Scientific literacy in eighteenth-century Germany

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Critics tend to qualify German intellectual life in the eighteenth century as a development that assumed a separate course from that of its French and English counterparts.¹ The German *Sonderweg* is attributed to the country's complex history of fractious politics that did not support the notion of centralized authority, but instead encouraged a state of outright instability, which presented itself as an ever-changing establishment and re-establishment of political allegiances to suit momentary rule. Germany's *Kleinstaaterei*, its existence as a loose alliance of small princely states, posed an obvious challenge to the formation of a uniform intellectual culture because its disparate nature undermined the very idea of commonality in favour of more regional tendencies. Yet, German intellectual culture did flourish in the eighteenth century, establishing a national presence and a strong tradition of academic thought, developments that are now seen as intertwined and inextricably linked. German *Aufklärung* was strongly felt at all levels of society, as it informed opinions, affected points of view and profoundly changed the manner in which one regarded the world. Arguably, its most significant effect was, however, on language itself, for writers of the German Enlightenment increasingly endorsed German as a language of learned discourse, deeming it not only capable of communicating abstract expression, but also entrusting its vernacular quality to be credible enough to encompass the depths of their own intellectual discoveries.

The purpose of this chapter is to highlight the development of this type of learned discourse as it occurred through scientific debate. The emergence of scientific literacy in Enlightenment Germany was a driving force that propelled overall public literacy as it set a standard, tone and objective for academic discourse which was later emulated in other fields of study. Propitious to the development of the scientific academic argument was the unprecedented expansion of print culture in Germany. The ready availability of printed matter afforded access to textual media and information for members of all levels of

1. There are a number of seminal texts that deal with this topic. For more information please see, for example, Gay (1969); Lepenies (2006); Eckhart (1990).

society, allowing the individual to appropriate knowledge in a solitary and personal manner. With this, the production and exchange of scientific knowledge also changed. This new method of appropriating knowledge created a pluralist communication system that challenged the very idea of a singular intellectual authority. Rather than being unconditionally respected, scientific treatises and theories were now openly questioned and authors had to defend their work in a much more public, and generally literate, manner than before. As this chapter demonstrates, this exchange of opinion elevated levels of literary expression by making everyone pay greater attention to the medium of language itself.

These contestations and rebuttals took place, for the most part, in periodical print media and as such were left available for open scrutiny long past the occurrence of the initial argument. In order to demonstrate the longevity and multifarious turns such discussions could take, this study examines the case of the preformation-epigenesis debate as it transpired at the height of the Enlightenment in eighteenth-century Germany. This debate was long, effusive and caustic. It originated in a scientific dispute between Caspar Friedrich Wolff and Albrecht von Haller, but then expanded to engage other members of the intellectual elite, polarizing opinions of some of the leading thinkers of the age. It spurred written reactions and counter-reactions from its participants and extended across disciplines to include both scientific observation and philosophical belief. The complexity and apparent insolubility of the argument left an unmistakable narrative trace that was documented in various journals, letters and essays of the day, providing therewith a veritable example of scientific literacy as it evolved and changed in eighteenth-century Germany.

This chapter isolates this singular, yet significant, debate by recounting some of the more important exchanges shared between the young scientist Wolff and his would-be mentor von Haller. It exposes the role print media played in the dissemination of knowledge and it highlights the use (and abuse) of that media by members of the establishment, while showing the overall importance of conviction and communication in formulation of new scientific theory. The involvement of other prominent thinkers of the age (such as Johann Friedrich Blumenbach and Immanuel Kant) is included as part of the chapter in order to illustrate the growing scope and depth the preformation-epigenesis argument assumed over time.

