

Weights and measures as a social construct:

Anthropological perspectives on ancient metrology

THEuMa Conference: "Towards a History of European Markets:
Institutionalization, Standardization and Legal Harmonization"

Università degli studi di Milano-Bicocca | June 19–20, 2025

Charles Doyen

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UCLouvain / INCAL / CEMA





Economy

Health

Innovation

Security

Society

Sustainability

25804

International Standards and other deliverables covering almost all aspects of technology, management and manufacturing.

174

Members representing ISO in their country.
There is only one member per country.

824

Technical committees and subcommittees to take care of standards development.



Weights and measures as a social construct

- Product of a **given society**
- Correlation with **technical and scientific developments**
- Instruments for **interaction with the environment**
- Standardisation of the **economy** (production, distribution and consumption of goods)
- Development of a **shared semantic memory** and **vision of the world**

Historical metrology

ÉTALONS MONÉTAIRES ET MESURES PONDÉRALES ENTRE LA GRÈCE ET L'ITALIE

SOUS LA DIRECTION DE CHARLES DOYEN



L'étude des étalons monétaires et des mesures pondérales du monde gréco-romain : une longue empoignade (XVI^e s. – XX^e s.)

François DE CALLATAÿ *

Les étalons monétaires et les mesures pondérales du monde gréco-romain ont depuis le XVI^e s. véritablement captivé l'attention des érudits et du grand public. Cette histoire n'a jamais été racontée et mériterait bien un livre. En attendant qu'on s'y attelle plus en détail que ce que cette communication peut prétendre, je dois à l'amitié de Charles Doyen de brosser en préambule de ce colloque international le riche tableau de ces débats tombés dans un profond oubli¹.

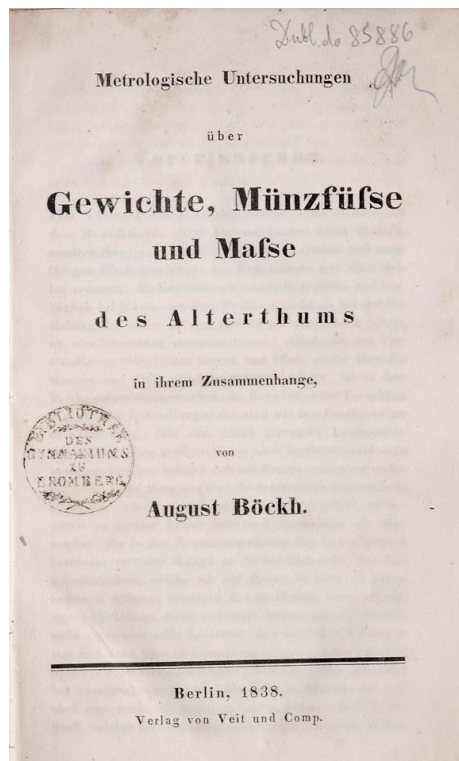
J'articulerai mon propos en trois périodes :

- 1) D'abord celle qui va du *De Asse* de Guillaume Budé paru en 1515 jusqu'au premier tiers du XIX^e s. ; elle est caractérisée par la volonté d'établir correctement le texte en vue de pouvoir traduire les valeurs rapportées par les auteurs anciens en leurs équivalents modernes.
- 2) Ensuite, la période qui couvre un petit siècle, de 1838 à la Première Guerre mondiale, qui est l'époque de la science allemande — et même prussienne car les grands ouvrages d'August Boeckh, de Friedrich Hultsch et de Johann Brandis sont tous parus à Berlin — dont l'ambition principale fut de retrouver la généalogie des étalons monétaires.
- 3) Enfin, les développements récents du dernier siècle. Plus pragmatique, cette période est marquée dans l'ensemble par une réaction vis-à-vis de constructions jugées trop théoriques et, dans le fond, sans grand intérêt historique. Profitant d'une amélioration des outils, dont la table de fréquence est l'illustration la plus parlante, les numismates se seront davantage intéressés aux problèmes de calibrage et de dispersion des poids qu'à l'établissement au centigramme près des étalons monétaires, faisant prévaloir l'esprit de finesse plutôt que l'esprit de système.

