating than discriminating regarding their social prestige in these circles. God would not speak to reason but to the heart.[67] Pietists saw women as God's privileged instrument of revelation. Women used their position boldly and criticized the world and church establishments as immoral. This was a known fact. However, in wider circles, having women critics of the order of things was considered disturbing and politically dangerous.

The exclusion of women from participation in political and cultural life was an urban phenomenon associated with the educated groups. Educational policies regarding the education of males and females further reinforced the gap between them.[68] Yet

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[65] See Betina Heintz and Claudia Honneger, "Zum Strukturwandel weiblicher Widerstandsformen im 19. Jahrhundert" in *Listen der Ohnmacht. Zur Sozialgeschichte weiblicher Widerstandsformen* (Frankfurt, 1981), 18.

[66] Richard Critchfield, "Prophetin, Führerin, Organisatorin: Zur Rolle der Frau im Pietismus," in Barbara Becker Cantarino, ed., *Die Frau von der Reformation zur Romantik*, 112-137, 112.

[67] For example, Gottfried Arnold stressed that "Es ist das Herz, das Gott spricht und nicht die Vernunft;" cited in Richard Critchfield, "Prophetin," 114.

[68] See Elisabeth Blochmann, *Das `Frauenzimmer' und die `Gelehrsamkeit.' Eine Studie*

women managed to maneuver within the gender boundaries prescribed by society. Schiebinger argues, for example, that in Germany, six out of forty-two astronomers were women.[69] Thus, the information available regarding women's roles in home-industry households, in Pietist circles, and in German craft traditions should make us reluctant to make hasty generalizations regarding gender roles in early eighteenth century Germany. Furthermore, women challenged the status quo themselves. Two poems of the time show how two women vindicated their intellectual capacities and gave reasons for their inequality:[70]

> This fact you'll surely not propose to disavow
> That God and Nature also women do endow
> With the same poetic talents which in us you attack
> It's not poetic talents, it's the time for them we lack!
>
> (Susanna Elisabeth Zeidler, c. 1686)

> When some cretin says, we've no creative mind,
> Then, I will be sure to pay him back in kind. [...]
> Don't let this wanton sex get off without the blame.
>
> (Anna Helena Volckmann, c. 1736)

über die Anfänge des Mädchenschulwesens in Deutschland (Heidelberg, 1973); J. Zinneker, *Sozialgeschichte der Mädchenbildung* (Weinheim, 1966).

[69] Schiebinger, *The Mind has no Sex?*, esp. chap. 3

[70] Susan L. Cocalis, ed., *The Defiant Muse. German Feminist Poems from the Middle Ages to the Present* (New York: Feminist Press, 1986), 15, 25, her translations.

Despite their complaints, women (and also "the people") would have to wait at least another century to be granted equal rights both in the political world and in the world of learning. The early Enlightenment would sow the seeds for their emancipation.

5. Conclusion

The birth of a lay reading public was the result of profound changes in eighteenth-century society. This reading public is an essential feature of the structure of German society and must be taken into account in any discussion of the public culture of science. Participation in the new urban group of professionals who were the main carriers of Enlightenment ideals was not determined on the basis of birth but on education (*Bildung*). These educated groups were the "public" of writers and readers who through the pursuit of common Enlightenment goals began to transcend narrow territorial and religious boundaries typical of the preceding feudal society. A new organizational and communication network developed: societies of various kinds that served as mouthpieces of Enlightenment reformist interests, publications for both learned and lay people, and a dense network of letters. These new organizational and communication structures allowed Enlightenment champions to transcend the actual social-political-confessional fragmentation. The educated could now keep abreast of the novelties in the European Republic of Letters and they could use these networks to propagate their values and ideals to broader circles. They used literature as a powerful means for accomplishing an important social mission. Literary and philosophical activity and debate were engaged as uniquely forceful emancipatory means for creating an Enlightened society.

Leipzig, a major center of the German Enlightenment, offers excellent conditions for a case study of the making of a German public culture. As a fair town, it was a meeting point for people involved in trade of all types of goods, including intellectual ones. As a major center for a prestigious publishing business, Leipzig was the cradle of numerous publications. As a university town, it provided important channels for intellectual debate. As the seat of a belligerent Lutheran orthodoxy, it offers avenues for exploring various ways in which tensions that originated in the new developments in society and in the world of learning were played out.

Members of the educated circles were critical of the absolutist order of estates, especially when it came to the privileges of the nobility, but they were not willing to extend this criticism to other underprivileged groups, especially women and "the people." Despite their universalist claims, Enlightenment champions were not concerned with reaching out to other underprivileged groups. They were interested in constituting and reinforcing their own social makeup. The next chapter addresses the intellectual reforms that began in the early decades of the century and attempted to make knowledge public. During the first decades of the eighteenth century, old-style scholarship became the target of vehement criticisms. Enlightenment champions argued that the exclusivity of learning should be abolished and new educational standards articulated. Latin had to be abandoned and knowledge had to become public. Science would make its first appearance in the world of the uneducated in German soil. It soon would became clear that the degree of the participation of the laity --of women as emblem of the ignorant-- would face bitter disputes and tensions that would have to be met effectively.

CHAPTER 2

MAKING KNOWLEDGE PUBLIC

An educational movement at its core, the Enlightenment sought to emancipate the individual from senseless authority and foster learning and autonomous thought and action. The social community of the future would include all those voices that hitherto had not been heard and had been barred from participating in the pursuit of knowledge. In order for science to become public culture, knowledge had to transcend the narrow confines of the scholar's cluttered study. Knowledge about the world should no longer be in the hands of a traditional learned elite who hoarded its insights in books which were written in Latin, a language incomprehensible to the general population. Growing book production and an expanded reading public were basic factors for the spread of Enlightenment values and ideals to the larger public. However, in order to create a new Enlightened human race the old scholarly style and institutions had to be submitted to an unrelenting critique. The new social order required the articulation of new ideals, in which science would have to negotiate its place.

1. Critiques of Old Learning (*Gelehrtenkritik*)

At the turn of the seventeenth century, the elitism of the old structures of learning began to yield to new ways of delimiting the legitimacy of intellectual endeavors. Several

writers of the early German Enlightenment judged the scholarship of the preceding period as "the charlatanry of the erudite."[1] The educational ideal continued to be the "general scholar." Scholarship was seen as *e-ruditio*, departure from roughness, cultivation of the whole person through knowledge; wisdom was an essential component of scholarship. But this wisdom also provided scholars with favors and exemptions that had almost entirely to do with the external conditions surrounding them. "For then as now," notes Pearl Kibre, "there were no ivory towers in university cities, and the scholars, willy-nilly, were drawn into the vortex of contemporary affairs."[2] Scholars could claim marvelous legal privileges. These included the right to silence the players of silly games interrupting their studies; the right to stop the construction of buildings that would impede the light entering their studies or lecture halls; the right, along with their wives, to wear the same clothing as nobles, etc.[3] Yet, the intellectual price scholars had to pay to be granted these favors was high. Intellectual tasks were demanding. The scholar had to know the structure and relations of all disciplines, the titles and content of all books, the character traits and oddities of all

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[1] See Anthony Grafton, "The World of the Polyhistors: Humanism and Encyclopedism," *Central European History* 18 (1985): 31-47; Conrad Wiedemann, "Polyhistors Glück und Ende. Von Daniel Georg Morhof zum jungen Lessing," in Heinz Otto Burger and Klaus von See, eds., *Festschrift Gottfried Weber* (Bad Homburg: Gehlen, 1967), 215-235; and Gunther E. Grimm, *Literatur und Gelehrtentum in Deutschland, Untersuchungen zum Wandel ihres Verhältnisses vom Humanismus bis zur Frühaufklärung* (Tübingen: Max Niemeyer Verlag, 1983), esp. chaps. 3-5.

[2] Pearl Kibre, *Scholarly Privileges in the Middle Ages* (Cambridge, Mass.: Medieval Academy of America, 1962), xv. Even though Kibre is discussing the Middle Ages, her comment applies equally well to scholars in early eighteenth-century Germany.

[3] William Clark, "On the Ironic Specimen of the Doctor of Philosophy," *Science in Context* 5/1 (1992): 101-102.

significant earlier scholars.[4] Given the proliferation of books since 1450 and of new knowledge since the Renaissance, this encyclopedic ideal had become difficult to realize. Morhof's 1697 work gave it an appropriately ambitious name: *Polyhistor*.[5] The polyhistors charted the relations of the disciplines to one another, laying these out in tables that always differed and generally revealed little measure of coherence.[6] They tried to force the basic content of individual disciplines and the main rules for studying any subject into concise introductory textbooks. Even Leibniz aimed at the creation of a survey of all knowledge derived from the best books and encoded in a universal language.[7]

By the turn of the century, this type of scholarship came under attack from several quarters. Critiques became most fashionable between 1705 and 1717.[8] Both Catholics and Protestants attributed the professional deformations of the scholars to the sin of pride. Both condemned scholarship as a mundane activity that had replaced theological wisdom. A treatise entitled *On the vices of the erudite* listed fifteen scholarly vices all stemming from arrogance.[9]

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[4] See in general L. E. Loemker, *Struggle for Synthesis* (Cambridge, Mass., Cambridge University Press, 1972), chap. 2.

[5] Grafton, "The World of the Polyhistor," 37.

[6] See, for example, P. R. Sellin, "The Last of the Renaissance Monsters...," in *Anglo-Dutch Cross Currents in the Seventeenth and Eighteenth Centuries* (Los Angeles: William Andrews Clark Memorial Library, University of California, 1976), 1-39.

[7] Grafton, "The World of the Polyhistors," 40.

[8] Most writings were produced in Leipzig between 1700 and 1720.

[9] Ahasver Fritsch, "De vitiis eruditorum," (Leipzig, Jena & Rudolstadt, 1677), cited in

During the first third of the eighteenth this critique of scholars and their ideal of learning became common coin. A series of dissertations on the topic were defended publicly at universities and famous *Gymnasiums*. Although published originally in Latin, they were collected and often translated. Johann Burkhard Mencke (1674-1732), professor of history at the University of Leipzig, in turn, ridiculed the minds and the mores of the polyhistors in his *Charlatanry of the Learned* (1713, 1715). He found the erudite compilers who had loaded seventeenth-century bookshelves with their huge folios to be figures of ridicule rather than learned scholars. Attacking their love for overblown titles, he wrote: "I have often wondered at the ostentation of our ancestors who introduced into the universities such honorifics as *Illustris, Excellentissimus, Clarissimus and Spectabilis,* formerly used only in addressing the princes and senators of Rome. Today...you see many demanding to be called *Clarissimus* who are absolutely unknown outside the walls of their city; *Magnificus*, who have scarcely any dignity at home; *Consultissimus*, who have little or no advice to give; and *Excellentissimus*, who do not know as much about anything worth knowing as the veriest

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Leonard Forster, "'Charlataneria eruditorum,' zwischen Barock und Aufklärung in Deutschland. Mit dem Versuch einer Bibliographie," in *Res Publica Litteraria: Die Institutionen der Gelehrsamkeit in der frühen Neuzeit*, Sebastian Neumeister and Conrad Wiedmann, eds. (Wolfenbüttel: Herzog August Bibliothek Wolfenbüttel, 1987), Part I, 203-220, 204. Fritsch lists the following vices: "1. on pride and arrogance 2. on quibbling about fame and the terms that have to be clarified; 3. on the luxury of titles; 4. on the enjoyment of pleasure; 5. on ridiculing pleasure and harshness in refuting other people's sayings and writings; 6. on the urge of writing; 7. on literary plagiarism; 8. on theft from public writers; 9. on profit and eagerness for gain; 10. on empty curiosity; 11. on fondness of novelties; 12. on the neglect of the study of divine wisdom; 13. on envy and emulation; 14. on assuming a false identity; 15. on lazy literary leisure; sighs of pious minds."

tyro."[10] G. W. Rabener, a popular satirists of the time, wrote a mock-dissertation entirely in footnotes.[11] Many contemporaries shared these views, and joined Mencke and Rabener in satirizing the pedantry of old scholarship. Educational reformers, in turn, attacked the sterility of the old curriculum. Yet, although they believed in schooling, reformers did not attempt to alter social relations. Individuals were still raised within their particular estate and educated to fulfill their appointed social roles. There were few efforts to educate the broad population.[12]

Philosophical critiques, based on a similar concept of arrogance without religious overtones attacked above all the social behavior of the scholars resulting from such vices. *Decorum* was the criterion for social behavior. Zedler's image of the pedant (*Schulfuchs*)[13] was not the Christian but the "honnête homme," the educated "homme du monde," who lives in this world and knows its rules. Pietist and philosophical critiques shared an interest in actual life coupled with a profound aversion to pedantic scholarship and to the abstruse speculations of academic scholars.

At this time, "curiosity" also had become a fashionable term.[14] A general desire for

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[10] J. B. Mencke, *The Charlatanry of the Learned,* tr. F. E. Litz, ed. H. L. Mencken (New York, 1937), 61-62.

[11] On this satirical literature in Germany, see Wolfgang Martens,"Von Thomasius bis Lichtenberg: Zur Gelehrtensatire der Aufklärung," *Lessing Yearbook* 10 (1978): 7-34.

[12] Vierhaus, *Germany,* 73.

[13] *Zedler*, 1745.

[14] On "gallant," "useful," and "curious" in their usage during the late seventeenth and early eighteenth century, see August Langen, *"Der Wortschatz des 18. Jahrhunderts",* in

knowledge, a nervous greed to grasp everything characterized these times.[15] Contemporaries considered this curiosity the foundational attitude that gave rise to modern encyclopedism.[16] For philosopher Christian Thomasius the polyhistoric ideal was wrong, foolish, and even dangerous.[17]

Deutsche Wortgeschichte, vol. 2 (Berlin, 1959), 24ff.; Georg Steinhausen, "Galant, Curiös und Politisch. Drei Schlag- und Modeworte des Perrückenzeitalters," *Zeitschrift für den dt. Unterr.* 9 (1895): 22-37; Martin Gierl, "Zur Entwicklung der `Historia Literaria' im 18. Jahrhundert," *Denkhorizonte und Handlungsspielräume, Historische Studien für Rudolf Vierhaus zum 70. Geburtstag* (Göttingen: Wallstein Verlag, 1992), 54-80; Gotthart Frühsorge, "Excursus: Curieus und curieuse Methode," in his *Der politische Körper. Zum Begriff des Politischen im 17. Jahrhundert und in den Romanen Christian Weises* (Stuttgart: B. Metzlersche Verlagsbuchhandlung, 1974), 193-205. On curiosity, see also Hans Blumenberg, "Rechtfertigung der Neugierde als Vorbereitung der Aufklärung," in *Erforschung der deutschen Aufklärung*, Peter Pütz, ed., (Königstein/Ts., 1980), 81-100; idem, *Der Prozeß der theoretischen Neugierde* (Frankfurt am Main, 1973), 103-21; Heiko A. Obermann, *Contra vanam curiositatem, ein Kapitel der Theologie zwischen Seelendunkel und Weltall* (Zürich, 1974); and Lorraine Daston, "Ravening Curiosity and Gawking Wonder in the Early Modern Study of Nature," Reprint 7, MPI für Wissenschaftsgeschichte, Berlin 1994.

[15] Frühsorge, *Der politische Körper,* 199 cited in Martin Gierl, "Zur Entwicklung der 'Historia Literaria' im 18. Jahrhundert," *70.*

[16] "Curiosität nämlich ist die Haltung, die die *Historia literaria* erfordert. Mit Gelehrten sei zu konversieren, mit Buchhändlern solle man sich bekannt machen, kein Buch sei unbesehen zu lassen und die Bücher seien fleißig zu lesen, die zur *Notitia librorum* führten. Mit einem Worte: `du must curieux seyn.'"Cited in Gierl, "Zur Entwicklung," 71.

[17] "Nichtsoweniger ist es die pure Wahrheit, es kann auch ein sehr gelehrter Mann, der viel gelesen, der eine groß Erkenntnis hat, der in der Tat für einen Polyhistor passieren kann, ein Müßigänger sein. Gibt nur Achtung, ob er mit seinem Studieren sich oder anderen Leuten einen Nutzen schaffe oder ob er es nur zu seiner Belustigung tue..., welches noch mehr paradox ist: die größten Helliones librorum und die in Studieren nichts tun, als immer was Neues lesen, sind die größten Müßigänger unter denen Gelehrten: denn sie nützen sich und anderen am wenigsten eben damit..." *Ausübung der Sittenlehre*, 1695, 13. Hauptstück, # 27, 115, cited in Notker Hammerstein, "Thomasius und die Rechtsgelehrsamkeit," *Studia Leibnitiana* 11/1 (1979): 23.

2. Christian Thomasius

Christian Thomasius is often referred to as the "Father of the German Enlightenment."[18] His father Jacob had been Leibniz' teacher between 1661-1663. A critique of old scholarship was one of Thomasius' main philosophical targets. Yet, he also provided guidelines for articulating an alternative educational ideal. He formulated early Enlightenment views that would serve as a powerful ferment in German society. Thus, I will briefly look at Thomasius' discussion of "true" learning, "true" gallantry, philosophy as "world-wisdom" (*Weltweisheit)* as a synthesis of both, and women's learning.

2.a. True Learning

On October 31, 1687, Thomasius announced on the black board of the University of Leipzig a lecture series in German that would cost him his position at the University of Leipzig. Until then, the vernacular had never desecrated the board. This lecture series was a course on the moral philosophy of the Spanish Jesuit Balthasar Gracián y Morales, *Agudeza y Arte de Ingenio*, published in 1648. The program notes were concerned with a perennial German problem: the imitation of the French. If Leipzig professors were

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[18] See *Zedler* 43, 1745, col. 1580. For more biographical details, Mark Steinmetz, ed., *Bedeutende Gelehrte in Leipzig* (Leipzig, 1965), vol. 1, 7-14; on various aspects of Thomasius scholarship, see the recent collection of essays *Christian Thomasius 1655-1728*, Werner Schneiders, ed. (Hamburg: Felix Meiner Verlag, 1989).

distraught at the idea of having lectures in German, they were absolutely undone when they saw the recommendations set forth in these program notes. For Thomasius suggested that if Germans felt the need to imitate the French, they should do it for the proper reasons. The French, he argued, possessed impeccable taste and great knowledge because they cultivated their language. What the Germans ought to imitate was not French taste but the essence and spirit of French culture: dedication to the mother tongue. But Thomasius went further: let us, he demanded, unclutter our minds; let us reorient ourselves and throw off the bulk of useless learning and minimize the burden of the past. Take Latin, for example. Why should the minds of so many unwilling and unable victims be tortured by a language that may have no practical value for them? Why petrify youngsters with the demand that they memorize material they cannot possibly understand? Burdening young minds with irrelevant facts was not only useless but also immoral.[19] Although the initial reaction to such an act was one of shock and anger, his colleagues soon imitated him.

Thomasius' was not the first series of lectures in the German language. As historian Irmgard Weithase notes, there was already a tradition of German lectures in Germany.[20] Why then, did this particular lecture series provoke such outrage? Both the

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[19] R. Spaethling,"On Christian Thomasius and his Alleged Offspring: The German Enlightenment," *Lessing Yearbook* 3 (1971): 201.

[20] Irmgard Weithase, *Geschichte der gesprochenen deutschen Sprache*, vol. 1 (Tübingen, 1961), 264, 271ff; Richard Hodermann, *Universitätsvorlesungen in deutscher Sprache um die Wende des 17. Jahrhunderts* (Diss. Jena, Friedrichsroda, 1891), 7ff. GeorgWitkowski, *Geschichte des literarischen Lebens in Leipzig* (Berlin, 1909), 201.

subject of these lectures and the way they were announced were revolutionary. The series was a blow to the established tyranny of Latin as the language of university instruction, a tyranny which not even Luther had managed to shake. In the seventeenth century there had been isolated voices raised in protest with the admonition that all instruction should be in the vernacular. Wolfgang Radtke (Ratichius, 1571-1635), an educational reformer, for example, embodied his proposals in a memorandum presented to the Reichstag in 1612, and Johann Balthasar Schupp had pointed out, in his *Dissertatio de opinione ex Avellino Marpurgensi (1655)* that a patient could be cured in German just as successfully as in any other language, and that the nature and attributes of God could be studied as well in German as in Latin. Scholars of distinction had also occasionally given lectures in the German language. Among them were the humanist Tallyman Heverling, who had lectured on Juvenal in Rostok (1501) and Paracelsus himself who had lectured in Basle on medical subjects in the German language (1526).[21] But Thomasius was the first person to announce a course of lectures in German. His fixing of the notice in the vernacular on the university black board was a symbolic gesture reminiscent of Luther's nailing his theses to the door of the church at Wittenberg. We will probably never know whether he was actually aware of the fact that his act took place on the day of the 170th anniversary of Luther's nailing of the theses.

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[21] For further details on this topic, see Hodermann, *Universitätsvorlesungen* and "Universitätsvorlesungen in deutscher Sprache: Christian Thomasius, seine Vorgänger und Nachfolger," *Wissenschaftliche Beihefte zur Zeitschrift des Allgemeinen Deutschen Sprachverein* 8 (1895).

Another reason for fury was that Thomasius' obviously was the first philosophical lecture in German. A few years later, he even compounded his heresy by founding one of the the first German-language periodicals, the *Monatsgespräche*. With this publication Thomasius inaugurated German journalistic polemics.[22] His journal was, in the manner of the *Journal des Sçavans* and the *Acta Eruditorum*, primarily a review of books. But in contrast to both these scholarly journals, Thomasius imbued his own with a critical point of view, with a specific pedagogical thrust and an ethical commitment. Knowledge was to be for all and not for a selected few. Thomasius was in many ways a forerunner of the more famous English editor of the *Spectator*, who declared in the tenth number: "I shall spare no Pains to make their Instruction agreeable, and their Diversion useful. For which Reasons I shall endeavor to enliven Morality with Wit, and to temper Wit with Morality....It was said of Socrates,[23] that he brought Philosophy down from Heaven to inhabit among Men; and I shall be ambitious to have it said of me, that I have brought Philosophy out of Closets and Libraries, Schools and Colleges, to dwell in Clubs and Assemblies, at Tea-tables, and in Coffee-houses."[24]

Thomasius dedicated the preface of the 1689 issues to his enemies. The open blast directed at the Leipzig academic establishment, together with his lecture series, were gestures that the Lutheran authority could not tolerate. In Thomasius' mind Latin stood for

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[22] K. E. Prutz, *Geschichte des deutschen Journalismus* (Hannover, 1845), vol. 1295.

[23] Cicero, *Tusculan Disputations*, 5.4.10, cited in *The Spectator*, ed. Donald F. Bond (Oxford: Oxford Clarendon Press), 1987.

[24] Joseph Addison, *The Spectator*, no. 10, 1711, 44.

old habits of thought, for Aristotelianism and Scholasticism. Some thirty years later, looking back at this event, Thomasius declared that nothing had so horrified the University of Leipzig since its foundation as his announcement of the lecture series, and that the blackboard might well have been reconsecrated with Holy Water. Thomasius himself provided his opponents with the justification for his expulsion from Leipzig by attacking Hector Gottfried Masius, Professor of Theology and court preacher to the King of Denmark.[25] Professor Massius had advanced the thesis that the Lutheran religion alone could guarantee a nation's order and stability, that only a Lutheran, aware of the divine origin of princely power, could be a truly peaceful and faithful subject. Thomasius, a Lutheran, was of a different mind and his defense of religious freedom was one of the most avid to come out of Germany at the time. And it provoked an immediate response. On March 10, 1690, a court order from Dresden ordered the University of Leipzig to withdraw from him all the rights and privileges of lecturing, tutoring, and publishing. This clearly meant his financial ruin and academic ostracism. A few days later, Thomasius abandoned Leipzig and went to Halle, where he continued with his lecturing in German. As a result, by 1717 he was able to state that lectures were being given in the German language "not only at Halle, but at other Protestant universities."[26]

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[25] On this, see R. Liebewirth, "Christian Thomasius' Verhältnis zur Universität Leipzig," in *Festschrift Karl-Marx-Universität Leipzig 1409-1959* (Leipzig, 1958), vol. 1, 71ff.

[26] In a review of Agricola's famous collection of proverbs, in Thomasius's periodical *Summarische Nachrichten von auserlesenen, mehrentheils alten, in der Thomasischen Bibliotheque vorhandenen Büchern*, 23, 1717, 917, cited in Blackall, *The Emergence of German*, 13.

In 1691, Thomasius published his *Einleitung zu der Vernunfft-Lehre*.[27] In the preface, addressed to his students, he justified his use of the vernacular in this work by stating that he wished to appeal to a wide public. The Greeks had not written their philosophy in Hebrew nor the Romans in Greek --each of these great nations had used its vernacular because they rightly envisaged philosophy as a subject for all the people. The French philosophers of recent times had followed the ancients in using the vernacular for their writings. Why should the Germans, by resisting the vernacular, suggest to other nations that philosophy and learning could not be written in their language? Knowledge of Latin was not a sign of superior intelligence or learning, he maintained.

Thomasius began by defining learning as "a knowledge that makes a person skillful in distinguishing well the true from the false, good from evil, [and] in giving warranted true and occasionally probable causes for this in order to foster in the life of the community his own and other peoples' temporal and eternal well-being."[28] Knowledge in his view is essentially practical. His definition combined cognitive and ethical criteria. Summarizing the first section, Thomasius remarked that scholarship was not: (1) learning that does not bring usefulness or lead to salvation; (2) the mere knowledge of many languages; (3) learning that requires a specific profession; (4) learning that is

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[27] *Einleitung zu der Vernunfft-Lehre* (Halle, 1691; reprint Hildesheim: Georg Olms, 1968), cited as *Einleitung*.

[28] "Die Gelahrheit ist eine Erkäntniß / durch welche ein Mensch geschickt gemacht wird das wahre von dem falschen / das gute von dem bösen wohl zu unterscheiden / und dessen gegründete wahre, oder nach Gelegenheit wahrscheinliche Ursachen zu geben / umb dadurch sein eigenes als auch anderer Menschen in gemeinen Leben und Wandel zeitliche und ewige Wohlfart zu befördern." *Einleitung, 75-6.*

restricted to men and excludes women; (5) learning that is exhausted in polymathy (*Vielwissen*); (6) learning that cannot be justified in practice; and (7) learning that confuses natural reason and revelation.[29] University scholars regarded themselves as an estate with their own tradition and code of honor. Thomasius' critique aimed at depriving scholars of their privileged position. Since being learned in this new sense depended neither on the amount of knowledge one could display nor on the quantity of books one had read, becoming learned became an option open to a broader public. In his view, all human beings could acquire learning.[30]

With his ideal of the usefulness of learning, Thomasius attempted to bind scholarship with the educated "bourgeoisie." University scholars regarded themselves as an estate with their own tradition and code of honor. Thomasius' critique aimed at depriving scholars of their privileged positions. By postulating the use of the vernacular, he suggested that the world of learning be integrated into the world of the "bourgeoisie." If scholarship had to be made relevant to real life, the interest of broader circles had to be won to areas of learning that had traditionally been the preserve of specialists. Latin had to be abandoned. Thomasius' pleas were not merely theoretical. They gained practical significance with his legal and pedagogical and political battles.[31] In 1701 he published his *Theses on the crimes of magic (Theses Inaugurales De Crimine Magiae)*, in which he

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[29] *Einleitung*, ##38-44, 87-88.

[30] *Einleitung*, ## 38-44, 87-88.

[31] See Grimm, *Literatur und Gelehrtentum*, 386-407 and references.

attacked the time-honored practice of religious persecution and the burning of witches. Thus, he effectively ended the witch hunts and trials in Germany. There can be no doubt that the most important step toward practical enlightenment in Germany had been taken.

2.b. True Gallantry

The term "gallant" had been used since about 1650 in the context of baroque courts and became peculiar to the early Enlightenment. Originally, it referred to the polished manners and correct demeanor of aristocrats toward others, especially women. Between 1679 and 1720 it underwent important connotational changes. These shifts in meaning were mirrored not only in the theoretical writings of the time but also in literature such as the moral weeklies and the gallant novel.[32] When adapted to the German context, gallantry became an educational ideal and part of the new learning.

Thomasius addressed the question of gallantry in a series of lectures at the University of Leipzig. In 1689 he claimed to treat the topic for the first time in systematic fashion.[33] The title of his lecture openly spoke of the acquisition of social graces as

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[32] See John McCarthy, "The Gallant Novel and the German Enlightenment, 1670-1750," in Kors and Korshin, eds., *Anticipations of the Enlightenment*, 185-217.

[33] The lecture was entitled *"Christian Thomasius eröffnet Der Studierenden Jugend Einen Vorschlag, Wie er einen jungen Menschen, der sich ernstlich fürgesetzt, Gott und Welt dermahleins in vita civili rechtsschaffen zu dienen, und als ein honnet und galant home zu leben, binnen drey Jahre Frist in der Philosophie und singulis Jurisprudentiae partibus zu informieren gesonnen sey."* Reprinted in C. Wiedemann, *Der galante Stil:*

essential to a life of virtue. A "honnêt und galant homme" is suited to serve God and man in an honorable way. A later lecture of 1693 drew an even more distinct parallel between Christ's teachings and the life of a "galant homme."[34] But already in his celebrated inaugural lecture of 1687 Thomasius had raised the issue of "gallantry," expressing his dismay at the widespread misuse of the term "gallant," which was being used to describe all sorts of things such as dogs and cats, slippers, tables and benches, quills and ink, and who knows what else.[35] "What is gallant and a gallant person?" he further asked. Appropriately used, the term describes the social behavior which derives from a combination of "understanding, learning, a sense of good judgment, politeness, and a cheerful disposition which abhors all stiffness, affectation and coarse bluntness." The ideal Thomasius proposed, though based on French manners and habits, was not meant to be a superficial imitation of these. Instead of mimicking the French, Thomasius contended, the Germans should adopt above all the essence of the graceful manner so characteristic of the French. When all these "individual parts" are combined in one

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1680-1730 (Tübingen, 1969), 1-2, cited as *Galanter Stil.*

[34] *Chr. Thomasens Erinnerung Wegen deren über seine Grund-Lehren, Bissher gehaltenen Lectionum* (1701?), reprinted in *Galanter Stil*, 22f.

[35] "Diese Wort [sei] bey uns Teutschen so gemein und so sehr gemißbrauchet worden, daß es von Hund und Katzen, von Pantoffeln, von Tisch und Bäncken, von Feder und Dinten, und ich weiß endlich nicht, ob nicht auch von Aepffeln und Birn zum öfftern gesagt wird;" Christian Thomasius eröffnet der Studirenden Jugend zu Leipzig in einem Discours Welcher Gestalt man denen Frantzosen in gemeinem Leben und Wandel nachahmen solle ein Collegium über des Gratians Grund-Reguln, Vernünfftig, klug und artig zu leben" (31.10.1687), reprinted in *Galanter Stil*, 1.

person, the ideal of "the perfect, wise man" is realized.[36]

In 1693, Thomasius elaborated on the difference between true and false gallantry. The catalyst for his remarks was the pervasive shallow behavior among students toward the fair sex. He began by distinguishing three categories of people: animals, men, and Christians, which correspond to three ways of life. He then argued that false gallantry marked only the first category: animals, which is equated with a life of dissolution. Men and Christians, instead, are characterized by true gallantry and correspond respectively to a life of common sense and a life of elegant politeness.[37] On the basis of such distinctions Thomasius developed a whole doctrine of "ius decorum." "Decorum" is the Latin equivalent of French "galanterie,"[38] and is later defined as "the soul of human intercourse, a human frailty but not a vice."[39] Gallant behavior also acts as a social equalizer, for gallant men measure others not according to social standing but according to breeding.[40]

Professor Johann Christoph Gottsched also recognized the beneficial value of the gallant style for creating pleasant, useful members of society. On September 15, 1727, he published an ironic, half-serious proposal in his moral weekly, *Der Biedermann*. Its goal

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[36] "Denn wenn man diese Stücke alle zusammen setzet, wird endlich un parfait homme Sâge oder ein vollkommener weiser Mann daraus entstehen," *Galanter Stil*, 4.

[37] "Christian Thomas Entbietet der studierenden Jugend in Halle, Seinen Gruss und Dienste....(1693)," *Galanter Stil,* 18.

[38] "Christian Thomasius eröffnet der Studierenden Jugend...," *Galanter Stil*, 4.

[39] "Christian Thomasens Erinnerung Wegen deren über seine Grund-Lehren...," *Galanter Stil,* 22.

[40] Benjamin Neukirch, *Anweisung zu Teutschen Briefen (1721), Galanter Stil*, 40.

was to attract students back from a dissipated life in their drinking haunts and whorehouses to a serious pursuit of their academic studies.[41] His proposal was to replace all the dry, pedantic, boring professors at the universities with "gallant, erudite women." The presence of these women on the faculty and in the administration of the universities would be most effective in drawing the masses of students back to the lecture halls. The students would readily leave their dissolute street-life and return in mass to the diligent pursuit of their studies in an effort to gain the approval of their "gallant 'Professorinnen und Doctorinnen.'" Not only would students pursue their academic goals with zeal, Gottsched suggests, but they would also learn proper manners and moral behavior from the good example of their new mentors. In this ironic vision, Gottsched discerned the essential difference between the false and the authentic gallant code outlined by Thomasius in 1693. Beyond the benefit for the students themselves, other advantages could be realized from such a judicious application of the gallant style. For example, academic positions would become available to those learned women who had no previous prospect for useful employment. And Gottsched left no doubt that there were enough qualified women in 1727 who equaled or even surpassed men in erudition and aptitude (1:82).[42] In time, other women would be encouraged by the example of these successful,

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[41] Gottsched, Johann Christoph, *Der Biedermann* (Leipzig, 1727-29; reprint, Stuttgart 1975), 81-82.

[42] Who these women were is hard to tell. Most studies dealing with Leipzig cultural life simply ignore women. What is known is that Gottsched's wife Luise Adelgunde Kulmus was an active member of Leipzig literary life. See Th. W. Danzel, *Gottsched und seine Zeit* (Leipzig, 1848; reprint Hildesheim 1970).

gallant women to seek academic careers, careers hitherto unfairly denied them (1:82). Thus the benefit of combining gallant behavior in its authentic form and academic studies is seen as twofold: (1) boorish, indolent students would begin to pursue their studies with rare enthusiasm and (2) new social opportunities would be created for women whose numbers would perceptibly swell the ranks of the useful and diligent members of society (208). Although the term "gallant" had been used since ca. 1650 in the context of baroque courts, it became peculiar to the early Enlightenment. When adapted to the German context, gallantry became an educational ideal. To be gallant, i.e., to strive for this educational ideal implied that one would try to adopt all useful sciences. As we will see, the editor of the first Lexicon for literate ladies, discussed in Chapter 3, spelled out what these sciences were and in what sense they would be "useful."

2.c. Philosophy as Worldly-Wisdom (*Weltweisheit*)

With true learning and true gallantry philosophy would become "worldly-wisdom." It would deal with this world and with God, but always in worldly terms, i.e., without recourse to the authority of Scripture.[43] Further, it would be open to the world (*weltoffen*) and oriented to the world (*weltzugewandt*). "World" is less a term that refers to the audience than an opposite term for "school." It expresses rather what the

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[43] Helmut Holzey, "Der Philosoph für die Welt -eine Chimäre der deutschen Aufklärung?" in idem and Walter Ch. Zimmerli, eds. *Esoterik und Exoterik der Philosophie* (Basel, Schwabe & Co. Verlag, 1977), 124.

philosopher speaks about, and how he does so. Worldly-wisdom would no longer be knowledge for its own sake but existential knowledge. Philosophy, as *Welt-weisheit* would provide natural reason with the necessary insights for a good life in this world. Reason and virtue were inseparable. Philosophy was always enlightenment, a subjective process of self-liberation from prejudice, ignorance, and error; it was ongoing critique, never final enlightenment. A new reformed philosophy would bring about a general intellectual and ethical renovation. With his emancipatory project Thomasius wanted to liberate philosophy from traditional theology and, at the same time, extend philosophy for the enlightenment of everyone, regardless of social standing and gender. Philosophy had to be for the world not for the schools. Its goal was not to attain a precise knowledge of first principles, but the living acquisition of the necessary and useful.[44] Thus already his contemporaries praised Thomasius as the courageous Enlightenment champion who fought to achieve intellectual autonomy, to improve education by tearing down the walls of a cloistered and self-indulgent academia; he appears as the man who reached out to the yet uneducated, furnishing them with the belief that they could improve their lives and social well-being if they used their God-given powers of reason.

The new middle classes, however, as discussed in Chapter 1, shared the Enlightenment criticisms of the absolutist order of estates with varying degrees of commitment. But they adhered to tradition when it came to the role and rights of women. They were up in arms against the nobility's inherited privileges, demanded the abolition

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[44] Schneiders, "Der Philosophiebegriff," 68.

of class barriers, and rebelled against repression by an authoritarian state. But the fact that women were excluded from this universal vision of progress and freedom struck few people at the time as a contradiction. Yet, women's rights and aptitude for learning had been a perennial topic of discussion and dispute in the European context. Gottlieb Wilhelm Rabener (1714-1771), a famous satirist, captured the controversial nature of the topic in Germany in his satirical definition of a learned woman, when he affirmed, "Learned women, is a problem."[45] To this we now turn.

3. "Learned Woman is a Problem"

Discussions regarding women's nature, their ability to learn, their rights and duties were by no means new in the eighteenth century, nor were they peculiar to Germany.[46] The *querelle des femmes* was a European phenomenon and many texts were widely circulated and translated. The topics debated were not only related to women's learning but also to women's right to humanity itself. Theoretical writings such as tracts and dissertations consistently referred to these issues. In the early eighteenth century we still find publications that question whether women are human beings or not. The main

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[45] See Introduction, n. 62.

[46] The best treatments for the German context are Silvia Bovenschen, *Die imaginierte Weiblichkeit, Exemplarische Untersuchungen zu kulturegeschichtlichen und literarischen Präsentationsformen des Weiblichen* (Frankfurt am Main: Suhrkamp Verlag, 1979), esp. part II; and Heidemarie Bennent, *Galanterie und Verachtung. Eine philosophiegeschichtliche Untersuchung zur Stellung der Frau in Gesellschaft und Kultur* (Frankfurt/Main: Campus Verlag, 1985).

evidence for "proving" that they were not was derived from the Bible and other religious tracts. As late as 1752 a treatise entitled "Curious proof that women do not belong to the human race" was listed in a catalogue of current publications.[47] In 1665 Wilhelm Schütz maintained that women were indeed human. The following year a repudiation of Schütz's work was published.[48] Many of the ideas espoused in this work were typical arguments at the time when the editors of the moral weeklies wrote, and these represent in many ways counterarguments to them. Poliandin considered subservience and lack of intelligence to be inborn characteristics of all females simply due to their gender. While he admits that women do have some degree of intelligence, it is of a different quality and quantity from that of men. Women's intellect cannot be developed or improved. Moreover, women are responsible for their own state of ignorance. Since they are brought up and educated by females, ignorance is passed from one generation to the next, and women must therefore bear responsibility for perpetuating their own status quo.

One of the main premises on which Poliandin constructed his argument was that women are naturally inclined to be sedentary and to remain in the home. Conversely, men

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[47] *Curieuser Beweis, dass die Weiber Nicht zum menschlichen Geschlecht gehören.* Richards points out that it cannot be proved whether or not the work was actually published, for no copies of it can be located. Since I have not had access to the sources referred to in this section, I rely on her analysis, "The image of women," pp. 84ff.

[48] [Johann Gorgias von Kronstadt?], *Polliandis gestürtzter Ehrenpreiss des hochlöblichen Frauen-Zimmers / Oder Vertädiger Männliches Geschlechts / darinnen von Wort zu Wort die Erörterung ohne Fug in Zweiffel gezogene Frage / Ob das Weibliche Geschlecht am Verstande dem Männlichen von Natur Gleich / auch zu Verrichtung Tugendsamer Wercke und Thaten / ebenmässig "qualificirt" und geschickt sey? Wiederlegt / und eine viel bessre und formlichere Meynung gezeiget wird.*

have a proclivity for the sciences (*Wissenschaften*) and learning, which implies a necessity for contact outside the home. Moreover, women must not only remain at home but also must attend to specific duties necessary for the efficient running of the household simply because their husbands wish it. The subservience is based on the arbitrary expectations and desires of men. Women must have internalized these values to the extent that they are obedient and subservient of their own free will! Women are naturally not suited for public life. But this does not mean that they do not have any choice at all: it is up to them either to be good wives and mothers or bad ones!

