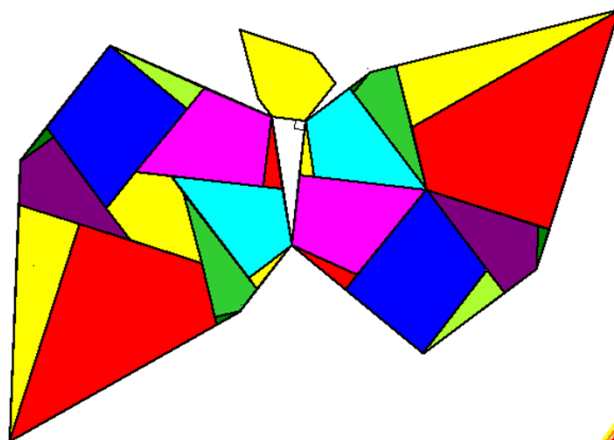


CIEAEM65

in honour of Emma Castelnuovo



Torino, Italy 22 - 26 July 2013

Mario Barra

Univ. Di Roma “La Sapienza”

- **I would like to thank the members of the Committee of CIEAEM for inviting me to talk about Emma Castelnuovo.**
- **I especially thank my friend Luciana Bazzini, that is a very good researcher and an exceptional organizer.**
- **Finally, I must tell you, with much regret, that my English is really very poor, as you have already understood. I sincerely beg your pardon.**

- **With Emma I have held 13 expositions of mathematics: 7 in Italy and 6 abroad, in:**

Roma - Scuola Tasso 1974,

1976: University of Roma, Bologna - UMI,

CIDI: Bari, Genova, Milano,

Roma: Accademia dei Lincei 1979,

1974: Bruxelles, Lausanne,

1976: Karlsruhe – ICME,

1976: Louvain - CIEAEM,

1977: Limoges - APM,

1980: Barcellona

**About this subject, I wrote with Emma
a book translated into French**



and some papers, for example:

Barra M., 1975, The Cycloid - A didactic Experience - A new proof,
Educational Studies in Mathematics, n. 6, pp. 93-98.

**The title
of my lecture is:**

**Revolutionary aspects and actuality
of the teaching of
Emma Castelnuovo,
"digital translations" with a DGS
(dynamic geometry software)
of her didactic materials,
and possible developments
in high school and university**

barra@mat.uniroma1.it

**I start
with a little
history of teaching**

A very ancient teaching



An ancient teaching



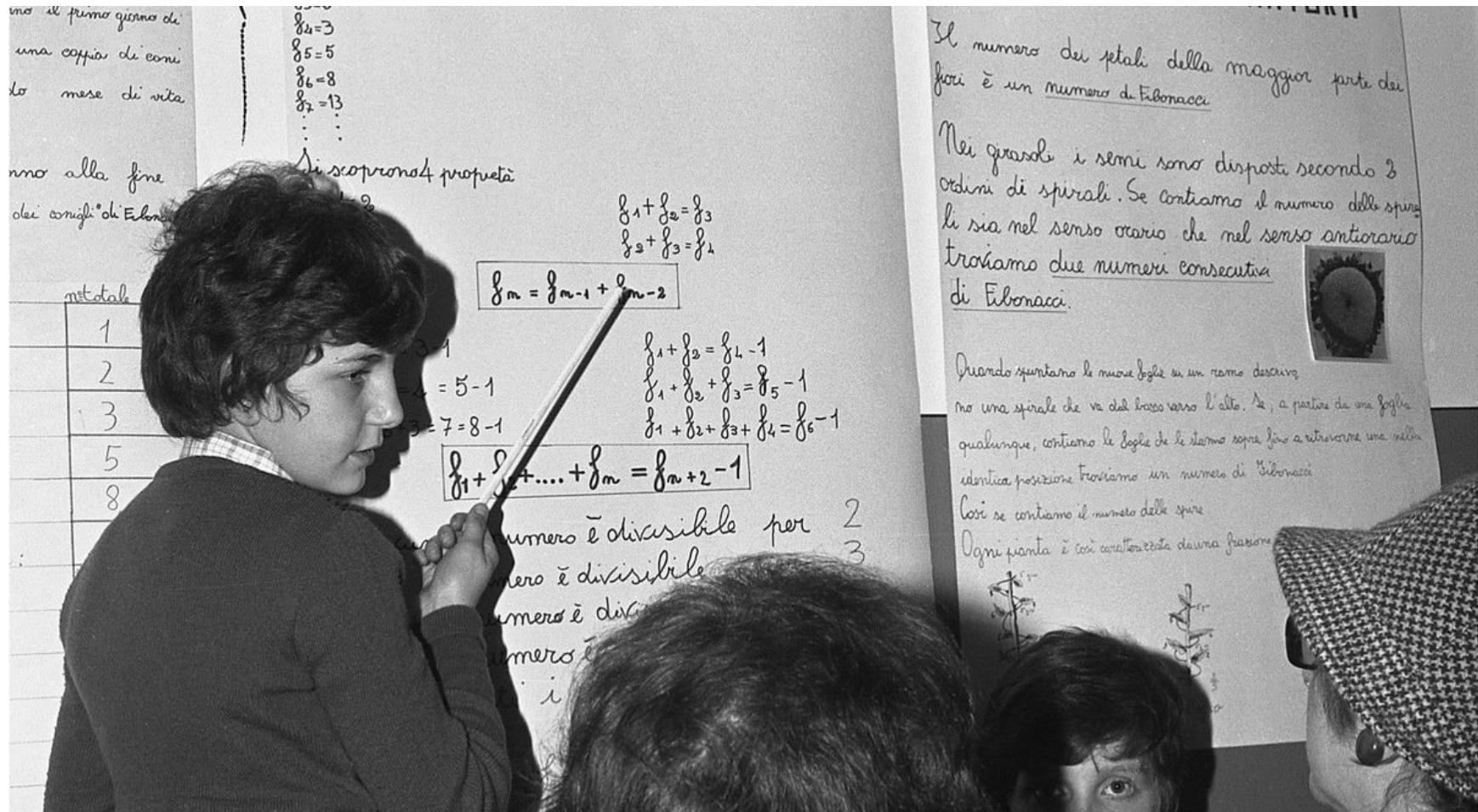
Emma Castelnuovo



**My dear
Emma**



A student of Emma



do you know Pick's theorem?