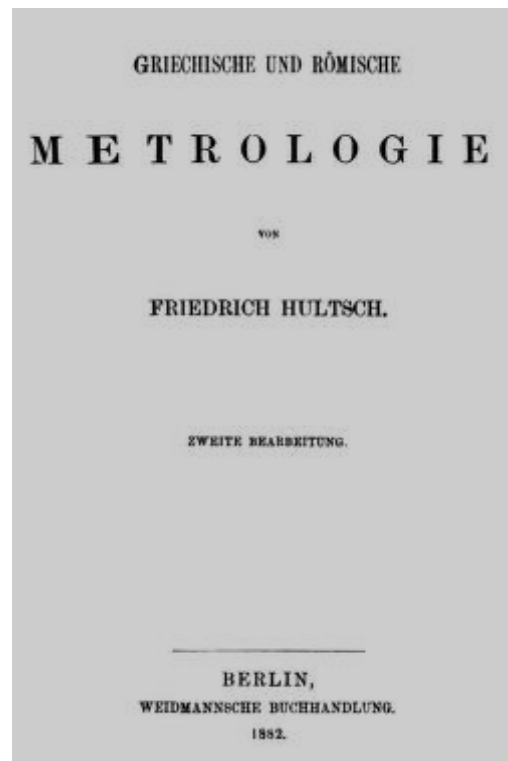
* Bibliothèque royale de Belgique, Université libre de Bruxelles, École pratique des Hautes Études (IV^e section).

¹ Ce colloque est le premier à être consacré aux étalons monétaires du monde gréco-romain. Signe d'un regain d'intérêt pour la problématique en général, il survient après celui organisé le 17 mars 2012 à Paris (INHA) sur « La mesure dans l'Antiquité : la documentation archéologique ».

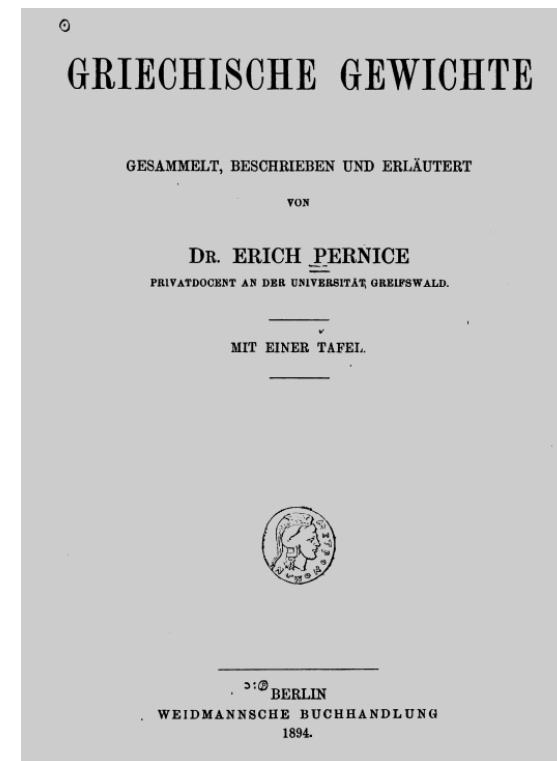
Reconstructing ancient standards



Boeckh 1838



Hultsch 1862 [1882²]



Pernice 1894

1795–1799

French metric system

Metre Convention

1st CGPM

2nd CGPM

3rd CGPM

1875

1889

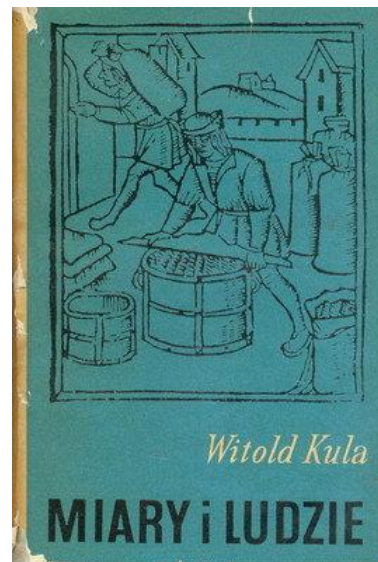
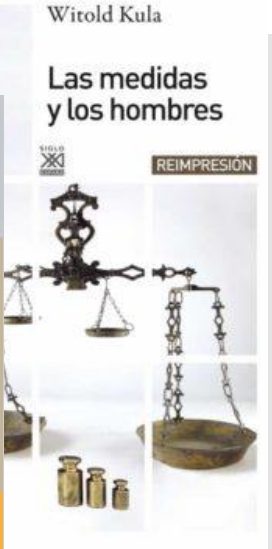
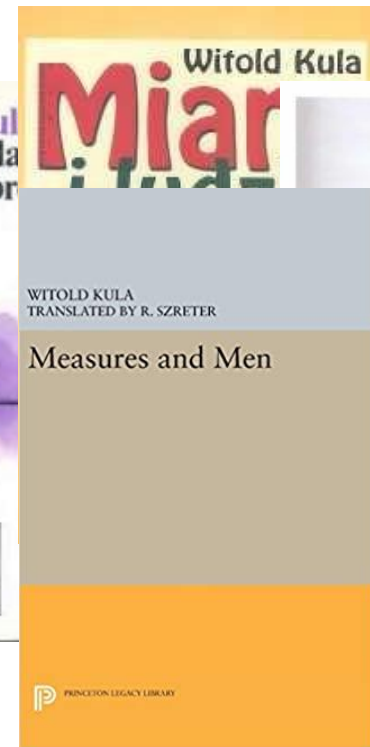
1895