The inability and inequality of women is not only intellectual but also moral. The fact that women experience pain when giving birth renders them incapable of being completely virtuous, for that pain is a remainder of and punishment for their sinfulness. Women are weaker in all aspects of life and must, therefore, be subordinate to and ruled by men. Women's inferiority in the intellectual, moral and physical realms is reinforced by their impossibility to achieve salvation by their own means. If women are granted salvation at all, it is only as a gift of God in his infinite mercy. He has the power of showing pity even on the most unworthy being. Even this century, Max Funke published in Halle in 1910 a text with the title: "Are Women Human Beings? Women are not human beings" (*Sind die Weiber Menschen? Mulieres homines non sunt*"). The author claims that this is no satire, but a scientific demonstration![49]

In Thomasius' writings we find a thorough treatment of the issue of women's

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[49] For further examples from earlier times, see the collection of essays edited by Elisabeth Gössman, *Ob die Weiber Menschen seyn, oder nicht?* (München: Iucidum, 1988).

learning. The purpose of his treatise *Jungfer-Academie*[50] is to explore the reasons why, by the early 1700's, women had been recognized as human beings in theory but not in actual practice (#1). He then exposes the prejudices that have led to women's exclusion from disciplines such as theology and law. For Thomasius "female learning" (*Weibergelahrheit*) did not mean the "foolery...that women should follow men in all the learned foolishness that up to now has been called erudition" (#25). Instead, their studies should benefit them and their families. For this purpose, females need to learn to use their powers of reason and judgment. Thomasius' list of reasons why women should study include: to demonstrate what true learnedness was and guard us from unnecessary and pedantic learning, and to turn to the most necessary and useful studies. Women would prove that truth can be sought without ulterior motives, particularly money; they would have more respect for learned men and vice versa; women could aid their husbands in matters requiring greater intellectual acumen; they could direct the studies of their sons and in case of necessity, inform them; women could better understand the business of their husbands and continue them after their death; they could undertake the learned jobs for which their husbands had no time due to their business; and women would have a useful pastime. Most of the reasons are based on stereotypical gender-roles: to enable women to benefit male members of the family or to provide them with a useful hobby. Nevertheless, this discussion is valuable since it contains concrete suggestions of areas in which women could expand their horizons. Moreover, although Thomasius distinguished

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[50] "Vorschalg einer Jungfer-Academie," in *Auserlesene Anmeckrungen Über allerhand Materien*, Franckfurt u. Leipzig, 1707), vol. 4. I indicate the paragraph number in the text.

between the types of learning appropriate for men and women, he does not explain in what the differences consisted. The prime purpose of studying was common to both: enabling them to be of service to their family and to humanity. This could be achieved if each carried his / her occupation more proficiently and expertly. He claims, "a lady who studies according to our way, has to perform her female tasks better and must take care of her household better than one who has not studied."[51] In addition, women would be both qualified and available for certain types of learned work which, again, he does not define. Furthermore, women can regulate their schedules more easily for they are "not bound to any public office and are therefore more masters of themselves than men." Several paragraphs later he specified that the teaching methods in girls' schools should be the same as those in boys'.

In another text entitled "On the Imitation of the French," Thomasius raised the question "why prevent women from studying?" The refusal to permit girls to study was blamed on the "prejudices and preestablished opinions of men."[52] Further reasons were based on theology, law, medicine, and philosophy. As he named the reasons, he discredited their perpetrators either directly or indirectly, implying that they were unenlightened (##4-7). Some of the beliefs that prevented girls from studying were that they would neglect their household duties and they would pretend to gain authority over

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[51] "ein Frauenzimmer das nach unserer Art studiert / muß ihre weibliche Arbeit besser machen / und besser haußhalten können / als eine die nicht studiert hat" (#26).

[52] "Von der Nachahmung der Franzosen," 1687, reprinted in Christian Thomas *Kleine deutsche Schriften*, Julius Otto Opel, ed. (Frankfurt/Main: Minerva Verlag, 1983), 121.

men. The biblical view (from Corinthians) that women should be silent in church was the cause for the clergy's traditionally negative attitude toward women and learning (##20-24). Thus Tomasius' general theories regarding women's education were quite liberal. Now almost all subjects could be relevant to women's occupations. Nevertheless, he restricted their professions to the traditional ones: wife, mother, and housekeeper.

Thomasius' treatment of women's learning generated and was part of wider discussions. That the editors of the moral weeklies, especially those up to the 1740's, discussed many aspects of the topic and showed that the issues had not been settled. For them, it was not merely a matter of asking whether women should be learned or not and of answering the question either negatively or affirmatively. Their discussion included a theoretical treatment of many specific elements: "false" versus "true" learnedness; the conflict between studying and household duties; and the need for and the right of women to be educated. In addition, editors provided examples of learned women to illustrate their theories and occasionally made statements that seemed to be designed to counteract stereotypical beliefs. And again, although Thomasius' most progressive views did not result in immediate educational policies, they became widespread in a literature that attempted to correct societal evils. The editors of the weeklies attempted to show that both the "state" and future generations would benefit if women received more extensive instruction not only in household matters and methods of raising children, but also in ethics and academic subjects like poetics, literary criticism, and even science. Yet, whereas certain editors maintained that women had the right to study and become learned, they rarely advocated the same type or quality of learning for males and females. The

weeklies repeated time and again that their purpose was not to make women true scholars (*eigentliche Gelehrte*). Since they should not by any means try to equal academicians and university professors, they did not have to go into the depth of the sciences but should enjoy the fruits of serious scholarship, make it their own, and transform it into something useful.[53] Women's learning should be ancillary and enhance their abilities as wives and mothers. Seldom did German editors suggest that women be permitted to study in order to benefit themselves as human beings. However, although the ideal woman was still first and foremost a wife, mother and housekeeper, she was now at least granted permission by some editors and encouraged by others to broaden her education. The result: she would be an understanding wife to her husband and an intelligent mother to her children! Thus she would fulfill her roles more successfully and with more insight --thereby becoming a useful member of society.[54] In spite of the emancipatory elements, the assumption of women's natural destiny to be wives, mothers, and housekeepers, went unchallenged. These gender-biased stereotypes were further reinforced with theological arguments that presented the social order as natural order. Time and again the editors of the weeklies stressed that knowledge that does not lead to virtue is useless and even harmful. All knowledge that was not within the confines of *Weltweisheit* and did not help make people more human was evil.

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[53] Martens, *Botschaft der Tugend*, 420.

[54] It is important to stress that all this is specifically valid for the weeklies up to 1740. Later weeklies emphasize that women should limit their interests to the fine arts more than to any other sciences. Martens, *Botschaft der Tugend*, 531.

Thomasius' plea for reform was not immediately heeded by the authorities of the higher institutions of learning. Yet, if the progressive tendencies of the early Enlightenment are pointed out, the impact of his rebellious acts, such as his Leipzig lectures, the legacy of his teaching, and the power of his printed word constituted important contributions. From our contemporary perspective, his thought may seem contradictory or regressive. However, Thomasius contributed to the articulation of certain ideals that mirrored broader political and literary trends that served as a ferment in Enlightenment society. Some of his critiques would even be applicable to our contemporary academy. However, the philosophical canon banned his thought from the sphere of legitimate philosophical discourse, and histories of philosophy therefore rarely include his name or discuss his thought. Had the tradition of inquiry that he inaugurated been taken seriously in all its implications, Thomasius and his legacy would occupy a central place in the philosophical canon of the German Enlightenment. When we consider the contributions of thinkers like Thomasius, it is clear that the German Enlightenment was much more than a product of Kant's critical genius.

Purged of the fancies of the pedants, true gallant learning would meet the needs of the day. Philosophy would become philosophy for the world and would result in a deep intellectual and ethical reform of society. But this world of learning was not open to "everyone," in a literal sense, as Thomasius claimed. To him, "everyone" meant that knowledge would be no longer the privilege of a small elite who were able to ensure the preservation of its privileges by keeping its wealth within the confines of its own sphere, distanced from the world. "Everyone" now was the growing group of intellectuals and

professionals of the higher middle strata of society.

4. "Science" in Literature for Lay Publics

During the first decades of the eighteenth century, Leipzig was known as the seat of a combative Lutheran orthodoxy. Theologians were being displaced from their central position in the world of learning. These shifts did not occur without conflicts and opposition. Theologians responded in various ways. One of the ways in which tensions between theological and secular authority were played out was in the proliferation of physico-theological writings. The innovative contribution of the Germans to this tradition lay in the area of presentation: the particularly effective persuasive power that was attributed to poetry by traditional humanist rhetoric was placed by the poets at the disposal of the physico-theological doctrines (whereas the English writers had preferred the tract or the sermon). Several of these works were produced in Leipzig, such as Bärmann's "Treatise on the Intentions of the Creator" (*Abhandlung von den Absichten des Schöpfers*, 1739); Benemann's "The Rose" (*Die Rose*, 1742); "The Tulip" (*Die Tulpe*, 1741); or Küttner's "The Knowledge of God from his Works" (*Die Erkenntniß Gottes aus seinen Wercken*, 1726). Even Valentin Ernst Löscher, known as a recalcitrant orthodox Lutheran published in 1734 a work of this nature, entitled *Strange Works of God in the Realms of Nature, Art, and Happiness, as a Useful Introduction through the Vestibule*

into the Sanctuary, for the Glorification of God's Name and Common Perfection.[55] Löscher explains that he had preached this work in 1722 and now presented it to the reader in the form of excerpts.

Newton was rarely absent from the registers of authors cited by physico-theologians to corroborate their thoughts.[56] The first German scientific compendium addressed also to women, Johann Jacob Scheuchzer's *Physica oder Naturwissenschaft*, was probably the chief source for the dissemination of Newton's optical theories in Germany after 1711. The first edition had appeared in 1703, one year before Newton's *Optics*. Subsequent editions in 1711, 1729, and 1743 differed from the first in that the author included an entire chapter entitled "of light and color according to Mr. Newton's opinion"(*Von dem Liecht und Farben nach Herren Newtons Meynung*). This new section of about thirty pages was devoted to an explanation and paraphrase of Newton's *Optics*. This compendium was widely known in Germany. It was probably the chief source for the dissemination of Newton's optical theories in Germany after 1711, especially for those not familiar with other vernacular languages. The work was included in the reading list of the moral weekly, the *Patriot;* the eighth issue of 1724 recommends Scheuchzer's *Kleine Physica*; a revised edition of 1728 included the new edition of 1711.

In the dedication of the first edition Scheuchzer notes that his work is aimed at

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[55] Valentin Ernst Löscher, *Merckwürdige Wercke Gottes in denen Reichen der Natur, der Kunst, und des Glückes, Als eine nützliche Einleitung durch die Vorhöfe in das Heilige, zur Verherrlichung des Göttlichen Nahmesn und gemeiner Besserung* (Dresden, 1734).

[56] Sara Stebbins, *Maxima in minimis. Zum Empirie und Autoritätsverständnis in der physikotheologischen Literatur der Frühaufklärung* (Bern, 1980), 85ff.

learned and lay people, and he explicitly included women in the reading public. In his view, the ideal woman is "a wise, careful mother, who cares not only for the smallest speck of dust, but also for the biggest bodies of the world...who is a painstaking housekeeper,...a rich but also careful spender."[57] Nature is referred to as "mentor (*Lehrmeisterin*) of our whole life, [who] leads our thoughts to a recognition of God, and makes us enjoy the practice of good works." The religious component of Scheuchzer's understanding of science is further strengthened in the preface of the second edition (1711). Relying on a series of quotations from the Bible, he notes that he wants natural science to be seen as "a little river that flows from God's clearest original truths." The contemplation of the beauty of God's artwork will bring humans such enjoyment, that there is probably nothing comparable to it. To Scheuchzer, women should be invited to join this earthly paradise, and thus, they are woven into the fabric of physico-theological rhetoric. But physico-theology was not just a matter of enjoyment; it was also an effective weapon against atheism. Atheism had bothered the Protestants particularly since the beginning of the seventeenth century, and even more, because it was difficult to determine what exactly was meant by it. In the end, "atheism" was a projection of the anxieties and fears of Protestantism in face of the social and ideological transformations, the cracking of the feudal order, and the consolidation of a rationalist and empirical worldview.[58]

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[57] This and the following quotation are taken from Nasse, *Frauenzimmer-Bibliothek,"* 327-29, my translation.

[58] Uwe-K. Ketelsen, "Naturpoesie als Medium bürgerlicher Ideologiebildung im frühen

Newtonianism in Germany was more than a "new philosophical school" confined within the walls of scientific academies.[59] Theological and political interests were at play in these popularizing efforts. As we will see, the main lines of the physico-theological argumentation was a common pattern in the literature addressed to lay readers. Writers faced the threats posed by the *new sciences,* symbolized by Newton, by embedding scientific themes in physico-theological rhetoric. Science had to be made acceptable to the Lutheran orthodoxy since they were the key arbiters of knowledge. Newton's presence in this context acquires political meaning.

In contrast to the theological orthodoxy, physico-theological literature did not dismiss the new science. On the contrary, it made the wide enthusiasm for natural-science problems and a passion for the observation of nature productive. Didactic poetry, as descriptive poetry, affected the way readers looked at the world. It was crucial in the dissemination of new insights to lay educated strata. Although didactic poets' main purpose was not to disseminate science in Germany, at least as an unintended implication, they did play this role. Poets communicated to the lay person not the details of the mechanistic cosmos but the conviction that they lived in a lawful universe, and that this lawfulness was guaranteed by God. The perception that science, if set within the

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18. Jahrhundert," in Norbert Mecklenburg, ed., *Naturlyrik und Gesellschaft* (Stuttgart, 1977), 54.

[59] Paolo Casini affirms: "Auf dem Kontinent wurde der Newtonianismus zunächst mehr as eine neue philosophische Schule und nicht as eine wissenschafliche Syntehese angesehen." *"Isaak Newton" in Jean Pierre Schobinger, ed., Grundriss der Geschichte der Philosophie begründet von Friedrich Überweg, völlig neuberabeitete Ausgabe* (Basel, 1988), vol. 3, 481.

appropriate boundaries, would lead humans to a knowledge of God was one of the main reasons why it was praised as a "useful" enterprise.

This chapter has discussed the various critiques of old pedantic scholarship removed from the concerns of real-life. Science, to be legitimate, had to be shown to contribute to the making of a new type of learning that would lead to a better world and a better life. Most scientific compendia of the time include at least a paragraph that lists the reasons why it is good to cultivate physics: Physics leads to the knowledge of God; it is knowledge for its own sake; it serves for entertainment purposes, to combat superstition and for practical-technical uses.[60] An author adds: "He to whom this is not enough encouragement is not worthy of being a human being."[61] Physics compendia hoped to draw some benefit for both the physical and spiritual well being of people, to both purposes physics was "useful." The claim to the usefulness of science was the

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[60] "Vernünftige Wesen werden durch nichts so sehr zur Erlernung einer Wissenschaft gereizt, als wenn man sie überführet, wie wichtig, nützlich, und angenehm sie sey: 1. Sie lehret uns auf eine überzeugende Weise einen Gott kennen, der allmächtig, weise und gütig ist. Beyspiele und Beweis ist die ganze Natur; 2. Sie vergrössert und erhöhet unsere Einsichten und Kenntnisse; 3. Sie erwecket durch so viele reizende Beobachtungen und Versuche das würdigste und reinste Vergnügen unserer Seele. Man denke nur an die angenehmen Verusche...mit der Electrisier-Maschine; 4. Sie benimt uns manche kindische Furcht und Aberglauben. Man denke an die Cometen; 5. Durch sie erreichen fast alle Künste und Handwerke ihren Grad der Vollkommenheit. Man überlege doch nur, ob nicht die ganze Verbesserung der Öconomie, der Färbereyen, der Zubereitung des Leders und unzähliges anderes von der richtigen und gründlichen Kenntniß der Naturlehre ihren Ursprung nehmen muß." Gunter Lind, *Physik im Lehrbuch, 1700-1850. Zur Geschichte der Physik und ihrer Didaktik in Deutschland* (Berlin: Springer-Verlag, 1992), 14-15.

[61] "Wem dieses nicht genug zur Aufmunterung ist, der ist nicht werth ein Mensch zu seyn." Boeckmann, Johann Lorenz, *Naturlehre, oder: die gänzlich umgearbeitete Malerische Physik* (Karlsruhe: Macklot, 1775).

crucial rationale for its popularization.

Before we move to the mechanisms employed for extending science to the laity, we will look at an important chapter of publishing history in Germany: the birth of German reference works. The birth of this new genre is a witness to the effectiveness of earlier efforts at creating a lay reading public. Lexicons of all kinds were compiled as a response to new educational needs. But when women were brought into the picture, and their supposed interests addressed, serious conflicts emerged. "Learned woman is a problem," claimed a sagacious satirist of the time, a problem of multiple dimensions. Everyone should be educated, everyone should have access to science, but, when women were incorporated into this universalist claim, when even science was offered to the ladies, the boundaries of their participation needed to be clearly defined. The occasion of the publication of the first lexicon for the ladies was used to reinforce social roles, to legitimize them with theological arguments, and not to effect changes in the current social relations. This chapter shows that some acquaintance with science had become an essential component of a lay person's outlook. Amaranthes' *Lexicon* is not about scientific matters, but by the late 1730's, a discussion of the limits of scholarship cannot avoid including them.

CHAPTER 3

The Birth of the Lexicons: Amaranthes' *Useful, Gallant, and* Curious *Ladies' Lexicon* (1715, 1739, 1773)

Fig. 6 Frontispiece Ladies' Lexicon, 1739
Source: Herzog August Bibliothek Wolfenbüttel

1. Introduction

In 1715, Amaranthes (Gottlieb Siegmund Corvinus), lawyer and poet from Leipzig, published his *Useful, Gallant, and Curious Ladies' Lexicon,*[1] the first German lexicon for literate women. This lexicon was of a piece with early Enlightenment efforts to end the exclusivity of scholarship typical of previous times and to extend education to broader circles (see Chapter 2). Amaranthes' *Ladies' Lexicon* promised women the necessary aids to make themselves at home in the "curious" and "gallant" world.

As is well known, encyclopedias had a long history behind them.[2] Since most scholarly discussions have centered on Diderot's and d'Alembert's French masterpiece, the *Encyclopédie*, historians have overlooked the significance of "indigenous" traditions. The neglect of encyclopedias as a topic of scholarly investigation is nowhere more evident than for the period from 1674 to 1750.[3] Regarding the German milieu, scholars have paid

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[1] *Nutzbares, galantes und curiöses Frauenzimmer=LEXICON* (Leipzig: Gleditsch, 1715, 1739, 1773), hereafter cited in the text as *Ladies' Lexicon*. All translations from the German are my own unless otherwise indicated.

[2] For a general treatment of encyclopedias, see Robert Collison, *Encyclopaedias: Their History throughout the Ages* (New York: Hafner Publishing Co., 1966).

[3] Frank A. Kafker, ed., *Notable Encyclopedias of the Seventeenth and Eighteenth Centuries: Nine Predecessors of the Encylopédie* (Oxford: The Voltaire Foundation, 1981), 7. Interestingly, John A. McCarthy points out the same neglect for the history of German prose literature between 1670 and 1750. See "The Gallant Novel and the German Enlightenment, 1670-1750," in Kors and Korshin, *Anticipations of the Enlightenment*, 185-217.

some attention to the development of encyclopedic works for the pre-1750 period.[4] Notably, however, Amaranthes' *Ladies' Lexicon* is missing from all these discussions. An exception is the work of Alwin Schultz, who, exploiting the wealth of information contained alphabetically in this work, provided an account of German women's everyday-lives at the beginning of the eighteenth century.[5] This chapter explores the circumstances of production and reception of this reference work as part of a more general trend in Leipzig during the first decades of the eighteenth century. Because the work is addressed to the ladies, I will emphasize the ways in which the editor and his critics approach the debates of women's learning, as well as the particular role they assign to science. This work was clearly not of scientific nature, and this makes it a particularly interesting avenue for assessing not only how writers presented science to lay people, but also how they perceived and addressed the dangers and social consequences of doing so. In keeping with contemporary trends, Amaranthes' *Ladies Lexicon* does not attempt to make the ladies true scholars. It argues that learned disciplines, including science, should be made

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[4] In their essay "The Deutsche Encyclopädie and Encyclopedism in Eighteenth-Century Germany," Willi Goetschel, Catriona MacLeod and Emery Snyder examine distinct features of German encyclopedism and variations upon the encyclopedic theme that resulted in hybrid genres such as the *Conversationslexicon*. See Clorinda Donato and Robert M. Maniquis, eds.) *The Encyclopédie and the Age of Revolution, 1789/1989, The French Revolution: A UCLA Bicentennial Program* (University of California, Los Angeles, 1981) and Ulrich Dierse, "Enzyklopädie: Zur Geschichte eines philosophischen und wissensschaftstheoretischen Begriffs," *Archiv für Begriffstgeschichte*, Supplementheft 2 (Bonn: Bouvier, 1977).

[5] Alwin Schultz, *Alltagsleben einer deutschen Frau zu Anfang des 18. Jahrhunderts* (Leipzig, 1890).

available to them. We will investigate why, to what extent, and for what purposes ladies should delve into such matters. We will find the answers to these questions from a careful reading of the prefaces of the first and second editions and from other related literary sources.

The preface to the first edition (1715) offers an account of the publishers' motives for entrusting Amaranthes with the composition of his *Ladies' Lexicon*. It also provides information regarding the readers Amaranthes had in mind. A journalistic quarrel followed the publication of the first edition. As a result, Amaranthes felt he needed to tell his readers why and to what extent he believed women should devote themselves to the learned sciences. The preface to the second edition (1739) shows that Amaranthes was well aware of previous discussions of these issues and illustrates the inflammatory nature of these discussions.

2. Amaranthes' *Ladies' Lexicon*, 1715, 1739

Amaranthes' *Ladies' Lexicon* was the product of both the commercial interests of the publishers and early Enlightenment efforts to help women fulfill their roles more successfully and with more insight. Authors now granted women access to scholarship, even to physics, but only to the extent that it would make them understanding wives to their husbands and intelligent mothers to their children.

When the first edition of Amaranthes' *Ladies' Lexicon* appeared on the market in 1715, changes in the world of learning as well as in the socio-political realm were already underway. From the numerous critiques launched against old-style scholarship, a new ideal of education had begun to crystallize. That Amaranthes would call his lexicon "useful," "gallant," and "curious," does not come as a surprise to us. The terms "curious," "gallant," and "useful" used in the *Ladies' Lexicon*'s title capture, as chapter 1 and 2 have argued, some key features of early Enlightenment culture.[6] Christian Thomasius had articulated some current trends in the social world as well as in the world of learning, including a thorough discussion of women's learning. With his emancipatory project Thomasius wanted to liberate philosophy from traditional theology and, at the same time, extend philosophy for the enlightenment of everyone, regardless of social standing and gender. Philosophy had to be for the world, not for the schools. Its goal was not to attain a precise knowledge of first principles, but the living acquisition of the necessary and useful. Although Thomasius and others who followed in his steps endorsed the extension of philosophy for the enlightenment of everyone, regardless of social standing and gender, women's right to attain an education and their ability to acquire learning continued to be a highly contested topic. This, as we have seen, is best summarized by G. W. Rabener in his definition of a learned woman: "Learned woman is a problem." Purged of the fancies of the pedants, true gallant learning would meet the needs of the day. Philosophy would become philosophy for the world and would result in a deep intellectual and ethical

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[6] For references, see Chapter 2, notes 14-15.

reform of society. But this world of learning was not open to "everyone," in a literal sense, as Thomasius claimed. To him, "everyone" meant that knowledge would be no longer the privilege of a small elite who were able to ensure the preservation of its privileges by keeping its wealth within the confines of its own sphere, distanced from the world. "Everyone" now was the growing group of intellectuals and professionals of the higher middle strata of society. As an instance of early Enlightenment efforts to extend education to broader audiences, Amaranthes' *Ladies' Lexicon* promised the ladies the necessary aids to make themselves at home in the "curious" and "gallant" world. But if true scholarship was still a male preserve, why extend it also to the ladies?

2.a. The Publishers and the "Signs of the Times"

One answer to these questions can be found in Amaranthes' comments in the preface to the first edition of his *Ladies' Lexicon* (1715). He noted:[7] The publishers have already served the male sex with their famous German and Latin lexicons. The distribution of such compendious and praiseworthy books has proven the usefulness of their enterprise for the general public. Now, this laudatory concern has been extended to the question of how to serve the female sex with their useful publishing house in order to offer them some advantage. With such reflections, they came to the idea of a *Ladies' Lexicon* and entrusted me with its preparation. Amaranthes referred here to publishing

house of the Gleditsch family. Johann Friedrich Gleditsch (1653-1716),[8] known at the time as the "king of the book-dealers," was one of the three main Leipzig book-dealers around 1700. The Gleditsch firm was the spiritual promoter of several encyclopedic works such as Johann Burchard Mencke's *Compendiöse Gelehrten-Lexicon*, continued and expanded significantly by Chr. G. Jöcher, J. Chr. Adelung and H. W. Totermund. The works that Gleditsch had produced "for the male sex," according to Amaranthes, were Johann Hübner's *Reales Staats=Zeitungs= und Conversations-Lexikon*[9] (1704, 31 editions, even into the nineteenth century) and his *Natur= und Kunst=Lexicon* (1712).[10] Hübner had studied in Leipzig from 1689 to 1691. Extolling the fecundity of Leipzig culture, he exclaimed in 1712:

During the last fifty or so years, there has been such a marked increase in the

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[7] I paraphrase.

[8] For biographical references, see "Letztes Ehren-Gedächtniß Herrn Johann Friedrich Gleditschens, Weyland Bürgers und weitberühmten Buchhändlers in Leipzig (Leipzig 1716). Also J. E. Volbeding in *Allgemeine Encyclopädie der Wissenschaften und Künste*; J. S. Ersch and J.S. Gruber, I, section A-G, part 69 (Leipzig 1859), 23-5; Kelchner in *Allgemeine Deutsche Biographie*, IX (1879): 222-23; and A. J. Brauer in *Neue Deutsche Biographie*, IV (Berlin 1964): 439-40.

[9] The first edition did not contain the term "Conversation." It was added to the fourth edition of 1709. Hübner did not write his preface until 1713 (cf. reprint, Bern, 1972). On the history of the *Konversationslexikons*, see Enrst Herbert Lehmann, *Geschichte des Konversationslexikon* (Leipzig, 1934).

[10] Peter Nasse, *Die Frauenzimmer-Bibliothek des hamburger "Patrioten" von 1724. Zur weiblichen Bildung in der Frühaufklärung* (diss. Münster , 1975), 226ff.

number of sciences that it would be necessary to double the number of university chairs for every discipline to be taught separately. Moreover, so much has been added to each science that the old natural philosophers, mathematicians, and historians, if they could rise again with all their knowledge, would only pass for poor beginners. Furthermore, the population of the empire of learning has increased so greatly that now, wherever one turns there are swarms of learned people and many lowly sciences which used to be left to mechanics are cultivated by literati. Finally, the present century is imbued with so much curiosity that everyone wants to know everything. Because these eager learners could not reach their goal so long as Latin had a monopoly in all learned matters, the Germans have followed the example of other nations and translated almost all the sciences into their mother tongue.[11]

If taken at face value, Hübner's remarks seem to suggest that Thomasius' exhortations had been heeded: "everyone" now would have some intellectual curiosity and strive for the acquisition of learning. And the Germans would have produced the necessary reading materials to satisfy this curiosity among lay people. Yet despite his optimism, even in the

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[11] These remarks appeared in the foreword to his medical-technological-scientific lexicon, *Curieuses und Reales Natur-Kunst-Berg-Gewerck- und Handlungs-Lexicon darinnen nicht nur die in der Philosophie, Physic, Medicin, Botanic, Chymie, Anatomie, Chirugie und Apothecker-Kunst, wie auch in der Mathematic, Astronomie, Mechanic, Bürgerlichen und Kriegs-Baukunst, Schiffahrten...*3d. ed. (Leipzig, 1717), iii-iv, cited in Hufbauer, *The Formation of the German Chemical Community,* 6.

most progressive towns relatively few of the inhabitants had a taste for reading.[12]

Hübner was known as an excellent pedagogue and became rector, first in Merseburg, then of a famous Hamburg *Gymnasium*, the Johanneum. He was the author of several successful school-texts, published from 1693 on. Although Hübner had only written the prefaces to the lexicons Amaranthes referred to, after their first few editions it became common to name the work after him. In a writing published in 1710, Hübner responded to several criticism that the *Zeitungs=Lexicon* had received, certified that he was not its author, and noted that its usefulness was sufficiently proven by its positive reception.[13] By the time the sixth edition was published, in 1713, Hübner commented on "the actual origin and true purpose of the book." It had already been well received by many thousands of lovers of the "political" sciences. The ideal of "gallant" person was often fused with that of the "political." According to *Zedler*, "gallant" referred more to private, personal happiness, while "political" referred to clever, worldly-wise, public conduct.[14]

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[12] See Rolf Engelsing, *Analphabetentum und Lektüre: Zur Sozialgeschichte des Lesens in Deutschland zwischen feudaler und industrieller Gesellschaft* (Stuttgart: Metzler, 1973).

[13] "Das so gennante Reale Staats=Zeitungs= und Conversations=Lexicon, welches Herr Johann Friedrich Gleditsch in Leipzig An. 1704 zum ersten; An 1706 zum andern; An 1708 zum dritten; und An. 1709 zum vierdten mahle aufgeleget hat; ist nicht mein WErck, welches ich in allen vier Vorreden deutlich genug bezeuget habe. Das Buch zwar an sich brauchet meiner Defension nicht: sondern wie es sich durch seine Nutzbarkeit schon selber recommendiret: also ist es auch bishero bey allen gescheuten Leuten beliebt und angenehm gewesen." Johann Hübner, *Abgenöthige Vertheidigung seiner heruasgegebenen Schrifften, Wieder die unbillige Censur....* (Leipzig: Gleditsch, 1710), 6-7.

[14] See *Zedler*, article "politicus," vol. 28, cols. 1528ff.

Hübner's lexicons were not addressed to specialist scholars but to a lay audience interested in general education. The first was a *Zeitungs-Lexicon* because it was aimed at the curious reader who, with the help of this work, would be able to read the so-called *Zeitungen* and *Nouvelles* with understanding. The reader would not find in it "a professorial erudition" (*Cathedralische Erudition)*, but only "all sorts of pieces of gallant learning indispensable for daily political dealings with intelligent people." Finally, the attribute "real" meant that terms were not explained "literally or according to their grammar" (*verbaliter or grammatice)*, but in terms of reality (*realiter*). This meant that one should not expect to find in the work "school terms or phrases," nor, since it was a "Staats-Lexicon," "scholastic distinctions or other pedantries" (*Distinctiones Scholasticas oder andere Pedanterien*). After all it was not a "historical" work but a "Zeitungs-" Lexicon, and above all, a "Conversations-" Lexicon. Thus, it should not be confused with a work that aimed at providing a complete presentation of whole disciplines and sciences or "academic pansophic systems." The main point was that the work promised to provide readers with all they needed to solve the difficulties they might find when reading the new periodicals and conducting daily conversation. An additional benefit that this work would provide its users is that its practical format would allow travelers to carry it with them for consultation purposes or for writing in it.[15]

In absolute figures, the reading public was still small and encompassed but a

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[15] "Vorbericht," 3, reprint 1972. Nasse, *Frauenzimmer-Bibliothek* (n. 10 above) notes, however, regarding its size, that it would not have been easy to carry in a handbag.

minority of the middle class.[16] However, the audience began to change in terms both of number and of social makeup. During the early decades of the eighteenth century, the literary world became more and more a literary marketplace: increased demand resulted in increased production. New magazines and learned periodicals made knowledge available to curious, learned and lay publics. Book-dealers and publishers were quick in reading the signs of the times and encouraged the production of literature for scholars and merchants, women --and even peasants. New types of books emerged that replaced the old Latin treatises and compendia. Lexicons of all kinds flooded the market, so that by mid-century Johann Andreas Fabricius, classical philologist and "father" of the German physico-theologians, could claim: "We have received so many specialized and general lexicons, that one could fill a whole library with them, and this century could be called the Lexical- and Journal century."[17] In the preface to his literary lexicon, Johann Christoph Gottsched, a leading figure in the literary world of the early Enlightenment, referring to the readers and users of these lexicons, and to the purpose of their teachings, wrote:

For what harm does it do if, besides the true scholars, who make of the sciences a

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[16] See Jochen Greven, "Grundzüge einer Sozialgeschichte des Lesers und der Lesekultur," in Alfred C. Baumgärtner, ed., *Lesen-ein Handbuch* (Hamburg: Verlag für Buchmarkt-Forschung, 1973), 126.

[17] Johann Andreas, *Abriß einer allgemeinen Historie der Gelehrsamkeit*, 3 vols. (Leipzig, 1752; reprint Hildesheim, New York: Georg Olms Verlag, 1978), vol. 1, 152-153.

proper tool, a good number of the so-called "uneducated" are not wholly ignorant? Isn't it also always pleasanter in common life to deal with people who know something than with those who know nothing at all? The handful of true and thorough scholars who inhabit our universities do not make the world competent and the whole nation clever and well-mannered, but for the most part the uneducated who nevertheless know something about the fine arts and sciences; this is necessary for their way of life and for a proper and lively social intercourse.[18]

In the preface to his *Philosophisches Lexicon* (1726) Johann Georg Walch reinforced these views: "One does not write such books in order to learn a certain science from them, but only to look things up, and thus to provide a certain comfort in the process of learning."[19] As a result of these processes, some *uneducated* people of the seventeenth century would be replaced by the *educated* (*gebildete*) of the mid-eighteenth century. Since lexicons of this kind had not previously existed, their value for the improvement of the educational level of a broader reading public should be emphasized. If by 1760 Gottsched could also claim that "one could procure oneself a whole library of German

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[18] *Handlexikon oder Kurzgefaßtes Wörterbuch der schönen Wissenschaften und freyen Künste* (Leipzig, 1760), col. 6f., cited in Raabe, "Gelehrte Nachschlagewerke," 98.

[19] J. G. Walch, *Philosophisches Lexicon* (Jena, 1726), 5.

dictionaries,"[20] Gleditsch and his successors played no small role in making this possible. Their contemporaries already recognized their merits. A reviewer wrote that "one should thank them for the invention of all sorts of lexicons."[21] A bibliography of lexicons listing 220 titles already appeared in the eighteenth century.[22] That this type of work would assuage the curiosity of many was beyond doubt on the part of the publishers. That the ladies would inevitably witness the proliferation of written materials and listen to the informed conversations of the male members of their circles was also obvious to them. Given the success of the other works, Amaranthes' *Ladies' Lexicon* could not be a total commercial failure. And it was not. Although the number of copies sold probably did not exceed a few thousand,[23] many *Moral Weeklies* adopted it as "required reading" in their list of literature recommended for women.[24] Whether a typical woman of the upper middle class could have read and appreciated the works these reading lists recommended

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[20] Preface to his *Handlexicon*, 1.

[21] Neue Biliothec Oder Nachricht und Urtheile von neuen *Büchern* (Frankfurt/Leipzig, 1715), 42, 134.

[22] [Heinrich Christian Schmid], "Verzeichnis der in deutscher Sprache verfaßten Real-Wörterbücher über Wissenschaften und Künste," in *Journal von und für Deutschland* 8 (1791): 1049-61.

[23] Precise information is not available.

[24] For example, the *Discourse der Mahlern* (1723), the *Patriot* (1724, 8, and book edition 1728), the *Vernüftige Tadlerinnen* (Halle 1725, Hamburg 1738) and others. See Wolfgang Martens, "Leserezepte fürs Frauenzimmer. Die Frauenzimmer=biliotheken der deutschen Moralischen Wochenschriften," in *Archiv für Geschichte des Buchwesens* XV (1975): 1143-1200; and Nasse, *Frauenzimmer-Bibliothek* (n. 10 above).

is, however, problematic. The list placed high expectations on its readers and, even from the perspective of the late eighteenth century, the books were expensive. It was unlikely that most families would spend money on books to help educate their members. Particularly among the less educated "bourgeoisie," the possession of books was probably limited to a few inherited volumes of spiritual or edifying literature. Probably for want of books suitable for the female reader the editors of the weeklies deemed it necessary initially to provide women with a demanding and heavy diet although, as a matter of principle, "serious" fields of knowledge such as theology, jurisprudence, and medicine were withheld from them.

2. b. The Intended Audience

In the preface and the body of the second edition of Amaranthes' *Ladies' Lexicon* (1739) we can find another answer to the question "Why extend learning to the ladies?" Amaranthes noted in the preface that he had written this book hoping that three types of women would find in it something useful and according to their taste: the homely (*haushältige*) and solicitous, the curious and gallant, and finally, the learned. Amaranthes considered his own view on women an improvement over the attitudes toward women in other countries:

"According to their bizarre opinion, the ancient Jews must have held

women to be something disgraceful, because they thank God every day for not having made them women. And among the Turks, women are so despised that they cannot even attend the religious services at the mosques, but must lie before the doors and pray. And the foolish Persians call women *Haram*, which in their language means as much as accursed. And the wild Scythians thought it even filthy to say the name 'woman.'"[25]

In Germany, instead, Amaranthes implied, women were honorable creatures. They fully participated in religious services, and their name was not associated with uncleanness.Thus, Amaranthes suggested that homely and solicitous women would find in his *Ladies' Lexicon* all they needed to manage an efficient household: baking recipes never before published, instructions for preparing many kinds of useful and new meals, all arranged in alphabetical order, as well as everything they needed for their kitchen and laundry, workroom and dining room, as well as for their adornment, clothing, and fashion, also for the education of their children, and the management of their servants.

Curious and gallant ladies could also use this work with considerable enjoyment, utility and entertainment, since they would find in it women's spiritual and worldly orders, offices, titles, honorary posts, professions and trades, privileges and charities, wedding and funeral solemnities. Amaranthes stressed the fact that his work would also provide women with information about their gallantries, foreign fashions, accounts of

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[25] See article "Frau oder Weib," col. 497.

female artists, curious and noteworthy ladies, makeup, amusements, games and entertainments, superstitions, special expressions and sayings, silk, cotton and other things for their cleaning and clothing. And because, as everybody knew, the female sex showed no little love and inclination to German poetry, Amaranthes considered it useful and necessary to include the names and deeds of the goddesses and other mythological women to whom poets referred in their poems, to make their reading easier. At the same time, although this was a "Real"-Lexicon, which meant that it embodied everything that belonged to the female sex, Amaranthes made an effort not to include articles on things that almost everybody knew such as descriptions of basic household items. And since foreign women too were curious to know German terms and expressions, it would provide them as well with something curious and useful.

Finally, Amaranthes hoped that the learned ladies would not take this book into their wise hands gratuitously and without enjoyment. They would find in it more learned women than they could possibly find at any university of the world. By reading this, they would realize that they had no need to envy ancient Mount Helicon, with its nine muses. In Greek mythology, Mount Helicon was the center of the cult of a group of sister goddesses, of which very little is known. Probably they were originally the patron goddesses of poets, although later their range was extended to include all liberal arts and sciences. As early as Homer's *Odyssey* there were nine muses. But Amaranthes claims that he could list more than nine hundred who stood out for their remarkable learning. Other writers such as Caspar Eberti and Christian Franz Paullini had pointed out early in

the century that the arguments about women's alleged inferior intellectuality could be supported neither from a rational-scientific nor from a theological point of view.[26] In Amaranthes' view, the strength of women's reason and "their quite masculine spirit" fully challenged the disdainful title "*female sex*," as if it were only a feeble tool.

2.c. "Learned Woman is a Problem"

Amaranthes' *Ladies' Lexicon* did not go uncriticized. An anonymous reviewer of a monthly periodical from Halle not only derided "gallant Leipzig," where, he said, it was not surprising that it would have produced a *Ladies' Lexicon*, but also the author, whom apparently all Leipzig "praises as a living *Ladies' Lexicon*."[27] In a later issue of this periodical, (1715, 469) the editor even affirmed that Amaranthes himself would have boasted of being such an entity. The reviewer mentioned that even female voices complained of being offended for having been considered so stupid as to need such a

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[26] Early in the century two works listed the names and accomplishments of hundreds of learned women, including Germans. These were Johann Caspar Eberti*Eröffnetes Cabinet deß Gelehrten Frauen-Zimmers / Darinnen die Berühmtesten dieses Geschlechtes umbständlich vorgestelt werden* (Frankfurt, 1706) and Christian Franz Paullini, *Das Hoch- und Wohl-gelahrte Teutsche Frauenzimmer: Nochmals mit mercklichen Zusatz vorgestellt* (Frankfurt, 1705).

[27] *Neue Bibliothec oder Nachricht und Urtheile von neuen Büchern* (Frankfurt/Leipzig, 1715), 42, 140.

Lexicon.[28] The work contained many things that even a five-year old would know, had she only learned to speak German.[29] Moreover, the reviewers pointed out that Amaranthes omitted many things that could have been helpful.[30] Soon after the first review, a Leipzig scholar published a positive appraisal of Amaranthes' **lexicon** that tried to undermine the arguments of the Halle critic, stressing that "sound reason forbids us to consider this work unnecessary."[31] (As we know, Amaranthes, the publishers, and the editors of the moral weeklies also were of a different opinion). The *Ladies' Lexicon* would bring the ladies enjoyment and provide them with useful and entertaining matters. What the Halle-Leipzig journalistic quarrel shows was that the issue of women's learning remained controversial. Furthermore, to the reviewers it was clear that the quarrel was not just about intellectual matters: it had obvious social dimensions. What knowledge, how much knowledge, should one grant the ladies? This was not an easy question to answer, and Amaranthes knew it. He devoted the preface to the second edition of his *Ladies' Lexicon* (1739) to answering these questions.

In this preface Amaranthes showed that he was well aware of previous discussions of women's learning and of the contribution his work had represented: "To be sure, if I

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[28] *Ibid.*, 46, 470.

[29] *Ibid.*, and 1715, 42, 141.

[30] *Ibid.* 42, ff. The term used is "Machwerk:" concoction/lousy book.