1. German language and the academic tradition

The absence of a clear and established protocol regarding a single authoritative language of scientific discourse becomes jarringly apparent when one com-

pares the leading academies of science in the German speaking world in the eighteenth century: the academies in Berlin, Göttingen and Munich. The Berlin Academy, founded 1700, conducted its affairs initially in Latin, but by mid-century (1744), reflecting the Francophile nature of both its curriculum and staffing, it switched to French. *Die Akademie der Wissenschaften zur Göttingen* (1751) taught in Latin, while at the *Churfürstliche-Bayerische Akademie der Wissenschaften* in Munich, established 1759, the language of instruction had always been German.²

This lack of consensus regarding the status of German as a scientific language reflects not only an uncertainty over the merit of its institutional usage, but more importantly, an ambiguity over its credibility in matters of scientific discourse. Institutional skepticism vis-à-vis the validity of German as a viable academic language would prevail for most of the eighteenth century. For example, in the Berlin Academy French continued to be the official language of conduct as late as 1804, for it is only then that its journals *Mémoires* and *Histoire* were replaced with an in-house German version (*Abhandlungen*) to chronicle the work and publish the proceedings of the Academy. (For a discussion of other academies, see also Gunnarsson's 'Introduction' and Bazerman's chapter in this volume.)

Efforts to standardize German were made early in the century by academics themselves, who attempted to counter the neglect the language suffered in the official scholarly realm. At the University of Halle philosophers Christian Wolff and Christianus Thomasius famously adopted German (rather than Latin) as their language of instruction, thereby endorsing its usage in research and in the promulgation of academic findings.³ Support to the cause of developing German academic literacy was also given, perhaps somewhat less radically, by men of letters such as Johann Christoph Gottsched, who despite deep personal Francophile leanings, promoted the usage of German through extra-curricular acts of sociability. In his *Deutsche Gesellschaft* (1727), a literary society at the University of Leipzig, he insisted that all communication be strictly conducted in German.⁴ Gottsched's involvement in his literary society anticipates later developments of the era, for over the course of the century the emergence of such private organizations and gatherings became increasingly commonplace,

2. For more comprehensive information on the development of the academy in Germany please see Grau (1988); Hartkopf (1992); Vierhaus (2003).

3. For a brief contextual introduction to the intellectual climate in eighteenth-century Germany and a synopsis of Thomasius's and Wolff's work please see Martini (1965: 168–226).

4. The history of the *Deutsche Gesellschaft* is well chronicled in Döring (2002).

as people assembled to discuss intellectual and cultural issues in an increasingly casual setting. For Germany these types of gatherings bore additional significance, as they also constituted an important linguistic occurrence for the members; due to the relative informality of these meetings, affairs were quite naturally conducted in German.

The formation of such *Societäten* (Wittmann 1999: 191) – to mention but one of the many names by which they are known – was a common occurrence in eighteenth-century Germany. These societies had an invariably cohesive nature. They operated under the auspices of commonality, sharing a basis of interest and reference among their members, regardless of one's class or standing. The result of this policy was unprecedented. For the first time members of the academe, the bourgeoisie and nobility could congregate in a neutral setting with the objective of articulating and debating a particular issue, making the act of the intellectual pursuit the common thread of their confluence.

The regularity of these learned meetings furthermore assured a continuity of discussion and the establishment of networks of information, guaranteeing a productive interaction of their members. As the dissemination of knowledge mixed with an overall eighteenth-century tendency to socialize, an occurrence that was becoming an essential component of proper social conduct, the basic nature of information-exchange changed. Most significantly, the perception of conveying knowledge had altered. In these congenial social settings the presentation of knowledge was seen as an interactive public event, which, because it was no longer confined to predictable fora, welcomed the influx of capricious and entertaining ideas as a primary stimulus.

2. Periodicals and the communication of knowledge

This democratization in the exchange of ideas had an indelible effect on print culture, as members of these societies quickly moved beyond the immediacy of debate to create a legitimate body of publishable knowledge to be disseminated to the public at large. Members published the ideas and findings of their societies either through their own periodicals or through literary magazines, establishing a firm literary presence on the intellectual scene in Germany. Because the programs of these societies were determined by the interest of individual members, rather than by the expertise of a given group/school of thought, the mandate of these societies was not decidedly set, which meant that it often ran not only concurrent, but in deliberate contest, to that of the establishment. Moreover, members-turned-writers directed their attentions to a wide range of non-academic topics. They demonstrated through debate, and subsequent pub-

lication, that their inquisitiveness was to be understood as more than mere intellectual exercise, and they frequently sought practical solutions to day-to-day conundrums that had little to do with academic issues.

