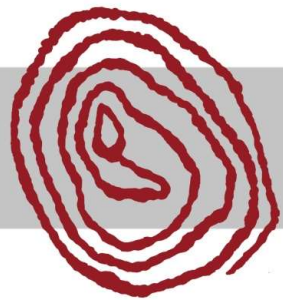


Inventorying known marine astrolabes

Sines e o seu Porto. História e Património.

Filipe Castro e Alexandre Monteiro
Câmara Municipal de Sines
7 e 9 de Setembro 2017



INSTITUTO DE ARQUEOLOGIA E PALEOCIÊNCIAS
DA UNIVERSIDADE NOVA DE LISBOA

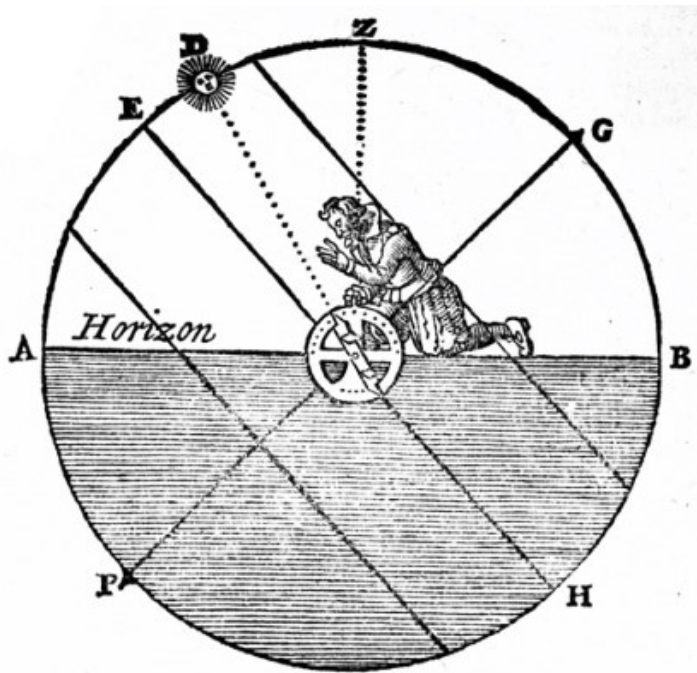
IAP



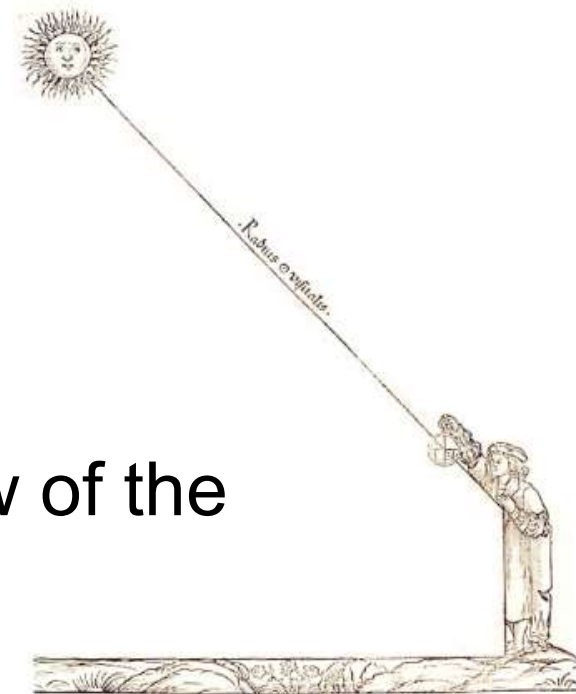
J. Richard Steffy Ship Reconstruction Laboratory

