

The Identity & Maritime History of the Deep-Sea Tortugas Shipwreck

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From 1990-91 Seahawk Deep Ocean Technology of Tampa, Florida, conducted the world's first comprehensive deep-sea shipwreck excavation on a small *navio* from the Tierra Firme Spanish fleet lost off the Florida Keys on 5 September 1622. Archival documentation does not specify the names of all this fleet's ships. The fate of the smaller merchant vessels not connected to the transport of royal taxes or consignments are particularly neglected. A combination of historical and archaeological research suggests that the best fit identification for the deep-sea Tortugas shipwreck is the Portuguese-built and Spanish-operated 117-ton *Buen Jesús y Nuestra Señora del Rosario*.

The outward-bound final destination of this *navio* to Nueva Cordoba, Cumana along northeast Venezuela's Pearl Coast, would explain the consignment of pearls associated with the wreck. The recorded length of the Tortugas ship's keel also corresponds to the size of the *Buen Jesús* as specified in its outbound manifest based on Spanish *Ordenanzas* shipbuilding regulations. Cumana was particularly renowned in the 1620s for the cultivation of high value tobacco, and it is proposed that the *Buen Jesús* may have been transporting a significant cargo of this plant to Seville when disaster struck.

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1. The 1622 Tierra Firme Fleet

Establishing the identity of the deep-sea Tortugas wreck is compounded by complex methodological problems. First and foremost, contemporary accounts of the 24-hour hurricane that enveloped the Florida Keys on 4-5 September 1622 concentrated on the fate of the major 'treasure' ships in the Tierra Firme fleet. References to the smaller, less valuable merchant vessels that were not transporting Crown property received cursory coverage. In addition, the same ship is often cited under multiple different names or just by the name of the owner or captain, some of whom do not match listed personnel. On occasions, a ship and owner/captain's name seems to be conflated. Multiple vessels also carried the same name.

The sources concur, however, on the basic timeframe of events and the climatic conditions preceding the tragedy. Historical documents, notably *A True Relation of that Which Lately Hapned to the Great Spanish Fleet, and Galeons of Terra Firma in America* (1623), and primary documentation collated by Martín Fernández de Navarette (1971, Tomo XII, 1371, fols 128-35), confirm that the Tierra Firme fleet set sail from Portobello on 22 July 1622 and reached Cartagena on 27 July (AGI *Contratación* 5116; Fig. 15). On 3 August the ships continued towards Havana, where they dropped anchor on 22 August to prepare for the home voyage to Spain (Fig. 16). The following day the fleet general ordered every ship to register its gold, silver,

bullion, merchandise and other commodities in the account books with a view to sailing on 28 August.

To discuss the optimum date of departure, the Governor of Havana called a council with the General commanding the soldiers, the Admiral of the Armada, the Captain General of the Fleet and his Admiral, the Supervisor of the Treasury. Despite prevailing fair weather, the collective wisdom favored remaining in port pending the lunar conjunction, expected on 5 September, which "did commonly in those parts bring clouds and obfuscation of ayre, which would not vanish without tempests, and turbulent winds" (*A True Relation*, 1623).

Behind schedule and well into hurricane season, 28 ships with their "Admirall", eight galleons, three *pinaces* (presumably *pataches*, small fleet dispatch ships) and "other attendants upon the Fleet, with their consorts" eventually weighed anchor at sunrise on Sunday 4 September. Rather than head directly for the Bahama Channel, the fleet spent the day tacking in front of Havana, monitoring whether the lunar conjunction was likely to improve conditions.

By Monday 5 September the fleet was underway at the worst possible time: the weather window had indeed changed and the incoming winds turned to the northeast. A storm was brewing and the ships wound up their mainsails, tied them fast to the yards and continued solely under the power of their mizzen sails. The wind strengthened and started to whistle, the clouds thickened and the horizon

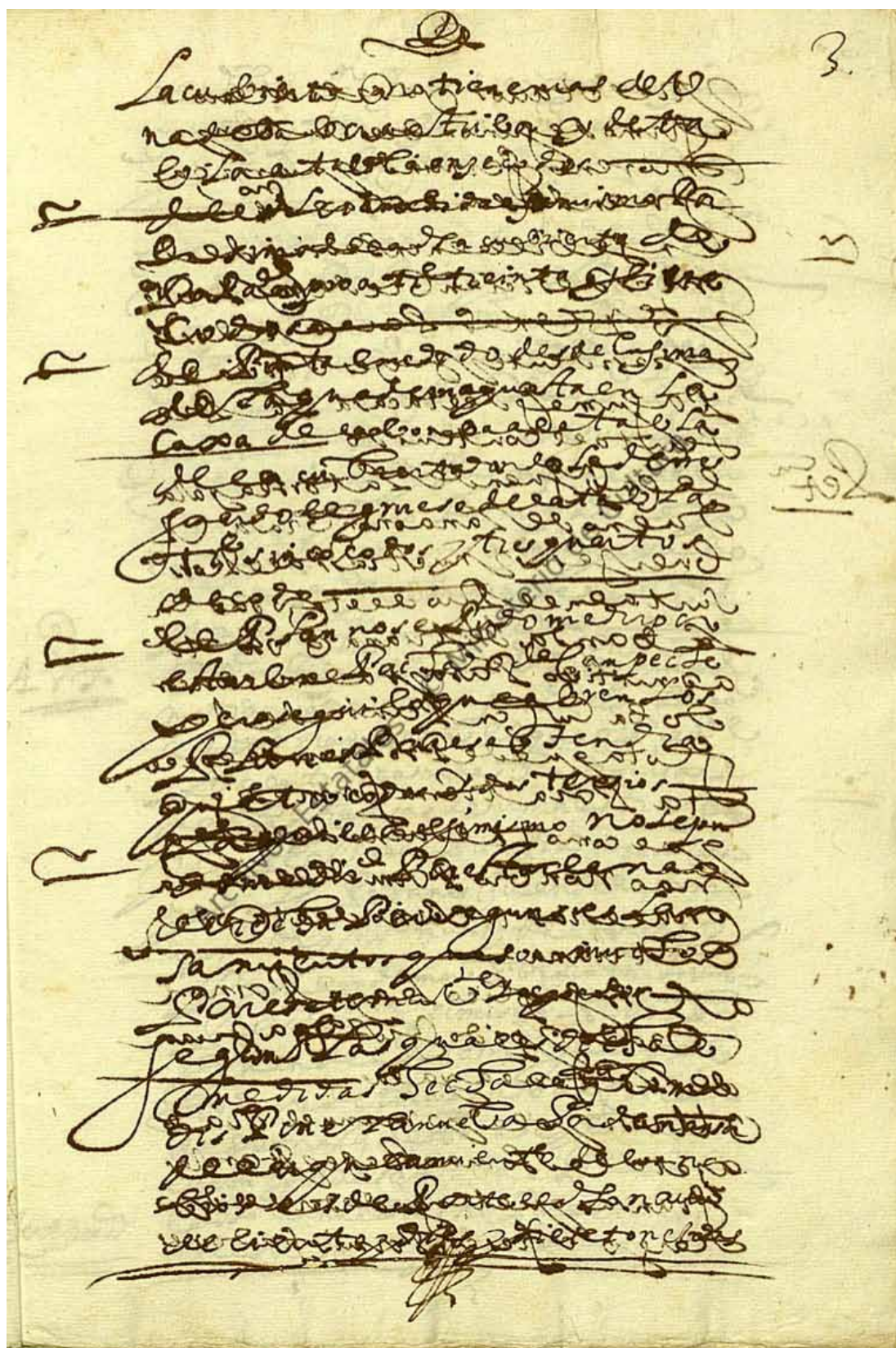


Fig. 1. Section of the Spanish manifest of the Buen Jesús y Nuestra Señora del Rosario, identified as the merchant vessel lost in September 1622 at the Tortugas shipwreck site off the Florida Keys. Photo: Archivo General de Indias, Contratación 1172, N.2, R.1.

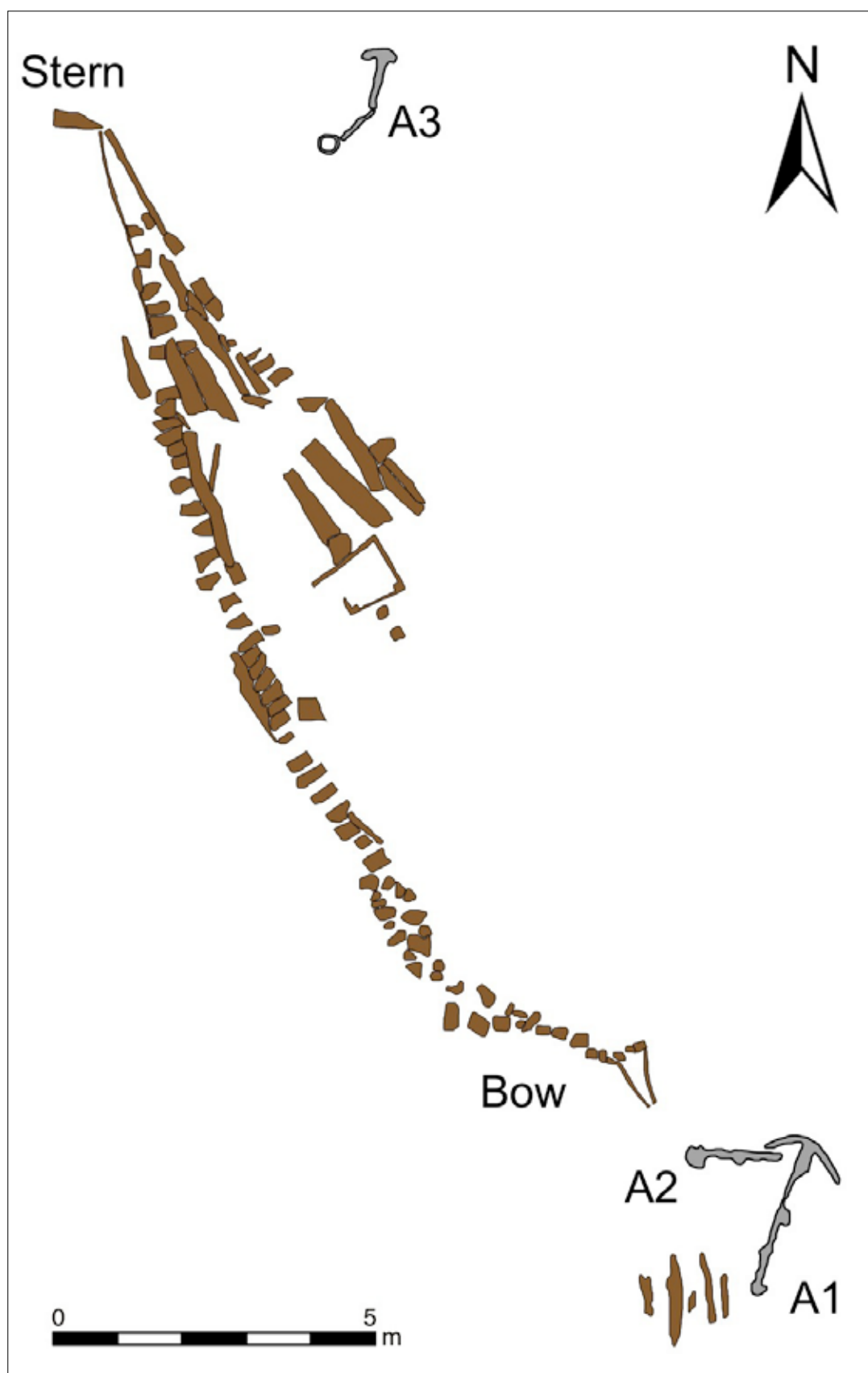


Fig. 2. Plan of the Tortugas shipwreck hull as partly excavated in 1990-91.

turned overcast. At sunrise the fleet was very close to the Tortugas Islands and 'Bajos de los Martires' when the hurricane hit (Fig. 17).

The air became so dark that the fleet ships lost sight of one another. Before midday (*A True Relation*, 1623):

"all the Galeons were dissipated and dissevered, and the most part of the Fleet for their better passage went before the wind, tooke a course to save themselves as well they could: In which violence they were driven from one another, and the wind continued so impetuous, that it not only unloosened their tacklings and sayles, but brake asunder their fore-masts, and rent their maine yards in shivers, so they had not shift but to beare no sayle at all, or crosse the wind as they could."

