

Robert St-Louis

Henry Sully, RÈGLE ARTIFICIELLE DU TEM(P)S –
1714 Vienna, 1717 and 1737 Paris

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Henry Sully, *RÈGLE ARTIFICIELLE DU TEM(P)S* – 1714 Vienna, 1717 and 1737 Paris

Robert St-Louis*

In 1714, while living in Vienna, London-trained English clockmaker Henry Sully wrote and published the most influential horological book, in French, of the early eighteenth century. This article compares and discusses the different editions of this ground-breaking book, and provides translations of original texts by the author. Other written works by Sully, actual and planned, are also briefly described.

Introduction

Henry Sully (1679–1728) was an English horologist.¹ After moving from London to the Netherlands in 1706–07,² he earned a living repairing clocks and watches in the Hague and Leiden for four years.³ While living there, he wrote (in French⁴) and published his first book, whose title translates as *Summary of some rules to make a good use of watches, and useful reflections on the way to repair them, and the abuses that can occur* (Fig. 1). Sully's first publications were largely aimed at owners of watches, providing them with practical advice on choosing and using their timepieces – essentially a user manual – something which had not been written by any horologist before him.

Evidently, his first book had some success as a second printing was requested by the

author in 1711, and a third printing was done in Frankfurt-on-Main the following year. In a 'Note to readers and booksellers' on the first page, Sully wrote:

A few hundred copies of this writing that I distributed, having been well received by the public – even though I only briefly touched on subjects that are more necessary to know by those who want to make good use of their watches, and maybe also things that are not necessary for those who have some knowledge of horology – I thought it worthwhile to make a second edition, for the use of those who need such help. And to allow those who live too far from the author to be able to address him directly, and also be able to use this text, I advise booksellers of other towns, who may

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1. Born and raised in a small village in Somerset, England, Henry Sully was apprenticed in London under Charles Gretton. Following the completion of his apprenticeship and tenure as a journeyman, he very briefly practised as a London clockmaker, before moving to the Netherlands for reasons not fully understood. He later moved to Paris where he spent most of the last twelve years of his life. For other information on Sully, see: Robert St-Louis, '1716: A Watch of New Construction' – a meeting of two great horological minds', *Antiquarian Horology* 42/3 (June 2021), 199–218.

2. By the summer of 1707, Sully was living in The Hague, Holland, where he was married to one Anna (or Anne) Horton, and they had their first of several children baptized there, a daughter, on August 21st. It cannot presently be determined whether Henry had married Anna in England, or in Holland. They had four children together.

3. For a discussion of possible reasons for Sully's move to the Netherlands see: <https://timetales.ca/2020/09/10/henry-sully-move-to-the-netherlands-ca-1705-06/>

4. All of Henry Sully's published writings were in French. Little is known of his education in Somerset, but it must have given him linguistic skills that helped him learn languages on the Continent, and make a living expressing himself in French. Some authors over the years have suggested he was descended from Huguenot immigrants, but that is unsupported by any evidence.

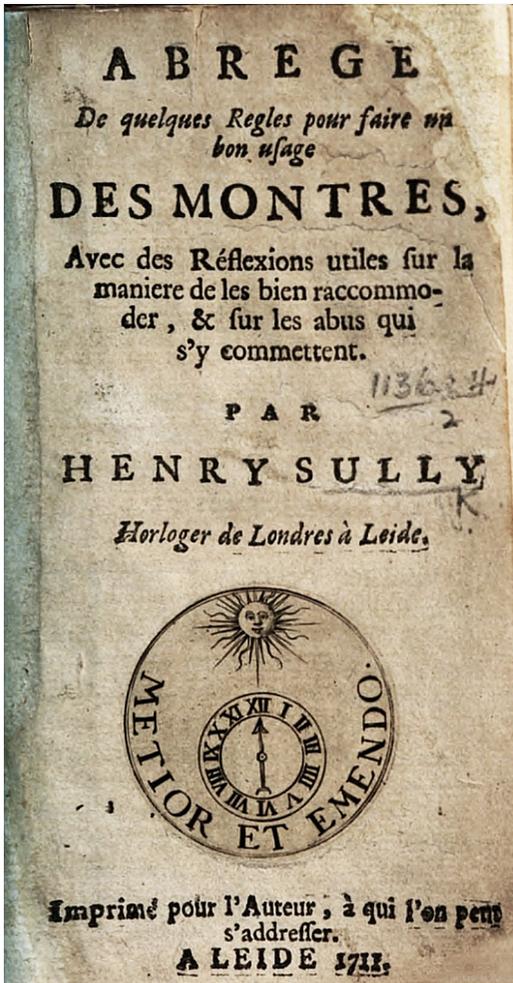


Fig. 1. Title page of Sully's 1711 booklet.

want copies, to address those requests to me, they will have them for the same price as the books that are sold in bookshops.

The circular diagram on the front page, referencing Sully's craft as a horologist, shows the sun and a clock dial, and aptly includes

the words 'METIOR ET EMENDO' ['I measure and repair/improve']. Sully identifies himself as a horologist from London, which was a good marketing element, given that London at the time was seen as the horological capital of the world.

Thus a horological writer was born, and this small booklet, which appears to have been written rather quickly, clearly became popular, necessitating Sully to augment the text and publish a number of expanded editions. This publication also served to advertise his watch-and clock-repair services, which put him in contact with people who owned such timepieces, and brought them to him for service.

Sully must have realized the popularity and importance of such a horological text, which led him to start writing the broader and more detailed *Règle artificielle du tems* for which he is best known, first published in 1714 in Vienna.⁵ This article describes and compares the three editions of Sully's most important horological book,⁶ and discusses its influence on later horological writing.

Règle artificielle du tems (Vienna, 1714)

After his wife died in Leiden in 1710,⁷ Sully lived briefly in Vienna, where he managed to obtain the patronage of the Duke of Arenberg.⁸ It was there that he completed (no doubt encouraged and supported financially by his patron) his second book, *Règle artificielle du tems* [The artificial regulation of time], printed there in 1714 (Fig. 2). The book was unlike any previous work on horology: it provided to the reader in clear language a description of the measurement of time by clocks and watches, how these devices functioned, how to regulate and maintain them properly, and much more of interest and use to any learned person desiring to

5. For a useful and detailed English description of the contents of the three editions, refer to G.H. Baillie's excellent *Clocks & Watches An Historical Bibliography* (London: N.A.G. Press, 1951), pp. 141, 150–151, 190–191.

