Christoph Pfautz as a Reviewer for the *Acta Eruditorum*: the Invention of a German Tradition in the Sciences[1]

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Abstract: In 1682, Otto Mencke and Christoph Pfautz founded the *Acta Eruditorum*, the first fully-fledged German scientific journal. In this paper, I argue that this journal had a fundamental role in shaping the narrative on the rise of the new science in the 17th century, placing Germany as the ideal intermediary between tradition and innovation. In particular, Pfautz's review of Newton's *Principia* in the *Acta Eruditorum* initiated the Leibniz-Newton controversy, which forced the German tradition to reconsider its role and reshape its philosophical foundations to appeal to a wider international audience.

Keywords: Pfautz, Leibniz, Newton, reviews.

1. Introduction

This paper explores the contribution of Christoph Pfautz to the development of a German tradition in the sciences. In 1682, Pfautz was one of the founders of the *Acta Eruditorum*, the famous German journal that greatly contributed to the debate on science and philosophy in Europe during the early modern times and beyond. More specifically, the paper argues that Pfautz's review of Newton's *Philosophiae Naturalis Principia Mathematica*, which appeared in the *Acta Eruditorum* in July 1688, had a pivotal role in the process of defining the scientific debate, to the point that a true German tradition was almost invented around the opposition suggested there by Pfautz not only between Newton and Leibniz but also between an English and a German way of doing science.

As a preliminary remark then, it is important to specify in which sense a German tradition was invented in such a way: no one denies that many great and talented scientists engaging in the European debate were already active in Germany before the foundation of the *Acta Eruditorum*, as much as no one denies that there was among the German scientist a concrete interest in promoting themselves as representatives of a unique German tradition in the sciences,

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distinct from those developed in France, England or Italy. However, before the end of the 17th century, there were also decisive historical, social, and conceptual reasons that prevented the rise of a clear and distinct German tradition and its consolidation, especially if we take as a model, much like the German scientists of that time did, how science was being developed in other parts of Europe in the same period.

It seems in fact that the requisite for scientific traditions to consolidate during the 17th century was not only the presence of a single major author from a certain area and the supporters gravitating around their ideas, for instance Newton or Descartes, because otherwise Leibniz would have been a great candidate for this to happen also in Germany, but instead his presence became relevant only at a later stage. Focusing solely on the authors prevents us from understanding the significant cultural support from the home country on which those traditions were built on. This support can be evaluated analyzing three specific historical processes: the institution of scientific societies, which were founded on a shared vision about how science should be practiced and developed; the adoption by local universities of the methods and notions related to that scientific tradition in their teachings, tying together the apparently independent freedom of scientific societies with their more politically and geographically grounded power; finally, the institution of one or more scientific journals that would lead the main narrative on how that scientific tradition was superior to others, thus worth following. Having a wider historical and sociological approach will clearly show the significant political and nationalistic turn that various scientific traditions in Europe took starting from the second half of the 17th century. While on a surface level science as a general practice has promoted since its beginnings the idea that a scientific theory was worth as much as it was verifiable, reasonable, and reproducible by anyone, regardless of any other contingent factor concerning their promoter, like their origin or other political or religious affiliations, the local social entities involved were progressively realizing how important leading the main narrative concerning the evolution of science was. These two opposing needs created a peculiar situation in which scientists from other parts of Europe were indeed accepted in certain circles, on the condition however that they shared the same general framework of that circle. For instance, when a young Leibniz was sent to Paris to learn the most advanced mathematics, his introduction to the Parisian circle was possible on the premise that his work had to tackle topics researched among that tradition: there is a substantial difference in political scope between a young Leibniz working with Tschirnhaus on the limits of Descartes' geometry and a mature Leibniz writing the *Brevis demonstratio erroris memorabilis Cartesii* on the *Acta Eruditorum* in 1686.[2]

[2] Tschirnhaus in fact, who was already a member of the *Académie royale des sciences*, met Leibniz in Paris. For an account of their jointed work and how it differs from Leibniz's later approach, see Kracht-Kreyszig 1990 and more recently Rabouin 2022.

This political pressure was possible because the evolution of academies, universities, and journals in France and England had reached a level where these three main pillars were already working together to preserve the cultural influence of their corresponding country. They constituted the main model for the development of the German tradition, which in the earlier part of the century was instead lagging behind in the realization of the same conditions. What makes the rise of the German tradition unique however is not only the fact that it consolidated later with respect to the English and French ones, but also that the catalyst of this process was the political use of a review that appeared in a scientific journal, something which is generally considered a minor expression of a wider cultural phenomenon.

The paper investigates why this was the case and Pfautz's central role: the following chapter shows how Germany struggled to create a consistent scientific narrative before the foundation of the *Acta Eruditorum* and tries to make sense of why this was the case on a wider conceptual level. The third chapter analyzes in detail Pfautz's contribution to the *Acta Eruditorum* as a reviewer before his review of Newton's *Principia*, while the fourth one analyzes this seminal review in detail. The last chapter shows how, under Christian Wolff, Pfautz's efforts consolidated in a centralized management of scientific academies, universities and journals, in a way that was unprecedented for Germany at that time.

2. Before the *Acta Eruditorum*: the struggles of the German tradition

Given that the French *Journal des Sçavans* and the English *Philosophical Transactions of the Royal Society* started being published in 1665, almost twenty years before the foundation of the German *Acta Eruditorum*, understanding what happened in German territories during that time gap becomes extremely important. Pfautz's life reflects the many active exchanges between German scholars that were going on during that time and the unique approach to the new science that they were promoting, but also their struggles in finding unity of intent.