The waves continued to roll, and then the wind turned to the south, rain started to fall and the seas ran very high.

Another source places the time when the hurricane struck at 7am (AGI *Contratacion* Gen. 1144). The ships remained victims of the elements and incapable of steering under sail until 3pm, a condition that forced the 630-ton *Santa Margarita's* mainmast to snap and its rudder to break. The storm continued to rage until the morning of Tuesday 6 September, leaving behind a trail of devastation. The surviving ships headed back to Havana for repairs and to survey the damage, limping into port between 10-14 September. On Monday 12 September only 10 ships had returned safely to port, seven merchant vessels and three galleons, all dismasted and full of water (including the *capitana* of the fleet, *Nuestra Señora del Rosario*, *Santa Ana la Real* and the *Nuestra Señora de la Candelaria*). Sources loosely report that five galleons, 11 other ships, plus "some others" from the Tierra Firme fleet eventually reached Havana safely (AGI *Mexico* 29, N. 101, Doc. 3).

On all eight wrecks scattered across more than 80km of the Florida Keys as far east as the Marquesas Keys, around 550 people, including 121 priests, drowned (Lyon, 1989: 68; Mathewson, 1986: 24). The gold, silver, pearls, indigo, cochineal, tobacco and other products lost were valued at 4,000,000 *pesos*. The wrecked *Atocha* and *Margarita* alone were transporting a registered million and a half *pesos* each, of which 254,000 *pesos* belonged to the king (AGI *Contratacion* 5116).

The total number of ships lost on the Florida Keys varies within historical documentation between seven and nine. The sunken treasure ships included the *Atocha*, *Margarita* and the *Nuestra Señora del Rosario*, which was entirely salvaged soon after in a cay near the Tortugas islands. Nearby to the *Rosario* a fleet *patache* sank in the shallows.

Of the remaining casualties the historical testimony is frustratingly limited, presumably because these ships sank

in deep water during the hurricane, where their movements went largely unobserved. *A True Relation* merely states that two "Ships of the Fleet" were lost "before they could approach the shore". A 'Communication from Don Luis de Cordoba to Crown Havana', dated 10 December 1622 (AGI *Santo Domingo* 132; cf. Lyon, 1989), also referred to "two moderate-sized ships of the convoy, which capsized in the force of the weather." The same generalization eventually circulated in London's *News of the Week* for 26 May 1623, which reported that "In the same hour, with the same tempest, and almost at the same place" as the loss of the *Atocha* and *Margarita*, "two ships of the fleet were swallowed in the sea, and perished before they could reach shore." These deep-water casualties are strong candidates for the Tortugas shipwreck.

The only historical source that specified names for this lost group merely stated that "Also three merchant *naos* were lost, that of Juan de la Torre Ayala, of Gaspar Gonzales de los Reyes and of Fulano Virgilio; all these sinking completely with no survivors on them" (Navarette, Tomo XII, 1371, fols 128-35).

Lyon's well-researched summary of events (1989: 62-6) concluded that five ships were swept towards the Florida Keys and sank in the shallows: the *Rosario*, the fleet *patache* (tender), a Portuguese slaver, the *Margarita* and the *Atocha*. One further small ship, the *Buen Jesús*, which apparently had lost both masts and its rudder, "fell farther and farther behind the other vessels and was finally lost to sight", while the small *Nuestra Señora de la Consolación* struggled along under a close-reefed foresail and abruptly capsized.

Research consulted by Barnette (2003) concurred that the *Nuestra Señora de la Consolación* of Captain Gonzalo Perez capsized in deep water and remains undiscovered. Barnette suggests that the Tortugas wreck excavated by Seahawk equates possibly to the *Nuestra Señora de la Merced* of Captain Juan de Campo. Such a correlation is improbable (see Section 2 below), not least because the *Merced* is now believed to be a 'ghost galleon' that did not actually sail with this fleet (Moore, 1991).

2. The Identity of the Tortugas Shipwreck

For the sake of objectivity it must be acknowledged that the Tortugas region of southernmost Florida is a sprawling ship's graveyard, where myriad vessels met their fate and where 241 casualties of all periods have been documented (Murphy and Jonsson, 1993: 144). Some of these date close to the disaster of 1622. A small *patache* carrying mail foundered about 3 leagues off the Dry Tortugas in 1621 en route from Veracruz to Spain; the flagship and the galleon

Espiritu Santo both sank in the Florida Straits in 1623; one of two galleons sent to the Keys to protect salvors working the *Margarita* from attack by Dutch privateers went down 4 leagues to windward of the *Atocha*; a salvage vessel foundered in 1625; two galleons of the Tierra Firme fleet of 1630 carrying supplies from Havana to St. Augustine were wrecked at the head of the Florida Keys; and, finally, a ‘relief ship’ sailing from New Spain to St. Augustine was lost in 1691 (Marx, 1969: 42-3; Bearss, 1971: 43; Skowronek, 1982: 9; Flow, 1999).

The Tortugas shipwreck’s material culture, however, so closely matches sets excavated from the *Atocha* and *Margarita* that there can be no doubt that it comprised part of the fleet returning to Spain that sunk off the Florida Keys on 5-6 September 1622 (Stemm *et al.*, 2012). The Tortugas coin assemblage includes no issues post-dating 1622 and the latest match by mint and assayer those recorded on the *Atocha* and *Margarita* (cf. Tedesco, 2012). Additional sets of artifacts recovered from the *Atocha* are duplicated on the Tortugas site in the form of gold finger bars stamped with identical mint, *quinto* and karat quality production marks, while the four forms of olive jars (including parallel *graffiti* notations), the tablewares (Columbia Plain, Blue-on-Blue Seville maiolica, Blue ‘Morisco’ ware) and non-Spanish kitchen colonowares clearly originated in the same kilns as the ceramic wares from the *Atocha* (Kingsley *et al.*, 2012). Other parallel artifacts include the astrolabes, beads and a bronze mortar and pestle.

While contemporary historical sources focused on the king’s gold and silver lost on the fleet’s largest ships, the *Atocha*, *Margarita* and *Rosario*, references to the fate of the smaller merchant vessels were cursory. No official list of lost merchant vessels has survived into the modern day. Various sources cite the seven or eight ships wrecked off the Florida Keys on 5-6 September 1622 as comprising:

- The *Atocha*.
- The *Margarita*.
- The *Nuestra Señora del Rosario*.
- A *patache*.
- Three to four other vessels (most commonly cited in accounts).

The *Atocha* and *Margarita* discovered and excavated by Mel Fisher and his team are the most celebrated shipwrecks of the Florida Keys and have inspired numerous popular publications and preliminary scientific notes (Mathewson, 1986; Lyon, 1989; Malcom, 1990; 1993; 1998; Smith, 2003; Tedesco, 2010) and an excellent analysis of the ceramic record (Marken, 1994). The lost *Nuestra Señora del Rosario* and *patache* can be safely discounted from the



Fig. 3. The port of Seville c.1590 by Alonso Sanchez Coello, with a detail of a merchant vessel moored along the Guadalquivir river of comparable form to the Tortugas ship.

current investigation. Sources unanimously agree that the *Rosario* galleon ran aground on a cay, largely identified as Tortugas (*A True Relation...* 1623; ‘Communication from Marquise of Cadereita... 1623’; ‘Communication from General Don Francisco Venegas... 1624’; Navarette, 1971, Tomo XII, 1371, fols 128-35; Marx, 1969: 42; Barnette, 2003: 141-4). The ship’s company all survived to report the wreck’s location (*A True Relation...* 1623):

“The Galeon of our *Lady del Rosario*, wherein Captaine Chacurretta was Commander, likewise perished, not without great suspition beforehand: she rann aground, as the Admirall did, so that none of the Ships that came into the Harbour could give an account of her, until a certaine Barke arrived the 22 of September at the Port of Havana with Letters from the said Captaine, which advertised them, that the said Galeon perished in Tortuga, all the company escaping miraculously, who had the fortune to save themselves with convenient victual and necessary suppliments, keeping firme stations on their chests, masts, and such other things.”

The *Rosario* was subsequently located by a salvage operation on 24 September 1622 “grounded on one of the keys”. All the crew and passengers were saved and the wooden structure above the waterline burned to expose the treasure within the hull, resulting in the recovery of all the silver and 20 pieces of artillery (AGI *Santo Domingo* 132; Lyon, 1989). Following the salvage of equipment valued at more than 6,000 or 7,000 ducats, another report confirmed that Vargas “began the operation of salvaging the silver, first setting fire to the galleon, to burn it down to water-level. In this way he recovered all the treasure, artillery, and copper which she carried and brought it all back to this port

Ship Name	Shipmaster	Owner	Ship Type	Tonnage	Direction
<i>N.S. de la Candelaria</i>	Pedro de Vargas	Antonio Ruiz Navarrete	Galleon (Havana)	650	Tierra Firme
<i>N.S. de la Consolacion</i>	Gonzalo Perez	Juan de Miranda	Navio (Triana)	180	Tierra Firme
<i>San Diego</i>	Pedro Gutierrez	Antonio Malla de Salcedo	Navio (Indias)	180	Tierra Firme
<i>N.S. del Buen Sucesso</i>	Gaspar Ochoa	Gaspar Ochoa	Navio (Portugal)	90	Tierra Firme
<i>N.S. del Rosario</i>	Bernabe de Ibarra	Pedro Diaz Franco	Navio (Havana)	100	Venezuela
<i>N.S. de los Reyes</i>	Diego Gallardo	-----	Navio (Seville)	180	Venezuela
<i>N.S. de Guia</i>	Juan Rodriguez de Acosta	-----	Navio (Triana)	100	Rio de la Hacha
<i>Santa Cruz</i>	Martin de Carbuera	Martin de Carbuera	Navio (Havana)	100	Jamaica
<i>Jesus y N.S. del Rosario</i>	Manuel Diaz	Juan de la Torre	Navio (Portugal)	117	Nueva Cordoba
<i>Santa Ana</i>	Sebastian Martin Hidalgo	-----	Navio (Margarita)	115	Margarita
<i>San Francisco</i>	Bartolome Garcia	Pedro Gonzalez	Navio	110	Cumana
<i>N.S. de la O</i>	Diego Guerra	Francisco Diaz Pimienta	Navio (Triana)	90	Cuba
<i>San Antonio (N.S. del Rosario)</i>	Tomas Felipe [Josefe de Licarça]	-----	-----	100	Santa Marta
<i>N.S. de Rosario</i>	Pedro Ortiz de Ibarrola	-----	Felibot (frigate of Havana)	110	Florida
<i>N.S. de Valvaneda</i>	Juan de Urriola	Estevan Blanqueto	Nao (Campeche)	500	Tierra Firme

Table 1. Tierra Firme fleet ships outward-bound to the Americas in April 1622 (Chaunu and Chaunu, 1956: 26-29).

with the people who were saved” (‘Communication from General Don Francisco Venegas, Governor and Captain-General of the Island of Cuba and the City of San Christobal of Havana, for the King Our Lord’; Lyon, 1989).

Site FOJE-UW-9 near Loggerhead Key, trial-trenched off the Dry Tortugas in 1982 by the Southeast Archaeological Center (SEAC), the University of South Florida and the FSU Marine Laboratory, is a possible candidate for the *Rosario*. The surface materials include Middle Period Spanish olive jar fragments, glass fragments, a wrought iron swivel gun, a wood fragment, brass fastener, galley tiles, ballast, a buckle and iron fasteners, which, combined with the site’s geographical location, is considered to be generally consistent with the documented sinking of the 600-ton *Rosario*, the only large early 17th-century vessel lost in that section of the Dry Tortugas. However, no specific temporal or cultural affiliation has been assigned to FOJE-UW-9 and no ballast pile typifying the wreck of a large ship has been identified (Johnson, 1982: 1, 20, 22, 28-9).

The nearby site FOJE-UW-17 associated with six swivel guns, significant quantities of olive jar fragments, ballast stones and other ferrous material has been assigned a probable 16th or 17th-century Spanish identity. The best guess concerning the site is that it represents a contemporary 1622 salvage vessel that sank in a second hurricane while attempting to salvage the *Rosario* (Johnson, 1982: 25, 28-9, 35-6).

