

Mathematics as Practice Questions in Indian History



What comes to your mind when you think of Mathematics ?

What are your thoughts about it ?

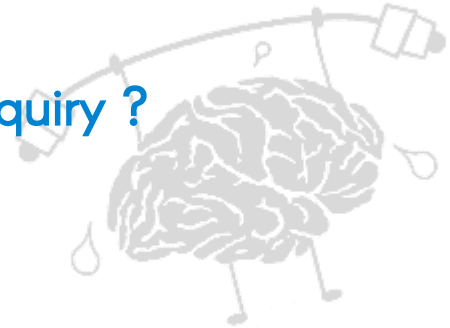
Do we all share similar ideas ?

If so Why ?

What are the process which shape our imagination ?

Shall we turn to history to inform our imagination ?

Can we archive “credible evidence” to help one shared inquiry ?



Written history and Archives



What does historical evidence say about the past of Indian mathematics?

What is a **text** ? – (product of the mind?)

What is **practice** ? – (product of the hand?)

How are they both related?

Our programme is to bring hand and mind together to reconstruct a different history of mathematics

- **Not** any one particular language
(all Indian languages)
- **Not** any one practice
(agrarian, mercantile, bureaucratic, ...)
- **To situate and ground**
Practitioners in time and place
- **Texts as records of practice**



What is an archive of practice ?

Texts are records of practice

- codification by those not directly connected to practice
- Not clear, if manuals at work
- pedagogic devices
- contain a world of computation
- professional virtuosity

Practitioners . . .

- Architect
- Carpenter
- Blacksmith
- Goldsmith
- Sculptor
- Boat maker
- Weaver
- Leather worker
- Accountant
- School teacher

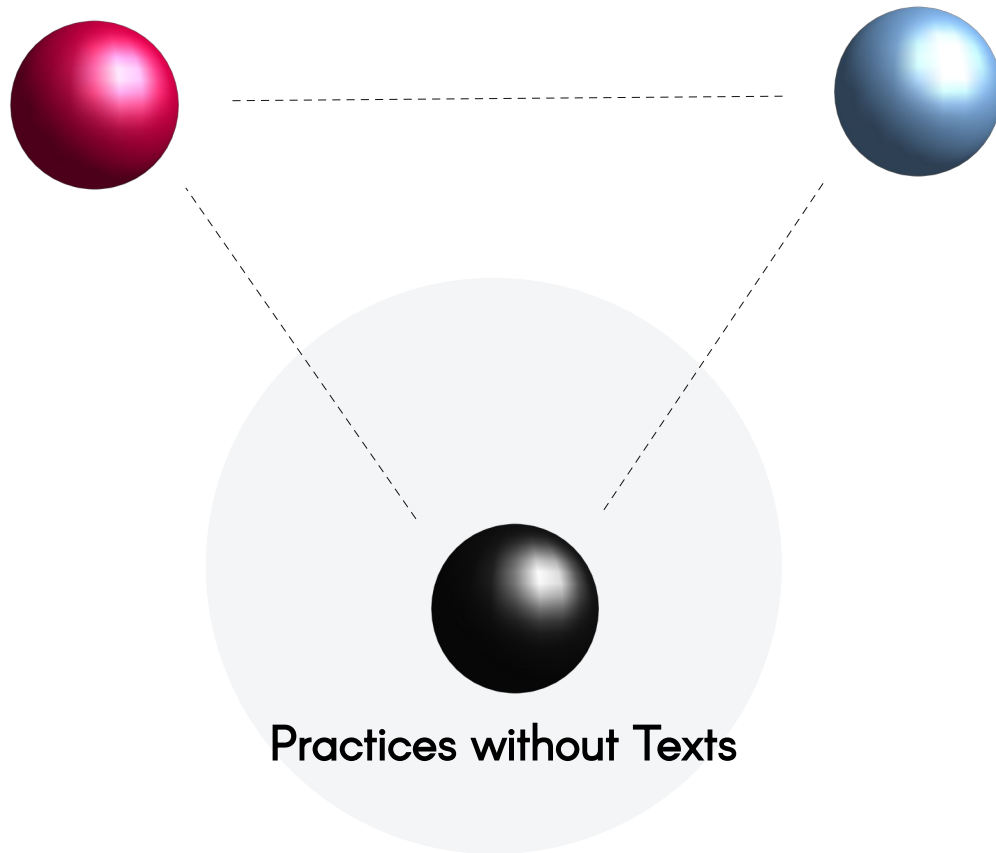
Practices without Texts

- Village blacksmith
- Leather worker
- Tool maker
- Agriculture workers ...
- How to write their history ?
- Which archive will help ?