If we focus solely on the evolution of the German journals, Gottfried Wilhelm Leibniz, who was acquainted and studied with Pfautz at the University of Leipzig in the 1660s, surely stands out as the author that attempted the foundation of a German journal the most. After the foundation of the two major French and English journals, Leibniz proposed first in 1668, and then in 1669 a similar endeavor in Germany, conceiving a journal called *Nucleus Librarius Semestralis*. The aim of the journal was trying to solve the main problem that, according to Leibniz, was preventing the German tradition to have international recognition: fragmentation. This fragmentation was at the same time political, because turning many different states in one single nation was not an easy task, but also scientific, because the many talented German scholars were at that time fighting one against the other without a common intent. In addition to this main problem, unlike other nations, Germany could not count on a city like Paris or London, a place that could have functioned as a shelter for all the scientists and scientific societies that were spread around the country. Leibniz's plan was to

write to the emperor in Vienna, with the support of different intermediaries, but he failed in securing the support needed. He made another attempt in 1679 conceiving a journal, called *Semestria Literaria*, that had even more ambitious objectives, but once again with no luck[3]. It was only natural then that in 1681 when contacted by Otto Mencke and Christoph Pfautz, who studied with him in Leipzig, he gave all his support to the foundation of the *Acta Eruditorum*. He was in good company though, since Mencke secured the approval of the *Collectores Actorum Eruditorum Lipsiensium*, a group of eminent intellectuals that were advocating for the foundation of the journal. After a tour around Europe made by Mencke and Pfautz in 1682 to find the necessary political and scientific approval, the journal was finally founded in 1682. In the end, the *Acta Eruditorum* can be considered the first fully fledged journal appeared in German territories, since the only one that had some luck before it, the so called *Miscellanea curiosa*, had however a convoluted and discontinuous publication history.[4] From a practical perspective, Otto Mencke, Pfautz's brother-in-law, had a central role in the creation of the journal,[5] but since he was no expert in mathematics or natural philosophy, he had to rely on Pfautz, Leibniz, and others on those topics. For this reason, when it comes to evaluate how the journal was shaping its narrative concerning the new science, the role of Pfautz, severely underestimated until now, is worth analyzing in detail.

Before the foundation of the *Acta* however, Leibniz's early attempts at creating scientific journals already show that in Pfautz's circle the idea that German territories needed a journal modeled after that of the other relevant cultural areas of influence was present since the very beginning of the twenty-year gap. All this journals were conceived mainly with the *Journal des Sçavans* in mind as their main model, but Pfautz and the other German scholars were also referring to what was going on in England and in Italy in the same period. The need for the foundation of a German journal in fact must have felt more pressing in the following years, while witnessing that even in Italy, where the presence of the Holy See was holding back the diffusion of new scientific ideas, things were changing for the better: in 1668 the *Giornale de'Letterati* starts being published in Rome, with a new edition of the same journal being published later in 1675 and directed by Giovanni Giustino Ciampini, founder of the *Accademia Fisico-matematica* in 1677. It seems then that only Germany was lagging behind in the race for creating a voice that would represent their tradition among the Republic of Letters.

Concerning what Pfautz could have done regarding this situation, it is important to note that his influence was not particularly relevant until he became professor of Mathematics in Leipzig in 1676. From that moment on, Pfautz becomes the dean of the university for several semesters, a position that will have a decisive impact on the foundation of the *Acta Eruditorum*. This does not mean

[3] This is well documented in Antognazza 2009, 97, 238, 239.

[4] See Leaven 1990, 18.

[5] See Leaven 1990.

however that the attempts made before the *Acta Eruditorum*, such as those of Leibniz, were single attempts not related to a shared goal: a common pattern could be found here, showing how the scholars that contributed to the rise of the German tradition were all gravitating around the Saxon-Thuringian universities, like the University of Jena and the University of Leipzig. Some of the scientists involved were students in one university and then became professors in the other or vice versa. For example, Pfautz started teaching mathematics in Leipzig to replace Johann Kühn, a professor who studied at the University of Jena. There, Leibniz studied for a while with Erhard Weigel, who was also the teacher of Johann Christoff Sturm before him. These are all main characters that contributed to the development of the German tradition in the sciences: besides Leibniz, who does not need any presentation, Sturm, for instance, will end up teaching at the University of Altford and founding the *collegium experimentale*, pioneering experimental science in Germany, while Weigel will have a central role in presenting the German tradition as the one in charge of a reform of the calendar based on solid scientific observations[6]. All these scientists were also acquainted to other professors coming from the same area, like Jakob Thomasius or Samuel Pufendorf, establishing a common background also in philosophy and the law. They all refer to other German scholars who were active in other parts of Germany, such as Joachim Jungius or Athanasius Kircher, but these authors represent more an important influence or the demonstration that German scholars were worth considering, rather than actual contributors to the same cause. The main difference and the reason why the efforts of the scientists working in the Saxon-Thuringian area are worth being analyzed for the purpose of identifying a German tradition is that they are the first scholars that with their actions and with the creation of the *Acta Eruditorum* received international response and recognition. Before the *Acta Eruditorum* then, despite the emergence of a common cultural tradition in this area around the 1660s, the political institutions that were supposed to help in the creation of the journals failed to offer substantial support, hence the twenty-year gap with other cultural traditions outside Germany.

