Measure, Value and the Promise of Justice in colonial South India

ifp
Research on Culture Environment & Society
Institut Français de Pondichéry

KHC
KERALA HISTORY CONGRESS

Social History of Mathematical Practices

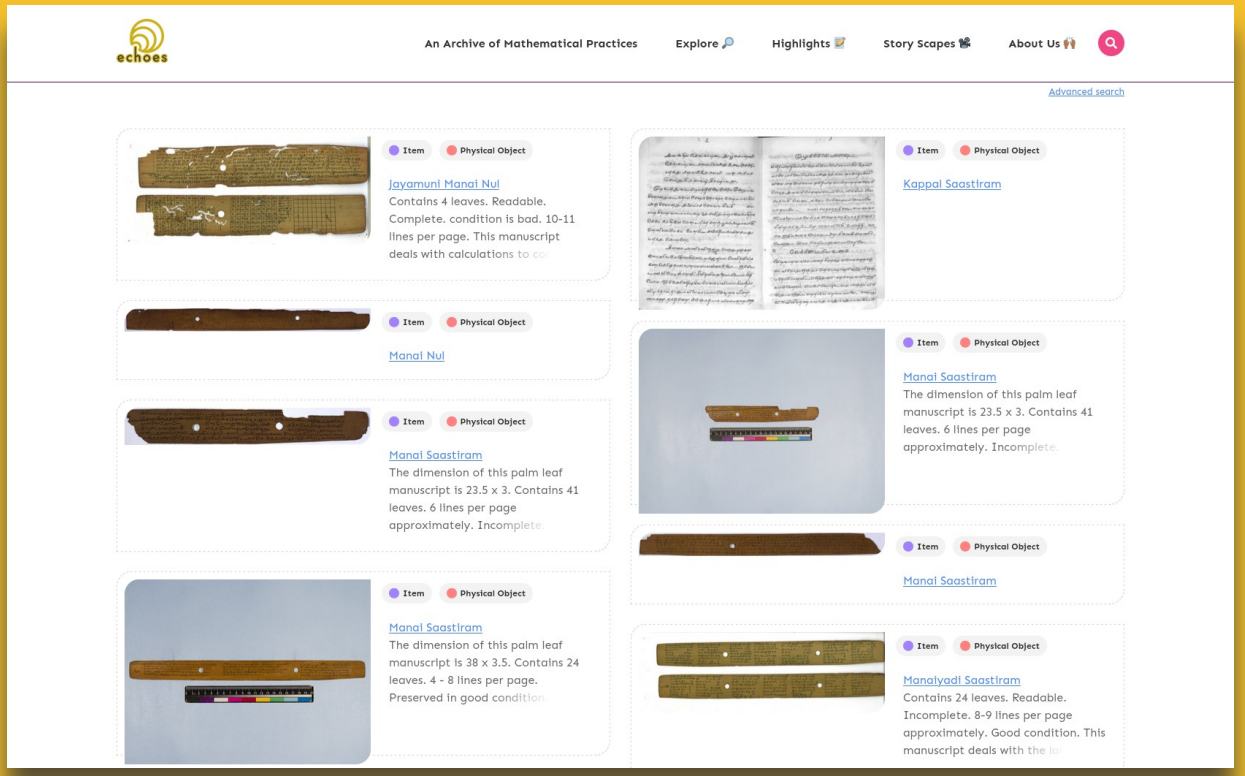
- Practitioner's mathematics to reconstruct the nature of computational work as part of occupations, and their consequences for measuring public
- Pervasive presence of measurement in the world of practitioners
- Computational work and records of their practices, as sources of social histories

Archive of texts

Museum of objects

Atlas of Measures

Archive of Texts



The archive web application can be accessed here: https://exhibits.cooponscitech.in