Text as records of practice

Practitioners

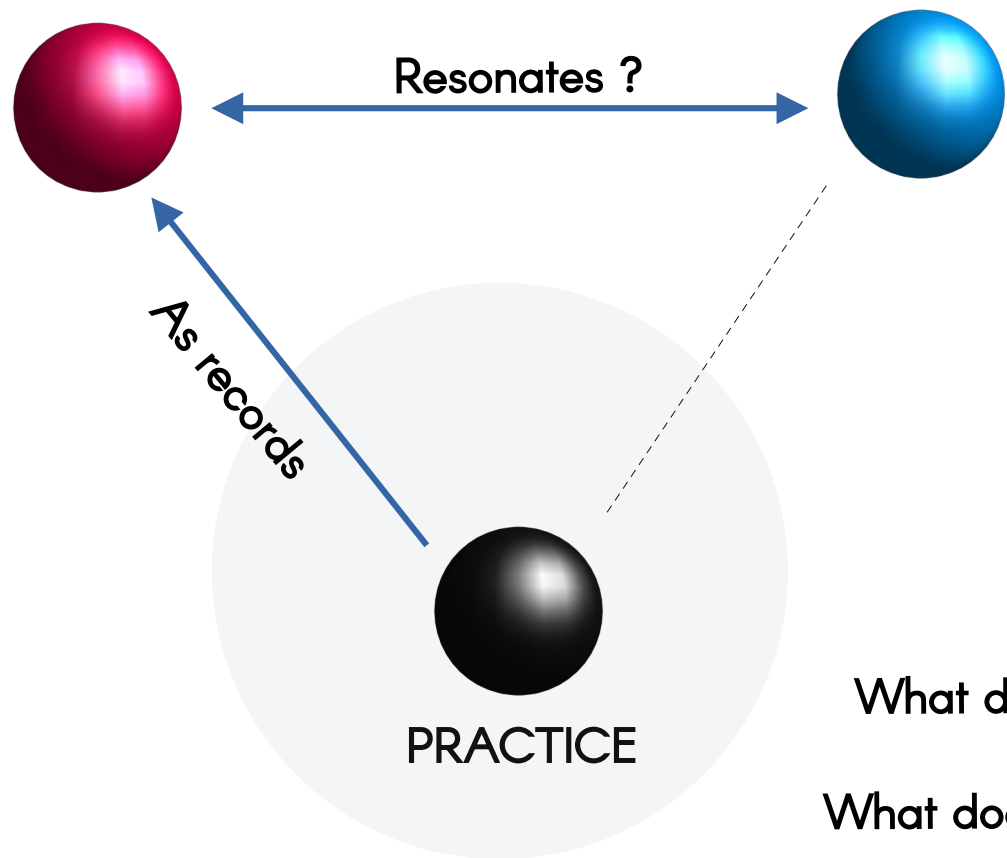


Practices without Texts



TEXT

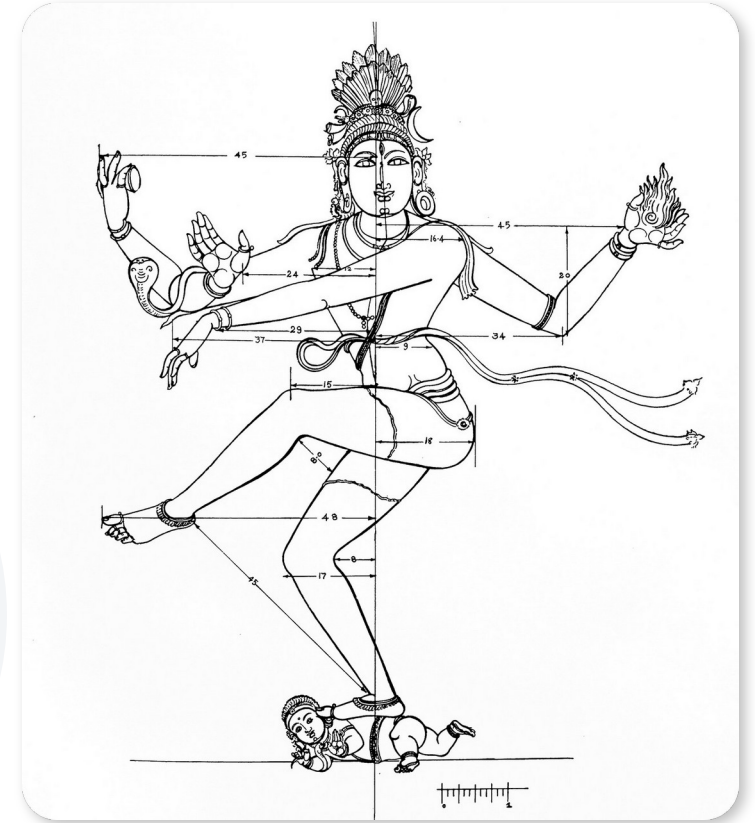
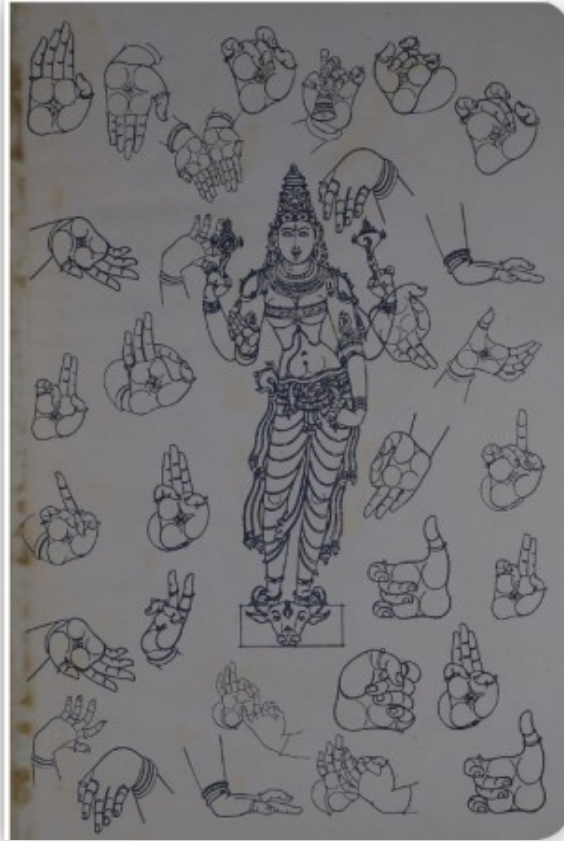
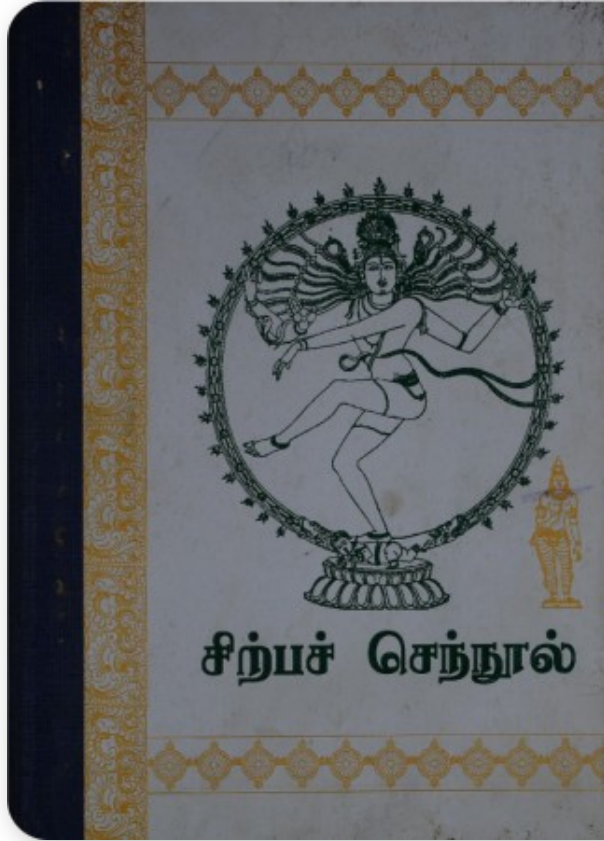
PRACTITIONER



What does the text inform?

What does the text not inform?

Sculpting



cirpacennūl text

Sculpting



cirpacennūl and the practice of sculpting

Boat Building



School Teaching



Encuvati, the tamil number primer
- product of tinnai school

What does the site of
learning look like ?

What did they used for
learning ?