1901

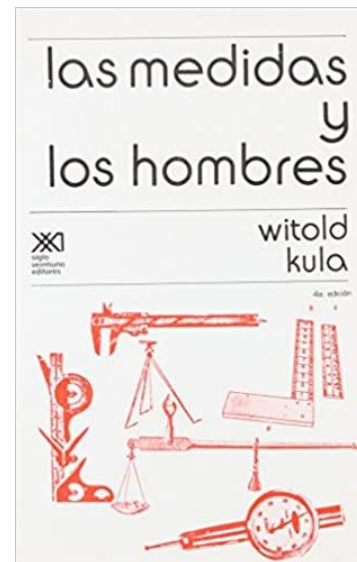
Measures and men



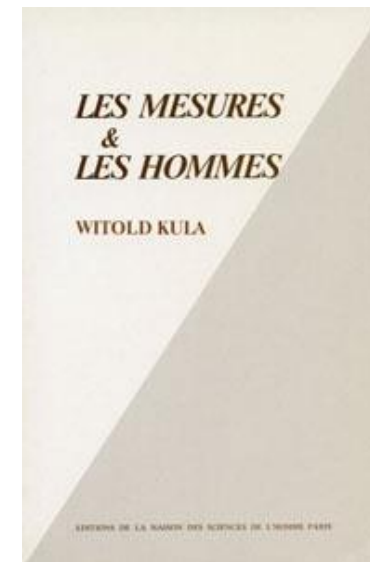
Witold Kula and Nina Assorodobraj



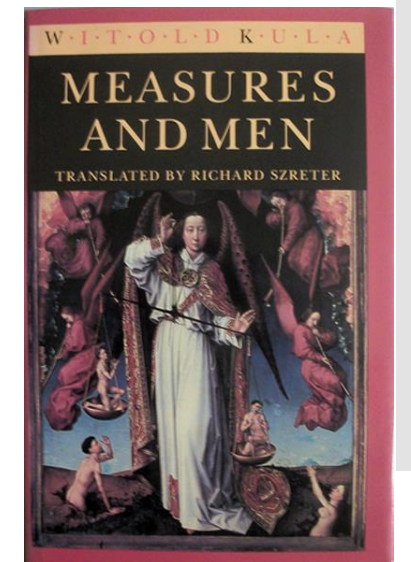
1970



1980



1984



1986

Context of measurement operations

Using specific measurement units

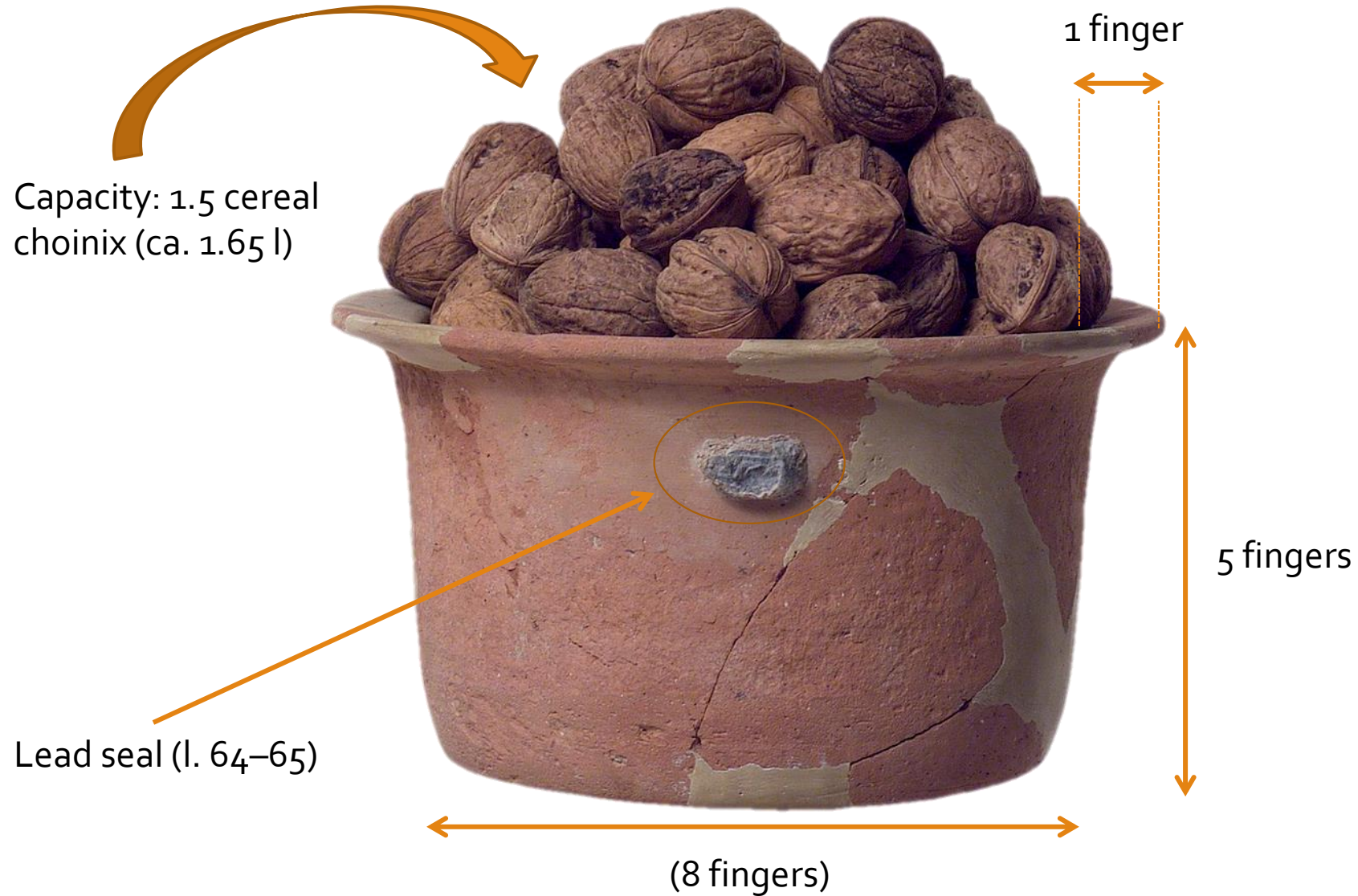
- Weights, scales and capacity measures adapted to the commodities and the context of the metrological operations
 - Different units for wholesale trade (*emporion*) and retail trade (*agora*)
 - Specific units for certain commodities (e.g. wood and coal, wool, fruit, etc.)

A specific measure for certain fruits

“The sellers of walnuts (i.e. Persian nuts), almonds, hazelnuts (i.e. nuts of Heraclea), pine nuts, chestnuts, lotus seeds (i.e. Egyptian beans), dates, and any other delicacies which are sold with these, lupines, olives, and kernels, shall sell with a measure (μέτρον) having a capacity of three cereal half-choinikes filled to the brim, selling with this increased *choinix* having a depth of five fingers and a width of the rim of one finger. [...]” [Athens, ca. 115 BCE]



A specific measure for certain fruits



Context of measurement operations

Using specific metrological standards

- Metrological standards may vary from one city-state to another and/or over time
- Specific standards for certain commodities (e.g., commercial mine vs. monetary mine)

Specific standards for certain commodities