The act of publicizing predicaments and soliciting the general public for assistance became the standard means of intellectual enquiry in these polemical societies in the eighteenth century. Posing the "open question" in printed matter provided an opportunity for debate, allowing both the access and distribution of ideas, while also maintaining a fluidity of interaction - a principle that was at the very core of many of these societies. The results of these non-discriminatory discussions often had far-reaching consequences for the community as a whole, a development that attests to the benefits of open interaction between writer and public. One must only think of the impact the Berlin *Mittwochsgesellschaft* (the Wednesday Society) had on the development of Western intellectual thought with the publication of its *Berlinische Monatsschrift*. In 1783 Johan Friedrich Zoellner, pastor, theologian and member of the society, opened up debate on the practical consequence of the German Enlightenment. Among the responses received, there were missives from both Moses Mendelsohn and Immanuel Kant, the latter of whom voiced a clear call to intellectual courage (*Sapere aude!*) and maturity, which stands as the seminal definition of *Aufklärung* to this day.

In light of such occurrences, the significance and potential intellectual range of the periodical cannot be underestimated. As a popular and new genre on the literary scene it irrevocably changed the nature of reading culture in Germany. Much has already been written about the explosion of print matter in the eighteenth century, and specifically about the German fanaticism with reading at the time.⁵ The statistics on periodicals are particularly astounding in this regard, for two-thirds of all scientific journals in Europe were published in Germany, making the German scientific periodical one of the biggest literary enterprises on the continent. The magnitude of influence it exerted and the popularity it garnered were eventually overshadowed by questions of authenticity and quality; however, in the strict sense of functioning as a means of communication with the public, it did prove to be extraordinarily efficient.

When studying the meteoric rise of the periodical in the eighteenth century, and its incredible success, it is easy to overlook other important aspects of this literary genre.⁶ Setting the practical advantages aside, one must consider the laden and overlapping interaction that this literary form sustained. Publication of any periodical implied a constant collaborative effort between author, editor and publisher, working with an intensity of interaction which had not been seen

5. Guthke (1975); Giles (1981); Wittmann (1999).

6. See Johns (2003: 536–560).

previously, and whose joint work served both to accentuate and to validate the importance of the written medium itself. As the notion of a secular publishing culture and book trade took root in popular consciousness, it transformed the perception of German-speaking cities such as Leipzig, Halle and Berlin. These cities were no longer seen as mere geographical locales, for as they became known for their printing houses, book fairs and the publication of a particular periodical, they also acquired the reputation as a “reading centre”, a designation that carried a clear and, more importantly, apolitical intellectual connotation.

As scholars and thinkers increasingly employed the medium of print to exchange and contest ideas, periodicals created a new dynamic network of communication between readers and writers, a contribution that was particularly significant in a country as geographically disparate as eighteenth-century Germany. Many differences of opinion were aired through the pages of the periodical as many established authorities took advantage of this open forum both to promote and to argue their case in the public sphere. By gravitating towards print and opting to reveal their queries and complaints in such an open (and permanent) way, writers themselves sanctioned debate and dispute as acceptable modes of intellectual discourse. It is important at this point to differentiate open periodical writing from other forms of written expression, such as, for example, correspondence. For although many grievances have been vented (and subsequently published) through personal correspondence, these grievances were initially envisioned as private. The disagreements declared within a periodical, on the other hand, became the immediate and inescapable property of the public sphere and therefore thoroughly out of the control of both writer and recipient.

Despite its potentially damaging effect on the reputation of the people involved, the polemical aspect of the periodical proved surprisingly helpful in the proliferation of scientific ideas. Through periodicals science became an integral part of public discourse. This development is due in part to the accessible and egalitarian format of the periodical, but more importantly, to the manner in which the periodical presented science to its readership. With its emphasis on discussion and its increasingly disputatious prose, periodicals presented science as a dynamic discipline intent on presenting knowledge as a work in progress, rather than as a static set of rules. This proved appealing to a general public with little real invested intellectual interest in the discipline of science and with limited abilities to participate in all tenets of a purely scientific discussion.