ShipLAB

TEXAS A&M
UNIVERSITY

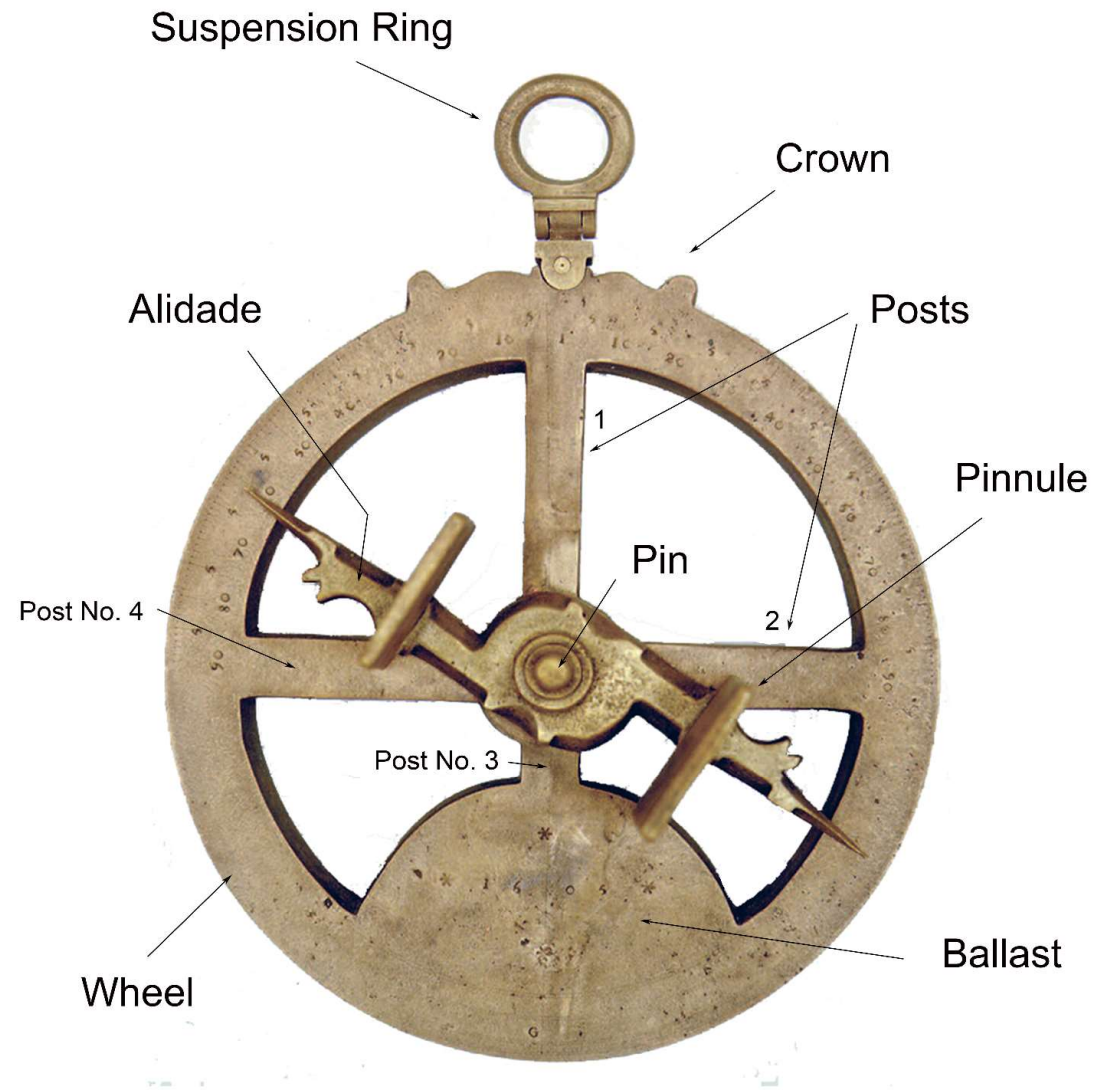


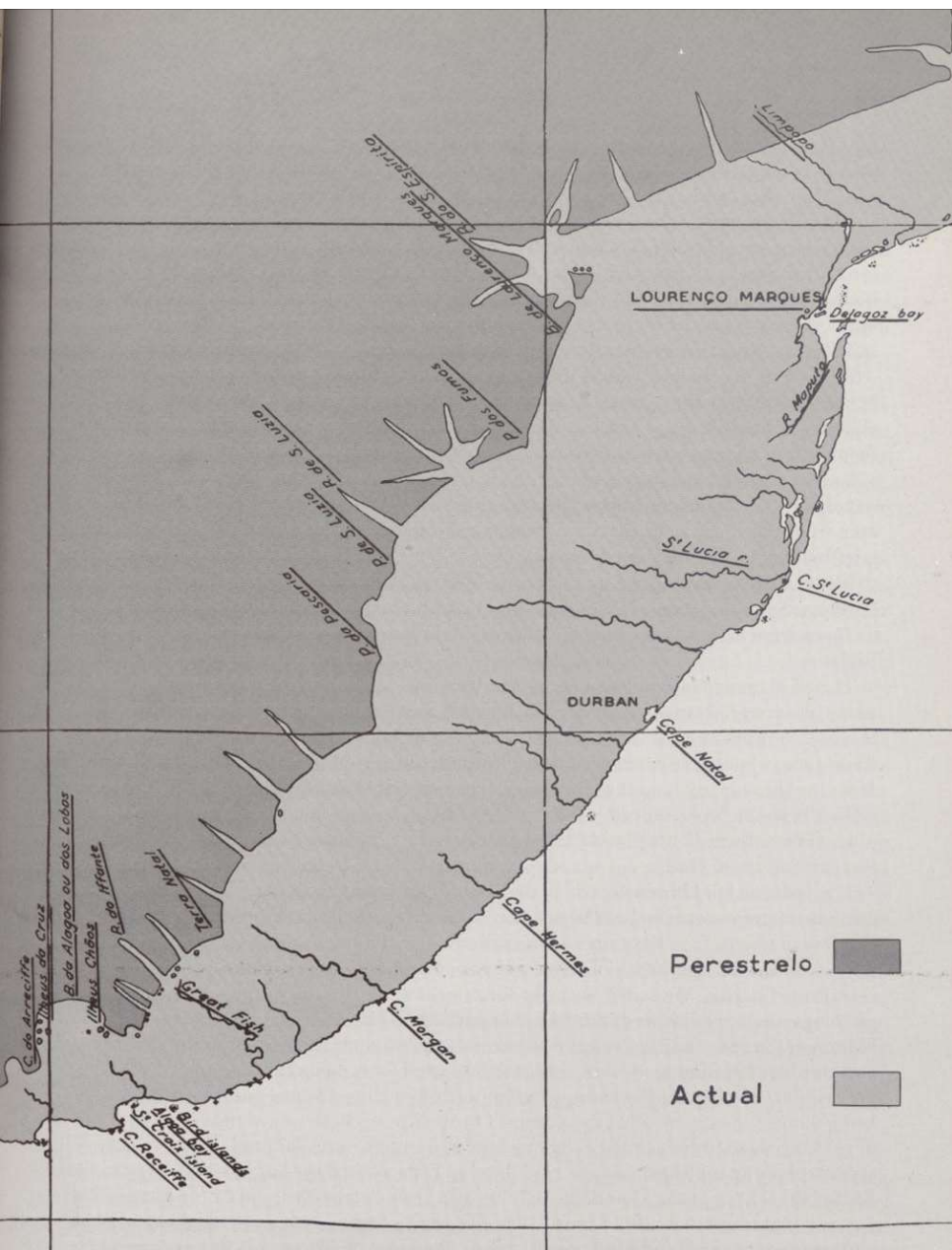
1 Developed in Roman Egypt, adapted by Islamic scholars, and passed to the neighbor Iberian states, astrolabes are part of the intellectual revolution that gave Europe larger and sturdier ships, organized state bureaucracies, and generated an unprecedented view of the planet.



Marine astrolabes are simplified versions of the Arab astrolabes and were used to measure the height of stars and planets in the sky.

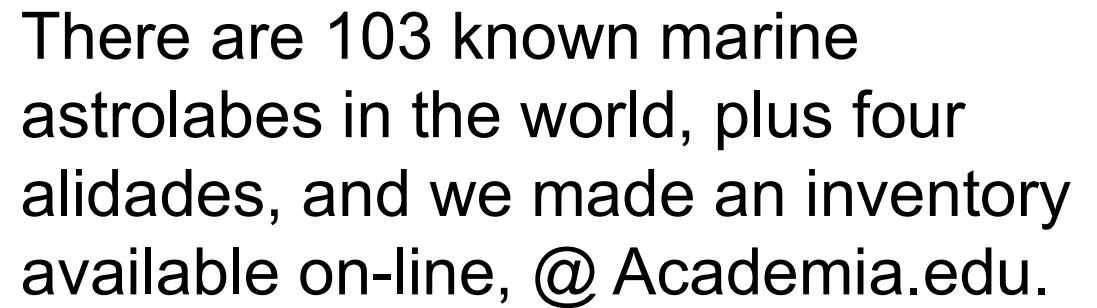
Marine astrolabe SJB III, dated to 1605 and signed with a "G" found on the shipwreck site of the Portuguese merchant ship *Nossa Senhora dos Mártires*, lost in 1606 at the Tagus mouth, Lisbon, on a return trip from India (No. 81).





Astrolabes made it possible for sailors to know the latitude of their positions, and helped map the planet in the 16th and 17th centuries.

Longitude could only be estimated until the late 18th century. Manuel Perestrelo's map, dating to the 16th century, illustrates this problem eloquently (Allen and Allen 1978. *The Guns of Sacramento*. Robin Garton).

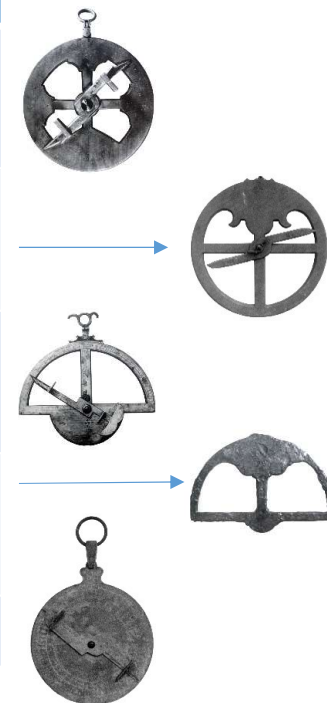


A substantial portion of the known surviving marine astrolabes has been recovered from *shipwrecks* and is eroded, making their identification and provenance difficult to establish

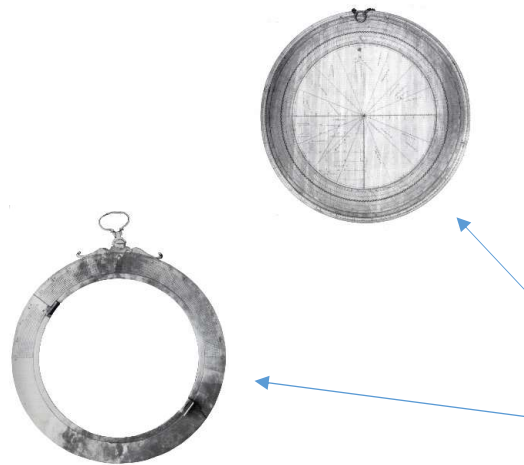
<https://tamu.academia.edu/FilipeCastro>

Taxonomies. Previous studies divided astrolabes into three main categories:

Type	Sub-type	Description
I	a	Wheel type with base ballast
	b	Wheel type with crown ballast
II	a	Semi-sphere with base ballast
	b	Semi-sphere with crown ballast
III		Wheel type without ballast



By 1988 there were 65 known astrolabes and A. Stimson published a book with a more complete taxonomy, which considered five main stylistic types:



Type	Sub-type	Description
0		Solid disk
I	a	Wheel type with base ballast
	b	Wheel type with crown ballast
II	a	Semi-sphere with base ballast
	b	Semi-sphere with crown ballast
III		Wheel type without ballast
IV		Planisphere for marine use
V		Concentric ring type

Now we have 103 specimens and we subdivided the five main stylistic types further:

Type	Sub-type	Ballast Shape	Post Top	Throne
0 – Disk	NA	NA	NA	3 – Ogee 4 – Complex
I – Wheel	a – Base ballast	1 – Triangular	1 – Simple	1 – Simple 2 – Convex 4 – Complex
				1 – Simple
		2 – Concave	1 – Simple	3 – Ogee
				3 – Ogee
		3 – Concave-stepped	1 – Simple	1 – Simple 3 – Ogee
				3 – Ogee
		4 – Semicircular	1 – Simple	3 – Ogee
				3 – Ogee
		5 – Convex-concave	1 – Simple	3 – Ogee
				3 – Ogee
			3 – Concave-stepped	
			4 – Convex	
			5 – Complex	1 – Simple 3 – Ogee
		6 – Complex	3 – Concave-stepped	1 – Simple 3 – Ogee
			5 – Complex	1 – Simple 3 – Ogee
	b – Crown ballast	6 – Complex	1 – Simple	3 – Ogee
II – Semicircle	a – Base ballast	2 – Semicircular	1 – Simple	3 – Ogee
	b – Crown ballast	3 – Convex-Concave	1 – Simple	?
III – No Ballast	NA	NA	2 – Triangular	?
			5 – Complex	1 – Simple
				3 – Ogee
IV – Planisphere				4 – Complex
V – Ring				1 – Simple
				3 – Ogee

All known astrolabes have a number (originally attributed by A. Stimson at the National Maritime Museum in Greenwich, England), and a name. We coordinated with him to continue the inventory.

Funchal (No. 100), sold at auction recently. Unknown provenance. Dated to 1595 and signed "Gois." Allegedly bought in Madeira Island in 1956.



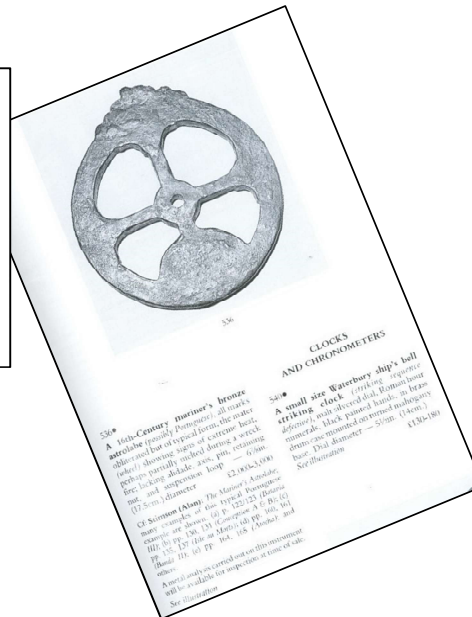
The **main interest** of our study is to inventory all known marine astrolabes. A **second objective** is to create a frame that may help identify and establish provenance of eroded astrolabes, or astrolabes with unknown origin.



Skokloster III astrolabe (No. 14), possibly acquired in Holland by Swedish field-marshal Carl Gustav Wrangel in the first half of the 17th century.

A **third objective** of the present study is to help establish easy rules for the determination of the authenticity of new astrolabes. At auction astrolabes may fetch values between \$30k and \$50k, and fakes sometimes surface in the antiques markets.

536●
A 16th-Century mariner's bronze astrolabe (possibly Portuguese), all marks obliterated but of typical form; the mater (wheel) showing signs of extreme heat, perhaps partially melted during a wreck fire; lacking alidade, axis, pin, retaining nut, and suspension loop — 6⁷/₈in. (17.5cm.) diameter £2,000–3,000

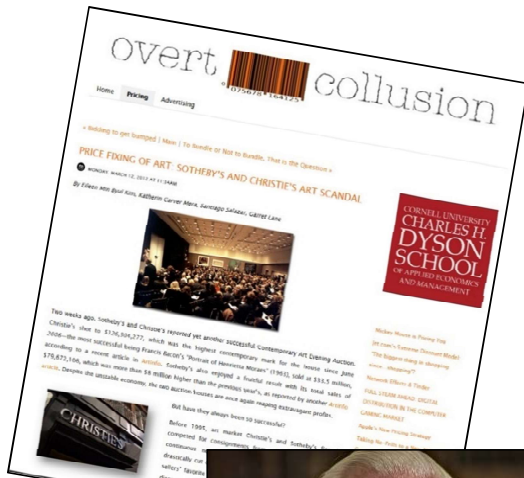


Is Christie's 1994 astrolabe a fake?



Fake astrolabe offered at auction in 2013, by Christie's.

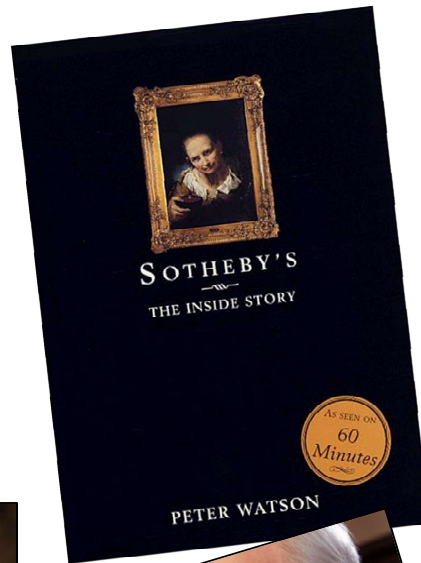
Auction houses are not always honest...



Dede Brooks collaborated with the prosecutors.



Christopher Davidge cooperated and was granted immunity and a \$8 m severance package.



Alfred Taubman served 10 months.

The provenance indicated by the auction house Christie's is "private collection, formed before 1920" and the price realized: \$59,700.

es-5723254-details.aspx


lendar GIS OGPS

SALE 9540 | LOT 67

PREV NEXT GO TO: Lot# GO

A BRONZE MARINER'S ASTROLABE

SEBASTIAO DE GOES, CIRCA 1600



ENLARGE & ZOOM

SHARE PRINT EMAIL

Price Realized ?
£37,500 (Set Currency)
(\$59,700)

Estimate
£30,000 - £50,000
(\$48,150 - \$80,250)

Sale Information
SALE 9540 —
TRAVEL, SCIENCE & NATURAL
HISTORY
10 October 2013
London, South Kensington

Contact The Department >

BUY CATALOGUE

OVERVIEW LOT NOTES

Lot Description
A BRONZE MARINER'S ASTROLABE
SEBASTIAO DE GOES, CIRCA 1600
of typical shipwreck condition, the wedge profile of Portuguese pattern, signed *SEBASTIAO DE GOES* to base, scale to quadrant 0°-90° 5° marked, alidade secured with wingnut 7th. (18cm.) radius

Special Notice
VAT rate of 5% is payable on hammer price and at 20% on the buyer's premium.

Provenance
Unknown shipwreck
Private collection formed before 1920
Thence by descent

Literature
Stimson, J. The Mariner's Astrolabe: A survey of known surviving examples. *Astrolabes* (1987), p. 88.