“And the market mina shall weigh one hundred thirty-eight drachmas of the *stephanephoros* (silver), in accordance with the weights (στάθμια) which are at the mint, and shall have a makeweight of twelve drachmas of the *stephanephoros* (silver), and everyone shall sell everything else with this mina, **except for what should expressly be sold in accordance with the silver (standard)**, balancing the beam of the scales at the weight of one hundred fifty drachmas of the *stephanephoros* (silver).” [Athens, ca. 115 BCE]



Former commercial mina
(ἐμπορικὴ μνᾶ)
(138 drachmas)



12 drachmas



New commercial mina
(ἐμπορικὴ μνᾶ)
(150 drachmas)

Modalities of measurement operations

Observing an imbalance of the scale

- Relative weighing between two commodities or between a commodity and a reference weight
- Need for a single weight or a simple set of weights
- Faster and easier operation than measuring an exact mass

“All morning, while the sacred light of day grew stronger, volleys of missiles from either side reached their mark, and warriors died. But when the sun had reached the zenith, **Father Zeus took his golden scales (χρύσεια ... τάλαντα)**, and placing mortal fates in either pan, one for the horse-taming Trojans, one for the bronze-clad Greeks, **grasping the balance, raised it by the middle. Down it sank on the Achaean side**, spelling doom for them. Their pan settled on the fertile earth, while the Trojans’ rose towards the wide heavens. Then Zeus himself thundered aloud from Ida, and sent a lightning bolt through the Greek army. Seeing it, they were dumbfounded, and terror seized them all.”

(Homer, *Iliad* 8.66–77)



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