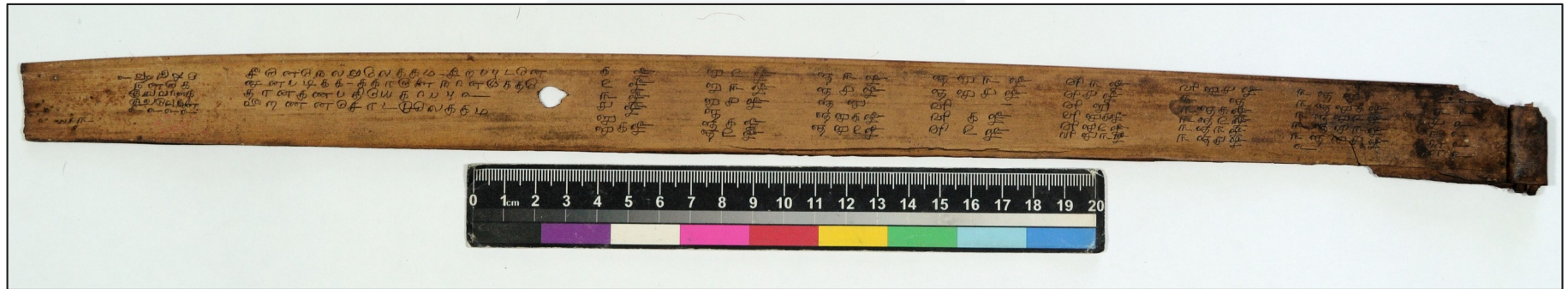


Tinnai school, a site of practice – into the world of computation

Eṇ cuvaṭi



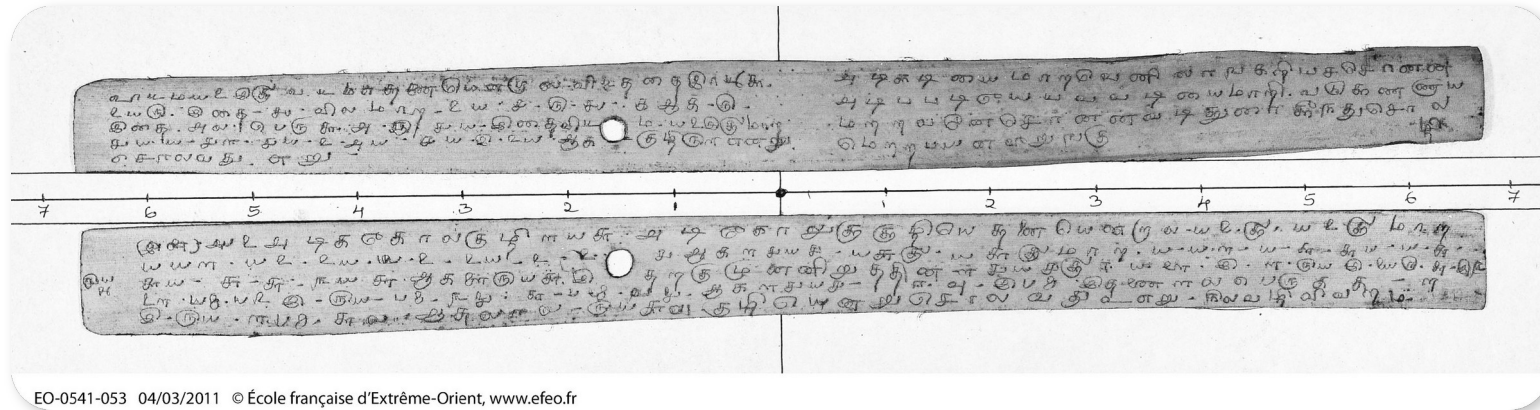
En cuvati



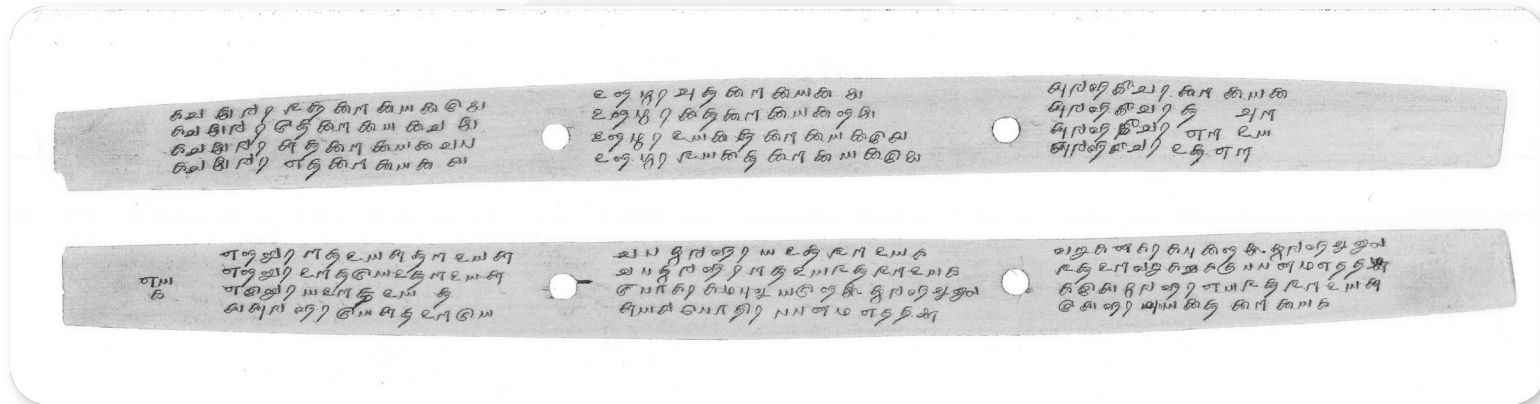
[illegible]

Encuvati in printed form – have been in use till 19th CE

Text for computation in practice

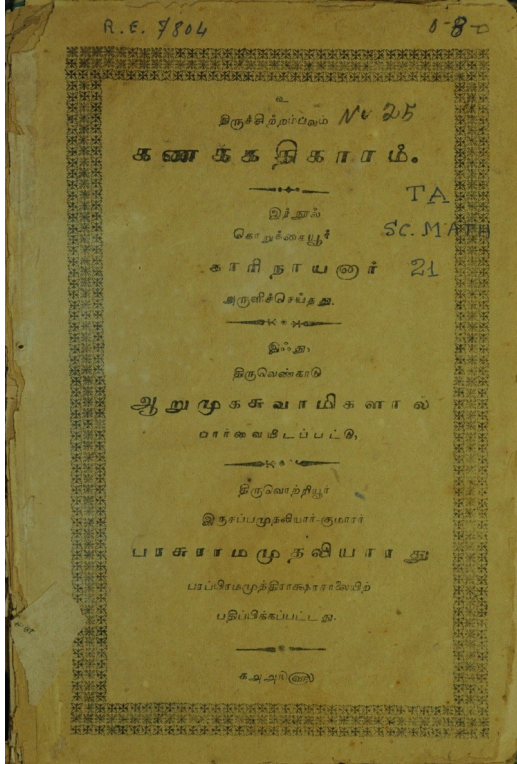


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Kanakkatikaram, a Tamil mathematical treatise 18th CE

