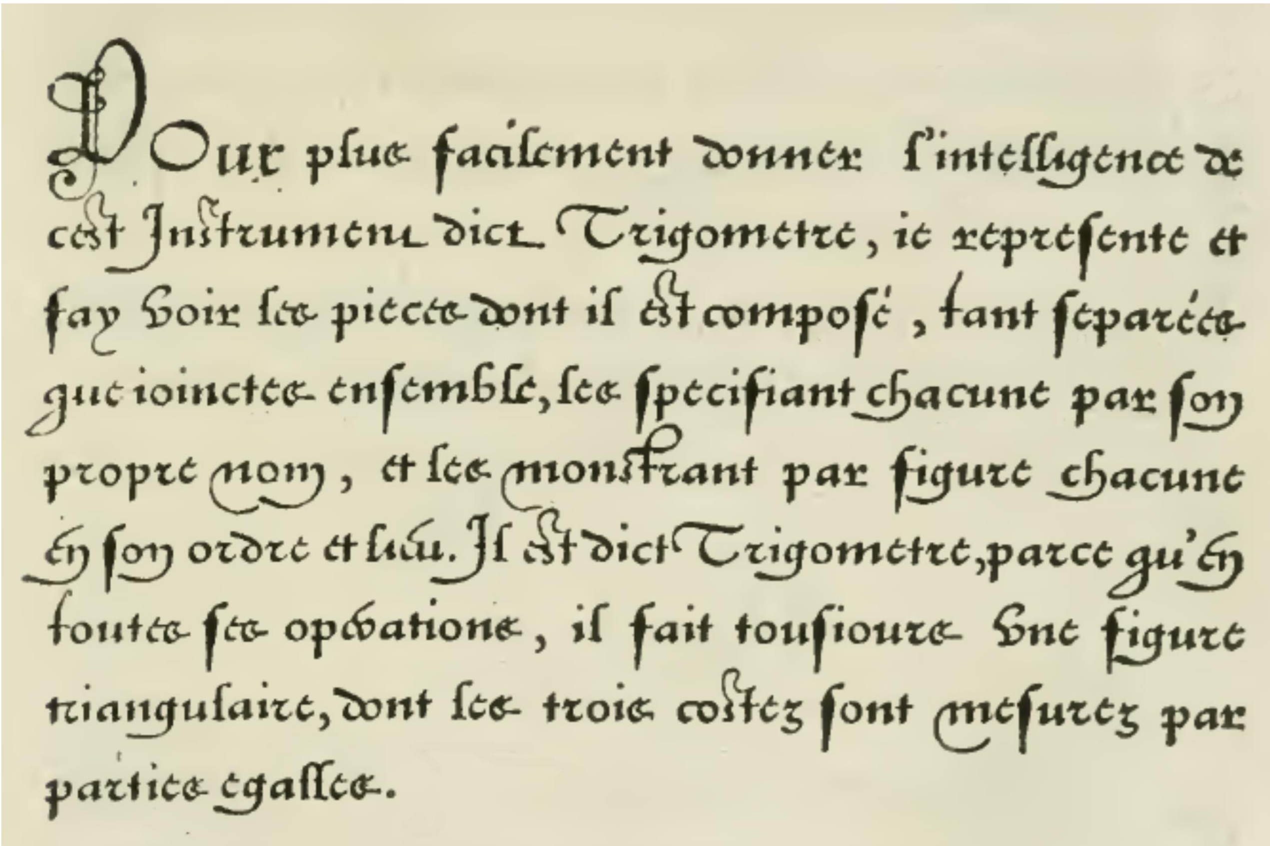
THE PRINCIPLE OF THE TRIGONOMETER

MEASURING


Pour plus facilement donner l'intelligence de cest Instrument dict Trigometre, ie represente et fay voir les pieces dont il est composé, tant separees que ioinctes ensemble, les specifiant chacune par son propre nom, et les monstrant par figure chacune en son ordre et lieu. Il est dict Trigometre, parce qu'en toutes ses opérations, il fait tousiours une figure triangulaire, dont les trois costez sont mesurez par parties egalles.