Public scientific debates could furthermore often be a source of entertainment for readers as the rhetorical rancour inherent in a scientific quarrel was often the element that transformed the debate into a type of spectacle for all parties involved. Some scientists, however, abhorred this sort of unnecessary and unprofessional exposure. Swedish taxonomist Carl Linnaeus, for example, was

well-known to have abstained from professional disputes for this very reason. In his opinion, scientific disputes that played out in public were never helpful to an elaboration of subject matter and therefore clearly unworthy of the scientists themselves.⁷

Scientific disputes in eighteenth-century Germany were, however, common, and as they occurred they had an impact not only on the immediate members involved, but also on the evolving scientific literacy of the general public. An incident that is worthy of mention within this context is the famous epigenesis-preformation debate that dominated literature of the life sciences after the 1750s. This debate is significant, not only because of its protracted and rather complicated duration, but also because it clearly attested to the reality of an evolving textual presence of scientific discourse in German. It firmly took place in print and in the public domain and involved some of the leading thinkers of the era, transgressing in the process the boundaries of science to find proper expression for the predicament in question.

3. Disagreement and debate: preformation vs. epigenesis

At the centre of the original debate were Albrecht von Haller (1708–1777) and Caspar Friedrich Wolff (1734–1794), men of different age groups and of two very separate philosophical leanings. Haller was a recognized scientific authority who was well-known for his work on anatomy and physiology at the University of Göttingen. He was also an established figure in Germany's nascent vernacular print culture with extensive personal experience in writing and publishing. In addition to being the poet of a very popular collection of poems,⁸ Haller exerted literary authority over institutional affairs by presiding over the academy's review journal, *Die Göttingischen gelehrten Anzeigen*, and assuming editorial control over its content. Scientifically, Haller was an ardent believer in preformation theory and he participated in the generation debate of the day by adopting a traditionalist view. Haller had struggled to find a conclu-

7. In a letter to Albrecht von Haller dated September 13 1748, Linnaeus counsels Haller how to respond to professional criticism. He writes: "If you will but listen to me as a friend, I would advise you to write no answers to Hamberger and such people. He is not on level with you; and the more he is your inferior, the more consequence you give a man who would otherwise remain in obscurity, known only to those immediately about him." Quoted from Smith (1821: 421).

8. Haller's nature poem "Die Alpen" (1729) was particularly popular with the reading public.

sive formulation for this theory for over a decade and in his early research he did briefly consider evolution as a possibility for form creation. However, in his mature work, he conclusively asserted the notion of the embryo as a preformed, pre-existing entity that was *not* subject to the laws of evolution, thereby refuting all other theories of evolution. As critics have noted, this viewpoint was consistent with his personal religious upbringing and therefore it was not surprising that it surfaced so obviously in his late work.⁹

Haller's approach clashed with the concurrent theory of epigenesis, an opposing school of thought that endorsed evolutionary treatment of development. Epigenesis was process-oriented and it sought to address the more creative dimensions of nature by actively analyzing change, a move that discredited the premise of preformation in favour of a dynamic understanding of natural phenomena (cf. Pahta, this volume). Haller's preformation study was published in a two-volume work entitled *Sur la formation du coeur dans le poulet* in 1758 and it marked the beginning of the epigenesis-preformation dispute. In the text Haller argued the manifest visibility of the heart, claiming that it existed from the very beginning of the embryo and that it was, to cite Müller-Sievers, "terrified into action [i.e. visibility] by the 'rotten odor' of the semen and which then pumped up... all other organs" (Müller-Sievers 1997: 36). What is interesting here is that Haller based his doctrine almost entirely on his personal ability to observe the experience, stating *de facto* that this testimony alone guaranteed the scientific validity of the argument. He supplied experiments to support the argument, but maintained that observability of structure was the best and final proof for the existence of structure. His preformation theory depended thus heavily upon the astute perception of the scientist, but also upon his/her philosophical convictions: for in order to endorse this preformation theory, one needed to believe that scientific investigation does need not to go further than the eye can see.

