# The English Translation of the 1652 Edition of J.F. Niceron's *La perspective curieuse*

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## Abstract

J. F. Niceron's iconic 1652 book on mathematics and anamorphic art has been strangely neglected for translation into English. After an extended effort over 10 years, this neglect has been rectified and an English version has been prepared and accepted for publication. During the process of preparation, much new data has been discovered and/or organized (concordances, time-line biographies etc.) and are included for the benefit of future scholars. Included in the new material is a mathematical commentary which, while not encyclopaedic, provides mathematical explication of much of the original mathematics and presents it in modern notation. Some aspects of today's publication process are described.

## Introduction

The discovery of perspective in the 15th century was accompanied by advances in geometry that served to explain and even advance this intersection of mathematics and art. It is no accident that the great artists of the late Renaissance were also mathematicians (da Vinci, Brunelleschi, Alberti etc.). Some of the concepts involved were sufficiently subtle as to become contentious and out of this came the so called "perspective wars" that probably stimulated the advance of perspective knowledge and the publication of perspective treatises.

As with any other area of mathematics, there were scholars who explored the limits of the subject and this resulted in examining the nature of images with perspective so excessive that they appeared nonsensical unless observed from a particular point and in a particular direction. This is then a departure from artistic perspective in which the eye-point and direction-of-gaze can have very wide limits before the observer notices any distortion. This more severely constrained type of image became known as "anamorphic" and fostered its own acolytes and books of mathematics and art from Daniel Barbaro (published 1569) to Grégoire Huret (published 1672), in a century which might be called the "golden age of anamorphism".



**Figure 1:** *Title page to the 1652 edition*

Early in the second half of this period is the life and work of the Minim friar Jean-François Niceron (1613-46), author of *La perspective curieuse* [1] first published in 1638, and then expanded over the next 20 years in both content and in translation. Niceron had the good fortune to be mentored by the Minim polymath Marin Mersenne who took over the project when Niceron suddenly died. It was completed by Gilles Personne de Roberval when Mersenne too died. In the final edition of 1652 (See Figure 1), it is sometimes difficult to see where Niceron leaves off and Mersenne begins. Nevertheless, the Mersenne contributions can be identified with some confidence, and what remains is sufficient to confirm the genius of Niceron alone.

Niceron accomplished a great deal of ground-breaking mathematics in a lifetime of only 33 years, and his seminal book *La perspective curieuse* was adopted by the artistic community and ultimately eclipsed all others as a practical manual for artists. There is scarcely an anamorphic artist who has not, or professes to have not, studied Niceron.

It seems strange then that this book that has remained current for almost four centuries has never been translated into English. (*Note*: A modern French translation is available on the internet (http://architectura.cesr.univ-tours.fr/Traite/Textes/B250566101_11518.pdf), but it does not include any of Niceron's plates. A critical edition and translation in Italian was to appear in 2007 as a result of work by Agostino de Rosa, but the project turned short and was never released). At a time when almost every work of scholarship was translated into Latin and vernacular this book escaped. This is all the more remarkable in that Niceron himself says that the book is not for scholars, but for the practitioners in art; it is a manual. Niceron and Mersenne themselves reworked part of the book in Latin (as *Thaumaturgus Opticus*), and perhaps it was the existence of this edition that suppressed the urgency of an English translation.

The volume consists of four books in addition to some front matter (dedications, etc.):
Book 1          Review of perspective methods
Book 2          Plane (or geometric) anamorphs
Book 3          Anamorphs in cylindrical or conical mirrors
Book 4          Anamorphs in refracting media.

The extensive regard for Niceron's work might lead one to assume that the material is almost flawless and encyclopaedic; this is not the case. In fact, the 1652 posthumous edition was so carelessly edited that literally hundreds of typographical errors make it necessary to read the text and analyze the theorems very carefully to get the necessary error-free text that permits the mathematics to be used.  In addition, there are some critical errors or omissions in Book 1, the summary of perspective theory, and also some mathematical errors that lead to incorrect results. In light of this, it seems that a corrected, English edition is long overdue.