If we consider the other two main pillars theorized for the creation of a unique scientific tradition in Germany, that is the creation of scientific societies and the diffusion of new ideas in the universities, we find in that period the same struggles occurred for the foundation of relevant scientific journals. The problem was not that there was a lack of scientific societies in Germany: for example, there was the already mentioned *Collegium curiosum sive experimentale* joined by Leibniz already in 1666 and founded by Sturm, or the *Societas Ereunetica* founded by Jungius. In addition to these societies, all plans related to the foundation of a journal by Leibniz mentioned before were also envisioning the foundation of corresponding scientific societies but, much like the journals, they never saw the

[6] See Schmidt 2022.

light of day.[7] Concrete advancements were made by Leibniz at a much later time, when the the peace of Ryswick in 1697 caused a renewed patriotism in Germany. Thanks to this event and to the fact that Leibniz was acquainted at that time with Sophie Charlotte of Hannover, he was able to contribute to the creation of Berlin's observatory, which led to the foundation of the Berlin Academy of science in 1700, symbol of the new monarchy of Prussia. The context in which this academy was found is then very political and it is a testament to the nationalistic turn that the practice of science took at the end of the century. Much like the *Acta Eruditorum* then, the Berlin Academy is a late attempt that shows how in the previous years Germany was lagging behind in these terms. We witness here the first synergy in Germany between a journal and a scientific society since the observatory and the society were originally founded to give Germany a leading role in the reformation of the calendar. Before 1700, Weigel first and then the *Acta Eruditorum* paved the way for this to happen, promoting German talented scholars on this topic as the only ones capable of offering the correct astronomical measurements needed to reform the calendar.

On the relationship between the rising new science and German universities instead, the problem before 1682 was that the ideas developed by the scholars involved in this fundamental turn were considered at first too dangerous to be adopted. While it is true that many of the scholars that will have an important role in the foundation of the *Acta Eruditorum* were already acquainted thanks precisely to the universities in which they completed their studies or in which they started teaching, they were not however in a dominant position inside those institutions from a political perspective, at least during the first half of the century. Many accusations were being made about the ideas promoted by these scholars that led to several internal clashes.[8] First and foremost there was a problem of clarity which was making the old establishment suspicious: the new scholars were promoting a form of syncretism between the new science and old ideas taken from different traditions that was hard to decipher. While they were still referring to the scholastic tradition, they were also involved in the revaluation of philosophers and philosophies, above all Pythagoras and some obscure form of mathematical Pythagorism, that didn't have the same appeal as Aristotle to the traditionalists populating the universities, especially because they were seen as dangerous ancestors of Spinoza's philosophy.[9] A good amount of effort and years then were spent by the new German scientists and philosophers to

[7] See Roinila 2009.

[8] During his career, Weigel was opposed by the faculty of theology at the University of Jena. A similar fate was faced at a later time by Christian Wolff, an opposition that became the center of the German cultural debate for several years.

[9] As much as a connection between Pythagoras and Spinoza seems implausible, it was fairly reasonable in the context of the German syncretism. The idea was that, if we take mathematics as a form of metaphysics and we conceive real entities as numbers modeled after God, there wouldn't be a significant way to discern this God from those entities. This would lead to an homogeneity between God and the world similar to Spinoza's *deus sive natura*.

clean their names from these accusations and to offer a metaphysical background that was compatible with more traditional beliefs. If we take into account this conceptual problem, together with the lack of a unified intent and political support, it is clear why the German tradition was having trouble in manifesting as a unique alternative internationally.

When the *Acta Eruditorum* finally appeared in 1682, the first important objective was defining the cultural framework in which the journal wanted to operate and how it was posing itself with respect to other international journals and scientific societies. This process took some years and it can be certainly studied through the many contributions published in the journal. The value of the reviews that appeared in the journal instead is often underestimated, but for the purpose of understanding what was the international framework in which the rising German tradition was seeing itself, I believe they give us a fundamental advantage: since the contributions to the journal are proposed and accepted, they entail relationships with authors that in some way are already acquainted with the journal. Reviews instead can be made of works that are or may become relevant for the scholars gravitating around the journal, without direct contact with the author of the work reviewed. They show in other words what the journal considered culturally relevant and the constellation of authors it wanted to be remembered with, even when an actual connection with those authors was at that stage only wishful thinking. In addition to this, reviews are a way to prove what actual books were circulating in a certain territory and what books were not.[10] For this reason, studying the journal's reviews allows us to see more clearly what were its international reference points. The role of the reviews is particularly important for Pfautz and the German scientific tradition in general, because we can appreciate through them the passage from a journal that wished for international recognition to a journal that was granted international recognition thanks to Pfautz's review of Newton's *Principia*, which planted the seeds for the Leibniz-Newton controversy. An overview of Pfautz's reviews before this one then will give an idea of the general framework in which the German tradition wanted to operate, but it will also show how it wanted to bend the main narrative of the new science to its plans.

3. Pfautz and the *Acta Eruditorum*: an overview of his contribution as a reviewer

I am offering here a brief summary of Pfautz's work as a reviewer after the foundation of the *Acta Eruditorum* and before his review of Newton's *Principia* in 1687. The purpose of this analysis is to show common patterns in his work and the wider cultural context in which these reviews became relevant, as they set the stage for the first controversy where the German scientific tradition identified itself as an independent cultural movement. This summary highlights how,

[10] In particular, the publication of so many reviews shows how the University of Leipzig had a central role in the production and circulation of books in Germany. See Leaven 1990.

despite Pfautz's apparently neutral reviewing style, every choice was made to foster a certain debate in German territories, and it was related to the cultural context in which Pfautz was born and raised.