6. For a summary table comparing the chapter/section titles and page numbers in all three editions (1714, 1717, 1737) see the appendix.

7. Volgraff e.a., Ed., *Christiaan Huygens Oeuvres complètes*, Vol. XVIII. *L'horloge à pendule 1666–1695*, (The Hague: Martinus Nijhoff, 1934), p. 701.

8. Leopold Philippe of Arenberg (1690–1754) was the 4th Duke of Arenberg, an aristocrat and military officer. He fought in the War of Spanish Succession in 1706, and was a field commander in several other European conflicts. Note that the name is often spelled 'Arenberg' in contemporary documents.

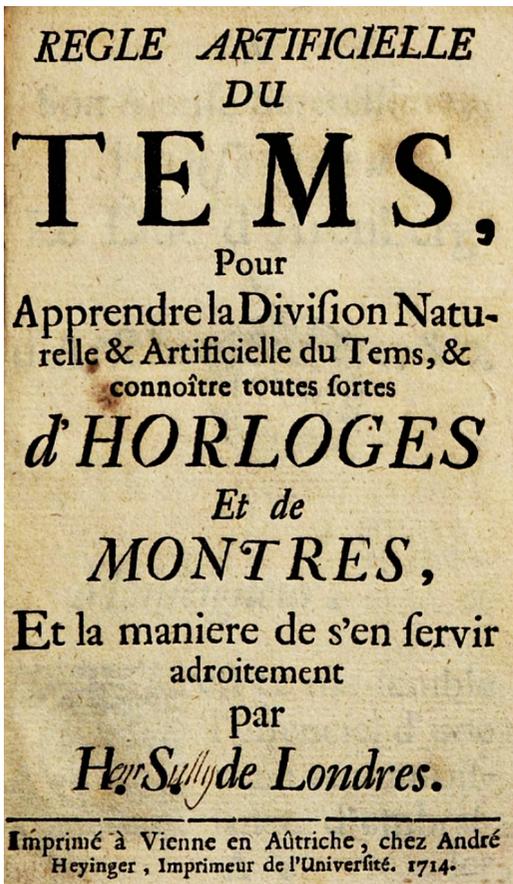


Fig. 2. Title page of the 1714 edition of *Règle artificielle...* In this copy, the initials H. S. are completed by hand to read Henr[y] Sully.

better understand the timepieces in their possession. *Règle artificielle du temps* was well received by many learned individuals, including the mathematician Leibniz,⁹ who wrote a commentary on the manuscript, which Sully included at the end of the printed book.

In the preface, Sully wrote that he had found few treatises on horology, and none that could 'serve as instruction to those who have no prior knowledge' of the discipline. He mentioned William Derham's *Artificial Clockmaker*, first published in London in 1696, which he said was a 'useful and very interesting work' but had been written mainly for people employed in the craft, and dealt directly with arithmetic aspects of horology,

such as calculating tooth counts for clocks and watches. Sully also mentioned John Smith's *Horological Disquisitions*, first published in London in 1694, where astronomical means of ensuring that clocks are telling accurate time were very well laid out. Sully suggested that both these previous books, though very useful regarding their purpose, 'don't go where would be needed, to give instructions aimed at the general public.' He clearly felt there was a need for such a book, and some of his customers and acquaintances probably urged him to share his considerable horological knowledge in writing.

It is impossible to determine how many copies of the original 1714 edition were printed, and how many print runs were produced of that edition. Perhaps it didn't sell that well in Vienna, which may have in part motivated Sully to relocate to Paris and have it printed there.

Sully was aware that the content of his book might be received differently by various readers, and offered these thoughts in the Preface:

I should warn [the reader] that it is not enough to read this small treatise purely to satisfy one's curiosity; this would not suffice to transmit so many rules and instructions which, even for such a small subject, demand constant attention, especially of those who have no prior knowledge of such things. Learned people may discover a few things they had not thought about, yet the author, being someone who has not pursued advanced academic studies, may require their indulgence, as he is well aware of the difficulties to write well, to dare flatter himself of having succeeded.

There may also be those who see a problem with instructions presented to them by an artisan; I don't say they are completely wrong, since there is so little in common between handling the file and the pen; but even if it would be foolish for a man of the trade to consider himself a '*bel esprit*' [person of wit], may the reader have the kindness to consider that there are some who work in the trenches, who could

9. Gottfried Wilhelm Leibniz (1646–1716) was a prominent German polymath, an important mathematician and natural philosopher of the Enlightenment.



Fig. 3. Detail of frontispiece of the 1714 edition of *Règle artificielle...* We assume that the seated person is Henry Sully.

well know how to direct field advances, and that any man who is proud to call himself a soldier, does not limit himself to carrying a musket.¹⁰

In the end, the Republic of Fine Arts is a free country, and although it would be difficult for one to show oneself in public without becoming assaulted from one side or another, one can, it seems to me, manage well if one has the right intention, by showing that the desire to serve the public has more to do with what one undertakes, than with seeking profit or vanity.¹¹

One important component of the 1714 edition is the frontispiece engraving, which is the only likeness of its author that has come down to us—assuming of course, that the relaxed, reclining figure with unbuttoned frock coat and vest, facing Old Father Time, in fact represents Henry Sully. Certainly, the figure is surrounded by symbols of time, and holds a piece of paper with a clock dial drawn upon it. A detail from this engraving, done by a Viennese engraver, appears in Fig. 3. The costs to develop the drawing and engraving were probably part of the contribution of the Duke of Arenberg to Sully's book project. For some reason, this figure was left out of the later editions of *Règle artificielle du tem(p)s*.

Règle artificielle du tems (Paris, 1717)

Following his move to Paris in 1716,¹² Sully had the book reprinted by the bookseller Grégoire Dupuis the following year (Fig. 4). Most of the content was exactly the same as the Viennese edition, with some additional sections provided by the author, at the front and the back of the book.

As can be seen from comparing the title pages of the Viennese and Paris editions, there are interesting refinements in language and description in the title.