SALE ROOMS CONTACT HELP SITE MAP PRIVACY COOKIES SECURITY TERMS & CONDITIONS FOLLOW US

astrolabe sold by christie's

Lots In This Sale

- DECLINATORY CONSTRUCTION AND HORIZONTAL
NICHOLAS BION, EARLY 18TH CENTURY
PR. £3,250(\$3,358)
- A SILVER BUTTERFIELD DIAL
MICHAEL BUTTERFIELD, CIRCA 1700
PR. £2,250(\$3,582)
- SHAGREEN CASE OF DRAWING INSTRUMENTS
ENGLISH, CIRCA 1800
PR. £1,188(\$1,891)
- AN ENGLISH GONIOMETER
BECKER, EARLY 20TH CENTURY
PR. £1,188(\$1,891)
- DESCRIPTION OF A DOUBLE REFLECTING
P. & J. DOLLOND, CIRCA 1770
PR. £1,750(\$2,786)
- A CORNISH DIP CIRCLE
WILLIAM WILTON, CIRCA 1835
PR. £6,250(\$9,950)
- A LACQUERED BRASS HORIZONTAL MICROSCOPE
CHARLES CHEVALIER, MID 19TH-CENTURY
PR. £7,500(\$11,940)
- A SCHLUSSELGERÄT
CIRCA 1944
PR. £3,750(\$5,970)
- A BRONZE MARINER'S ASTROLABE
SEBASTIAO DE GOES, CIRCA 1600
PR. £37,500(\$59,700)
- CLAUDIUS PTOLEMAEUS
(C. 100-170)
PR. £10,000(\$15,920)

All Lots in this sale PREV NEXT



Astrolabes were precision instruments: an analysis of the two specimens shows that the one on the right is a crude copy of the Francisco Padre II astrolabe (No. 97), which was recovered in Cuba, at the Francisco Padre shipwreck site, in the 1990s. Could hardly be in a “private collection, formed before 1920”

2

Taxonomy

Type 0
Solid Disk



?

Type I
Wheel Shape

a. w/ base ballast



b. 1533
b. 1668

b. w/ crown ballast



c. 1625
b. 1656

Type II
Semi-Sphere

a. w/ base ballast



c. 1600

b. w/ crown ballast



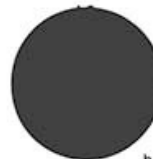
b. 1629

Type III
Wheel Shape
No Ballast



c. 1700

Type IV
Planisphere



b. 1654

Type V
Concentric Ring



c. 1750

I(a)1



b. 1533
b. 1585

Triangular base ballast

I(a)2



1575
b. 1622

Concave base ballast

I(a)3



b. 1588
1608

Convex base ballast
w/ simple post tops

I(a)4



1632
1656

Convex base ballast
w/ simple upper post tops

I(a)5



c. 1588
b. 1668

Convex base ballast
w/ concave post tops

I(a)6



1555
1632

Complex base ballast

I(a)7



b. 1606
1643

Ogee base ballast

I(a)8



c. 1600

Ogee base ballast
w/ molded posts

Type 0 (not dated)

Solid disk



Las Palmas astrolabe, No. 47,
not dated, but perhaps one of
the earliest known.

Type 1a1 (b. 1533 to b. 1585)

Wheel shape (1), base ballast (1a), triangular ballast (1a1)



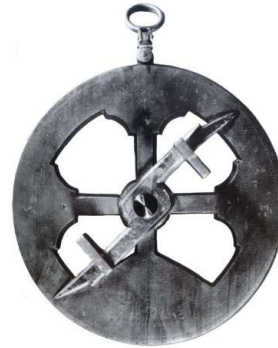
b.1533 Bom Jesus I



b.1533 Bom Jesus II



b.1533 Bom Jesus III



1536 Arts et Metiers I



1540 Palermo



1545 Padre Island III



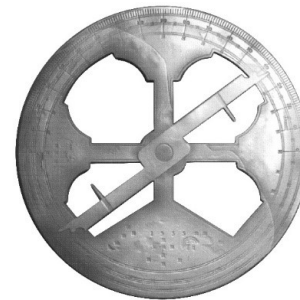
1550 Padre Island II



1550 Padre Island I



b. 1554 S. Bento



1555 Ines de Soto I



b. 1585 Santiago

Type 1a1 (not dated)

Wheel shape (1), base ballast (1a), triangular ballast (1a1)



? Vera Cruz



? Colombian



? Shiel



c. 1550 Bermuda



? MIA

Type 1a2 (1575 to b. 1622)

Wheel shape (1), base ballast (1a), concave ballast (1a2)



1575 Aveiro



b. 1588 Girona II



a. 1578 Francisco Padre I



a. 1578 Francisco Padre II



1593 Funchal



b. 1610 Madre de Deus



1616 Atocha V



b. 1622 Seahawk IV



b. 1622 Atocha I

Type 1a2 (not dated)

Wheel shape (1), base ballast (1a), concave ballast (1a2)



? Mounts Bay



? Tenerife



? La Rochelle

No ballast. Type 1a or Type 3? (not dated)



? Lyme Bay

Type 1a3 (b. 1588 to 1608)

Wheel shape (1), base ballast (1a), convex ballast, simple post tops (1a3)



b. 1588 Girona I



b. 1600 San Diego



1605 Atocha III



1605 SJB III



1608 Florence



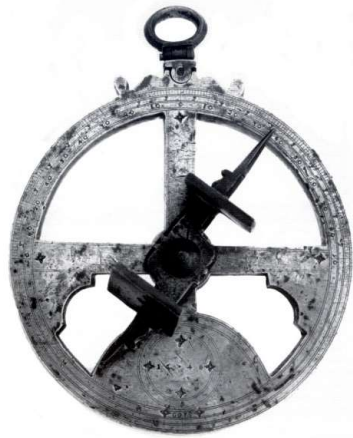
? Crocker Reef

Type 1a4 (b. 1641 to 1656)

Wheel shape (1), base ballast (1a), convex ballast, simple upper post top (1a4)



b. 1641 Concepcion C



1648 Coindreau



b. 1656 Rio Grande do Norte

Type 1a5 (1568 to b. 1668)

Wheel shape (1), base ballast (1a), convex ballast, concave post tops (1a5)



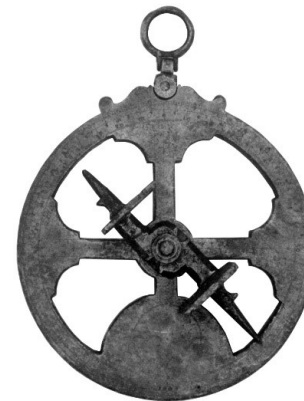
1568 Isle aux Morts



c. 1588 Valencia



1602 Manila



1602 Banda II



1602 Lucayan I



b. 1606 SJB I



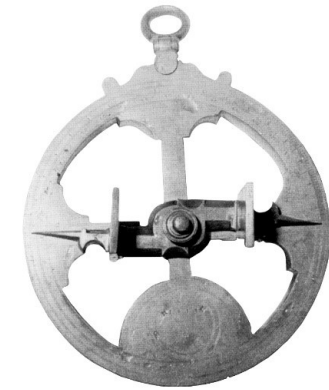
b. 1606 SJB II



1616 Atocha II



1616 Atocha IV



1616 Rincon

Type 1a5 (1568 to b. 1668)

Wheel shape (1), base ballast (1a), convex ballast, concave post tops (1a5)