Pfautz's first 1682 review in the *Acta Eruditorum* is Gilles de Launay's *Cosmographie,*[11] a relatively unknown book on the geographical description of the earth using the notion of sphere. While the review was particularly short, we can already appreciate here Pfautz's plain reviewing style, which focuses mainly on the exposition of the book's contents, only to add subtle and polite criticism when needed (in this case, he highlighted how the book was focusing primarily on the geographical description of Europe rather than the entire world). In the wider cultural context, this review becomes relevant because it shows the German interest in the topic of spherical geometry and its use in the construction of globes, something on which both Weigel and Leibniz extensively researched[12]. Seen in this context then, the review is an attempt to establish a connection between these German research efforts and the French ones.

Pfautz's second review of the same year is the *Cometarum natura, motus et origo* by Johann Christoff Sturm,[13] a book on the nature of comets. Again, the importance of this review is to be found in the author reviewed and in the wider context that it implies: at that time, before his criticism of Leibniz's metaphysics became relevant in the following years, Sturm was considered part of the same cultural milieu where Pfautz was raised: Sturm studied mathematics, natural philosophy and theology with Weigel in Jena until 1662, only to figuratively leave his place to Leibniz in the following year. In Pfautz's review, Sturm is considered primarily for his contribution as an astronomer, something which is often underestimated by contemporary scholars: despite our interest in the more philosophical explorations of these authors in fact, it is important to remind that they were focusing first and foremost on their activity as astronomers, an activity which led them to fairly decent results[14]. This is probably why, as it will be shown, Pfautz's review of Newton's *Principia* had such a profound impact on the invention of a German tradition, since all the German scholars, despite their differences, were at least agreeing on the rejection of some major astronomical assumptions related to Newton's theory. This kind of unity of intent was probably impossible to obtain starting from other scientific premises, as the quarrel between Sturm and Leibniz for example shows.

[11] Pfautz 1682, 56.

[12] See Weigel 1657 or *Trigonometria sphaerica tractanda per projectionem* in Leibniz, 1923-. Preprint available at https://www.gwlb.de/leibniz/digitale-ressourcen/repositorium-des-leibniz-archivs/laa-mathesis.

[13] Pfautz 1682, 116.

[14] German scholars were among the first to offer a categorization of comets and they were competent in the prediction of eclipses. Other efforts in the same direction were paling in comparison, as Pfautz highlights in his review of *Cometa annorum 1680 et 1681 et in eundem astronomici conatus atque physicae meditatione* by Pietro Maria Cavina, a work renown for being inaccurate on several levels. (Pfautz 1682, 163).

The same focus on astronomical observations, models and results can be found in Pfautz's review of Jonas Moore's *A New System of mathematicks*,[15] published the same year: Moore was not only a prominent member of the Royal Society, but he was also one of the members who contributed the most in the creation of the Royal Observatory at Greenwich, founded in 1676.

Another relevant review during the first year is that of Jakob Bernoulli's *Conamen novi systematis cometarum*,[16] where the author argues that comets are nothing more than satellites of a planet gravitating around the sun, but placed at such a longer distance from the earth that we perceive its satellites only when their orbit comes closer to our planet. The review is particularly long and, above all, is presented with the reproduction of the geometrical disposition of the comets and the planets. Pfautz in fact praises in particular the geometrical elegance of the solution and refers to Bernoulli's main influence, which in this case is Descartes' *Geometrie*. This theory was completely wrong (only Newton will find the true solution of the problem at a later time) but it shows nonetheless how Pfautz focused often on the topic of comets, their origin study and classification, in order to show that also Germany, with authors such as Sturm, had something relevant to say on the matter. These few initial reviews already attempt to connect the two most important cultural movements in Europe active in French and England with the work that was being carried on in Germany on a major scientific topic.

The first review in the following year is that of Ptolemy's *Harmonikon*.[17] At a first glance, it might be of interest only because it is one of Pfautz's few reviews concerning an author who was active before his times, but the book reviewed is actually the latin edition of the *Claudii Ptolemaeii harmonicorum libri tres*, the latin translation edited and annotated by John Wallis. The review becomes then an excuse to praise this author and present his works, thus mentioning also the Wallis-Hobbes controversy. Wallis and Hobbes were among the most influential English authors in the cultural circles gravitating around the Saxon-Thuringian universities[18]. The review of Ismael Boulliau's *Opus novum ad arithmeticam infinitorum*,[19] which appeared later in that same year also had the same ideal function of celebrating and spreading Wallis' works, since the author claims in this book that he successfully proved what Wallis showed in his *Arithmetica Infinitorum* only by induction.

In 1683, Pfautz's reviewing activity continues with three subsequent reviews[20]. Among those, beside another review of one of Sturm's works, the most important is the review of Pierre Ango's *Optique*. The review of this book, written by a French jesuit who was professor at La Flèche's college, shows on one side

[15] Pfautz 1682, 145.
[16] Pfautz 1682, 178.
[17] Pfautz 1683, 77.
[18] See Probst 2018.
[19] Pfautz 1683, 207.
[20] Pfautz 1683, 163-169.

the interest in expanding the relationships with the Jesuits, something which is going to be a distinctive trait of many authors gravitating around the *Acta Eruditorum*, as shown for example by Leibniz's coeval interest in the relationship between the Jesuits and the Chinese culture or that of Wolff on the same topic at a later time.[21] On the other side, Ango's *Optique* is an interesting choice in itself, because of the unique approach proposed in his book: Ango argues that there was a misunderstanding in the interpretation of Aristotle's theory on the nature of light and that, once the true meaning of Aristotle's words would have been found, his ideas would have contributed in a positive way to the contemporary scientific debate "contra *Recentiorum* Physicam"[22]. This idea that there is an opposition between the "*Princeps Philosophorum*"[23], misunderstood by his most famous interpreters, and the *Recentiores*, a general category in which are grouped indiscriminately personalities such as Descartes, Hobbes, Spinoza, and Gassendi who failed to see the importance of a modern interpretation of Aristotle's works, is also at the core of many German works written in those years. Many German scientists were calling themselves *Conciliatores*, scholars that were going to offer the perfect blend between modern science and the supposedly real interpretation of Aristotle. The most important expression of this idea is probably Leibniz's 1669 letter to Thomasius[24], another author frequently reviewed during those years in the *Acta Eruditorum*, although not by Pfautz. The terminology used in that letter to name the different sides of this ideal clash is the same used by Pfautz in his review of Ango's *Optique*, showing continuity in their intent. We could safely say that the *Conciliatores* are both a first timid instance of a German tradition in the sciences and at the same time its worst enemy, according to what I've shown in the previous chapter on the downsides of German syncretism.