Turning now to the content of the books, the dedication (*A Son Altesse Serenissime, Monseigneur Le Duc d'Arenberg & d'Arshot, &c.&c.&c.*) is absolutely identical in both editions, printed from the same typeset, and no differences can be seen in any of the nine pages. Even the date on the signature is identical (*Vienne ce 30.me Juillet 1714.*). The same holds true for the eleven-page 'PREFACE A ULECTEUR' that follows. Likewise, the four-page 'TITRES des Chapitres' is unchanged.

In the pages that follow, the text differs to varying degrees, as explained in a two-page *AVERTISSEMENT* [Notice] to the reader, which precedes chapter 1. The *Avvertissement* is paginated [iii] and iv. In it, Sully wrote:

Having come to Paris after the printing of my book [1714 edition], and having shown it to some of my friends; an illustrious scholar made me realize that I started too quickly in giving distinct ideas about all sorts of clocks and watches, and that it was necessary that I first provide a better and more detailed understanding of what is a clock and a watch, to allow the mind of my reader to better understand the rest of my text. I found this advice so appropriate that I started to write what presently follows, and which in a future printing will become the first chapter.

Since being in Paris, I had another opportunity to increase my book by adding

10. The reference to the theatre of war is interesting, because it has been said that Sully had accompanied his mentor, the Duke of Arenberg, during some of the latter's war expeditions, to keep the Duke's, and other commanders' watches, running well and accurately, which was an important for coordinating artillery and troop movements, and strategies on the battlefield.

11. Those interested in reading other translated excerpts from Sully's book can view them at: <https://timetales.ca/2022/01/11/quotes-from-henry-sullys-règle-artificielle-du-temps-1737/>

12. Arenberg had moved to Paris that year, and Sully followed him there.

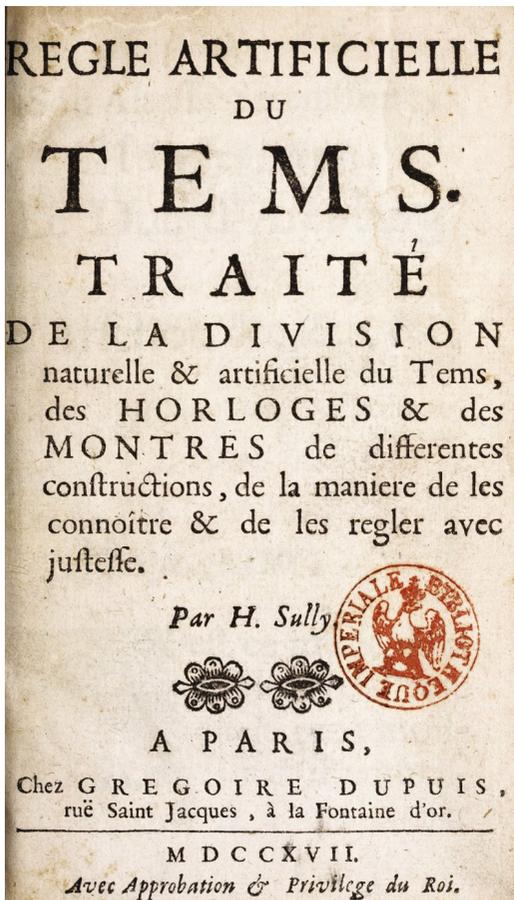


Fig. 4. Title page of the 1717 edition of *Règle artificielle...*

a Memoir on Horology, that I had the honour to read at the Académie Royale des Sciences in the month of June 1716, and which is found at the end of this work. Although I hope that this memoir will be understandable as presented here, in order to make it more useful for workers, I plan on joining figures that will better explain certain things regarding execution. In this printing, I have thus placed in the text, wherever needed, references to figures, even though they are not yet completed. These figures will be printed shortly, which along with the explanations I will add, will form a supplement to this memoir.¹³

I have also added comments that a scholar of the Jesuit Society made on my

book, and that the late M. le B. de Leibnitz, did me the honour of sending to me in Paris in 1715. These comments, along with my response, are at the end of the book.

There follows a new twenty-page section (pages v to xxiv), providing the 'better and more detailed understanding of what is a clock and a watch', announced in the *Avertissement*. In this new section, each subject is numbered with a capital roman number, as was the case for the text in the 1714 edition. Sully proceeded to give a thorough introductory description of a clock, and all its parts. He went on to describe the wheels, how they are constituted, and how they interact with each other in the train of the clock. He then explained how the weights are used to drive the clocks, and how the pendulum and escapement at the other end regulate its operation to allow the device to display time. After he had completed his discussion of clocks, he described their smaller counterparts, the spring-driven watches, along with their distinctive components, the fusee, the balance wheel and the balance spring.

From this point on, the 1717 edition replicates verbatim all the pages from the 1714 edition. The replicated text starting with Chapter 1 on page 1, like the original edition, and the final chapter X ends on page 114. Therefore, not one character appears to have been changed in pages 1–114, supporting the possibility that Dupuis was working with already printed sheets coming from Heyinger's original print run in Vienna, or had access to the original typeset galleys themselves.

Following this, both editions feature the same *Avertissement*, introducing the remarks of the Baron of Leibniz, which resulted from Sully sending him a copy of the manuscript of his book. Leibniz's comments are on the following six pages. The 1714 edition ends at that point. Leibniz introduces his comments on Sully's manuscript:

One could strongly wish there were a book on horology, able to convey all the practice of the Art, not only related to its primary

13. The figures Sully refers to were actually added to the book only in the 1737 edition.

purpose, the measurement of time, but also about the accessories to this, which consists of many beautiful inventions developed by the masters of the Art. The author of this discourse, who has joined theory with practice, and who also has the talent to express himself well, would be very well suited to writing this work.¹⁴

The 1717 edition goes further by adding two new sections following the Leibniz comments.

Firstly, a section paginated 1 to 26, consisting of excerpts (pages 1 to 8) of a letter from Father Kresa,¹⁵ written to one M. Williamson, Clockmaker to the cabinet of His Imperial Majesty, dated 9 January 1715. These comments pertain both to Leibniz's comments, and to the text of Sully's book itself. In the next pages (9 to 26) Sully replied to points raised by Kresa,¹⁵ and produced an updated six-page 'equation table' showing the variations of day length throughout the year.