[31] *Deutsche Acta Eruditorum* 1715, 35, 891-98, 893. This moved the Halle party to respond: *Neue Bibliothec*, 1715, 46, 469-71.

were to follow the rough souls who do not want to admit that it should be permitted for a lady to settle down with scholarly disciplines, we could have spared ourselves the effort of printing these pages." Recently, someone had attempted to revive this old opinion, affirming that "for a man who makes learning his profession, a housewifely woman is much more necessary than a learned ornament to his house. Others have fiercely opposed this opinion, but we cannot examine here the *pros* and *cons* of the arguments adduced. Some *preliminary* thoughts about the question if, to what extent, and why women should devote themselves to the learned sciences will serve for now as a brief preface."

Amaranthes' arguments are as follows:[32]

1. If learning is a proficiency in getting to know thoroughly and penetratingly things that will lead to our true happiness and in teaching them afterwards to others in orderly fashion, then by no means can we wholly exclude such pleasing creatures from knowledge of this kind.

2. If women are not lifeless machines, or milliners' blocks, shaped and decked out according to the rules of the art, but reasonable thinking beings, whom the good creator has often well supplied with more judgment, inventive genius, and persistence than men, then they can and must also acquire a thorough and penetrating knowledge of necessary and useful truths.

3. These pages contain whole crowds of women who possess such intellectual gifts in high degree, and our daily experience provides us now and then with similar examples.

4. Even the nature and the purpose for which human beings live in this world obliges the female sex to think of the sciences in order to improve their minds and to obtain knowledge of divine and human truths and excel in the practice of good.

5. They have an immortal soul whose eternal well-being they have to care for through the acquisition and practice of Christian faith and obligations.

6. Their intelligence and will are often subject to more weakness and incompleteness than is the case with men. How to use their intelligence properly and place a rein on their very strong inclinations, all these are things that are indispensable for them to know.

7. Without the help of these sciences they cannot rightly become what Providence essentially destined them to be: intelligent and loving wives, wise mothers, prudent mistresses in their house, and living examples of virtue and composure to their female neighbors and friends. They will reach this goal even better, if, in

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[32] I quote here the preface, n.p.

accordance with their aims, they understand a little about natural law and about the general rules of civil law, but even more if they possess most of the moral code and the rules of prudence. The first will make them just, the second, decorous, and the last useful creatures.

If they have time and opportunity, they can make this very serious science clearer and more tangible through geography and history, especially those of their homeland, above all if they are asked to present their thoughts in their native language both orally and in written form, according to the rules of eloquence. I also recommend physics (*Natur-Lehre*) as a science that can prove useful for several purposes in their household, but the experiments should not be carried too far.

The conditions of their station and circumstances will set the standard and the rules for the acquisition of these sciences, and to this extent, I believe that women should be granted access to the sciences.

However, those female persons who have gone into too much depth in mathematics, scientific philosophy, political science, criticism, philology, poetry, languages, the higher theology, law and medicine will not be of much use to anyone. If one such creature should appear in the learned world, let it be admired

as a foreign plant, but by no means presented for imitation. According to what I have said above, the best sciences are those that will help a woman understand how to better take care of her kitchen, her storeroom and other household arrangements, and to regularly foster her husband's enjoyment. I would add some other things, but the boundaries of a preface force me to stop here.

He was right. He had said enough. In keeping with the gallant ideal of education, scholarship had to lead to a good life. Even history, as Eberti and Paullini had shown, proved that many women were capable of learning. But women's good life was inextricably bound to that of their husbands. Again, Amaranthes reinforced his point of view with theological considerations: God has made women reasonable, but he too has made them weaker and bound to their passions. Thus, let them acquire the necessary knowledge that would not prevent them from obtaining salvation. This knowledge will not subvert God's social order: let them be better wives and always devote themselves to their husbands' pleasure!

3. Conclusion

Contemporaries had observed that the light of science had spread through Germany and other countries from Leipzig. But the light of science was rooted in social practices that enabled and constrained the expansion of "reason." The social and

intellectual phenomena that nurtured the German Enlightenment were inextricably intertwined. Amaranthes' *Ladies' Lexicon* was embedded in the social tensions generated by the displacements that the new forms of knowledge were bringing about in the scholarly world. Theologians were increasingly deprived of their central position in the world of learning. Literature began to untangle its commitment to theological concern and authority. Amaranthes' *Ladies' Lexicon* was composed to fulfill psychological and social needs, to articulate and implement values and ways of looking at and ordering the world. It thus contributed to the promotion of broader Enlightenment interests in German culture. As part of the social fabric we have come to call the "Enlightenment," Amaranthes' *Ladies' Lexicon* was constrained by social tensions. But it also contributed to delimiting the participation of women in the world of learning in general and of science in particular.

Amaranthes' *Ladies' Lexicon* was clearly not addressed to women of the lower social strata. The work as a whole, as is clear from the frontispiece, addressed women from the higher "bourgeois" circles, perhaps even those of the nobility. Housekeeping was still highly valued (at least at the time of the publication of the first two editions). "Domesticity" was described as the virtue of keeping oneself in the home and taking care of the household.[33] Since a woman had no access to institutions of higher learning, and the goal was not to make of her a trained professional but to provide her with general learning, the only option left for her was to become an autodidact (*Selbst-Lehrerin*).

Referring to Maria de Gournay, a French Renaissance learned woman,[34] Amaranthes noted that "Rolandus Maresius called her an autodidact, because she had learned most things by herself."[35] Amaranthes' intention was by no means to break with traditional role patterns. On the contrary, he stressed the social value of his work as a contribution to societal "good." Amaranthes' *Ladies' Lexicon* was typical of early Enlightenment efforts to make learning available to wider circles. By looking at "the world behind the books," we gain a better understanding of the dialectic of commercialization and the expansion of "enlightened" reason. As Amaranthes indicated, the publication of his *Ladies Lexicon* was the initiative of a sagacious publisher whose business had been successful in similar ventures for the male public. Producing an appropriate work for a female audience could not be a commercial failure and, as we have seen, it was not.

Although Amaranthes and the authors of the moral weeklies claimed that scholarship was now available even to the ladies, the degree and extent of their participation was set within clear boundaries. Amaranthes' arguments regarding women's learning are in line with other current discussions of these issues. Women should not become true scholars. Scholarship and intelligence are very distinct qualities. The preface to the third edition (1773) clearly reinforces this distinction: "We say: our purpose is by

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[33] *Ladies' Lexicon*, col. 722.

[34] See Erica Harth, *Cartesian Women. Versions and Subversions of Rational Discolurse in the Old Regime* (Ithaca and London: Cornell University Press, 1992), 19-20, 28, 38.

[35] *Ladies' Lexicon*, Col. 921.

no means to make them learned ladies! The world would not want to dispense with homely and reasonable women! A really good housekeeper is an excellent wife. A learned lady, instead, who lacks understanding of domestic economy and is not diligent in performing it could be useless and even noxious. Let the proper distinctions be made between an intelligent and a learned lady!....Without intelligence, without prudence, my ladies, you couldn't even be what we [Providence (1739)] want you to be: wise housekeepers, sensitive mothers, and pleasant companions."[36] Women should not become true scholars but, again, adequately informed outsiders to learned culture. If the publication of the first edition of Amaranthes' *Ladies Lexicon* suggests that this was the desired outcome of the use of such work, Amaranthes makes sure that he addresses these issues in the preface to the second edition. Now, in 1739, he argues that women should be what Providence wants them to be. Theological constraints were still deeply felt and the role of women is again legitimized as God's order.

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[36] Preface to the third edition, 1773, no p. n.

The second part of this study presents three of the means employed in making science available to new larger publics. Didactic poets and dialogue writers conceived their works as effective media for fulfilling new Enlightenment tasks. Their presentation of science had various consequences for the making of a certain image of science, of the identity of the popularizers themselves, and of the audience, its needs, and the ways to satisfy them. The second part of this study pays special attention to the mechanisms of control implemented in these writings for demarcating the participation of various groups in the world of science. Public displays of science and the particular topic of electricity raise further questions about the credibility of science for both learned and uneducated people. Electricity challenges the boundaries established in literary culture between learned and uneducated, male and female, serious and trivial. All this leads us to suggest, in the conclusion, possible answers to the following questions: What did popularization mean in this context and at this time? Why make science available to the public? How effective were the literary mechanisms of control embodied in our texts? What do the public displays of science teach us about the limits of scholarly control of science? And finally, what was the role of science in the public sphere in the context of the early German Enlightenment?

PART II: THE PUBLIC CULTURE OF SCIENCE

CHAPTER 4

DIDACTIC POETRY

"That poetry is the best suited to spread
wisdom among raw human beings"[1]
Johann Christoph Gottsched

Oh Newton! let my song, inspired by your maxims
instruct and entertain the German mind! [2]
Abraham Gotthelf Kästner

1. Introduction

During the early decades of the eighteenth century, science was not confined to elite groups of natural philosophers. It also stirred the imagination of poets. German poets embraced didactic poetry as an especially apt medium of effectively fulfilling new Enlightenment tasks. Broader sections of the growing lay public could now be instructed in fields of knowledge previously withheld from them. Chapter 2 has described the profound changes in the social position of writers and publishers during the first decades of the eighteenth century. The birth of didactic poetry contributes to and mirrors the shift from courtly-based

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[1] "Daß die Poesie am geschicktesten sey, die Weisheit unter den rohen Menschen fortzupflanzen." Johann Christoph Gottsched, in *Zwo Schriften, welche in der deutschen Gesellschaft zu Leipzig, auf das Jahr 1733 die Preise der Poesie und der Beredenheit erhalten haben,* reprinted in Joachim Birked, ed., *Johann Christoph Gottsched Ausgewählte Werke.* (Berlin: Walter de Gruyter & Co., 1968, vol. 1, 103-116).

[2] "O Newton! möchte doch, erfüllt von deinen Sätzen,
Mein Lied der Deutschen Geist belehren und ergötzen."

Abraham Gotthelf Kästner (1719-1800), "Philosophisches Gedicht von Kometen,"

art to the independent writer. These shifts rested not only on individuals' great powers as writers but on a number of broader social and intellectual changes as well, in which science played a crucial part. Didactic poetry was one of the various forces that converged in the excitement and satisfaction of a public taste for and curiosity about scientific matters. The production and consumption of this literature constitutes one significant dimension of the complex dynamics that contributed to the promotion of Enlightenment interests in German culture. How and why did didactic poets and their readers communicate with this new poetic genre? Why did science, --and which science?-- become central to the Enlightenment gospel as preached by didactic poets? To do justice to the full range of factors which attracted writers and readers to didactic poetry it is necessary to develop a less prescriptive and more flexible approach than that adopted by historians of literature and science concerned with individual and exceptional texts. Rather than limiting my analysis to the discussion of poetic conventions for the composition of such pieces, my emphasis will be on the function this poetry is envisaged to fulfill. This is in keeping with conceptions both of language and of literary art that were current at the time. Liberated from its mediocrity and corruption, Gottsched argued that poetry should be restored to its original function: as a partner with the same rights as philosophy and the sciences, poetry should take over the important task of transmitting and spreading meaningful emancipating truths. Newton and the glories of science are central to this Enlightenment gospel as proclaimed by didactic poets. The Newtonian lesson for the uneducated is not just a lesson about who Newton is,

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in *Gesammelte poetische und schöngeistige Werke*. (Berlin, 1841, part 2, 69-76, 71).

but also about the prestige and authority of science, its legitimate practitioners, and about who the pupils or readers are or should be.

During the early decades of the eighteenth century, Newton became a symbol of the promises and success of science in the European Republic of Letters. Although most aspects of natural philosophy can be traced in didactic poetry, my focus here will be on Newton, his accomplishments, and the significance of his contributions to the scientific enterprise more broadly. A series of *éloges* and hymnic poems spread his fame beyond the small number of people who could understand his works and beyond national and disciplinary boundaries. Natural science questions were inextricably connected with metaphysical, religious, and philosophical problems. The order described rationally by the scientist was grasped imaginatively by the poet.[3] The image of the universe as a divinely created and sustained system was a poetic commonplace by the early eighteenth century. Philosophers and poets gave Newton credit for discovering the system in all its exciting complexity. If Newton's conception of the universe became, within a generation, a part of the outlook of educated circles, it was not because they had read the *Principia*. A whole

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[3] See Marjorie Hope Nicolson, *Newton Demands the Muse. Newton's Opticks and the Eighteenth Century Poets* (Princeton: Princeton University Press, 1946) for British literature. James R. Naiden discusses Latin poems on Newton, "Newton Demand the Latin Muse," *Symposium* VI (1952): 111-122; and Ruth T. Murdock, French poems, "Newton and the French Muse," *Journal of the History of Ideas* 19 (1958): 323-334. For other important studies of the impact of science on poetry, see M. H. Abrams, M. H, *The Mirror and the Lamp: Romantic Theory and the Critical Tradition* (London / New York: Oxford University Press, 1953), chapter 11 and William Powell Jones, *The Rhetoric of Science: A Study of Scientific Ideas and Imagery in Eighteenth-Century English Poetry* (London: Paul, 1966). See also Julia L. Epstein and Mark L. Greenberg, "Decomposing Newton's Rainbow," *Journal of the History of Ideas* 45 (1984): 115-140.

choir of different voices was singing Newton's glory. From 1720 on, German didactic poets joined their European peers in the praise of Newton, often embedding their poems in physico-theological rhetoric. While the authors glorified the new science and deified Newton, their poems also reveal them as uneasy outsiders insinuating their way into a world they increasingly perceived as foreign. The ascendancy of science meant the concomitant diminution of their authority. Didactic poetry shows anxiety about the adequacy of poetic language and about the place of poetry in culture. Anxiety about the dramatically increasing social recognition of science, reason, and, by association, prose discourse, accounts, in part, for a poetry which is declared to be didactic but which also appropriates and transforms scientific discourse. Science does not just provide "sources" to literature that can be strip-mined at will. Rather, it emerges as having a cultural and social history that needs to be told. In section 2, I present samples of German poetry that appropriate Newton in a variety of ways. In section 3, I outline the main features of the genre as they were discussed by contemporaries and I suggest guidelines for interpreting the meaning and functions of the poetry discussed in the preceding section. With this discussion I articulate the peculiar function didactic poetry plays in the early German Enlightenment and the role of science in this context.

2. Newton Demands the German Muse

Didactic poetry offers a complete account of who Newton is and what he has accomplished. It also provides a comprehensive account of who the scientist is, what he

does, where his authority is grounded, and what the scientific enterprise in more general terms looks like. In what follows, I have chosen some samples that best exemplify the main answers given to these questions in the early eighteenth century and illustrate the nature of the didactic genre.

In his poem "Philosophic poem on comets" (*Philosophisches Gedicht von den Kometen*)" 1744, Abraham Gotthelf Kästner celebrates Newton as the muse of didactic poetry and offers an account of his merits:

> You, who accomplished infinitely more than other humans,
> penetrated with daring gaze into nature's inmost parts.
> Oh Newton! let my song, inspired by your maxims
> instruct and entertain the German mind!
> Indeed, not filled with formulae, nor sharp in demonstrations
> but yet as thoroughly as poetry allows[4]

In "Invitation to Mr. Germerhausen," (*Einladung an Hr. Germershausen*) 1747, Samuel Gotthold Lange (1711-1781) reminds his old friend Germershausen of their long standing

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[4] Du, der unendlich mehr, als Menschen sonst gelang,
Ins Innre der Natur mit kühnem Blicke drang,
O Newton! möchte doch, erfüllt von deinen Sätzen,
Mein Lied den Deutschen Geist belehren und ergötzen.
Zwar nicht von Rechnung voll, nicht in Beweisen scharff,

friendship and recounts how the Goddess Minerva introduced him to science:

> She [Minerva] introduced you to the great Newton,
>
> and showed you naked nature
>
> and number, weight and measure, with which the creator
>
> endowed the world[5]

Newton is cited as the pinnacle of human scientific achievement. The reference to bare nature endowed with number, weight and measure is a description of the new scientific attitude towards nature which converts it into measurable quantities.

In "The spirit of religion" (1743), Johann Daniel Overbeck describes the sorry state of the Christian religion before Luther, and compares Luther's reformation of religion with the reformation Newton brought into science:

> Just as Newton's clear spirit,
>
> uncovered far more clearly
>
> world, body, and nature,
>
> than they, who followed the tracks
>
> of learned poetry; before his coming

---

5 Doch gründlich, wie man es in Versen werden darf. (71)
Sie lehrte Dich den grossen Neuton kennen,
Und zeigte Dir die nackende Natur,
Und Zahl, Gewicht und Maas, damit der Schöpfer
den Weltbau versehn (112)

undertook to wonder through this wide field;

just as he carefully put aside

many a prejudice and hasty delusion;

forgetting school learning and shrewd advice,

sought all himself,

measured all himself,

until he shed light everywhere on the darkness

and thus set the foundation of truth properly in place,

so Luther there....[6]

Newton, relying on his own experimentation and measurements, overthrew the falsehoods of the past! He marked a new beginning! Swiss polymath Albrecht von Haller (1708-1777) calls him "the New Moses" who has given us the tablets on which God's eternal laws are written:

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6 Wie Newton's heller Geist Welt, Körper und Natur
Weit klärer aufgedeckt, als die, die auf der Spur
Gelehrter Dichtungen, eh er dazu gekommen,
Sich durch diess weite Feld zu wandern vorgenommen;
Wie er manch Vorurtheil und übereilten Wahn
Und Schlüsse sonder Kraft behutsam abgethan,
Der Schulgelehrsamkeit aud klugem Rat vergessen,
Selbst allem nachgeforscht, selbst alles ausgemessen,
Bis er es überall im Dunkeln Licht gemacht,
Und so der Wahrheit Grund recht in den Stand gebracht:
So macht es Luther dort...

A Newton exceeds the goal of all created spirits,

he finds nature at work, and seems to be master of the cosmos;

he weighs the inner force that stirs in bodies

making some fall down and others move in a circle,

and breaks open the tablets of the eternal laws

made once by God, so that he would never violate them.[7]

Johann Jakob Dusch (1725-1787) explicitly calls Newton "priest of nature." Urania, the muse of astronomy, had always taught men the mysteries of the heavens but only in recent times has she revealed through Newton truths unknown to the ancients:

But you entrusted to recent times your secrets

which they [the ancients] do not grasp

and Newton, your darling, became the Priest of Nature.[8]

Johann Daniel Overbeck, "The spirit of religion" (1743)

7 Ein Newton übersteigt das Ziel erschaffner Geister,
Find die Natur im Werk, und scheint des Weltbaus Meister;
Er wiegt die inn're Kraft die sich in Körpern regt,
Den einen sinken macht, und den im Kreis bewegt,
Und schlägt die Tafeln auf der ewigen Gesetze,
Die Gott einmal gemacht, dass er sie nie verletze

Gedanken über Vernunft, Aberglauben und Unglauben, 1729, reprinted in Albrecht von Haller, Versuch Schweizerischer Gedichte (Bern : Beat Ludwig Walthard, Sammlung der Besten Deutschen Schriftsteller, 30 vols., vol. 2, Haller's Gedichte, 1772, 64).

8 Aber du hast späteren Zeiten die Geheimnisse vertraut,
die jene nicht begreifen, und Newton, dein Liebling,
wurde der Priester der Natur

Daniel Wilhelm Triller (1695-1782) cites Newton as the mortal who came closest to the mysteries of nature. He pictures the spirit of the dead scientist in his new environment where he sees fully what can only be surmised in life: he marvels when he realizes that Newton dreamt true dreams! His theories regarding the planets and comets, color and light, are fully revealed as accurate.

German poets praise Newton as the mortal who came closest to the mysteries of nature, the great synthesizer of the new system of the heavens, the muse of didactic poetry, the new Moses, the priest of nature. Newton's contributions are not only representative of "man's" knowledge of heavens, but represent the pinnacle of knowledge.

Albrecht von Haller, in his "Thoughts on reason, superstition and atheism" (*Gedanken über Vernunft, Aberglauben und Unglauben*) 1729, lists some of the extraordinary achievements of modern science. With his reason, man seems to have achieved the impossible. Nature has revealed her mysteries to humans, the measurers, through measurement and mathematics:

> What nature used to hide, man's wit can now uncover,
>
> He measures the wide sea of infinitely vast distances;
>
> what was formerly unknown and unmeasured,
>
> is now measured and made evident through a page of numbers.[9]

Der Jenner, 145.

[9] Was die Natur verdeckt, kan Menschen Witz entblössen,

Haller stresses that Newton is not only the model scientist, but also the model pious scientist. He cites Newton's achievements as the highest attainment of human science. His major accomplishment is the new mathematical method with which the curved planetary orbits can be calculated, color theory, the theory of gravitational force which explains diverse phenomena like planetary orbits and tides. Yet all this is only the outer shell of nature, since "No created spirit penetrates Natures' innermost parts."[10] Newton was fully aware of this limitation of scientific knowledge. Although there is clear praise of the achievements of science, and Newton is the outstanding example of what man [sic] can accomplish, there are also warnings against transcending the limits of reason and science.

In the preface to the first volume of his *Physical Entertainments (Physikalische Belustigungen)*, Christlob Mylius (1722-1754) praises his countrymen for their interest in natural sciences, which he says has been growing rapidly. Abraham Gotthelf Kästner (1719-1800), in his preface to the third volume of the same periodical, two years later, maintains the same. He attributes the growth of popular interest in science to the increased use of German in scientific writing. Whereas other disciplines are cultivated by a few, natural science is useful and entertaining to all and so should be open to all. However, the professional scientist should, Kästner cautions, learn Latin and other foreign languages in

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Er misst das Weite Meer unendlich grosser Grössen,
Was vormals unbekannt und unermessen war,
Wird durch ein Ziffern-Blatt umschränkt und offenbar (64)

order not to have to rely on translations. Mylius' journal contains a poetic "Intermezzi:" a fable in verse at the very beginning entitled "The silkworm and the spider. A fable" (*Der Seidenwurm und die Spinne. Eine Fabel*). The silkworm taunts the spider for its useless activity. Its art is wasted compared to that of the silkworm who provides comfort and pleasure to man and thus is cared for by him. The spider, however, is not dismayed and replies that its art demonstrates the existence of a wise creator. Though the silkworm's function is of no use to man now, will it be so one hundred years hence? The moral:

> Seek and investigate with the same power
> the Creator's greatest and his smallest works,
> You wise sons of nature!
> Part of it is useful to your times.
> Posterity will seize the rest,
> And everything displays the Creator's trace![11]

The main purpose of the journal is "the useful" (*das Nützliche*). At the same time, as in the case of the fable, he justifies contemplations of nature even such as do not contribute anything of immediate utility, for they may do so in the future.

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10 "Ins innre der Natur dringt kein erschaffner Geist..." Haller, *Gedanken*, 196.

11 Sucht und erforscht mit gleicher Stärke
Des Schöpfers grösst' und kleinste Werke,
Ihr weisen Söhne der Natur!
Ein Theil davon nützt euren Zeiten,
Die Nachwelt wird den Rest erbeuten,
Und jedes zeigt des Schöpfers Spur.

Friedrich von Hagedorn published his poems "*Versuch einiger Gedichte" (Attempt at some poems)* in 1729. He was one of the beloved poets of the 1730's and 1740's. He had no scientific training and is known only for his literary work. Besides praising Newton, he expresses his faith that astronomers have thoroughly investigated the structure of the cosmos and that what they have discovered an amateur scientist can verify with his telescope. Following the best scientific style, Hagedorn provides in his footnotes the sources that reassure the reader of the truth of his statements about science.

In his poem "The scholar" (*Der Gelehrte*) 1740, Hagedorn voices respect for the man of learning and his new discoveries in science. However, in the same poem he makes it clear that he values the life of learning not so much for its own sake, but because it is more likely to lead to virtuous, non-frivolous conduct.

Mylius, in another popular scientific periodical, *The Natural Philosopher (Der Naturforscher)* published an essay entitled "Contemplations on the majesty of God" (*Betrachtungen über die Majestät Gottes*) 1743. Here he states that only the scientist, with his exact knowledge and close acquaintance with nature is in a position to recognize and appreciate the divinity that must stand behind all natural phenomena. The non-scientist in his approach to nature is necessarily superficial. He continues with numerous examples to show how much better the scientist, as a trained observer and experimenter, can penetrate the secrets of nature and attain a true understanding of her. Yet, not all is praise and seriousness! His "Elements of Physikopetitmaitrick," which appeared in the 1747 issue of *The Natural Philosopher* is a parody of the practice of his time of constructing systems pretending to scientific and mathematical accuracy. He develops his new science, complete

with axioms, postulates, theorems, observations and experiments, which he defines as "a science of the physical insights of young gentlemen."[12] The name of his science is derived from the French term for a young gentleman, namely "petit maître." A typical example of his wit is the third theorem that young gentlemen are scientists. His proof is as follows:

> "Young gentlemen can kiss, (16#) and kiss indeed (17#). Kisses are physical experiments (20.21#). He who kisses, therefore, makes physical experiments. But he who makes physical experiments, is a natural scientist (#19) Hence young gentlemen are natural scientists (272-3).

Poets also contrast and discuss the merits of prose and poetic form. Johann Siegmund Leinker (1724-1788), in the preface to his odes (1759), states his purpose in writing poetry about scientific matters. It is interesting that he speaks of the collaboration of science and poetry as if it had become an established practice.[13] He explains the respective functions of poetic form and scientific content. Whereas poetic ornaments amuse the senses, scientific truths impart to the work the quality of depth which it would not otherwise have.[14]

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[12] "Eine Wissenschaft von der physikalischen Einsicht der jungen Herren."

[13] "Seitdem die Dichtkunst in dem Klange der Reime ihren Vorzug nicht alleine mehr wehlen darf; so sucht sich dieselbe mit den Gedanken eines Weltweisen immermehr und mehr zu verbinden. Sie macht daher selbst auf die Wissenschaft Ansprüche," Leinker, *Odes*, n.n.

[14] "Ihre Fabel belustiget die Sinne, fordert aber ihren Schmuck von Wahrheiten und belebet mit jenem Geiste ihre Bilder. Je erhabener der Gegenstand, je würdiger werden die

Poetry must collaborate with science to make the subject matter clear, for poetry relies too much on images, whereas science has the capacity to penetrate deeper. The poet lists the many achievements of learning and says:

> If I sing of all these matters
>
> you, muse, cannot be my only help.
>
> No, if its is to sound clearly,
>
> you, as well, oh natural science,
>
> you know how to penetrate into the inmost depths.
>
> If she relies on images,
>
> and if many will not understand you
>
> then this is certainly not for them![15]

Only science can give us a deeper view and insight into the world. The poet promises to sing with the aid of the Muse of poetry and the spirit of science.

Züge angebracht. Und was ist erhabener als die Natur in ihrer Ordnung, Wirkungen und Geschöpfen?" (Preface).

[15] Soll ich nun diesen Stof besingen
So hilfst du Muse mir nicht nur,
Nein, sondern soll es deutlich klingen,
Auch du, o Lehre der Natur,
Du weist ins innerste zu gehen,
Wenn jene nur auf Bilder dicht
Und wird dich mancher nicht verstehen,
So sey auch dieses für ihn nicht (62)

During the eighteenth century, physics (*Natur=lehre*) came to be treasured as the best example of an emancipated form of human knowledge. Yet poets portray science as a divine matter: the goddess Minerva appears to the poet and exhorts the poets of the time to use their art in the service of wisdom. Poets can, therefore, sing of the world and of man with the aid of the Muse of poetry and the spirit of science. In order to attain wisdom: "man" has to recognize the rational order that God has implemented in nature. The new age, in which the sciences have made so much progress, is exalted. Science has brought a new age of light and truth. Furthermore, if "men" continue to follow reason, the golden age would surely come. Dusch depicts the new age that science has brought about in Messianic imagery.[16] In the best scientific style poets offer footnotes as warrants of the truth of their statements. Only the scientist has the capacity for truly understanding order in nature; only the scientist with his exact knowledge and close acquaintance with nature is in a position to recognize and appreciate the divinity that must stand behind natural phenomena. For the scientist, the only authorized observer and experimenter, can penetrate to a true

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16 ....Ich will die Weisheit singen;
Wie sie durch Wissenschaften den Unform unsrer Welt
Zum Paradies gebildet, der Reiche Flor erhält. (14)
....So war die Erd ein Kampfplatz der Barbarey geworden (22)
....
Gott schaute vom Olympus auf diese Tief hinab:
Der Himmel ließ geöffnet die güldne Zeit herab (23)
Stürzt feigen Aberglauben sein blutigs Altar um;
Zerbricht sein eisern Zepter, und führt durch bessre Lehren
Die Welt von fürchterlichen zu heiligen Altären. (24-5)

Johann Jacob Dusch, *Die Wissenschaften* (Göttingen: Victorinus Bosiegel, 1752).

understanding of nature; only he has legitimate access to scientific learning. As exemplar of Enlightenment knowledge, science belongs to the realm of light and clarity. Its truths will do away with all forms of darkness. But just as in the case of Newton, not all is praise and celebration of the glories of science. We also hear critical voices who suggest that science and reason should be kept withing certain boundaries. Only a science that leads to God is a really pious science. Newton himself, after all, confessed his ignorance regarding the nature of gravity and reverted to occult qualities.

3. Didactic Poetry: New Medium, New Tasks

Since the eighteenth century, literary historians have noticed the abundance of didactic poems. But they considered these compositions at best as precursors of the "true" poetry associated with the age of Goethe, who himself banished the genre from the temple of the Muses on grounds of its form. Though dismissed by critics, didactic poetry was widely read and highly valued by contemporaries, especially between 1730 and 1760. Contemporary critics resisted the reproach that "more than a century would be required in order to tear out a whole people from its natural roughness."[17] Professor Johann Christoph Gottsched was seen by his contemporaries as someone who knew how to combine the "serious sciences" with literary concerns. Furthermore, the former "owe him, if not their

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[17] "daß mehr als ein Jahrhundert dazugehöre, wenn ein ganzes Volk aus seiner natürlichen Rauhigkeit gerissen werden soll;" Johann Jacob Bodmer, "Nachricht von dem Ursprung und dem Wachstum der Critik bey den Deutschen," in *Sammlung Critischer,*

growth, certainly their dissemination."[18] By 1737, Gottsched was also very optimistic about the progressivenes of the current intellectual situation and argued that it would have important implications for the quality of literature. In his view, "In the past few years, criticism has become more common in Germany than it used to be;"[19] "It is true, for the past twenty years, Germany has philosophized more than it ever has. Reason is very refined among our compatriots, wild wit is tamed, and extravagant fancy has been brought to its proper boundaries. Good taste in the arts has thus now also been significantly improved."[20] Poetry, according to Gottsched "is the best suited to spread wisdom among raw human beings."

Poetry was one of several media employed for such tasks. Gottsched's optimism regarding the intellectual accomplishments of his times contrasts sharply with other critics' perceptions of the contemporary status of German poetry. Looking back to the time when he started writing poetry, Haller remarks that he and Friedrich von Hagedorn (1708-1754)

Poetischer un anderer geistvoller Schriften (Zürich, 1741), 2. Stück, 81-180, 4.

[18] "Gottscheds Verdienste schränken sich nicht auf deutsche Sprache, Literatur, und ...Beredsamkeit und Dichtkunst ein; auch enrsthafte Wissenschaften haben ihm, wohl nicht Vermehrung, aber Ausbreitung zu verdanken." Abraham Gotthelf Kästner, *Vermischte Schriften* (Altenburg, 1772), Part 2, 84.

[19] "Das Kritisiern ist seit einigen Jahren schon gewöhnlicher geworden in Deutschland, als es vorhin gewesen," Gottsched, *Critische Dichtkunst* XXX.

[20] "Es ist wahr, Deutschland hat seit 20 Jahren mehr als vorhin jemals philosophiert. Die Vernunft ist unter unsern Landsleuten sehr geläutert, der wilde Witz gebändigt, und die ausschweifende Phantasie in ihre gebührende Grenze eingeschränkt worden. Dadurch inst nun auch der Geschmack in den freyen Künsten um ein vieles verbessert worden." Gottsched, *Beiträge*, VI, 661.

"both came at a time in which the art of poetry had been lost in Germany;"[21] and by the end of the century, Johann Georg Sulzer (1720-1779) assures us that both Haller and Hagedorn should be credited with having "removed the insult of barbarism from Germany."[22] Eighteenth-century literary critics sought the reasons for Germany's cultural lag in its territorial fragmentation: "It is always going to be an obstacle for us, that Germany does not have one single capital," moan the *Letters on Literature.*[23] Others questioned the public for whom poets wrote. The court receded as audience and patron while a growing "bourgeois" public that went beyond learned circles began to take form. Poetry should now no longer serve as entertainment and decoration of courtly conventions nor be exhausted in empty tributes. The transition from occasional to didactic poetry marked not only a structural transformation of the literary genre as such, but also implied a deep change in the functions of poetry.[24] Didactic poets criticized occasional poets vehemently and accused them of merely adorning banal events and prostituting their craft by writing for commissions. Poets should now venture into "higher" truths and value poetry for its social utility. As an activity shaped by reason, poetry should meet the tasks of the day and contribute to making an enlightened human race.This transformation was essential for the propagation of the

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[21] "Beyde kamen wir in einer Zeit, da die Dichtkunst sich aus Deutschland verloren hatte," Haller, 397.

[22] "den Schimpf der Barbarey von Deutschland weggenommen hätten." Johann Georg Sulzer, *Allgemeine Theorie der schönen Künste*, 2. ed. (Leipzig, 1778), vol. 1, 349.

[23] "Es wird uns immer hinderlich sein, daß Deutschland nicht eine einzige Hauptstadt hat." *Briefe, die neueste Literatur betreffend* (Berlin, 1759ff., 1766f.), 254.

[24] On occasional poetry in Germany see Joseph Leighton, "Occasional Poetry in the Eighteenth Century," *The Modern Language Review* 78/2 (1983): 340-358.

Enlightenment gospel.

Eighteenth-century poets drew on classical and Renaissance traditions that assigned to literature an important social mission. According to these views, language is conceptualized as action, as a force acting on the world, contrary to the modern concept of language as signification, as a series of signs to be deciphered. Poetry is an instrument of power whose value is to be measured by the force of the impression it produces.

In antiquity, t poetry is a political force that explains Plato's banishment of the poet from his ideal Republic. Only someone who accorded to poetic language the highest degree of power in determining human action and behavior could regard poets as dangerous enough to exile. The reader in antiquity was a citizen of the state, the author, a shaper of civic morality, and the critic a guardian of the public interest: literature, its producers, and consumers were related to the needs of the polity as a whole.[25] Poetry could arouse patriotism, stimulate interest in specific institutions or events, teach admiration for a particular ruler, or demonstrate the existence of virtue in the society in which the reader actually lived.[26]

In the Renaissance, literature was once more defined as a shaper of public morals. Its nature and value depended upon the kinds of effects it produced, effects that were equated, as before, with moral behavior and not with textual meaning. The audience was no

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[25] See Jane P. Tompkins, *Reader-Response Criticism. From Formalism to Post-Structuralism* (Baltimore: Johns Hopkins University Press, 1992), 203-4, who offers a succinct account of the relationship between literature and society in the Western world.

[26] O. B. Hardison, Jr., The Enduring Moment. A Study of the Idea of Praise in Renaissance Literary Theory and Practice (Chapel Hill: U. Of North Carolina, 1962), 108.

longer constituted as a crowd to be stirred or soothed, but as a small group of influential people, consisting of highly placed members of the government, the court, and the aristocracy, individuals known to the poet who are in a position to dispense the patronage he needs. Poetry again had a social function, as it did in antiquity, but the content of that function changed, since the social, economic, and political structures that defined it had changed. In addition to its being regarded as an inculcator of civic virtue, poetry became a source of financial support, a form of social protection, a means of procuring a comfortable job, an instrument of socialization, a move in a complicated social game, or even a direct vehicle of courtship.[27] Poems, therefore, were forms of influence: they could accomplish specific social tasks that prose could not.

German didactic poets embraced the persuasive powers of poetry with great enthusiasm and redefined the social tasks it should fulfill. They also conceived poetry as a means of promoting Enlightenment values that would contribute to eliminating the previous exclusivity of scholarship. Gottfried Wilhelm Leibniz summoned his contemporaries to use the German language just as the poets of the seventeenth century had done. But Leibniz argued that it was not enough to compose only German sonnets. The German language would not be adequately honored, he argued, "as long as we ourselves don't practice our language in the sciences and in important subject matters, which is the only means to bring it to a high regard among foreigners as well as to make the "'Un-German-minded Germans'

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[27] Tompkins, Reader-Response Criticism, 208.

ashamed of themselves."[28] Poetry would now be put to the task of spreading the Enlightenment message to circles formerly excluded from the world of learning. In order to fulfill these tasks, the poetry of the previous century had to be restructured, the new didactic strategies and social tasks spelled out.

In his *Attempt at a Critical Theory of Poetry (Versuch einer Critischen Dichtkunst)* Gottsched initially took up the Aristotelian rejection of didactic poetry. Only in the fourth edition of this work did he add a chapter "on dogmatic poems" with the justification "that poets have been the oldest teachers of the human race."[29] In the introductory chapter Gottsched stressed that poetry had already fulfilled this ambitious office of teacher of humankind in the Ancient world.[30] In order to save poetry from its current profanations, didactic poets should reappropriate these tasks with new vigor. Poetry, however, should not replace philosophy, religion, or political theory (*Staatslehre*), but only transmit their insights, assuming thus an important educational function. Through didactic poems, poets can communicate to "mediocre heads" (*mittelmäßigen Köpfen*) even the most bitter truths, especially regarding moral issues. By clothing philosophical truths in a poetic mantle, they

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[28] "solange wir nicht unsere Sprache in den Wissenschaften und Hauptmaterien selbst üben, welches das einzige Mittel ist, sie bei den Ausländern in hohen Wert zu bringen un die undeutsch gesinnten Deutschen endlich beschämt zu machen." Gottfried Wilhelm Leibniz,"Unvorgreifliche Gedanken, betreffend die Ausübung und Verbesserung der deutschen Sprache. Zwei Aufsätze," U. Pörksen, ed. (Stuttgart. 1983); *idem*, "Ermahnung an die Deutschen, ihren Verstand und ihre Sprache besser zu üben, samt beigefügtem Vorschlag einer deutschgesinnten Gesellschaft," in *op. cit.* 47-78, 64f.

[29] "daß die Dichter die ältesten Lehrer des menschlichen Geschlechtes gewesen;" *Critische Dichtkunst*, 566.

[30] "Die alten Poeten waren nämlich die ersten Weltweisen, Gottesgelehrten, Staatsmänner." Gottsched, *Critische Dichtkunst*, 90.

can "teach the world knowledge and virtue, playfully, as it were."[31] "The ornaments, decorations, witty and pleasant presentation of the most serious teachings make them into poems. Otherwise in their proper philosophic dress they would have a very meager and often unpleasant appearance."[32] Furthermore, Gottsched argues,

> When poets intrude on their disciplines (i.e. philosophers') they do this only in order to please mediocre heads, who only want to know a little about it and do not care about the highest degree of thoroughness. Since these comprise the majority of the human race, it suffices if they are not told falsehoods.[33]

Gottsched then went on to explain how, in his view, the driest truths can be made appealing and why this poetry could be useful:

> truths should be presented in such an order, that readers can understand them

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[31] "Erkenntnis und Tugend der Welt gleichsam spielend beyzubringen." (577).

[32] "So koennen wir auch diesen groeßern Arten poetisch abgefaßter Schriften hier die Stelle nicht versagen. Der Ausputz, die Zierrathe, der geistreiche un angenehme Vortrag der allerernsthaftesten Lehre, macht, daß sie Poesien werden: Da sie sonst in ihrem gehoerigen philosophischen Habite ein sehr mageres un oft verdrüßliches Ansehen haben würden." *Critische Dichtkunst*, 609.

[33] "Wenn sich die Poeten sich in ihre (das heißt der Philosophen) Wissenschaften mengen, so thun sie es bloß, den mittelmässigen Köpfen zu gefallen, die nur einigermaßen etwas davon wissen wollen, un sich um den höchsten Grad der Gründlichkeit nicht kümmern. Diese machen allezeit den größten Teil des menschlichen Geschlechts aus: un da es genug inst, wenn man ihnen nur nichts falsches sagt..." Gottsched, *Critische Dichtkunst*, 575.

more or less and can see them in context. And in this process, everything should be fashioned with the adornments of poetic language in such a lively and ingenious way, that people will be able to read the result with enthusiasm and enjoyment. Since the most bitter truths, especially in moral matters, are so to speak sweetened and gilded in such a way: one can certainly see, that it is not useless to prepare such writings.[34]

Didactic poetry was aimed at a particular audience and was designed to achieve particular effects. German poets followed in the Horatian tradition that stressed the poet's role in society as a skilled craftsman, teacher, and civilizing force.[35] According to the Horatian dictum in *Ars Poetica*:

> Poets aim either to benefit, or to amuse, or to utter words at once both pleasing and helpful to life. Whenever you instruct, be brief, so that what is quickly said the mind may readily grasp and faithfully hold: every word in excess seeps out of the well-stocked mind. He gets every vote who combines

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[34] "....das Wahre in solcher Ordnung vorträgt, daß man sie ziemlich verstehen und ihren Zusammenhang wenigstens klar einsehen könne; dabey aber alles mit Zierrathern einer poeteischen Schreibart so lebhaft un sinnreich ausbildet, daß man es mit Lust un Vergnügen lesen könne. Da nun auch die bittersten Wahrheiten, sonderlich in moralischen Sachen, auf solche Art gleichsam verzuckert und übergüldet werden: So sieht man wohl, daß es nicht undienlich sey, dergleichen Schriften zu verfertigen." Gottsched, *Critische Dichtkunst*, 611.