Due to its shallow geographical proximity to the *Rosario* (Marx, 1969: 42), the *patache* (designed to carry dispatches, survey forward of advancing fleets and guard entrances to ports) may also be excluded from attempts to define the deep-sea Tortugas shipwreck. According to a ‘Communication from Don Luis de Cordoba to Crown Havana, Dec. 10, 1622’ (AGI *Santo Domingo* 132; Lyon, 1989), “the fleet armada *patache*... grounded in Tortuga”. Barnette (2003: 141-4) has suggested that this wreck may possibly correspond to the ‘Coast Guard Dock Ballast Pile’ site.



Fig. 4. The port of Seville c.1590 by Alonso Sanchez Coello, with the Americas fleet preparing to sail. The merchant vessels along the banks of the Guadalquivir river are of comparable form to the Tortugas ship.

No archaeological data link the 19m-long Iberian 'Mystery Wreck', located at a depth of 6m off Marathon in the Florida Keys, with one of the missing 1622 Spanish ships, although the site has been interpreted as the possible remains of an *aviso* or dispatch vessel traveling in the company of other ships in the first half of the 17th century. Material culture recovered from the 'Mystery Wreck' includes ballast stones, encrusted iron objects, 208 musket balls, 127 grape shot, 34 lead shot, three cannonballs, firebricks, wood, a rudder gudgeon, a piece of melted copper, one piece of bone, lead sheathing, a broken *mano* (grinding stone), an anchor and anchor ring, olive jar body sherds and four olive-jar necks (McKinnon and Scott-Ireton, 2006: 187, 193; Smith *et al.*, 2006: 19).

The three or four additional losses associated with the Tierra Firme fleet of September 1622 outside the major large silver galleon group of the *Atocha*, *Margarita* and the *Rosario* are generally cited in disparate contemporary sources as being associated with:

- Juan de la Torre Ayala.
- Gaspar Gonzales de los Reyes.
- Fulano Virgilio.
- Navarette also mentions a Portuguese frigate (excluded because the Tortugas ship was a merchantman) and a *nao vizcatna* (from Biscay) of Pedro de Vargas (presumably the 650-ton *Nuestra Señora de la Candelaria*, actually lost off San Lucar, Spain, outward bound: Chaunu and Chaunu, 1956: 26-7; Moore, 1991).

Chaunu and Chaunu's *Séville et l'Atlantique* confirms the name of Juan de la Torre Ayala's ship as the *Buen Jesús y Nuestra Señora del Rosario* (Manuel Diaz master, *navio*, built in Portugal, 117 tons, outward bound to Nueva Cordoba in Venezuela; Table 1). No other ships of the Tierra Firme fleet cited in *Séville et l'Atlantique* were either owned or captained by a Gaspar Gonzales de los Reyes or a Fulano Virgilio. Bearing in mind that names were often confused and conflated, of potential tangential relevance within the Tierra Firme fleet may be a Gonzalo Perez, master of the *Nuestra Señora de la Consolacion*, a Gaspar Ochoa who owned the *Nuestra Señora del Buen Sucesso* and a Pedro Gonzalez who owned the *San Francisco*. Moore (1991) has also suggested that the name Gaspar Gonzales de los Reyes may have become confused with the actual name of the ship the *Nuestra Señora de los Reyes*. To this pattern of uncertainty is the generic tendency in Spanish history to use 'Fulano' to mean 'Anybody' when an individual's name was unknown (pers. comm. Greg Stemm, 5 October 2012; Claudio Lozano Guerra-Librero, 8 October 2012).

The long-list for the possible identity of the Tortugas wreck based on the outward-bound Tierra Firme fleet listed by Chaunu and Chaunu (1956: 26-9) thus comprises:

- *Buen Jesús y Nuestra Señora del Rosario* (master Manuel Diaz, owner Juan de la Torre, *navio* of Portugal, 117 tons, outward bound to Nueva Cordoba).
- *Nuestra Señora de la Consolacion* (master Gonzalo Perez, owner Juan de Miranda, *navio* of Triana, 180 tons, Tierra Firme).

Codos					
Length	34	36	39	41	45
Keel	28	30	32	34	36
Breadth	9	10	11	12	13
Rake Stern	2	2	2 ¼	2 1/2	3
Rake Stem	4	4	4 ¾	5	6
Depth	4	4 1/2	5	5 1/2	6
Tonnage (toneladas)	80 ¾	106 1/8	157*	198	251

* This tonnage is not provided by Fernández-González (2009: 12) and instead derives from Rodríguez Mendoza (2008: 179, table 11).

Table 2. Dimensions established by Ordenanzas of 1618 in codos (from Fernández-González, 2009: 12).

Meters					
Length	19.53	20.68	22.41	23.56	25.86
Keel	16.09	17.24	18.38	19.53	20.68
Breadth	5.17	5.74	6.32	6.89	7.47
Rake Stern	1.14	1.14	1.29	1.43	1.72
Rake Stem	2.29	2.29	2.72	2.87	3.44
Depth	2.29	2.58	2.87	3.16	3.44
Tonnage	80 ¾	106 1/8	157*	198	251

* This tonnage is not provided by Fernández-González (2009: 12) and instead derives from Rodríguez Mendoza (2008: 179, table 11).

Table 3. Dimensions established by Ordenanzas of 1618 in metric equivalent to the codos (one shipbuilder cubit = 57.468cm) (from Fernández-González, 2009: 12).

- *Nuestra Señora del Buen Suceso* (master Gaspar Ochoa, owner Gaspar Ochoa, *navio* of Portugal, 90 tons, Tierra Firme).
- *San Francisco* (master Bartolome Garcia, owner Pedro Gonzalez, *navio*, 110 tons, Cumano).
- *Nuestra Señora de los Reyes* (master Diego Gallardo, owner unknown, *navio* of Seville, 180 tons, Venezuela).
- *Buen Jesús y Nuestra Señora del Rosario* (master Manuel Diaz, owner Juan de la Torre, *navio* of Portugal, 117 tons).
- *Nuestra Señora del Rosario* (master Bernabe de Ibarra, owner Pedro Diaz Franco, *navio* of Havana, 100 tons).
- *Nuestra Señora de los Reyes* (master Diego Gallardo, *navio* of Seville, 180 tons).
- *Santa Ana* (master Sebastian Martin Hidalgo, *navio* of Margarita, 115 tons).
- *San Francisco* (master Bartolome Garcia, owner Pedro Gonzalez, *navio*, 110 tons).

The material culture of the Tortugas ship is strongly linked through its ceramic assemblage to Seville. In theory, this might exclude the *Buen Jesús y Nuestra Señora del Rosario*, a *navio* of Portugal. However, this vessel sailed with the *flota* from the Guadalquivir River and thus had clearly visited Seville (AGI *Contratación* 1172, N.2, R1). For this reason this ship cannot be excluded. Whether the *Buen Jesús* commonly operated out of Portugal or was just built there and subsequently relocated to Spain remains undetermined from the historical record.

The presence of 6,639 pearls on the deep-sea Tortugas shipwreck also points to direct or indirect commerce with Venezuela's northeastern coast. Known Tierra Firme vessels that travelled outward to Venezuela in 1622 included:

Of these outward-bound ships the *Nuestra Señora del Rosario* may be excluded from the long list because it seems to have been local to the Americas and was not involved in a round trip back to Spain. The ship's owner and master did not possess corruptions of names that include permutations of any word in Gaspar Gonzales de los Reyes or Fulano Virgilio, and the *Rosario* was also seemingly too small to correspond to the deep-sea Tortugas wreck (see Section 3 below).

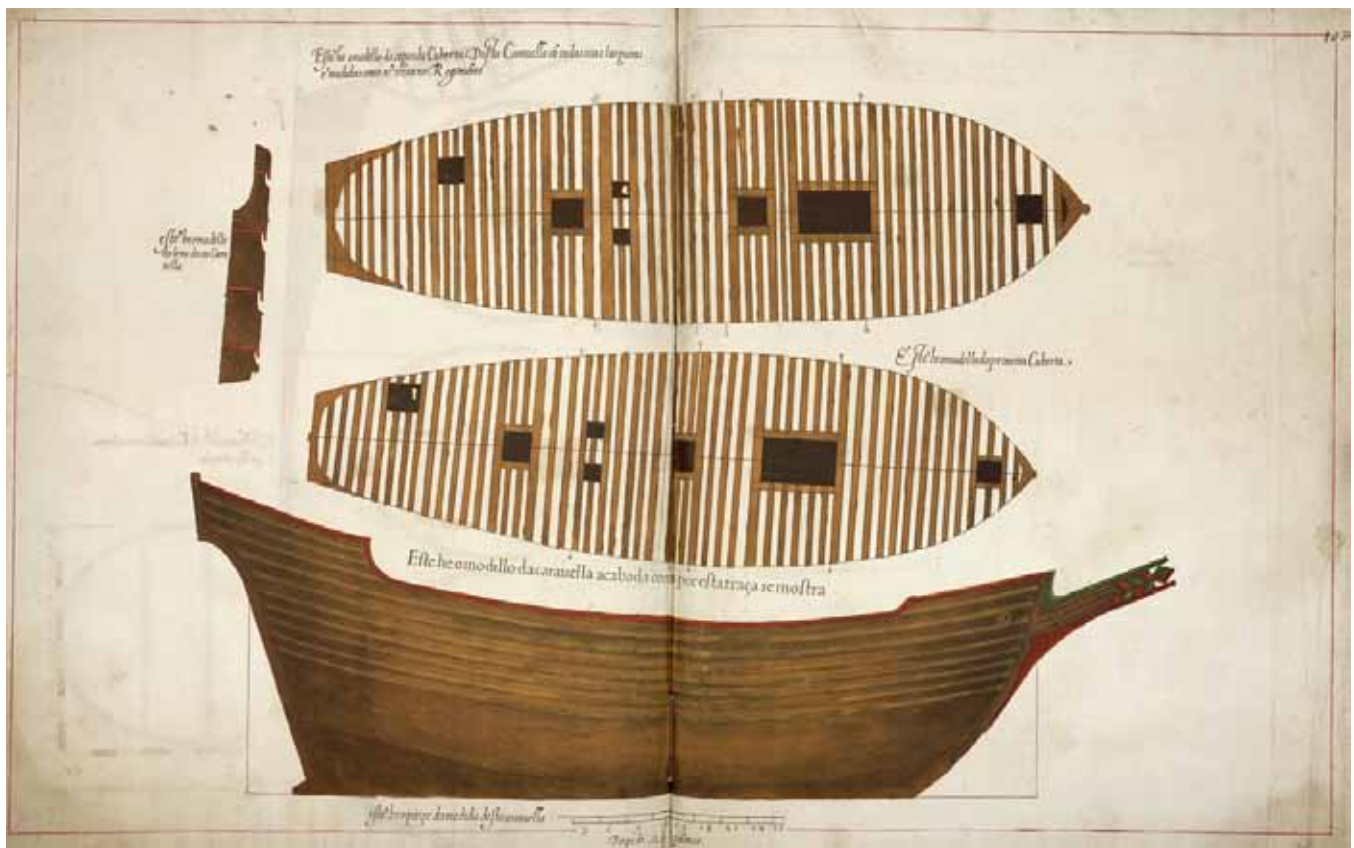


Fig. 5. A Portuguese caravel of probable comparable anatomy to the Tortugas ship, depicted in 1616 in the *Livro de Traças de Carpintaria*. Photo: Biblioteca da Ajuda, Lisbon.

Further, historical sources confirm that three of these ships, the *Nuestra Señora de los Reyes*, the *Nuestra Señora del Rosario* and the *San Francisco* were still active in subsequent years. The *Nuestra Señora de los Reyes* arrived back in Spain in 1623 with other ships in the fleet of the Marquis of Cadereita that survived the storm of 1622 (AGI *Contratación* 171 A, 808, 809 A; AGI *Contratación* 2988; AGI *Contratación* 5777). The *San Francisco* was also documented readied for a voyage with the Tierra Firme fleet to Rio de la Hacha once more on 28 November 1623 with the same master as in the previous year, Bartolome Garcia (AGI *Contratación* 18). The *Nuestra Señora del Rosario* has not been tracked down in post-1622 Spanish manifests and documentation, but since its captain and master appear in sources continuing to trade with the Americas in later years it plausibly survived as well. The *Santa Ana la Real* did not sink off the Florida Keys during the hurricane (México 29, N. 101, Doc. 2).

This leaves three ships proposed for a final shortlist, the *Nuestra Señora del Buen Sucesso* (90 tons), the *Buen Jesús* y *Nuestra Señora del Rosario* (117 tons) and the *Nuestra Señora de la Consolacion* (180 tons).