Village Revenue Records



Kaṇakkatikāram, kāri nāyanār,
parappirama mutrakshara salai
press, Tiruvorriyur, 1880

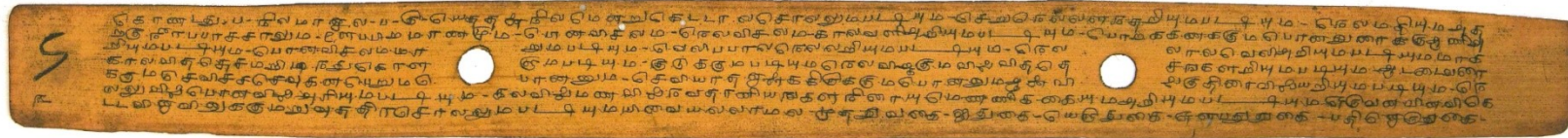


18th Century Revenue Account Manuscript Bundles – of Chengalpet district of Madras
presidency, contains comprehensive information on land, tax, etc.. of the village

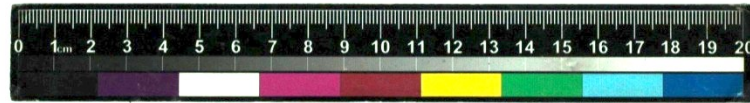
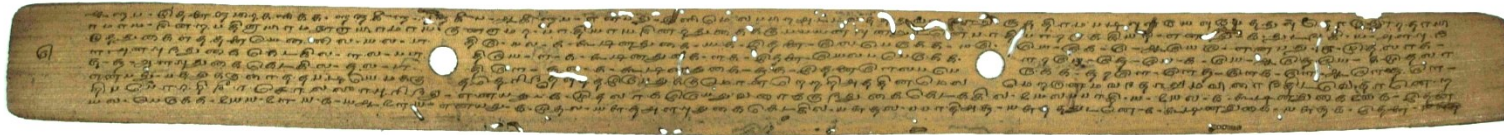
Kaṇakkatikāram

[computation as work]

A Tamil mathematical text from 14th-15th century. Found in different locations across the Tamil speaking region. This text contains 60 sutras of **computational procedures** dealing with land, grain, wages, taxation, irrigation and a huge collection of mathematical problems.

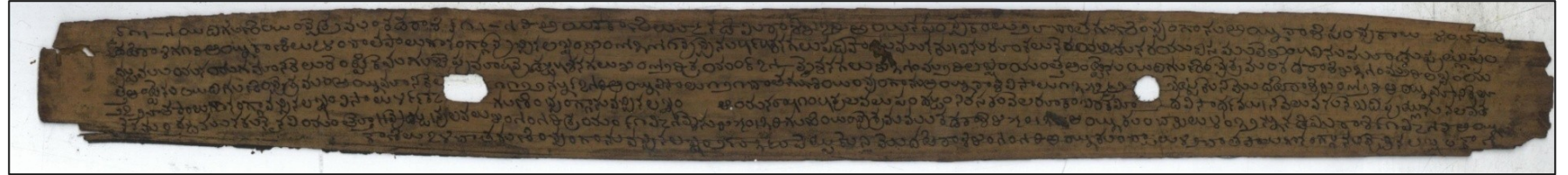
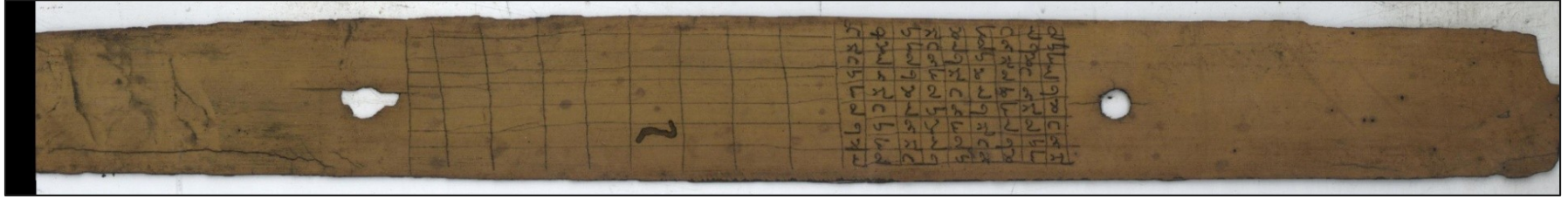


UVS Library, Tiruvanmiyur, Chennai



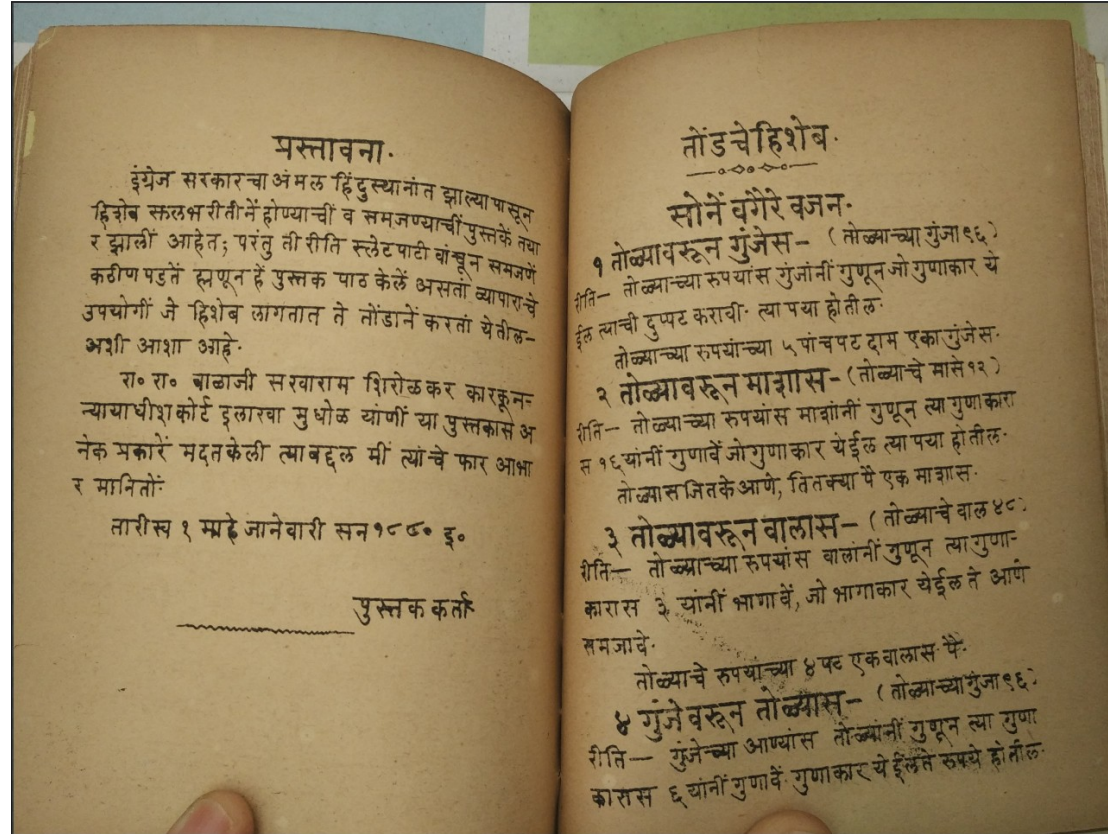
Santhalinga Adigalar Tamil college library, Perur, Coimbatore