[35] O. B. Hardison, Jr. and Leon Golden, *Horace for Students of Literature. The "Ars*

the useful with the pleasant, and who, at the same time he pleases the reader, also instructs him.

-Horace, *Ars Poetica*, 333-46.[36]

Horace replaced a simple dichotomy ("aut prodesse...aut delectare") with a complex synthesis of simultaneity. Pleasure and instruction, far from occupying opposing ends of a logical or aesthetic spectrum sit squarely together in both the poet's intention and the audience's reception of his work. Brevity is not only the soul of wit but also the *sine qua non* of instruction: the very conciseness of verse, even in forms fuller and more discursive than epigram and lyric, allows it privileges that might be denied to the wordier wanderings of prose. The requirement that poetry profit as well as delight is initially defined in terms of teaching or instruction. But precisely because poetry combines the useful and the delightful it does more than teach, it persuades. Poetry should not just convey knowledge but move to action. Ancient critics had already recognized the civilizing power of poetic works.[37] Early

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Poetica" and its Tradition (Gainseville: University Press of Florida, 1995).

[36] Willard Spiegelman, *Didactic Muse. Scenes of Instruction in Contemporary American Poetry* (Princeton, New Jersey: Princeton University Press, 1989), 3.

[37] Thomas Cole offers a comprehensive list of epideictic passages in which the topos of the civilizer of savagery is used of anything the speaker has in mind to praise: the civilizers of early man, the earliest Sophists, the poets as predecessors of the earliest Sophists; Athens (Isocrates), oratory (Isocrates, Cicero), philosophy, architecture (Vitruvius), farming (Xenophon, Tibullus) and in parodies for comic effect --the arts of love and of cooking. *Democritus and the Sources of Greek Anthropology* (London: The American Philological

poets made use of the poetic form in their attempts at civilizing previously uncultivated men. To German poets, poetry could also become an instructional device which could also be used to communicate science to the lay reader. Triller articulated the typical early Enlightenment view that scholarship should be useful:

> You scholars, who sit around
>
> are cold and sweat beside your books
>
> who bury yourselves though still alive
>
> and have only this goal,
>
> that posterity will once know you;
>
> Are you not, by all rights, a light
>
> that only shines for others,
>
> but not for yourselves?[38]

His own poems, instead, are "select, instructive, and edifying, always founded on ethics and

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Association, 1967), 6-7.

[38] Ihr Gelehrten, die ihr sitzet,
Bey den Büchern friert un schwitzet,
Euch lebendig schon begrabt,
Un nur diesen Endzweck habt,
Daß euch einst die Nachwelt kennet;
Seyd ihr nicht mit Recht ein Licht,
Das allein für andre brennet,
Aber für sich selbsten nicht?"

PB II, (1746), 311.

physics (*Natur=Lehre*) or the preservation of the Christian religion."[39] The avocational poet pleads for an extensive use of reason even to prove the truths of Christianity.

From an artistic point of view, "the content of a didactic poem is the most boring part of it," affirms philosopher Moses Mendelssohn (1729-1786). Scientific matters belong properly to prose form and must therefore be transformed in such a way, "that its owner [philosophy] can no longer recognize it as her own."[40] In its proper form, scientific knowledge is conceived only for the professional (*Fachmann*), "stripped of anything that can please, dry, serious, monotonous, tiring."[41] In order to make this content fruitful beyond the scholarly circles of specialists, a didactic poem should do everything "to overcome the resistance of the reader to the subject matter."[42]

Poetry differs from philosophy not only in its content but also in its form:

> "Give one and the same sentence to a philosopher and to a poet to elaborate. One will seek the sharpest clarity, the analysis of the concepts, and the connection with their foundations...The poet instead [transforms] clarity into liveliness through the multiplication of its characteristics...explanations into

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[39] "Der Inhalt der Gedichte ist auserlesen, lehrreich und erbaulich, un jederzeit auf die Sitten und Natur=Lehre, oder die Bewahrung der christlichen Religion, gegründet." *PB* II, 1746, Preface, v.

[40] "daß die Eigenthümerin ihn nicht mehr für den ihren anerkennen kann." Johann Jakob Dusch, *Vermischte kritische und satyrische Schriften* (Altona, 1758), II, 45.

[41] "entblöest von allem, was gefallen kann, trocken, ernsthaft, einförmig, ermüdend."

[42] "den Widerwillen des Lesers gegen den Stoff zu überwinden." *Ibid.*, 68.

descriptions, and sharp demonstrations into sensuous persuasion."[43]

Furthermore, philosophers have access to higher truths that are unfit for lower intelligences. It is the task of the poet to clothe them in a way that can make them appealing:

> Since the truth, which philosophers capture through deep reflection, is without appeal to the coarse senses of most people, and does not make any impression on them, [the poets] have to prepare truth of this kind following the taste of the majority, so that it may become general. And since entrance into the human heart, which is attained through the toilsome conviction of the understanding, is mostly closed for their teachings, they have to be careful to conquer the reader's heart through a new path by means of a harmless trick.[44]

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[43] "Man gebe einen un eben denselben Satz einem Weltweisen un einem Dichter zum Ausarbeiten. Der eine wird ...die schärftste Deutlichkeit, Auflösung der Begriffe, un Verbindung mit ihren Gründen suchen...Der Dichter hingegen [verwandelt] die Deutlichkeit durch Vervielfältigung der Merckmale in Lebhafftigkeit...die Erklärungen in Beschreibungen, un die scharfen Beweise in sinnliche Überredungen." Christoph Joseph Sucro, *Versuche in Lehrgedichten und Fabeln* (Halle, 1747), 6ff.

[44] "Da die Wahrheit, die von den Weltweisen mittelst tiefen Nachsinnens erkannt worden, für die groben Sinnen der meisetn Menschen ungeschmack ist, un keinen Eindruck auf sie machet, müssen sie solche nach dem Geschmacke der mehrern zubereiten, auf daß sie allgemein werde; un da ihren Lehren der Eingang in das menschliche Hertz, der durch die mühsame Überzeugung des Verstandes erhalten wird, meistentheils verschlossen ist, müssen sie bedacht seyn, sich der Hertzen durch einen neuen Weg mittelst einer unschuldigen List zu bemächtigen." Johann Jakob Breitinger, *Critische Dichtkunst* (Frankfurt and Hamburg, 1740), 2 vols. I, 6; similarly Gottsched, *Critische Dichtkunst*,

Whereas philosophy and the sciences obtain their proper objects as a result of logic, and are often difficult, dry, even boring, poetry presents its topics in an agreeable manner. "Since the dogmatic and logical way of teaching is considered to be too toilsome, burdensome, and completely dark and imperceptible for the masses, it is no wonder that poetry has been seen and praised at all times as the general interpreter of wisdom and teacher of virtue."[45] Even abstract and unattractive things acquire in it an appealing appearance. Poems attract the reader and entertain him while they transmit the teaching without the reader's noticing it. Poetry becomes, in this way, an aid to the unenlightened.

As an equal partner of philosophy, poetry deals with the same matters but addresses them to a different readership. Whereas philosophy appeals to the "higher" faculties --that is, it is superior both in the field of knowledge and in the social world, poetry's audience was referred to as "rabble" (*Pöbel*),[46] "rough mob" (*rohes Volk*),[47] or "the masses" (*großer Haufen*).[48] Swiss literary critic Johann Jakob Breitinger (1701-1776), stresses the purpose of poetry in a similar vein: "To tell the truth through images to those who don't have much

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577.

[45] "Da die dogmatische un schließende Lehrart dagegen viel zu mühsam, beschwerlich, und für den großen Haufen der Menschen gantz dunckel und unvernehmlich gefunden wird;....ist es nicht zu verwundern, daß die Rede- un Dicht-Kunst zu allen Zeiten vor allgemeine Dollmetscherinnen der Weisheit und vor Lehrerinnen der Tugend angesehen und geehrt worden." Gottsched *Critische Dichtkunst*, 577.

[46] Breitinger, *Critische Dichtkunst*, I, 124.

[47] Johann Jakob Bodmer, Critische Betrachtungen über die poetischen Gemälde der Dichter, (1744), 140.

[48] Breitinger, *Critische Dichtkunst*, 5.

intelligence."[49] Furthermore, the readers are compared to children:

> To the class of children belongs all the rabble of the human race who are not concerned about knowing the truth, and are like children in relation to it.[50]

For poets, ignorance and unenlightenment were an illness that needed to be healed. The patient behaved like a child who refused to swallow the needed medicine: although humans were capable of becoming educated, they were not willing.[51] Poetry's task was to entice into learning those for whom philosophical thought is too difficult, the moral teachings too dry and unattractive.

Furthermore, Gottsched argues that poetry is not only good for the uneducated but also for scholarly people, since "poetry is as edifying as morality and as agreeable as history. It teaches and entertains and is appropriate for both learned and uneducated people: the

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[49] "Dem, der nicht viel Verstand besitzt, / Die Wahrheit durch ein Bild zu sagen." Gellert, Christian Fürchtegott, "Die Biene un die Henne," in H. Klinkhardt, ed., *Sämtliche Fabeln und Erzählungen, Geistliche Oden und Lieder* (Munich, n.y.), 233.

[50] "In die Classe der Kinder gehöret aller Pöbel des menschlichen Geschlechtes, der sich um die Erkenntnis der Wahrheit nicht bekümmert, und in der selben ein Kind ist;" Breitinger, *Critische Dichtkunst*, 124.

[51] Sein Herz, zur Arbeit träge, hängt, außer Gleichgewicht,
Zur Sinnenlust hinüber, un liebt das Ernste nicht.
Auch darin sorgete die Güte für den Schwachen,
Das, was ihm nützlich war, auch angenehm zu machen.
Ein sanft Gefühl des Schönen lag schon in jedem Sinn,
Un zog die Neubegierde zum Angenehmen hin.

Dusch, Johann Jacob, *Sämtliche poetische Werke*, Part 1, 1765, 122.

former admire the poet's special skill as an artistic imitator of nature; the latter, instead, find in his poems a favorite and instructive pastime."[52] Poetry therefore not only communicates knowledge to the great masses of uneducated people but also charms the learned, who can find pleasure and entertainment in the poetic disguise of higher truths. A didactic and an aesthetic intent are found side by side in most reflections on the functions the new poetry should fulfill. In this way, poetry participates in the Enlightenment program that seeks "to make reason and virtue general among human beings,"[53] thereby fostering their eternal bliss (*Glückseligkeit*). To amuse (*delectare)* and to benefit (*prodesse)* should be inseparable: pure *delectare* is purposeless, and pure *prodesse*, formless. A poet writes to be useful:

> To be useful do I wrap myself up in such clothes,
>
> To be useful do I adorn myself with such ornaments,
>
> To be useful do I always attempt to conduct my pen beautifully.[54]

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[52] "Die Poesie hingegen ist so erbaulich, als die Moral, und so angenehm als die Historie; sie lehret und belustiget, un schicket sich für Gelehrte und Ungelehrte; darunter jene die besondere Geschicklichkeit des Poeten, als eines künstlichen Nachahmers der Natur bewundern; diese hingegen einen beliebten und lehrreichen Zeitvertreib in seinen Gedichten finden." Gottsched, *Critische Dichtkunst*, 167.

[53] "Verstand und Tugend unter den Menschen gemein zu machen." Christian Wolff, cited in Wolfgang Ulrich, *Studien zur Geschichte des deutschen Lehrgedichtes im 17. und 18. Jahrhundert* (diss. Kiel, 1960), 102.

[54] Zum Nutzen hüll ich mich in solche Kleider ein,
Zum Nutzen pfleg ich mich mit solchem Schmuck zu zieren,
Zum Nutzen such ich stets die Feder schön zu führen.

J. S. Portmann, "Die ihre Nützlichkeit lobende Poesie," *Belustigungen des Verstandes und des Witzes* (Leipzig:1742), 466-71, 468.

4. Readers: Children, Mediocre Heads, Rough Rabble: Unflattering Consequences of the Enlightened Message?

A closer look at the ways in which authors address readers raises questions about the dubious didactic strategies of the poets. However, if seen in another light, the derogatory and condescending tone poets use for addressing their readers, may be seen as a subtle way of winning the readers over to the Enlightenment cause.

Some common elements in the background of the authors of didactic poetry help us to understand their approach. On the basis of biographical data, literary historian Christoph Siegrist describes the composition of the circle of didactic poets as follows:[55] More than half of them come from the homes of Protestant clergy.[56] The fathers' libraries, which began to include more worldly literature, allowed for a growing interest in moral and educational issues, stimulating intellectual curiosity in their children. A second group represented by the authors are the sons of government officials, while the provenance from merchant homes is more limited. The order of artisans, farmers, and other manual workers is not represented at all.

Most authors of didactic poems have another profession and write poems in their spare time. This is why most collections are called "attempts" (*Versuche*) or "avocational

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[55] Christoph Siegrist, *Das Lehrgedicht der Aufklärung* (Stuttgart: Metler, 1974), 228-33.

[56] On the significance of Protestant homes for the diffusion of the Enlightenment and a growing interest in secular literature, see Herbert Schöffler, *Protestantismus und Literatur* (Leipzig, 1922); and Laddie Risk, *Der Einfluß des evangelischen Pfarrhauses auf die Literatur des 18. Jahrhunderts* (diss. Tübingen, Bremen, 1932), 36ff.

works" (*Nebenstunden-Werke*). Most live in commercial towns, such as Hamburg, Zürich and Leipzig, as well as Prussian and Saxon provincial towns. No poet comes from Southern-Catholic areas, nor from the Rheinland, in which baroque devotional- and sermon-literature dominates. In other words, these data suggest that didactic poets come essentially from the same areas as the moral weeklies, the popular periodicals that also served didactic purposes by communicating Enlightenment thought to the reading public. Their form "high" topics, and elevated aesthetic distinguish didactic poems from the moral weeklies, although many of the poets were also involved in the composition of such periodicals.[57]

The composition of the actual readership of didactic poetry is more difficult to establish. Here we have to limit ourselves to the information that can be gathered from poems and the theoretical writings themselves.[58] We often hear optimistic statements that a poet should write for everyone. Kästner for instance, suggests that a poet should be intelligible to all readers.[59] Triller wishes that his poems be read "with special usefulness and pleasure by people of all higher, middle, and lower estates of both sexes."[60] Or even more decisively, poet Niklaus Dietrich Giseke (1724-1765) wrote:

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[57] See Martens, *Botschaft der Tugend*, 108f. and 147f.

[58] I have searched extensively and unsuccessfully for diaries and the correspondence of lay actors in the Saxon area.

[59] Abraham Gotthelf Kästner, "Gedanken über die Verbindlichkeit des Dichters, allen Leuten deutlich zu seyn," in *Gesammelte poetische und schöngeistige Werke* (Berlin, 1841), Part II, 76-82, 78.

If only the charm of the muse moved every German

and, praised everywhere, only good taste reigned!

The wise man would then not often be a pedant

and the merchant too would praise the intellect.[61]

Yet Kästner makes it explicit that "everyone" should not be taken literally. He refers only to elite scholarly circles:

[the poet] He should not become a teacher of the bad populace

One does not want one's song to make a woman cry (...)

It suffices if he makes the effort to play for a mind

that can think correctly and knows how to feel delicately

...yet even from among these souls

which you separate from the rabble, I will choose again.

You cannot dedicate your verse to every "bourgeois:"

Nor can mine be for every reader (...)

So let him too be learned, who wants to understand my song.[62]

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[60] Triller, *PB*, Preface, n.p.

[61] Wenn doch der Musen Reiz einst jeden Deutschen rührte,
Und, überall verehrt, nur der Gechmack regierte!
Der Weise wäre dann nicht oft nur ein Pedant,
Und auch de Handelsmann verehrte den Verstand.
Giseke, "Schreiben an den Herrn von Hagedorn von dem Einflusse des Geschmackes in das menschliche Leben," *Bremer Beytäge* 3: 481-93, 493.

In his "Writing on the influence of good taste on human life," Giseke also reinforces the view that the masses are not fit for such an elevated fare since they are dominated by their bodily instincts:

> The rabble of our days cannot grasp such high teachings...
>
> He who enjoys himself only physically, does not think anything,
>
> can barely feel any longer.[63]

Or in Meier's view, "...The common man possesses so few powers, so little taste and insight, that he is hardly capable of tasting the beauty of mediocre thoughts."[64] The

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[62] Er soll kein Lehrer nicht des schlechten Pöbels werden,
Man will nicht, daß sein Lied ein Weib zum Weinen bringt
...
Genug, bemüht er sich, für einen Sinn zu spielen,
Der richtig denken kann und zärtlich weiß zu fühlen
...doch selbst aus diesen Seelen,
Die ihr vom Pöbel trennt, werd ich von neuem wählen.
Dürft ihr nicht euren Vers gleich jedem Bürger weyhn:
So darf auch meiner nicht für jeden Leser seyn
...
So sey auch der gelehrt, der will mein Lied verstehen...
Kästner, "Gedanken über die Verbindlichkeit des Dichters," 79.

[63] So hohe Lehren faßt der heutge Pöbel nicht, ...

Nur körperlich sich freut, nichts denket, kaum noch fühlet.

Giseke, "Schreiben an Herrn von Hagedorn von dem Einflüsse des Geschmackes," 492.

[64] "Der gemeine Mann besitzt so wenig Kräfte, Geschmack und Einsicht, daß er kaum

examples could be multiplied at will. They suffice to illustrate a common thread of the early German Enlightenment: on the one hand, education should be extended to all, the exclusiveness of learning should be abolished. On the other hand, however, educational expectations should be kept within the higher circles of the educated. The accommodation to lower strata could only have damaging consequences. Didactic poems are written for those who find pleasure in higher truths and virtue: those readers who "like to be taught, readers who welcome the truths themselves that poets present to them with adornments. These readers are grateful to the didactic poet."[65]

To this group of lovers of truth and virtue belong, in addition to scholars themselves, their learned friends and colleagues, civil servants, as well as their female companions. What is clear, regarding the readers of didactic poems, is that they should at least be somewhat familiar with the intellectual atmosphere and current scholarship, and have some intellectual curiosity. As we have seen in Chapter 2, it is also clear that the number of readers is very small.

From a sociological point of view, however, this group is quite homogeneous. Since only people with a certain education, as well as financial means and time for reading, would have interest in literature at all, broader circles of the population are excluded. The nobility, if they had any dealings in intellectual things, preferred French literature, which was more

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vermögend ist, die Schönheit der mittelmäßigen Gedanken zu schmecken." Georg Friedrich Meier, "Untersuchungen einiger Ursachen des verdorbenen Geschmacks der Deutschen," in *Absicht auf die schönen Wissenschaften* (Halle, 1747), 34.

[65] "die sich gern unterrichten, Leser, denen die Wahrheiten selbst willkommen ist, die ihnen der Dichter geschmückt zuführet. Diese wissen dem didactischen Dichter Dank."

fashionable.[66] "Bourgeois" readers would have been recruited among scholars, professors, physicians, pastors, teachers, and students, as well as higher government officials. They, together with their wives, would have been the main readers of this literature, as well as of most of the serious literature produced in those decades. The issue of women's participation --the degree of their participation-- was, as we have seen in Chapter 2, a contested topic. It therefore does not come as a surprise, that didactic poets themselves address women explicitly and set their participation in the world of poetry within clear limits.

Although women were excluded from the higher institutions of learning, the moral weeklies suggest that they are capable of studying useful sciences and literature.[67] This trend is extended further to didactic poetry. The public is altered not only quantitatively but also qualitatively. Although women themselves also began to write, this emancipatory process was, of course, contested. As late as 1746 authors argued that women did not have the capacity for understanding higher poetic forms:

> A lady, for example, from the middle estate, may understand a pastoral poem, an elegy, a comedy, or even a tragedy and works of that kind, but not

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Dusch, cited in AdB 1767, 4.

[66] Frederick the Great articulated in his famous writing "De la littérature allemande" (French-German , Christoph Gutknecht and Peter Kerner, eds., Hamburg: Buske, 1969) a "class"-prejudice.

[67] See Martens, Botschaft der Tugend 523; and Max Wundt, Die deutsche Schulphilosophie im Zeitalter der Aufklärung, (1964, reprint Hildesheim), 228f.

a Pindaric ode, not a didactic poem like Pope's...or Haller's.[68]

Another anonymous writer, in his "Notice for a lady, on some types of poems," puts it even more pointedly in one of Gottsched's journals:[69]

> Mademoiselle,
>
> In fact, you were quite wrong, when on Sunday you were so sensitive about the fact that I did not want to sit down immediately and teach you what Sapphic odes, anacreontic odes, pastoral, satires, and others really are. The examination of the true nature of all these important matters has caused the greatest scholars many headeches and you wanted to take it in casually, with a glass of wine and a bowl of comfits? But since you still wanted me to write to you, I will offer you some written notice of these matters. If this notice appears to you too short or too unclear, you may command me to read you a lecture about it.

Toward the end of his remarks, the learned scholar concludes:

> I believe I have said enough to you for the first lesson of the instruction I am

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[68] "Ein Frauenzimmer z. E. von mittlerem Stande, versteht zwar vielleicht ein Schäfergedicht, eine Elegie, eine Komödie, auch wohl eine Tragödie, und dergleichen, aber keine pindarische Ode, kein solches Lehrgedicht wie Pope [...] oder Haller." *Bemühungen zur Beförderung der Critik und des guten Geschmacks* (Halle, 1745), 408.

[69] Belustigungen des Verstandes und des Witzes (Leipzig: Breitkopf, March, 1745).

supposed to offer you. If it is not more than, or maybe not even close to, what you expect to know, it is certainly more than you ought to know. You said recently that a man does not need to have a full and thorough understanding of a lady's finery. What you granted us that we might know was that we should only be able to notice when there was a mistake in the way you array yourself, without our being able to say what the error actually consisted in. So if I want to repay you in the same coin, I should not give you that many notices about poetry, which indeed is only one type of finery for a masculine person, and, by rights, you should only have proper concepts about the types of poems, in the same way as that lady had about the stars, who expressed her amazement at the bright light of the star by exclaiming: oh! there is a real fixed star!

I am your most devoted...[70]

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[70] "Nachricht für ein Frauenzimmer, von einigen Arten von Gedichten" von Ebda.

"Mademoiselle,

In der That, Sie hatten sehr unrecht, dass Sie am Sonntage so empfindlich darüber wurden, als ich mich nicht gleich hinsetzen, und sie belehren wollte, was sapphische Oden, anakreontische Oden, Schäfergedichte, Satiren, u.d.g. mehr eigentlich waren. Die Untersuchung von der eigentlichen Beschaffenheit aller dieser wichtigen Sachen, hat den größten Gelehrten viel Kopfbrechen gemacht, und sie wollten es so bey Gelegenheit, bey einem Glase Franzwein und einer Schale Confect, mit einehmen? Weil Sie aber doch immer haben wollen, daß ich Ihnen schreiben soll: so will ich Ihnen einige schriftliche Nachricht davon aussetzen. Wenn ihnen dieselbige zu kurz oder zu undeutlich vorkommt, so dürfen Sie nur befehlen, wenn ich Ihnen ein Collegium darüber lesen soll. 279

...

Women not only lack the intellectual capacities for understanding such types of poetry: didactic poetry itself is a male endeavor! Yet, in 1759, a review affirms that it has "stopped being a wonder and a rarity that a lady can make verses."[71] Luise Adelgunde Gottsched (1713-1762), Anna Luisa Karsch (1722-1791), Johanne Charlotte Unzer (1724-1782) and Marie Sophie von LaRoche (1730-1807) are only a few of the main examples cited to illustrate this trend, beginning after 1740.[72]

Authors of didactic poetry often portray their readers as fearful and childlike and in need of the poet's medicine. If we remember how children are treated in other literary instances of the period, it becomes hard to avoid the unflattering implications of this comparison. Children are symbols of absolute vulnerability, helplessness, and wailing. A weak intelligence, moreover, accompanies their bodily frailty. Examples of such

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Ich glaube, daß ich Ihnen genug für die erste Lection in dem Unterrichte, den ich Ihnen geben soll, gesagt habe: und wenn es nicht mehr, oder vielleicht noch nicht einmal so viel ist, als Sie zu wissen verlangen: so ist es doch gewiß mehr, als Sie wissen sollten. Sie behaupteten letztens, eine Mannesperson müßte von dem Putze des Frauenzimmers keine vollständige und gründliche Kenntniss haben. Alles, was Sie uns zu wissen verstatteten, kam darauf an, daß wir es gleichsam nur empfinden sollten, wenn ein Fehler bey dem Putze begangen wäre, onhe sagen zu können, worinnen er eigentlich bestünde: wenn ich also gleiches mit gleichem vergelten wollte, so sollte ich Ihnen auch nicht so viel Nachrichten von der Poesie geben, die in der That nur eine Art vom Putze bey den Mannspersonenn ist; und Sie sollten von Rechts wegen ebenso ordentliche Begriffe von den verschiedenen Arten der Gedichte haben, als jenes Frauenzimmer von den Ste3rnen, die ihre Verwunderung über das starke Licht eines Sternes zu entdecken, ausrief: ey da steht ein rechter Fixstern! Ich bin Ihr ergebenster 285 (my und.)

[71] "Seitdem es aufgehört hat, ein Wunder und eine Seltenheit zu seyn, dass ein Frauenzimmer Verse machen kan;" *Das neueste aus der anmuthigen Gelehrsamkeit* X (1761): 134.

[72] On these women, see Bonnie G. Smith, *Changing Lives. Women in European History*

condescension towards the audience could easily be multiplied, but perhaps a more pressing question at this point is: Why would poets approach their readers in such an obviously patronizing way? What rhetorical aims and goals could possibly be served by the poet's concerted strategy of comparing their audience to children? The simile suggests that poets treat their readers as children rather than as autonomous equals in search of commonly shared goals. The use of these metaphors are not just isolated bits of formal beauty or of self-expression but part of an intended mode of communication. These metaphors have consequences both for the relation of poets to their readers and th2eir particular strategies of persuasion. Why would learned poets struggle to impart their doctrine to their reluctant readers in such a homespun, inelegant way? The answer lies partly in the current understanding of the nature of language and poetry. Poetry is an eminently suitable vehicle to convey Enlightenment teachings to the potential disciples. It can claim an attractiveness, persuasiveness, and lucidity that is often foreign to prose discourse.

A comparison with Epicurean literature may provide us here with some interpretive clues. Epicurus himself (341-271 b. C.) fostered a highly authoritarian view of philosophical argument. Through rigidly controlled communities, he tried to maintain a sharp distinction between active authority figures and their passive followers. Epicurus resembles some contemporary sect leaders whose teaching is a coercive therapy in which pupils, like sick patients, are forced to put themselves entirely in the power of their teachers. If they want to get well, they must give up their autonomy. The central difficulty for the

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Since 1700 (Lexington: D. C. Heath and Company, 1989).

Epicurean doctor is to convince the pupils of the existence and the gravity of their illness: fear of death produces subservience to religious beliefs and religious authorities. Religious belief is bad, because it is superstitious and irrational, built upon false and groundless beliefs about the gods and the soul. It is also bad because it makes people dependent upon priests, rather than on their own judgment. And priests stimulate human fears further, increasing their dependence.[73] Didactic poetry also combats superstitious religion and illuminates what would otherwise be obscure. The learned poet is in command of light!

Though it might be tempting to attribute a corresponding view of therapeutic philosophical and poetic argument to didactic poets themselves, it is clear that they too repeatedly assert their own authority and treat their audiences as if they were sick children in need of their therapy. Moreover, they blithely justify deception as a means to psychic health and appear to place no value at all on individual judgement or autonomy. Thus we appear to have all the necessary ingredients for an overtly coercive and highly authoritarian mode of philosophical teaching. Among other things, such a view might help to explain the adoption of poetry for spreading the Enlightenment message. But still, why address the audience in such an overtly paternalistic way? Could the poet have hoped merely to bully a captive audience into reading and adopting his argument? No reader is forced to keep reading any particular piece, regardless of its poetic enticements. The key then must be in the poet's ability to seduce his reader. Poetry has irresistible effects however much one remains conscious of the poet's methods. This authoritarian imagery blatantly denies the importance

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[73] See Martha C. Nussbaum, "Mortal Immortals: Lucretius on Death and the Voice of

or indeed the possibility of a reader's rational autonomy, which openly contradicts the Enlightenment message it is supposed to convey.

The use of the metaphor of fearful children, however, can be seen in a different light. If children are superstitious, intellectually limited and prone to infantile fears, when the reader comes to the realization that he shares beliefs with such a child, he is more likely to want to give them up. One explanation for this reaction might be that looking down on ills one is free from has a reassuring effect. There also might be less laudatory pleasures such as those experienced from excluding others, or despising them with impunity, or backbiting them without fear of detection or reprisal. Who would like to be included among such vulgar crowds shrinking back from the saving truths didactic poets can offer? To do so, would be both infantile and boorish. Readers might identify with doctors rather than with the sick. Like many learned critics, they may include themselves among the adults sadly shaking their heads at the masses of the sick or the unclean populace. But in identifying with learned masters, they have already accepted a certain model of paternalistic ethical argument, with all of its ethical presuppositions. Compassion and detachment both bind readers either to the poet or to the addressee, and thus to the particular terms in which the instruction is offered. In winking with the poet behind the back of the fool, readers themselves may be swallowing more of the poet's medicine than they suspect. Didactic poets attribute healing powers to science. To them, poetry is much more than an external sweetener. The sweetness of Enlightenment thinking heals and frees the reader. The poet is

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Nature," *Philosophy and Phenomenological Research 50* (1989-90): 303-51.

like a bee making honey from the flowers of higher teachings. Every poetic device is deliberately adapted to the clear and persuasive presentation of Enlightenment truths.

5. Conclusion

From Horace to our days, a major current of Western poetics has flowed from the wells of pleasure to the depths of instruction. That poetry could serve pedagogy seemed as certain in the classical and early modern worlds as it may appear untenable in the contemporary one. Poets traditionally held mirrors up to nature not simply to reflect it but to occasion reflection and right action in their readers. Didactic poems played a crucial role in the educational process of the "bourgeoisie." In an attractive way, didactic poems offered their readers moral and scientific truths that not only conveyed to them moral standards, but also could lead them to right action. They became lay sermons, filling the vacuum that emerged with the supersession of theological devotional literature. The moral weeklies had also effectively embraced this task. Now, in an aesthetically appealing way, didactic poems spread and reinforced the new self-image and world-view of the Enlightened groups. The circle of those who could enjoy such elevated fare was still very small. Yet, through the poetic disguise of higher truths, poets began to open the difficult field of philosophical and scientific thought to the non-specialists. Didactic poems bring these views into the ladies' boudoir, the offices of government officials, preachers, teachers, and merchants, and contribute, in this way, to the consolidation and spread of a "bourgeois" consciousness. Didactic poems --like the science embedded in them-- are key building blocks in the

constitution and emancipation of the modern "bourgeoisie" and the articulation of their cultural patterns.

The arts are certainly as old as human civilization, but the manner in which we are accustomed to group them and to assign them a place in our scheme of life and of culture is comparatively recent. The institutionalization of poetry as an art reflects the particular cultural and social conditions of that time. Poetry participates in the constitution of the "fine arts" as clearly defined institutions and becomes "literature."[74] Around the mid-1700's, poetry, music, painting, sculpture, and dance were finally brought together and distinguished from mere skill or the crafts of artisans by dropping any workday function. Never as central as religion, the family, the law, or the state -- the four great institutional pillars of society-- the fine arts nonetheless became one of the key features of Western culture. In T. S. Eliot's famous phrasing in *Tradition and the Individual Talent*, "the existing monuments of art form an ideal order among themselves, embodying the mind and the conscience of Europe."[75] In its most secular form, poetry claimed no access to the mysteries of the ancient past but only a new power to do what myth has always done, to compose stories that give the world meaning in a satisfactorily human way.

Didactic poetry is not merely superficial, since it arises from the depths of established doctrines and is also the lucid medium which allows readers to "see" the workings of nature. As a didactic form of literature, poetry can contribute to the edification

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[74] Paul Oskar Kristeller, "The Modern System of the Arts," *Renaissance Thought II. Papers on Humanism and the Arts* (New York: Harper & Row, 1965), 163-227.

[75] *Ibid.*, 153.

of society and the individual. The reader must be won over to an acceptance of Enlightenment ideas. Poetry renders scientific truths more alluring, more memorable, and easier to grasp. The reader can be attracted and held by the honey of poetry, which makes learning a pleasant experience, but which also has the power to impress the reader with a sense of the divinity of Newton, his teachings, and the scientific enterprise more broadly.

Both philosophy and pedagogy return beneath the poetic mantle. Poets have resumed their historically sanctioned roles as teachers. The didactic genre guarantees the effectiveness of poetry as an educational instrument, and whatever compels poets to perform their own repeated rituals in figurative language also assures their success as agents of instruction. Didactic poets exploit poetry's coercive powers and use them as new strategies for drawing and reinforcing the boundaries of the scientific sphere in German culture. But didactic poems were not the only means employed for presenting science to German lay society. Dialogue writing, to which we turn in the next chapter, was conceived as an especially apt medium for an uneducated public. Fontenelle's *Conversations on the Plurality of Worlds* and Algarotti's *Newtonianism for the Ladies* were translated into German shortly after their publication. Gottsched, the translator, conceives of his efforts at providing a German version of these works as a worthy enterprise. But his remarks on the history of the genre also help explain why there were no original German works at the time. To this subject we now turn.

CHAPTER 5

DIALOGUE-WRITING

The Example of Algarotti's *Newtonianism for the Ladies*

1. Introduction

In 1745, Algarotti's *Newtonianism for the Ladies* appeared, as the translator put it, "in German dress." In a series of six conversations, a philosopher promises to introduce his lady to the mysteries of the whole Newtonian corpus. The lesson the uneducated will draw from these conversations, however, is not a lesson about Newtonianism or about scientific truths. It is a lesson about who the legitimate practitioners of science are or should be, and how the limits of the participation of the laity should be drawn. Algarotti's *Newtonianism for the Ladies* is a powerful means for contributing to drawing the boundaries of the scientific sphere in German culture.

Johann Christoph Gottsched,[1] the translator, added a discussion of the purpose of making this work available to a lay public preceding Algarotti's text. He also furnishes the text with a variety of footnotes that allow us to reconstruct how he envisaged this text to function in the German context. His discussion also includes comments about the

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[1] See Introduction, 27 for an introduction to Gottsched's work and role in Leipzig's cultural scene.

dialogue form as an appropriate genre for the uneducated. Therefore, this chapter begins with a brief discussion of the dialogue as genre in the broader European context, with special attention to the ways in which German authors used it. In 1726, Gottsched had already re-translated Fontenelle's *Conversations on the Plurality of Worlds,* first translated by philosopher Ehrenfried Walter Graf von Tschirnhaus in 1703. This text had been so well received by the public that by 1727, in cooperation with Breitkopf, his publisher, host, and friend, Gottsched issued a collected version of the Fontenellian texts.[2] Fontenelle's *Conversations* had made a great impact on Breitkopf's publishing style. Up until 1726, Breitkopf had only published poetry, journals, and some other small writings. Gottsched then showed him his translation of Fontenelle's work, which made such a good impression on the publisher that he decided to put it in print. A new era of nicely printed works had thus begun in Germany.[3] The boldness of the German translator and the commercial acumen of the publisher paved the way for this book to reach the German audience. For this Fontenelle would thank Gottsched personally.

A brief historical reflection on the nature of the dialogue preceded his collected edition

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[2] *Herrn Bernhard von Fontenelle Auserlesene Schriften, nämlich von mehr als einer Welt, Gespräche der Todten und die Historie der heydnischen Orakel, vormals einzeln herausgegeben,nun aber mit verschiedenen Zugaben und schönen Kupfern vermehrter ans Licht gestellet von Johann Christoph Gottscheden*, Leipzig: Bernhard Christoph Breitkopf, 1751. This was the fourth German edition of Fontenelle's *Conversations* (first 1703; second 1726, third, 1727; fourth, 1751).

[3] "Herr Breitkopf las meine Übersetzung und meine Anmerkungen durch und fand sovil Vergnügen dran, daß er sich entschloß, selbts eine Probe damit zu machen: ob er künftig einen glücklichen Verleger abgeben könnte. Er druckte auch in der That diesen fontenellischen Tractat so sauber, daß diess Büchlein, so zu reden, den Anfang der Epoche von schön gedruckten deutschen Büchern in diesem Jahrhundert abgab. Dies geschah 1726." Cited in von Hase, *Breitkopf und Härtel*, vol. 1, 66.

A brief historical reflection on the nature of the dialogue preceded his collected edition of Fontenelle's work. This discussion is a key to understanding how he perceived the Germans' position in the European world of letters. But it also helps explain why there are no original dialogues on scientific matters written by Germans themselves, and why Gottsched felt the need to turn to translations. Gottsched adopted the dialogue as a type of discourse able to teach the uneducated philosophical truths unfit for their lower intelligences. Despite his rather unflattering pedagogical strategies, he too envisioned the dialogue as a particularly effective means for fulfilling new Enlightenment tasks. The dialogue had the advantage of personalizing scientific views and distributing authority among participants. Science could be presented as an ongoing process of discovery and the readers could identify with any one of the protagonists --either male or female. The dialogue allowed a presentation of science that was neither too "dry" for the general public nor too "banal" for the learned. The dialogue was, thus, an ideal means for contributing to the creation of a broader reading public and for convincing lay readers of the importance of pledging allegiance to science.

2. German and European Traditions of Dialogue Writing

2.a. Gottsched's Discourse on Dialogues (1727)

The dialogue had been used in the European Republic of Letters as a type of discourse that claimed to be able to do things that other forms of discourse could not do. In

his *Discourse on Dialogues,*[4] Gottsched argued that although the dialogue is as old as the book of Job, nobody cultivated the art of writing such pieces as well as Plato did, "since one cannot read something more natural, more reasonable and charming than precisely these."[5] Gottsched then proceeded to discuss the works of Xenophon, the Romans Lucian and Cicero,[6] and more recent European authors such as the Spanish Vives, the French Corderus, the Italian Castellio, and the German Erasmus who all followed in the Latin tradition.[7] These authors addressed their works to young school-students, in order "to help scholarship recover from the long-lasting barbarism in which it had fallen in Europe."[8] These dialogues proved their worth with the fact that they were still profitably used in the schools two-hundred years later. Gottsched wondered, however, "why these worthy men did not also discuss other important subject-matters in dialogue form....Laurentius Valla is the only one who, to my knowledge, composed an important philosophical and theological treatise in

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[4] "Discurs des Übersetzers Abhandlung von Geschprächen überhaupt," Erste historische Abtheilung, XX-LXII, reprinted in Mitchell, ed., *Gottsched Ausgewählte Werke,* vol. 10, Kleinere Schriften, part 1, 1-72. In what follows, paraphrase this text.

[5] "...denn man kann nichts natürlicheres, vernünftigeres und anmuthigeres lesen als eben dieselbe." *Discurs*, 8.

[6] For an excellent discussion of Plato, Lucian, and Cicero's use of the dialogue see Virginia Cox, *The Renaissance Dialogue. Literary Dialogue in its Social, Political Contexts, Castiglione to Galileo* (Cambridge: Cambridge University Press, 1992).

[7] See David Marsh, *The Quattrocento Dialogue; Classical Tradition and Humanist Innovation* (Cambridge: Cambridge, Mass.: Cambridge University Press, 1980).

[8] "Um der, durch eine langwierige Barbarey verfallenen Gelehrsamkeit in Europa wieder aufzuhelfen" *Discurs*, 13.

dialogue form during that time."[9] Valla belonged to the humanist tradition that shared the faith in the possibility of reaching truth by means of disputation.[10]

In a second section, Gottsched addressed a question raised by Lord Shaftesbury: "Why we moderns who abound so much in treatises and essays are so sparing in the way of dialogue which heretofore was found the politest and best way of managing even the gravest subjects."[11] In Gottsched's view, good writers had not been lacking in any branch of scholarship since the Reformation. But these authors used a completely different way of teaching in their books, mostly a systematic way. Gottsched then considered it appropriate to ask why among so many well-known people who flourished in the previous and current century, and whose writings are highly valued by most people, no one had chosen the art of writing in dialogue form.

Lord Shaftesbury had both addressed this question and answered it:

> "Dialogues are a reflection of the spirit of those who converse. In a natural conversation, not only the capacity of the understanding but also the liveliness of the spirit and the inclinations of the heart are expressed. Thus it

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[9] "Indessen nimmt es mich Wunder, warum diese wackere Männer nicht auch andre wichtigere Materien in Gesprächen vorgetragen...Laurentius Valla ist meines Wissens der einzige, der um die damahligen Zeiten, eine wichtige Theologische und Philosophische Materie Gesprächsweise abgefasset hat." *Discurs*, 14.

[10] See Cox, *Renaissance Dialogue*, 55-77.