With this outlook, however, as Elke Witt has so correctly identified, the study of organism form no longer lies within "the scope of scientific research" (Witt 2008: 653), but becomes rather a matter of one's approach to science as a discipline. It becomes a matter of personal belief and principle and therefore impossible to prove in objective, empirical terms. By presenting his findings in

9. As Helmut Müller-Sievers asserts, preformation was very much in keeping with Haller's pietistic beliefs. He writes: "And this closed economy of the organism, into which life is "knocked" from the outside and which is terminated by external death, can serve as a religious and moral bastion against the openness and transitoriness of the Buffonian model where, at least since puberty, the organism is always dying and where the physiological (and sexual and political) exchange with the outside is of vital and mortal importance" (Müller-Sievers 1997: 36).

the manner in which he did, Haller conveyed his preformation study as scientific truth, rather than as personal opinion, and this precluded any future alternative investigations from his objective professional consideration. Haller's study was strongly challenged by Caspar Friedrich Wolff, who presented a divergent theory of generation in 1759 in his dissertation *Theoria Generationis*. Wolff claimed the opposite viewpoint from Haller, by stating that the emergence of organisms was in fact the production of something irreducibly new, and therefore not something that could exist within the scope of opinion of a scientist, but rather, needed to be understood as part of nature itself. He refused to reduce nature to a pre-formed mechanistic model and explained epigenesis as a progressively creative dimension existing within nature, terming the workings of this force a vital force, a *vis essentialis*.

The debate that ensued between Haller and Wolff continued for the next ten years and it happened at a very public level within the open domain of print. After an initial gracious acknowledgement, Haller responded to Wolff peremptorily, reviewing his dissertation negatively (and anonymously) in *Göttingische gelehrte Anzeigen*. Revealing little generosity of mind, and no consideration for Wolff's young career, Haller lambasted the theories of his junior colleague, announcing to the scientific community that Wolff's work was fundamentally flawed (Haller 1760: 1226–1231). Wolff refused to acquiesce to Haller's established scientific authority. Instead, he translated his theory into German and republished it in 1764 as *Theorie von der Generation*, introducing the work to a wider audience by rearticulating some of its more salient points in accessible language. It is rather poignant to read the passion with which Wolff wrote to express his commitment to the cause of epigenesis, for one sees how deeply, and personally, involved he was in the entire affair. Preformation seemed to have offended Wolff's very understanding of nature. Addressing Haller's interference, Wolff wrote:

Until now it was a living Nature, which brought about infinite changes by its own forces. Now it is a creation, which only seems to bring about changes, but actually and by its nature stays unchanged in the way it was constructed, besides getting more and more worn-out. Before it was a Nature that destroyed itself and created itself anew, to thereby bring forward infinite changes and to present itself again and again in a new angle. Now it is a lifeless lump, losing one part after the other until the whole stuff finds its end. Such a miserable nature I cannot stand. (Cited in Witt 2008: 654)

Wolff's conflict with Haller lasted until Haller's death in 1777, with the unproductive result of damaging Wolff's career and not bringing any lasting solution to the debate itself.

As Shirley A. Roe has asserted within her own extended study of the matter, the Haller-Wolff debate was not merely an intergenerational disagreement on a particular theory; it touched on deeper philosophical issues that went beyond the scientific investigation at hand. She states:

The debate between Haller and Wolff rested, however, on more fundamental philosophical grounds, which included not only the problem of the operation of forces in development but also such issues as the role of God in the world, the question of spontaneous generation, the relationship between observability and existence, and, more generally, the nature of scientific explanation as applied to the problem of generation (Roe 1975:189).

It could be successfully argued, however, that the difficulty of reconciling the divergent scientific approaches between Haller and Wolff was also a matter of deficient linguistic means on both sides, for, as they so spectacularly demonstrated, neither party was able to create or appropriate the necessary nuance of argument that would reach solution.