To more easily give an understanding of this instrument called the Trigonometer, I represent and illustrate the parts of which it is composed, both separate and conjoined, specifying each with its own name, illustrating them, in their turn and place, with a diagram. It is called a Trigonometer because, in all its operations, it always keeps a triangular shape, whose three sides are measured out in equal parts.

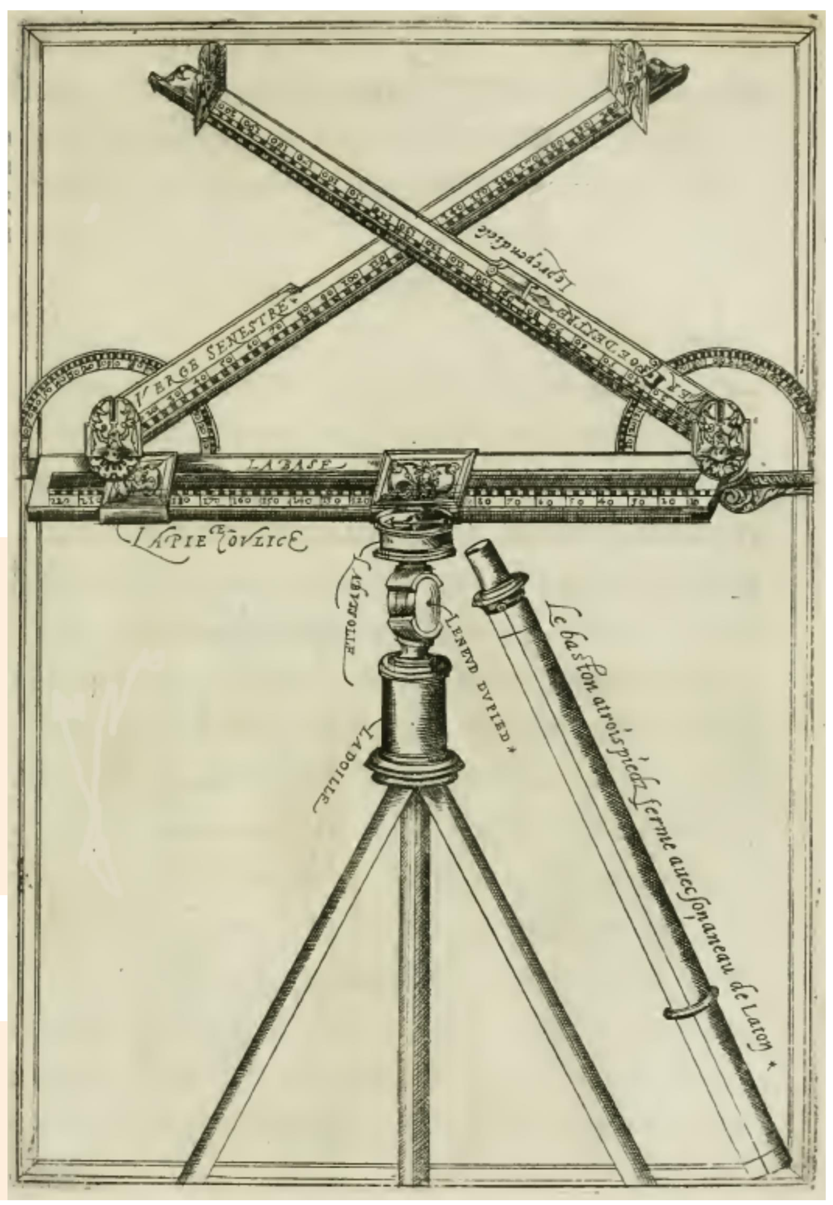
Illustrations taken from the **Treatise On The Use Of The Trigonometer**, *newly invented and brought to light by* ***PHILIPPE DANFRIE***.