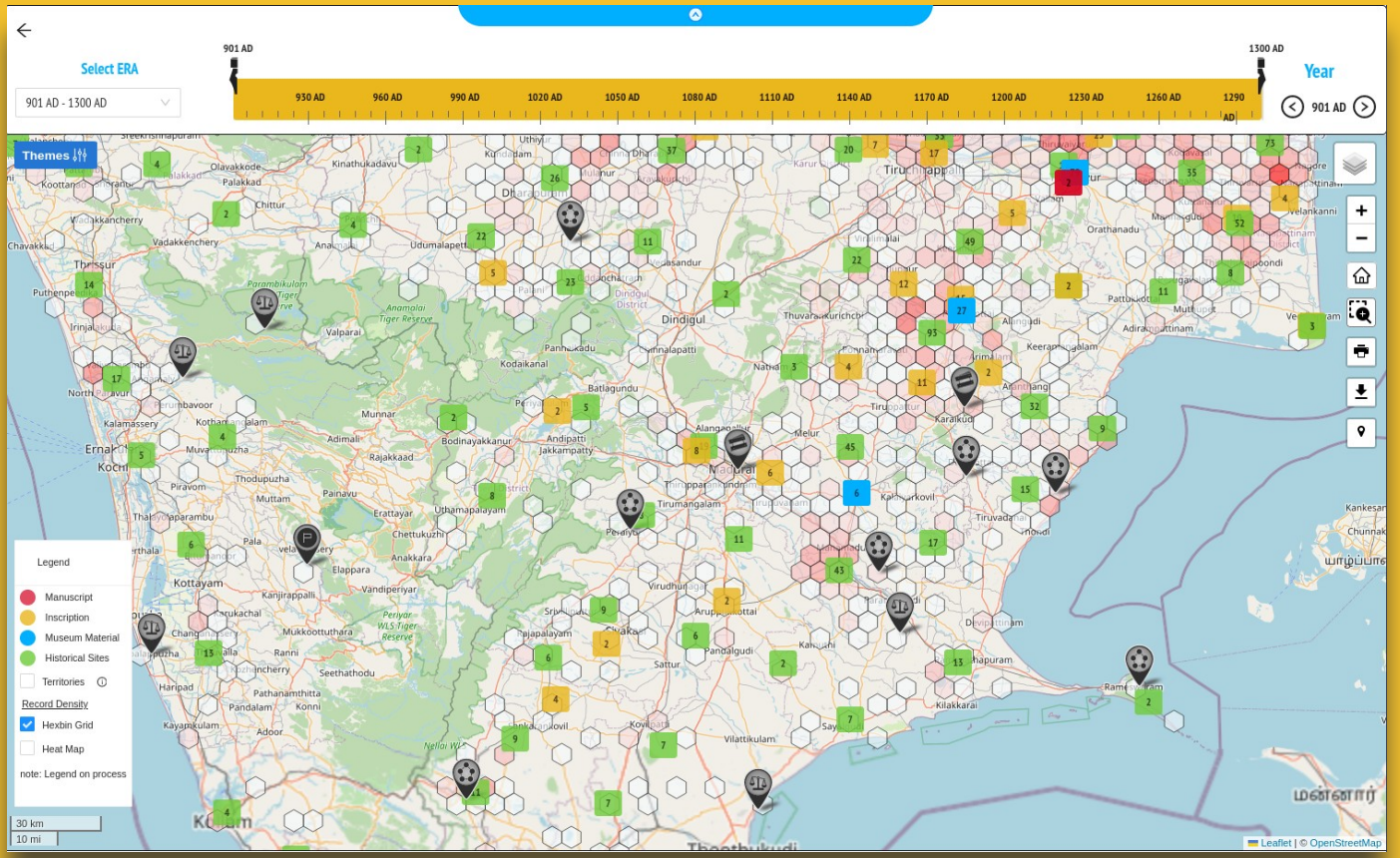
Museum of Objects – Tulabhavana weight and measuring Museum, Davangere

Museum of Objects

Museum of Objects

Museum of Objects

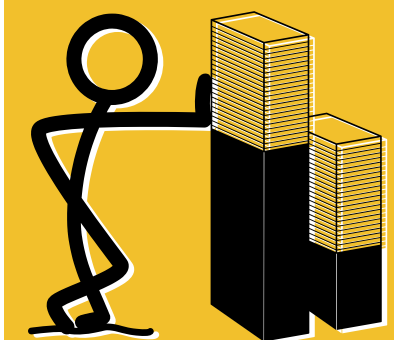
Atlas of Measures



The atlas web application can be accessed here: https://echoes.ifpindia.org

As sources for the historian
As pedagogic resources

- ✔ Visualizing heterodoxy in measuring
- ✔ Mapping the diversity of standards in measurements
- ✔ But the objects of measurement such as land, grain, weight and time etc., continue to remain the same, across time.
- ✔ But CONTEXT transforms measures.



the eternal struggle ...

Across time, histories of measurement, show the eternal struggle between heterodoxy and standardization

Heterodoxy

- local
- familiar
- negotiable
- contested
- closer to needs
- mutual aid
- libertarian

Standardization

- supralocal
- objective
- transparent
- authoritative
- possibility of fairness
- proximity to legally defined frames of justice

Why then measurement, as part of social history of computational practices ?