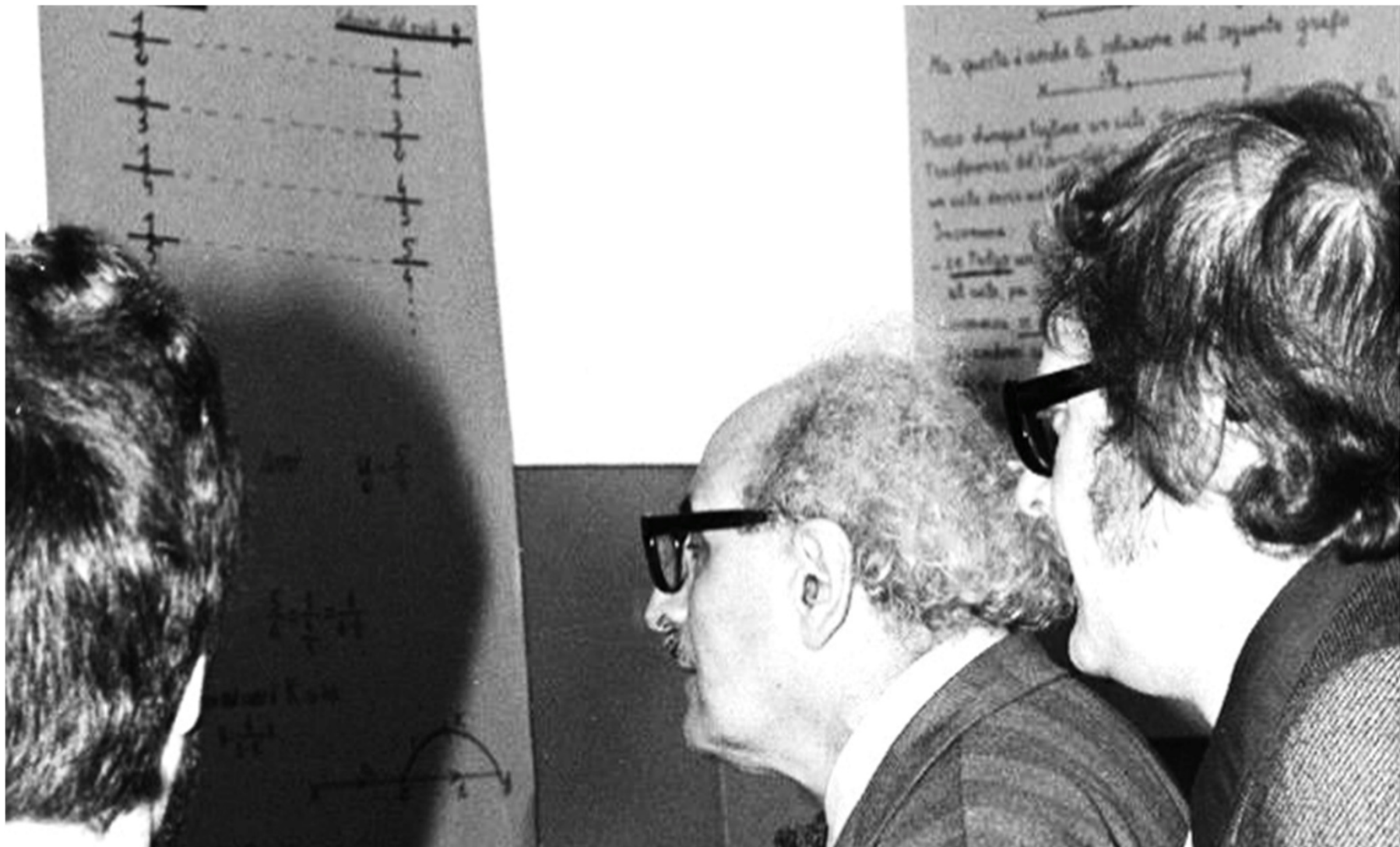


how to understand cartography with didactic materials



Prof. Anna Sofia Krygowska controls

Prof. Hans Freudenthal controls



**Please
a moment of attention:**

**I have a message from
Emma Castelnuovo
directed to all of us:**

Dear friends,
I can not physically be with you, but in many ways ,
I am with you:
- there are my friends, young and old,
- there is our mutual love for students and for teaching,
- there is a tradition of CIEAEM that we have built together.

I'm sure: the CIEAEM meeting will be very interesting,
as usual.

Thank you very much to have associated my name with this meeting,
and thanks for your good wishes for my one hundred years.

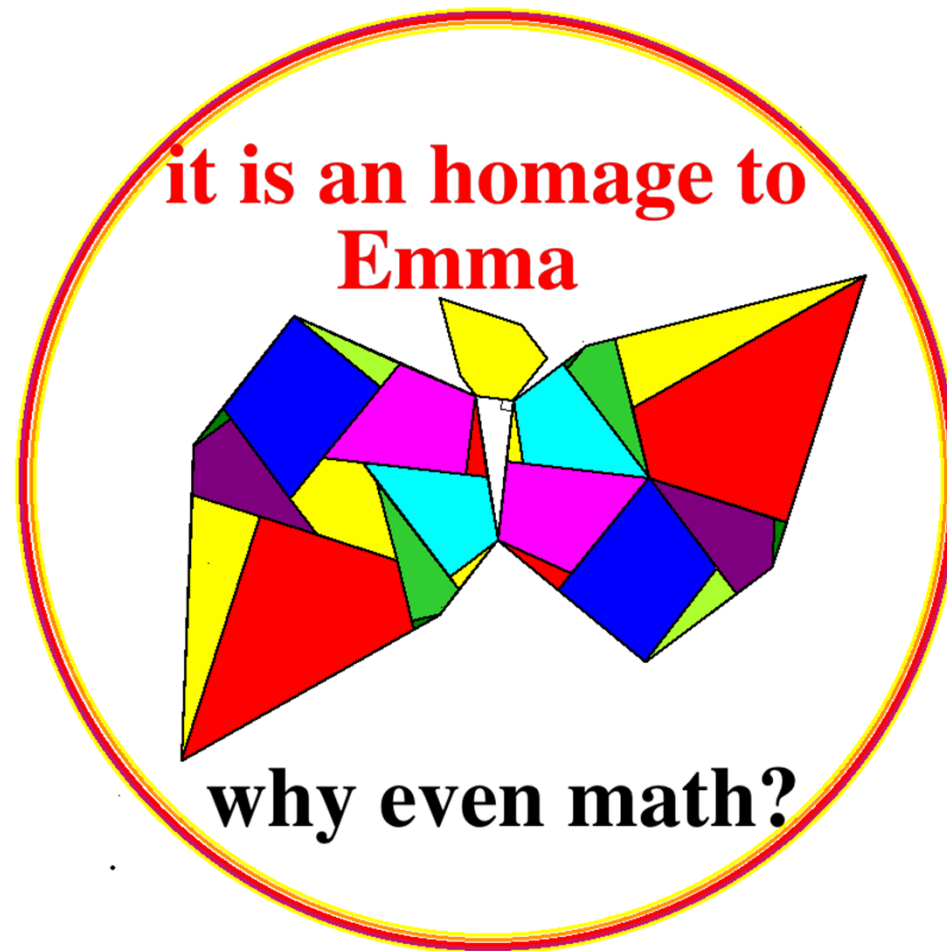
I wish you all good work with sincerity and affection.
We must always remember that there is nothing more important
than improving the future of our students.