[11] Anthony Ashley Cooper Shaftesbury, *Characteristics of Men, Manners, Opinionns, Times, etc.* (Gloucester, Mass.: Peter Smith, 1963), vol. 2, 6.

is easy to see why Greeks and Romans wrote in dialogue form: They did not need to refrain from giving us a portrait of all qualities of their persons. They were reasonable and virtuous people. They lived in free republics, and had therefore noble souls; they did not need to speak other than what they thought out of slavish fear. When they talked to one another, they did so in a free, noble and reasonable manner befitting decent people. Thus it was no disgrace to them to see themselves painted to the life in their dialogues. But among us, according to Lord Shaftesbury, it is very different. We can be compared with the Ancients in scarcely any detail. If they were free, we are slaves. If they philosophized without fear, according to the power of natural light, we are from our youth on filled with myriads of prejudices that prevent us from using our reason. We resemble them least of all with respect to the spontaneous nature of social intercourse. What compliments, what misplaced tokens of friendship, what useless courtesies are there that an alleged state of well being has not introduced among us? In short, if the Moderns (*Neuern*) write no dialogues, this is due, according to Lord Shaftesbury, to the fact that they are ashamed of reproducing their own infamy in writing for posterity."[12]

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[12] "Sie dorften sich nemlich nicht scheuen, uns die Schildereyen von ihren Personen nach allen Eigenschafften zu geben. Sie waren vernünfftige und der Tugend beflissene Leute. Sie lebten in freyen Republicken und hatten also edle Seelen; dorfften auch aus keiner Sclavischen Furcht anders reden als sie dachten. Wenn sie also miteinander

Although Gottsched endorsed Shaftesbury's answer, he himself claimed to have another and better explanation for the lack of dialogues in modern times. He assumed that the ability to present the sciences and the arts in systematic order is a sign of a fully mature understanding:

> "In case of need, a half-scholarship can come up with a few wise sayings, some clever teachings, and a half dozen good occurrences. More is not needed to compose a dialogue. In conversations, one does not philosophize with the greatest sharpness.... In short, a systematic presentation demands a very great depth, thoroughness, and order of thought. This is why the Ancients liked so much, the Moderns so little, to write in dialogue form. The sciences were then in their infancy and youth. One only began to catch sight of single truths here and there....Today, scholarship has acquired a very

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redeten: so thaten sie es auf eine freye, edle und vernünfftigen Leuten anständige Manier. Und so war es ihnen keine Schande, sich in ihren Gesprächen nach dem Leben abgeschildert zu sehen....Ganz anders verhält sichs, nach des Herrn von Schafftsbury Meynung, mit uns. Wir sind mit jenen Alten fast in keinem Stücke mehr zu vergleichen. Waren sie frey; so sind wir Sclaven. Philosophirten sie ohn alle Furcht, nach dem Vermögen ihren natürlcihen Lichtes; so sind wir von Jugend auf durch viel tausend Vorurtheile erfüllet, die uns im Gebrauche der Vernunfft hindern. Am wenigsten sind wir ihnen im Absehen auf die ungezwungene Art im Umgange zu vergleichen. Was vor Complimenten, was vor verstellte Freundschaffts=Bezeugungen, was vor unnütze Höflichkeit hat nicht ein vermeynter Wohlstand bey uns eingeführet? ....Kurtz, daß die Neuern keine Gespräche schreiben; das kommt, nach Herrn Schafftsbury, daher, weils sie sich schämen, ihre eigene Schande schrifftlich auf die Nachwelt fortzupflanzten."

different appearance (*Ansehen*). One makes efforts to ground everything on basic truths, one explains things in a clearer way, and proves one's teachings in a more thorough way: this is why the art of writing dialogues has been considered inconvenient to present the sciences....The lack of written conversation shows nothing less than the maturity of our contemporary scholarship and the preeminence of our times over that of the ancients."[13]

In other words, to write dialogues is a second-order occupation. True scholars are bound by the nature of their knowledge to the systematic style of presentation.

Furthermore, Gottsched argues that access to this type of mature scholarship is the privilege of a few, since the systematic way of teaching is only fitting to the kind of people who have a thorough understanding and the patience for reflecting. These people are few. Even most of those who do study simply memorize what their teachers tell them or what they find in the first books they read. To those people it would be advantageous if they had many good dialogues to read: through them they would slowly be led to reflection.

Gottsched justifies the use of the dialogue and his work as translator on pragmatic grounds. Since second-order intelligences abounded in his time, and since only few people have the intellectual capacity for mature scholarship, the dialogue will play an important role:

But besides scholars, there are many other people who occasionally read

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[13] *Ibid.*, 18-19.

books, even though they never want to make a profession of studying (*aus dem Studiren ein Handwerck machen*). These people don't have the capacity for a thorough [study of the] sciences, but it would still be useful for them to get some instruction in some truths of physics and ethics. Why should they only read historical books and novels?....Among us, Protestants, the prejudice that one should leave the populace (*Pöbel*) in blindness and ignorance was removed a long time ago. Why don't we make it easy for them to acquire some knowledge? Why do we hide our scholarship in barbaric Latin?[14]

The form used is in itself an argument about the nature of the knowledge communicated. This explains why Christian Wolff, despite having told Manteuffel he would write a philosophy for the ladies in 1738,[15] soon backed down from his intention. According to Manteuffel, writing for the ladies would result in benefits for all humankind, since the ladies have immense influence on their male partners.[16] "One of the great secrets

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[14] *Ibid.*, 22-3.

[15] "Da ich vernehme, daß auch hin und wieder die Dames zu philosophieren Lust gewinne, könnte ich Ihnen einen sehr großen Dienst thun, wenn ich für Sie eine Philosophie schreibe." Heinrich Ostertag, *Der philosophische Gehalt des Wolff-Manteuffelschen Briefwechsels*. (Leipzig, 1910; reprint Hildesheim, 1980), Chapter 2, "La Philosophie des Dames," 15. See also Jean Ecole, "A propos du projet de Wolff d'écrire une 'Philosophie des Dames," *Studia Leibnitiana* 15/1 (1983): 46-57.

[16] "Ce n'est pas le seul interêt que je prens au beau-sexe, qui m'en fait pesner ainsi. Ce sexe a tant d'influence et d'ascendant sur la pluspart des hommes; mais principalement sur les jeunes gens; que de s'appliquer à les render raisonnable, c'est travailler indirectement 5

of those who have enough charity to embark in correcting men through the force of reasoning," Manteuffel writes to Wolff, "is to accommodate [one's thoughts] to the spirit and taste of those one tries to instruct... And it is foremost to this end that you have projected to write a Philosophy for the Ladies, I believe that in order to season it to the taste of the Public.... you will have to think of a form more susceptible of many pauses than a simple discourse."[17] And more to the point, since the ladies' mind is "naturally more superficial and more impatient than most males" he wondered if it would be possible at all to put Wolff's doctrine "a little more at their level."[18] Yet this is not possible. Wolff's philosophy is only fit for systematic exposition, and therefore not fit for the female mind. It could not be violated by constraining it in other literary forms: "his rigid and severe system is not suitable for literary artifices."[19] Gottsched himself had argued earlier that the maturity of modern scholarship was the reason for the lack of dialogues in his day. This discussion helps us explain why Gottsched considered it legitimate to translate Fontenelle's and Algarotti's works as well as the lack of original German pieces of a similar nature.

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rendre tel le nôtre." Ostertag, *Philosophische Gehalt*, 16.

[17] "Or, un des grands secrets de ceux, qui ont assez de Charitè, pour entreprendre de corriger les hommes par la force du raisonnement, c'est de s'accommoder au genie et au goût de ceux qu'ils tachent d'instruire....Et comme c'est principalement à cette fin là que vous avez projetté d'écrire une Philosophie des Dames, je crois pour achever de l'assisonner au goût du Public...Il faudra encor songer, à luy donner une forme plus susceptible de diversité et de pauses, qu'un simple discours." *Ibid.*, 22.

[18] "....vous demander s'il n'y auroit pas moyen, de mettre Votre doctrine un peu plus au niveau de l'esprit des femmes, naturellement plus superficielles et plus impatientes que la plus-part des hommes." *Ibid.*, 26.

[19] "Son système rigide et sévère ne se prête pas aux artifices littéraires." Ecole, "A

2.b. Theological and Literary Antecedents

By the time science was grafted into conversational forms, the dialogue had experienced a long history in Germany both in theological and literary fields. Theological polemics since the Reformation had made use of the disputational form. According to historian Leopold von Ranke, the Reformation could be described as a "big conversation," although one might rather say, a great "disputation," since the number of disputations published was in direct proportion to the violence of the actual theological quarrels that took place. By the Thirty Years War (1618-1648), this type of disquisition reached an unprecedented height.[20] Although Hans Sachs' *Reformationsdialoguen* still showed a reconciliatory tendency, soon the disputational type of dialogue became typical of the whole genre. As early as the beginning of the sixteenth century, Erasmus set a precedent in cultivating the dialogue form in his *Colloquies* (1518; first expanded edition 1522). Erasmus' dialogues were widely used in schools as a textbook of Latin conversation and thus became by far the most widely diffused of all his writings. This was a fictional, satirical type of dialogue that had its roots in the tradition of Lucian. In the first decades of the sixteenth century, Italian writers of Reformist sympathies enthusiastically embraced the

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Propos du projet de Wolff," 226.

[20] Herbert Jaumann, "Die Kommunikation findet in den Büchern statt. Zu Harsdörffers Literaturprogram in den *Gesprächsspielen*," in Italo Michele Battafarano, ed. *Georg Philipp Harsdörffer. Ein deutscher Dichter und europäischer Gelehrter* (Berlin: Peter

Lucianic-Erasmian dialogue and it seemed set to become a standard vehicle for theological and social debate. With the Counter-Reformation, however, the development of the genre was choked off, its recent history as an ally of "heresy" overlaying its respectable fifteenth-century past.[21]

This tradition of German theological debate was in sharp contrast with the Italian humanist tradition associated with Tasso and Castiglione that appeared almost contemporaneously. If the free exchange of opinions is the essence of true dialogue, in the Germanies, the conditions for a peaceful discussion were lacking until way into the seventeenth century.

Towards the end of the Thirty Years War, Georg Philipp Harsdörffer published a series of dialogues entitled "Conversational Games" (*Gesprächsspiele*). These conversations were not bound to the culture of disputation (*Streitkultur*),[22] as was the case of many humanistic dialogues of the *Quattrocento*, but to a culture of play (*Spielkultur*).[23] Harsdörffer's main contribution was to have created a new possibility for play and dialogue for his readers. He envisioned his conversations as a work of education and peace

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Lang, 1990), 163-80, 177.

[21] Cox, *Renaissance Dialogue*, 28.

[22] See Gierl, *Pietismus und Aufklärung*.

[23] See Rosmarie Zeller, *Spiel und Konversation im Barock. Untersuchungen zu Harsdörffers "Gesprächspielen"* (Berlin, New York, 1974) and Kenneth G. Knight, "Harsdörffers Gesprächsspiele und ihre Nachwirkung," Battafarano, ed. *Georg Philipp Harsdörffer*, 181-194.

(Bildungs- und Friedenswerk).[24] If we take into consideration that seven of the eight volumes were already published towards the end of the Thirty Years War, at the time of peace negotiations, it is clear that his views of the dialogue were a response to the current political conditions. He explicitly argued that Germans were already familiar with other kinds of games, such as card-games or the "game with glasses." Now they should get to know the *Conversational Games (Gesprächsspiele)* which had the advantage that no participant had to lose. These conversations differed from other disputational and polemical dialogues in that they would mainly contribute to a convivial exchange.[25] Harsdörffer emphasized time and again that his dialogues should be useful as "training" excercises for relating to other people, especially if they were practiced appropriately. In his *Poetischen Trichter*, he characterized the dialogue as "the sweet reply" (*das süße Gegenwort*), "the kind objection" (*die holde Widerrede*), "the polite conversation" (*höfliche Unterredung*), "the friendly word-exchange" (*freundliche Wortwechsel*), and the "free bond of society" (*freye Band der Gesellschaft*). As emblem he chose a young man of happy appearance (because for women it is more appropriate to be silent than to talk [*weil den Weibspersonen das Schweigen besser ansteht als das Reden*]). In his right hand, the young man held a note with the text: woe to the lonely!" *(Weh dem Einsamen")*.[26]

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[24] Irmgard Böttcher, "Der Nürnberger G. Ph. Harsdörffer," H. Steinhagen and Benno von Wiese, eds., *Deutsche Dichter des 17. Jahrhunderts* (Berlin, 1984), 301ff.

[25] G. Ph. Harsdörffer: *Der poetische Trichter*, 3. vols. (Nürnberg, 1647-1653; reprint Darmstadt, 1969), see vol. 3, "Gespräch," p. 232.

[26] Vol. 3, 33. See C. Lord and D. A. Trafton, *Tasso's Dialogues* (University of California, 1982), 26f.

Besides fulfilling a social function, Harsdörffer's *Gesprächsspiele* would educate their readers. Since he believed he was living in an era in which knowledge was making major progress, readers should be taught in a more entertaining manner than was customariliy the case with textbooks or compendia. In Harsdörffer's view, "in this way, all sciences which besides usefulness bring amusement (such as the contemplation of the stars) can be learned through this kind of dialogue in a playful manner."[27] Thus, when Gottsched turned to the translation of dialogues of a scientific nature, the dialogue as a means for informing and educating lay people was already in place. What knowledge, how much knowledge should be made accessible to the uneducated? These were contested matters, and Gottsched knew it!

3. Algarotti's *Newtonianism for the Ladies*[28]

Algarotti's *Newtonianism* followed in the tradition of Fontenelle's *Conversations on the Plurality of Worlds* that had introduced Descartes' cosmology to the French ladies and soon was translated into several European languages. This work had set forth the ideas of the "new philosophy" --infinite space and time, innumerable worlds, the existence of other unknown creatures-- in terms palatable to gentlemen, scholars, and ladies alike. In his book,

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[27] "Alle Wissenschaften welche benebens Nutzen sonderliches Belusten bringen (als die Betrachtung der Sterne ist) können auff dergleichen Gesprächart Spielweiß erlernt werden." *Gesprächsspiele*, vol. 3, 101.

[28] Francesco Algarotti, *Il Newtonianismo per le dame* (Napoli Milano, 1737).

a marquise and a philosopher, walking together in the garden of her castle on a moonlit night, enter into conversation and, turning their attention starward, contemplate Cartesian vortices and the possibility of new worlds.[29]

Algarotti's *Newtonianism for the ladies* promised its readers that they would find in it information about the complete Newtonian corpus: Newtonian optics and universal attraction. The publication of Newton's *Optics* in 1704 represented a landmark for the scientific understanding of the phenomenon of light. Written in English prose rather than Latin, the *Optics* was more accessible to a wider audience than the *Principia* had been. The *Optics*, like Newton's *Principia*, had not merely been "written." It had been issued in printed editions and discussed in all major learned journals of Europe. This does not mean that "the widely held opinion that Newton's optical work is straightforward, clear, and accessible"[30] is accurate. What cannot be disputed, however, is that throughout the eighteenth century, the *Optics* dominated the science of optics with almost tyrannical authority, and exercised a broader influence over natural science than the *Principia* did.[31] The *Optics* was received in

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[29] On Fontenelle and the French ladies see Harth, *Cartesian Women*, 123-167; for a discussion of the strict scientific content of the *Conversations*, see Kleinert, *Die allgemeinverständliche Phyikbücher*; for the British context, see Gerald Dennis Meyer, *The Scientific Lady in England 1650-1760, An Account of her Rise, with Emphasis on the Major Roles of the Telescope and Microscope* (Berkeley: University of California Press, 1955), 16-48.

[30] Casper Hakfoort, "Newton's Optics: The Changing Spectrum of Science," John Fauvel, Raymond Flood, Michael Shortland, and Robin Wilson, eds., *Let Newton Be!* (Oxford, New York, Tokyo: Oxford University Press, 1988), 82.

[31] Richard S. Westfall, *Never at Rest, A Biography of Isaac Newton* (Cambridge: Cambridge University Press, 1980), 640.

Germany with great enthusiasm. Scholars like Christian Wolff accepted Newton's conclusions solely on the basis of the experimental evidence given by Newton in the *Optics*.[32] Algarotti's *World-Science for the Ladies* (*Welt=Wissenschaft für das Frauenzimmer*), as the German translator put it, provided the reader with scientific information.[33] But more importantly, it portrayed the scientific enterprise in a way that bore little resemblance to other accounts of actual scientific practice. My analysis will attempt to show the significance that this difference had not only for the general image of science, but also for the specific German context for which the translation was deemed appropriate.

3.a. Circumstances leading to the German translation[34]

In his preface, Gottsched makes some comments that help us understand the circumstances in which and the public for which this translation was written. First, he noted that

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[32] Hakfoort, "Newton's Optics"; and *idem*, *Optica in de eeuw van Euler*, Opvattingen over de natuur van het licht, 1700-1795 (Amsterdam, 1980).

[33] On the scientific content of this work, see Kleinert, *Die allgemeinverständlichen Physikbücher*, 37-44; A. Rupert Hall, *All Was Light, An Introduction to Newton's* Opticks (Oxford: Clarendon Press, 1993), 212-14, 225, 229-33.

[34] The German translation was based on Du Perron *Le Newtonianisme pour les dames ou Entretiens sur la lumière, sur les couleurs, et sur l'attraction* Castera's (Paris: Montalant, 1738), *Is. Newtons Welt=Wissenschaft für das Frauenzimmer, oder Unterredungen über das Licht, die Farben, und die Anziehende Kraft* (Braunshweig, , 1745). All references are taken from this edition, my translations, unless otherwise indicated. I indicate the page number of the German edition in the text.

the world has for a long time given up the stubborn prejudice that the acquisition of the sciences is a privilege that only belongs to men. The fair sex, through thousands of proofs has worked its access into the sanctuary of wisdom, which it had been denied by so many...Now the deepest sciences have become their entertainment. Who doesn't admire the efforts of the great Marquise du Châtelet? And it is in fact a mistake to consider the knowledge of the world and the powers of nature as a matter form which one should exclude these delicate creatures" (2-3).

Building on the physico-theological tradition, the argument stressed the importance of science to lead people to a knowledge of God's wisdom: "There is hardly anything that could bring us to a more lively conviction of the creator's inscrutable wisdom than the examination of the forces which He has laid in nature." In Gottsched's view science has heightened human's self-understanding: "We begin to treasure humans themselves, who, despite the fall, still retain enough power to investigate more precisely the deepest mysteries." Yet this optimism had its limits. The investigation of nature cannot be exhausted, and this forces humans to be aware of their limitations: "We compare what we know with what we don't, and what we probably will never comprehend. We acknowledge our inability with humility, and finally this contemplation always ends with the hearty desire to attain the reign of perfection, in which the veil of ignorance and error will fall from our

eyes." He then concluded: "To these contemplations we all have a natural right. Neither social standing nor sex should allow us to make exceptions. The Creator has wanted to reveal himself in the realm of nature to our sons as well as to our daughters, and it is a cruelty to deny the latter access to such revelation." Here again we find similarities with Thomasius' and the moral weeklies' argument: "although some probably lack the time and opportunity for thorough insights, for those who do have the time, science can become the most appropriate remedy for the squandering of time, for eradicating ridiculous superstitions, and for allowing mothers to accustom their children from their earliest days to the knowledge of God." This is why "the *Newtonianism for the Ladies* of the great Newton appears now in German dress" (5). Gottsched noted that one should not think that, because the book was written in the form of a conversation, it is only intended for women. As we have seen, women represent but do not solely constitute the lay public to be educated. Newton's name is used to legitimate the work and increase the book's worth. Since "Newton is the author, a man whom no scholar names without the greatest respect," readers can be assured that they will find in it "most advantageous thoughts." The translator only mentions Algarotti, the actual writer, as the publisher, not the author, of the original Italian manuscript. A final observation by the translator reflects a personal concern with his deadline: given the little time he has until the next book fair in Leipzig, he has left out the author's prefaces but promises that they will follow later.[35]

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[35] I doubt they actually did, since this seems to be the only German edition of Algarotti's work.

3.b. Algarotti's preface[36]

Although Gottsched did not manage to translate this section of Algarotti's work, I will look at it briefly because it contains some explicit references that help understand the overall purpose of the work with which Gottsched had no explicit quarrels. Women should not become true scholars and Algarotti presents scientists as "initiates" and "priests" who have a privileged access to the "sanctuary of science." The use of such theological language is important for understanding later similar statements in the work.

In this preface, Algarotti praised Fontenelle for his leadership in the move toward popularization. Fontenelle (1657-1757) had begun the tradition of *éloges*,[37] brief biographies of each recently deceased member of the *Académie des Sciences*, filled with subtle psychological observations, clear and elegant explanations and evaluations of each man's work, and an overarching image of scientists as a secular sainthood in disinterested pursuit of knowledge.[38] "You were the first to bring philosophy out of the studies and libraries to introduce it in the circles and in the ladies' dressing room. You were the first to interpret for the most pleasant half of the World these hieroglyphs that were formerly only

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[36] Here I follow the French edition cited in n. 27.

[37] See Charles B. Paul, *Science and Immortality. The Eloges of the Paris Academy of Sciences (1699-1791)* (Berkeley: University of California Press, 1980).

[38] Nina R. Gelbart, Introduction to Bernard le Bovier de Fontenelle, *Conversations on the Plurality of Worlds*, trans. H. A. Hargreaves (Berkeley: University of California Press, 1990), xvii.

for the initiated. You adorned with the most beautiful flowers a field bristling with thorns..."[39] Following Fontenelle's example, he too had banished lines and figures from his work because they would make it look too serious and scare off the ladies: "Would you like me to make an outline [of the Zodiac] in the sand?" the philosopher asked. "No," she answered, "it would give my garden a scholarly air which I don't want it to have."[40]

German readers were already familiar with Fontenelle's *Conversations*. As early as 1703, a first German translation was published. In 1726, Gottsched himself produced a new translation with the justification that "no more clever (*sinnreiche*) conversations than these have been brought to light." A year later, in the Preface to his collected edition of Fontenellian dialogues he affirmed that

> books of such worth don't' lose their lovers so quickly and in such circumstances, reasonable book-dealers try to procure a new brilliance and the best reception for their business by all the means in their power. The publisher, who does not easily miss the opportunity of contributing to the honor of the German book-trade and to the enjoyment of the lovers of good books, decided to give this book the same honor it had received in Holland

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[39] "Le premier vous sçutes rappeller la Philosophie du fonds des Cabinets & des Bibliotheques pour l'introduire dans les Cercles, & à la Toilette des Dames. Le premier vous interprétâtes à la plus aimable partie de l'Univers ces hieroglyfes, qui n'étoient autrefois que pour les initiés. Vous ornâtes des plus belles fleurs un champ tout herissé d'épines..." (my transl.). Note the similarity to Addison's comments in the *Spectator*; see Chapter 3, n. 25 above.

through a new edition adorned with beautiful engravings (*Kupfer*).[41] Furthermore, the edition published a year earlier was so well received, that the edition is already completely sold out.

Despite Gottsched's optimism and appreciation for Fontenelle's work, a successful moral weekly published in Hamburg, the *Patriot,* (1724-26), contested its usefulness for the education of lay people. The editor included Fontenelle's *Conversations* in the list of reading materials recommended for lay readers. In 1724, an anonymous pamphlet questioning the Patriot's reading list was circulated in Hamburg.[42] The essay strongly objected to the Patriot's list because the books recommended in it included those of "Papists [i.e., Roman Catholics], Calvinists, half Socinians, atheists, enthusiasts and people of the kind." While the author approved of Luther's writings, he could not condone tolerance for various religions. Moreover, he took issue with two concepts implied in the *Patriot*; that all

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[40] Fontenelle, *Conversations,* 18.

[41] "Allein Bücher von so bewährter Güte verlieren ihre Liebhaber sobald nicht; und vernünftige Buchhändler suchen ihrem Verlage bey solchen Umständen , durch alles, was in ihrem Vermögen ist, einen neuen Glanz, und eine noch bessere Aufnahme zu verschaffen....Der Herr Verleger, welcher nicht lecihct etwas ansich ermangeln läßt, was zur Ehre des deutschen Buchhandels, und zum Vergnügen der Liebhaber guter Bücher gereichen kann, hat sich entschlossen, auchdiesem seinem ersten Verlagsbuche diejenige Ehre anzuthun, die ihm in Holland, durch eine mit schönen Kupfer gezierte Auflage wiederfahren war." *Auserlesene Schriften*, Preface, 11-12.

[42] "Sehr gelinde Reflexions Über den Sogenannten Patriotinen, und die von ihm Num. 8 Vorgeschlagene Frauenzimmer-Bibliothec." This is based on Wolfgang Martens, "Die Flugschriften gegen den Patriot (1724): Zur Reaktion auf die Publizistik der frühen Aufklärung," in *Rezeption und Produktion zwischen 1570 und 1730: Festschrift für Günther Weydt*, ed. Wolfdietrich Rasch et al., (Bern: Francke, 1972), 515-36.

of the works listed in the reading list were worth reading and that women were capable of reading the texts with intelligence and discretion. He further disputed the claim that Araminte, the alleged owner of the *Patriot*'s recommended library, could discuss practically any topic, including various religious beliefs. This is sufficient evidence to convince him that Araminte must be fictitious. He condemns not only those theological books he considers heretical, but also works by philosophers like Fénelon, Wolff, and Locke. He contends that, even though it may not be considered dangerous in some circles to recommend secular books by these authors (e.g., Wolff on drawing and painting), such attitudes will certainly lead to the eventual corruption of women. Moreover, he also condemns works of a scientific nature. He challenges the suggestion that Fontenelle's *Conversations* would be of any use to women.

The lady's encounter with Newtonian science is presented as a conversion experience: First, she is a Cartesian; then, she follows Malebranche, and finally she is forced to embrace the system of the man [Newton] "who would be at the head of *the Human Race, if the superiority of genius and learning decided superiority in rank.*"[43] These conversations, Algarotti notes, "could pass for a complete corpus of Newtonian philosophy. The sanctuary of the Temple will always be reserved to the priests and to the favorites of

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[43] Regarding the French translation, Michael Delon notes that Algarotti's translator tried in his own preface to attenuate the impact of this "conversion à la vérité," and so to rehabilitate Descartes, by making the fictional marquise's development seem more evolutionary. See Michel Delon, "La Marquise et le philosophe," *Revue des Sciences Humaines* 182 (1981-82): 72.

divinity, but the vestibule and the other parts will be open to the laity."[44] These observations set the stage for the six conversations that follow. The lessons the reader may draw from them have not only to do with Newtonian science, but with a certain image of science and its legitimate practitioners. At the same time, as I will show, the instruction is about who females are, "this sex who prefers feeling to knowing."[45]

3.c. A *Newtonian* lesson?[46]

In a series of six conversations, a philosopher embraces the task of introducing his lady to the mysteries of Newtonian science. He has already announced in the preface that he will take his pupil from the Cartesian vestibule to the "sanctuary of Newtonian science." By the beginning of the fourth conversation the lady is ready to enter the sanctuary. "It is time, Madame, that I take you into the sanctuary of philosophy: it is a sacred place that doesn't admit either the philosophical sinner[47] or heads full of vortices, globules, atoms, subtle matter, or other similar chimeras" (229). "All general hypotheses given so far for first causes

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[44] "Ainsi ces Entretiens peuvent passer pour un Corps entier de Philosophie Newtonienne. Le sanctuaire du Temple sera toujours reservé aux Prêtres & aux favoris de la Divinité, mais le Vestibule & les autres parties s'ouvriront pour les prophanes." Préface, l.

[45] "...ce Sexe, qui aime mieux *sentir que sçavoir.*" Preface, xlv.

[46] This section is based on the German translation. I indicate the page numbers in the text.

have fallen in disgrace."[48] "Newtonian philosophy," the philosopher assures her, "holds everything it promises" (230). Since philosophers don't make guesses, they don't venture into the darkness of first reasons (231). The ancients were ignorant of all modern inventions. "Their lack of instruments, their superstition, credulity, and the unhappy habit of preferring the wonderful to the truthful placed insurmountable barriers to the progress of the sciences" (237-8). "The original manuscripts of nature are observations and experiences" (233). These diverse experiences not only gratify our curiosity, but they are also the source of many inventions which have made our lives comfortable" (239). The lesson continues:

> He [Newton] has revealed to us the nature of light and colors; he has shown us the true and the real, without trying, as Cartesians do, to erect an imaginary system to explain its causes. Madame, you are going to see here a completely new world, enriched with the most beautiful truths; Newton has discovered them, and you won't find in them the least trace of previous philosophers. His treatise on optics cost him thirty years of investigation and work; good philosophy couldn't have a better model; just one of his experiences gives us more light than the most brilliant and ingenious system could give us (249) ... Up to here, you had seen bizarre fashions in different

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[47] French translation says profane (*prophanes*).

[48] "...alle gemeine Sätze (Hypotheses), welche man bis hierher über die erste Ursache

> systems, which have reigned successively in the empire of the imagination. Their false brilliance seduced people's pride and credulity. Now Newton brings you light and truth, which will speak to you with candor (253).

By the end of the conversation, the philosopher concludes: "this is what has to happen according to Newton's system, and also what really in fact occurs. I have had the joy of repeatedly being its witness" (264-5). The clever lady has understood her lesson, and exclaims: "Now I understand you, and realize that nature herself has pronounced the final verdict on these three systems" (265). However, when the philosopher delves into the depths of the refrangibility of the rays, the lady expresses her confusion: "You make me tremble, Sir. Is this experience not enough? Are others necessary in order to prove the diverse refrangibility? Have I allowed you to persuade me without enough reasons?" The philosopher replies:

> A charming and clever lady like you never allows herself to be persuaded by other than weighty reasons. It's just that Newton does not want you to become a Newtonian so quickly. This experience is no doubt sufficient to prove the diverse refrangibility of the rays, but not to satisfy a philosopher who wants to examine nature in a thousand different ways, and subject her

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gegeben hat, in eben dasselbe Unglück verfallen sind" (231).

to a thousand proofs, in order to be sure of what he has to believe.

The lady refuses to draw final conclusions about herself, and questions the philosopher's presentation: "Wouldn't one say, Sir, that you present nature as a real coquette, and that you give Newton the traits of a jealous man who believes he cannot trust anything?" "At least I can assure you, Madame, that nature has been all the time the object of your love. It's a pity that I cannot explain to you all the experiments he has conducted ..." The lady, who cannot take her exclusion, exclaims: "I beseech you, do make me a Newtonian!"

By the fifth conversation we learn that philosophy has already deployed its radiance on the lady: "As soon as I saw her beauty shine, I stopped being master of myself, and my ecstasy took me so far, that I have sought the means to confirm Newton's system; you can judge from this how vast my passion is!" (317). At this point, the langauge strongly resembles a religious experience as if the presence of the divine had burst in sudden eruption. After consulting Newton's oracle (369), the philosopher attempts to explain the concept of universal attraction to her. But this is beyond her intellectual powers: "Truly, you drag me into a completely new world, in which I feel completely alien" (369), the lady exclaims. "This new property," she adds, "is of such a genre that my reason cannot grasp it so easily. It is one of those mysteries that one cannot penetrate without entering into the cabinet. I understand, or at least I boast of understanding, that the rays are diversely refrangible and find enough clarity in this. But that bodies would attract light, or that

everything in nature is endowed with mutual attraction, this is an enigma that embarrasses me, and the obscurity of which I find disgusting!" (371-72).

Once she has given him the opportunity, the philosopher proceeds to complete the lesson. He emphasize that she lacks the qualities needed for being a member of the scientific priesthood! When she shows some hesitation over gravitation, the philosopher rebukes her, telling her that she needs to be thoroughly convinced: "We would do both you and Newton's system a great wrong if we tried to offer it to you without good proof." But at the same time, he withdraws this proof from her: "It's a shame that we can't expound the system to you with all the force of the demonstrations and calculations that accompany it. It will undoubtedly lose much in the process." Yet the lady's encounter with Newtonian optics has made her optimistic and, again, she refuses to accept her own limitation. "It doesn't matter," she says, "I'll be patient; since I cannot contemplate attraction with all the brilliance with which mathematicians contemplate it, I will be like those curious people, who, when they can't have a painting, make do with a print. I hope that you will make it as much like the original as possible" (377-8).

By the sixth conversation the lesson has finally convinced the lady, who sweetly accepts her fate and extends her submission to others as well: "Let us be satisfied with our weakness without grumbling; Nature does not allow us here to become complete Newtonians. She wants us to enjoy ourselves with things as they appear on the surface" (405). The philosopher surely does not try to correct her but reinforces her conviction: "I don't know, Madame, if I should further allow you to enter into the Newtonian sanctuary.

There are mysteries in this philosophy that are much more elevated than all those that I have communicated this far ... you would need to drop the little profanity you still have in you" (455-6). And this, of course, is not deemed possible. When the lady further voices her bewilderment, he scolds her saying: "Madame, you mock the most sacred things of physics, of which you do not know the reasons! Oh, how much of the profane you still have in your spirit!" (456-7). The lady is not worthy to stand in the presence of the divine. The sacred sphere has to be protected from defilement; holiness and impurity are at opposite poles. Thus, it is the philosopher's task to reprehend her.

Newton is not praised without reservation. Algarotti provides two reasons, and Gottsched feels compelled to add a third. Newton himself, "this divine man, who could be considered the founder of the sciences,"[49] has not transgressed the boundaries of science. The conversation gets to a point where they have "reached the boundaries of Nature, where ideas get dark, and God has set humans barriers. Not even the philosopher has all the keys to the Temple of truth" (473). Newton has not overstepped these limits. "Where he cannot provide the appropriate experiences, he remains silent" (475).

Furthermore, Newton "was, no doubt, an excellent man; but as a human being, he had his strengths and his weaknesses. His strength lay in geometry; his weakness, in chronological matters. This has already been noted a long time ago. Father Petau[50]

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[49] "Neuton, dieser göttliche Mann, den man wol für einen Stifter der Wissenschaften ansehen kann" (248).

[50] Dionysius Petavius (1583-1652) was a French Jesuit. In his *Dictionary,* Pierre Bayle says: "I shall not give the character of his vast and deep learning, for it may be found in a

triumphed in this type of science, as he did in many other genres, and the illustrious Englishman has not deprived him in the least from his laurels" (475).

Algarotti had ventured into a field in which Gottsched was the expert. "Hasn't poetry found in the new discoveries a source for images and penetrating descriptions?" (242). Gottsched could not let this pass without intervening: "prisms, airpumps, and all these diverse instruments that have revealed to us so many beautiful mysteries, can be used in comparisons and descriptions. These are fit for 'didactic poetry' but not so for epic, pastoral or idyllic poetry." In these genres, images have to be natural. Furthermore, "since a poet speaks for everyone, the readear must be able to understand him without having learned the difficult sciences such as mathematics, physics, and geometry" (242-3).

What, then, is the Newtonian lesson? Has Algarotti merely "explained the facts of science to men and women who had no professional interest in it?" Have we witnessed "The triumphal march of the Newtonian paradigm?"[51] Has scientific information merely sifted from the higher spheres into the heads of the uneducated?[52] Readers were already familiar with Fontenelle's *Conversations*. The German versions of this text were all based on editions based on the second French one, to which Fontenelle had added a sixth evening, in which he corrected the first edition that had left his lady "learned." Erica Harth argues

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new book sold by all Booksellers (*The Elogies of Illustrious Men,* by Mr. Perrault, vol. 1, 63 & seq. of the Dutch Edit, 1698)." *The Dictionary Historical and Critical of Mr. Peter Bayle* (New York: Garland Publishing, Inc., 1984), vol. 4, 600.

[51] Introduction, nn. 2-3.

[52] *Ibid.*, 14.

that Fontenelle took it for granted that scientific knowledge had to remain the property of the specialists. She shows that Fontenelle's goal was to gain prestige for the new philosophical party. The *Conversations* were to serve as publicity, literally as advertising display, as a bid for public support of the scientific interest group. That the public is incarnated in a lady was no accident. As a titled lady, she calls to mind the Cartesian *salonières*. Socially, Fontenelle's marquise is a powerful figure to contend with; her sex, however, makes her an inferior. Thus she is the perfect vehicle for Fontenelle's propaganda. As a marquise she can lend her prestige to the new enterprise. As a woman, however, she will remain safely on the outside of scientific practice and its potential power. This convenient discrepancy between gender and social rank is the reason that Fontenelle makes her a spectator of a scene in which she, unlike the members of the *Académie des Sciences*, will never attempt to intervene. Furthermore, as a marquise, she is taken seriously enough by Fontenelle to be the emblem of the "ignorant people" he wishes to convert; as a woman, she prefigures the larger public who would admire the wares of philosophy while remaining safely outside its workshops. At the end of the first edition of 1686, Fontenelle leaves his Marquise learned. But by the second edition of 1687, he withdrew from her even this minimal right of participation in the new philosophy by returning her to her separate sphere of pleasure at the end of the sixth evening. By 1687, the Marquise had been converted into a permanent spectator of masculine knowledge. Neither Fontenelle's nor Algarotti's projects were truly projects on educating lay people. They were an effort in advertising display. Their purpose was not that the whole public become members of the "elect." The type of

education offered ensured that its public would get a sufficient smattering of this culture to remain outside the circle of "learned scholars" and yet be able to appreciate their work. Once won over to the cause of science, this public would do everything it could to spread the good news of science to society at large.

Algarotti's lesson was a frank imitation of Fontenelle, as he himself acknowledges. Fontenelle's work, however, was a product of the French salon, which was non existent in Germany at this time. In Germany, it appealed to women of a somewhat lower class --maybe women who aspired to be what Fontenelle's marquise actually was. The title page of the German edition shows that the lady and the philosopher have abandoned the garden of the aristocratic marquise of the French edition and moved into the study of the German scholar. Algarotti's text makes information on Newtonian philosophy available to more people. But this information is embedded in myth-making imagery that enhances the authority of scientists and their pronouncements. The overall result of this presentation is the illusion that science is not human-made, but "nature's" transparent talk. Nature herself pronounces verdicts to settle disputes. Nature herself does not want the lady to become a Newtonian too easily! Newton's pronouncements are not only a reflection of Nature but also an oracle that may be consulted at will by the scholarly priests. This oracle includes a verdict on women's nature. If God has chosen to reveal himself to Newton, there is no other access to divinity than through his gifts of divination. Thus, women's exclusion from the sanctuary of philosophy is sanctioned not only by Nature, but also by the divinity itself who has chosen to speak through Newton, and

the philosopher, his interpreter. The natural order is God's order. Still only a selected few are granted access to the sanctuary of science. Only a few have the privilege of the intellectual qualities that makes them valid members of the scientific priesthood. It is the duty of any good priest, however, to dispense the divine mysteries to the uninitiated for their moral improvement and eternal bliss. By doing this, their task is also to ensure that social roles stay in place while reinforcing their own position of authority. In other words, instruction about science is at the same time instruction about who the scientist and the pupil are. Newton's insights about optics and universal gravitation were "disseminated" among more people, but true access to them was to remain the privilege of a few.

4. Conclusion

The choice of genres for making science public was not accidental. Didactic poetry and the dialogue were engaged as the most appropriate means for addressing the uneducated, that is, they were said to be fit for a certain type of intelligence that scholars believed most uneducated people had.

Dialogues are not only indicative of who the intended readership is. These genres also establish the difference between those who have true access to the miracles of science and those who have to remain irremediably as outsiders. This difference has implications for both how the type of knowledge conveyed should be appreciated and how the difference between the legitimate producers and the consumers of this knowledge should be perceived.

In other words, these genres reinforce the difference between the knowledge to which poets or Algarotti and the German translator who serve as mediators have access, and the knowledge conveyed to the lay public. At the same time, the message in both cases is that higher truths lose their status in this process. The difference between high and low science is established. The public culture of science, however, was not only a literary culture. Therefore, we need to move now to another means employed for making science public: public forms of display. The case of electricity challenges some of the accomplishments of literary culture and, ironically, appears as the embodiment of the boldest claims of the educated: everyone should have access to science. This only becomes a reality when science gets out of the hands of well-intentioned elite scholars. This is the topic of the next chapter.

CHAPTER 6

Public Displays of Science: The Life and Times of Electricity in Leipzig, 1740-1750: Trivial Entertainment or Serious Study?

Fig. 7 Electrostatic Experiment
Source: Bildstelle, Deutsches Museum

Fig. 8 Christian Wolff
Source: Sächsische Landesbibliothek, Deutsche Fotothek

1. Introduction

Early in the eighteenth century, public lectures were held at the University of Leipzig and other sites. These performances faced strong opposition from University officials and serious savants. Although information on these activities is scant, some evidence has survived and serves to show that interest in public demonstrations was both growing and, as a result, facing opposition for various reasons.[1] The story of electricity in Leipzig that this chapter tells in greater detail proves that the growing curiosity of fair-minded people, the excitement of serious scholars with the new natural forces that fascinated them, and the sagacity of those who soon learned how to exploit the available resources converged in expanding the participation of a broader lay public in the world of science.

In 1710, Johann Christian Lehmann became the first physics professor at the University of Leipzig in recognition of his skill in experimental physics (*Physica experimentalis*).[2] His public performances in these matters faced such an opposition that he performed his demonstrations for "interested audiences" in a garden pavilion, at his

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[1] Records of public meetings cited in pre-war literature are no longer available either at Dresden or at Leipzig. This section, therefore, is based on these publications, esp. O. Wiener, T. Des Coudres, "Das Physikalische und das Theoretisch-physikalische Institut," in *Festschrift zum 500jährigem Jubiläum der Universität Leipzig,* vol. 4 (Leipzig: Hirzel, 1909).