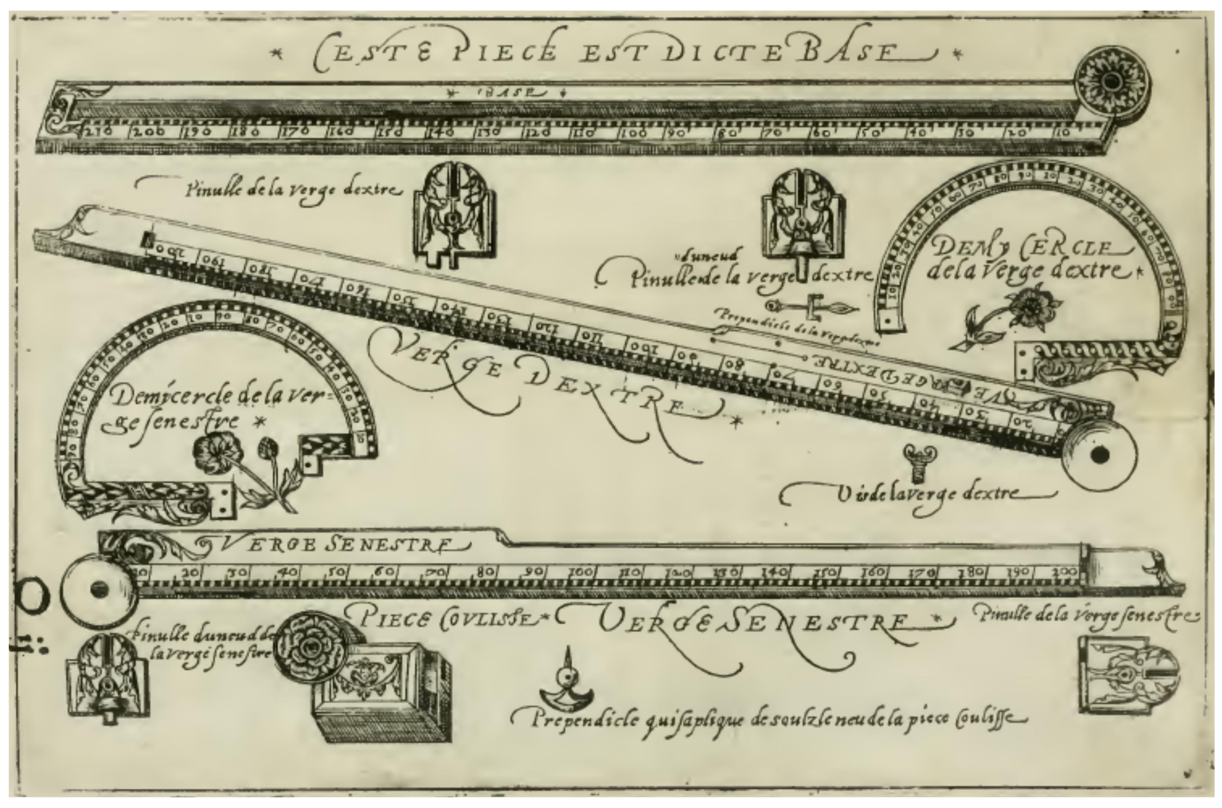
DANFRIE Philippe (1532-1606)