3. Ship Magnitudes

The optimum means of correlating one of these vessels to the Tortugas wreck is by determining the Seahawk ship's tonnage. The vessels listed in the outward-bound Tierra Firme fleet of 1622 ranged in age from new to four years old maximum (Chaunu and Chaunu, 1956: 26-9) and thus would have been constructed following the Spanish *Ordenanzas* regulations for shipbuilding of 1618, which relied on the formula of one shipbuilder's cubit to one *codo*, the equivalent of 57.468cm (Tables 2-3).

Based on accepted correlations between tonnage and vessel dimensions, the 90-ton *Nuestra Señora del Buen Sucesso* would have had a keel length of over 28 *codos* but less than 30 *codos*; the 117-ton *Buen Jesús* y *Nuestra Señora del Rosario* would have had a keel length of over 30 *codos* but less than 32 *codos*; and the keel of the 180-ton *Nuestra Señora de la Consolacion* would have measured between 32-34 *codos*. While Portuguese ships may not have been constructed to the same *Ordenanzas* formulae, these correlations provide a general means of determining the comparative ship sizes for these Iberian craft.

In 1991 the Tortugas wreck's length was measured by Offshore Project Manager John Astley using the on-site Sonardyne navigation and surveying system (Astley and Stemm, 2012). From the *in situ* lower sternpost to where the keel started to rise to form the lower stempost in the bows measured 17.4m (57ft). The Sonardyne system was calibrated for this specific activity and provided an accuracy of +/- 10cm (pers. comm. John Astley, 6 January 2012). This dimension provides the maximum total length of the Tortugas ship's keel (Fig. 2).

Based on these *in situ* measurements, the Tortugas shipwreck most tightly corresponds to the dimensions of a Spanish *navio* with a keel length closest to 30 *codos* and a 10 *codos* beam (Figs. 3-5), data that most plausibly identify the wreck as the *Buen Jesús y Nuestra Señora del Rosario*. Notably, the owner of this ship, Juan de la Torre, is specifically mentioned in contemporary sources of 1622/23 as having lost a ship in the Florida Keys hurricane. This *navio* was outward-bound to Nueva Cordoba, Cumana on the north coast of Venezuela, which was the center of Spanish pearl harvesting in the colonial era. The presence of 6,639 pearls on the Tortugas wreck again points towards this identification.

The above calculation of the Tortugas ship's proposed dimensions uses the Spanish *codos* for cross-fleet comparisons, even though the *Buen Jesús* is listed as a Portuguese vessel (see Section 4 below). As such it presumably would have been built using the *rumo* as its unit of measurement (Castro, 2008: 69). Nevertheless, the ship may be readily compared to other Spanish craft in the 1622 Tierra Firme fleet for two reasons.

The *Ordenanzas* of 1618 demanded consistency in ship construction for all *flota* ships, specifying that "We order that all the *Navíos* to be fabricated from now on in all our Kingdoms and Lordships be in accordance with these *Ordenanzas* without exceeding one point." Craftsmen that failed to comply with these regulations were subjected to substantial fines: 500 ducats for the fabricator, 100 ducats for the master shipwright and 1,000 ducats and loss of position for the superintendent (Fernández-González, 2009: 8, 17). Secondly, the inspection of the *Buen Jesús*'s suitability for service in the Tierra Firme *flota* specified the vessel's measurements in *codos* (AGI *Contratación* 1172, N.2, R.1), thus facilitating accurate cross-fleet dimensional comparisons using this unit of measurement.

4. The *Buen Jesús y Nuestra Señora del Rosario*

While the homeward-bound manifest for the *Buen Jesús y Nuestra Señora del Rosario* has not been located in the

archives, the outward-bound register and manifest – as compiled by the inspector of the ship in port, Juan Zarco de Amaya, witnessed by Pedro de Miranda, Juan de Herrera, Atanasio de Gongora and signed off by Fermín de Ynurrica, Antonio Moreno and Juan de Sandoval – provide key information about the ship's structure, character and itinerary (Fig. 1). The administrative and registration process was lengthy, taking six months to conclude (cf. AGI *Contratación* 1172, N.2, R.1).

The captain of the *Buen Jesús* initially sought permission from Casa de la Contratación officials to sail to the province of Santa Marta-Río de la Hacha-Nueva Córdoba on 9 October 1621 in the company of the fleet being prepared for Tierra Firme. On 23 October the characteristics of the ship were presented to the Casa. Having verified these specifics, three days later the Casa admitted the *Buen Jesús* to the voyage. On 18 February 1622 the Casa acknowledged satisfaction that Juan de la Torre, the ship's owner, was not burdened by any pending debts and thus was legally permitted to travel with the Tierra Firme fleet.

The master and captain of the *Buen Jesús* paid the necessary voyage bonds on 19 February in the form of 10,000 *ducados* and swore to comply with the ordinances of the Casa de la Contratación. On 18 March Manuel Díaz confirmed in writing that the ship was prepared to sail and that the inspection of the Casa officials was expected. On 22 March the Casa ordered the *Buen Jesús* to be inspected, at which time the officials granted multiple merchants' cargo transport licenses (AGI *Contratación* 3041). Finally, the ship was inspected in the river of Seville on 29 March and officials granted final clearance for the *Buen Jesús y Nuestra Señora del Rosario* to depart with the Tierra Firme fleet (Figs. 3-4).

The following characteristics relate to the dimensions, crew and itinerary of the *Buen Jesús* (AGI *Contratación* 18; AGI *Contratación* 1172, N.2, R.1):

- Owner: Juan de la Torre Ayala.
- Master: Manuel Díaz.
- Construction: Portugal.
- Tonnage: 117 and three-eighths ton.
- Length (stern to prow): 37 *codos*.
- Keel: could not be measured due to the overlying presence of cargo ("palo de Campeche"), but was estimated at 28 *codos*.
- Breadth: 11 *codos*.
- Depth: 5 $\frac{3}{4}$ *codos*.
- Departed from the River Guadalquivir with the fleet of General Juan de Lara Morán.
- Route: Santa Marta, Río de la Hacha and Nueva Córdoba.

Date (1622)	Merchant	No. Wine Jugs	No. Pipes Wine	No. Oil Jugs
22 February	Xpoval de Biedma	1,500	10	
22 February	Gonzalo de Herrera		2	100
22 February	Juan de Céspedes			100 <i>arrobas</i> 100 jugs = 200 total?
12 March	Baltasar de León	100		
17 March	Pedro Fernández	200		
25 March	Juan de Neve	100		
25 March	Francisco de Gandía	300		
25 March	José del Bosque	300		

Table 4. Quantities of wine and oil/olive jugs granted for shipment to the Americas on the *Buen Jesús y Nuestra Señora del Rosario*, but not transported in their entirety (AGI Contratación 3041).

Following the inspection, Captain Zarco confirmed that the ship was in good condition and stipulated that it should carry four anchors and a boat with two sets of oars. In terms of ordnance, the ship was designated as needing to be armed with four iron cannon and its ammunition, a hundred bullets, 12 muskets, gunpowder, lead bullets and two dozen “magpies”. The ship was crewed by ten sailors and a licensed pilot, and supported by eight cabin boys and three pageboys. Registered passengers were Francisco Afelio de Gandía, Francisco de la Torre y Ayala, the merchant Juan de Céspedes and Cristóbal de Biedma.

The manifest for the *Buen Jesús*’s outward-bound voyage (AGI Contratación 1172, N.2, R.1) reveals a complex pattern of multiple consignments transported to different destinations and personnel. A disparity exists between the original volume of commodities cleared for transport on the ship by named merchants (as stipulated in AGI Contratación 3041; Table 4) and the physical cargo eventually stowed and shipped (AGI Contratación 1172, N.2, R.1). The former document permitted a total of 2,500 jugs of wine to be transported by various merchants on the *Buen Jesús* (Table 4).

However, in the final eventuality just 1,400 commercial wine jars were stowed, albeit alongside extensive additional forms of cargo. This was supplemented by 500 jugs of wine for which Juan de la Torre Ayala only paid tax on 200 in Seville and was compelled to pay further tax on the remainder to the Royal Officials of Cartagena on 27 July 1622 (AGI Contaduría 1394). These were intended for use by the crew, with the surplus seemingly expected to be sold in the Americas.

The consignments transported to New Spain by the *Buen Jesús y Nuestra Señora del Rosario* in 1622 included a variety of wine and oil jars, mixed foodstuffs, fabrics, metal

items and art works, and consisted in its entirety of (AGI Contratación 1172, N.2, R.1):

1. Juan de Neve, a citizen of Seville, loaded fabrics, knives, women’s shoes and mattocks. Taxes paid in Seville on 10 March amounted to 6,500 *maravedís* (*almojarifazgo*) and 1,300 *maravedís* (*avería*).
2. Francisco Ajelli de Gandía, a citizen of Seville, loaded 300 wine jugs from Aljarafe (Seville) of his own crop and on his own account and risk, bound for the city of Nueva Cordoba with the fleet of Tierra Firme of General Juan de Lara for delivery of the wine. Taxes paid in Seville on 17 March amounted to 765 *maravedís* (*almojarifazgo*) and 1,125 *maravedís* (*avería*).
3. Juan de la Torre Ayala and Juan de Neve (each owning 50%) loaded iron bound for the city of Nueva Cordoba. Taxes paid in Seville on 9 March amounted to 9,500 *maravedís* (*almojarifazgo*) and a further 9,500 *maravedís* (*avería*).
4. Juan de Céspedes loaded a tapestry with a painting of the souls of purgatory bound for the city of Nueva Cordoba to be collected there by Juan de Lemos, and in his absence by Diego López Aries, citizens of Cartagena, and to be sent later to Captain Antón Suarez at the lagoon of Maracaibo, on whose account and risk the picture was shipped. Taxes paid in Seville on 4 March amounted to 750 *maravedís* (*almojarifazgo*) and 150 *maravedís* (*avería*).
5. Juan de Céspedes loaded packaged food, quince meat, hats, fabrics, raisins, hazelnuts, almonds and chestnuts bound for the city of Nueva Cordoba. The merchandise was consigned to Luis de Lemos, and in his absence to Diego López Aries, and in the absence of both to Gaspar Fernández Rebelo, all citizens of Cartagena. The

recipients were charged with selling the merchandise and sending the profits to Spain on the account of Juan de Céspedes, to whom the merchandise belonged and on whose account and risk it was loaded. Taxes paid in Seville on 4 March amounted to 8,000 *maravedís* (*almojarifazgo*) and 1,700 *maravedís* (*avería*).

(Luis de Lemos, the son of Portuguese parents but living in Seville, was a prominent slave merchant and the owner of two large ships that traveled under permission each year to Rio de la Hacha, mainly carrying clothes from Spain. De Lemos developed commercial contacts across Spain and the Indies, and also had relatives in Nicaragua with whom he traded primarily indigo (Ortega, 2002: 146).)

6. Juan de Céspedes loaded oil, capers and olives bound for the city of Nueva Cordoba. The merchandise was consigned to Luis de Lemos, in his absence to Diego López Aries, and in the absence of both to Gaspar Fernández Rebelo, all citizens of Cartagena, so that the merchandise recipient had to sell it and the profits be sent to Spain on account of Juan de Céspedes, to whom the merchandise belonged and on whose account and risk it was loaded. Taxes paid in Seville on 4 March amounted to 1,700 *maravedís* (*almojarifazgo*) and 340 *maravedís* (*avería*).
7. Juan de Céspedes loaded 400 jugs of wine from Trebujena (Seville) bound for the city of Nueva Cordoba. The merchandise was consigned to Luis de Lemos, in his absence to Diego López Aries, and in the absence of both to Gaspar Fernández Rebelo, all citizens of Cartagena, so that the merchandise's recipient had to sell it and send the profits to Spain on account of Juan de Céspedes, to whom the merchandise belonged and on whose account and risk it was loaded. Taxes paid in Seville on 9 March amounted to 13,220 *maravedís* (*almojarifazgo*) and 1,768 *maravedís* (*avería*).
8. Juan de Céspedes loaded fabrics, ten flasks of brandy/sherry and a chest with women's shoes bound for the city of Nueva Cordoba. The merchandise was consigned to Luis de Lemos, in his absence to Diego López Aries, and in the absence of both to Gaspar Fernández Rebelo, all citizens of Cartagena, so that the merchandise's recipient had to sell it and the profits be sent to Spain on account of Juan de Céspedes, to whom the merchandise belonged and on whose account and risk it was loaded. Taxes paid in Seville on 9 March amounted to 2,500 *maravedís* (*almojarifazgo*) and 500 *maravedís* (*avería*).
9. Xpoval de Biedma loaded on his account and risk 500 jugs of wine from Salteras (Seville) bound for the city of Nueva Cordoba. The wine was to be delivered to Juan de la Torre Ayala, in his absence to Diego Bernal

de Heredia, and in the absence of both to Juan de Peña. Taxes paid in Seville on 18 March amounted to 275 *maravedís* (*almojarifazgo*) and 2,210 *maravedís* (*avería*).