As an Activity

- As an activity, it promises justice – through a process which is otherwise, relative and arbitrary
- But, as an activity, that is always suspect, prone to manipulation and in ways that it eludes the possibility of the promise to deliver justice
- In what ways, justice becomes elusive in measurement ?

Calculation

In the struggle between heterodoxy and standardization, there is an additional dimension, that becomes crucial to the need for standards – calculation, both as an agency and as process.

Standardization anticipates Calculation

because, calculation is supposed to make the exchange transparent

At the threshing floor,

- **At the threshing floor,**
- **Calculations** *of yield,*

  proportions, distribution while

  measuring requires a

  delegated functionary such as

  the revenue accountant

Standardization anticipates Calculation

But, Calculation begins after labour, in the process evading labour, even if measurement seemingly accounts for labour

Pearl colander

1) Grading

2) Sorting

3) Weighing

4) Calculating Cevvu

5) Price as Value

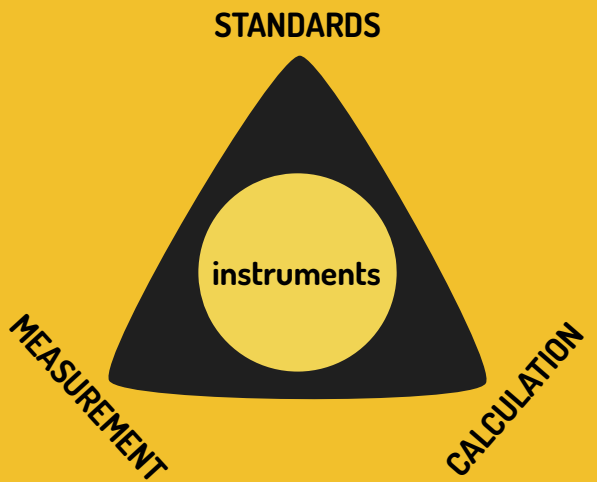
1) Where is labour ?

2) Hence, methods of measuring value needs political scrutiny

How is value generated ?
How is value assigned ?
How is value measured ?
How is value calculated ?

The Triad

To us, the triad of **measurement, standard, calculation** becomes a frame, to understand **how** commensuration, as an everyday activity, in routine exchange, becomes **discrete stages** in calculation of values by making it *visible, sensible and apparent*.



The measuring instrument

- Where is the measuring instrument in this frame ?
- The instrument is a device as well as a material product of this triad !
- Relation between device and fairness in exchange
- It brings the promise, closer to the context of exchange

The instrument therefore, delivers justice ?

- Be it heterodoxy or standardized exchange, the instrument requires verification
- However, standardized exchange, demands an arbitrating authority
- the authority therefore, will ensure compliance, and subvert manipulation
- But still does not intervene in the calculation of value – often left to the murky lanes of the market !