1619 Concepcion A



b. 1622 Sta. Margarita



b. 1622 Seahawk I



b. 1622 Seahawk II



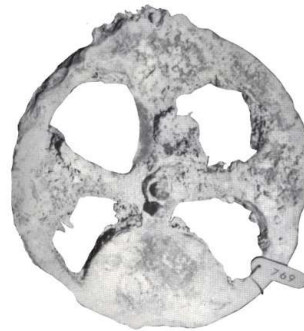
b. 1622 Seahawk III



1642 Sta. Escolástica



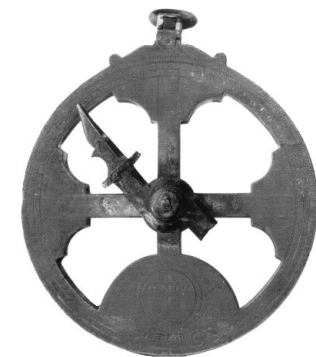
b. 1629 Batavia III



1641 Concepcion B



1645 Passa Pau



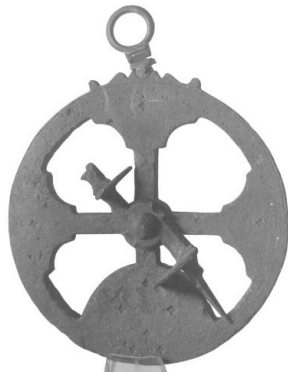
1648 Cadiz I

Type 1a5 (1568 to b. 1668)

Wheel shape (1), base ballast (1a), convex ballast, concave post tops (1a5)



b. 1668 Sacramento A



b. 1668 Sacramento B



? Christie's 1994

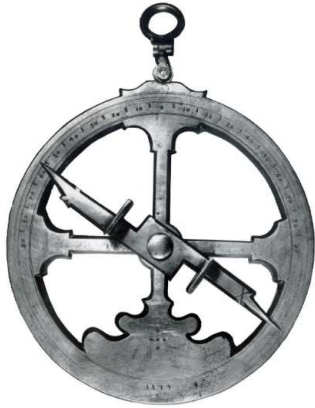
Possibly a false...



? Cadiz III

Type 1a6 (1555 to 1632)

Wheel shape (1), base ballast (1a), complex shape (1a6)



1555 Dundee



b. 1565 Red Bay



1568 Banda I



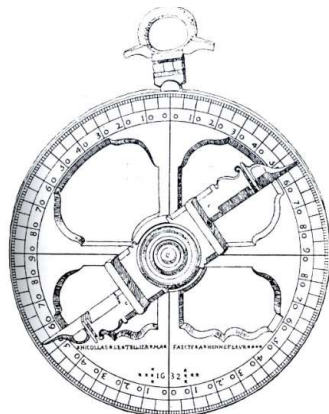
1568 Liddy



1593 San Martin



1617 Isle aux Morts II



1632 Caudebec



? Museo Naval

Type 1a7 (b. 1606 to 1626)

Wheel shape (1), base ballast (1a), ogee shape (1a7)



b. 1606 Nassau



1616 St. Andrews



1626 Skokloster I



? Zacharchuk



? Ile Brehat II

Type 1a8 (c. 1600)

Wheel shape (1), base ballast (1a), complex shape (1a8)



c. 1600 Mewstone



c. 1600 Huelva



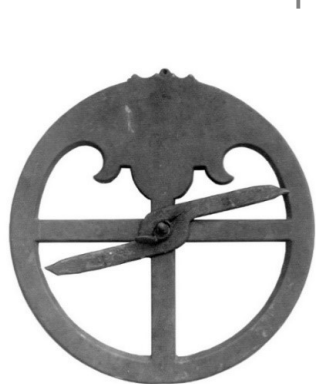
? Ericeira



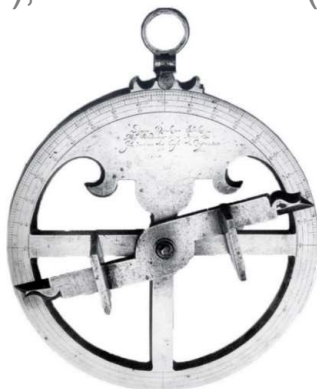
? ARS

Type 1b (c. 1625 to b. 1656)

Wheel shape (1), crown ballast (1b)



c. 1625 Isle of Wight



c. 1626 Skokloster II



c. 1626 Skokloster III



1628 Batavia IV



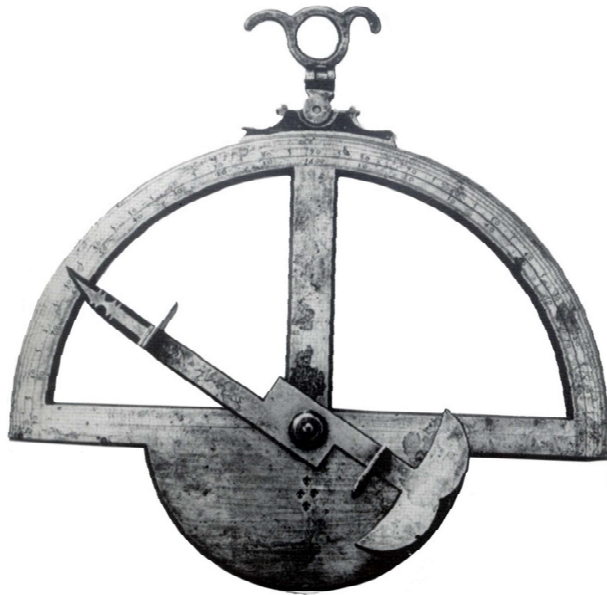
b. 1629 Batavia I



b. 1656 Vergulde Draeck

Type 2a (1600)

Semi-sphere (2), base ballast (2a)



1600 Kronborg

Type 2b (b. 1629)

Semi-sphere (2), crown ballast (2b)