[2] "Die Professionem Physices auf der Universität Leipzig, Dr. Christian Lehmann, seiner gerühmten guten Geschicklichkeit halben, so er sich in Physica experimentali beygeleget." "Ersetzung der Professoren=Stellen in der philosophischen Facultät zu Leipizg, 1668-1731," Sächsisches Hauptstaatsarchiv Dresden, Loc. 10538.

own expense, with the assistance of the *mechanicus* Johann Jacob Leupold. The theologian Olearius opposed the experimental practice of the chemist Johann Christoph Scheider, alleging that the repulsive smells that such practice produced disturbed the work of other scholars.[3] Karl Hufbauer states that in 1710 the Elector of Saxony appointed Scheider to a new ordinary chair of chemistry and ordered the University to provide him with a laboratory. Using various forms of resistance --which Hufbauer does not describe--, the Faculty managed to force Scheider to withdraw in 1714.[4]

Demonstrations also had their dark sides for serious scholars. Kästner complained that even students came to physics lectures expecting to be entertained.[5] He had to give up teaching from a manual, then the standard lecture course, because most of his students wished to "see" physics, not to learn anything about it. In his autobiography, Kästner compared the seriousness of the French officers who attended his courses with the lightness of the German students.[6] He preferred to lecture to these officers because

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[3] "Oeffentliches Laboriren und Demonstrieren stieß auf wütenden Widerstand. Zunächst gab es einen Protest des Theologen Olearius gegen die Unbterbringung und das Experimentieren des Chemikers Scheider im Paulinum, da in dergleichen Laboratoriis nicht nur Arsenicalia...als das stärkste Gift..., sondern auch Antemonialia und Spiritus urinosi....so einen gräßlichen Gestanck verursachen, unumgänglich zu pflegen praepariret zu werden, zu geschweigen, daß der Dampf an isch selbst wie ein Gifft ist und nebst der anderen specificirten Dinge Rauch denen Gelehrten und allen studiosiis, die mit dem Kopfe arbeiten sollen, fast unerträglich ist." Cited in E. Friedberg, *Die Universität Leipzig* (Leipizg, 1909), 42-3.

[4] Hufber, *The Formation of the German Chemical Community,* 256-7.

[5] Abraham G. Kästner to J. E. Scheibel, April 1 1799, in Kästner, *Briefe aus sechs Jahrzehnten, 1745-1800* (Berlin: Behr, 1912), 218.

[6] "Ich fand aber wenigstens bei denen, die sich meines Unterrichts bedienten, daß sie in

"playing with experiments has never been my inclination."[7] Towards mid-century, however, there was an explosive outbreak of enthusiasm regarding all things electrical. To this story we now turn.

2. The Career of Electricity in Leipzig

"Wouldn't you say, dear reader, that we live in an electrical century? No subject is talked about so much nowadays as electricity."[8] writes Johann Gottlieb Schäffer in the preface to his *Electrical Medicine* (1766). The decade between 1740-1750 led to a definitive incorporation of experimental natural philosophy into the University curriculum. Yet, in the eighteenth century, conducting experiments was not an activity disciplined through formal instruction or codified by professional rules. The study of electricity was in its infancy, and as Joseph Priestley pointed out in his *History*, everybody with the appropriate apparatus could make discoveries and contribute to its development. This was, consequently, the era of the amateur scientist and the collector-

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der Naturlehre einen besseren Geschmack hatten...um tiefere und gründlichere Einsichten bemüht waren, als die meisten der deutschen Studierenden." Rudolf Eckart, *Abraham Gotthelf* Kästner's Selbstbiographie und Verzeichnis seiner Schriften (Hannover: Ernst Geibel, 1909), 13.

[7] *Ibid.*

[8] "Schein(e)t es nicht, geneigter Leser, als wenn wir jetzo in einem electrischen Seculo lebten? Man höret in unsern Tagen von keiner Materie so viel sprechen, als von der Electricität." *Elektrische Medizin oder die Kraft und Wirkung der Electricität im menschlichen Körper und dessen Krankheiten besonders bey gelähmten Gliedern aus Vernunftgründen erläutert und durch Erfahrungen bestätiget* (Regensburg, 1766).

patron. At this time, many areas of experimental physics were still integrated in the social world of the emerging "bourgeois" cultural business. The field of electricity is probably the most outstanding example of a branch of science that is generally neither professonalized nor an activity excluded from the public domain, but that certainly enjoyed an extraordinary great popularity. The Dutch historian Johan Huizinga put forward the thesis that much of human progress was attributable to the instinct of play.[9] Play seems to be a particularly strong factor in eighteenth-century experimental science. Thus, in order to grasp the complexities of electricity's career in the world of the Enlightenment, we cannot devote our attention only to the traditional organizational structures for the production of science (the university and the academy). I want to invite you to follow me to the various areas in which electricity roused the curiosity of different groups and individuals and to examine the different media that satisfied this growing interest in things electrical.

The actual pathbreakers in electricity research in Germany were scholars from the University of Leipzig: philosophers Christian August Hausen and Georg Mathias Bose, and philologist Johann Heinrich Winkler. From 1705 on, there was a slow growth in electrical research in England and France.[10] The new views developed did not in the first

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[9] Johan Huizinga, *Homo Ludens: a study of the play-element in culture* (Boston: Beacon Press, 1955).

[10] For a thorough account of the history of electrical theory see John L. Heilbron, *Electricity in the 17th and 18th Century* (Berkeley: University of California Press, 1979), and W. D. Hackmann, *Electricity from Glass: The History of the Frictional Electrical Machine, 1600-1850* (Alphen aan den Rijn: Sijthoff & Noordhoff, 1978).

instance find resonance in Germany.

Eighteenth-century historian of electricity Daniel Gralath (1708-1767), a former judge, the mayor of Danzig, and the founder, director and leading spirit of the Danzig scientific society, records that, in Germany, the study of electrical phenomena was, as early as 1730, considered a closed problem and an uninteresting branch of science. Gralath made Christian Wolff co-responsible for this standstill. Wolff had close contact with the scientists of his time. According to Paul Hazard, his contemporaries called him The Sage, the name of philosopher not being good enough for him. Whole nations admired him. France admitted him to honorary membership of the *Académie des Sciences*, the highest distinction they had to bestow. The English had a number of his works translated, convincing evidence of the esteem in which they held him, coming as it did from a nation who considered themselves as unrivalled in the sphere of thought and philosophy.[11] Wolff served as Peter the Great's main adviser in the long and tedious preparatory work which led to the founding of the St. Petersburg Academy of Sciences in 1725.[12] Wolff's contribution was key to the establishment of experimental philosophy in the German University in the eighteenth century.[13] Wolff saw in the investigation of electricity only a propaganda medium of the British, aimed at establishing Newtonian

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[11] *La pensée européenne au XVIIIè siècle,* 1946, English, *European Thought*, 40, 38.

[12] Alexander Vucinich, *Science in Russian Culture* (Stanford, Ca.: Stanford University Press, 1963), 48.

[13] See Georg Pahl, *Geschichte des naturwissenschaftlichen und mathematischen Unterrichts* (Leipzig, 1913); Friedrich Paulsen, *Die deutschen Universitäten und das Universitätsstudium* (Berlin 1902, reprint Hildesheim, 1966).

physics. In a letter to Gralath he wrote in 1743: "But because people are of the opinion that electricity is not so common as he (Guericke) already seems to believe, they have not bothered much about it.[14] In the same letter, Wolff reports his views on this issue to Gralath:

> Because in England they wanted to introduce *attractionem universalem*, they also began to undertake *experimenta de Electricitate*. Since I am no friend of this enterprise, I did not take account of them at the time when I was writing my *Experiments*, for the reason that I did not see any special use for the few that were then available.[15]

This was not in any case a subject on which he wished to dwell: it smacked too much of those detestable attractions. For Wolff, "everything works mechanically; the physical world is nothing but a clock; physics is `mechanical philosophy.'"[16] The physicist should

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[14] Weil man aber vermeyent, daß die Elektrizität nicht so allgemein sey, wie er (Guericke) schon zu vermeinen scheine, so hat man sich auch darum nicht viel bekümmert.Letter from Wolff to Gralath, 31.12.1743, cited in Daniel Gralath, "Electrische Bibliothek, Zweytes Stück, *Versuche und Abhandlungen der Naturforschenden Gesellschaft in Danzig* 3: 326.

[15] "Nachdem man in England die attractionem universalem einführen wollen, so hat man auch angefangen die Experimenta de Electricitate vor die Hand zu nehmen. Da ich nun von derselben eben kein Freund bin, so habe zu der Zeit, da ich die Experimente geschreiben, auch nicht darauf Acht gehabt, indem ich von den wenigen, welche dazumal vorhanden waren, keinen besonderen Nutzen zu zeigen wußte." *Ibid.*

[16] Wolff, *Cosmologia* (1737), # 127 and 138, cited in Heilbron, *Electricity*. 45.

have nothing to do with occult qualities and he should therefore reject action at a distance, attractions understood as a primitive force.

A year later, however, in a letter to Manteuffel dated 3.8.1744, Wolff modified his responsibility only a little and blamed the Cartesians: "That no one paid attention to these experiments was the fault of Cartesianism, which eliminated all *attractiones* from nature."[17]

He reinforced the view that electricity should be explained with mechanical causes, that is, with the help of "vortices Cartesianas."[18] Even in letters from 1747, he expressed his hope that the electrical experiments would have convinced the British of the untenability of the "whimsies of the vi attractione."[19] Gralath thus observed in 1756 that Wolff was not willing "to see [any] effects of universal attraction, let alone to search for them."[20] Only in the late 1740's did Wolff begin to find the subject "useful," and its experiments worth recommending as so many confutations of "Keill's whimsies about attractive force."[21]

From about 1742 on, an explosive development displaced the center of the

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[17] "Daß man aber auf diese Experimente keine Achtung gehabt, war der Cartesianismus Schuld, welcher alle attractionen aus der Natur eliminierte." Cited in Ostertag, *Philosophische Gehalt,* 65.

[18] *Ibid.*, 64, 67.

[19] "*Grillen von der vi attractionem.*" *Ibid.* 133f., 137-9.

[20] "Anziehungwirkungen zu sehen [geschweige denn] zu suchen." (ref!) On Wolff's rejection of universal attraction as an "occult quality" see Heilbron, *Electricity*, 43ff.

[21] Wolff, *Allerhand Nützliche Versuche* (1745-7), 150.

electrical initiative for some years to Germany. Leipzig electricians awakened the electrical machine to new life.

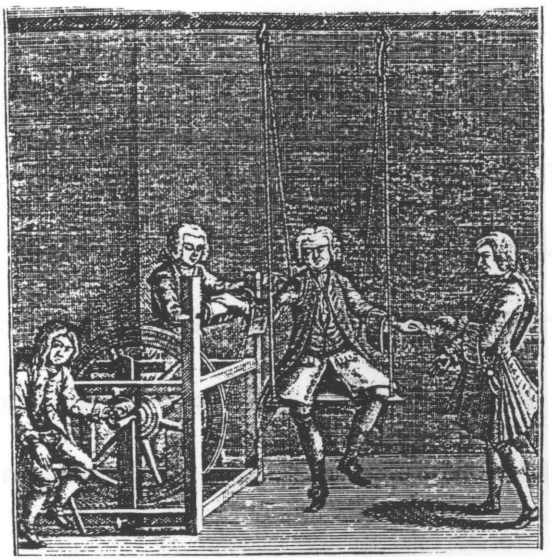

Fig. 9 Electrical Machine
Source: Joh. Gottlob Krüger, *Zuschrift an seine Zuhöhrer*, 1745
Bildstelle, Deutsches Museum

Christian August Hausen is even mentioned as the one who invented the electrical machine for the second time. As was current among learned men, Hausen took a study trip (1716-17) that took him to Paris and London, and that allowed him to make acquaintance with Newton, Halley and Desaguliers, among others.[22] There he witnessed electrical experiments and, when he returned to Leipzig, he established the first experimental series of lectures that had electricity as its subject. This presumably took place in a room of his house, since this was not only the destination of students, but also of many distinguished and noble people, who, on the occasion of a visit to the fair,

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[22] Hackmann, *Electricity from Glass*, 47f.

wanted to be witnesses of the wonders that could be seen at the famous professor's home. A prospective student from Niedersachsen, for example, expressed his wish "to be able to enjoy for a while the instruction of Your Excellency and of the Master of the House. I am in my twenty-third year, an age which has not yet excluded a person from the hope of thoroughness...How happily would I exchange my fatherland for the flowering city of Leipzig."[23] One can barely imagine what a "magic" effect the electrical experiments might have had on their spectators. If their enlightened thinking forbode many to believe in such magic arts, the insecurity this caused them was still big. Hausen might have appeared to some as the true Prometheus, who had brought humans fire or, better, knowledge.[24]

Georg Matthias Bose, called in 1739 to hold the chair in physics (*Naturlehre*) at Wittenberg, became famous not only because of his design of the electrical machine. The following decade, he would also become an influential author and at the same time, the most eccentric showman and poet of electricity. His electrical displays performed in public with a good deal of showmanship fired the imagination of his spectators, including

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[23] "E. Hochedlen und des Herrn Hausens Unterricht eine Zeitlang geniessen zu können. Ich bin in meinem 23. Jahre, einem Alter welches man von der Hoffnung zur Gründlichkeit noch nicht ausgeschlossen;" and he exclaimed: "Wie gerne wollte ich um Ostern mein Vaterland mit dem blühenden Leipzig vertauschen." *Gottsched Briefwechsel*, VIa, 1740, 14, 16.

[24] Prometheus stole fire for men: took over the task of creation and thought of a way to make mankind superior. He fashioned them in a nobler shape than the animals, upright like the gods; and then he went to heaven, to the sun, where he lit a torch and brought down fire...and now, though feeble and short-lived, mankind has flaming fire and therefrom learns many crafts. Edith Hamilton, *Mythology. Timeless Tales of Gods and Heroes* (New York: Little, Brown & Company, 1942), 74-5.

that of his more serious fellow scholars. Bose knew how to present the most accomplished electricity comedy. If the broad field of electricity had already offered enough opportunities for stimulating entertainment, this was even surpassed when humans became the object of experimentation. No aspect of physics had made this possible before. Bose made the "electrical kiss" known. When he held a meeting, an attractive, isolated lady had to offer the guests the welcome kiss. Since she was connected to an electrical machine, there always was a rumbling amusement, when the guest, surprised by the electrical shock, pale with fear, moved back or had to sacrifice a tooth due to a clumsy reaction. Even though these "electrical kisses" could be very painful, they enjoyed an unrestricted popularity.

Fig. 10 The Electrical Kiss
Source: Bildstelle, Deutsches Museum

Bose's second show was the "beatification," or fiery (holy) halo.

Fig. 11 Beatification
Source: Heilbron, *Electricity*, 269.

An initiated person stood in contact with an electrical machine and, following an agreed upon sign or after invoking the heavens, he was surrounded by a radiant contour in the dark room. (An electrified plate above the evacuated crown discharged a halo.)

Beyond this, Bose also became known for his poetry. In 1744 he published his didactic poem "The discovery and progress of electricity outlined with poetic pen" (*Die Electricität nach ihrer Entdeckung und Fortgang mit Poetischer Feder entworffen*). Here he tried to encourage his colleagues, the didactic poets, who, as we have seen in Chapter 4, already dealt with numerous aspect of science, to sing the praise of the electrical wonders:

You, poets, inspired with Apollo's lightning bolt

who paint nature so beautifully, so vividly;

won't one of you stand up, and raise a memorial

to the proud oddities of electricity?

Arise, my muse, arise. Bear witness through my mouth

to the most incomprehensible of all wonders.

Make my pen remain high, fiery, and virile.

Let it describe marvelously what is so marvelous to see.[25]

A third Leipzig electrician was Johann Heinrich Winkler, then still professor of ancient languages at the University of Leipzig. Winkler had heard of Hausen's experiments at the table society (*Tischgesellschaft*) held weekly by Cabinet and State minister Count Ernst Christoph von Manteuffel, and was determined to be Hausen's successor. "The Count not only watched this novelty of nature for himself, but he also made it popular among people who distinguish themselves from others by their standing and reason,"[26] reported Winkler. When Hausen died, Winkler took over his electrical

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[25] Ihr Dichter, deren Geist Apollens Blitz bestrahlt,
Und die ihr die Natur so schön, so lebhaft mahlt,
Steht keiner von Euch auf, den stolzen Seltenheiten
Der Electricität ein Denckmahl zubereiten?
Auf meine Muse, auf. Jetzt thu durch meinen Mund
Das Unbegreifflichste von allen Wundern kund.
Verschaffe, daß mein Kiel hoch, feurig, männlich bleibe,
Was wunderbahr zu sehn, auch wunderbahr beschreibe.
(XI-XII)

[26] "Der Herr Graf sah nicht nur selber diese Neuigkeit der Natur an, sondern machte sie

inventory, and within two weeks, he had already tried everything known up to then. Hausen had already had many people rushing to his house at fair time, especially from the higher estates. To Winkler, the son of a poor worker of a rented mill *(Mühlenpächters)* from Oberlausitz this was very appealing. And he was, indeed, not disappointed. His home became one of the most visited in Leipzig.

Manteuffel was a key figure between science and politics in Saxony. His home was always open to local and foreign scholars and politicians for discussions. He repeatedly played the role of the typical extra-academic sponsor of electricity. His unpublished correspondence makes it clear that he was convinced of the political significance of science. He affirmed, for instance, that "the sciences and commerce [are] the two most important means of restoring an exhausted and brutalized country." In a letter to Mme. Gottsched he adds: "It is not enough that a sovereign cultivate [the sciences]; it is also necessary that he open his purse to scholars, and that he open it even more ... than others do."[27] Building up a collection of the necessary equipment for experimental practice was an expensive business. The professor of experimental physics was expected to furnish some if not all of his equipment.[28] The extent of the collection,

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auch bey Personen, welche Stand und Vernunft von andern unterscheiden, bekannt und beliebt." J. H. Winkler, *Gedanken von den Eigenschaften, Wirkungen und Ursachen der Elektricität*, 1744, 127.

[27] "...les sciences et le commerce...sont les deux principaux moyens pour retablir un pays epuisé et abruti....Il ne suffit pas qu'un Souverain ...cultive les sciences; il faut encore, qu'il ouvre la bourse aux savans, et qu'il l'ouvre même plus largement que d'autres. " *Gottsched Briefwechsel*, VII, 1741, 23.

[28] O. Wiener, "Das Physikalische und das Theoretisch-physikalische Institut," 24-69.

and hence of instruction, was proportional to the depth of the professor's pocket, "there being no public subsidies for the improvement of knowledge."[29] Bose had already complained that he had had to pay "ready money for all my instruments, without exception, from my air pump to my funnel."[30] Mantueffel, a ready sponsor of learning and electrical matters, knew that the professor or demonstrator was not regarded as a good credit risk and therefore required external help.

Manteuffel ordered the construction of "a new machine for the new invention."[31] The construction of Winkler's electrical machine was the result of an intensive cooperation with the lathe-turner (*Drechslermeister*) Johann Friedrich Giessing. Winkler took many orders from Manteuffel, but also from visitors to the Leipzig fair. Gralath writes therefore with good reason, that "Electricity would have to thank chiefly this shrewd statesman and great promoter of the sciences for its reception and rapid growth."[32]

Royalty also fell prey to the frenzy for electricity. The Leipzig newspapers, which

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[29] Kästner to Haller, Aug. 1 1755, Kästner, *Briefe* (1912), 35, cited in Heilbron, *Electricity*, 148.

[30] "Il me faut payer argent comptant tous mes instrumens, sans excepter aucun, depui ma pompe pneumatique jusqu'à l'entonnier, pourtant je suis professeur en physique. A plus forte raison mes téléscopes, la pendule, les micromètres, etc., ne sont acquis qu'à mes propre[sic] dépens, n'étant que des opera supereogationis, où je travaille pour aisni dire par pur [sic] magnanimité." Bose to Gottsched, *Gottsched Briefwechsel*, XII, 1750, 23-4.

[31] "eine neue Maschine von der neuen Erfindung verfertigen." Gralath, *Abhandlungen* I, 1747, 279.

[32] "Es habe also die Elektrizität ihre Aufnahme und schleunigen Wachstum diesem klugen Staatsmann und großen Beförderer der Wissenschaften, gröstentheils zu verdanken...." Gralath, *Abhandlungen*, 1744, 19.

described the most recent events weekly, reported "how the royal Elector Xavier had observed the electrical experiments."[33] Furthermore, in addition to its already numerous amusements, the aristocratic world had discovered a new one: electricity as an amusement (*Elektrizitätsbelustigung*). After finishing a meal, an amateur physicist or a scholar displayed the electrical wonders. One of the most popular demonstrations was the electrical child (fig. 12). For this purpose, the person in charge used a "globe-electrical machine" consisting of a glass globe put into rapid rotation by a large wheel and circular cord. An assistant rubbed it with his hand. A boy, suspended with his feet near the globe, in turn electrified a second boy standing in a vat full of solidified pitch or wax.

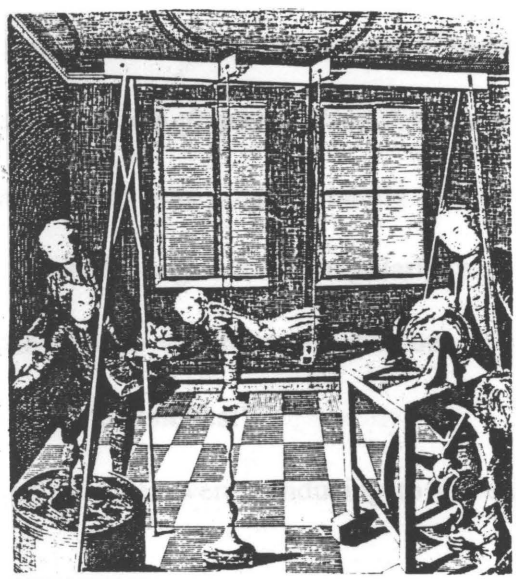

Fig. 12 The Electrical Child
Christian August Hausen, Novi Profectus in historia Electricitatis, Leipzig, 1743.
Source: Bildstelle, Deutsches Museum

This growing interest in electrical matters beyond the strict academic milieu in

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[33] "wie der Königl. Chur Prinz Xaverius...die electrischen Versuche in Betrachtung gezogen hätte." *Leipziger Blätter* 1745, 27.

rather private circles of high society speeded the German electricity boom. "The whole of Leipzig was thus again encouraged to become acquainted with the wonders of electricity,"[34] wrote Winkler. "In all social gatherings, new experiments were repeatedly conducted, so that something was observed almost daily that had up to then been hidden."[35]

Electricity expanded and transformed the traditional institutional basis of science. Some scientific societies, for instance, owe their emergence to their members' desire to participate in the electrical discoveries of their Saxon colleagues. This is true for the *Naturforschende Gesellschaft Danzig* of 1743, which was mostly led by Gralath's initiative. But already the year before the "Society for the Lovers of Truth (*Wahrheitsliebende Gesellschaft* also referred to as *Les Alétophiles*) in Stettin was founded. This new branch was created mainly out of interest in the investigation of electrical matters. "Our meetings are held regularly; each member gives proof of his zeal through some machine with which he enriches our collection....We electrify with great enthusiasm in our small assemblies!"[36]

Several circumstances were conducing to the expansion of interest in electrical

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[34] "Ganz Leipzig war hierdurch auf das neue ermuntert worden, das Sonderbare der Electricität kennen zu lernen." Winkler, *Gedanken*, 132.

[35] "In allen Gesellschaften wurden daher immer neue Versuche angestellt, wobey man fast täglich etwas anmerkte, was annoch war verborgen gewesen." *Ibid.*

[36] "Nos assemblées se tiennen reguliérment, chaque membre donne preuve de son zèle par quelque machine dont il enrichit notre cabinet...Nous éléctrisons à force dans nos petites assemblées!" *Gottsched Correspondence* IX, 1744, Stettin, 216.

phenomena, not last, that Hausen, Bose, and Winkler worked precisely in Leipzig, the town of the fairs, in which at least twice a year a public keen of hearing and anxious for novelties had a rendevouz. The phenomenon of electricity stays underdetermined if one pursues its success only in the context of traditional institutions such as the university and the academy. Electricity proved, on the one hand, its practical usefulness to social life. On the other hand, it responded to the educational and entertainment needs of an eighteenth-century public which was repeatedly fascinated by scientific themes, and watched, marveled, and probably feared its magical appearance.

Gralath reports that "the lecture-halls and studies of the physicists (*Naturforscher*) in which the [electrical experiments] were performed were no longer restricted to students, but were visited by people of both sexes and of higher and lower standing."[37] Here "of both sexes," and "of lower standing" have, of course, to be seen rather critically. It is clear that a broader public did not take part in university professors' lectures. The interests of these groups were served rather by the growing numbers of traveling "electricians," who were in great demand.[38] There were always people who, behind the novelty of electricity, with unfailing instinct, saw a chance to make money,

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[37] "die Lehr-Saale und Studier-Stuben der Naturforscher worin die [elektrischen Versuche] aufgeführt wurden, blieben nicht mehr denen Studierenden eigen, sondern sie wurden von Personen beyderley Geschlechts, vornehmen und geringern Standes besuchet."

[38] See A. Kistner, "Die `Elektrizitätsbelustigung' im achtzehnten Jahrhundert," *Himmel und Erde* 21 (1909): 312-319 and, although for a later period and souther area, A. Rüger, "Die Populäre Naturwissenschaft in Nürnberg am Ende des 18. Jahrhunderts: Reisende Experimentatoren, öffentliche Vorlesungen und physikalisches Spielzeug," *Berichte zur Naturwissenschaft* 5 (1982): 173-91.

and brought this and that experiment to the yearly markets. Even Benjamin Franklin first encountered an electrical machine through a traveling electrician.[39]

Fig. 13 Electrification for One Schilling
Source: Vierhaus, *Die Wissenschaften*, 245

Traveling electricians moved with their strange apparatus from place to place, and found everywhere a curious public for their astonishing experiments with the mysterious natural force. The delight in the wondrous, apparently supernatural, procured a good livelihood for all those who knew how to repeatedly perplex the broader public with ingenious performances or decorate the simplest experiments in good theatrical manner. Even as late as 1829, the *Frankfurter Zeitung* announced the demonstrations of a traveling electrician as "a magician's evening entertainments" (*Abendunterhaltungen eines Zauberers*).[40]

Electricians devoted a good part of their efforts to the construction of toy mechanisms like the "electrical roasting jack," "the electrical spider," or the "electrical

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[39] Heilbron, *Electricity*, 324.

[40] H. Fricke, "150 Jahre Physikalischer Verein Frankfurt/M." (Frankfurt a. M., 1974), 21.

bell."[41] Little animals, for instance, were killed with an electrical spark. There were of course enough people who enjoyed this new fashionable way of killing. To be a Jupiter in command of lightning once in one's life, at least in the world of the flies, sparrows and mice, this had its appeal! These toys were the fruit of a widespread enthusiasm and also of the perspicacity of their inventors, who knew how to capture the signs of the times. In the end, these trivialities had another meaning: serious researchers also wanted to know that a larger public was keen in following their efforts competently and would grant them honor. With such trivialities, the physics of those days acquired broader appeal. It won enthusiastic practitioners and many generous benefactors.

But not everything was mere play. The eighteenth century was deeply convinced of the usefulness of natural philosophy. In almost every physics compendium of the time there is a paragraph that lists the reasons why it can be good to cultivate physics: Physics leads to the knowledge of God; it is knowledge for its own sake; it serves for entertainment purposes, to combat superstition and for practical-technical uses.[42] An

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[41] See Kistner, "Die `Elektrizitätsbelustigung;'" Johann Heinrich Winkler, *Grundriss einer Ausführlichen Abhandlung von der Electricität* (Leipzig, 1750), 15; and Benjamin Franklin, *Briefe über die Elektrizität*, 1758.

[42] "Vernünftige Wesen werden durch nichts so sehr zur Erlernung einer Wissenschaft gereizt, als wenn man sie überführet, wie wichtig, nützlich, und angenehm sie sey: 1. Sie lehret uns auf eine überzeugende Weise einen Gott kennen, der allmächtig, weise und gütig ist. Beyspiele und Beweis ist die ganze Natur; 2. Sie vergrössert und erhöhet unsere Einsichten und Kenntnisse; 3. Sie erwecket durch so viele reizende Beobachtungen und Versuche das würdigste und reinste Vergnügen unserer Seele. Man denke nur an die angenehmen Verusche...mit der Electrisier-Maschine; 4. Sie benimt uns manche kindische Furcht und Aberglauben. Man denke an die Cometen; 5. Durch sie erreichen fast alle Künste und Handwerke ihren Grad der Vollkommenheit. Man überlege doch nur, ob nicht die ganze Verbesserung der Öconomie, der Färbereyen, der Zubereitung des Leders und

author adds: "He to whom this is not enough encouragement, he is not worthy to be human."[43] Physics compendia hope to draw some benefit for both the physical and spiritual well being of people; it is "useful for both purposes.

Medicine and theology were not untouched by the new phenomenon of electricity. In the preface to the second edition of his Electrical Medicine, Schäffer writes:

> The experiments already performed by the most famous scientists (*Naturforscher*) as well as the experiences of the most learned physicians bear witness enough to the fact that electricity has real utility in physics and medicine. Thus it ought to be accepted that no one would any longer seriously want to affirm that such electrical experiments were useless, or childish games played by scholars, and electric cures, on the other hand, false and unfounded. Nevertheless, we still live in a world in which the most undeniable truths are sometimes questioned, disputed, and challenged by some without any reason, especially if they are new. It is not surprising, therefore, that this should be the fate of the electrical experiments and cures! As a proof, I want to let another author [Mr. Bunzen] speak. This one says: `The fact that many value the electrical

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unzähliges anderes von der richtigen und gründlichen Kenntniß der Naturlehre ihren Ursprung nehmen muß." Lind, *Physik im Lehrbuch,* 14-15.

[43] "Wem dieses nicht genug zur Aufmunterung ist, der ist nicht werth ein Mensch zu seyn."

machine so little is due to the fact that they are too stupid to judge such a machine or to appreciate its worth.'"[44]

The writings of the first generation of authors who wrote about medical electricity were based on the common assumption that one should electrify the sickened human body or even only certain specific sick regions. This was effective and possible, because the human body is able to conduct the electrical matter and this would not remain on the surface.[45] The identification of electricity with the life principle or vital force would shape the research praxis decisively. Bohnberger reports that, in the second half of the eighteenth century, at every village inn, an electrician provided those who could not afford traditional medical care with electrotherapy.[46]

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[44] "Daß die Elecricität einen wirklichen Nutzen in der Physic und Medicin habe, davon sind die bisher von den berühmtesten Naturforschern angestellte Versuche, und von den gelehrtesten Ärzten bemerkte Erfahrungen, Zeugnisse genug. Man sollte daher glauben, daß niemand mehr im Ernste werde behaupten wollen, daß dergleichen electrische Versuche unnütz, oder gelehrte Kinderspiele, die electrischen Curen aber, falsch, und ungegründet wären. Jedoch wir leben noch immer in einer Welt, in welcher die unleugbarsten Wahrheiten von einigen, und öfters ohne allen Grund, in Zweifel gezogen, bestritten und angefochten werden, besonders aber, wenn sie neu sind. Was Wunder also, wenn das nämliche Schicksal auch den electrischen Versuchen und Curen widerfähret! Ich will zu einem Beweise einen andern Schriftsteller reden lassen. Dieser saget also: 'Daß viele die Electrisirmaschine so gering achte, kommet daher, daß sie zu blödsinnig sind, solche zu beurtheilen und ihren Werth zu erkennen.'"

Bunzen, Erklärung der electrischen und magnetischen Kräften [sic]; cited in Schäffer; I have not been able to locate this work.

[45] Gralath provides several examples. See *Geschichte der Elektrizität. Versuche und Abhandlungen der Naturforschenden Gesellschaft in Danzig* I (1747): 284, 295, 297.

[46] Gottlob. Chr Bohnberger, *Beiträge zur theoretischen und praktischen*

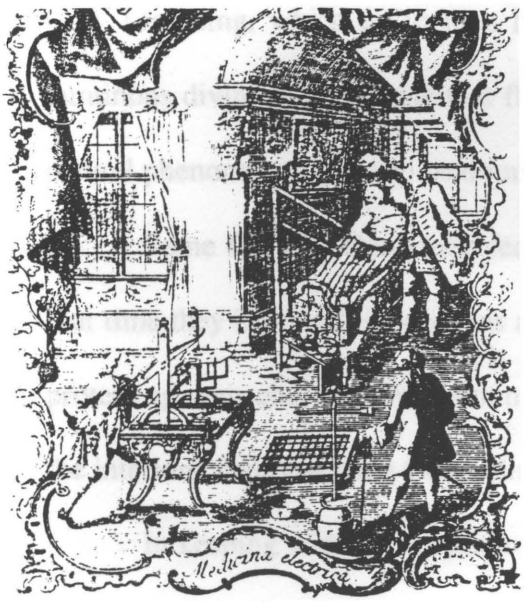

Fig. 14 Electrotherapy
Source: Bildstelle, Deutsches Museum, rara

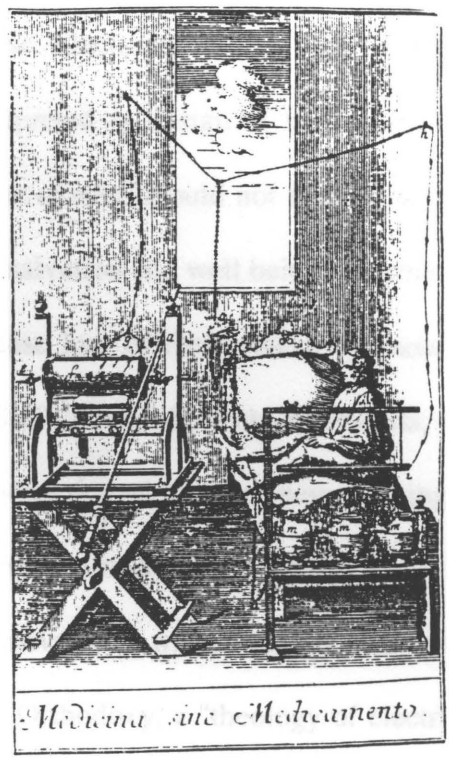

Fig. 15 Medicine without Remedy
Source: Schäffer, Elektrische Medizin, 1752
Bildstelle, Deutsches Museum

Electricity finally managed to creep into the religious sphere as well. As early as 1745 a treatise appeared in print with the title "Sacra Pentecostalia," which described the coming of the Holy Spirit during Pentecost as a case of spiritual electrification. The medieval understanding of God and Christ was guided by the image of light --God as sun, as the light which projects its force into the world, and also into the soul and spirit of humans. With the discovery of electricity, besides this light symbolism, a new image emerged: electricity appeared as the most tangible representation of the hidden presence

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Elektrizitätslehre, 5 vols. (Stuttgart, 1793-95).

of the divine force that penetrates the whole universe. Electricity became a new symbol of God. Lightning, which up to then had been interpreted as a sign of the unpredictable numinous divine omnipotence that flashed from the clouds, should not only be seen as a natural phenomenon but also be dominated for the salvation and well being of humans.

Some German clergymen feared an immense loss of their power, because until that time they had used lightning as a symbol of God's wise judgment. Afterwards, while protecting their churches by lightning rods, they were forced to order new paintings for the interiors, demonstrating God's almighty power symbolized through lightning.

In keeping with the "physico-theological" movement, whose main purpose was to make the new sciences acceptable to the Lutheran Orthodoxy, a "theology of electricity" appeared, which produced a series of writings in which important questions were discussed. For example, wasn't the construction of lightning-conductors at churches an interference in the execution of divine justice, and, therefore a sin, in the full sense of *superbia*, the insolent human self-affirmation against God? These attempts at theological interpretations of electricity might have even reached the pulpits, but the evidence is not conclusive.

Our "excursion" into the early world of electricity has now to come to an end. Electrical phenomena shaped the multifaceted relations of theater, market, and divine creation. University professors, who, to be sure, still considered themselves the true guardians of natural scientific knowledge, wanted to participate in the excitement that worldly trivialities had brought about. As Priestley put it, they wanted to "play a major

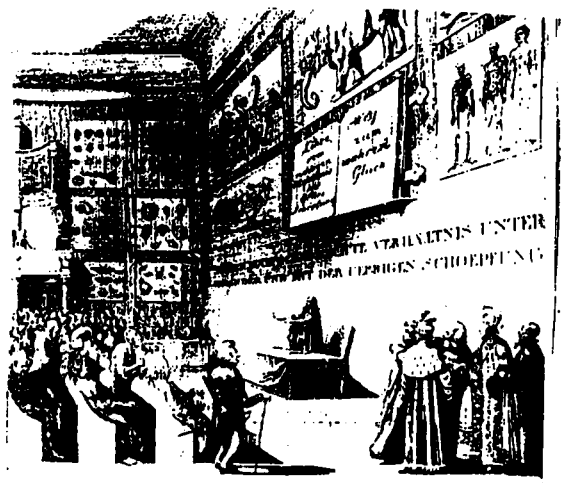

Fig. 16 The Physicotheological Church of the Future
Source: F. H. Ziegenhagen, *Lehre vom richtigen Verhältnis zu den Schöpfungswerken,* 1799.

role in the most important appearances of nature."[47] As an article of fashion and commerce, electricity stirred up the interests of broader circles and secured contemporary physics a resonance that went far beyond what any academic institution could have produced. Electrical phenomena could conquer audiences, satisfy customers, heal the body and save the soul. Electricity's social success also enhanced its status as a scientific discipline and the status of the scientists. But the champions of this science did not have sufficient control mechanisms to bind electricity's social significance solely to traditional institutional structures. On the contrary, this science shows a certain opportunism that allowed her to profit from its favorable social standing: the boundaries between trivial entertainment and serious study were blurred.

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[47]"...in den größten und wichtigsten Auftritten der Natur eine Hauptrolle spiele(n)." J. Priestley, *Geschichte und gegenwärtiger Zustand der Electricität nebst eigenthümlichen Versuchens* (2nd. ed., 1772), XVI and 331.

3. Conclusion

Public displays of science were an important contributing factor to the making of science as public culture. Although most of the records of early lectures in experimental physics are lost, the information available illustrates some important points that we have encountered at different stages in this study. Physics was incorporated into the curriculum of the University of Leipzig as early as 1712. Experimental physics had become a legitimate subject of study for serious scholars. But this incorporation of science into the curriculum generated tension and conflicts. The first physics professor, Johann Christian Lehmann, faced opposition from the Lutheran establishment. Why would they oppose his public demonstrations? What could possibly be at risk in such a practice? Although I cannot offer a definitive answer on these matters, it is clear that public demonstrations represented a threat to the exclusivity of scholarship that was best preserved by the use of the Latin language. Thomasius had already been expelled from Leipzig a decade earlier and so was Francke for his disrespect of social conventions. That Lehmann was forced to perform his demonstrations in a private garden pavilion is just a sign that the official German institution of learning, the university, would not tolerate challenges to its authority as as a state institution. If science indeed began to "speak the language of the fatherland," as Bose would put it a few years later, the exclusion of unwelcome intruders to the small circles of the learned could not be efficiently managed. The issue of the public character of intellectual endeavors was also an issue of power.

The career of electricity in Leipzig challenged the most cherished

accomplishments of learned culture, as well as their newly constructed difference between elite and uneducated structures. If the participation of the laity in the world of learning could be controlled by printed means, once electricity conquered the marketplace and enlisted the interest of various sectors of society, gone were all claims to power. Yet the irony of electricity's career in Leipzig is that, in a way, it was the fulfillment of the most democratic of Enlightenment pronouncements: everyone should have access to learning, everyone has a right to contemplate God's work in nature regardless of sex and social standing! If the literary control mechanisms incorporated in didactic poetry and the dialogues of scientific content discussed in previous chapters were powerful enough to prevent their champions from seeing the contradictions in which they incurred, the career of electricity challenged Enlightenment elitism and allowed for the true public character of science these Enlightenment champions had proclaimed with missionary zeal. Even the most vulgar workers could indulge in the pleasures that traveling electricians offered at fair-time. Even the wives of peasants could offer their bodies at the altar of the electrotherapist, once all other resources had been exhausted. And even the clergy would have to change their imagery in order to reassure their flock that God was still in control of nature.

If the literary means that gave birth to a lay public had been effective in creating and satisfying a growing taste for science, the wonders of the new force of nature were even more powerful for effecting its credibility. But they had the advantage that they did not make discriminations among the public. Anyone with eyes sharp enough to see could be a witness to the miracles of electricity. Anyone courageous enough to risk the loss of a

tooth could offer his/her body for experiencing an electric discharge. No educated taste for poetry was required to be a member of the public of electricity. Electricity accomplished indeed the true public nature of science loudly proclaimed by philosophers and *littérateurs* in the previous decades. The public traditionally excluded from the world of learning, a public without distinctions of gender or class or age or education, had now won access to science.

CONCLUSION

As German people labored to forge an enlightened nation, science became a key feature of lay people's consciousness. A growing curiosity about all things scientific extended throughout eighteenth-century life, creating new means for its satisfaction as well as tensions and contradictions. Building on a framework of current historiography, this study has painted an image of early eighteenth-century life providing an understanding of the many forces that converged in making science a revered ideal.