10. Pedro Fernández Hidalgo loaded on his account and risk 200 jugs of wine from Sierras Llanas bound for the river of the Hacha in the province of Tierra Firme with the fleet of General Juan de Lara. Taxes paid in Seville on 18 March amounted to 510 *maravedís* (*almojarifazgo*) and 894 *maravedís* (*avería*).

Despite the availability of a detailed manifest for the final outward-bound voyage of the *Buen Jesús*, the precise history of this ship and its owner and master eludes us. Records for the vessel and/or owner and master prior to 1622 are also not present in the Archivo General de Indias archives. The *Nuestra Señora del Rosario* listed as sailing to and from Venezuela in 1619 with the Tierra Firme fleet of General Fernando de Sousa does not share the same precise ship or master's names (AGI *Contratación* 2196, 2198, 3026). Neither the vessel nor the personnel of 1622 accompanied fleet general Juan de Benavides Bazán to New Spain in 1621 (AGI *Contratación* 1864-1871).

However, both Simón de la Torre and Juan de la Torre, the owner of the *Buen Jesús*, crop up in 1619 loading money onto the *San Francisco de Padua*, the flagship of the Tierra Firme fleet returning to Spain that year (AGI *Contratación* 2195). Sources also indicate that Juan de la Torre traded in slaves: in May 1622 the Casa de la Contratación filed a lawsuit against him for failing to deliver three slaves to Seville picked up in New Spain by the *Magdalena* in 1616.

The implications of the archival data are that Juan de la Torre Ayala was a well-known merchant and ship owner who was familiar with the markets of Venezuela. While he and his family had ventured to the Americas on multiple occasions prior to 1622, this seems to have been the first voyage of the *Buen Jesús y Nuestra Señora del Rosario* to New Spain. The absence of the ship in pre-1622 documentation hints that it was newly built in Portugal and that this trading enterprise was opportunistic in nature, exploiting the established maritime trade route of the Tierra Firme fleet.

5. Nueva Cordoba: the Frontier 'City' of Cumana

The outward-bound manifest of the *Buen Jesús y Nuestra Señora del Rosario* compiled in Seville confirms that nine out of the ship's ten outward-bound consignments were destined for Nueva Cordoba (AGI *Contratación* 1172, N.2, R.1; Chaunu and Chaunu, 1956: 26-7). Even though the manifest cites an antiquated geographical term, the

locality concerned was undoubtedly the ‘city’ bearing this name on Venezuela’s Pearl Coast (pers. comm. Mark Sullivan, 29 November 2011), more familiarly known in the early 17th century as Cumana. In New Andalusia the Indian name of Cumana – first discovered by Christopher Columbus during his third voyage of 1498 – superseded the former names of Nueva Toledo and Nuevo Cordoba (Marquez and Ramos Navarro, 1998; Tarver and Frederick, 2005: 25; Von Humboldt *et al.*, 2009: 181).

By the first quarter of the 17th century Nueva Cordoba was the established military headquarters and distributive center of the Pearl Coast fisheries (Fig. 6). As early as 1504 the Crown had ordered the Spanish Governor of Hispaniola, Nicolas de Ovando, to build a fort near Cumana to protect the royal taxation interests against *rescate*, illicit trade, barter and contraband (Warsh, 2009: 16). A Franciscan and Dominican religious monastic presence followed in 1518, and after a Spanish armed expedition landed 300 armed soldiers from five ships in 1521 the local Indians were ‘pacified’ and Nueva Cordoba founded. Soon after the settlement changed its name to Santa Inez de Cumana (Humbert, 1906: 46, 48).

Following harvesting and securement in locked boxes, the region’s highly coveted pearls were stored in coastal warehouses situated at Nueva Cadiz on Cubagua, La Asuncion on Margarita, Cumana and at Rio de la Hacha on the mainland, pending distribution to market (Figs. 7-10). The royal *quinto* was imposed in these key centers for return to Spain (typically *in natura* rather than as converted coin) and from here private cargos were dispatched to other major Spanish Caribbean entrepôts, such as San Juan, Santo Domingo, Puerto de Plata, Cartagena and Havana (Warsh, 2009: 16, 29-31).

According to the monk Antonio Vázquez de Espinosa, who returned to Spain from the Americas in 1622, the city of Cumana in Nueva Andalusia was founded by Captain Gonzalo de Ocampo in 1520, when he arrived to retaliate against the Indians’ destruction of the local Franciscan convent and the murder of its friars (Clark, 1942: 52). Spain established the *gobernación* (governance) of Margarita in 1525, comprising the islands of Margarita, Coche and Cubagua, which from 1528 were situated within the province of Venezuela under the jurisdiction of the *audencia* of Santo Domingo. In 1567 the seat of Margarita’s *gobernación* was transferred to the City of Asunción (Tarver and Frederick, 2005 34-5). The *gobernación* of Cumana (Nueva Andalusia) was established in 1568 by the conquistador Diego Fernández de Serpa (died 1570) on the site of the former ‘city’ of Nueva Cordoba, an event that coincided with the re-founding of the town (Lombardi, 1976: 24; Tarver and Frederick, 2005: 35).



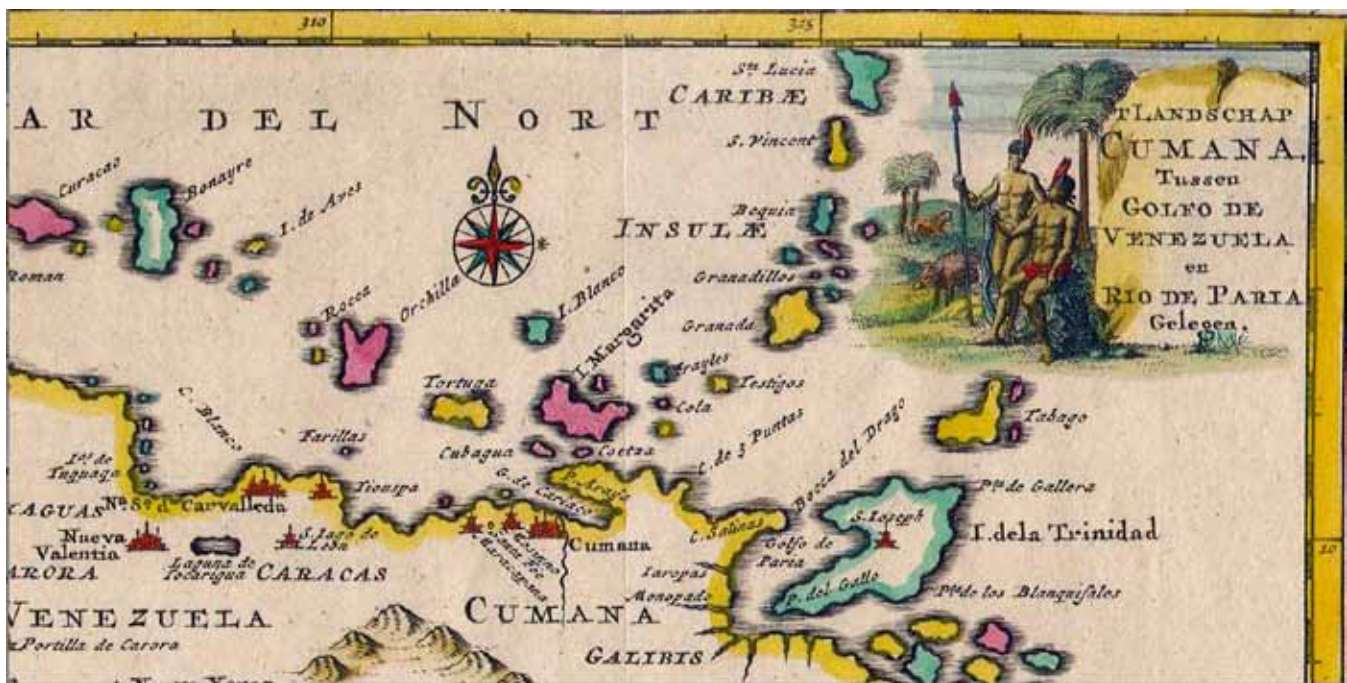
Fig. 6. Pearl divers and fishermen on the island of Cubagua, Venezuela, harvesting oysters for Spanish overlords. From Theodor de Bry, *Americae Pars Quarta* (Frankfurt, 1594, plate XII). Photo: John Carter Brown Archive of Early American Images 09775.

On 22 July 1619 King Philip III appointed Captain Diego de Arroyo y Daza as the new Governor of Nueva Andalusia, which retained its headquarters at Cumana (Marley, 2008: 167). The frontier settlement’s status may have improved following the burning of the castle and town of Margarita by Dutch forces in 1620 (Marshall, 1832: 480). By January 1622 sources hint that Cumana was dwindling, perhaps one of the reasons why the Governor of Santa Marta petitioned the king of Spain to send 50 men there for purposes of defense and repopulation in the annual outward-bound ‘royal pearl galleon’ (AGI *Santa Fe* 50).

By the end of the 17th century the Capuchin order of Aragon had a significant presence at Cumana, alongside three additional civil settlements. Cumana itself consisted of around 100 small thatched buildings built of mud and tree branches and owned by impoverished farmers. The small town of San Balthasar do los Arias (also known as Cumanacoa) comprised 20-25 structures similarly constructed and inhabited by poor Mulattos and Negros, who cultivated tobacco for local consumption. Cocoa cultivation was also carried out in small farms at San Felipe de Austria or Cariaco (Humbert, 1906: 49).

The character of the Spanish fortified headquarters along the Pearl Coast is captured in a later comparative description of the early 19th century (Depons, 1806: 60):

“The city of Cumana, near a hundred leagues east of La Guira, is sufficiently difficult to access to an invading enemy. Situated a cannon shot from the sea, with its harbour



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half a league to leeward, it has nothing to fear but attacks under sail, which the distance would render ineffectual. In case of debarkation, a fort, well maintained, situate on a hill in the eastern quarter of the city... The island of Margarita, four leagues to the north of Cumana, is defended by nature, and one company of regular troops... This island derives no attractions from its productions. The ungrateful soil admits no culture except of cotton, and that only in parts least cursed with sterility."

Before he returned to Spain in 1622, Antonio Vázquez de Espinosa described a significant presence at Cumana, which had 200 Spanish residents, plus Negros, Mulattos, Indians and servants. The city included a parish church, a Dominican convent with a few friars and a shrine under the patronage of Our Lady of Carmen, which served as a hospital for the sick. Two Spanish villages existed in its district: San Felipe, 24 leagues inland with 40 residents, and Cumanagoto west of Cumana, opposite the island of Bor-racha, which had 150 Spanish residents and large numbers of Indians in its hinterland (Clark, 1942: 52-3).

Excavations in 1954, 1955 and 1961 on the nearby island of Cubagua – Nueva Cadiz in the colonial period – provided insights into the regional architecture and town planning (Figs. 12-13). Walls were built of uncut stones, chinked with clay and plastered with lime produced from ground coral. The floors were of simple earth, while the flat roofs were reed plastered with clay. Buildings were arranged in rectangular blocks. The largest houses, plus a church, were situated to the southeast, where the trade winds offered the greatest cooling effect. A monastery was located on a side street and a second church to the island's leeward end. A typical house consisted of four rooms: a living room and bedroom at the front, and a storeroom and kitchen at the back flanked by a walled patio. Some houses

possessed masonry stairways indicating original access to a second story. Rectangular hearths were raised 50cm above kitchen floors. In one excavated house a pot full of pearls was discovered (Rouse and Cruxent, 1963: 135-7). Such was the nature of the landscape and economic character of Cumana and its environs when the *Buen Jesús y Nuestra Señora del Rosario* visited in 1622.