Secondly, Sully introduced into the Paris edition his 'Description of a watch of new construction. Presented to the Royal Academy of Sciences in June 1716. By H. Sully.' This last section was quite recent, as Sully's successful presentation to the Academy had only taken place a few months earlier.¹⁶ The body of the text comes to a close at this point and is followed, as was the 1714 edition, by the customary Table of Contents, and by the paragraph entitled 'Approbation' [Approval] signed by Cassini in May 1717, in which the astronomer conveyed a positive judgment on the manuscript that he was given the opportunity to read. Following this is the obligatory lengthy section found at the back of all French books of that era entitled 'Privilege du Roy' [Privilege of the King] which essentially assigned a copyright to the author for twenty years.

Just as for the 1714 edition, it cannot be determined how many copies of the 1717 edition were produced by Grégoire Dupuis. The book appears to have had some success, and demand is suggested by Dupuis himself, in his introductory note 'To the reader' at the front of the 1737 re-edition: 'For a long time, the public has demanded a new edition of this book [...] that I couldn't bring myself to print without making corrections'. This suggests that Dupuis would have to reset the type for a new printing, and decided it would only be worth the effort after making the necessary changes and corrections to the text.¹⁷

Règle artificielle du tems (Paris, 1737)

Almost twenty years after the 1717 edition, Grégoire Dupuis commissioned Sully's friend and past collaborator Julien Le Roy,¹⁸ a Parisian horologist of great renown, to edit, re-write, and significantly augment the book with some of his own memoirs, thereby producing the final edition of the book, published in 1737. By that time, Henry Sully had been dead several years, having passed away in Paris in October 1728.

There is a small change in the title of the book, with the 1737 edition (Fig. 5) replacing the archaic spelling of time, *tems*, with the more current *temps*. This is but a small example of the many changes carried out on Sully's original text by Julien Le Roy and the publisher Dupuis, in coming up with the '*Nouvelle Edition corrigée & augmentée de quelques Memoires sur l'Horlogerie, par M. Julien Le Roy, de la même Société*' (New edition corrected and augmented by certain memoirs on horology, by Mr. Julien Le Roy, of the same Society). The Society referenced here, and ascribed to Henry Sully as well as to Le Roy, is the *Société des Arts*, first created around 1718, and re-established in 1728,

14. As will be seen later, Sully intended to write such a fulsome horological tome as Leibniz suggested. Life dictated otherwise.

15. Jakub Kresa (1648-1715) was a Czech born diplomat and mathematician.

16. For more information on this subject, see Robert St-Louis, '1716: A watch of new construction – a meeting of two great horological minds', *Antiquarian Horology* 42/2, Summer 2021.

17. For more information on the publication and publishers of the 1714 and 1717 edition, refer to: <https://timetales.ca/2022/01/15/publication-of-henry-sullys-book-regle-in-vienna-and-paris/>

18. Julien Le Roy (1686–1759) was born in Tours and trained by his father who was a clockmaker. He moved to Paris in 1703 and quickly established a reputation as an outstanding worker. Eventually he opened up a workshop and sold clocks and watches for many years in the exclusive Place Dauphine area. He was conferred the title 'horloger du Roi' in 1739.

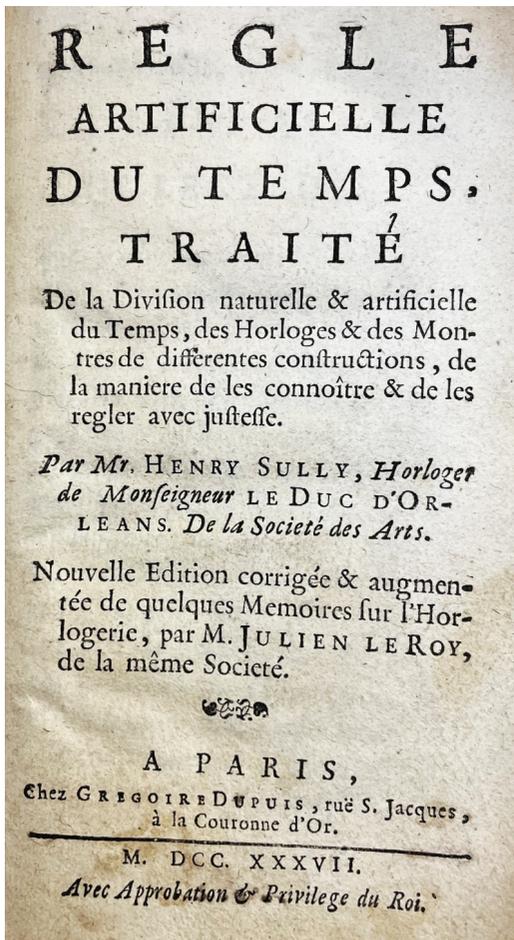


Fig. 5. Title page of the 1737 edition of *Règle artificielle*...

with both Sully and Le Roy being important founding and participating members.¹⁹

The publisher/bookseller opened with this note to the reader:

For a long time, the public has asked for a new edition of this book, in which most sentences are loaded with useless words and make for difficult reading, such

that I could not print it without making corrections. After having thought seriously about who should make these changes, and consulting friends on the matter, I asked Julien Le Roy of the Société des Arts, whose knowledge of horology and the relationship he had with the author, made him capable of helping me: convinced by my solicitations, he helped me, without changing anything that was essential, so that one will see everything that the author has said and thought. We have nevertheless removed many paragraphs deemed of little use, which were replaced by a few judicious words inserted into the text.

Thus, a good portion of Sully's original wording from the 1717 edition had been changed or reworded by Le Roy and the publisher. This must have represented a significant amount of work for Julien Le Roy, who ran a busy and prosperous watch/clock-making business at the time. Possibly, he elicited the help of his son Pierre²⁰ in the process. About the book, Sully himself had written in the Preface:

Regarding the style [of the writing], I have preoccupied myself primarily with clarity, and have preferred repeating myself when dealing with complicated subjects, than using a more proper style at the cost of remaining unclear. Finally, I ask the reader to consider that I wrote in a language that is foreign to me.

Sully was well aware of his limitations as a writer in the French language, but it is nevertheless impressive that, only a few years after landing in the Netherlands, he had written a sizable and influential book on a complicated subject, destined for a general readership, in a language that was not his mother tongue.²¹

19. For a detailed discussion on the *Société des arts* [Society of the arts], and the roles that Sully and Le Roy played in it, see Paola Bertucci, *Artisanal Enlightenment. Science and the Mechanical Arts in Old Regime France* (Yale University Press, 2017).