During that year, Pfautz introduced also a topic that would play a decisive role in the relationships between the German scholars and the Italian scholars: the reform of the calendar. Pfautz tackles this issue in a clever way by reviewing François Blondel's *Histoire du Calendrier Romain*.[25] Much like he already did with Ptolemy's work, Pfautz here uses a review of an old topic (the Roman calendar) to introduce a new one (the adoption of the Gregorian calendar first introduced by Pope Gregory XIII). In Germany, the work on the reform of the calendar was first initiated by Weigel and then carried on after his death by, among others, Leibniz and Sturm[26].

[21] See Maitre 2020 and Lach 1953.

[22] Pfautz 1683, 163.

[23] Pfautz 1683, 163.

[24] Leibniz to Thomasius, April 1669 (Leibniz 1923, AA II 1, N. 11).

[25] Pfautz 1683, 347. For an account of the Italian research on the calendar, see Appetecchi 2023.

[26] See Schmidt 2022.

By giving more information on these reviews and the context in which they were published, I believe we could now already see a certain pattern in Pfautz's choices: the intent was first to promote German authors like Sturm in the international field as good scientists, particularly astronomers capable of achieving good and reliable measurements. This promotion was presented together with a philosophical framework in the field of natural philosophy and mathematics, where German scholars were presented as *Conciliatores*, with respect to the opposition between the old Aristotelian science and the new emerging one. Since there is an easy parallel between this approach and German religious irenicism, it is easy to see why they were thinking of themselves as the ideal intermediaries between the opposing traditions. In the attempt of assuming this role, the German scholars were led to those authors that, despite coming from a conservative background, were experimenting with merging old ideas with the new scientific ideas, like the Jesuits. The culmination of this process of taking the international lead in the role of intermediary should have been the reform of the calendar, where something that was approved by the most conservative side, the catholic church, was planned for being adopted also in Germany, yet improved and verified by the reliable German astronomical observations. This masterplan is reflected in the *Acta Eruditorum*'s reviews of the following years, before Pfautz's review of Newton's *Principia*.

Concerning Pfautz only, notable mentions of these last years before Newton's review are some reviews related to the English tradition and to the attempted connection with the Royal Society, such that of Barrow's *Lectiones* in 1684,[27] or the review in the following year of the *Clavis geometrica catholica* from Thomas Baker,[28] another mathematician of the Royal Society who tried to find a solution for biquadratic equations. Particularly important is also the review of Hevelius' *Annus Climactericus*[29], which refers to a famous controversy between the author, Robert Hooke and John Flamsteed.[30] This shows that Pfautz and the German scholars, despite being attracted by the dialogue with the English tradition, were also aware of possible misunderstandings and controversies.

A unique review that appeared during these years is the review of the Jesuit Tachard's travelogue to China and Thailand.[31] This seems to be an unusual topic[32] for Pfautz, given his past reviewing activity on the journal, but some hints in the review connect it to the topics already analyzed: on one side, the travelogue contained also astronomical observations gathered during the journey, which

[27] Pfautz 1684, 84.

[28] Pfautz 1685, 25.

[29] Pfautz 1685, 141. The title refers to the idea of certain years which were considered particularly important in the life of a person.

[30] Hevelius was an advocate for naked-eye astronomy and he was proud of his results. Renown is the controversy with Edmond Halley. See Szanser 1976.

[31] Pfautz 1688, 6.

[32] Particularly interesting in this sense is that Pfautz puts an emphasis on the Thai notion of God, as explained in the book.

is probably the reason why the review was assigned to Pfautz in the first place, and on the other side it is also important to remind that the Jesuit's missions to China were among the most interesting from a scientific perspective. The Jesuits operating there were attracted by the opportunity of teaching the new science to the natives and for this reason, they started long exchanges with scholars of the German tradition, such as Leibniz.

Finally, the most notable review before Newton's *Principia* is the review of Christian Huygens' *Astroscopia*.[33] In classic Pfautz's fashion, it is a review of a recent book that serves to present and praise an author considered important in the international field, who played a significant role in influencing the German tradition. It is widely known that Huygens was a fundamental author and guide for Leibniz in his early years, but the fact that he was acquainted with Leibniz does not mean that he was aware of the major research activities happening in Germany at that time. Iconic in this sense is Huygen's letter to Leibniz, dated February 1691[34], where Huygens, who had just received Weigel's visit, basically wonders with his former student who that person was, despite the fact that Huygens was already quoted by Weigel in one of his 1674 works and despite the fact that he was so celebrated in Germany in the same cultural milieu. This exchange clearly shows the strong dichotomy between how the masterplan of becoming an international reference was playing out in the minds of the German scholars and how it was actually affecting the balance of the cultural narratives abroad before the Leibniz-Newton calculus controversy had taken traction. However, the situation was about to change soon and the catalyst of this change was Pfautz's review of Newton's *Principia*.