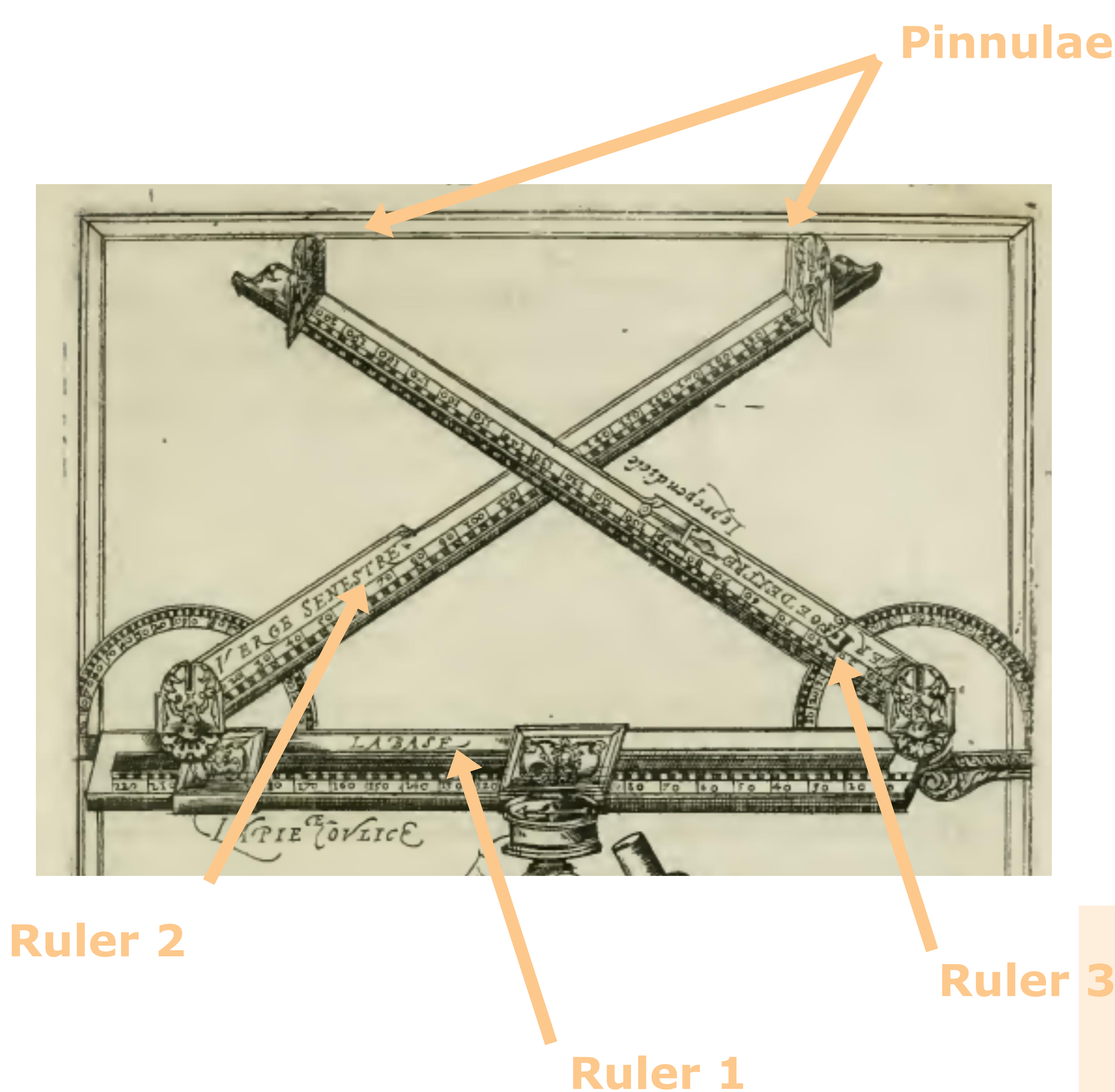
Made his debut as a printer and then as bookseller in Paris.

Was then by turns engraver, printer, maker of type, gunner-ordinary to the King, engraver of mathematics and engraver of coats of arms.

In 1582 he became Engraver-General of the French mint and an inventor of mathematical instruments, including the graphometer, for which he published the Statement Of Use in 1597.