20. Pierre Le Roy (1717–1785), the oldest of Julien's four children (all sons), who followed his father in the horological profession, and worked alongside him for many years, taking over the family business after Julien's death in 1759. Pierre was well-educated and a fine horological writer.

21. In spite of the critical comments by the publisher to warrant the re-edition of the text, Sully's original words from 1714 are pleasant to read, and often convey the endearing original voice and linguistic 'accent' of an Englishman doing his best to write in French, often literally translating English phrases.

The obvious differences between the 1717 and 1737 editions, other than editorial changes to Sully's original text, are twofold.

Firstly, there is a lengthy section (pages 239–272) of an incomplete text by Sully – ‘found after the death of its author’, writes Le Roy on page 274 – entitled ‘Critical history of different kinds of escapements’. This is probably an initial attempt by Sully to write a section of his envisioned six-part ‘Study of Horology’, which will be discussed later.

Following this, on pages 275 to 433, are numerous memoirs by Julien Le Roy, and one by Pierre Gaudron, on horology. Many of these had already been read to the Société des Arts, as Le Roy wrote in his preface, where he also said:

I have yielded to the solicitations [of the publisher Dupuis] and the occasion to place [these memoirs] at the end of an excellent book, which deals with the same subject, and to which two of these memoirs relate.

These memoirs by Le Roy add tremendous value to the 1737 edition of Sully's book, providing readers with possibly the only version of these important texts by a master watchmaker in Paris at that time. Some are directly related to Sully but others describe interesting aspects of Le Roy's own horological principles and productions.

Arguably the most interesting and valuable of Le Roy's sections is the one entitled ‘*Memoire pour servir à l'histoire de l'horlogerie, depuis 1715 jusqu'en 1729*’. [Memoir to serve the history of horology from 1715 to 1729]. In it, Le Roy essentially recalled his long collaboration and friendship with Henry Sully, from the time the latter relocated to Paris in 1715, up to his death in 1728 and just beyond. This text is extremely important to anyone interested in Henry Sully's life and work, as it constitutes one of the few contemporary accounts of this subject,

by someone who knew the Englishman very well.²² The impression one gets from reading Le Roy's preface and this memoir, is that his participation in the revision of Sully's 1717 edition was very much a labour of love, to serve the memory of his deceased friend, and possibly to provide some financial assistance to Sully's widow and children.

At the very end of the 1737 edition, after the usual copyright section entitled ‘*Privilege du Roy*’ [Privilege of the King], is an interesting small paragraph entitled ‘*Cession du present Privilege*’ [Cessation of the present privilege]. It was signed on 22 October 1731 by Henry Sully's widow, Angélique Potel, and basically conferred to the publisher Dupuis all rights to the works of her deceased husband, for him to do as he wishes. No doubt, this was done to allow Dupuis to embark on the re-write of the book, with the help of Julien Le Roy. The widow probably received some monetary compensation for conferring the rights to Dupuis, and this may have been arranged by Sully's friend Le Roy, who was godfather to Sully's last son, also named Henry, born in 1721.²³

Foreign editions

At the time Sully wrote *Règle artificielle du tems*, French was recognized as the predominant universally-read language in Europe, allowing communication of new ideas and knowledge to a wide range of educated persons in various countries. While some English books, such as the two mentioned by Sully in his Preface – Derham's *Artificial Clockmaker* and Smith's *Horological Disquisitions* – were later translated into French and printed on the continent, few French books on horology were translated for dissemination in England. Sully's influential book was never translated into English. Even though Sully suggested he had been preparing an English version of his 1726 book,²⁴ he never seems to have worked on translating

22. For translations of Le Roy's biographical text on Sully, see: <https://timetales.ca/2021/04/05/biography-of-henry-sully-by-julien-le-roy-1737/>

23. For a discussion of the relation between Le Roy and Sully's youngest son named Henry, see: <https://timetales.ca/2021/02/08/possible-reference-to-sully-son/>

24. See *Avertissement* (no page number) dated 31 December 1726 in Bordeaux, which precedes page 49 in: *Description abrégée d'une Horloge d'une nouvelle invention*, Briasson, Paris, 1726. Sully writes: ‘The English edition of this book will appear imminently in London’. It evidently was never published, but suggests that Sully may have been intending on making a play for the English Longitude Act (1714) Great Prize.



Fig. 6. Title page of the 1746 German translation of *Règle artificielle*...

his book *Règle artificielle du temps* for an English audience. This is rather odd since there was certainly nothing like it before

in the English language, nor for a long time after, but educated Englishmen who were well versed in French, probably read it in its original language.²⁵

Règle artificielle du tem(p)s was translated into German by Antoine Charles, an Augsburg watchmaker, and published in 1746 in Lemgo²⁶ (Fig. 6); a second edition was published in 1754. Charles added a 10-page preface, in which he was highly critical of the state of the watch trade in his country, and stated that he hoped Sully's book could serve as an antidote. German editions of some of Sully's other writings also came out over the years,²⁷ suggesting that German readers and horologists appreciated the importance of his written output.

No other translations of Sully's books are known to the present writer.

Future writing projects

Near the end of his life, in 1726, Sully outlined an ambitious plan to write an all-encompassing treatise on horology, as Leibniz had suggested to him twelve years before. This plan was described in his penultimate book 'Description of a clock of new invention for accurately measuring time at sea'.²⁸ On pages 284–290, Sully declared his intention to write a 'traité' (treatise) on horology in six volumes. The first volume would consist of an augmented version of his 1717 book *Règle artificielle*... and would stand on its own.²⁹ The

25. This may also be indicative of the differing attention placed on either side of the Channel on Sully's contributions as a horologist; for example, his incomplete but important body of work on marine clocks for determination of longitude. Possibly, he was shunned or at least neglected by English circles because he had turned his back on the English horological heritage by relocating to the Continent and spending the rest of his life there. Conversely, he may also have been somewhat underappreciated by the French, because he was an Englishman in their midst.

26. Lemgo is a small university town in the Lippe district of North Rhine-Westphalia, Germany, 25km east of Bielefeld and 70 km west of Hannover. This area is now one of the most important cluster regions for mechanical engineering and industrial electronics in Germany.