Ganithamu



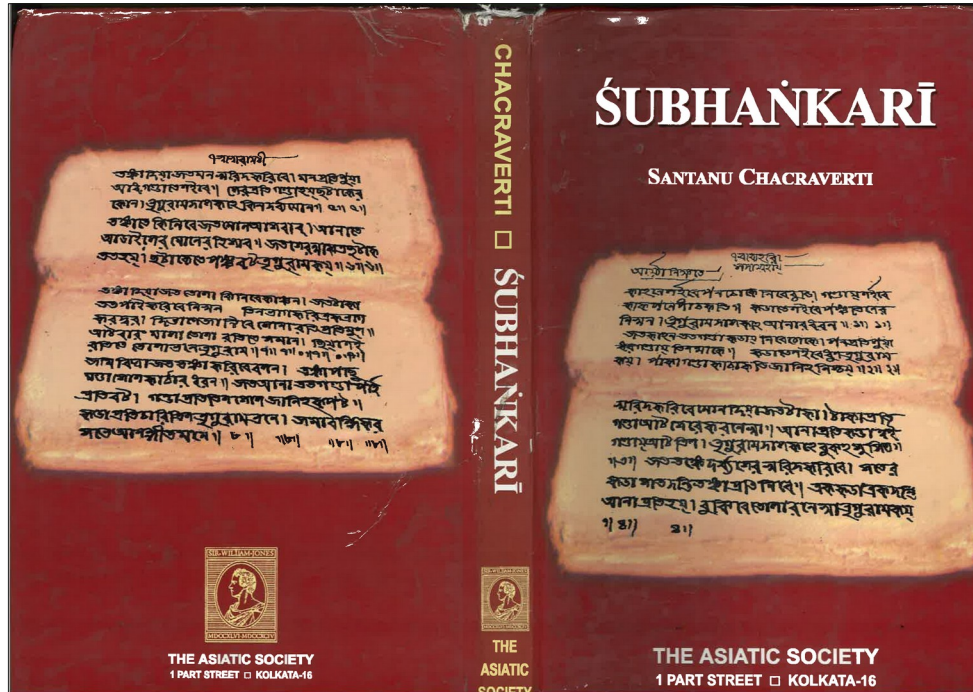
Telugu manuscript - Ganithamu - mathematical treatise similar to Encuvati TEL B 0132 D 2277,
Government Oriental Manuscript Library, Chennai

Mathematical manuals, primers of early 19th century



20180720-110050, Tondche Hished, Marathi number
primer on revenue accounting

Shubankari



Monograph Series No. XLIII

Śubhankarī—An Indigenous Tradition of Elementary
Mathematical Instruction
by Santanu Chacraverti

Published in February 2007

Published by
Professor Ramakanta Chakrabarty
General Secretary
The Asiatic Society
1 Park Street
Kolkata 700 016

Printed at
M/s. New Asian Printers
29/7 Phears Lane
Kolkata 700 073

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\$ 33

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A bengali record of computational practice in school and at work