5. Reviewing Newton's *Principia*

The publication of Newton's *Philosophiæ Naturalis Principia Mathematica* in July 1687 was followed by only four reviews in the entire world. The first one appeared in England in the *Philosophical Transaction* as a sort of presentation of the book, and it was written by Edmond Halley, renown astronomer and member of the Royal Society. All the other three appeared an entire year after the book's publication. The first one was a review from the *Bibliothèque Universelle* in March 1688; the second one, published shortly thereafter, was the one in the *Acta Eruditorum* by Pfautz; finally, the last one appeared in the *Journal des Sçavans*. While the note by Halley was nothing but a simple summary of Newton's thesis, prepared for readers that already knew and accepted his views and discoveries, the one published in the *Bibliothèque Universelle,* and written by no other than the philosopher John Locke, had an important role in spreading Newton's ideas throughout the continent, especially because it avoided the explanation of mathematical details that would have been too complicated for the majority of

[33] Pfautz 1684, 563.

[34] Huygens 1891, X, 15-16, 141-142.

readers in favor of a more generalist approach. Considering that the review appeared in the *Journal des Sçavans* was nothing more than a small remark where Newton was criticized for not adhering to the Cartesian dogma, Pfautz's review is considered the one that had the most detailed scientific exposition of Newton's ideas and, for this reason, the most neutral of the three reviews appeared outside England. On this topic for instance, the opinion of James Axtel, a scholar who worked on Locke's review, is worth quoting in its entirety:

> For the scientist or the mathematician, the review in the *Acta Eruditorum* was probably the best. In twelve octavo pages the reviewer went deeper into the structure and methodology of the *Principia* than either Halley or Locke had done, but, like them, he made no effort to criticize Newton's work. He was content to give a detailed summary. Although this was probably the best review from a scientific standpoint, two things unfortunately mitigated its effectiveness in spreading Newtonianism to the European intellectual class. First, the *Acta* was published in Latin, and Latin was read by an increasingly smaller audience than French. It is true, of course, that most scientists and mathematicians could understand Latin, but here we are concerned primarily with the more general lay audiences of the literary journals. And second, it reached very few French libraries where the Cartesian orthodoxy was most firmly entrenched. The *Acta* does not even appear on the list which Daniel Mornet compiled of the most popular periodicals in French libraries, which ends with a journal found only in three of the 500 catalogues consulted (Axtel 1965, 158–59).

It is fascinating how this quote, in the light of the reconstruction of the German cultural references presented in this paper, can be considered both an acceptable account of the situation and an incomplete one. It is a take that can be defended on the premise that the goal of the review was «spreading Newtonianism», something that the author tends to believe probably because, according to his reconstruction, Pfautz «made no effort to criticize Newton's work». The same can be said for the reasoning for which the fact that Pfautz's review was not appealing to a French speaking world prevented its thorough diffusion, even though this claim seems to be unclear in itself, since nothing would have prevented the scientists of that time, who could clearly understand latin, to later divulge Pfautz's review in their own native languages, especially French. On a very general level then, it is indeed true that Pfautz's review failed in spreading Newtonianism, but only if our approach as historians of science is based on the idea that Newton's theory represented the winning side of history and that researching on this matter means first and foremost researching on the ways in which Newton's theory became the dominant one. However, this approach fails to see the deep implications that Newton's work and Pfautz's review had on German society and, in the long run, on the rise of a German tradition in the sciences.

Having highlighted Pfautz's reviewing journey in the years before the publication of the *Principia*, we can clearly see instead that Pfautz's review was far from being neutral. Beyond the deceiving neutral tone of Pfautz's reviewing style, there are two relevant passages that show how some of Newton's ideas

were not well received at all. The first one is the remark that the mathematical method implemented by Newton was similar to that presented by Leibniz, which can be considered the start of the Leibniz-Netwon calculus controversy[35]. The second one is Pfautz's remark on how Newton's ideas implied on a fundamental level the adoption of specific methodological and philosophical premises, such as the existence of the void and action at a distance[36]. Above all, this last remark, reframed in the wider context of Pfautz's reviewing activity, shows how Newton's implied principles were strongly against whatever the rising German scientific tradition was trying to build.[37] Pfautz was far from being a neutral reviewer since the moment the review was published the stage was already set for the perfect storm to happen. Newton's work represented the greatest threat faced by the slowly developing German scientific tradition, not only because it implied the accusation of plagiarism for one of its members, but because it associated the most important mathematical advancement of the century with philosophical principles that were not compatible with those adopted by the German tradition, since this tradition was presenting itself internationally as the one which was destined to successfully merge the new science with old yet reevaluated philosophical principles, above all the Aristotelian impossibility of the void.

Even if Descartes shared similar Aristotelian premises regarding the refutation of the void, accepting or not Newton's ideas was for the French-speaking world mainly a matter of siding with Descartes or not, since Descartes and his tradition had already put a lot of effort in differentiating themselves from the old philosophy, defining an independent space for science and its method to thrive, while conceiving at the same time other ways to still defend the Christian tradition. In German territories instead, much more was at stake, because the activities of their scholars were directly connected with a kind of syncretism that was not completely independent from older metaphysical assumptions. At a more fundamental and conceptual level, the real threat seemed to be that Newton's mathematical method, which was different from the French one and instead similar to the Leibnizian one, directly implied its metaphysical assumptions. Defending Leibniz then became for the German community also a way to defend their metaphysical assumptions. Leibniz followed his tradition in this direction, while an alternative scenario would have been submitting to the Eng-

[35] «Ubi & de sua (cui geminam Cl. Leibmtio esse affirmat) methodo determinandi maximas & minimas» (Pfautz 1688, 309).