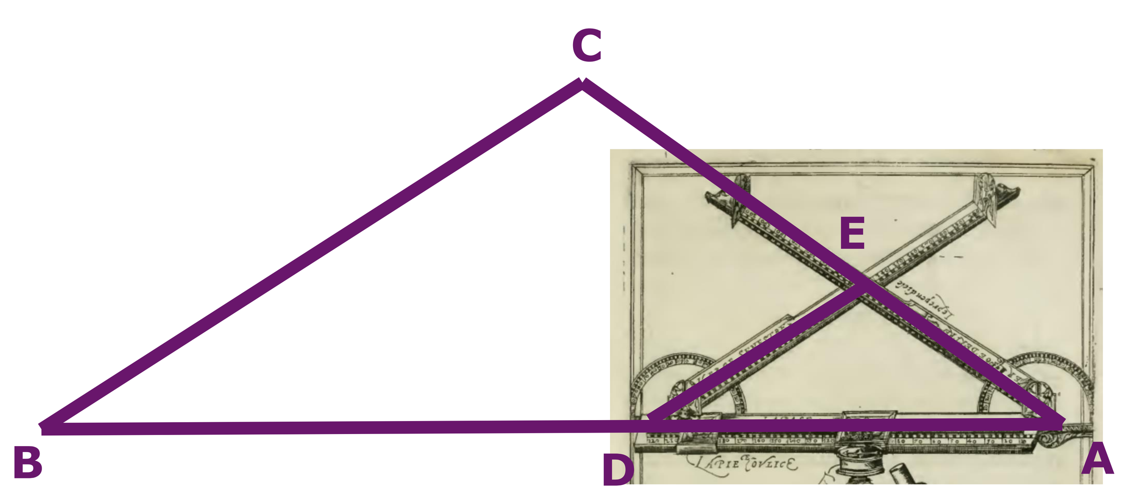


The trigonometer consists of a foot and three graduated rulers. The first ruler is fixed at the foot. The second slides and pivots on the first ruler. The last ruler only rotates. Aiming is done with the sights fixed to the rulers.

The use of the trigonometer requires knowledge of some length AB, on the ground.

We wish to find the distance from A to C.

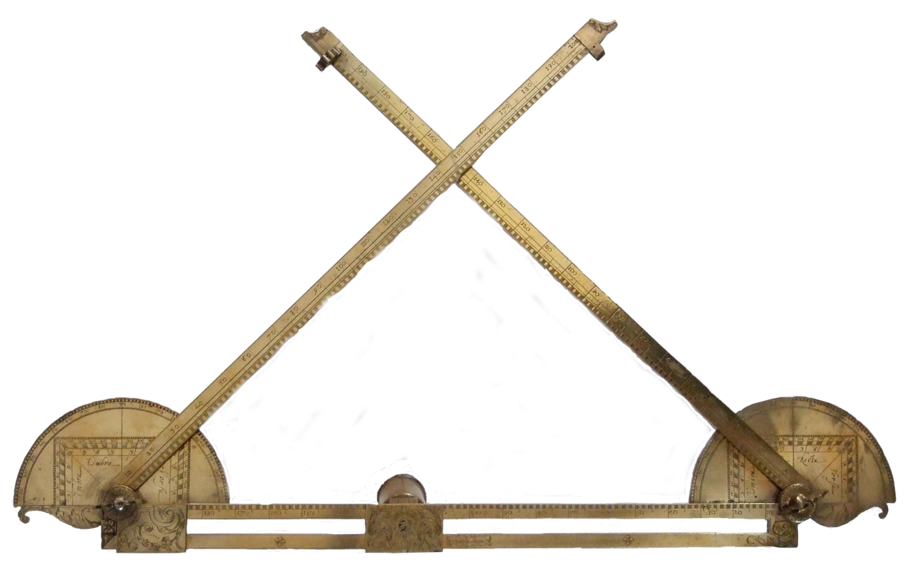
The observer places themselves at A with the trigonometer, aims at point C with ruler 3 and then locks it to prevent it rotating. He then moves to B, aims at point C with ruler 2 and locks it to prevent it rotating. He then slides ruler 2 (the sliding part) so that rulers 2 and 3 intersect on a graduation.



The straight lines (BC) and (DE) being parallel, the triangles (ABC) and (ADE) are similar and we have:

$$\frac{AD}{AB} = \frac{AE}{AC}$$

We deduce thus **AC** from this.



The trigonometer of Danfrie
Marseille Observatory

IREM Aix-Marseille
http://www.irem.univ-mrs.fr/expo2013