Emma Castelnovo

My answer:
how I see

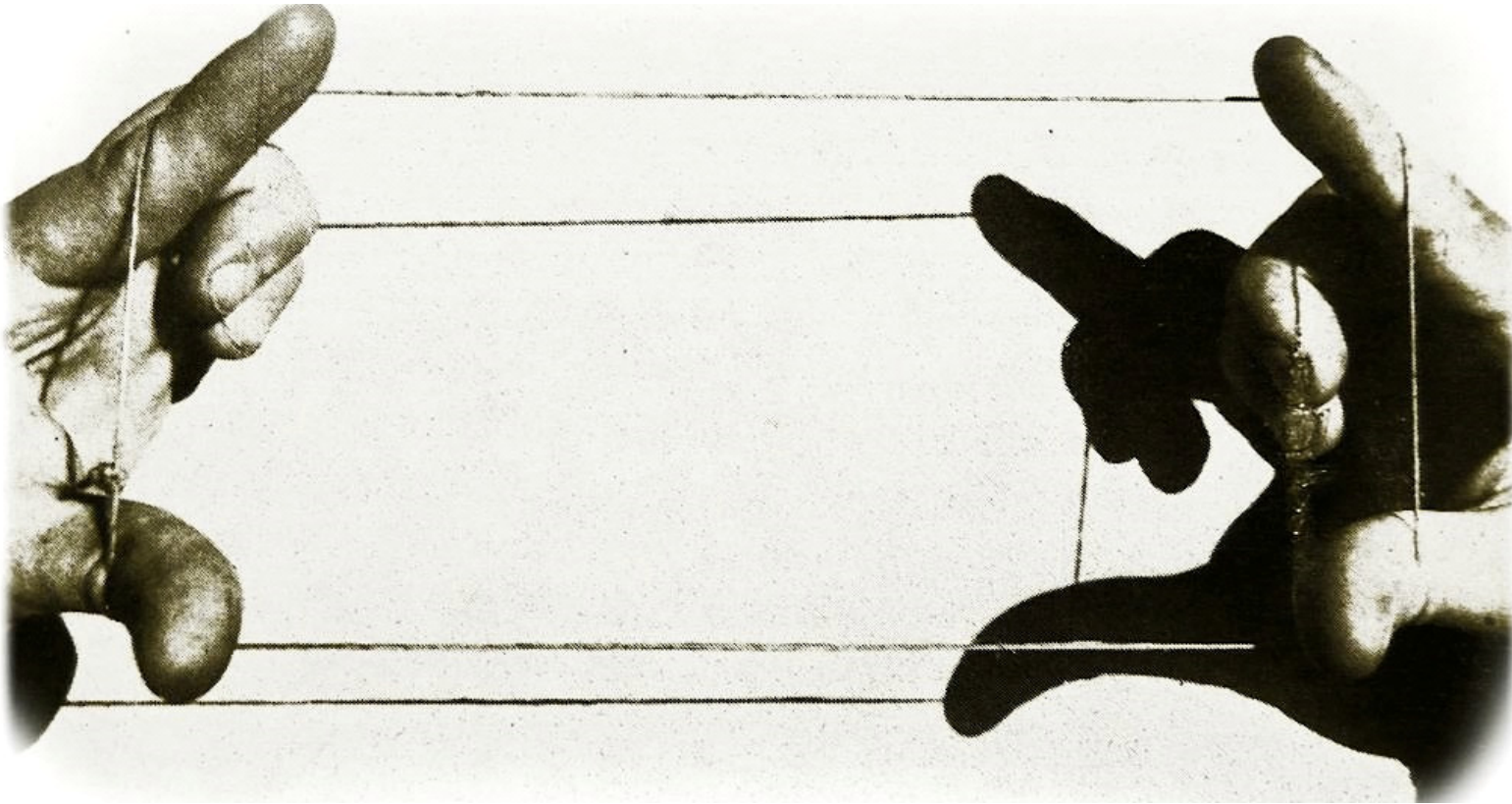
Emma Castelnuovo

**Beauty, colors, “movement”,
lightness,..., mathematics**



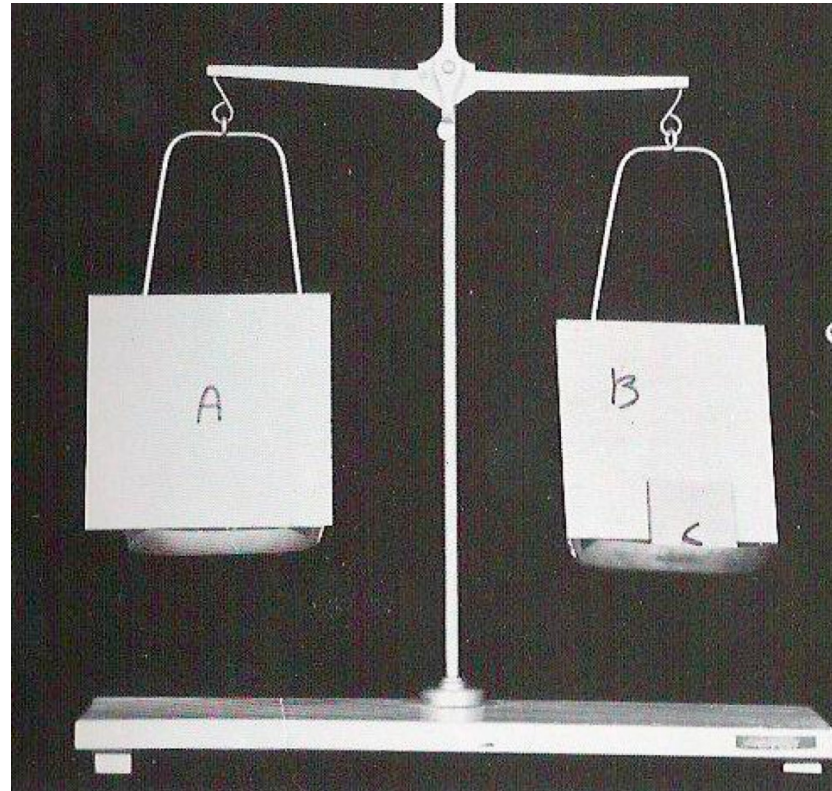
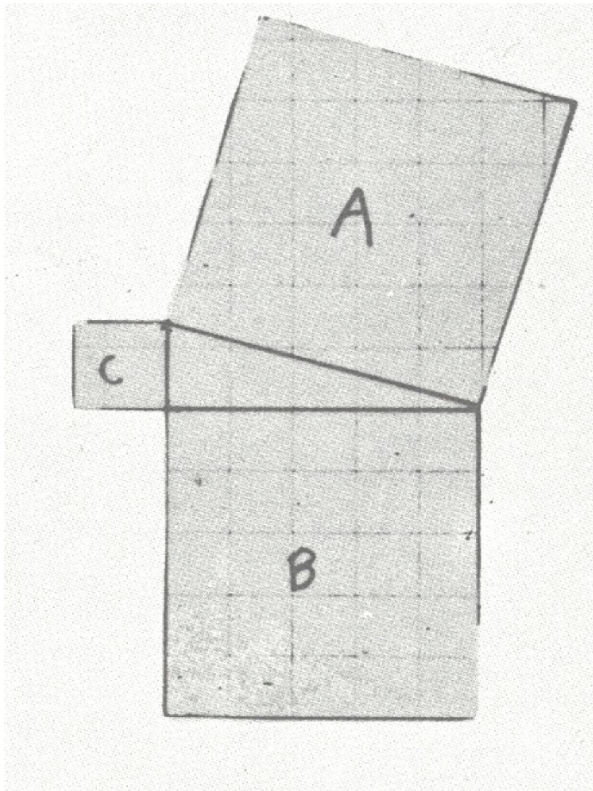
**In my short time,
I will speak only about the
didactic materials,
their interest, applications, limits,
"digital translations",
developments in high school
and in university**