Even though Venezuela's oyster fisheries were excessively over-exploited in the first half of the 16th century, resulting in species collapse and crisis, limited volumes of pearls were still harvested in the second half of the 16th century and into the first half of the 17th century. But business was certainly slow. In 1622 the king was informed that the fisheries were badly depleted, so that just one ship was required at Cumana and Margarita annually to collect the royal pearl tax *in natura* (AGI *Contratación* 5173).

Under these circumstances why would the *Buen Jesús y Nuestra Señora del Rosario* have risked venturing beyond the economic core of the main Tierra Firme fleet's geographic circulation to the depleted oyster beds of Cumana? This *navio* certainly was not designated for the conveyance of the royal *quinto* back to Seville in 1622 because the king's pearls were registered for export to Spain onboard the ships of General Tomás de Larraspuru (AGI *Contaduría* 1669).

The most probable explanation is that since pearls were in such short supply significant consignments could only be secured at source, which in addition was the ideal means of negotiating optimum deals. If correct, then the *Buen Jesús* sailed to Cumana speculatively at a time when the availability of the product was a matter of chance. As a 'Letter from Pedro Gómez de Revenga and Pedro Ruiz de Guicaburuaga to the Casa de la Contratación' written from Margarita on 11 June 1623 explains (AGI *Contratación* 5116):



Fig. 9. 'Occidentalis Americae Partis' from *Americae Pars Quarta* showing the Pearl Coast topography of eastern Venezuela (Frankfurt, 1594). Photo: John Carter Brown Archive of Early American Images 09887-2.



Fig. 10. Satellite view of Cumana in eastern Venezuela, the destination of the Buen Jesús y Nuestra Señora del Rosario in 1622 and location of the oyster harvesting islands of Margarita, Cubagua, Coche and of the salt marshes of the Araya peninsula.



Fig. 11. Satellite view of the bleached saltmarshes and lagoon of the Araya peninsula opposite the mainland of Cumana, Venezuela.



Fig. 12. Aerial view of ruins from the colonial Spanish oyster and pearl harvesting town on the island of Cubagua, Venezuela.

“Your Excellency will consider the sending of pearls from this island to be a new thing because they have not been remitted for so many years, caused by their absence in the fishery. Twelve *marcos*, three ounces and three *ochavas* and two *tomines* of all types have been collected in the Royal Box of our charge of the royal fifth (*quinto real*) of His Majesty these passed years. And although the quantity is so weak because of the large expenses expended by His Majesty, and the great loss of silver in the galleons of the last year did not help the matter, we have encouraged ourselves to make up to His Majesty for this shortage, delivered in this island in a pack covered with cloth and with its key to Captain Pedro de Aguilar y Guzmán, a person named for this effect by General Antonio de Oquendo, directed to Cartagena to the said general so that he should register them in the *capitana* or in the *almiranta* ship to deliver to Your Excellency in the Casa de la Contratación, so that having received the said pearls Your Excellency, by the testimony of the registration that goes with this, the will of His Majesty will be done”.

The mercantile character of the Tortugas ship’s pearl consignment is not intrinsically transparent. No manifest registrations for 1622 mention cargos of pearls collected at Cumana and Margarita other than the king’s *quinto* (AGI *Contratación* 5173; AGI *Santo Domingo* 206). The reality is obscured by an absence of documentation: between June 1622 and June 1623 the accountants of Santa Fe (and possibly Santo Domingo) suffered continuous illness that prevented them from producing accurate accounts (AGI *Santa Fe* 52).

The discovery of a chest of pearls on the wreck of the *Margarita* off the Florida Keys, not listed in the ship’s manifest (Tedesco, 2010: 21), proves that this exotic form of jewelry remained in circulation and was almost certainly

exported as contraband. Another reference to the ships of the Marquis of Cadereita suggests that the 1622 fleet was in on the game more widely. In June 1623 royal officials informed the king that one consignment of emeralds and another of pre-drilled pearls originating in Rio de la Hacha – both unregistered – were discovered on Cadereita’s ships and that the Casa de Contratación was unsure how to process the contraband (AGI *Contratación* 5173). Though neither Cadereita’s vessels, nor the *Margarita*, traded directly with Cumana and Margarita, evidently pearls remained coveted, in circulation and could be secreted onto merchant vessels at source.

In conclusion, the pearls excavated from the deep-sea Tortugas shipwreck fit the maritime history of the *Buen Jesús y Nuestra Señora del Rosario* in 1622. Like the unregistered pearls reported from the ships of the Marquis of Cadereita, and associated with the *Margarita*, some of the Tortugas examples were also pre-drilled, which may hint at an overall impression of contraband. Alternatively, the procurement of royal taxes in 1622 leaves no doubt that surplus pearls could be purchased at Cumana, which would suggest a typical commercial model for their presence on the Tortugas ship. Whichever holds true, perhaps after the *Buen Jesús* joined the main Tierra Firme *flota* it was this merchant vessel that made an early profit by selling a few extra chests to interested parties in the fleet.

6. Rio de la Hacha, Colombia

Located in modern northeastern Colombia, one of the ten consignments listed in the *Buen Jesús*’s outward-bound manifest were Pedro Fernández Hidalgo’s 200 wine jugs to be delivered to Rio de la Hacha en route east to the final destination at Cumana (Fig. 7). The locality was renowned



Fig. 13. Dense oyster shells strewn across a ruined road between buildings on the island of Cubagua, Venezuela, 16th to 17th century Spanish Nueva Cadiz.

as a clearing house for pearls and slaves, which ultimately caused its downfall at the hands of marauding smugglers and privateers.

In the first few decades following the discovery of oyster beds in northeastern Venezuela, pearls were commonly sold down the line to Rio de la Hacha, which functioned as a regional collecting center inhabited by treasury officials, private contractors and craftsmen. In 1536, for instance, Juan de la Berrera of Seville bought a quarter-share in a Cubaguan pearl-fishing venture and 12 years later sold 400,057 *maravedis* of pearls to the treasurer in Rio (Donkin, 1998: 326-7). Pearl harvesting began in its own right at Rio in 1542, 1,000km west of Venezuela's Pearl Coast (Orche, 2009: 22).

In the mid-16th century Rio de la Hacha possessed around 50 households, but no productive hinterland. Thereafter, the slave trade swiftly took center stage. Sir John Hawkins sold slaves and merchandise at Rio in 1567 for £6,250, and in 1569 another English convoy delivered 260 African slaves at both Rio and Santa Marta (Reiss, 1997: 24). By 1572 the Casa de la Contratación reported that a significant part of the illegal 'negro' slave trade ran to the Indies without registration from the ports of Algarve and Portugal in ships dispatched to Puerto Rico, Cabo de la Vela, Rio de la Hacha and Islas de Barlovento and thence onward to Santo Domingo "and are sold in truck for hides and sugar" (Andrews, 1978: 73).

Sir Francis Drake's men sacked and burned Rio and its *ranchería* in 1595, taking five canoes and over 100 'negros' (Guasco, 2008: 8). English and French corsairs again raided its fisheries in 1598, 1599 and 1603, impoverishing the town. By 1616 Rio de la Hacha's pearl fishery had been silent for five years and was still dormant in 1620 (Andrews, 1978: 127, 164, 222).

Antonio Vázquez de Espinosa's *Compendium and Description of the West Indies* seems to reveal something of a renaissance between this date and 1622, when he returned to Spain (Clark, 1942: 314-5). The friar referred to the city as "one of the best and richest in this State", populated by over 100 Spanish residents and boasting a parish church, two Dominican and Franciscan convents and a hospital. Four heavy bronze cannon and a garrison of soldiers protected a good fort, where the Paymaster and Treasurer of the Royal Patrimony were stationed. Pearl fishing 8-16 leagues offshore towards the Cape of La Vela with "seven boats of Negroes" was once again active. Moreover, de Espinosa was familiar at Rio de la Hacha with "quantities of hides dressed here, brazilwood, guaiacum, and other valuables". Nevertheless, the site's role in the commercial history of the *Buen Jesús y Nuestra Señora del Rosario* in 1622 seems to have been minimal.

7. Venezuelan Tobacco

In light of the interpretation of the 209 olive jars excavated from the Tortugas wreck as containers for ship's stores, rather than a cargo of foodstuffs and liquids, the excavated hull appears to have been improbably empty. What other commodities might the *navio* have carried? Returning to Seville with an empty hold devoid of the riches of the New World would have been unthinkable. In the absence of tangible excavated archaeological data from the comprehensive fieldwork, any supplementary goods are likely to have been organic in nature. If the *Buen Jesús's* pearls were contraband, the vessel would have had an added reason to stock up with other products at Cumana to justify to Crown regulators its presence in northeast Venezuela. Tobacco may be proposed as a highly likely primary cargo stowed for export to Seville.

Depending on which source is consulted, Venezuela emerges as not especially rich in regional produce, and in the 19th century was remembered as a region that "procured no kind of commercial produce... Cupidity received no other ailment but that derived from the pearls in the environs of Margareta. Here the pearl fishery was carried on with equal activity and inhumanity; but soon, by means of sacrificing Spaniards and Indians to this murderous occupation, the bank of oysters that produced them was exhausted" (Depons, 1806: 268).



Fig. 14. Aerial view of the Spanish colonial garrison fort on the Araya peninsula, built in the early 17th century to safeguard the abundant salt reserves from Dutch incursions.



Fig. 15. The Tierra Firme port of Cartagena, Colombia, in 'Civitas Carthagenae in Indiae occidentalis...', drawn to accompany Walter Bigges' Expedition Francisci Draki, published in 1588.

The early modern proposed agricultural 'sterility' was a far cry from late 16th- and 17th-century reality. In Vázquez de Espinosa's lifetime, prior to his return to Spain in 1622, Indian corn supplies for bread were produced locally "and in this district they grow and harvest a great amount of tobacco, which is the chief staple of the country. They have other crops and native fruits which are highly regarded, and sugarcane and sweet potatoes". The residents also built ranches along the banks of Cumana, where quantities of cattle, pigs and horses were raised between abundant Indian corn and yucca. Excellent fish were available in profusion (Clark, 1942: 52-3).

Cumana's 17th-century fertility was confirmed by the historian José Agustín Oviedo y Baños, born in Sante Fe de Bogotá in 1671, who was familiar with a Venezuela that "abounds in wheat, maize, rice, cotton, tobacco, and sugar, from which dainty and exquisite conserves are made. Also there is found cacao, which in trade brings its inhabitants their greatest wealth". Its forests produced mahogany, divi-divi, lignum vitae, brazilwood, jacaranda and cedar, while vanilla plants, Sarsaparilla and indigo were common field crops. Canafistula, tamarind, chinaroot, tacamahac (a remedy for headaches), Carora balsam, and Cumana or Maria oil (an antidote for wounds and a highly prized preventive of muscle spasms) were cultivated for medicinal applications (Johnson Varner, 1987: 7-8).

Venezuela also seemingly possessed tin and copper mines "of great opulence and productivity. His Majesty profited from the considerable amount of metal that was extracted from them and carried to Spain for casting artillery". Oviedo y Baños was similarly impressed by Venezuela's blue-veined, highly fine transparent crystals and woods processed for dyes. "In sum", he concluded, "there is every-

thing that might be desired for the maintenance of human life without any need for the products of neighboring provinces. If the application of its inhabitants were equal to its fertility, and if they knew how to profit from the benefits it offers, it would be the richest province in America" (Johnson Varner, 1987: xv, 7-9). Cocoa production emerged in the 1620s and would remain a profitable export for the next 200 years (Page, 2003: 609).

Although the success of tobacco within Spain began in 1558, widespread commercialization only took place in the early 17th century in Seville, Lisbon and Amsterdam. With insufficient precious metals accessible to cover its debts on the international market, Spain started to lean on tobacco as a staple specialist crop for revenue exchange (Nater, 2006: 93, 98). Caribbean Creole farmers cultivated tobacco on a large scale along the north coast of Venezuela and on Cuba in the last decades of the 16th century and, within a second tier below the high-value products (gold, silver, emeralds and pearls) of the Americas, it swiftly became the dominant commodity exported to Seville (Baud, 1991: 31).