27. See Tardy, *Bibliographie Générale de la Mesure du Temps* (Paris, 1947), pp. 239–240.

28. Henry Sully, *Description d'une horloge d'une nouvelle invention pour la juste mesure du temps sur mer* (Paris: Briasson, 1726). This book in part described Sully's attempts to design and build a working marine chronometer, that was tested near Bordeaux that year with some success. Sully realized the clock needed more refinement, but he unfortunately did not have time to further advance his work in this area, and it was left to his friend Julien Le Roy's son Pierre, and the Swiss immigrant Ferdinand Berthoud, to build on Sully's work and take French chronometry to the next level.

29. In Sully, 1726, on the un-numbered page preceding page 1, Sully writes that 'the second edition of *Règle artificielle du tems* will be published shortly, with considerable additions and copper etched figures.' He is clearly referring to a revision of the earlier 1717 edition, that he had been working on as part of his planned horological treatise. Possibly Julien Le Roy was provided with Sully's revision papers, to help him prepare the 1737 edition.

other five books would (in his words) consist of: (2) the history, (3) the description, (4) the theory, and (5) the practice, of horology. The sixth book would consist of letters and critical essays, which would put the other five books into proper context (*'donner le juste prix'*), since 'only by criticism can we clarify doubtful subjects and stimulate the mind.'

The *Mémoires de Trévoux*³⁰ of March 1728 (pp. 420–422) features a review of Sully's last published work, a small booklet entitled *Méthode pour régler les montres & pendules* [Method to adjust watches and pendulum clocks]. Here, Sully had returned to the spirit of his very first writings, providing practical advice to watch and clock owners. Possibly, he wrote it to generate badly needed income after some very difficult economic setbacks. Also outlined in this last published work is another indication of his ambitious plan for his previously mentioned six part study of horology, and the reviewer concluded:

There only remains but to wish two things: firstly, that someone as able as Mr. Sully executes this work in its entirety; secondly, that the Scientists and Artists (*Scavants et Artistes*) communicate to him, in good spirit and enthusiasm, everything they deem to be useful to execute such a work, which indeed requires the help of many hands and minds.

This collaborative approach to fully describing horology later came to be realized in numerous articles within Diderot and d'Alembert's *Encyclopédie* project.³¹

Influence on later French horological writing

Sully's *Règle artificielle du temps* had a strong influence on horological writing in France

during the eighteenth century, a period of intense intellectual activity and writing on many subjects. During these *'années lumières'*, horological writing matched the considerable advancements in watch and clock design and construction that occurred. Much of this was done by French horologists, who described in great detail the intricate aspects of their craft, to inspire other practitioners. These authors included Julien Le Roy and his son Pierre, Antoine Thiout, Jean Jodin, Jean-André Lepaute and Ferdinand Berthoud and others.³²

Julien Le Roy, Sully's one-time collaborator and long-time friend, never wrote a book himself, preferring to write several memoirs on particular horological subjects over the years, some presented to the Académie Royale des sciences, others to the Société des arts, of which he was a founding and prominent member. However, his fingerprints are all over the revised text of the 1737 edition of *Règle artificielle...*, which also features many of Le Roy's own memoirs, including one which is the closest we have to a contemporary biography of Henry Sully.³³

In 1734, a Dominican priest called Jacques Allexandre published in Paris a book entitled *Traité général des horloges* [General treatise on clocks]. It is a fine attempt to document the breadth of history of horology from earliest times to the present, primarily focusing on clocks, but with some discussion of watches. The book features a most interesting 105-page bibliography of all the books, many quite ancient, consulted by Allexandre in writing his book. In it, Sully's *Règle artificielle ...* is described at length, with Allexandre summarizing the subject of each of its chapters. References to Sully also appear in two other places in the body of this 1734 work.

30. The *Journal de Trévoux*, formally the *Mémoires pour l'Histoire des Sciences & des beaux-Arts*, but often called the *Mémoires de Trévoux*, was an influential academic journal that appeared monthly in France between January 1701 and December 1782.

31. Diderot, D'Alembert, *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers* (Paris, 1751–1766).

32. For a brief discussion of these writers, see: <https://timetales.ca/2020/09/03/henry-sully-antoine-thiout-ferdinand-berthoud/> For a discussion on lesser-known Jodin, see: <https://timetales.ca/2021/11/02/jean-jodin-horloger-et-auteur/>

33. *Mémoire pour servir à l'histoire de l'horlogerie, depuis 1715 jusqu'en 1729* [Memoir to serve the history of horology, from 1715 until 1729], in: *Règle artificielle du temps* (Paris, 1737), pp. 381–413.

The next horologist to try his hand at writing a comprehensive horological book is Antoine Thiout,³⁴ whose *Traité d'Horlogerie, Méchanique et Pratique* (Paris, 1741) is described by G. H. Baillie as 'an exhaustive treatise written by a maker of great repute'.³⁵ It consists of 400 pages of text and over ninety foldout drawings of all aspects of clock and watch design, as well as the tools used in producing them. Until the publication of Ferdinand Berthoud's two-volume *Essai sur l'horlogerie*, it would remain the most complete work on this subject produced in France, and probably any other country, and is still a very useful reference on eighteenth-century horological tools and practices.

Interestingly, Thiout's book includes a substantial ten-page article by Sully on the verge escapement, complete with a detailed diagram. This text is very thorough and technical, had never appeared in print before, and may have been one of the sections that Sully had prepared for his ambitious six-volume publication, which had somehow found its way to Thiout.

Jean André Lepaute is the next writer of importance.³⁶ At just over 300 pages, and seventeen foldout diagrams, his *Traité d'horlogerie*, published in 1755, is a shorter work than Thiout's, but it is the one most inspired by Sully's *Règle artificielle...*, and in some ways could be seen as an expanded update to that publication. The 'Historical Preface' of his book features nine pages of biographical information on Sully (largely based on Le Roy's own memoir from the 1737 edition). Lepaute wrote:

It was to update the work that Mr. Sully had printed in 1717, entitled 'Règle artificielle du tems', that Mr. Julien Le Roi gave a second edition in 1737, augmented by many works of his making.

This second edition having also

disappeared in turn, the necessity to come out with a third, made us desire to substitute a more perfect and useful work on its subject and on the current state of horology; in light of this, we have felt best to abandon the work of Mr. Sully, and we have only conserved traces of its initial form, such that one can say that Mr. Sully's book gave us the opportunity rather than the model. Mr. Sully, not ideally suited to the task of a writer, had not been able to provide enough order, style, expression, nor clarity in his work, and his editor [...] preferred augmenting a useful work rather than correct it, and thereby turning it into a pleasing work; thus, after a total metamorphosis, we found ourselves obliged to also regretfully change a title that Mr. Sully and the reputation of Mr. Le Roi had made respectable.