The translation work began in 2006 and was completed in 2017. Along the way, a more qualified mathematician/historian (Dominique Raynaud, Université Grenoble Alps) was added as author and a more qualified text editor (Sylvia Hunt, Laurentian University) also joined.

The headings below are those of the major sections of the ensuing work.

**Editions.** The editions included in the study are those of 1638 (1$^{st}$), 1646 Latin (2$^{nd}$), 1652, (3$^{rd}$) and 1667 (4$^{th}$). Evidence is presented that the 4$^{th}$ is spurious, being from the same printing as the 3$^{rd}$. The edition chosen for translation and intensive study is the 3$^{rd}$ of 1652.

**Time-line.** A time-line in tabular form is given outlining the major historic and artistic events from the year of da Vinci's first anamorphic drawing of a child's face (1595) to 1725, the year of publication of Jean Courtonne's treatise on "Practical Perspective". This provides a quick reference of works, authors, and events for scholars.

**Histories.** Brief histories of the major players (Niceron, Mersenne, Roberval, and the Minim Order) are included here. This section is largely from secondary sources and is only for the reader's quick information about the lives and work of these mathematicians/artists.

**Graphics.** The most complicated, non-mathematical topic is the history of the graphic material and who was responsible for what. Both Niceron and Mersenne created plates (see Figure 2), and the confusion

arises as to what plate is referred to in the text. We have alleviated this confusion by creating this table which attempts to clarify the creator of the drawing and its role in the text. This information is presented in tabular form for each edition of the volume.

**Concordance.** Since the text is a mixture of sections written by at least three persons, the contributions of each have been identified and the resulting concordance presented in a tabular form. This concordance should be of particular usefulness to future research.

**The Translation.** The overall mechanics of effecting the translation was constant for all of the text, but there were accommodations made for the constantly improving OCR technology. Initially the technology could not cope with the low contrast of the source material. The text was first transcribed, by typing, into a WORD file and a preliminary dictionary look-up was undertaken for all unfamiliar words (Grandsaignes d'Hauterive 1947) [2]. It was the practice with 17th-century French language not to use many accents, having, for example, an extra (but silent) 's' to indicate the specific sound of the accent. In order to use the OCR, we had to replace these antiquated spelling practices with modern French accents; this was done to the text at this stage. As time progressed, some of these steps became more automated due to increasing improvement in OCR technology and other tools such as machine translation.
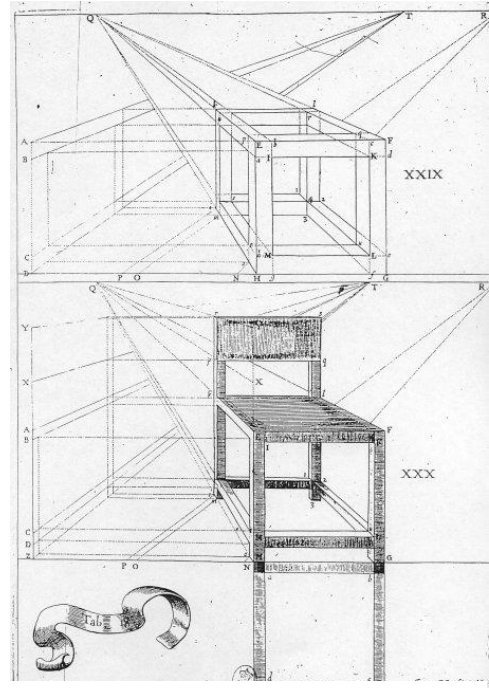


**Figure 2:** *Plate 18 showing a plane anamorph*

Another vexing problem was the punctuation. At this period in the development of the French language, punctuation can be described as 'profligate'. Colons and periods are used to end sentences apparently at random, and commas seem to be scattered in a profusion that mocks the austere usage in modern English and French.

At this stage, the translation was assembled by hand and the proper syntax imposed on the fragments in the WORD file.

Since this was to be a translation governed by the mathematics, it was necessary to check for mathematical accuracy such that the text and mathematics were in mutual agreement. Disagreements were sorted into categories such as "correct", "wrong-unintentional" (e.g. typos), and "wrong-mathematically". After assembling these into footnotes and correcting the manuscript, it was deemed finished.