Pedagogic records of learning arithmetic in Tamil Madrasas



Mahalra Arabic College, Kayalpattinam

Pedagogic records of Tamil Madrasas

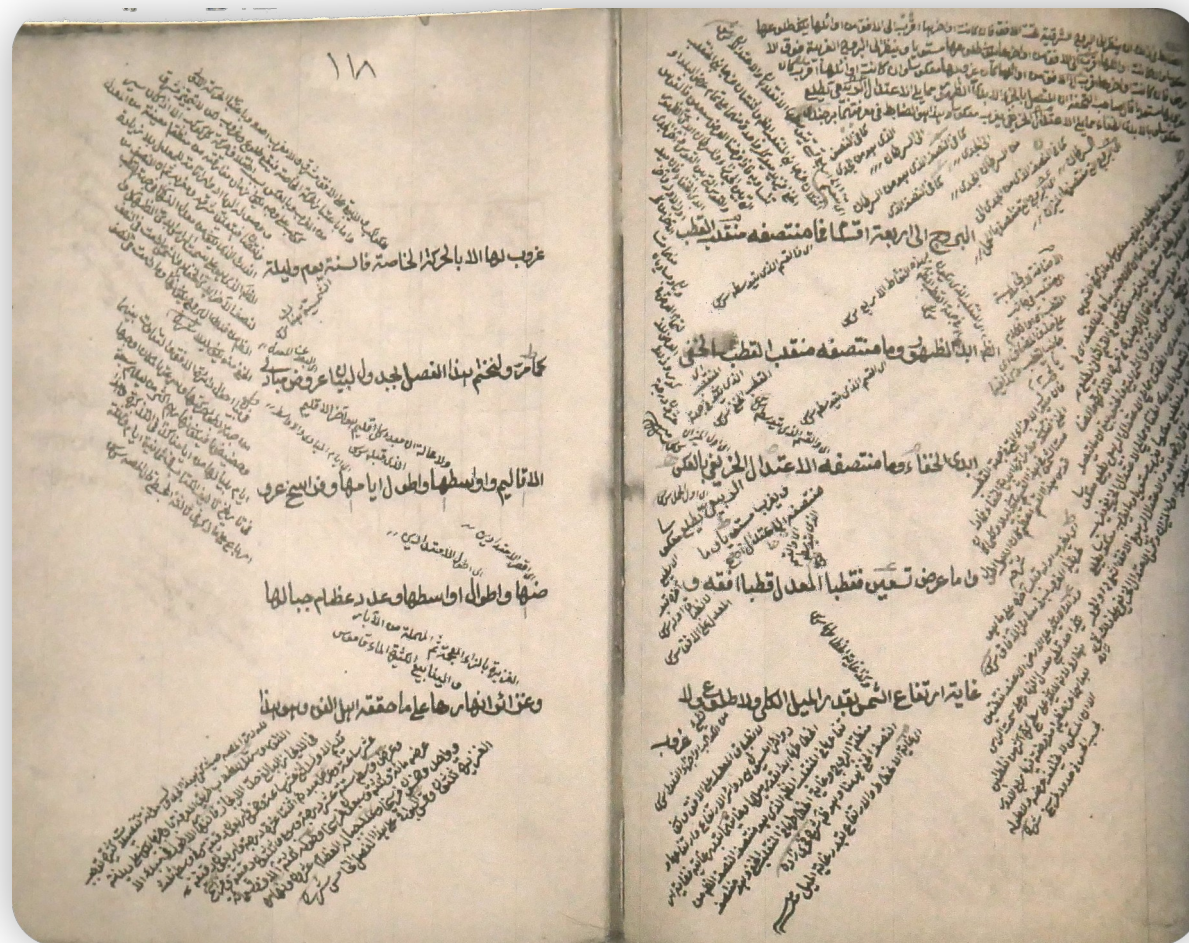


*Vellore, Madrasa Al-Baqiyat-us-Salihah,
Mother Madrasa of TamilNadu*



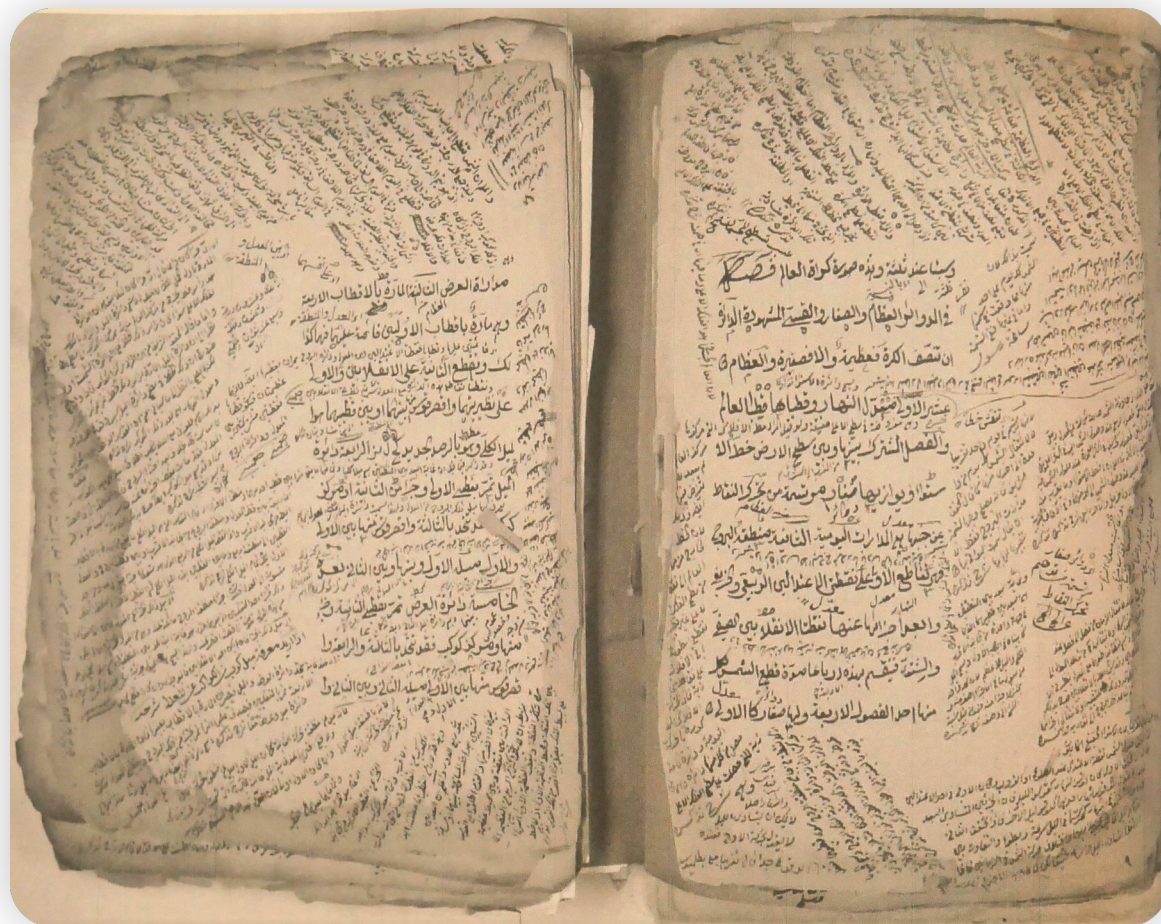
*Lalpettai, Al-Unwar, famous for
scholar Ammani Hazrath*