[36] More precisely, Pfautz highlights the incompatibility between Newton's theory and Descartes' vortex theory, which means that the effect of gravity has to be based on action at a distance. It is not by chance in fact that Leibniz's first article written as a reaction to Newton will attempt to fix this problem (Pfautz 1688, 310).

[37] Remarkable in this sense is the fact that only few months after the review of the *Principia*, Pfautz will review one of Weigel's works on spherical geometry. This positive review enriched with expensive drawings appears out of place if we compare Weigel's achievements with Newton's, unless we take into account the cultural background detailed in this paper.

lish tradition on one side, accepting for instance the metaphysical framework that argued for the existence of the void and for absolute space and time, and on the other side claiming Leibniz's priority in the discovery of the mathematical method that made that tradition shine. This was never an option however for the German tradition, on the light of its political objectives: the dialogue with the Roman Church, the Jesuit tradition and the French tradition was conceived on the very metaphysical premises that Newton's work was refuting.

In this sense then, Pfautz's review had a pivotal role in the creation of a German tradition in the sciences, because it forced that rising tradition to make a choice between assuming a leading role internationally or submitting to another tradition. In this process of becoming aware of their role, the German scholars will progressively move away from their naive syncretic efforts of the early years and they will start conceiving a scientific approach that could have been seen and defined as uniquely German.

6. Conclusion: Pfautz's legacy and the consolidation of the German tradition

Leibniz will be concerned with the calculus controversy only at a later stage of his life, with respect to Pfautz's review. The history of the Leibniz-Newton controversy is widely known and scholars usually agree that it started around 1699.[38] Already in 1688 however, Leibniz was deeply stimulated by Pfautz's review[39], as three major articles were published on the *Acta Eruditorum* in the following year and inspired by Newton's work show. One of these articles, the *Tentamen de Motuum caelestium Causis*, was an attempt to offer a mechanical explanation of the force of gravity, showing that, in a way, the controversy on the correct metaphysical premises of natural philosophy precedes the controversy on the origin of the infinitesimal calculus and it is the result of Leibniz following Pfautz in trying to define the metaphysical framework of the German tradition. Despite the controversy then, we cannot dismiss the importance of Pfautz's review and Leibniz's reading of the *Principia*, because it made Leibniz realize how the German scientific tradition was relying on syncretistic ideas that were not able to compete in that form with the most recent scientific advancements. Suddenly then, the reference to actual works written by Aristotle, summoned with the purpose of finding a new and unique perspective, became a mere homage to ideas considered similar: that of Leibniz becomes a reevaluation of Aristotle's substantial forms and not a reuse, because the context now had to change and become completely Leibnizian, or rather uniquely German. In the same spirit in the following years, the concept of substance

[38] A relatively recent contribution is Bardi 2006.

[39] As shown in Antognazza 2009, 295. Whether Leibniz red the *Principia* in 1687, 1688, or 1689 remains unclear, but it seems that he was not willing to admit an early read of Newton's masterpiece because he was worried that the public would have judged his subsequent works derivative. Given the relationship with Pfautz, it is likely that he could have access to the book already in 1687.

is progressively substituted with the concept of monad and the argument on the *vis viva*, with its own controversy[40], becomes the cornerstone of Leibniz's natural philosophy. Recent studies have also pointed out that the very reading of Newton's *Principia* seems to have stimulated Leibniz in developing a more robust and streamlined version of his iconic definition of space as a system of relations.[41] By answering Pfautz's call, Leibniz was put in the position of redefining the entire German metaphysical framework that served as a premise for their scientific contributions.

If this process represents the invention of a German tradition in the sciences from a conceptual standpoint, it is also true that the German society and its institutions were finally ready to at least partially support this fundamental change. The life of Christian Wolff is a sort of testament of this consolidation: he studied in Jena under Hamberger, Weigel's successor, where he was introduced to Sturm's works; He was one of Pfautz's students (they wrote a jointed review in 1706) and he was hired by Mancke as a reviewer for the *Acta Eruditorum*, where he wrote forty papers and almost five hundred reviews; he was also hired as a professor of mathematics in Halle thanks to Leibniz's support. In addition to these biographical facts related to the Saxon cultural milieu, Wolff is widely known for having popularized the use of the German language in philosophy and, despite the criticism that was still being made in many conservative circles against him, the controversies he took part in never impacted is ever rising popularity. At the end of his life, the Wolffian tradition was a reality involved in developing every main pillar supporting the German tradition: from the presence in several scientific societies to the fundamental role in the *Acta Eruditorum*, which gave Wolff an unprecedented international recognition as a German scholar.[42] The German tradition in the sciences was now a reality, so much so that a young Immanuel Kant, despite resorting to Newton's ideas at a later time, had to dedicate the majority of his early efforts to defending and expanding this tradition, working on the concept of *Vis viva* first and later proposing his own *Monadologia Physica*.

While Pfautz's contribution represents only a fraction of a wider and still unexplored cultural background related to the *Acta Eruditorum*, it shows nonetheless how the practice of reviewing other works could shape the narrative concerning a scientific tradition, even when the style proposed is apparently neutral. The constellation of national and international authors proposed by Pfautz in his reviews tells us the story of how the German tradition was conceiving itself with respect to other cultural influences and help us understanding how and why major shifts in the evolution of its narrative happened as a reaction to these reviews.

[40] See Iltis 1971.

[41] In recent years, Vincenzo De Risi has presented seminal work on Leibniz's unpublished manuscripts pointing out in this direction. See "The Genesis of Relationism. Leibniz's Early Theory of Space and Newton's Scholium". Forthcoming in *Oxford Studies in Early Modern Philosophy*, 12, 2025.