I will speak about:
rectangles with the same perimeter



**simple instruments, but I would
need to show them in movemen**

**different ways to communicate, eg
the properties of Pythagoras theorem**



some classical theorems

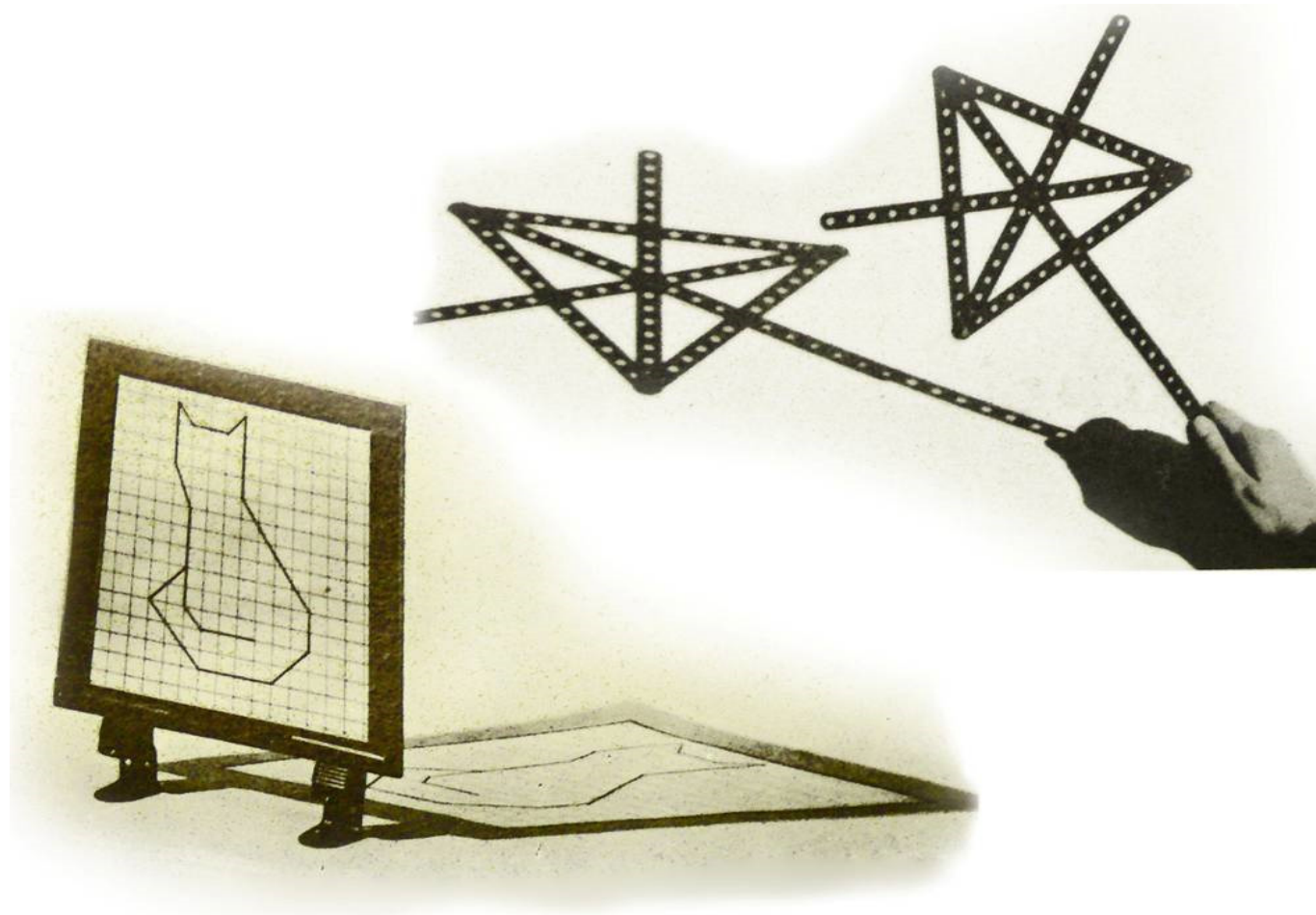
art

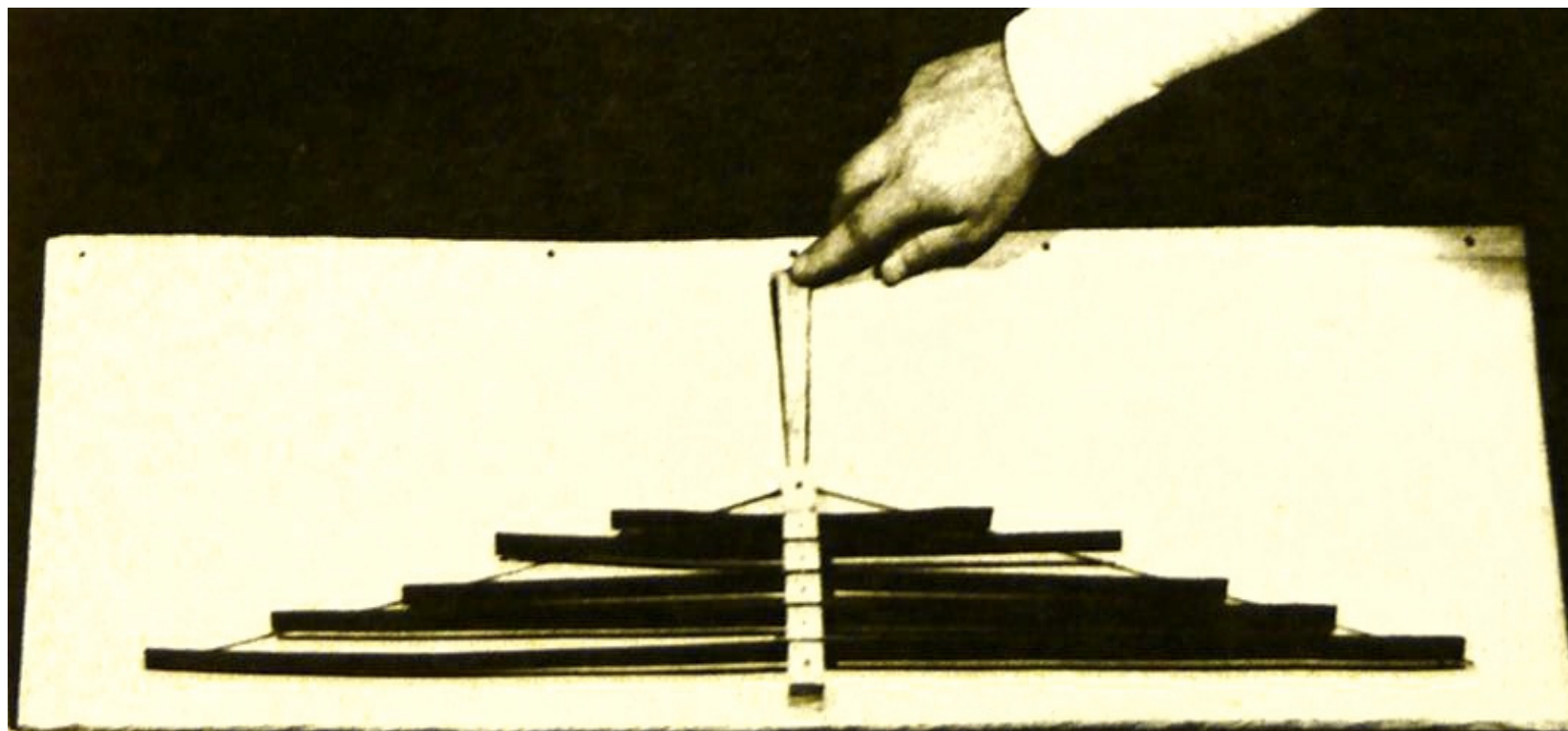
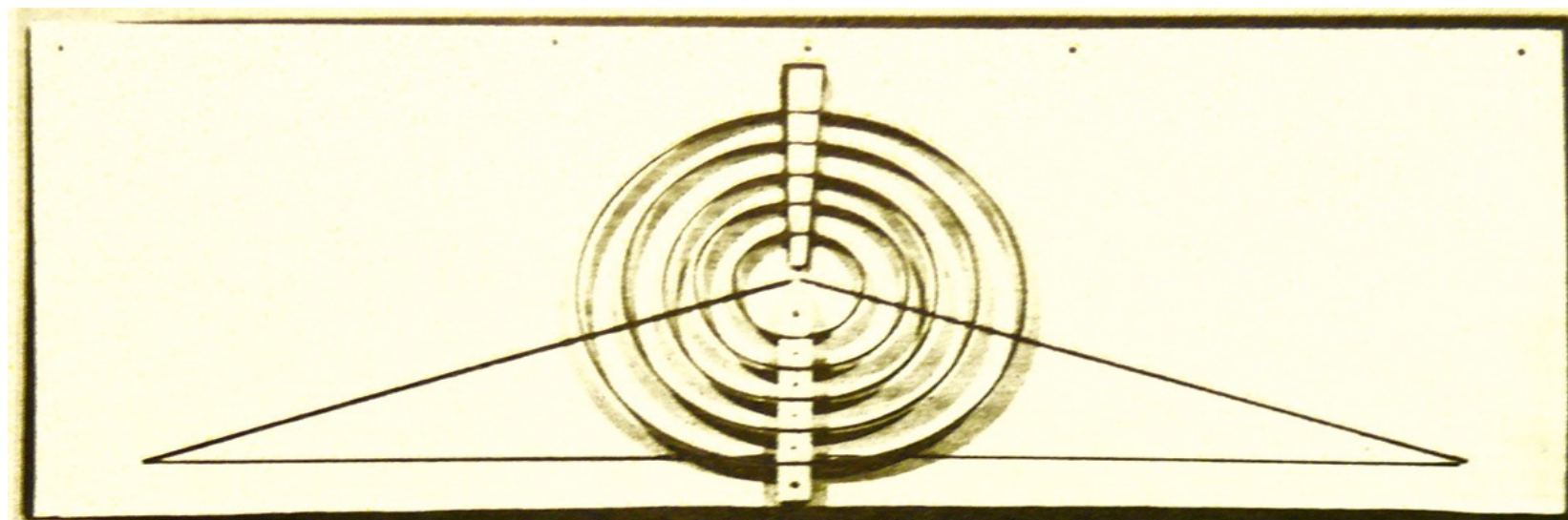