Mathematics Primer



Khulasat-Al-Hisab, with Teacher and Student notes

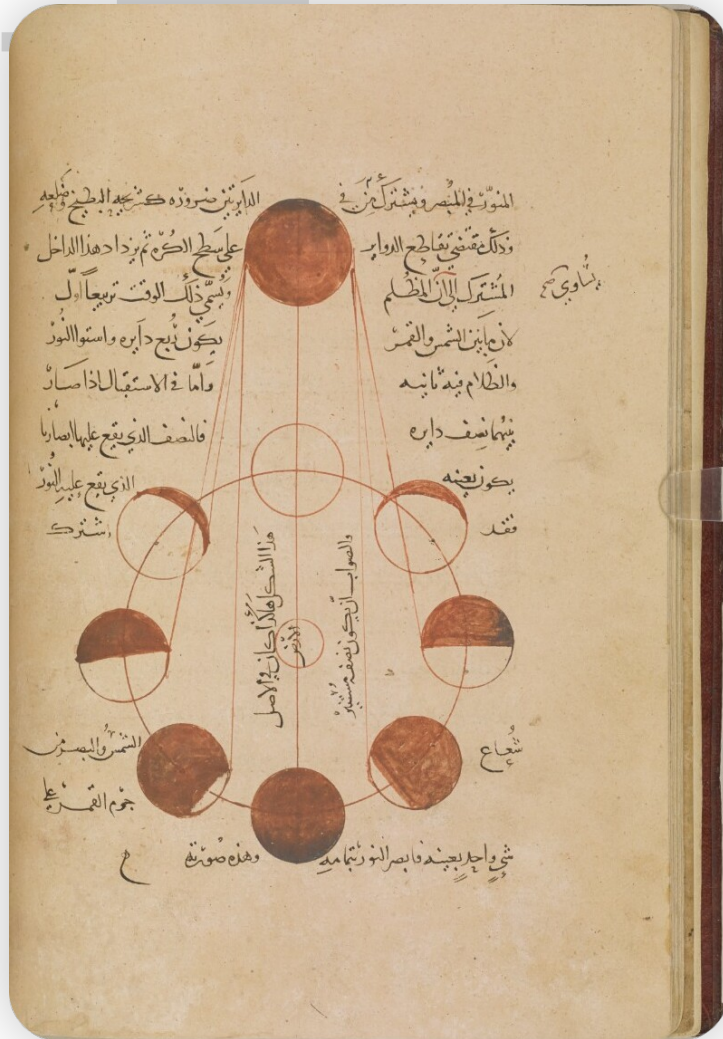
Mathematics Primer



Khulasat-Al-Hisab, with Teacher and Student notes

Book of Stars

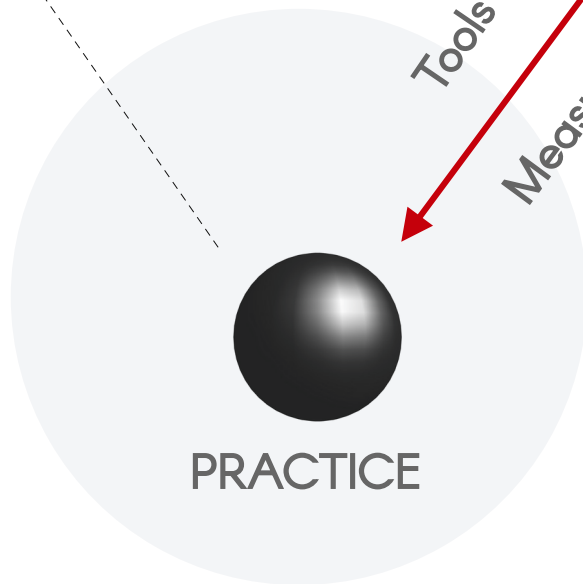
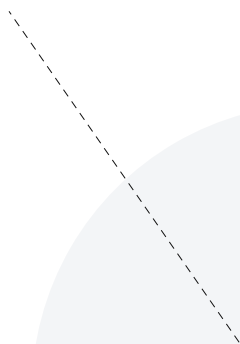
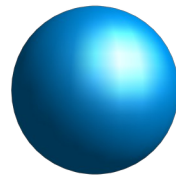
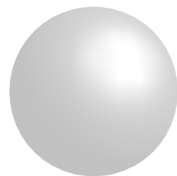
Al-Biruni, Kitab Al-Tafhim li-awail sina'at al-tanjim



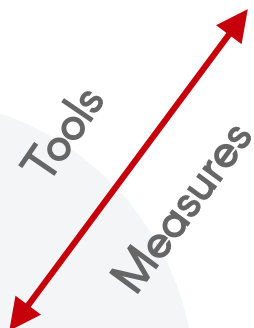


TEXT

PRACTITIONER



PRACTICE



How measuring is central to the
work of practitioners such as the
tool maker?

We have lots of such tools buried in museums

What if we bring them to historical
scrutiny?





Eravatti - Measuring instrument for running water for Irrigation



Koonai – a vessel for measuring water



Padi – for measuring grain (8 padi ≈ 1 Marakkal)



Marakkal – for measuring grain

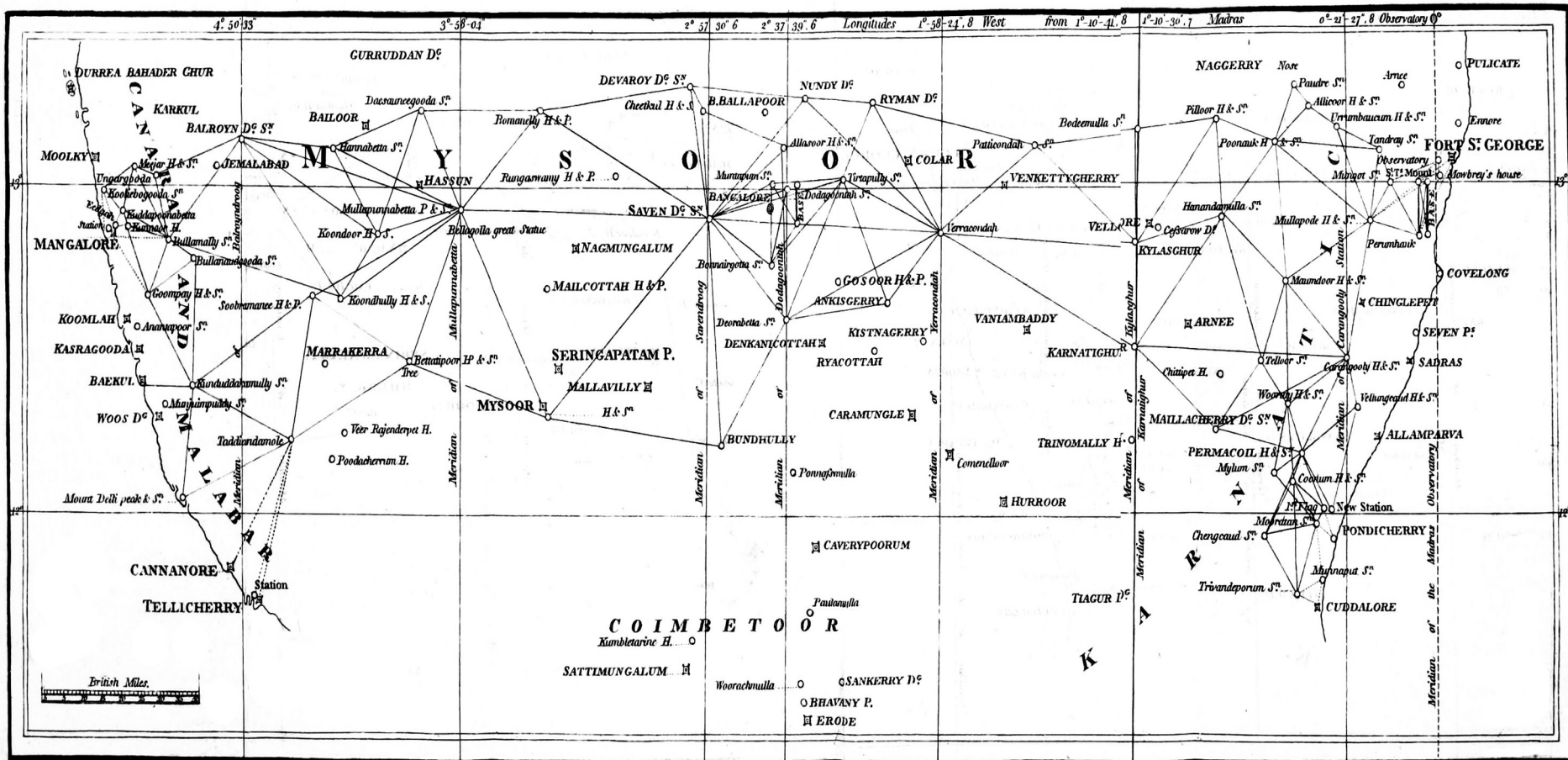
Grain as Taxes, Grain as Wages, Grain as Food