Investigations into generation theory continued through the concerted work of Johann Friedrich Blumenbach (1752–1840), the Göttingen anatomist and anthropologist who advocated epigenesis over preformation on the basis of his own research on green hydra and its regenerative powers. In 1780 he published his findings in an essay entitled “Über den Bildungstrieb” in *Göttingisches Magazin der Wissenschaften und Litteratur*. A year later he reiterated his findings more expansively in his monograph *Über den Bildungstrieb und das Zeugungsgeschäfte*. He revisited the same topic yet again in various editions of his seminal work *Handbuch der Naturgeschichte*. The difficulty of constructing a single conclusive theory on the subject matter of epigenesis becomes quite apparent through the shifts in formulation that occurred in successive editions of his work, which demonstrates that Blumenbach was actively working out tenets of the theory by constantly and diligently revising his research.

A significant trait of Blumenbach’s efforts was his conscious use of language, which he modified throughout the various editions of his work in order to accommodate his growing research. He did not fixate on a particular terminology or on a given mode of expression; instead he adapted language to the purpose of his research, modifying his texts as he saw appropriate. Fully aware of the complicated nature of the subject matter he was presenting, Blumenbach acknowledged previous accomplishments in generation theory by accrediting his predecessors for the advances made. In his work he duly chronicled the names of scientists who had furthered the study of organism formation, noting his own contribution as a matter of continuing this historical study of a natural phenomenon. As the following passage demonstrates, he presented his research

very cautiously, seeking to integrate it within existing scientific theories: “Without entering into a long and tedious detail of all the doubts and difficulties which rise up in opposition to so singular theory, I shall content myself with adding a few reflections...” (Blumenbach 1792: 9).

By framing his epigenesis argument in such a conciliatory manner, Blumenbach paid homage to the scientific establishment, while also detaching his work from its precedent. He also took the notable step of distancing himself from the nomenclature of his predecessors, as he understood full well the objectionable connotations Wolff’s *vis essentialis* had for the scientific community. Rather than allowing his research to be interpreted through the lens of an esoteric philosophical vitalism, a trap that Wolff had fallen into with Haller, Blumenbach designated aspects of his research more astutely. He collegially acknowledged Wolff’s work, but also distinguished it as separate from his own. Most importantly, he reformulated his approach with carefully selected vocabulary. He identified his epigenetic vital force as *Bildungstrieb*, a formative drive, cleverly binding its existence to that of the organism itself, thereby eliminating any suggestion of a speculative approach.

Despite its linguistic reformulation, Blumenbach’s formative drive continued to share some of the problematic traits of the *vis essentialis*; most significantly an innately abstract existence that could not be verifiably shown or empirically maintained. The careful re-designation of the mysterious vital force as a *Bildungstrieb* clearly suggested a purposive formation (unlike Wolff’s *vis essentialis*), yet this assertion still could not be demonstrated in positivistic, scientific terms. Rather than succumbing to scientific scrutiny and the inevitable criticism of philosophical abstraction, Blumenbach received unexpected encouragement for his work precisely from the field of philosophy, which helped not only maintain but also develop his epigenetic theory further. His work drew the attention and support of Immanuel Kant (1724–1804).

Kant was drawn to teleological principles found in Blumenbach’s work and he agreed with the principle of self-organization of organic matter that permeated the epigenetic outlook. Blumenbach’s theory overlapped in many ways with his own work at the time, as Philip R. Sloan explains: “...the *Bildungstrieb* theory was put forth by Blumenbach as a phenomenological force that acted in lawful ways, and in this way it was in agreement with Kant’s interpretation of forces in the *Metaphysische Anfangsgründe* of 1786” (Sloan 2002: 249). Kant was thus in a good position to praise Blumenbach for the advances he made in the field of epigenesis and made reference to him in his *Critique of Judgment* (Kant 303–307). What ensued between the two men is interesting, for despite operating from divergent fields of research – epitomizing in many ways the ‘Two Cultures’ divide – they engaged in an active exchange of their work, mu-

tually sustaining their intellectual efforts. As Timothy Lenoir asserts, Kant's intervention was particularly fruitful, for it provided the necessary language "for clarifying issues at the heart of Blumenbach's work" (Lenoir 1980: 88), allowing for its mature formulation in subsequent editions.