A literary public realm began to emerge at the turn of the century in which theological interests played a central role. Literary and learned societies joined their efforts with publishers and book dealers in propagating Enlightenment views and educating the laity. The development of a lay reading public was a necessary condition for the extension of science through German society. Once new structures of communication were in place, people formerly excluded from the world of learning began to gain access to a world in the process of criticizing its older style and ideals. The mere rejection of old-style scholarship was not sufficient to accomplish deeply felt needs of reform: new ideals had to be articulated. Deeply rooted intellectual, social, and political obstacles had to be overcome effectively. Critics often blamed the Lutheran establishment for preventing the glory of Saxon scholarship. They attacked it viciously and held it responsible for German backwardness. In 1737, Gottsched sent Manteuffel a long letter in French in which he reflected on the Saxon situation. He encouraged Manteuffel to "continue your protection of

true knowledge, oppressed almost everywhere by the propagators of ignorance and superstition."[1] Manteuffel, who was convinced of the value of science for making an enlightened society, replied:

> "I had imagined that, in Leipzig, one would never abandon a principle that I thought was received as generally true: that with the sciences it is as with commerce: in order to make them flourish, one has to leave those who cultivate them a complete freedom."[2]

In 1734 Johann Lorenz von Mosheim, a theologian, preacher, and artist, had already warned Gottsched that he would fall into the hands of the "Inquisition."[3] Some years later, Gottsched even complained that "there is nothing else to do in Saxony for truth; everything is on its way towards Papism and Superstition."[4] In Gottsched's view, fear was, therefore,

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[1] "Cependant, j'ose conjurer Votre Excellence, de continuer Sa Protection au veritable Savoir opprimé presque partout par les Propagateurs de l'ignorance et de la superstition." *Gottsched Correspondence*, 1737, Cited in Danzel, *Gottsched und seine Zeit*, 19-20.

[2] "Je m'étais imaginè, qu'on ne se departiroit jamais à Leipsic d'un principe, que j'y croiois reçu comme generalement vrai; savoir, qu'il en est des sciences comme du commerce et que pour les faire fleurir, il faut laisser une entière libertè à ceux qui les professent." *Ibid.*

[3] "Ich habe es lange vermuthet, daß Ew. Hochedelgeb. in die Haende der Inquisition gerather wuerden." *Gottsched Correspondence* 1734, cited in Danzel, *Gottsched und seine Zeit*, 25.

[4] "Vous etes persuadez, qu'il n'y a plus rien a faire en Saxe pour la Verite; que tout s'y achemine vers le Papisme et la Superstition." *Ibid.*, 75.

the natural response of anyone engaged in pursuing the cause of truth.[5] In 1739 Manteuffel expressed his disdain for the Orthodoxy even more pointedly. If the cause of truth was to be advanced, the first step to be taken would be to "start by refraining the pedantic bigotry of your so-called orthodox...these enemies of truth and good sense; these monopolizers of ignorance; these pestilences of every Republic...these antipodes of reason."[6] The grip that the theological establishment had on eighteenth-century Saxon life was an essential factor in the legitimation of science in German society. Science was becoming the new object of veneration in European culture. And this science had to be made palatable to German sensitivities.

In the early decades of the century a Thomasius and a Gottsched had made universalist proclamations of the enlightenment of "everyone." Gottsched, voicing the typically optimistic view, exclaimed:

> Scarce had old Latin ceased to rule
>
> When radiant Truth came into Season;
>
> With German as the teacher's tool
>
> The very Rabble turned to Reason.[7]

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[5] "wie gegründet hier in Sachsen die Furcht aller deren ist, die sich zu Werkzeugen der Wahrheit aufwerfen..." *Gottsched Correspondence* VIa, 1740, 141.

[6] "commencer par refreiner la bigoterie pedantesque de vos soi-disant ortodoxes... de ces ennemis de la verité et du bon sens; de ces Monopoleurs de l'ignorance; de ces pestes de toute Republique...ces antipodes de la Raison." *Gottsched Correspondence* V, 1739, 239.

[7] Kaum hub man an, auf Deutsch zu lehren

Yet when certain existing social relations were challenged, any such enterprise of education aroused sharp opposition. "Everyone" should have access to knowledge provided that traditional social arrangements were not subverted. The case of Amaranthes' *Ladies Lexicon* offers a lively portrayal of some of the mechanisms through which the boundaries of the literary public sphere were traced. Previous disputes regarding women's ability and right to acquire learning were still alive in the Saxon context. Amaranthes was compelled by a journalistic quarrel to defend the value of his work, and also to assure his readers that this work did not aim at subverting the social order. In these circumstances, a statement regarding the extent to which learning should be made available to the ladies became essential. And also in this context, Amaranthes suggested that physics was useful to the ladies, although the experiments should not be carried too far! Performing experiments had become a practice familiar to an educated person. This, in turn, was what physics was all about. But how shall we understand the limits, "not too far," to which this practice would be set when women were granted participation? Amaranthes himself provides us with an answer to this question: some science is useful because it can have practical applications -- measuring techniques, for instance, could be useful in a lady's kitchen. But science is also an

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Zum Trotze der Lateiner-Zunft:
Gleich stieg der Wahrheit Glanz zu Ehren
Der Pöbel selbst bekam Vernunft.

Quoted by Georg Steinhausen, Georg, *Der Aufschwung der deutschen Kultur vom 18. Jahrhundert bis zum Weltkrieg* (Leipzig and Vienna, 1920), 6.

ideal means for leading people to God. Since God's purposes are inscribed in nature, encouraging women to an intelligent appreciation of nature's order could only have positive consequences. Women would be led to God and, through them, their children, which would result in the creation of a happy human race. Science had become one of the givens of eighteenth-century society that could not be ignored or dismissed with facile arguments. Therefore, the degree of women's participation had become a pressing issue that needed to be settled.

Amaranthes' strategy for demarcating the participation of the ladies was not an isolated case within the public culture of science. Didactic poetry and dialogue-writing were two of the key means used for making science available to the laity. Science was not the only concern of enlightened champions attempting to enhance the educational and moral level of their readers. It was incorporated into an already existing literary public sphere built on new structures of communication and forms of sociability. But why focus on science? Why make it available to the laity? Why preach the Newtonian gospel to the German laity?

When scholars presented science to the uneducated, they carefully set their texts in physico-theological rhetoric. They portrayed nature as God's creation and suggested that its study was simply one of the many ways to celebrate God's glory. Writers portrayed this celebration of God's glory as the proper destiny of human beings. Making such knowledge available to the laity was, therefore, a legitimate task. In his unpublished correspondence, Manteuffel voiced the Enlightenment creed of the usefulness of science. Speaking about the new Prussian King he wrote:

"I have been assured that our Royal Prince, although he has seen and learned so much in his travels, is being instructed for an hour a day...in the knowledge of physical curiosities. There probably is not a study more useful than this for a character who likes to do some meditation. The physical curiosities, if one investigates them according to good principles, lead us, as by degrees, to a just idea of the Supreme Being and his perfections, and they make us feel the need of trying to conform our actions to him, as much as they tend, as they have to, to make us and our fellow citizens, more and more perfect and happy.[8]

Manteuffel was curious to find out who the king's teacher was and what he was being taught, but to my regret, no response to this letter is extant in the correspondence, nor have I been able to identify the person he referred to. This letter is an instance of the current conviction of the utility of physics: it is useful because it leads to God and this in turn has important consequences for the making of an enlightened human community. Science again, is not knowledge for its own sake, but knowledge that has important ethical and

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[8] "On m'assure que Mr. notre Pr. Roial, quoiqu'il ait tant vu et appris dans les voiages, se fait instruire,une heure par jour...dans la conoissance des curiositez Phisiques. Il n'y a peutètre pas d'étude plus utile que celle la pour un genie qui se plait un peu a mediter. Les curiosites phisiques, lorsqu'on les recherche selon de bons principes, nous conduisent, comme par degrès, à une juste idèe de l'Etre-Suprême et de ses perfections, et nous font sentir la necessité de tacher d'y conformer nos actions en tant qu'elles tendent, comme elles le doivent, à nour rendre, et nos concitoyens, de plus en plus parfaits et heureux." *Correspondenz des Grafen von Manteuffel und von Brühl, des Hofrathes Walther u.a.*, 1740, letter dated August 4, 1740.

social implications.

The usefulness of science was also tied to its entertaining nature and its ability to cater to a basic human need. Both literary means and public displays could serve this purpose. Didactic poets explicitly referred to the Horatian dictum that the best teaching is the one that is transmitted while entertaining the reader. The dialogue tradition in Germany, in turn, built on the notion that it was time to give up bitter disputations and to start works of peace and education. Dialogues could provide useful entertainment. And, without a doubt, the success of electricity's career in Leipzig was to a great extent due to its ability to provide avenues for play. But the usefulness and entertaining nature of scientific knowledge do not suffice to explain the drive for popularization. Making science available to the laity also served the interests of the actors involved in the popularizing process.

This point becomes especially clear in the case of didactic poetry. Didactic poets appropriated science and addressed their readers not as disinterested observers of new knowledge but as a group of people aware of the broader shifts that were occurring in their culture. Their poetry embodies the tensions inherent in the growing prestige of science, the broader cultural shifts related to its growing authority, and the consequent displacement of other groups in society. Poets' glorification of science becomes, thus, a form of self-glorification, a scream in a situation of despair at the loss of earlier ways of construing their own identity in court circles. If poets had been able to draw their prestige from the support of courtly patrons, the new print situation forced them now to make their song appealing to

a faceless public. Didactic poets' passion for preaching the enlightened message is more a passion for making their own self-image than for enlightening their readers.

The role of mediator that poets could assume had its appeals. The growing prestige of science in the European culture also helps explain the use of Newton in German culture. Why not praise the publishing business and its wonders, which was recognized as a truly German contribution to the world of learning? Why not praise Christian Wolff, whom contemporaries already acknowledged as *praeceptor Germaniae*? The choice of a figure of international renown is not accidental. By singing the glories of Newton and the scientific enterprise, poets created for themselves a place in the new culture. By adapting the Newtonian message to German needs, they became the new purveyors of meaning to a culture that was loosening its religious ties. If Bose had claimed that he wanted to make electricity speak the German language, didactic poets also wanted to make science speak their tongue. While glorifying Newtonian science and creating a participatory role for themselves, German poets neither claimed the prestige of the true maker of scientific knowledge nor did they suggest the blind following of the great Englishman. In their writings, they made sure that proper due was paid to the real producers of scientific knowledge, which they paired with philosophical knowledge more broadly. Poets construed their own role as mediators. However, this intermediary role insured their prestige head and shoulders above the status of the populace in their story. At the same time, German poets made sure that an enlightened mind would preserve its critical powers. Time and again they stressed that the goal was not becoming blind followers of great scholars. In his didactic poem entitled *Three Attempts on Human Reason,* Dusch makes this point forcefully:

Be slave to no sect, whencesoe'er it came,

However ancient, and whate'er its name....

Plague-like, fashion and fancy take their hold,

From son to son, whole kingdoms to enfold.

Here Epicurus only's God, there Plato comes to notice,

Truth dwelleth now with Thomas only, now with Scotus;

But you, beg not; from atoms seek no light,

From Plato, Epicurus, Eleatics or the Stagyrite,

From Newton, Descartes, Wolff, what seems of weight,

They're often simply forced to formulate.

But like the bee, take food from far and wide.

Truth's honey often lies at poison's side.

Be a fruitful man, never rushing to opine,

Nor try to make our reason into the divine;

Don't leave your proper place to ponder,

And always learn for use, not out of idle wonder.[9]

9

Sey keiner Secte Sclav, so alt ihr Ursprung ist...
Bey der ist Epikur,bey dieser Plato Gott;
Bald wohnt die Wahrheit nur beym Thomas, bald beym Scot:

The poem stresses the importance of intellectual freedom and autonomy. Dusch puts Descartes, Newton and Wolff at the same level, as potential gods of new sects. Although readers should recognize their merits, they should not follow these great men without restrictions and personal reflection. The bee becomes the emblem of an enlightened mind that knows how to find her nourishment even in the midst of poisonous distractors. And again, it also becomes clear that this is not a task for women or for the people. "Be a fruitful man but don't make our reason into the divine!" "Don't be bound to believing, like the people!" Earlier in the poem the poet had explicitly made the latter point: reason is the

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Du aber bettle nicht, nimm nichts vom Demokriten,
Vom Plato, Epikur, Eleer, Stagiriten,
Vom Newton, von Cartes, vom Wolf unürberlegt
Für wichtig, was sie oft nach Nothdurft ausgeprägt.
Doch sey der Biene gleich, und nimm aus allen Schriften
Der Weisheit Honig liegt oft nahe bey den Giften.
Sey fruchtsam, doch ein Mann, der nie auf Glauben irrt,

Noch menschliche Vernunft zu Gottes machen wird;
Der sich im Grübeln nie aus seinem Kreis entfernet,
Und alles zum Gebrauch, nicht bloß aus Neugier lernet.

Johann Jacob Dusch, "Drey Verusche über die menschliche Vernunft," *Sämtliche Poetische Werke* (Altona, 1765), 129-208.

privilege of a few, no business for the people:

> Thou, Nature's dowry, best gift of the good Lord,
>
> Reason! does man deserve your rich reward?
>
> The common folk dislike you; believing is their fate.
>
> It's you wisecrackers ridicule and stupid people hate.[10]

The image of the bee also suggests that enlightened knowledge is not knowledge for its own sake. The poet exhorts his readers (and himself) not to dwell on empty tributes but to seek everything for its usefulness and to reject mere intellectual curiosity. This, as we have seen, is an essential component of the enlightened gospel and of the strategies employed in various circumstances for justifying making science available and appealing to the laity. Didactic poetry conveys authority and prestige to the poets, as they joined their European peers and composed the German stanza of the Newtonian hymn. The accuracy of the information purveyed mattered less than the efficacy of their communication.

The role of Gottsched as translator of dialogues of scientific content can be analyzed in terms similar to the role of poets. His contemporaries had already observed his role as

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10 Du Aussteur der Natur, des Schöpfers beste Gabe,
Vernunft! verdienet wol der Mensch daß er dich habe?
Der Pöbel mag dich nicht: Zu glauben ist sein Theil:
Du bist des Witzlings Spott, und bist des Blöden Greul
Ibid.

mediator and observed that the sciences owed him, if not their growth, certainly their dissemination.[11] As a good member of the European Republic of letters, Gottsched was the center of a tight international epistolary network and kept abreast of the novelties in the world of learning. Gottsched's convictions regarding the importance of science moved him to procure a translation of Muschenbroek's physics --the use of which presupposed a certain level of education-- and of Fontenelle's and Algarotti's works. Although the Fontenellian enterprise proved more rewarding on a personal level ---Fontenelle himself thanked him profusely for his services --both texts, despite their claims of making science available to the public, contributed instead to reinforcing women's exclusion from the world of science. Gottsched's reputation as mediator between the divine knowledge to which the philosopher has access by entering the sanctuary of science and the laity unfit for such a sacred fare remained intact.

The choice of genre for making science available to the laity was an essential aspect of popularizing efforts. Writers employed didactic poetry and the dialogue as the most appropriate means for addressing the uneducated. These genres, they argued, were fit for the type of intelligence they claimed to address. Literary form is in also an argument about the nature of the knowledge communicated. This is why Christian Wolff, despite his offer to write a philosophy for the ladies, backed down from his intent. His philosophy was only fit for systematic exposition. It could not be violated by being constrained in other literary forms. Gottsched himself had argued that the maturity of modern scholarship was the reason

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[11] See Chapter 5, n. 18.

for the lack of dialogues in his day. In a way, we can surmise that German philosophers themselves considered their knowledge too high for popular profanations. This may also help us explain the legitimacy of translations and the lack of German original examples for the laity.

But genres not only point to the readers. They also establish the difference between those who have true access to the miracles of science and those who have to remain irremediably as outsiders. This difference has implications for both the type of knowledge conveyed and the consumers of this knowledge. The genres that are used reinforce the difference between the knowledge to which the poet or the translator who serve as mediators has access, and the knowledge conveyed to the lay public. At the same time, the message in both cases is that higher truths lose their status in this process of generic transformation. The difference between high and low science is established. But here an important clarification is in order: the process of generic transformation is not a process of dilution or simplification: the message conveyed to the laity is a new message that resembles very little the actual scientific content of a work such as Newton's *Principia*.

"Popularization" meant the dissemination of science. But it was not Newtonian mathematics or physics that was made available to the laity but the conviction that the universe is an orderly creation. The German laity needed to know that science's universe was not a soulless machine to be feared but God's work in nature; that science's order is a replica of God's plan in nature and not the mere construction of impious secular minds. This orderliness is guaranteed by the scientists' authority and prestige. This was a conviction of vital importance for the broader circles of the uninitiated. If the threats that the new science

posed were to be effectively met, it did not suffice to decry the atheism of the new philosophers. An alternative and appealing framework was needed. Under the poetic mantle, didactic poetry could do this in an effective manner. This is one of the main reasons for its abundance and success in German culture. The dialogues, in turn, given their civilizing nature, could fulfill these tasks while avoiding open confrontations. Their entertaining nature was a vital resource to trick the reader and please the establishment.

Gottsched's correspondence contains several letters that testify that, by 1740, a taste for science had been established among the laity. Christian Großman, of Werschau, wrote to Gottsched to let him know that he had attended a private series of lectures on his philosophy in Dresden, and wanted to become an autodidact. In his letter, he asked Gottsched to give him advice on the acquisition of appropriate reading materials: "I wish to study by myself, so that I will not waste time...for this, I lack the appropriate books...on mathematics, on philosophy, on physics, what belongs to it, a complete introduction and instruction and also a Lexicon."[12] This man was indeed such a minor person, that he did not make it into the biographical archive of German personalities. Gottsched's response is also missing. What this letter documents, however, is that lay people have become interested in physics and see value in pursuing its study: the need for and curiosity about scientific matters had been effectively created. Another letter from a painter from Meißen, Johann Christ. Aug. Birnbaum, further reinforces the point. The letter was also addressed to Gottsched with a

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[12] "Ich möchte von mir selbst studiren, damit mir nicht die Zeit vergebe...hierzu fehlen mir aber Bücher...von der Mathematique; von der Philosophie; von der Physica, was dazu gehöre, eine vollkommene Einleitung und Unterrichtung und auch ein Lexicon." *Gottsched*

request for advice for reading materials. Birnbaum identified himself as an uneducated person *(Ungelehrter)*, who from his youth had experienced a deep love and inclination to the sciences and to good scholarship. Since as an uneducated person he could not grasp the full range of scholarship, he had to satisfy his urge for knowledge by reading good and reasonable books. Attached to his letter he sent Gottsched a draft of a list of reading materials and asked him to improve it. His list of "good books on physics" (*Naturlehre*) includes the three volumes of Wolff's work and Fontenelle's *Conversations*. In a separate category which he calls "on theology and the knowledge of God from nature" (*von der Gottesgel. u. die Erkenntins Gottes aus der Natur)* he includes nine physico-theological works, Niewentyt,'s Derham's, and the rest by German authors.[13] Gottsched's response is not preserved either. What this letter shows is not only that this layman had developed a taste for science, but also that he had grasped the distinction between a learned and a lay person very clearly. Yet, despite being uneducated, he now knew that some learning, even physics, was now granted to the laity. And he did not want to miss his opportunity.

What are, then, some of the lessons that we can draw about the "popularization of science" in the Early German Enlightenment? I have discussed how the implementation of literary means was employed for drawing the boundaries of the scientific sphere in German

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Correspondence IX, 1744, 193.

[13] "Ich, der ich von Jugend auf eine sehr große Liebe und Neigung zu denen Wißenschaften und guter Gelehrsamkeit bey mir empfunden....als ein Ungelehrter....so verschaffet mir doch das Vergnügen welches ich in Lesung guter und vernünftiger Bücher finde." The German titles are Fabrici Hydrotheol; Rohr Phytoth.; Lesser Insecto-the. and Hydroth; Benemann Blumen. *Gottsched Correspondence* XV, 1750, 118-19.

culture. I have suggested that new mechanisms of control more suited to the new situation of a print culture were implemented to establish a distinction between the legitimate practitioner or knowledge-maker and the addressee of popularized knowledge. I have also suggested that the message conveyed to the laity is not a message about the "facts of science" but rather a message that enhances the authority of scientists and their pronouncements. "Popularization," in this sense, is not the diffusion of scientific ideas that enlighten the readers: it is the construction of the credibility and authority of science. "Popularization" is legitimation. It is in this sense that I suggested in the Introduction that the popularization of science is the price that had to be paid to gain at least public support and recognition. This was an essential aspect of the growth of science in eighteenth-century society. People had to be convinced that science was not just certain people's trade, but a universally important ideal, to which every educated person owed allegiance. These processes cannot possibly be described as "distortion" or "simplification" of higher truths. The message is not about what Newton said or did, but about *why* we should believe him and *that* we must believe him. This is an essential component of the enlightened gospel: to be enlightened is to hold such beliefs in the authority of science and to be able to give an account of their foundation. Let me illustrate this point with a contemporaneous testimony:

In 1740, Luise Adelgunde Gottsched, who was a keen correspondent of Manteuffel's, remarked that a French reviewer had dared to deprive Newtonian physics of its importance. She wrote:

"The author of the scholarly article [published] in the French papers should

be a bit more careful. He has charged Newtonian physics with such an unimportance, or even of such an uncertainty: but since it is based on such irrefutable experiments, so that already the French French /:I call them such to distinguish these from the Berlin French;/ have already disputed about this to their embarrassment."[14]

Mme. Gottsched did not know Latin, and could not possibly have been one of the few European readers of Newton's *Principia*. She had not had access to the University of Leipzig, since this was against current mores. She was an industrious helper of her husband, a poet and writer herself, who kept abreast of the novelties in the European Republic of Letters. Since as a woman she could not have witnessed Wolff's experiments in physics, and probably never performed experiments herself, how then, did she acquire the conviction of the irrefutability of Newtonian physics? Why did she even feel she had to defend such an article of belief from profanation? Her testimony suggests that the work of popularization had been successful: an enlightened mind would be convinced of the importance and credibility of science and would employ the resources within her reach to extend such a conviction to others. Once Newton had conquered the literary public sphere, even women could have access to the articles of enlightened belief. The only requirement for

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[14] "Der Verfasser des gelehrten Artikels bey den franz. Zeitungen mag sich auch ein wenig in acht nehmen. Er hat in dem Blatt was wir gesehen haben die Newtonische Physick einer Unwichtigkeit beschuldigt, oder noch einer Ungewissheit: da sie doch auf solche unumstoessliche experimenta gegruendet ist, dass sich schon die franzoesischen Franzosen /:ich muss sie zum Unterschied mit den berlinischen so nennen;/ daranzu schanden disputirt

participation in this sphere was an adequate training and a sufficient level of intellectual curiosity. This still does not make women insiders to scholarly circles, but it enrolls them as intelligent and informed spectators.

Literary means could be effective in regulating the laity's participation. But how effective indeed could such control mechanisms be? How could Mme. Gottsched have become conversant in the Newtonian creed? I wish to suggest that popularization was not only dissemination of a belief in the authority and credibility of science. Popularization was also discrimination, both in the strict etymological sense of allowing to observe or constituting differences between knowledge and people; but also in the sense of showing partiality in favor of or prejudice against them. The popularization process created the distinction between high and low science, between producers of scientific knowledge and consumers thereof; and between the educated and "the masses" or the "rabble." The discriminating powers of popularization had implications for the status of science as a body of knowledge; for its legitimate practitioners and those who become unauthorized; and for social distinctions more broadly. To return to the image I used in my chapter on didactic poetry, only those who have developed a sufficient level of education and are able to wink with the poet behind the back of the fool will have access to the didactic gospel. And I deliberately have used this term to indicate that (1) there is an important message to be conveyed; (2) only certain authorized members of the elite are authorized to preach it; (3) the audience is badly in need of this message --it will have important consequences not only

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haben." *Gottsched Correspondence* VIa, 1740, 234-35.

in shaping their mental framework but in providing them new liberating truths and shaping their lives. In other words, the Enlightenment message offers the carriers of such message a new frame of meaning that can give them a new sense of direction and cohesion, not only as individuals but also, and more importantly so, as members of the chosen flock.

The legitimation of science in early Enlightenment Germany was not just the work of literate culture. When science moved into the marketplace beyond the sphere of print, as the example of electricity in Leipzig illustrates nicely, serious study and trivial play became difficult to differentiate. Learned scholars could not control the career of electricity but still its success beyond learned circles had important implications for the scientific enterprise as well. Fascination with the new wondrous power of nature undid the tidy work of discrimination of lettered culture: electricity transcended differences of class, sex, and education but still enhanced the authority and prestige of those who could tame the new force of nature.

Finally, are there ways for the historian to establish if the processes of dissemination and discrimination were merely a matter of empty rhetoric or indeed powerful actions that made a difference in the lives of people? These are obviously very difficult questions. A strict causal connection between women's exclusion from German scientific societies and universities until the nineteenth century and the literary mechanisms of control described in this study cannot be established on firm grounds. I believe, however, that some of the deepest convictions of both scholarly and non-scholarly people regarding women's rational inability for higher scientific thinking ---of the Newtonian kind, for this time-- has deep roots in the processes described in this study. Algarotti's claim that women are too full of

the profane to be granted access to the scientific priesthood cannot be taken at face value. But it certainly is part of a larger matrix of intellectual, cultural, and social structures that reinforced and implemented such views in German culture. This is, of course, not peculiar to the German scene, but its occurrence in this context raises questions as to the effectiveness of the means employed. I believe that by unearthing some of these mechanisms, we may look at the roots of contemporary sexism and elitism and contribute to undoing the power it still has in contemporary culture.

Furthermore, another level at which I believe these mechanisms of exclusion have been effective is in the inability of Enlightenment thinkers themselves to see the contradictions they incurred when they proclaimed democratizing teachings. These mechanisms of control were effective means for deepening these conflicts and contradictions. Enlightenment champions could continue to preach an Enlightenment gospel with their unusual passion without paying attention to contesting voices. Anna Helena Volckman had complained early in the century that males denied women "a creative mind."[15] Her poems may have served as a ferment to encourage others to question the current state of affairs. But as we have seen, women were also denied in print the ability to understand a didactic poem. Women's voices were easily silenced by male authors who could count on the cooperation of astute publishers. Mme. Gottsched, again, offers us an eloquent example. In anger and frustration, she burned her own collection of poems because she was not able to find a publisher willing to desecrate his name with a woman's writings.

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[15] See Chapter 1, 84.

"Book dealing is the weapon of truth,"[16] claimed a contemporary observer. And publishers knew it!

The texts discussed in this study were embedded in the social tensions generated by the displacements that the new forms of knowledge were bringing about in the scholarly world. Theologians were increasingly deprived of their central position in the world of learning. Literature, began to untangle its commitment to theological concern and authority. Poets, in turn, attempted to wrest authority from science by writing didactic poems. The threats posed by the growing prestige of science during this period had to be effectively met. What was at stake was not the survival of a few theological statements but the stability of the social order. Science's order had to come to terms with God's order. This was an essential lesson for the broad circles of the uninitiated.

The literature addressed in this study aimed at intervening in its audience. It was composed to fulfill psychological and social needs, to articulate and implement values and ways of looking at and ordering the world. "Newton" functions in German culture as a multifaceted and highly flexible symbolic resource of multiple meanings. His name was used (1) to construct and reinforce the prestige and authority of science and its authorized practitioners; (2) to establish and reinforce social roles; (3) to legitimate "science" by making it acceptable to the Lutheran orthodoxy (whether in poetic form or by setting the frame of the work by means of prefaces or introductions; (4). to draw and control the

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[16] Referring to the Berlin book dealer Haude, whose nickname is "Doryphore," Manteuffel explains --"he who carries the weapons, since book dealing is the weapon of truth." *Gottsched Correspondence* V, 1739, 234.

borders of the scientific space in German culture. As hero, prophet, model of pious scientist, arbiter of gender roles, and teacher of moral lessons, Newton could speak the language of the fatherland and be used as a resource to promote Enlightenment interests in German culture. The vehicles used for making science public had not just "communicated the facts of science to interested non-professional readers;" nor did scientific information sift passively into the lower spheres of the uneducated; nor have we witnessed the "triumphal march of the Newtonian paradigm." These means were typical of early Enlightenment efforts to make learning available to wider circles. Yet the tactics for making science available to these circles were at the same time exclusionary strategies. The shift from Latin to German in the world of learning surely represented the elimination of an old strategy for excluding the uninitiated. This was a vital step, but one that should not blind us to the new strategies devised for drawing and reinforcilg the boundaries of the scientific sphere in German culture. Serious scholars had proclaimed the end of the exclusivity of learning: science should be available to "everyone." The beauty of the example of electricity is that, without great proclamations, this is what it did. Electricity represented the most democratic dream of the learned come true.

Science was not the creation of a few isolated minds. Poets and philosophers, women and printers, clergymen and litterateurs joined the Enlightenment cause with varying degrees of awareness and involvement. Their joint efforts resulted in the articulation and propagation of a certain image of the scientific enterprise, in the drawing of boundaries between insiders and outsiders, in forging the cultural authority of science. Popular science works are essential building blocks in the composition of a new learned

outlook shaped by Enlightenment ideals, tensions, and contradictions.

BIBLIOGRAPHY

1. Early Modern Works

a. Manuscript Sources

Correspondenz des Grafen von Manteuffel und von Brühl, des Hofrathes Walther u.a., Sächsisches Hauptstaatsarchiv, Loc 3063, 1740.

Gottsched Correspondence 1722-1756, 22 vols., University Library Leipzig, Ms 0342 .

"Die Professionem Physices auf der Universität Leipzig, Dr. Christian Lehmann, seiner gerühmten guten Geschicklichkeit halben, so er sich in Physica experimentali beygeleget." "Ersetzung der Professoren=Stellen in der philosophischen Facultät zu Leipizg, 1668-1731," Sächsisches Hauptstaatsarchiv Dresden, Loc. 10538.

b. Printed Works

Algarotti, Francesco, *Il Newtonianismo per le dame.* Napoli Milano, 1737.

----------, *Le Newtonianisme pour les dames ou Entretiens sur la lumière, sur les couleurs, et sur l'attraction.* Paris: Montalant, 1738.

----------, *Is. Newtons Welt=Wissenschaft für das Frauenzimmer, oder Unterredungen über das Licht, die Farben, und die Anziehende Kraft.* Braunshweig, 1745.

Amaranthes Gottlieb Siegmund Corvinus, *Nutzbares, galantes und curiöses Frauenzimmer=LEXICON.* Leipzig: Gleditsch, 1715, 1739, 1773.

Belustigungen des Verstandes und des Witzes. Leipzig, Breitkopf, 1742.

Bemühungen zur Beförderung der Critik und des guten Geschmacks. Halle, 1745.

Bodmer, Johann Jacob, "Nachricht von dem Ursprung und dem Wachstum der Critik bey den Deutschen," in *Sammlung Critischer, Poetischer un anderer geistvoller Schriften.* Zürich, 1741.

Boeckmann, Johann Lorenz, *Naturlehre, oder: die gänzlich umgearbeitete Malerische Physik.* Karlsruhe: Macklot, 1775.
Bodmer, Johann Jakob, *Critische Betrachtungen über die poetischen Gemälde der Dichter.* Frankfurt, 1744.

Bohnberger, Gottlob. Chr., *Beiträge zur theoretischen und praktischen Elektrizitätslehre*, 5 vols. Stuttgart, 1793-95.

Breitinger, Johann Jakob, *Critische Dichtkunst.* Frankfurt and Hamburg, 1740.

Briefe, die neueste Literatur betreffend. Berlin, 1759ff.

Deutsche Acta Eruditorum, Oder Geschichte der Gelehrten, welche den gegenwärtigen Zustand der Literatur in Europa begreiffen. Leipzig, 1712ff.

Dusch, Johann Jacob, *Die Wissenschaften.* Göttingen: Victorinus Bosiegel, 1752.

----------, "Drey Verusche über die menschliche Vernunft," *Sämtliche Poetische Werke.* Altona, 1765, 129-208.

Eberti, Johann Caspar, *Eröffnetes Cabinet deß Gelehrten Frauen-Zimmers / Darinnen die Berühmtesten dieses Geschlechtes umbständlich vorgestelt werden.* Frankfurt, 1706.

Fabricius, Johann Andreas, *Abriß einer allgemeinen Historie der Gelehrsamkeit*, 3 vols. Leipzig, 1752; reprint Hildesheim, New York: Georg Olms Verlag, 1978 .

Fontenelle, [Bernard le Bovier de] *Conversations on the Plurality of Worlds.* Translated by H. A. Hargreaves. Introduction by Nina Rattner Gelbart, Berkeley: University of California Press, 1686/1990.

----------, *Herrn Bernhard von Fontenelle Auserlesene Schriften, nämlich von mehr als einer Welt, Gespräche der Todten und die Historie der heydnischen Orakel, vormals einzeln herausgegeben,nun aber mit verschiedenen Zugaben und schönen Kupfern vermehrter ans Licht gestellet von Johann Christoph Gottscheden.* Leipzig: Bernhard Christoph Breitkopf, 1751.

Franklin, Benjamin, *Briefe über die Elektrizität.* Translated by J. C. Wilke, Leipzig, 1758.

Frederick II, *De la littérature allemande. Ergänzt durch Justus Möser: Über die deutsche Sprache und Literatur*, Christoph Gutknecht and Peter Kerner, eds., Hamburg: Buske, 1969.

Garve, Christian, "Über den Charakter der Bauern und ihr Verhältnis gegen die Gutsherrn und gegen die Regierung. Drey Vorlesungen in der Schlesischen Ökonomischen

Gesellschaft gehalten von Christian Garve." Breslau 1786. New improved edition, reprinted in *Popularphilosophische Schriften*, ed. Kurt Wölfel, 1974 vol. 2.

Goethe, *Werke*, Sophien-Ausgabe. Weimar, 1903, 41, 2, 225-227.

Gottsched, Johann Christoph, *Der Biedermann.* Leipzig: Breitkopf; reprint Stuttgart 1975 .

----------, *Beiträge zur critischen Historie der deutschen Sprache, Poesie und Beredsamkeit.* Leipzig, 1739ff., cited as *Beiträge.*

----------, *Gedichte und Gedichtübertragungen.* Berlin, 1968, in. *Johann Christoph Gottsched Ausgewählte Werke*, J. Birke and P. M. Mitchell, eds., Berlin, New York, 1968ff, vol. 1.

----------, *Discurs des Übersetzers. Abhandlung von Geschprächen überhaupt, Erste historische Abtheilung*, XX-LXII, 1737; reprinted in P. M. Mitchell, ed., *Johann Christoph Gottsched Ausgewählte Werke*, Berlin, New York: Walter de Gruyter, 1980.

----------, *Versuch einer Critischen Dichtkunst durchgehends mit den Exempeln unserer besten Dichter erläutert*, 4th ed. Leipzig: Breitkopf, 1751, cited as *Critische Dichtkunst*, cited as *Critische Dichtkunst.*

----------, *Zwo Schriften welche In der deutschen Gesellschaft zu Leipzig auf das Jahr 1733 die Preise der Poesie und Beredsamkeit erhalten haben.* Leipzig, 1733.

Gralath, Daniel, "Geschichte der Elektrizität," *Versuche und Abhandlungen der Naturforschenden Gesellschaft in Danzig*, 3 vols. Danzig, 1747/1754/1756.

Haller, Albrech von, *Versuch Schweizerischer Gedichte.* Bern: Beat Ludwig Walthard, Sammlung der Besten Deutschen Schriftsteller, 30 vols., vol. 2, Haller's Gedichte, 1772.

Hübner, Johann, *Abgenöthige Vertheidigung seiner heruasgegebenen Schrifften, Wider die unbillige Censur....* Leipzig: Gleditsch, 1710.

----------, *Kurze Fragen aus der neuen und alten Geographie*, 6th ed. Leipzig, 1716.

----------, *Curieuses und Reales Natur-Kunst-Berg-Gewerck- und Handlungs-Lexicon darinnen nicht nur die in der Philosophie, Physic, Medicin, Botanic, Chymie, Anatomie, Chirugie und Apothecker-Kunst, wie auch in der Mathematic, Astronomie, Mechanic, Bürgerlichen und Kriegs-Baukunst, Schiffahrten...*3d. ed. Leipzig, 1717.

Kästner, Abraham Gotthelf, *Briefe aus sechs Jahrzehnten, 1745-1800.* Berlin: Behr, 1912.

----------, *Gesammelte Poetische und Schöngeistige Werke*, Teil I-IV. Berlin, 1841.

----------, *Vermischte Schriften* Altenburg, 1772.

Krünitz, J. G., *Oeconomische Encyklopädie oder allgemeines System der Staats- Stadt- Haus- und Landwirtschaft*. Berlin: Pauli, 1773-1858.

Leibniz, Gottfried Wilhelm, "Unvorgreifliche Gedanken, betreffend die Ausübung und Verbesserung der deutschen Sprache," U. Pörksen, ed. Stuttgart, 1983.

----------, Ermahnung an die Deutschen, ihren Verstand und ihre Sprache besser zu üben, samt beigefügtem Vorschlag einer deutschgesinnten Gesellschaft, in *ibid.* 47-
78.

Leinker, Siegmund, *Oden*. Frankfurt and Leipzig, 1759.

Leipziger Blätter. Leipzig, 1745ff.

Letztes Ehren-Gedächtniß Herrn Johann Friedrich Gleditschens, Weyland Bürgers und weitberühmten Buchhändlers in Leipzig. Leipzig 1716.

Löscher, Valentin Ernst, *Merckwürdige Wercke Gottes in denen Reichen der Natur, der Kunst, und des Glückes, Als eine nützliche Einleitung durch die Vorhöfe in das Heilige, zur Verherrlichung des Göttlichen Nahmesn und gemeiner Besserung*. Dresden, 1734.

Meier, Georg Friedrich, "Untersuchungen einiger Ursachen des verdorbenen Geschmacks der Deutschen," in *Absicht auf die schönen Wissenschaften*. Halle, 1747.

Muschenbroek, Pieter van, *Grundlehren der Naturwissenschaft*. Leipizg, 1747.

Neue Biliothec Oder Nachricht und Urtheile von neuen Büchern und allerhand zur Gelehrsamkeit dienenden Sachen. Frankfurt/Leipzig, 1709ff.

Newton, Isaac, *Opticks, Or a Treatise of the Reflections, Refractions, Inflections, and Colours of Light*, based on the 4th ed., London, 1730. New York: Dover Publications, Inc., 1952.

Nicolai, Friedrich, *Leben und Meinungen des Herrn Magister Sebaldus Nothanker*. 1790; reprint of the 4th edition, Berlin, 1960.

Der Patriot. Michael Richey, B. H. Brockes, et al., eds., 3 vols, Hamburg, 1724-1726.

Paullini, Christian Franz, *Das Hoch- und Wohl-gelahrte Teutsche Frauenzimmer: Nochmals mit mercklichen Zusatz vorgestellt.* Frankfurt: 1705.

Priestley, J. *Geschichte und gegenwärtiger Zustand der Electricität nebst eigenthümlichen Versuchens*, 2nd. ed. 1772.

Rabener, G. W., "Versuch eines deutschen Wörterbuchs," in *Sämtliche Schriften.* Leipzig, 1777, vol. 1.

Schäffer, Johann Gottlieb, *Elektrische Medizin oder die Kraft und Wirkung der Electricität im menschlichen Körper und dessen Krankheiten besonders bey gelähmten Gliedern aus Vernunftgründen erläutert und durch Erfahrungen bestätiget.* Regensburg, 1766.

Shaftesbury, Anthony Ashley Cooper, *Characteristics of Men, Manners, Opinionns, Times, etc.*, 2 vols. Gloucester, Mass.: Peter Smith, 1963.

Sucro, Christoph Joseph, *Versuche in Lehrgedichten und Fabeln.* Halle, 1747.

Sulzer, Johann Georg, *Allgemeine Theorie der schönen Künste*, 2. ed. Leipzig, 4 vols., 1778f.

Thomasius, Christian, "Von der Nachahmung der Franzosen." Leipzig, 1687; reprinted in Christian Thomas *Kleine deutsche Schriften*, Julius Otto Opel, ed., Frankfurt/Main: Minerva Verlag, 1983.

----------, *Einleitung zu der Vernunfft-Lehre.* Halle, 1691; reprint Hildesheim: Georg Olms, 1968, cited as *Einleitung.*

----------, "Vorschalg einer Jungfer-Academie," in *Auserlesene Anmeckrungen Über allerhand Materien*, vol. 4. Franckfurt u. Leipzig, 1707.

Triller, Daniel Wilhelm, *Poetische Betrachtungen, über verschiedene aus der Natur= und Sitten=Lehre hergenommene Materien*, 4 vols. Hamburg, 1737-55, cited as *PB.*

Weichmann, Christian Friedrich, *Irdisches Vergnügen in Gott*, reprint of the 4th edition. Bern: L. Herbert Lang, 1970.

Wiedemann, Conrad, ed. *Der galante Stil: 1680-1730.* Tübingen, 1969, 1-2, cited as *Galanter Stil.*

Winkler, Johann Heinrich, *Gedanken von den Eigenschaften, Wirkungen und Ursachen der Elektricität.* Leipzig, 1744.

----------, *Die Eigenschaften der Electrischen Materie und des Electrischen Feuers*. Leipzig, 1745.

Wolff, Christian, *Vernünftige Gedanken von den Kräfften des menschlichen Verstandes und Ihrem richtigen Gebrauche in Erkänntnis der Wahrheit*, 3rd. ed., 1722.