art

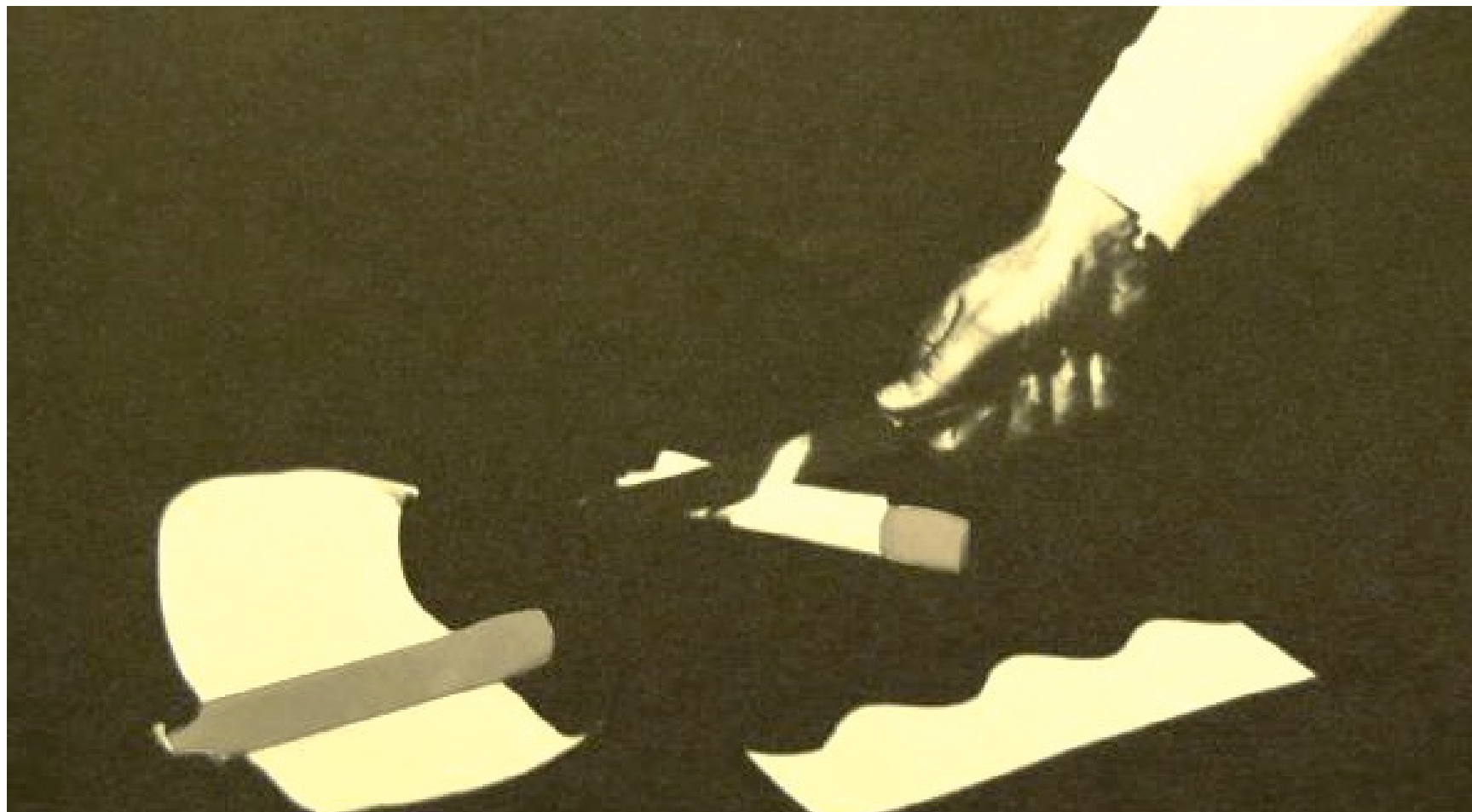


affine transformations

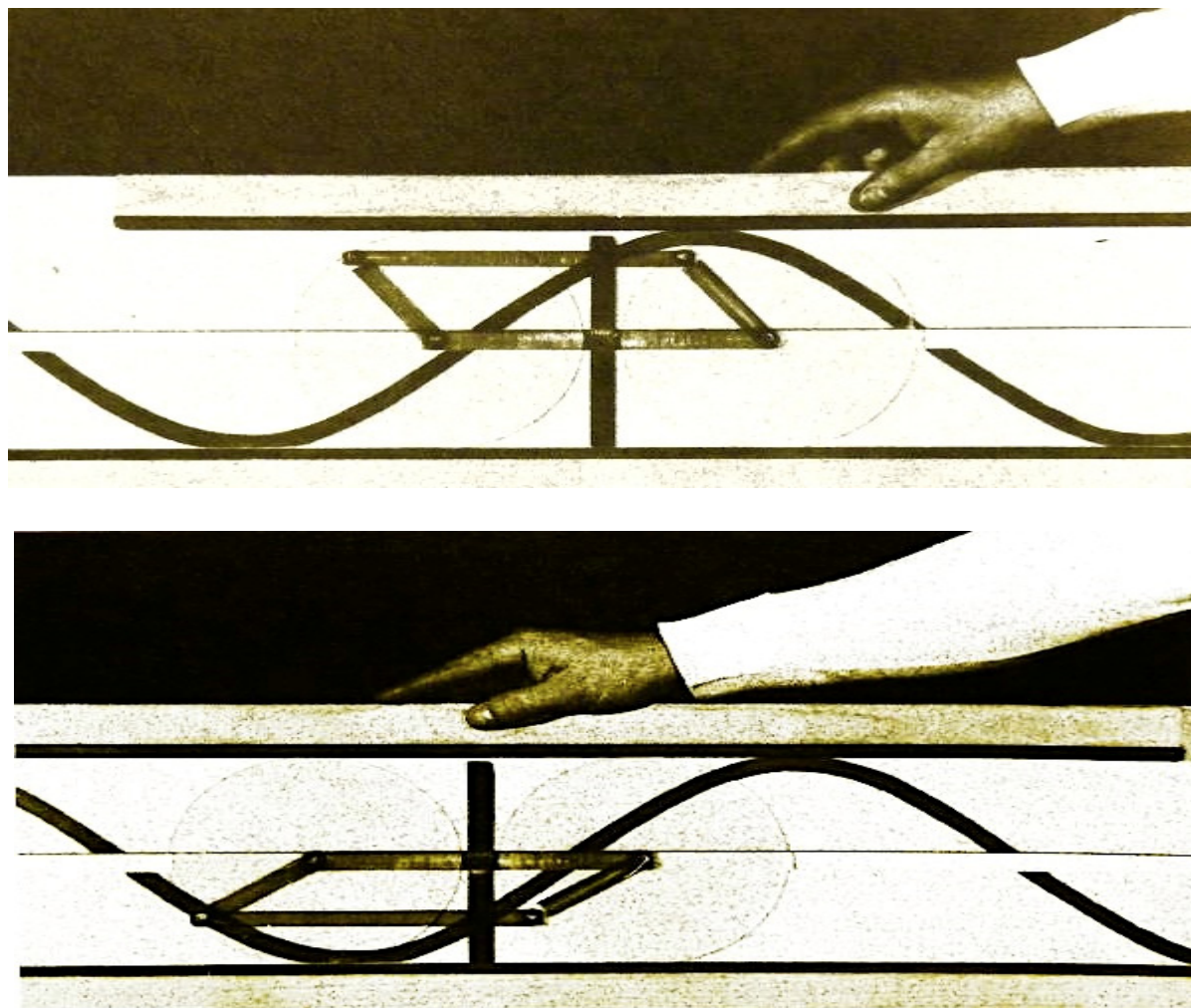




Opening and closing circles and cylinders



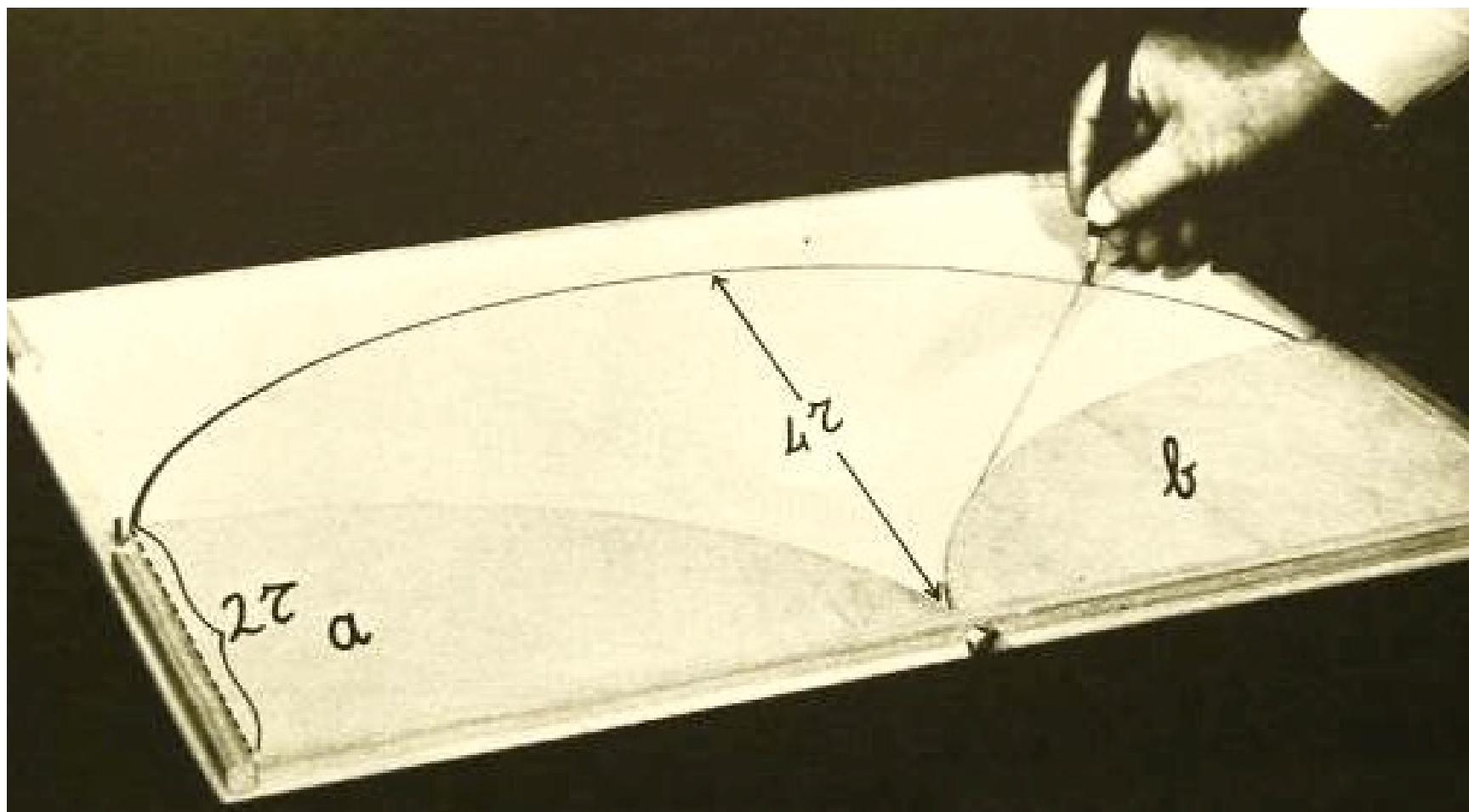
machine to show a sinusoid



Cartography that is a wonderful topic

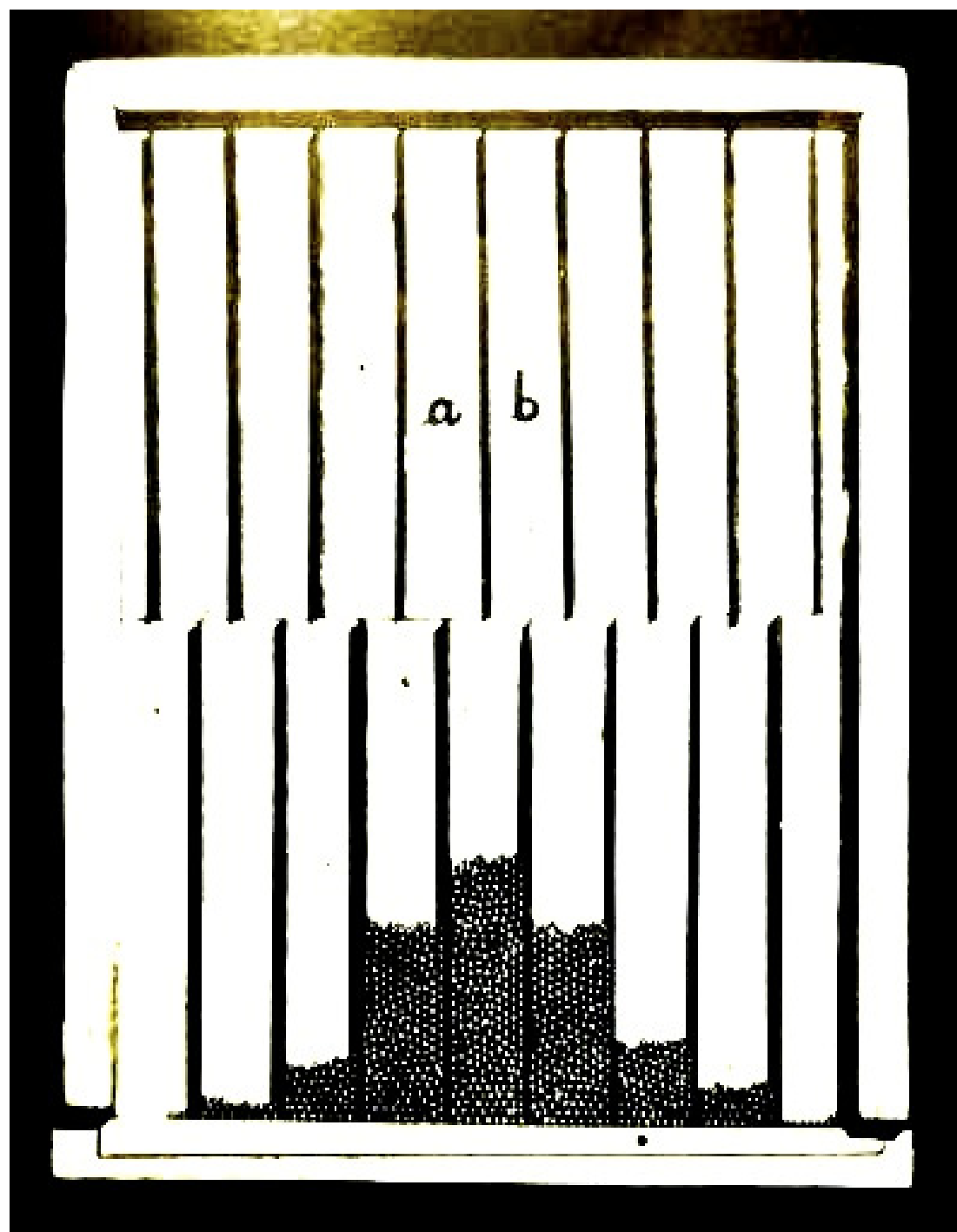


cycloid and other interesting and famous curves: spiral, cardioid, ...



a way to draw these curves





“But” it is necessary to make some considerations:

- most of the materials are dynamic and I would need some movies to show them**
- the materials need space**
- the material can be broken**
- it is difficult to reproduce**
- ...**

So maybe it's better to speak about the materials by using a DGS (dynamic geometry software)

some examples:
(look at the attached file)

**I hope I have shown
with some examples some
of the important elements
of the teaching of Emma
Castelnuovo**

In a short time, and with
a first rough approximation,
**we can characterize the teaching
of Emma Castelnuovo [EC]