b. 1629 Batavia II

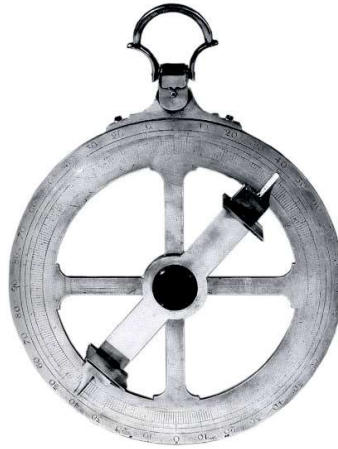
Type 3 No Ballast



c. 1555 Ines de Soto II



1603 Champlain



c. 1700 Felix



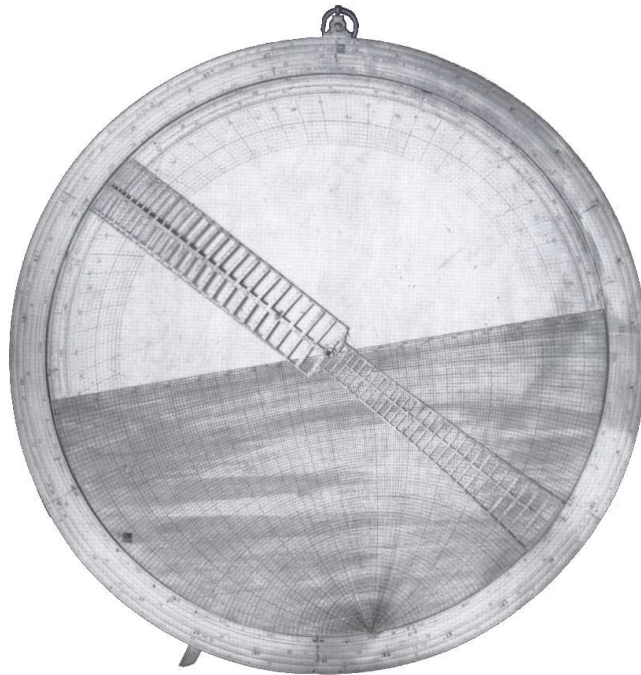
? Raza

Type 4

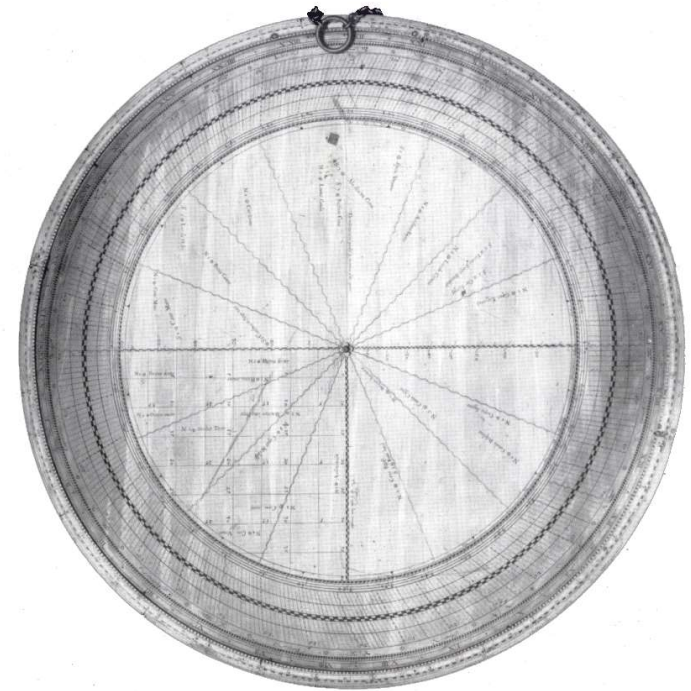
Planisphere (4)



1582 Krabbe



b. 1654 Florence I



b. 1654 Florence II

Type 5

Concentric ring (4)