Lepaute went on to write that his treatise was also an update on the great one published by Thiout, providing everything novel and interesting that had come out in horology since 1741. Lepaute is critical of Sully's abilities as a writer, but what is undeniable, in looking at the three subsequent books just described (Alexandre, Thiout, Lepaute), is that Sully had set an example of how horology could be described in its various aspects and details in a book, and that it was a worthwhile endeavour for a horologist to devote himself to, as a means of sharing and transmitting knowledge to younger practitioners of the art.

In Diderot and d'Alembert's *Encyclopédie*, 250 articles are devoted to horology, written by various authors including Jean-Baptiste Le Roy (second son of Julien), Jean Romilly, and Ferdinand Berthoud. On page 309 under the heading 'Horlogerie' one reads:

Horology ... has elevated itself to the level we see today [because] of certain artists

34. Antoine Thiout, the elder (1692–1767) became master-horologist in Paris in 1724. He was one of the clockmakers who produced pendulum clocks to display real and average time in the 1720s. His 1741 treatise remains one of the great sources of information on horological practices in eighteenth century France.

35. Baillie, *Clocks & Watches, An Historical Bibliography*, p. 203. Baillie also has interesting things to say about all the French authors mentioned in this section.

36. Jean André Lepaute (1720–1789) was an extremely respected and prolific clockmaker who produced timepieces for the most affluent customers of the time. He was married to a brilliant woman, Nicole Reine Étable de la Brière, a mathematician and astronomer.

loving their art and seeking perfection, fostering among themselves an emulation which has produced profitable results ... the genesis of this spirit of emulation is owed to English artists brought into France during the Regency period, notably Sully, the ablest of those who settled here ... Julien Le Roy, able watchmaker, was close to Sully (to whom we owe *La règle artificielle du tems*, a very good book), and benefitted from his knowledge.

Finally, the eighteenth-century French writer who came closest to realizing Sully's vision of an all-encompassing horological treatise was the prolific Swiss-born Ferdinand Berthoud,³⁷ whose *Essai sur l'horlogerie* [Essay on horology] was published in 1763; a second, revised edition came out in 1786. In Berthoud's two-volume tome, the text is both lengthier and more elegantly written than either Thiout's or Lepaute's, and in his case, the plates and diagrams are directly in support of the text. In his book, Berthoud briefly mentions Sully (on page xiv of Volume I), where he writes: 'it is to [him] that we owe *Règle artificielle du tems*, an excellent work that contains a very good memoir on ways to perfect a watch.'

Coda

As he approached the end of his life, Sully again turned to his trusty pen, probably to generate income to support his wife and numerous children. All the work and money he had spent on his marine timekeepers during the previous few years, which had not culminated in financial success, had no doubt

eaten up whatever savings he had, and even his tools had been sold off to appease the creditors. In the introductory pages of his 1728 booklet *Méthode pour régler les montres et les pendules* [Method to regulate watches and pendulum clocks], the publisher notes that Sully was also busy at the time preparing other works for publication, including:

- A translation of an English text from the Oxford astronomy professor David Gregory,³⁸ on the usefulness of mathematics and how to study them.

- A new practice to more exactly determine longitude for navigation.³⁹

- A second edition of *Règle artificielle...*, with additions and figures.⁴⁰

Some of these additional planned works, along with the massive horological treatise described earlier, never made it into print, because of Sully's untimely death after a sudden illness, in 1728. Sadly, no other texts by Sully appear to have survived and come down to us, but the few that have, give us a tantalizing glimpse into the body of knowledge and experience that Sully would have been able to impart upon the horological community, had he lived longer.

Henry Sully died on 13 October 1728 after a short illness, and his ambitious writing plans remained unfulfilled. A contemporary account indicates that '[the death of Sully] left his wife and five children in extreme misery, but Mr. the Curé [of the parish of St-Sulpice] looks after them all.'⁴¹ Ten years later, as we have seen, Julien Le Roy strove to augment and update Sully's *Règle artificielle du tems*, but it was still well short of the broad scope of Sully's envisioned future horological books.

37. Ferdinand Berthoud (1727–1807) was born in Plancemont Switzerland, and came to Paris in 1747, becoming master watch-clockmaker there in 1754. He died in Paris a wealthy man. His horological accomplishments are numerous.

38. David Gregory (1659–1708), professor of mathematics at Edinburgh University, and later professor of astronomy at Oxford University. One of Sully's last acts was a presentation of his translation of one of Gregory's papers to the *Société des Arts* in Paris.

39. This article does not discuss Sully's other major horological efforts, including trying for over twenty years to develop a marine timekeeper. He wrote about this life work in *Description abrégée d'une horloge d'une nouvelle invention pour la juste mesure du temps sur mer* (Paris: Briasson, 1726). In particular, refer to the section 'Éclaircissements' in that book, see <https://timetales.ca/2022/01/16/henry-sully-eclaircissements-clarifications-1726/>.

40. See note 24. For example, the chapter entitled 'Histoire critique de différentes sortes d'échappemens' [Critical history of different kinds of escapements], that was inserted by Julien Le Roy and his publisher in the revised 1737 edition of *Règle artificielle...* (pages 239-272). Also, the section on verge escapement that made its way into Thiout's 1741 book.

41. Angélique Delisle, writing to her brother Joseph-Nicolas Delisle on 17 January 1729, Bibliothèque de l'Assemblée nationale, Paris, Ms 1508, f. 49^v.

Bibliographical notes / sources

1714 edition

REGLE ARTIFICIELLE DU TEMS, Pour Apprendre la Division Naturelle & Artificielle du Tems, & connoître toutes sortes d'HORLOGES Et de MONTRES, Et la maniere de s'en servir adroitement par H. S. de Londres. Imprimé à Vienne en Aùtriche, chez André Heyinger, Imprimeur de l'Université, 1714.