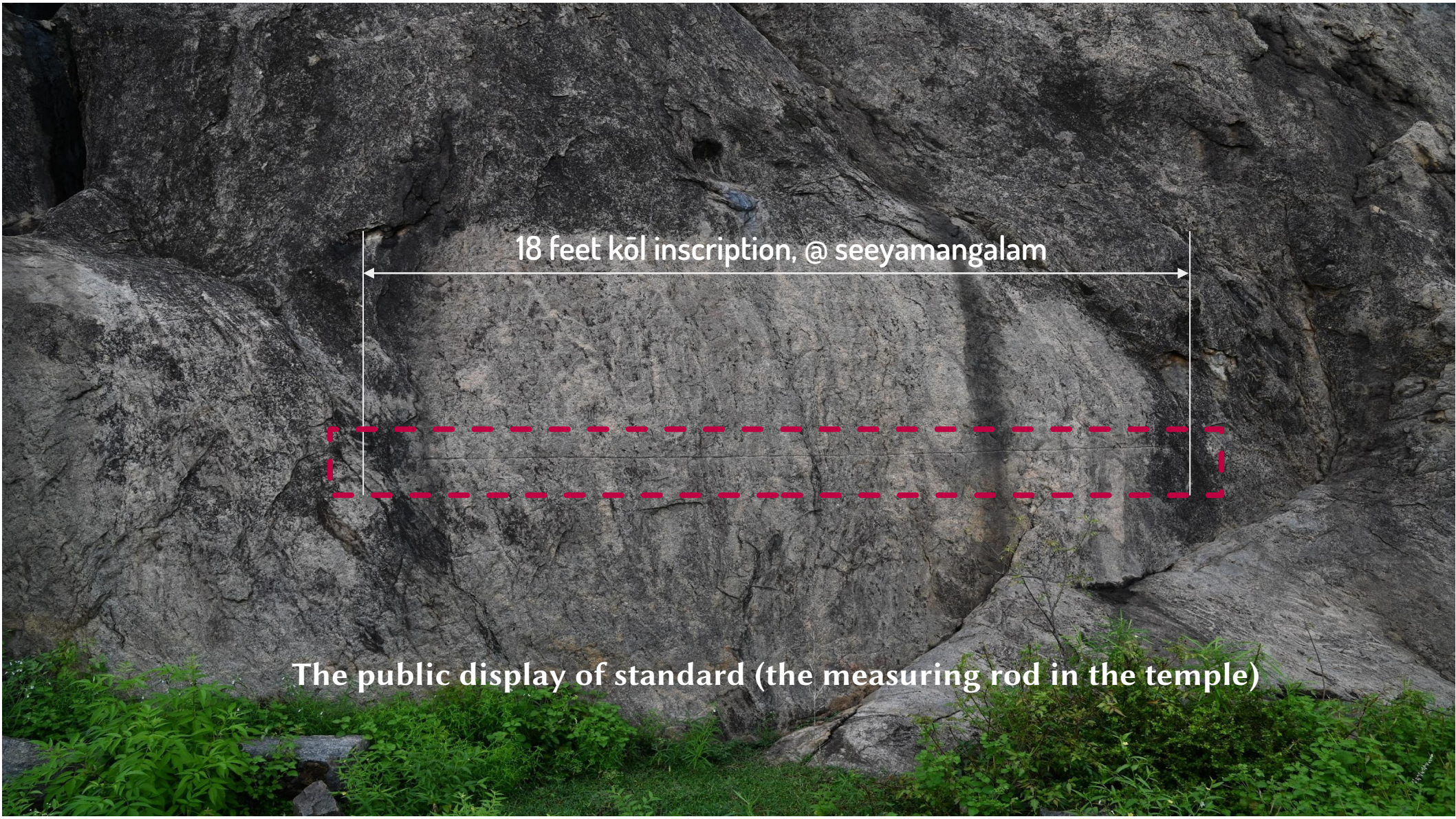
Measuring instrument and arbitration

What is verified then ?

- Accuracy and Precision through comparison of the instruments with the Standards
- Burden of Error – to be assumed by the State or the Parties of exchange ?
- This increases the attempts at standardization while distancing the arbitrating authority

In the process makes calculation even more abstract

Instruments could be everyday, but **increased abstraction** and the **concrete labour** of measuring makes the dissonance between **measurement** and **justice**, pervasive.



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

State and the instrument

- The Inspector or the overseer of standards, to fulfill the promise of the state
- The East India Company in Madras 1794-1850s, demonstrates the struggle between heterodox local and the Standardizing Imperative
- The economic, political and the mathematical mobilized
- The instrument as the arena of performance for the state

1794 Survey of Weights and measures used in the Madras Presidency
(staggered response)

1800 Seeking opinion about introduction of uniformity

1803 Ellis Plan, "**combined mathematical accuracy with perfect simplicity**"

- Kept the heap
- Measured the instrument and fixed dimensions
- Adhered to the local, adhering to custom
- Kept the Local in the Standard

Demand for Scales and weights, supply of instruments, stamping spree
Yet, demand could not be met

1819 But a relationship between bureaucracy of measures and commerce established

1819

Inspector of Tank Estimates, Major De Havilland questions Ellis Plan

The burden of **mismeasure**

the heap isn't the standard

inaccuracy in dimension

authority of the company, authority of knowledge at stake

1821

Court of Directors demand models to be sent to London

But collectors did not bother much, as one said, if he were to comply with the demand, he must send '**cart loads of bamboo joints and stones**'

But they did reach England

1825

The mysterious Havilland Report on the new standard, never submitted ?

Havilland's critique of Ellis Plan

- there was no adaptation of English weights or measures
- arbitrary data were assumed, instead of actual facts
- Ellis did not make any trials of existing measures of capacity
- no unit of measure of capacity could be fixed on such data as the grain heaped up,
- There can be no perfect right angled cone as the heap
- several inaccuracies of computation

The Models arrive at London.