Not surprisingly, there are critics who argue the exact opposite scenario, namely that it was Blumenbach who influenced Kant, and that it was science, rather than philosophy, that provided primary intellectual stimulus to the epigenesis discussion (Sloan 2002: 248). In the end what is remarkable about this interaction between these two seemingly opposite fields of study is the reciprocity of exchange and the attention paid by both men to the language of each other's work. Both were searching for a more apposite mode of expression that could express the subtleties of their work; neither found it in their own discipline and therefore they were forced to look for it elsewhere. In their quest for a more deliberate and precise articulation of ideas, they not only consciously wrote, but in doing so they popularized the premises of their respective sciences, thereby contributing both to scientific literacy and the knowledge base of their readers.

4. The marketability of scientific discourse

The evolving sophistication of German as a language of precise scholarly discourse is unfortunately difficult to trace at the popular everyday level. Reading had become an incredibly fashionable pastime, with everyone embracing the availability of print culture and contributing to its growing social importance. The popularity of the *Lesewut* trend, as it is also known,¹⁰ regrettably did not always correspond to the acquisition of knowledge. Critical understanding of the new and exciting book culture in Germany in the eighteenth century took time to develop, as the process of meaningful reading was frequently encumbered by issues of authenticity, quality and piracy that were prevalent on the literary market. The deluge of print material available to the general public was often of dubious quality and the information presented needed to be carefully scrutinized for accuracy. Texts were consequently often accredited as manifestations of knowledge with little questioning of the legitimacy of their contents.¹¹

An additional threat to the intellectual autonomy of books was the economic success of the enterprise as a whole. As the book trade became a profitable business, the reading public assumed a powerful market presence, becoming a com-

10. See Erlin (2007: 145–164).

11. Woodmansee (1984: 425–448) offers an excellent overview of the emergence of book culture in eighteenth-century Europe.

peting source of authority in determining the popularity, and by implication, the validity of a particular text. The readers' favourable reception of a text often became the deciding factor in the overall merit of a book. Writers, and especially writers of science, in eighteenth-century Germany were keenly aware of the precarious situation they faced and they responded to the capricious patronage of the general marketplace not only by appropriating their style of expression, but also by constantly negotiating a delicate balance between universality and exclusiveness in their work.¹²

It is under these circumstance that we see authors like Johann Kaspar Lavater (1741–1801), the founder of the quasi-science of physiognomy, having enormous success on the literary market. His multi-volume *Physiognomische Fragmente zur Beförderung der Menschenkenntnis und Menschenliebe* (1775–1778) was extraordinarily popular, despite its considerable cost and its many scientific inaccuracies and flaws.¹³ Understanding the importance of display, Lavater formatted his book in a particularly reader-friendly way. Part of the attraction of the book rested on its appearance and handsome style of the publication, which actively incorporated word and image and had many elaborate illustrations accompanying the text. On the other hand, there were also legitimate scientists who at this time embraced the literary mode as a natural extension of their scientific activities. The name that most readily comes to mind in this context is that of Georg Christoph Lichtenberg (1742–1799), a writer whose ironic and playful literary exploits in his so-called “waste books”, the *Sudelbücher*,¹⁴ eclipsed in fame his more serious accomplishments in the field of physics.

It becomes thus evident that acts of reading and writing in eighteenth-century Germany were not always driven by the most erudite of causes, and that the great production and consumption of reading materials of the era can be indeed tied into a larger debate on the overall phenomenon of an emerging consumer culture.¹⁵ If one, however, side-steps this sort of interpretation and focuses on the manifestation of this prolific literary production (rather than concentrating only on its underlying motivation), it is impossible to disregard the achievement and advancement created by the appearance of textuality in everyday German life. The presence of textuality on a day-to-day basis, regardless of whether it was manifested through journals, periodicals, newspapers or books, offered the public the opportunity to participate in the acquisition of knowledge, render-

12. For an interesting point of comparison for the German market see Fissell (2007).

13. See Graham (1979); Perceval and Tytler (2005).

14. For more information on the impact of Lichtenberg's aphoristic work, see Knauf (1977).

15. An excellent case study of this issue can be found in Wurst (2005).

ing epistemological goals as attainable to anyone with the sense to read. Within learned circles this increased literacy served as an impetus to explore new discourses of difference, establishing both dialogues and disputes between disciplines, and forcing everyone to take a little more note of what was expressed on the written page.

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