Google Books scan of copy at Osterr. Nationalbibliothek (Austria) No. 51.X.16
https://books.google.ca/books/about/Regle_artificielle_du_tems_pour_apprendr.html?id=8AxTAAAAcAAJ&redir_esc=y

1717 edition

REGLE ARTIFICIELLE DU TEMS. TRAITÉ DE LA DIVISION naturelle & artificielle du Tems, des HORLOGES & des MONTRES de différentes constructions, de la maniere de les connoître & de les regler avec justesse. Par H. Sully. A PARIS, Chez GREGOIRE DUPUIS, rue Saint Jacques, à la Fontaine d'or. MDCCXVII. Avec Approbation & Privilège du Roi.

Gallica scan of copy at Bibliothèque Impériale (France) No. V2389 – 21726
<https://gallica.bnf.fr/ark:/12148/bpt6k9621156v.texteImage>

1737 edition

REGLE ARTIFICIELLE DU TEMPS. TRAITÉ DE LA DIVISION naturelle & artificielle du Tems, des HORLOGES & des MONTRES de différentes constructions, de la maniere de les connoître & de les regler avec justesse. Par Mr. HENRY SULLY, Horloger de

Monseigneur LE DUC D'ORLEANS. De la Societé des Arts. Nouvelle Edition corrigée & augmentée de quelques Memoires sur l'Horlogerie, par M. JULIEN LE ROY, de la même Societé. A Paris, Chez GREGOIRE DUPUIS, rue S. Jacques, à la Couronne d'Or. MDCCXXXVII. Avec Approbation & Privilège du Roi.

Original copy in the possession of the present writer. There is a facsimile reprint by Kessinger Legacy Reprints (ISBN 9781166203511); and a Google Books scan of a copy at 'Bibliothèque Lausan'
https://books.google.ca/books/about/Regle_artificielle_du_temps.html?id=6wWAAAAQAAJ&redir_esc=y

1746 German edition

Heinrich Sully, Uhrmacher des Herzogs von Orleans, und Mitglied der Societät der Künste zu Paris. Unterricht von der Eintheilung der Zeit. Worinnen gehandelt wird von der natürlichen und künstlichen Eintheilungen der Zeit; von den verschiedenen Einrichtungen grosser und kleiner Uhren. Imgleichen von der Wissenschaft dieselbe gründlich zu beurtheilen, richtig zu stellen, und ordentlich zu richten. Mit nöthigen Figuren und Tabellen. Nach der neuesten Französischen Auflage in das Teutsche übersetzt, mit einigen nöthigen Anmerkungen aber vermehret von Antoine Charles, Uhrmacher in Magdeburg. Lemgo. Gedruckt bey Johann Heinrich Meyer, Hochgräflich[Lippisch] Hof-Buchdrucker, 1746.

e-rara (digitized printed works from Swiss libraries). Scan of copy from Bibliothek D. Eidg. Technischen Hochschule Zurich, Rar 4490. <https://doi.org/10.3931/e-rara-2588>.

Appendix. Tables of contents of the three French editions (translated headings)

Pages	1714	1717
A2–A6	Dedication to Patron (Arenberg)	Dedication to Patron (Arenberg)
B–B4	Preface to the reader	Preface to the reader
..B5..	Chapter titles	Chapter titles
	Foldout page of figures	Foldout page of figures
iii–iv	–	Note (<i>Avertissement</i>)
v–xxiv	–	General construction of clocks/watches
1–16	Chap.1 Different types of clocks/watches	Chap.1 Different types of clocks/watches
17–32	Chap.2 Reasons clocks better than watches	Chap.2 Reasons clocks better than watches
33–37	Chap.3 Natural and artificial division of time	Chap.3 Natural and artificial division of time
38–41	Chap.4 Apparent time and how to find it	Chap.4 Apparent time and how to find it
42–50	Chap.5 Equal time and finding it by stars	Chap.5 Equal time and finding it by stars
51–67	Chap.6 Using apparent and real time	Chap.6 Using apparent and real time
68–76	Chap.7 Choosing pocket watches	Chap.7 Choosing pocket watches
77–90	Chap.8 Judging the quality of a watch	Chap.8 Judging the quality of a watch
91–102	Chap.9 Adjusting the balance spring	Chap.9 Adjusting the watch balance spring
103–114	Chap.10 Care & repair of pocket watches	Chap.10 Care & repair of pocket watches
K–K3	Comments by Leibnitz on Sully’s manuscript	Comments by Leibnitz on Sully’s manuscript
(1)–(8)		Letter from Kresa to Williamson 9 Jan 1715
(9)–(11)		Sully resp. to Kresa comments on his book
(12)–(26)		Sully resp. to Kresa comments on eqn. table
28–60		Description of watch of new construction
		Two page list of printing errors
	1737	
	Foldout page of figures (re–drawn)	
aij–aiij	Bookseller note to the reader	
aiij	Preface	
1–26	Chap.1 General construction of clock/watch	
27–45	Chap.2 Different types of clocks/watches	
46–68	Chap.3 Reasons clocks better than watches	
68–75	Chap.4 Natural and artificial division of time	
75–80	Chap.5 Apparent time and how to find it	
81–94	Chap.6 Equal time and finding it by stars	
94–118	Chap.7 Using apparent and real time	
	Equation table	
119–131	Chap.8 Choosing pocket watches	
132–153	Chap.9 Judging the quality of a watch	
153–168	Chap.10 Adjusting the watch balance spring	
168–183	Chap.11 Care & repair of pocket watches	
184–192	Comments by Leibnitz on Sully’s manuscript	
193–238	Description of watch of new construction	
239–272	Critical history of different escapements	
	Memoirs on horology by Julien Le Roy of the Society of the Arts	
273–278	Preface (<i>anomaly on page numbers</i>)	
275–292	Historical memoir on Sully’s watch (<i>of new construction</i>)	
293–304	Description of new horizontal sun–dial	
304–314	Description of new universal portable sun–dial with compass	
315–318	Comments on construction of sundials (called Butterfield)	
318–322	Memoir on new way to correctly mark the hour on sun–dials	
323–331	New and simpler construction of alarm clock mechanism	
332–350	New and simpler construction of turret clocks	
350–356	Second memoir on turret clocks	
357–370	Third memoir on turret clocks	
370–381	New way to place repeating mechanism in clocks	
381–413	History of horology (and Henry Sully) from 1715 to 1729	
414–433	Memoir by Pierre Gaudron on pendulum clock construction	
	Table of chapters	