----------, *Allerhand nützliche Versuche, dadurch zu genauer Erkenntniss der Natur und Kunst der Weg gebahnt wird*, 1721-3.

Zedler, Johann Heinrich, *Großes vollständiges Universal-Lexicon aller Wissenschaften und Künste...*, vols. 1-64. Leipzig, 1731-1750, cited as *Zedler*.

2. Critical Studies

Abrams, M. H, *The Mirror and the Lamp: Romantic Theory and the Critical Tradition*. New York: Oxford University Press, 1953.

Amrine, Frederick, ed., *Literature and Science as Modes of Expression*. Boston: Kluwer Academic Publishers, 1989.

Arnold, Werner, Wolfgang Dittrich und Bernhard Zeller, eds. *Die Erforschung der Buch- und Bibliothekgeschichte in Deutschland*. Wiesbaden: Otto Harrassowitz, 1987.

Baur, Rolf, *Didactik der Barockpoetik. Die deutschsprachigen Poetiken von Opitz bis Gottsched als Lehrbücher der 'Poeterey.'* Heidelberg, 1982.

Beck-Busse, Gabriele, "Les 'femmes' et les 'illitterati'; ou la question du latin et de la langue vulgaire," *Histoire, Epistemologie, Langage* 16/2 (1994): 77-94.

Becker-Cantarino, Barbara, ed., *Die Frau von der Reformation zur Romantik*. Modern German Studies 7, Bonn: Bouvier, 1980.

----------, *Der lange Weg zur Mündigkeit: Frau und Literatur 1500-1800*. Stuttgart: J. B. Metzler, 1987.

----------, 1984 "Outsiders: Women in German Literary Culture of Absolutism," Jahrbuch für Internationale Germanistik 16.2, 147-77.

Benjamin, Andrew E., Cantor, Geoffrey N., and Christie, John R. R., eds., *The Figural and the Literal: Problems of Language in the History of Science and Philosophy, 1630-1800.* Manchester: Manchester University Press,1987.

Bennent, Heidemarie, *Galanterie und Verachtung. Eine philosophiegeschichtliche Untersuchung zur Stellung der Frau in Gesellschaft und Kultur.* Frankfurt/Main: Campus Verlag, 1985.

Beyreuther, Erich, *August Hermann Francke 1663-1727: Zeuge des Lebendingen Gottes.* Marburg and der Lahn: Verlag der Francke-Buchhandlung, 1956.

Bissinger, A., *Die Struktur der Gotteserkenntnis. Studien zur Philosophie C. Wolffs.* Bonn, 1970.

Blackall, Eric, A., *The Emergence of German as a Literary Language, 1700-1775.* Cambridge, Cambridge University Press, 1959.

Blackwell, Jeannine, and Zantop, Susanne, *Bitter Healing: German Women Writers from 1700 to 1830: An Anthology.* Lincoln: U. of Nebraska Press, 1990.

Blochmann, Elisabeth, *Das `Frauenzimmer' und die `Gelehrsamkeit.' Eine Studie über die Anfänge des Mädchenschulwesens in Deutschland.* Heidelberg, 1973.

Blumenberg, Hans, "Rechtfertigung der Neugierde als Vorbereitung der Aufklärung," in *Erforschung der deutschen Aufklärung*, Peter Pütz, ed., Königstein/Ts., 1980, 81-100.

----------, *Der Prozeß der theoretischen Neugierde.* Frankfurt am Main, 1973.

Bödeker, Hans Erich, "Reisen -- Bedeutung und Funktion für die deutsche Aufklärungsgesellschaft," in Woflgang Griep, Hans-Wolf Jäger, eds., Reisen im 18. Jahrhundert. Heidelberg, 1986.

----------, "Aufklärung als Kommunikationsprozeß," in R. Vierhaus, ed., Aufklärung als Prozeß, *Aufklärung* 2/2 (1987): 89-111.

----------, "Das Kaffeehaus als Institution aufklärerischer Geselligkeit," in Etienne François, ed., *Sociabilité et Société bourgeoise en France, en Allemagne et en Swisse, 1750-1850.* Paris, 1987, 65ff.

----------, and Ulrich Herrmann, *Aufklärung als Politisierung - Politisierung der Aufklärung*. Hamburg: Meiner, 1987.

---------- and Gerald Chaix, Patrice Veit, eds., *Le Livre Religieux et ses Pratiques.*

Etudes sur l'histoire du livre religieux en Allemagne et en France à l'époque moderne. Göttingen: Vandenhoeck & Ruprecht, 1991.

Böttcher, Irmgard, "Der Nürnberger G. Ph. Harsdörffer," H. Steinhagen and Benno von Wiese, eds., *Deutsche Dichter des 17. Jahrhunderts.* Berlin, 1984, 301ff.

Bovenschen, Silvia, *Die imaginierte Weiblichkeit: Exemplarische Untersuchungen zu kulturegeschichtlichen und literarischen Präsentationsformen des Weiblichen.* Frankfurt am Main, 1979.

Brecht, Martin, et al., *Pietismus und Neuzeit.* Göttingen, 1979.

Bruford, W. H., *Germany in the 18th Century. The Social Background of the Literary Revival.* Cambridge: Cambridge University Press, 1971 first ed. 1935 .

Chartier, Roger, *The Cultural Uses of Print in Early Modern France.* Princeton: Princeton University Press, 1987.

----------, *The Culture of Print. Power and the Uses of Print in Early Modern Europe.* Princeton, New Jersey: Princeton University Press, 1987; engl. 1989.

----------, "The Practical Impact of Writing," in idem., *A History of Private Life*, vol. 2: Passions of the Renaissance, trans. Arthur Goldhammer. Cambridge, Mass.: The Belknap Press of Harvard University Press, 1986; engl. 1989, 111-159.

Christie, John R. R "Aurora, Nemesis and Clio," *British Journal for the History of Science* 26 (1993): 391-405.

Clark, William, "On the Ironic Specimen of the Doctor of Philosophy," *Science in Context* 5/1 (1992): 101-102.

Cocalis, Susan L., ed. *The Defiant Muse. German Feminist Poems from the Middle Ages to the Present.* New York: Feminist Press, 1986.

Cohen, I. Bernard, *Album of Science. From Leonardo to Lavoisier. 1450-1800.* New York: Charles Scribner's Sons, 1980.

Collison, Robert, *Encyclopaedias: Their History throughout the Ages.* New York: Hafner Publishing Co., 1966.

Cooter, Roger and Stephen Pumfrey, "Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture," *History of Science* 32 (1994): 237-267.

Cox, Virginia *The Renaissance Dialogue. Literary Dialogue in its Social, Political Contexts, Castiglione to Galileo.* Cambridge: Cambridge University Press, 1992.

Dann, Otto, ed. *Lesegesellschaften und bürgerliche Emanzipation: Ein europäischer Versuch.* München: Beck, 1981.

Danzel, Theodor Wilhelm, *Gottsched und seine Zeit. Auszüge aus seinem Briefwechsel.* Leipzig: Dycksche Buchhandlung 1855; reprint Hildesheim 1970.

Darnton, R., *The Business of Enlightenment, a Publishing History of the Encyclopédie, 1775-1800.* Cambridge: Belknap Press, 1979.

----------, *The Literary Underground of the Old Regime.* Cambridge, Mass.: Harvard University Press, 1979.

Daston, Lorraine, Lorraine Daston, "Ravening Curiosity and Gawking Wonder in the Early Modern Study of Nature," *Max Planck Institut für Wissenschaftsgeschichte*, reprint 7, Berlin 1994.

Davis, Natalie Zemon, "Printing and the People," *Society and Culture in Early Modern France.* Stanford: Stanford University Press, 1975, 189-226.

Dear, Peter, ed. *The Literary Structure of Scientific Argument.* Philadelphia, University of Pennsylvania Press, 1991.

Delon, Michael, "La Marquise et le philosophe," *Revue des Sciences Humaines* 182 (1981-82): 65-78.

Dierse, Ulrich, "Enzyklopädie: Zur Geschichte eines philosophischen und wissensschaftstheoretischen Begriffs," *Archiv für Begriffstgeschichte*, Supplementheft 2, Bonn: Bouvier, 1977.

Dobbs, Betty Jo Teeter and Margaret C. Jacob, *Newton and the Culture of Newtonianism.* New Jersey: Humanities Press International, 1981-82.

Donato, Clorinda and Robert M. Maniquis, eds., *The Encyclopédie and the Age of Revolution*, 1789/1989, *The French Revolution: A UCLA Bicentennial Program*, University of California, Los Angeles, 1992.

Duchhardt, Heinz, *Das Zeitalter des Absolutismus.* München: Oldenbourg Verlag, 1989.

Dülmen, Richard van, *The Society of the Enlightenment, The Rise of the Middle Class and*

Enlightenment Culture in Germany. New York: St. Martin's Press, 1992.

Eckart, Rudolf, Abraham Gotthelf Kästner's Selbstbiographie und Verzeichnis seiner Schriften. Hannover: Ernst Geibel, 1909.

Ecole, Jean, "De la notion de philosophie expérimentale chez Wolff," *Etudes philosopiques* 4 (1979): 397-406.

Eisenstein, E., *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early-modern Europe*. New York: Cambridge University Press, 1977.

Engelsing, Rolf, *Analphabetentum und Lektüre: Zur Sozialgeschichte des Lesens in Deutschland zwischen feudaler und industrieller Gesellschaft*. Stuttgart: Metzler, 1973.

Epstein, Julia and Mark L. Greenberg, "Decomposing Newton's Rainbow," *Journal of the History of Ideas* 45 (1984): 115-140.

Evans, Richard J. and W. R. Lee, *The German Family: Essays on the Social History of the Family in Nineteenth and Twentieth-century Germany*. London: Croomtel, 1981.

Fabian, Bernhard, "English Books and Their Eighteenth-Century German Readers," in Paul Korshin, ed., *The Widening Circle: Essays on the Circulation of Literature in Eighteenth-Century Europe*. Philadelphia: University of Pennsylvania Press, 1976, 117-96.

Fara, Patricia, *Sympathetic Attractions. Magnetic Practices, Beliefs, and Symbolism in Eighteenth-Century England*. Princeton: Princeton University Press, 1996.

Festschrift Karl-Marx-Universität Leipzig 1409-1959. 2 vols. 1, Leipzig, 1958.

Fehér, Marta, "The triumphal march of a paradigm: A case study of the popularization of Newtonian Science," in *Tractrix: Yearbook for the History of Science, Medicine, Technology, and Mathematics* 2 (1992): 93-110.

Foucault, M. "Politics and the study of discourse," in *The Foucault Effect, Studies in Governmentality*. Chicago: University of Chicago, 1991, chapter 2.

Forster, Leonard, "'Charlataneria eruditorum,' zwischen Barock und Aufklärung in Deutschland. Mit dem Versuch einer Bibliographie," in *Res Publica Litteraria: Die Institutionen der Gelehrsamkeit in der frühen Neuzeit*, Sebastian Neumeister and Conrad Wiedmann eds. Wolfenbüttel: Herzog August Bibliothek Wolfenbüttel, 1987, Part I, 203-220.

Frevert, Ute, *Women in German History, From Bourgeois Emancipation to Sexual*

Liberation, trans. Stuart McKinnon-Evans, Terry Bond and Barbara Norden. Oxford: Berg, 1988.

Friedberg, E. *Die Universität Leipzig*, Leipizg, 1909.

Frühsorge, Gotthart, *Der politische Körper. Zum Begriff des Politischen im 17. Jahrhundert und in den Romanen Christian Weises*. Stuttgart: 1974.

Fulbrook, Mary, *Piety and Politics. Religion and the Rise of Absolutism in England, Württemberg, and Prussia*. Cambridge: Cambridge University Press, 1983.

Galison, Peter, "History, Philosophy, and the Central Metaphor," *Science in Context* 2 (1988): 197-212.

Gearhart, Suzanne "History as Criticism: the Dialogue of History and Literature, *Diacritics* (1987): 56-65.

Gierl, Martin, *Pietismus und Aufklärung. Theologische Polemik und die Kommunikationsreform der Wissenschaften am Ende des 17. Jahrhunderts*. Göttingen: Vandenhoeck & Ruprecht, 1997.

----------, "Zur Entwicklung der `Historia Literaria' im 18. Jahrhundert," *Denkhorizonte und Handlungsspielräume, Historische Studien für Rudolf Vierhaus zum 70. Geburtstag*. Göttingen: Wallstein Verlag, 1992, 54-80.

Gössman, Elisabeth, *Ob die Weiber Menschen seyn, oder nicht?* München: Iucidum, 1988.

Golinski, Jan V., "The Theory of Practice and the Practice of Theory: Sociological Approaches in the History of Science," *Isis* 81 (1991).

----------, "A Noble Spectacle. Phosphorus and the Public Cultures of Science in the Early Royal Society," *Isis* 80 (1990): 11-39.

----------, *Science as Public Culture. Chemistry and Enlightenment in Britain, 1760-1820*. Cambridge: Cambridge University Press, 1992.

Greenberg, Mark, "Eighteenth-Century Poetry Represents Moments of Scientific Discovery. Appropriation and Generic Transformation," in Stuart Peterfreund, ed., *Literature and Science, Theory & Practice*. Boston: Northeastern University Press, 1990, 115-138

Graevenitz, Gerhart, "Innerlichkeit und Öffentlichkeit. Aspekte deutscher `bürgerlicher' Literatur im frühen 18. Jahrhundert," *Deutsche Vierteljahrschrift für Literaturwissenschaft und Geistesgeschichte* 49 (1975) Sonderheft: 1-82.

Grafton, Anthony, "The World of the Polyhistors: Humanism and Encyclopedism," *Central European History* 18 (1985): 31-47.

Greven, Jochen, "Grundzüge einer Sozialgeschichte des Lesers und der Lesekultur," in *Lesen-ein Handbuch*, ed. Alfred C. Baumgärtner. Hamburg: Verlag für Buchmarkt-Forschung, 1973.

Grimm, Gunther E. *Literatur und Gelehrtentum in Deutschland, Untersuchungen zum Wandel ihres Verhältnisses vom Humanismus bis zur Frühaufklärung*. Tübingen: Max Niemeyer Verlag, 1983.

Guerlac, Henri, *Newton on the Continent*. Ithaca, N.Y.: Cornell University Press, 1981.

Habermas, Jürgen, *The Structural Transformation of the Public Sphere, An Inquiry into a Category of Bourgeois Society, Society,* trans. Thomas Burger with Frederick Lawrence. Cambridge, Mass.: MIT Press, 1989.

Hackmann, Willem D., *Electricity from Glass, The History of the Frictional Electrical Machine 1600-1850*. Alphen aan den Rijn: Sijthoff & Noordhoff, 1978.

Hakfoort, Casper, *Optica in de eeuw van Euler, Opvattingen over de natuur van het licht, 1700-1795*. Amsterdam, 1986.

Hall, A. Rupert, *All Was Light, An Introduction to Newton's Opticks*. Oxford: Clarendon Press, 1993.

Hamilton, Edith, *Mythology. Timeless Tales of Gods and Heroes*. New York: Little, Brown & Company, 1942.

Hammerstein, Notker, "Thomasius und die Rechtsgelehrsamkeit," *Studia Leibnitiana* 11/1 (1979).

Hankins, Thomas L., *Science and the Enlightenment*. Cambridge: Cambridge University Press, 1985.

Hanstein, Adalbert von, *Die Frauen in der Geschichte des deutschen Geisteslebens*, 2 vols. Leipzig, 1899.

Hardison, O. B. Jr., *The Enduring Moment. A Study of the Idea of Praise in Renaissance Literary Theory and Practice*. Chapel Hill: U. Of North Carolina, 1962.

Harth, Erica, *Cartesian Women. Versions and Subversions of Rational Discourse in the Old*

Regime. Ithaca and London: Cornell University Press, 1992.

Hase, Oskar von, *Breitkopf & Härtel*. Leipzig, 2 vols, 1917.

Hauser, Arnold, *The Social History of Art*, 4 vols. New York: Vintage Books, 1959.

Heilbron, John L., *Electricity in the Seventeenth and Eighteenth Centuries*. Berkeley and Los Angeles: University of California Press, 1979.

----------, *Elements of Early Modern Physics*. Berkeley: University of California Press, 1982.

Heintz, Betina and Claudia Honneger, "Zum Strukturwandel weiblicher Widerstandsformen im 19. Jahrhundert" in *Listen der Ohnmacht. Zur Sozialgeschichte weiblicher Widerstandsformen*. Frankfurt, 1981.

Herrmann, Hans Peter, *Naturnachahmung und Einbildungskraft*. Bad Homburg: Verlag Gehlen, 1970.

Hilgartner, Stephen "The Dominant View of Popularization; Conceptual Problems, Political Uses," *Social Studies of Science* 20 (1990/ 3, Aug.): 519-539.

Hinske, Norbert, ed., *Zentren der Aufklärung I: Halle. Aufklärung und Pietismus*. Heidelberg: Schneider, 1989.

Hodermann, Richard, *Universitätsvorlesungen in deutscher Sprache um die Wende des 17. Jahrhunderts*. Diss. Jena, Friedrichsroda, 1891.

----------, "Universitätsvorlesungen in deutscher Sprache: Christian Thomasius, seine Vorgänger und Nachfolger," *Wissenschaftliche Beihefte zur Zeitschrift des Allgemeinen Deutschen Sprachverein* 8 (1895): Berlin.

Holzey, Helmut, "Der Philosoph für die Welt -eine Chimäre der deutschen Aufklärung?" in *idem* and Walter Ch. Zimmerli, eds., *Esoterik und Exoterik der Philosophie*. Basel, Schwabe & Co. Verlag, 1977.

Hull, David, "In Defense of Presentism," *History and Theory* 18 (1979): 1-15.

Hoffmann, J. *Die 'Hausväterliteratur' und die 'Predigten über den christlichen Hausstand.'* Weinheim/Berlin, 1959.

Hufbauer, Karl, *The Formation of the German Chemical Community 1720-1795*. Berkeley and California: University of California Press, 1982.

Huizinga, J. *Homo Ludens: a study of the play-element in culture.* Boston: Beacon Press, 1955.

Hunt, Lynn, ed., *The New Cultural History.* Berkeley: University of California Press, 1989.

Jacob, Margaret, *The Cultural Meaning of the Scientific Revolution.* New York: Alfred A. Knopf, 1988.

Joeres, Ruth-Ellen B. and Mary Jo Maynes, eds. *German Women in the Eighteenth and Nineteenth Centuries, A Social and Literary History.* Bloomington: Indiana University Press, 1986.

Jordan, Mark, "A Preface to the Study of Philosophical Genres," *Philosophy and Rhetoric* 14/4 (1981): 202, 206.

Kafker, Frank A., ed., *Notable Encyclopedias of the Seventeenth and Eighteenth Centuries: Nine Predecessors of the Encylopédie.* Oxford: The Voltaire Foundation, 1981.

Kemper, Hans-Georg, *Deutsche Lyrik der frühen Neuzeit,* vol. 2: Frühaufklärung. Tübingen: Niemeyer, 1991.

Kernan, Alvin B., *The Imaginary Library, An Essay on Literature and Society.* Princeton: Princeton University Press, 1982.

Ketelsen, Uwe-K, *Die Naturpoesie der Norddeutschen Frühaufklärung.* Stuttgart, 1974.

----------, "Poesie und bürgerlicher Kulturanspruch. Die Kritik and der rhetorischen Gelegenheitspoesie in der frühbürgerlichen Literaturdiskussion," *Lessing Yearbook 8* (1976): 89-107.

----------, "Naturpoesie als Medium bürgerlicher Ideologiebildung im frühen 18. Jahrhundert," in Norbert Mecklenburg, ed. *Naturlyrik und Gesellschaft.* Stuttgart, 1977.

Kibre, Pearl, *Scholarly Privileges in the Middle Ages.* Cambridge, Mass.: Medieval Academy of America, 1962.

Kiesel, Helmuth and Paul Münch, *Gesellschaft und Literatur im 18. Jahrhundert. Voraaussetzungen und Entstehung des literarischen Marktes in Deutschland.* München, 1977.

Kleinert, Andreas, *Die allgemeinverständlichen Physikbücher der französischen Aufklärung.* Sauerländer Aarau, 1974.

Klemm, Gustav Friedrich, *Die Frauen: Culturgeschichtliche Schilderungen des Zustandes und Einflusses der Frauen in den verschiedenen Zonen und Zeitaltern*, vol. 6. Dresden: Arnold, 1854-59.

Klens, Ulrike, *Mathematikerinnen im 18. Jahrhundert: Maria Gaetana Agnesi, Gabrielle-Emilie DuChâtelet, Sophie Germain. Fallstudien zur Wechselwirkung von Wissenschaft und Philosophie im Zeitalter der Aufklärung*. Pfaffenweiler: Centaurus-Verlagsgesellschaft, 1994.

Knudsen, Jonathan, *Möser in the German Enlightenment*. Cambridge: Cambridge University Press, 1986.

Kobuch, Agatha, *Zensur und Aufklärung in Kursachsen. Ideologische Strömungen und politische Meinungen zur Zeit der sächsich-polnischen Union (1697-1763)*. Weimar: Hermann Böhlaus Nachfolger, 1988.

Kopitzsch, Franklin, ed., *Aufklärung, Absolutismus und Bürgertum in Deutschland*. Munich: Nymphenburger Verlagshandlung, 1976.

Kors, A. and Korshin P., eds., *Anticipations of the Enlightenment in England, France, and Germany*. University of Pennsylvania Press, 1987.

Korshin, Paul, ed., *The Widening circle: Essays on the Circulation of Literature in Eighteenth-Century Europe*. Philadelphia: University of Philadelphia Press, 1976.

Kristeller, Paul Oskar, "The Modern System of the Arts," *Renaissance Thought II. Papers on Humanism and the Arts*. New York: Harper & Row, 1965.

Kruedener, Jürgen, Freiherr von, *Die Rolle des Hofes im Absolutismus*. Stuttgart, 1973.

Kusukawa Sachiko, T*he Transformation of Natural Philosophy. The Case of Philip Melanchton*. Cambridge: Cambridge University Press, 1995.

Langen, August, *"Der Wortschatz des 18. Jahrhunderts"*, in *Deutsche Wortgeschichte*, vol. 2, Berlin, 1959.

La Vopa, Anthony J., *Grace, Talent, and Merit. Poor Students, Clerical Careers, and Professional Ideology in Eighteenth-Century Germany*. Cambridge: Cambridge University Press, 1988.

----------, "Conceiving of a Public: Ideas and Society in Eighteenth-Century Europe," *Journal of Modern History* 64 (1992): 79-116.

Lehmann, Enrst Herbert, *Geschichte des Konversationslexikon*. Leipzig, 1934.

Leighton, Joseph, "Occasional Poetry in the Eighteenth Century," *The Modern Language Review* 78/2 (1983): 340-358.

Levine, George, ed., *One Culture: Essays in Science and Literature*. Madison: University of Wisconsin, 1987.

Lind, Gunter, *Physik im Lehrbuch, 1700-1850. Zur Geschichte der Physik und ihrer Didaktik in Deutschland*. Berlin: Springer-Verlag, 1992.

Lindemann, Margot, *Deutsche Presse bis 1815: Geschichte der deutschen Presse*, vol. 1. Berlin, 1969.

Loemker, L. E., *Struggle for Synthesis*. Cambridge, Mass.: Cambridge University Press, 1972.

Lowood, Henry E. L., *Patriotism, Profit, and the Promotion of Science in the German Enlightenment. The Economic and Scientific Societies, 1760-1815*. New York & London: Garland Publishing, Inc., 1991.

Luhmann, Niklas, "The Work of Art and the Self-Reproduction of Art," in *Essays on Self-Reference*. New York: Columbia University Press, 1990.

MacKenzie, Donald F., "Topography and Meaning: The Case of William Congreve," in *Buch und Buchhandel in Europa im achtzehnten Jahrhundert*, ed. Giles Barber and Bernard Fabian.

----------, "The Book as an Expressive Form," *Bibliography and the Sociology of Texts*, The Panizzi Lectures, Wisconsin Press, 1985.

Marsh, David, *The Quattrocento Dialogue; Classical Tradition and Humanist Innovation*. Cambridge: Cambridge, Mass.: Cambridge University Press, 1980.

Martens, Wolfgang, *Die Botschaft der Tugend: Die Aufklärung im Spiegel der Deutschen Moralischen Wochenschriften*. Stuttgart, 1971.

----------, "Die Flugschriften gegen den *Patriot 1724 : Zur Reaktion auf die Publizistik der frü*hen Aufklärung," in *Rezeption und Produktion zwischen 1570 und 1730: Festschrift für Günther Weydt*, ed. Wolfdietrich Rasch et al. Bern: Francke, 1972, 515-36.

----------, "Leserezepte fürs Frauenzimmer: Die Frauenzimmerbibliotheken derdeutschen Moralischen Wochenschriften," *Archiv für Geschichte des Buchwesens*

(1975): 1143-1200.

----------, "Bürgerlichkeit in der frühen Aufklärung," in *Aufklärung, Absolutismus und Bürgertum in Deutschland*, ed. Kopitzsch.

----------, "Von Thomasius bis Lichtenberg: Zur Gelehrtensatire der Aufklärung," *Lessing Yearbook* 10 (1978): 7-34.

----------, "Formen bürgerliches Lesens im Spiegel der deutschen Moralischen Wochenschriften," in *Lesegesellschaften und bürgerliche Emanzipation: Ein europäischer Versuch*, ed. Otto Dann. München: Beck, 1981, 55-70.

----------, *Literatur und Frömmigkeit in der Zeit der frühen Aufklärung*. Tübingen: Max Niemeyer Verlag, 1989.

----------, ed., *Zentren der Aufklärung III: Leipzig, Aufklärung und Bürgerlichkeit*. Heidelberg: Lambert Schneider, 1990.

Meyer, Gerald Dennis, *The Scientific Lady in England 1650-1760, An Account of her Rise, with Emphasis on the Major Roles of the Telescope and Microscop*. Berkeley: University of California Press, 1955.

Mühlpfordt, Günther, "Die 'sächsischen Universitäten' Leipzig, Jena, Halle und Wittenberg als Vorhut der deutschen Aufklärung" in *Wissenschafts- und Universitätsgeschichte in Sachsen im 18. und 19. Jahrhundert*, Karl Czok, ed. Berlin/DDR, 1987.

Murdock, Ruth T., "Newton and the French Muse," *Journal of the History of Ideas* 19 (1958): 323-334.

Nasse, Peter, *Die Frauenzimmer-Bibliothek des hamburger "Patrioten" von 1724: Zur weiblichen Bildung in der Frühaufklärung*, Stuttgarter Arbeiten zur Germanistik, 10, 2. vols. Diss. Münster 1975, Stuttgart: Hans Dieter Heinz, 1976.

Nicolson, Marjorie Hope, *The Breaking of the Circle; Studies in the Effect of the "New Science" upon 17th-Century Poetry*. New York: Columbia University Press, 1960.

----------, *Science and Imagination*, Studies on the Effect of the "New Science" *upon Seventeenth-Century Poetry*. Ithaca, N. Y.: Cornell University Press, 1962.

----------, *Newton Demands the Muse: Newton's Opticks and the Eighteenth Century Poets*, Princeton: Princeton University Press, 1963.

Nussbaum, Martha C., "Mortal Immortals: Lucretius on Death and the Voice of Nature,"

Philosophy and Phenomenological Research 50 (1989-90): 303-51.

Obermann, Heiko A., *Contra vanam curiositatem, ein Kapitel der Theologie zwischen Seelenwinkel und Weltall.* Zürich: Theologischer Verlag, 1974.

Ostertag, Heinrich, *Der philosophische Gehalt des Wolff-Manteuffelschen Briefwechsels.* Leipzig, 1910; reprint Hildesheim, 1980.

Outram, Dorinda, *The Enlightenment.* Cambridge: Cambridge University Press, 1995.

Pahl, Georg, *Geschichte des naturwissenschaftlichen und mathematischen Unterrichts.* Leipzig, 1913.

Paul, Charles B., *Science and Immortality. The Eloges of the Paris Academy of Sciences 1699-1791.* Berkeley: University of California Press, 1980.

Paulsen, Friedrich, *Geschichte des gelehrten Unterrichts an den deutschen Schulen und Universitäten vom Ausgang des Mittelalters bis zur Gegenwart.* Leipzig: Verlag von Veit & Comp., 1919.

----------, *Die deutschen Universitäten und das Universitätsstudium.* Berlin 1902, reprint Hildesheim, 1966.

Peterfreund, Stuart, *Literature and Science: Theory and Practice.* Boston: Northeastern University Press, 1990.

Phillip, Wolfgang, *Das Werden der Aufklärung in theologiegeschichtlicher Sicht.* Göttingen, 1957.

Pickering, Andrew, ed., *Science as Practice and Culture.* Chicago: The University of Chicago Press, 1992.

Porter, Roy, "The History of Science and the History of Society," in *Companion to the History of Modern Science*, ed. Robert Olby, G. N. Cantor, J. R. R. Christie, and M. J. S. Hodge. London: Routledge, 1990, 32-46.

----------, ed., *The Popularization of Medicine 1650-1850.* London: Routledge, 1992.

---------- and Nikulas Teich, eds., *The Enlightenment in National Context.* Cambridge: Cambridge University Press, 1981.

Prutz, K. E., *Geschichte des deutschen Journalismus*, vol. 1. Hannover, 1845.

Raabe, Paul, *Bücherlust und Lesefreuden: Beiträge zur Geschichte d. Buchwesens im 18. u. frühen 19. Jh.* Stuttgart: Metzler, 1984.

----------, ed., *Buch und Buchhandel in Europa im achtzehnten Jahrhundert*, Wolfenbütteler Schriften zur Geschichte des Buchwesens, vol. 4. Hamburg, Dr. Ernst Hauswedell & Co., 1981.

Ramshorn, Carl, *Geschichte der merkwürdigsten deutschen Frauen,* 2 vols. Leipzig; Einhorn, 1842-43.

Rathmann, Lothar, ed., *Alma Mater Lipsiensis, Geschichte der Karl-Marx-Universität Leipzig*. Leipzig, 1984.

Reill, Peter Hans, *The German Enlightenment and the Rise of Historicism,* Berkeley. Los Angeles, Londong: University of California Press, 1975.

Richards, Ruthann, *The Image of Women in Selected Moral Weeklies of the Early English and German Enlightenment 1709-1745*. Phd. Diss. University of Cincinnatti, 1984.

Richter, Karl, *Literatur und Naturwissenschaft. Eine Studie zur Lyrik der Aufklärung*. Munich, 1972.

Rieck, Werner, "Literaturgesellschaftliche Prozesse in der deutschen Frühaufklärung," in Kopitzsch, ed., *Aufklärung, Absolutismus und Bürgertum in Deutschland,* 364-84.

Riedel, M., "Gesellschaft, bürgerliche," in O. Brunner et al., eds., *Geschichtliche Grundbegriffe*, vol. 2, Stuttgart, 1975, 719-800.

Risk, Laddie, *Der Einfluß des evangelischen Pfarrhauses auf die Literatur des 18. Jahrhunderts*. Diss. Tübingen, Bremen, 1932.

Rouse, Joseph, "What are Cultural Studies of Scientific Knowledge?," *Configurations* 1 (1993): 1-22.

----------, "Philosophy of Science and the Persistent Narratives of Modernity," *Studies in the History and Philosophy of Science* 22 (1991): 141-62.

Rüger, Alexander, "Populäre Naturwissenschaft in Nürnberg am Ende des 18. Jahrhunderts. Reisende Experimentatoren, öffentliche Vorlesungen und physikalisches Spielzeug," *Berichte für Wissenschaftsgeschichte* 5 (1982): 173-91.

Rupp, Jan C. C.., "The New Science and the Public Sphere in the Promodern Era," *Science in Context* 8/ 3 (1995): 487-507.

Ruppert, Wolfgang, *Bürgerlicher Wandel. Studien zur Herausbildung einer nationalen deutschen Kultur im 18. Jahrhundert.* Munich, 1977.

Sauder Gerhard and Jochen Schlobach, eds., *Aufklärungen*, vol.1: *Frankreich und Deutschland im 18. Jahrhundert.* Heidelberg: Winter, 1986.

Schaffer, Simon, "Natural Philosophy and Public Spectacle in the Eighteenth Century," *History of Science* 21 (1983): 1-43.

----------, "The Consuming Flame: Electrical Showmen and Tory Mystics in the World of Goods," in John Brewer and Roy Porter, eds., *Consumption and the World of Goods in the Eighteenth Century.* London: Routledge, 1992, 489-526.

Schatzberg, Walter, *Scientific Themes in the Popular Literature and the Poetry of the German Enlightenment, 1720-1760.* Bern: Herbert Lang, 1973.

Scherpe, Klaus R., *Gattungspoetik im 18. Jahrhundert. Historische Entwicklung von Gottsched bis Herder.* Stuttgart, 1968.

Schiebinger, Linda, *The Mind has no Sex? Women in the Origin of Science.* Cambridge: Harvard University Press, 1989.

Schimank, Hans, "Stand und Entwicklung der Naturwissenschaften im Zeitalter der Aufklärung," *Lessing und die Zeit der Aufklärung.* Göttingen: Vandenhoeck & Ruprecht, 1968.

----------, *Hoffnung auf Vernunft. Aufklärungsphilosophie in Deutschland.* Hamburg: Felix Meiner Verlag, 1990.

Schöffler, Herbert, *Protestantismus und Literatur.* Leipzig, 1922.

Schreier, Wolfgang, "Die Physik an der Leipziger Universität bis zum Ende des 19. Jahrhunderts," *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig*, Mathematisch-Naturwissenschaftliche Reihe 34/1 (1985): 5-8.

Schultz, Alwin, *Alltagsleben einer deutschen Frau zu Anfang des 18. Jahrhunderts.* Leipzig, 1890.

Scott, Joan W., *Gender and the Politics of History.* New York: Columbia University Press, 1988..

Secord, James A., "Newton in the Nursery: Tom Telescope and the Philosophy of Tops and

Balls, 1761-1838, *History of Science* 23 (1985): 27-151.

Segebrecht, Wulf, *Das Gelegenheitsgedicht. Ein Beitrag zur Geschichte und Poetik der deutschen Lyrik*. Stuttgart, 1977.

Seydewitz, Thea von, *Ernst Christoph Graf Manteuffel Kabinettsminister August des Starken, Persönlichkeit und Wirken*. Dresden, 1926.

Shapin, Steven, "'Nibbling at the teats of science': Edinburgh and the diffusion of science in the 1830s," Ian Inkster and Jack Morrell eds., *Metropolis and Province, Science in British Culture, 1780-1850*. Philadelphia: University of Pennsylvania Press, 1983.

----------, "Social uses of science," in R. S. Porter and G. S. Rousseau eds., *The Ferment of Knowledge: Studies in the Historiography of Eighteenth-Century Science*. New York: Cambridge University Press, 1980, 93-139.

----------, "Science and the public," in R. C. Olby et al. eds., *Companion to the History of Modern Science*. London and New York: Routledge, 1990, 990-1007.

Shinn, Terry and Richard Whitley, *Expository Science: Forms and Functions of Popularisation*. Dordrecht: D. Reidel Publishing Company, 1985.

Siegrist, Christoph, *Das Lehrgedicht der Aufklärung*. Stuttgart: Metzler, 1974.

Spaethling, R. 1971 "On Christian Thomasius and his Alleged Offspring: The German Enlightenment," *Lessing Yearbook* 3 (1971): 201-224.

Spiegelman, Willard, *The Didactic Muse. Scenes of Instruction in Contemporary American Poetry*. Princeton, New Jersey: Princeton University Press, 1989.

Stebbins, Sara, *Maxima in minimis. Zum Empirie und Autoritatsverständnis in der physikotheologischen Literatur der Frühaufklärung*. Bern, 1980.

Steinhausen, Georg, "Galant, Curiös und Politisch. Drei Schlag- und Modeworte des Perrückenzeitalters," *Zeitschrift für den deutschen Unterricht* 9 (1895): Leipzig 22-37.

----------, *Der Aufschwung der deutschen Kultur vom 18. Jahrhundert bis zum Weltkrieg*. Leipzig and Vienna, 1920.

----------, *Geschichte des deutschen Briefes. Zur Kulturgeschichte des deutschen Volkes*. Zürich: Weidmann, 1968.

Steinmetz, Mark, ed., *Bedeutende Gelehrte in Leipzig*, vol. 1. Leipzig, 1965.

Stewart, Larry, *The Rise of Public Science. Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750.* Cambridge: Cambridge University Press, 1992.

Stichweh, Rudolf, *Zur Entstehung des modernen Systems wissenschaftlicher Disziplinen: Physik in Deutschland 1740-1890.* Frankfurt: Shurkamp, 1984.

Stoddard, Roger E., "Morphology and the Book from an American Perspective," *Printing History* 17(1987): 2-14.

Sutherland, John, "Publishing History: A Hole at the Center of Literary Sociology," *Critical Inquiry* (1988): 574-589.

Thompson, Patricia, "The Literature of Patronage, 1580-1630," *Essays in Criticism* 2/3 July (1952): 267-84.

Tompkins, Jane P., *Reader-Response Criticism. From Formalism to Post-Structuralism.* Baltimore: Johns Hopkins University Press, 1992.

Troitzsch, Ulrich, ed., *Technologischer Wandel im 18. Jahrhundert*, Wolfenbütteler Forschungen 14. Wolfenbüttel: Herzog August Bibliothek, 1981.

Ulrich, Wolfgang, *Studien zur Geschichte des deutschen Lehrgedichtes im 17. und 18. Jahrhundert.* Diss. Kiel, 1960.

Venturi, Franco, *Utopia and Reform in the Enlightenment.* London: Cambridge University Press, 1971.

Vierhaus, Rudolf, ed., Aufklärung als Prozeß, *Aufklärung* 2/2 (1987).

----------, Vierhaus, *Germany in the Age of Absolutismus.* New York: Cambridge University Press, 1988.

----------, ed., *Wissenschaften im Zeitalter der Aufklärung.* Göttingen: Vandenhoeck & Ruprecht, 1989.

Vucinich, Alexander, *Science in Russian Culture.* California: Stanford University Press, 1963.

Wagner, Fritz, *Isaac Newton im Zwielicht zwischen Mythos und Forschung.* Freiburg/München, 1976.

Walker, Mack, *German Home Towns: Community, State and General Estate, 1648-1871,*

Ithaca, N. Y.: Cornell University Press, 1971.

Ward, Albert, *Book Production, Fiction and The German Reading Public 1740-1800,* Oxford: Clarendon Press, 1974.

Wiener, O., Des Coudres, T., "Das Physikalische und das Theoretisch-physikalische Institut," in *Festschrift zum 500jährigem Jubiläum der Universität Leipzig,* vol. 4. Leipzig: Hirzel, 1909.

Weinberg, Bernard, *A History of Literary Criticism in the Italian Renaissance*, 2. vols. Chicago: The University of Chicago Press, 1961.

Weis, Eberhard, *Gesellschaftsentwicklung in der frühen Neuzeit*, in Bosl, Karl and Eberhard Weis, *Die Gesellschaft in Deutschland* I. Munich, 1976.

Weithase, Irmgard, *Zur Geschichte der gesprochenen deutschen Sprache*, vol.1, Tübingen,1961.

Welke, Martin, "Die Legende vom `unpolitischen' Deutschen. Zeitunglesen im 18. Jahrhundert als Spiegel des politischen Interesses," in *Jahrbuch der Wittheit zu Bremen* 25 (1981): 161ff.

Westen, Louis Armour, *"Melitto-Logia" the Mythology of the Bee in Eighteenth-Century German Literature*. Diss., University of Illinois, 1952.

Westfall, Richard S., *Never at Rest, A Biography of Isaac Newton*. Cambridge: Cambridge University Press, 1980.

Wetzels, Walter, "Newton for the ladies: Algarotti's popularisation of Newton's optics" in *Transactions of the Eighth International Congress on the Enlightenment II*. Oxford: The Voltaire Foundation, 1992, 1152-1155.

Wiedemann, Conrad, "Polyhistors Glück und Ende. Von Daniel Georg Morhof zum jungen Lessing," in Heinz Otto Burger and Klaus von See, eds., *Festschrift Gottfried Weber*. Bad Homburg: Gehlen, 1967.

Witkowski, Georg, *Geschichte des literarischen Lebens in Leipzig*. Berlin, 1909.

Wittmann, Reinhard, *Geschichte des deutschen Buchhandels. Ein Überblick*. München: C. H. Beck, 1991.

Wundt, Max, *Die deutsche Schulphilosophie im Zeitalter der Aufklärung*. Tübingen, 1945; reprint Hildesheim, 1964.

Wuthnow, Robert et al., *Cultural Analysis. The Work of Peter L. Berger, Mary Douglas, Michel Foucault, and Jürgen Habermas*. Boston: Routledge, 1984.

Gustav Zart, *Einfluss der englischen Philosophen seit Bacon auf die deutsche Philosophie des 18. Jahrhunderts*. Berlin, 1881.

Zöckler, Otto, *Geschichte der Beziehungen zwischen Theologie und Naturwissenschaft*, Gütersloh, two vols.: Volume I, *Von den Anfängen der Christlichen Kirche bis Newton und Leibniz;* Volume II, *Von Newton und Leibniz bis zur Gegenwart*, 1877-79.

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