[42] For an account of Newton's reception during these years see Ahnert 2004.

References

Ahnert, Thomas. 2004. "Newtonianism in early Enlightenment Germany, c. 1720 to 1750: metaphysics and the critique of dogmatic philosophy." *Studies in History and Philosophy of Science* Part A, 35-3: 471–91.

Ango, Pierre. 1682. *L'Optique*. Paris: Estienne Michallet.

Antognazza, Maria Rosa. 2009. *Leibniz. An Intellectual Biography.* New York: Cambridge University Press.

Appaetecchi, Elisabetta. 2023. "Riformare il tempo. Una questione privata di Francesco Bianchini." In *Letteratura e Potere/Poteri Atti del XXIV Congresso dell'ADI (Associazione degli Italianisti) Catania, 23-25 settembre 2021*. Roma: Adi editore.

Baker, Thomas. 1684. *Clavis geometrica catholica*. London: Playford.

Bardi, Jason. 2006. *The Calculus Wars: Newton, Leibniz and the Greatest Mathematical Clash of All Time*. London: High Stakes.

Blondel, François. 1684. *Histoire de Calendrier Romain, Qui contient son origine & les divers changemens qui lui sont arrivez*. The Hague: Arnout Leers.

Boulliau, Ismael. 1682. *Opus novum ad arithmeticam infinitorum*. Paris*:* Lutetiae Parisiorum.

Habermann, K., Herbst, K. (ed.). 2016. *Erhard Weigel (1625-1699) und seine Schüler. Beiträge des 7. Erhard-Weigel-Kolloquiums 2014*. Göttingen: Universitätsverlag Göttingen.

Cavina, Pietro Maria. 1681. *Cometa anni 1680 et 1681 et in eundem astronomici conatus atque physicae meditationes.* Faenza: Giorgio Andrea Zarafagli.

Hevelius, Johannes. 1685. *Annus Climactericus.* Gdańsk.

Huygens, Christiaan. 1684. *Astroscopia compendiaria: tubi optici molimine liberata*. Apud Arnoldum Leers.

Huygens, Christiaan. 1891. *Oeuvres completes de Christiaan Huygens*. The Hague: Publiées par la Société Hollandaise des Sciences.

Iltis, Carolyn. 1971. "Leibniz and the *Vis Viva* Controversy." *Isis* 62-1: 21–35.

Kracht, Manfred, Kreyszig, Erwin. 1990. "E. W. von Tschirnhaus: His role in early calculus and his work and impact on Algebra." *Historia Mathematica* 17-1: 16–35.

Laeven A.H., Laeven-Aretz, L.J.M. 2014. *The authors and reviewers of the Acta Eruditorum 1682 - 1735*. The Netherlands: Molenhoek.

Laeven A.H., Laeven-Aretz, L.J.M. 1990. *The 'Acta Eruditorum' under the editorship of Otto Mencke (1644-1707): the history of an international learned journal between 1682 and 1707.* Amsterdam: APA - Holland University Press.

Lach, Donald F. 1953. "The Sinophilism of Christian Wolff (1679–1754)." *Journal of the History of Ideas* 14: 561–74.

Launay, Gilles de. 1681. *La cosmographie aisée, contenant la sphère, l'usage du globe terrestre, et la Géographie*. Paris: Michallet.

Leibniz, G. W. 1923-. *Sämtliche Schriften und Briefe*. Darmstadt, Leipzig, Berlin: Akademie der Wissenschaften zu Berlin.

Maitre, Marie-Julie. 2020. *L'analogie de Joachim Bouvet entre le Xiantiantu de Shao Yong et l'arithmétique binaire de Leibniz. Analyse d'une rencontre intellectuelle transculturelle.* New Taipei City: Sili danjiang daxue faguoyu wenxue xi.

Moore, Jonas. 1681. *A New System of the Mathematicks*. London: Godbid and Playford.

Newton, Isaac. 1687. *Philosophiae naturalis principia mathematica*. London: Streater.

Pfautz, Christoph. 1682-1688. *Acta Eruditorum*. Leipzig: Gunther.

Probst, Siegmund. 2018. "The Relation Between Leibniz and Wallis: An Overview From New Sources and Studies." *Quaderns d'Història de l'Enginyeria* 16: 189-208.

Ptolemy. 1682. *Claudii Ptolemaeii harmonicorum libri tres*. Oxford: E Theatro Sheldoniano,

Rabouin, David. 2022. "Can one be a fictionalist and a platonist at the same time? Lessons from Leibniz." *Noesis* 38: 161–94.

De Risi, Vincenzo. 2025. "The Genesis of Relationism: Leibniz's Early Theory of Space and Newton's Scholium." In *Oxford Studies in Early Modern Philosophy*, 12. Oxford: Oxford University Press. Forthcoming

Roinila, M. 2009. "G.W. Leibniz and Scientific Societies." *International Journal of Technology Management* 46-1: 165–79.

Schmidt, Robert W. 2022. "The Improved Calendar of 1700 and the Interplay with Astronomical Data - Der Verbesserte Kalender Des Jahres 1700 Und Das Wechselspiel Mit Astronomischen Daten." *Studia Leibnitiana*, 54-1: 96–116.

Sturm, Johann Christoph. 1681. *Cometarum natura, motus et origo*. Altdorf : Schönnerstaedt.

Tachard, Guy. 1686. *Voyage de Siam des Pères Jésuites envoyez par le Roy aux Indes & à la Chine*. Paris.

Szanser, A. J. 1976. "Johannes Hevelius (1611-1687)-Astronomer of Polish Kings." *Quarterly Journal of the Royal Astronomical Society* 17: 488–98.