During the 1590s and early 1600s Spanish Cumana and Caracas were transformed into Europe's main tobacco suppliers (Klooster, 2009: 150; Figs. 18-20). Dutch and English traders sailed in growing numbers to Cumana and La Guaira. Tobacco came to Cumana's salvation in 1592 when Sir Walter Raleigh attacked the settlement with six naval vessels: the locals bartered a cargo of tobacco with a Captain Flamenco in exchange for harquebuses, muskets, powder and shot, which enabled them to repel the English privateer (Clark, 1942: 53).

The leading tobacco cultivation center was Nueva Ecija de los Cumanagoto, a small village with 30 *vecinos* situated 12 leagues west of Cumana on the Pearl Coast near



Fig. 16. The Spanish silver fleet assembled at the Tierra Firme port of Havana, Cuba, in the 17th century (English School, 19th century). Photo: Private Collection/Peter Newark American Pictures/The Bridgeman Art Library.



Fig. 17. Detail of the Florida Keys where the Tortugas ship was wrecked in 1622. From 'Occidentalis Americae Partis', published in *Americae Pars Quarta* (Frankfurt, 1594). Photo: John Carter Brown Archive of Early American Images 09887-2.

the mouth of the River Unare, whose output amounted to 30,000lbs in 1603 and which was all bought within the space of three months that year in exchange for contraband (Sluiter, 1948: 182; Klooster, 1998: 31). Two years later Andrés de Rojas described the local producers as “riff-raff who have no other source of income than the tobacco crop that is so esteemed in Flanders and England. I realize they will not reform, for they are people of small account, some of them doing it one year and another lot the next, so that the place is like a fair, by way of which contraband enters and reaches as far as Peru” (Andrews, 1978: 227).

Although the methods of tobacco cultivation were not detailed in contemporary accounts of the West Indies, Antonio Vázquez de Espinosa's description of its production on the nearby island of Trinidad reflects the productive reality in the second quarter of the 17th century (Clark, 1942: 56-7):

“The tobacco is planted in little seedbeds like lettuce, and when it is ready – in November and December on this island – they transplant it along lines or rows, like a bean field or vineyard; and as it keeps growing, they clean out and weed the rows, until it is about a varia high, which point it reaches in about 50 days; thereupon they cap it, i.e., they cut off the crown or topmost shoot, so that it will grow to leaves, and they keep pulling off the branches or shoots which it puts out along with them, so that the leaves will grow and get thick, until it is ripe, which takes another 50 days, and they weed it continually and pick off the caterpillars which usually do

some harm to it. In this way the tobacco leaves grow 4 or 5 palms long, and more, and 2 or 3 across, according to the richness of the soil. After they ripen, they gather and string them and hang them up inside a house, so that there in the shade they may sweat and dry off, which takes 8 or 10 days; then they pull out the central vein and twist them up into ropes or rolls; there are men so expert in this operation that in one day they twist 300 pounds of tobacco and more.”

Towards the end of the 16th century northwest Europe was enveloped by an extraordinary market expansion for tobacco. In 1604 King James I criticized the scale and sweeping effects of the new social revolution in *A Counter-Blaste to Tobacco*, as having become “in place of a cure, a point of good fellowship, and he that will refuse to take a pipe of *Tobacco* among his fellows... is accounted peevish and no good company... Yea the Mistresse cannot in a more mannerly kinde, entertaine her servant, then by giving him out of her faire hand a pipe of *Tobacco*.”

According to customhouse Book of Rates, no tobacco imports were registered in England in 1558. By 1610, in contrast, England's tobacco use was valued at £60,000, and a year later a Spanish observer valued the annual national consumption at 100,000lbs worth 400,000 ducats. England's total imports for 1621-22 substantially exceeded 166,000lbs. The Netherlands, France and Germany combined consumed at least as much again. During the lifetime of the *Buen Jesús* tobacco was a highly coveted and costly luxury in a short-lived boom before expanded

production led to a crash in the later 1620s and 1630s. At that time prices dropped from 20–40 shillings per pound to just a few pence per pound *c.* 1630, dwindling a few years later to no more than a penny, a low cost that promoted a pan-societal addiction. In reality, England's tobacco was shipped almost entirely directly via the Indies. No more than 6,000lbs of this supposed Spanish royal monopoly actually came from Spanish hands (Andrews, 1978: 225, 229).

Between 1600 and 1625 most tobacco purchases on the Spanish Main were transacted at Cumana. Contemporary documents record that the Tierra Firme ships that sailed there in 1622 departed for Spain largely with cargos of tobacco (AGI *Contaduría* 1652; AGI *Contaduría* 1653). Indeed, the 1622 Americas fleet predominantly exchanged Spanish wine, clothes and gunpowder for the “fruits of the land”, specifically tobacco (AGI *Contratación* 5188).

At least two other major tobacco consignments were picked up beyond the Pearl Coast. The ships of the Marquis of Cadereita were topped up in Cartagena with great quantities of this product (AGI *Contratación* 5189). *Flota* administrator Diego del Valle Alvarado and accountant Martin de Urdaniz chronicled that at Cartagena 193,451 *pesos* of eight *reales* were paid by Tierra Firme fleet merchants to the royal officials as Crown tax in return for 14,964 *arrobas* and 22 pounds of tobacco (*Contratación* 5116) – 172 tons in modern equivalents. Both the *Atocha* and the *Rosario* carried shipments of tobacco alongside their riches of gold, silver and copper. Notably, a ‘Letter from Diego Pinelo to the Casa de la Contratación. Cartagena, 3 August 1622’ (also in AGI *Contratación* 5116) confirms that 3,772 pouches of tobacco were collected by fleet galleons at ‘Maracaybo’ in northwest Venezuela. Tobacco exports thus played a dominant role in the homeward-bound trade of the 1622 Tierra Firme fleet.

Given appropriate soil and climate, tobacco was easy to cultivate and did not demand the same level of skilled labor as sugar. For young colonies with little capital, labor or business organization, tobacco was an ideal crop. High profits, however, quickly attracted Dutch, English and French envy from Chesapeake Bay to the Amazon in the first quarter of the 17th century and, worryingly for the Spanish economy, caused a thriving contraband trade to evolve in Venezuela, and later across Trinidad and Guiana. As Sancho de Alquiza, the Governor of Caracas, informed the Crown in 1607, “tobacco has been one of the chief factors causing these coasts to be so much frequented by pirates, by reason of the great demand there has always been for it; and in truck for it they give merchandise that comes cheaper than had it been bought in Spain” (Klooster,



Fig. 18. A tobacco plant illustrated in the Hortus Eystettensis by Basil Besler (German School, the Stapleton Collection 1613). Photo: Private Collection/The Stapleton Collection/The Bridgeman Art Library.

1998: 31). The marketability of tobacco and its political control are proposed to have been a major reason for the *Buen Jesús*'s presence at Cumana in 1622.

8. Venezuelan Contraband Trade

Apart from purely commercial objectives, strong political reasons had arisen for Spain to need – and perhaps order – an increased mercantile presence at Cumana in 1622: the Crown was hemorrhaging economically as a result of lost revenues. To no avail local authorities had consistently complained to the Crown, the Council of the Indies and the House of Trade in Seville that since the 1570s Spanish merchants and ships neglected the ports of the Antilles and Tierra Firme east of Cartagena, allowing foreign smugglers and corsairs to infest the coasts. The island of Margarita opposite Cumana was a particularly favored stopping place for French and English corsairs, as well as Portuguese slave-smugglers and, ultimately, Dutch commercial infiltration. Its coastal watering places were natural smugglers' dens.

The scale of the problem was faithfully chronicled by Jerónimo de Torres, the town clerk of La Yaguana in Española, in 1577 (Andrews, 1978: 75-7):



Fig. 19. Native Americans picking and smoking tobacco leaves. From André Thevet, *La cosmographie vniuerselle ... Tome seconde* (1575). Photo: John Carter Brown Archive of Early American Images 07598-12.



Fig. 20. African slaves twisting and drying tobacco. From Jean Baptiste Labat, *Nouveau voyage aux isles de l'Amerique, ... Tome quatrième* (Paris, 1722). Photo: John Carter Brown Archive of Early American Images 09905-1.

“Among the settlements and ports most frequented for commerce by the French and Portuguese, the island of Margarita is the first they reach in the Indies, and next the ports of the province of Venezuela and Caracas... and they pass along this coast trading for pearls and gold, going on to Río de la Hacha and beyond to Cartagena and Nombre de Dios, where they complete their transactions... those that are merchants – Portuguese or French – run from Margarita along the Venezuelan Tierra Firme, doing a quick trade in passing because they prefer hides, sugar and cassia fistula to coin, gold or silver, for they say they get a double profit on such merchandise, one here and the other in their own countries, whereas with money they only get one...

All the settlements of this island, Margarita, the Venezuelan Tierra Firme and the islands of Puerto Rico, Española, Cuba and Jamaica are for the most part maritime, either by the shore or half a league or so away... even when the stock is at some distance they bring it on the hoof and hides and sugar in carts as far as the harbor where the ships lade, and for this purpose they have built houses by the shore where they stow the goods until a ship or bark comes for them; and it is this seaside nature of the merchandise that makes the trade possible and very secret... All the merchandise the inhabitants of these settlements trade with the enemy is delivered in deserted places, as I have said, and as secretly as possible; the territory is unoccupied and few or no people go there, but should anyone notice, all are *vecinos*, all are on the council and all are involved in trade, rich and poor... so that information is never to be found against anyone, nor can they be punished.”

By 1604 the Dutch had started surveying the Orinoco River, followed by the Swedes one year later. Initially Spain successfully contained these incursions, but constant war with the Caribs deflected attention away from the Pearl Coast, whose slaves were captured by the English and shipped to St. Vincent. Foreign powers seemed capable of attacking Spain's Venezuelan possessions at will (Tarver and Frederick, 2005: 31-2).

Not just the Dutch and English were profiting from smuggling, but Spanish officials were also in on the take. In 1611 the Governor of Sante Fe de Bogota accused Fernando de Berrio, the Governor of Trinidad, of illegal trade with the Dutch. Berrio claimed that his tobacco had been seized by Dutch troops, but the Crown was able to establish from planters that he had actually exchanged royal tobacco for slaves. Enemy intrusions escalated in 1614, when the Dutch built a fort at Essequibo (modern Suriname) as a base to arm the Caribs. A new, short-lived English settlement followed on the coast near Margarita, but when Sir Walter Raleigh's son attacked the Spanish fort of Santo Tomé down the Orinoco River in January 1618 with 10 ships and 500 troops, killing the Governor of Guayana, Diego Palomeque de Acuña, and also Raleigh's son, the adventurer was accused of insubordination and treason by King James I, imprisoned in the Tower and executed for his Indies misadventures in October 1618 (Whitehead, 1988: 86; Tarver and Frederick, 2005: 31-2).

The presence of the *Buen Jesús y Nuestra Señora del Rosario* and other vessels of the Tierra Firme fleet at Cumana in 1622 was arguably not purely commercial, but also strategic. Spain acutely needed to retain a strong visible presence along the Pearl Coast, where trade is likely to have been encouraged.

Commercial action in Venezuela in 1622 was intimately intertwined with protracted hostilities and leaking treaties

in Europe. In 1585 the English were the main regional predators, when a powerful fleet sacked Santo Domingo and Cartagena, launching an 18-year phase of plunder. Between 1585 and 1603, 76 English expeditions traveled to the Caribbean with 235 vessels (of which 74 were private ventures comprising 183 individual voyages). English raiding substantially damaged the lands east of Cartagena, leaving Venezuela's pearl fishery especially vulnerable, so that the Governor of Cumana reported in 1600 that the settlement was "barred from trade and intercourse with all places because no ship or frigate of trade dare not come hither". By 1596 just 43 smuggling vessels from Portugal, Andalucia and the Canaries had visited Margarita and Cumana during the previous ten years (Andrews, 1978: 135, 156, 165, 174).

Contraband trade across Venezuela and the adjacent islands escalated to an unprecedented scale at the turn of the 17th century, ushering in a critically dangerous mercantile era. From c. 1596 the Netherlands emerged as the main threat to Spain's monopoly on trade in her dominions, when two Dutch ships sold a purported 80,000 ducats worth of cloth at Margarita. Trade seems to have been particularly poorly protected along the Pearl Coast at the time. Thus, in 1595 Gillis Dorenhovenn, the captain of the Dutch *Zwemende Leeuw* (*Swimming Lion*), sailed to the wilds of South America, where he quietly traded at "Margarita, Cumaná, Manecillas & the Baya river." The goods exported from Zeeland were bartered for "tobacco, sassafras, canafistula, a great number of pearls of different kinds, gold jewelry, and costly leading-strings, gold crucifixes adorned with pearls, garnet, & emerald; earrings and finger-rings, and diverse precious stones, as well as wrought silver & a great number of hides, not to mention a batch of pieces of eight and pieces of four" (van Ittersum, 2007: 7, 21-2).