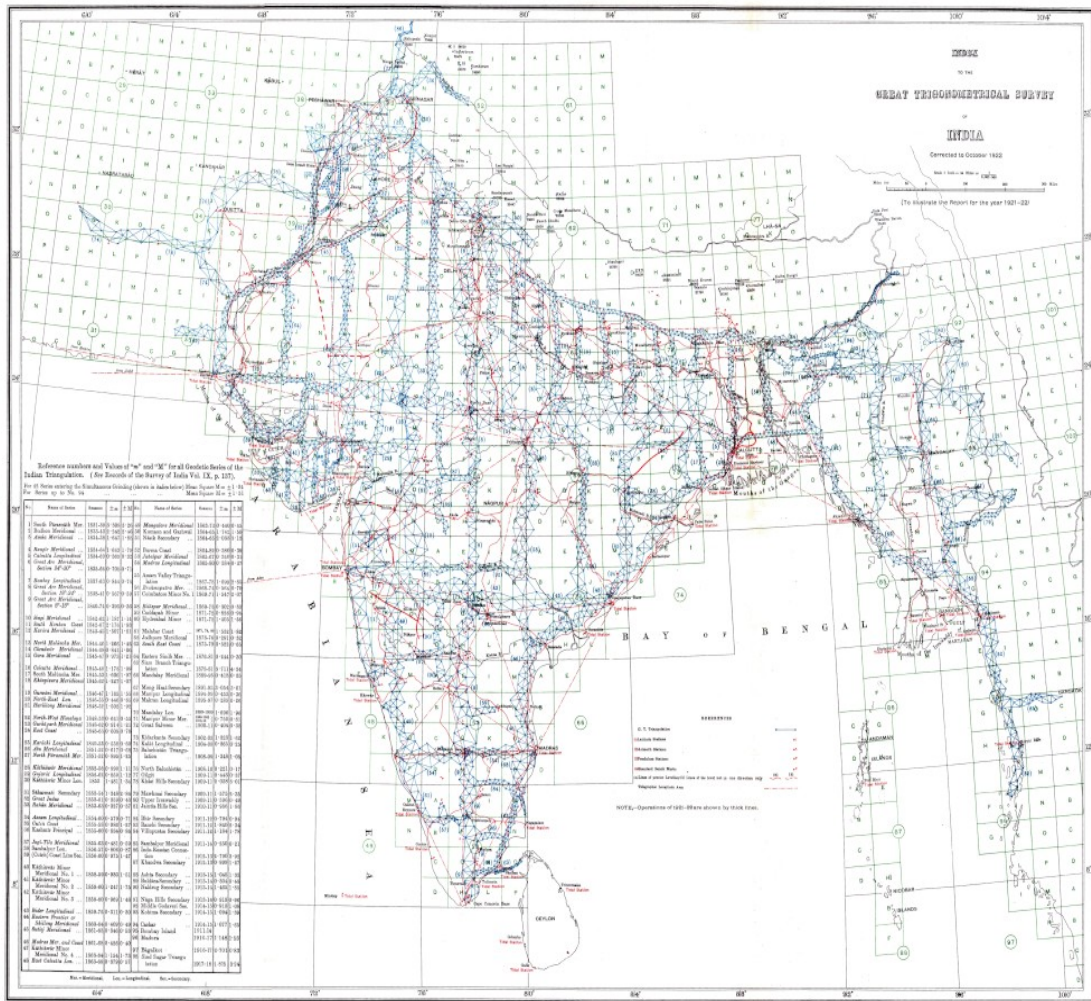


18 feet kōl inscription, @ seeyamangalam

The public display of standard (the measuring rod in the temple)

GENERAL PLAN OF THE TRIANGLES.





Surveyor's chain used to establish horizontal distances along compass sight lines.

One link equals .66 ft. or 7.92 inches

One chain equals 66 ft. or 100 links

Practitioner at workplace, Material, Tools and proportions coming together



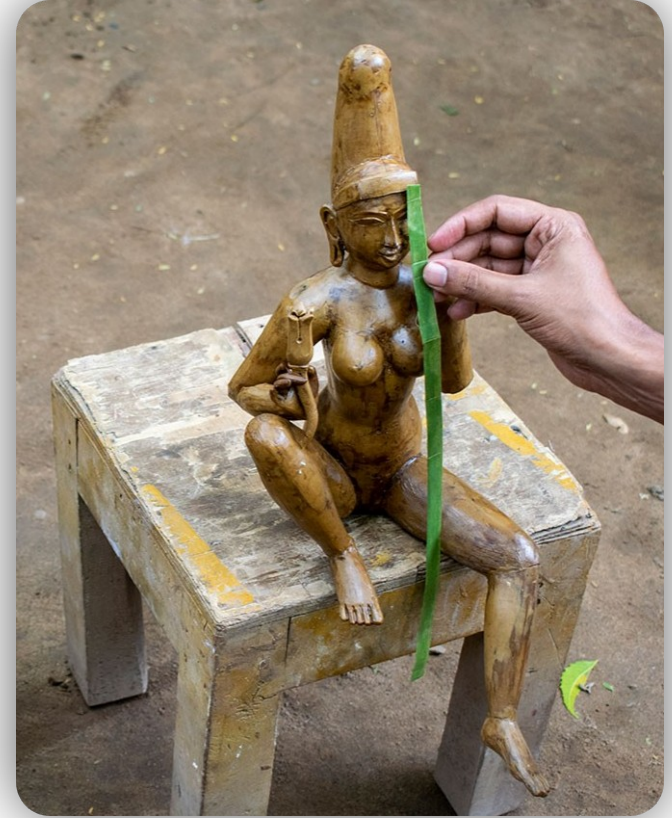
Practitioner at workplace, Material, Tools and proportions coming together



Practitioner at workplace, Material, Tools and proportions coming together



Practitioner using proportions (divine proportions) to begin the rough work



Proportions realized using leaf as a scale

Practitioner at workplace, Material, Tools and proportions coming together



Working with machine to realize proportions



Computing proportions with tools and labour

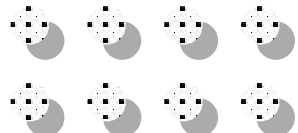


Practitioner working with clay and metal to make divine proportions

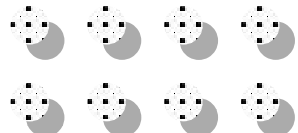
After activity

Could you able to do it as
intended ?

What are the challenges you
faced ?



What about practices existing
without any text ?



Tool

Practice



Practitioner

dignity, craft, dexterity, coordination, repetition, experience, livelihood . . . all of these constitute work. Can mathematics claim distinction and privilege away from such work? Then shall we imagine mathematics differently

Contact: senthil.babu@ifpindia.org | 9488084455

Archive of Practices



<https://exhibits.cooponscitech.in>

Historical Atlas of Metrology



<https://echoes.ifpindia.org>