in the transition from
a smaller to a greater presence of:**

- deductive teaching
- axiomatic approach
- abstract background
- static teaching
- descriptive teaching
- routine
- repetition
- "more" Arithmetic and Algebra
- many calculations
- words
- "ugliness" and lack of color
- boring subjects
- unclear aims
- topics little related
- infinitesimal calculus
- *perfection that is illusory*
- coldness

inductive teaching
 "natural" approach
 concrete background
 dynamic teaching
 constructive teaching
 reasoning
 participation, discovery
 "more" Geometry
 few calculations
 drawings, materials [no one like EC]
 beauty and colours
 interesting topics
 important applications
 connections between the topics
 infinitesimal reasoning
approximation, that is reality
 affection, seduction, empathy

- **The “tradition” starts from mathematics, trying to teach it well to the student**

- **Emma starts from the student and look for the mathematics that can be useful to him, through an operative, efficient, and convincing teaching, also looking at the needs of society**

- On 12 December 2003, on the occasion of the **ninetieth birthday** of Emma Castelnuevo, the Mayor of Rome, Walter Veltroni, said:
if today I am the Mayor of Rome it is because I have been a student of Emma Castelnuevo.

On 7 March 2009, the **President of the Italian Republic, Giorgio Napolitano**, appointed Emma Castelnuovo

Grand Officer of the Order of Merit of the Italian Republic

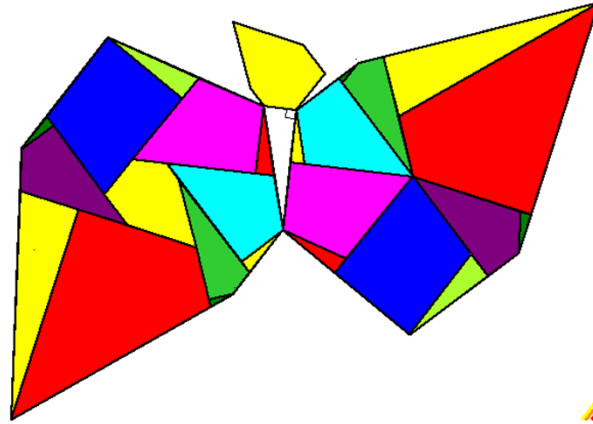
- *For the passion and commitment she put into her work, which allowed her to develop deeply innovative teaching proposals. To have contributed to the comprehension and learning of mathematics, stimulating interest and creativity in students ...*

Math encourages integration in classes with many immigrants, because it represents a unifying universal message



Emma said, touching in her humanity and modernity

**Congratulations on your
Hundredth Birthday
Emma Castelnuevo**



Thank you Emma

THE END