The King's Assaymaster gauged to decimals of a grain or a cubic inch

Results printed in Kellys' Cambist (values of weights in the Cambist may be those of the models sent to England, but they do not represent in all cases, the values assigned to them in India) Duplicates remained in India, but not to be found even in the 1850s

1829 CoD, to Madras, 3 Balances, with 3 sets of Troy and Avoirdupois weights
Established the Imperial Weights

1832 Mint Department says, ***no use to send standards, without a law or a Proclamation***

1833 No evidence for the adoption of Imperial measures

1833 NOV Jervis, Bombay proposed uniform standard based on the primitive standard, but not British, which is anomalous

(The primitive is the 'pendulum vibrating seconds in Latitude 45 deg, at the level of the ocean, in vacuo, at 39.5 deg F')

1836 Board of Revenue Circular to Collectors, another set of specimens sent to Jervis

1837 Another set sent to Madras Arsenal

1839 Madras Govt. Committee to adjust Madras measures to Imperial standards

- Committee complains that both country weights and English weights sent to them
- Says, only recognize the Madras measure as the country measure

1840 Another Committee

1841 Committee recommends a decimal scale

- GoI approves this Committee's Table of Weights and Measures
- leave the provincial systems untouched
- declare the value to the country weights and measures
- But, DO a Proclamation

1845 Military Board reported supply of new sets to all Collectors

1846 Proclamation issued

- more sets supplied
- but no obligation to use them
- heterodoxy ruled, convenience prevailed
- (Customs Dept used old measures, revenue dept used local measures)

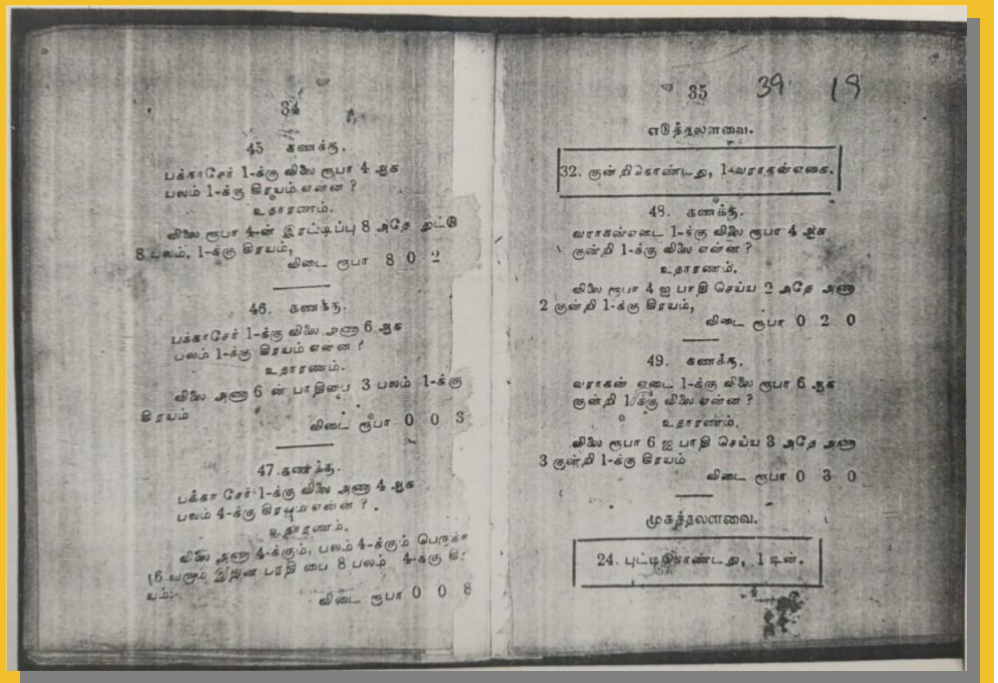
1851 More Complaints, more accurate information sought on Land and capacity measures

And began another round of inquiry, another set of calculations, more stamping, more sets sent...

But heterodoxy continued with the people, in the everyday
Drama performed on thousands of objects, that traveled between the villages to the collectors, to the Presidency and to London, back and forth

Measures as numbers in Schools

- There was another story unfolding in the Schools
- Conversions (local to the British) ruled the learning of mathematics
- Learning of numbers and the learning of measures proceeded in relation to each other
- Constant conversions, the traffic in proportional thinking, made generational learning of arithmetic as routine procedural calculations
- Examinations determined proficiency in arithmetic, minus the context of measurement
- Calculation, yet again, takes over, as standardization by the state, performed on the objects



The triad of measure, standard and calculation

shows different faces to different subjects at different times

A history to be unraveled, in the **practices of the people**