c. 1725 Madrid I



c. 1760 Madrid II

No Type



? Coimbra



1643 Delalande



c. 1760 Schoonhoven



c. 1600 Arts et Metiers II

Alidades & fragments



? Lady Burgess



b. 1656 Maravillas



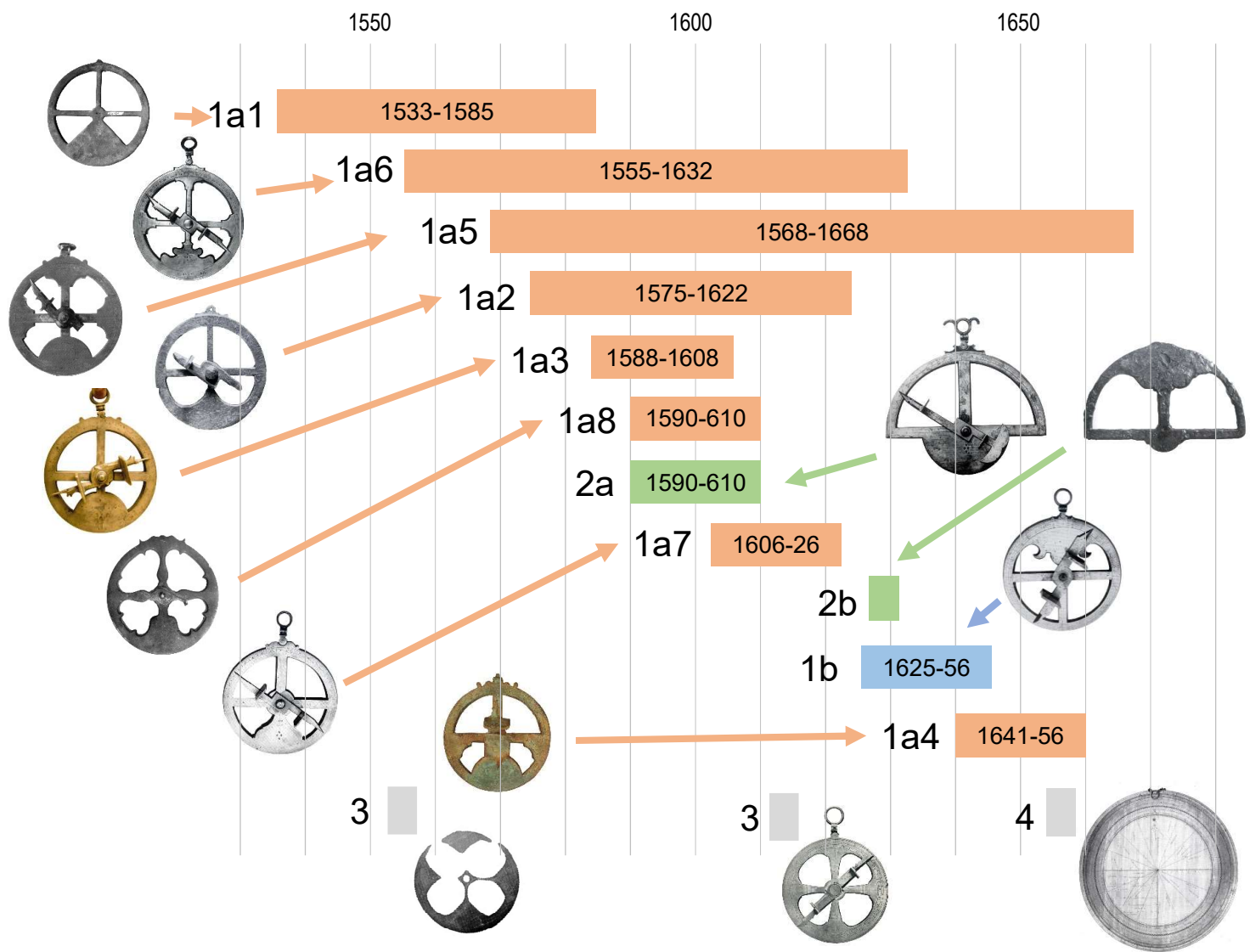
? Lake Hipocee



? Ines de Soto

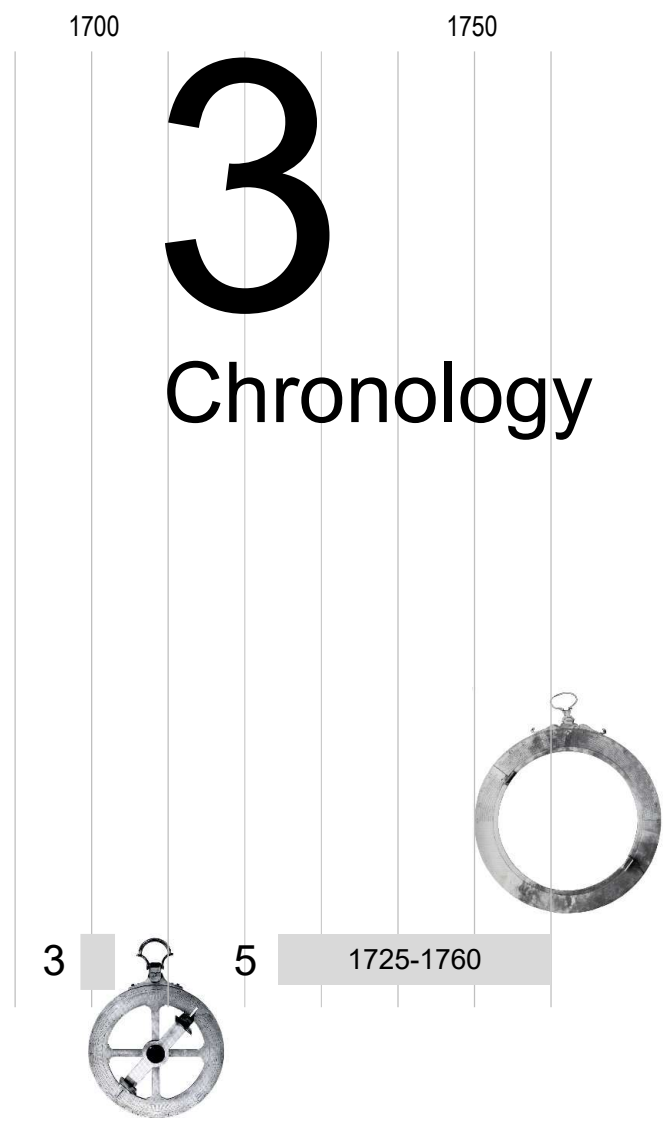


? Lucayan II

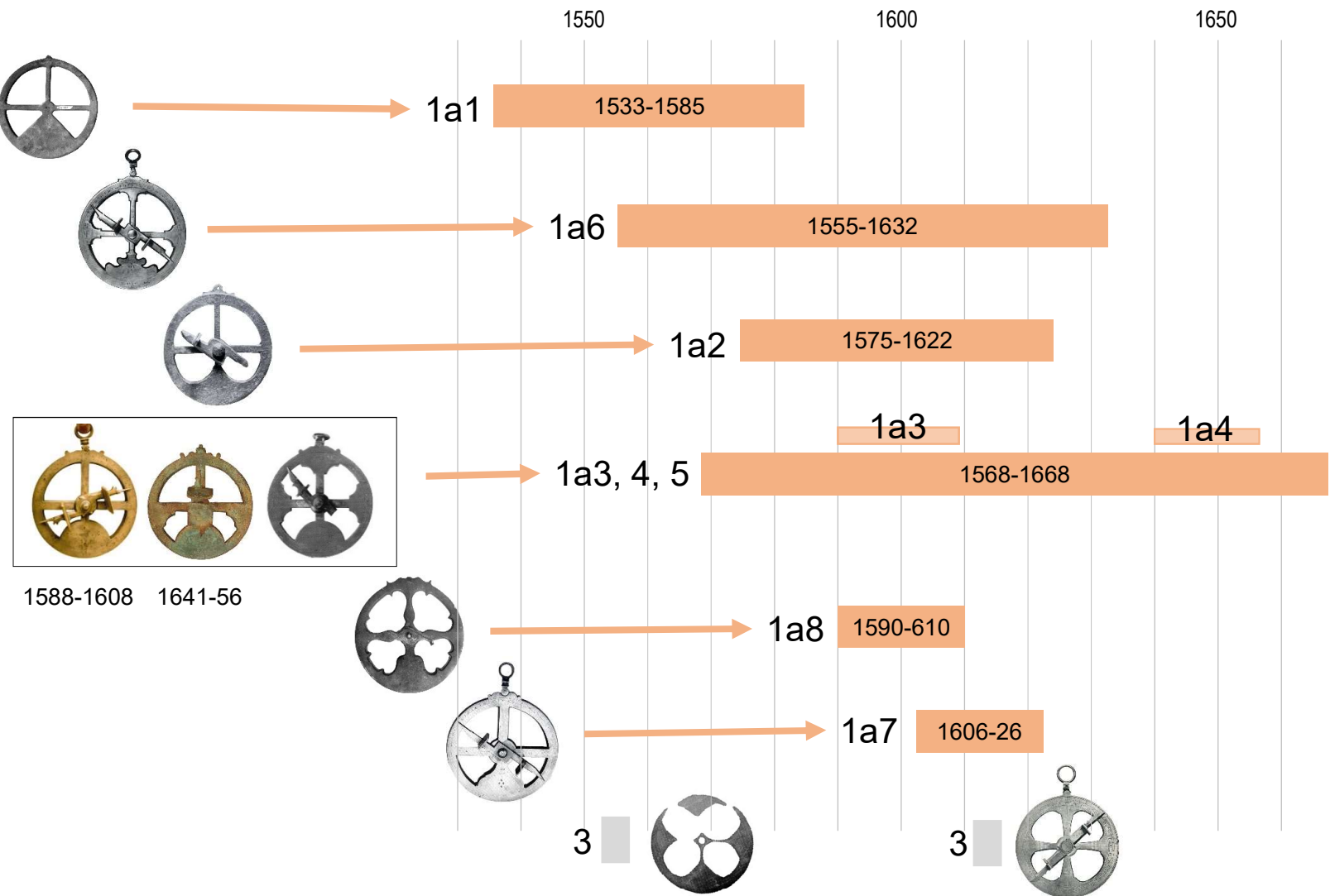


3

Chronology



1a



2a



2a

1590-610

2b



2b



1b

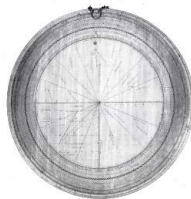
1625-56



1b

1600

1650



4

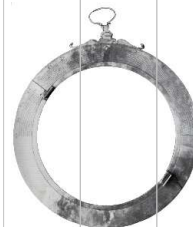


1700

1750



3



5

1725-1760

3

4

5

4

Assemblages from shipwrecks

Shipwrecks show us the dates and styles of astrolabes used at 11 particular moments.



Portuguese Indiaman named *Bom Jesus* and lost on the coast of today's Namibia in 1533 on the way to India





The Orangemund shipwreck was tentatively identified as a Portuguese Indiaman named *Bom Jesus* and lost on the coast of today's Namibia in **1533** on the way to India.

1a1



1a1



1a1



b.1533 *Bom Jesus* I

b.1533 *Bom Jesus* II

b.1533 *Bom Jesus* III



The Padre Island astrolabes are believed to come from the remains of a Spanish outbound ship named *Espiritu Santo*, lost on the coast of Texas during a hurricane in **1554**.

1a1



1550 Padre Island I

1a1



1545 Padre Island II

1a1



1545 Padre Island III



Two astrolabes from the **Ines de Soto shipwreck**, lost in Cuba around **1575**.

1a1



1a



1555 Ines de Soto I (No.86)

? Ines de Soto II (No.87)



Two astrolabes from the **Francisco Padre shipwreck**, lost in Cuba around **1590**.

1a2



Francisco Padre I (No.88)

1a2



Francisco Padre II (No.97)



Two astrolabes from the ship *Girona*, lost in Ireland **1588**.

1a1



Girona I (No.26)

1a2



Girona II (No.27)



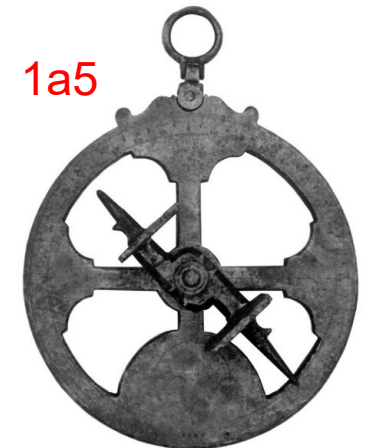
Two astrolabes from the shipwreck *Banda*, lost in the Mauritius Islands in **1615**.

1a6



1568 *Banda* I (No.43)

1a5



1602 *Banda* II (No.56)



Three astrolabes found at the presumable site of *Nossa Senhora dos Mártires* shipwreck, lost in **1606** near Lisbon on its return trip from India.

1a5



? SJB I (No. 78)

1a5



? SJB II (No. 79).