We thought long and hard about how to closely render the French title *La perspective curieuse*. In 17th-century French, the adjective *curieux* had a special meaning, which is not coincident with either English or modern French equivalents, which include both shades of astonishment and strangeness. This diagnosis is confirmed by scrutinizing 17th-century language practices. The *Dictionnaire de l'Academie françoise* reminds us that curiosity is not only the desire or willingness, but also the object sought for. The word clearly refers to the context of the *cabinets de curiosités*, where unique pieces of art and science were being preserved for observation and analysis. This close connection between curiosity and intellectual inquiry is, to a certain extent, reminiscent of the Latin. We discover in Gaffiot's dictionary that *curiositas* (desire to know, wonder, attention paid) comes from *curiosus* (careful, conscientious, eager for knowledge), which in turn comes from *cura* (care, attention). It is thus apparent that 17th-century French was more in keeping with the Latin etymology. To the extent that curious can include all these

overtones of something done with interest, care and attention, we decided to keep the title closest to the French: *Curious Perspective.*

**Navigation.** It was judged that navigation in the English and/or French texts would be inefficient with a standard word-index so another method was used. Niceron has divided almost all of the French text into "Propositions" for which he provides his own index keyed on the French page numbers. Accordingly, a notation was introduced which indicated the start-position of each French page in boldface in the outer margin of the English text; thus **Np15** indicates the start of page 15 in the French text.

**Publishing.** Publishing books is an expensive undertaking and it is not easy to find a publisher willing to take a risk on a manuscript that is submitted by unknown authors, as opposed to commissioned works. In this case, at least a dozen publishers were contacted and all were either not interested in the field, or had full title lists. Finally, a manager at the publishing arm of the Arizona Center for Renaissance and Medieval Studies (ACRM) in Tempe AZ showed guarded interest and invited the submission of a copy for perusal. The MS was submitted to two anonymous readers who submitted their reports in due course.

The reports of the readers was uniformly enthusiastic with no major concerns, but several productive suggestions. Some of these were so interesting (e.g. the Concordance) that they were adopted, and one of the readers (D. Raynaud) was recruited as a third author of the work. Unanimously, the readers urged that this work was 365 years overdue and should be published.[3]

**Mathematical Commentary.** In addition to the four books of Niceron's text, there is added a fifth book titled "Mathematical Commentary". The book contains proofs, explications, refutations, etc. of selected propositions. For example:

A.      Niceron's method for constructing plane anamorphs on the surface of pyramids and cones (Plates 26 to 29) is known [4] to be incorrect. Why it is incorrect and how to fix the problem is given here.
B.      Niceron's method of constructing a template for making anamorphic pictures in a cylindrical mirror involves a number of unexplained approximations. These approximations are addressed in the commentary.

## Conclusion

In the preface to our book, renowned Hungarian perspective artist István Orosz states that, 350 years after its publication, *La perspective curieuse* still has relevance in the artistic community. This art-mathematical book by the French friar J.F. Niceron has finally been translated into English. In the process, several interesting historical facts have emerged; these are all presented for the first time in a book entitled *Curious Perspective* and will benefit future generations of perspective artists and historians.

## References

[1]      Niceron, J.F. (1652). *La perspective curieuse ou magie artificiele des effets merveilleux.  De l'Optique, par la vision direct. La Catoptrique, par la reflexion des miroirs plats, Cylindriques & Coniques. La Dioptrique, par la reflection des Crystaux....* Paris, Pierre Billaine.
[2]      Grandsaignes d'Hauterive, R. (1947) *Dictionnaire d'Ancien Français: Moyen Age et Renaissance.* Paris: Librairie Larousse.
[3]      Niceron. J.F. (2017). *Jean-François Niceron's Curious Perspective.* Tran. J.L. Hunt, D. Raynaud, J. Sharp. Ed. S. Hunt. ACRM, Tempe AZ. To appear.
[4]      Hunt, J.L. (2006). "J.F. Niceron's *La Perspective Curieuse Revisited*", *Bridges London: Mathematics,   Music, Art, Architecture, Culture.* International Conference (London, August 4-9, 2006): 459-464. http://archive.bridgesmathart.org/2006/bridges2006-459.pdf.