1a3



1605 SJB III (No. 81)



Three astrolabes found at the Dry Tortugas presumable site of a Spanish shipwreck, lost in Florida in **1622**, tentatively identified as a ship named *Buen Jesús y Nuestra Señora del Rosario*.

1a5



? Seahawk I (No. 67)

1a5



? Seahawk II (No. 68).

1a5



? Seahawk III (No. 69)



Five astrolabes found at the *Nuestra Señora de Atocha* shipwreck, a Spanish ship lost in Florida in 1622, on its way to Spain.

1a2



Atocha I (No. 34)

1a5



Atocha II (No. 58)

1a3



Atocha III (No. 59)

1a5



Atocha IV (No. 60)

1a2



Atocha V (No. 61)



Four astrolabes from the shipwreck *Batavia*, lost in Australia in 1629.



? *Batavia* I (No.15)



? *Batavia* II (No.16)



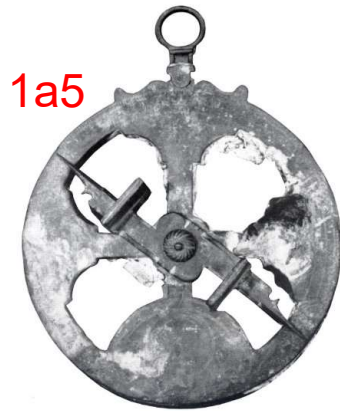
? *Batavia* III (No.36)



1628 *Batavia* IV (No.37)



Three astrolabes from the *Nuestra Señora de la Concepción* shipwreck, lost in the Dominican republic in 1641.



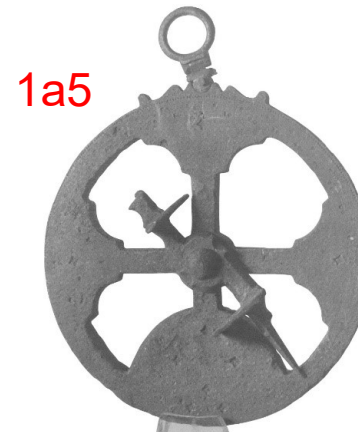
1619 *Concepción* A (No.40)

? *Concepción* B (No.41)

1632 *Concepción* C (No.42)



Two astrolabes from *Santíssimo Sacramento*, a Portuguese galleon lost near Salvador, Bahia, Brazil in 1668.



Sacramento A (No.38) *Sacramento* B (No.39)

A third astrolabe, very eroded, is said to have been found on this site and exist in a private collection.

5 Astrolabe makers

A third part of this talk pertains to the astrolabe makers. In the small collection we have it is possible to identify some makers and ateliers.



No. 03 FACIEBAT IOHANNES
KRABBE MUNDENSIS 1582



No. 13 Symen Dirckxen Blocker, Myn
Rondicheyt te Pryssen, Ick Vaer mee
hoogt te Wysen



No. 11 ELIAS ALLEN FECIT 1616



No. 17 NICOLAS LE TELLIER MA
FAICTE A HONNEFLEUR

The Gois family

Eleven astrolabes have the words “GOIS” or “A GOYS” engraved, or just the letter “G”. The dates of these astrolabes span a period starting in 1593 and ending sometime after 1656 and 1668. All these astrolabes are type 1a and subtypes 1a2, 1a3, 1a4, and 1a5.

Astrolabe	Date	Mark	Diameter [mm]	Thickness [mm]	Weight [gr]
Funchal (NMM 100)	1593	GOIS	188	-	3570
Francisco Padre II (NMM97)	No date	SEBASTIAO DE GOIS			
Atocha III (NMM59)	1605	G	156	18/20	2180
SJB III (NMM 81)	1605	G	174	20/21	2843
Florence (NMM 9)	1608	GOIS	197	15	2360
Sta. Escolástica (NMM 49)	1624	GOIS	169	20/21	2950
Concepción C (NMM 42)	1632	GOIS	165	23	2638
Coindreau (NMM 25)	1648	A GOYS	161	20	2530
R.G. do Norte (NMM 90)	1656	A GOYS	166	23	2240
Sacramento A (NMM 38)	b. 1668	A GOYS	173	20	2565
Sacramento B (NMM 39)	b. 1668	A GOYS	171	20	2320



Funchal (No. 100)
GOIS
1593
Ø 188 mm

1a2



Florence (No. 09)
GOIS
1608
Ø 197 mm

1a3

Santa Escolástica (No. 49)
GOIS
1624
Ø 169 mm



1a5

Concepción C (No. 42)
GOIS
1632
Ø 165 mm



1a4

Francisco Padre II (No. 97)
SEBASTIAO DE GOIS
(c. 1590)
Ø ?



1a2

Atocha III (No. 59)
G
1605
Ø 156 mm



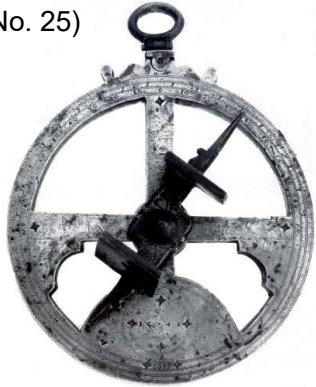
1a3

SJB III (No. 81)
G
1605
Ø 174 mm



1a3

Coindreau (No. 25)
A GOYS
1648
Ø 166 mm



1a4

Rio Grande do Norte (No. 90)
A GOYS
1656
Ø 166 mm



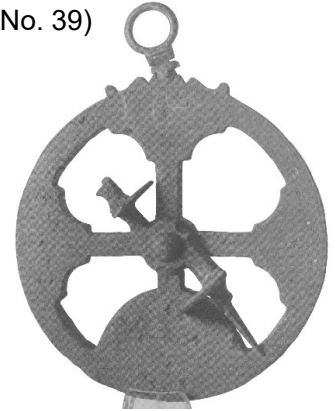
1a4

Sacramento A (No. 38)
A GOYS
(b. 1668)
Ø 173 mm



1a5

Sacramento B (No. 39)
A GOYS
(b. 1668)
Ø 171 mm



1a5

The Dias family

Three astrolabes have the words “Y DIAS.”

The dates of these astrolabes span a period starting in 1614 and ending in 1628. All these astrolabes are type 1a5.

Astrolabe	Date	Mark	Diameter [mm]	Thickness [mm]	Weight [gr]
Atocha IV (NMM 60)	1614	Y DIAS	172	20t/21b	2817
Concepción A (NMM 40)	1619	Y DIAS	175	21	2947
Isle aux Morts (NMM 44)	1628	G	172	21	2989

Atocha IV (No. 60)
Y DYAS
"16*14" between two stars
1a5

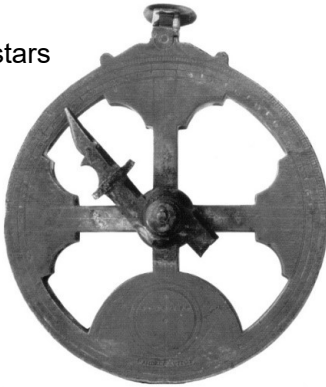


Isle aux Morts (No. 44)
Y DIAS
1628
1a5



Cadiz 1 (No. 64)
ANDRE RUFFO
"16*48" between four stars

1a5



Passa Pau (No. 84)
NICOLA? RVFFO
"16*45" between four stars

1a5



Atocha 2 (No. 58)
|
"1616" between four stars

1a5



Isle aux Morts 2 (No. 74)
ADRIAN HOLLAND
1617
"A ?O?NETE..."

1a5



Madrid 2 (No. 52)
E. Nairne
London



Schoohoven (No. 53)
Dollond
London





Muito Obrigado!