The Dutch may be credited for plunging the dagger into the heart of the failing pearl fisheries. The oyster beds of Margarita, Cubagua and Araya could only be worked in rotation every three years. With the Araya region less accessible and the Dutch presence magnified, pearl smuggling escalated. Pearl production at Cubagua between December 1600 and May 1601 yielded 40,000 ducats of produce, of which two Dutch smuggling ships carried away 30,000 *pesos* worth. In 1603 Suárez de Amaya reported that the royal *quinto* had dwindled to 3,000 *pesos*, and a year later to 1,600 ducats, a sum that could not even sustain the governor's salary (Sluiter, 1948: 181).

The main commodity sought by the Dutch was neither pearls, nor tobacco, but the region's abundant salt reserves, which were used in butter and cheese and to pickle meat, but were predominantly essential for the nation's herring industry after direct trade routes to Iberia – notably Setúbal

in southern Portugal – dried up following the outbreak of war between the Netherlands and Spain in the 1590s (Klooster, 1998: 26). Salt carriers from the Netherlands invaded the great 13km-long natural saltpan at the western end of Punta de Araya between Margarita and Cumana in 1594 (Jarvis, 2010: 189). The lagoon's gem salt was the finest in the Caribbean (Figs. 10-11, 14), and allegedly in the whole world (Sluiter, 1948: 176). That summer 13-14 ships filled their holds with salt. Eight more arrived in the autumn and 50 more vessels in May 1600, largely *urcas* (hulks) of 200-400 ton capacity. Many were armed and carried privateering papers. By 1603 more than 120 Dutch ships were annually collecting salt at Araya, plus another 30 English, French and Scottish vessels (Jarvis, 2010: 189).

The Dutch ships seizing free salt were comparable in volume to the official Indies fleets dispatched from Seville for Mexico and Portobello (Parry, 1963: 187). Official figures tabulated by Governor Diego Suárez de Amaya between 7 June 1600 and 8 December 1605 amounted to a minimum of 611 Dutch salt ships, plus a further 55 Dutch smuggling vessels in the wider Margarita-Araya-Cumana region. Over the same period just 25 English, four French, two Italian and one Scottish ship were listed (Sluiter, 1948: 178-9). In the reign of King Philip III a Spanish official observed that to the Dutch the salt pans were like mines "as rich as those of Potosí were for His Majesty". The majority of Dutch vessels sailed from the West Frisian towns of Hoorn, Medemblik and Enkhuizen, where the fishing industry thrived (Klooster, 1998: 27).

Antonio Vázquez de Espinosa described the Araya salt pans in 1622 as located three leagues from Cumana and as "the most abundant and the richest in salt to be found in the universe, for under the water lies rock salt in such quantities that if a hundred boats or galleons finish loading there, as has often been seen, and another hundred arrive, there is a cargo for all of them and one notices no diminution in consequence of earlier cargoes" (Clark, 1942: 54). A league and half in circumference, the lagoon lay 700 paces from the sea and was fed from the ocean, so that salt formed continuously in abundance. The produce was so concentrated that foreigners diluted it to make three boat-loads out of one.

From 1599 to 1605, Dutch, English and French vessels met little effective Spanish resistance, enabling Dutch ships to challenge the economic control of the Caribbean and to extend their influence over Trinidad, the Guiana coast, Caracas and beyond. Contraband trade and heavy defense commitments in Italy, the Mediterranean, Atlantic and the new front in the East Indies, would lead to such Crown poverty that in 1596 and 1607 Spain's debt payments were suspended. Creditors were instead compelled to accept state

bonds. The resulting loss of credit was a major cause of peace with France in 1598 and the Dutch truce of 1609.

Spain retaliated with words, but ultimately with limited actions. Peace with England improved relations in the West Indies in 1604, and a year later Fajardo led an expedition against the Dutch hulks at Araya with 14 galleons and 2,500 men. Twelve Dutch vessels were captured (as well as one French and three English interlopers) and the prisoners killed, drowned trying to escape, put to the sword, hanged or taken prisoner to Lisbon for consignment to the galleys. Following Bautista Antoneli and Pedro Suárez Coronel's inspection of the saltpans the same year, Spain decided that the best means of curtailing Dutch salt smuggling off Cumana would be to fill in the saltpans using a workforce of 500-600 Moriscos shipped in on four galleons and two *pataches* at a cost 162,000 ducats. The proposal was never realized. Instead, in 1605 royal approval was granted for a force of ten vessels totaling 2,300 tons to be built for the permanent defense of the Caribbean (two galleons, four *galeoncetes* of 300 tons each, and four minor craft) carrying 630 soldiers, 580 sailors and 150 cast pieces. The project would cost 224,689 ducats for construction and 271,114 ducats a year for maintenance, but when the coinage arrived from New Spain in 1606 the treasury siphoned it off for alternative purposes. The scheme was suspended (Sluiter, 1948: 177; Andrews, 1978: 201-203).

Ultimately, the main Spanish strategy devised to end the contraband trade was desperate and ill advised. By an ordinance of 26 August 1606, Margarita, Cumana and Caracas, the chief producers of tobacco, were ordered to suspend sowing tobacco seeds for ten years and, in February 1606, Pedro Suárez Coronel, the Governor of Cumana, was instructed to depopulate Cumanagoto, the regional commercial epicenter (Andrews, 1978: 214).

With one regional fire extinguished, others quickly broke out. The prohibition merely enabled the tobacco trade to expand under foreign control, impoverishing the Spanish dominions further. Although all cultivation along the coast of Cumana had stopped, it boomed instead in Trinidad, and in the 'Wild Coast' between Venezuela and northern Brazil from the Orinoco River as far as Maranhao, where the French, Dutch and English built new factories and plantations (Klooster, 1998: 32). Bernardo de Vargas Machuca, the Governor of Margarita, also pointed out in 1609 that the ban was counterproductive because it made the African slaves and pearl fishermen of Margarita restless and unproductive (the inference being that slaves were pacified with cheap tobacco). More immediate political concerns were undoubtedly exerted by the Church, whose yearly levies in excess of 1,000 ducats from tobacco sales were in jeopardy (Baud, 1991: 32; Goodman, 2005: 133).

In 1611 the Governor of Honduras complained about the ruinous condition of his province, as well as conditions in Jamaica. A year later the population of Panama had dwindled by two-thirds due to changes in the pattern of American trade, and Rio de la Hacha pleaded remission of its taxes because it was too poor to pay them. To make matters worse, Caribs from Tobago and further north attacked Cumana (Andrews, 1978: 222).

The uneasy truces within the West Indies came to an end in 1618 with the Thirty Years War in Europe. The Dutch-Spanish truce expired in 1621 within weeks of Philip IV taking the throne. A marked revival of corsair attacks ensued in the Caribbean, and Margarita, Cumana and Punta de Araya bore the brunt of heavy assaults. Privateers raided Margarita in 1618 and the island was ransacked in August 1620. Following Dutch attempts to seize the saltpans in 1621, the Governor of Cumana, Diego de Arroyo Daza, fortified the area in November 1622 (Andrews, 1978: 236, 238; Fig. 14).

According to Antonio Vázquez de Espinosa, King Philip IV ordered a garrison and fort to be built at Santiago de Araya in 1622 for the protection and defense of the salt beds. The new fort held 200 infantry soldiers, a lieutenant under the command of Don Juan de Vargas Machuca, 40 bronze and cast iron cannon, 25 artillerymen and their master gunner, so that "the salt beds are protected and the pirates no longer dare come to them, and so that nest of pirates was broken up" (Clark, 1942: 54). The project was a success and after the soldiers drove off another heavily armed Dutch incursion in January 1623, the Dutch withdrew from Araya and began instead to exploit San Martin in the Leeward Islands, Bonaire, Tortuga and Curaçao off the Venezuelan coast for salt (Andrews, 1978: 238).

9. Conclusion

The collective archaeological evidence for the deep-sea Tortugas shipwreck excavated by Seahawk Deep Ocean Technology (pearls, keel length and 'negative' data indicative of an organic primary cargo), examined against the profile of outward-bound ships in the Tierra Firme *flota* of 1622, suggests that the 117-ton *navio Buen Jesús y Nuestra Señora del Rosario* (master Manuel Diaz, owner Juan de la Torre) best fits the profile for this shipwreck.

The keel measures 17.40m in length maximum, which corresponds to a vessel with a keel length just in excess of 30 *codos* (17.24m and 106 1/8 tons) and a beam of 10 *codos* (5.74m). These parameters seem to discount the other two short-listed possibilities. At 90 tons the *Nuestra Señora del Buen Suceso* appears to be too small (28-30 *codos*, 16.09-17.24m) and at 180 tons the *Nuestra Señora de la Consolacion* too large (32-34 *codos*, 18.38-19.53m).

While the outward-bound destination of these two vessels is unspecified in Spanish manifests (AGI *Contratación* 1172 merely states they were heading for Tierra Firme), journey's end for the *Buen Jesús y Nuestra Señora del Rosario* was officially listed as Nueva Cordoba (Cumana), which was the center of Venezuela's celebrated Pearl Coast. The consignment of 6,639 pearls excavated from the Tortugas wreck adds credibility to the proposed identity of the ship.

At first glance the pearl cargo rationalizes the *Buen Jesús's* presence at Cumana on the east coast of Venezuela. However, 1622 coincided with a critical moment in time for Spain's control over Tierra Firme, and wider political and economic currents may have underlain the ship's voyage to the Pearl Coast. Smuggling plagued Venezuela as contraband tobacco and pearls eroded the Crown's tax revenues. The minimum of a thousand ships that sailed from Amsterdam to America in search of free salt and colossal illicit trade between 1587 and 1602 reflects the enormity of the commercial problem (Sluiter, 1948).

The start of King Philip IV's reign coincided with a profound change in Spain's commercial policy towards the Northern Countries (notably the Netherlands and England) as the fear of a negative balance of payments, whereby deficits would have to be paid off in silver, necessitated a shift towards a more protectionist policy (cf. Nater, 2005: 254). With the end of the 12-year truce signed with the United Provinces in 1621, all trade was officially closed to the rebels. At the time of the *Buen Jesús's* fateful voyage, Spain was committed to a phase of economic warfare designed to suffocate enemy trade (Aparicio, 2009: 1-2). The *Buen Jesús* was conceivably a pawn that served to help maintain in a small way both a visible presence at Cumana and to guarantee the flow of taxed tobacco to Seville.

The possibility of a major consignment of tobacco on the *Buen Jesús* fits with the maritime history of the 1622 fleet, from which at least the *Atocha* and *Rosario* were transporting the same product. Venezuelan tobacco may also have served as a perfect camouflage to cover the captain's tracks in procuring valuable contraband pearls at Cumana (cf. Rondón, 2009), if this was the case; the pearls found on the *Margarita* are similarly absent from the ship's home-ward-bound manifest.

Other secondary cargos were also readily available in Venezuela and may have been picked up at Cumana or Rio de la Hacha. Indigo, cocoa, sugar, ginger, copper, turquía stone for painters, garnets and other merchandise were all accessible in the Bay of Maracaibo in northwest Venezuela, a transit point en route to and from the Pearl Coast (AGI *Contratación* 5173). Other produce is often proposed for this period, but American cotton can be excluded because this trade did not develop until the 1740s (Thomson, 2008).

Cacao is often envisioned as having taken off by 1622. Pope Pious V proclaimed in 1569 that chocolate mixed with water could be consumed during a ritual fast as a "restorative" and not as actual food. While Dutch pirates were busy throwing a cargo of cacao beans, mistaken for sheep droppings, overboard from a captured Spanish galleon, in 1585 the first official shipment arrived in Seville. Some scholars argue that by the 1620s cacao from the *criollo* variety of the *Theobroma* tree had become Venezuela's primary export (Kim, 2007). The dominant plantations of Caracas emerged in the late 16th century using Indian labor (Klein, 1986: 85); by the early 17th century Caracas is sometimes accepted as having started to export cacao (Piñero, 1994: 34).

In terms of scale, such trade is unlikely to have been significant in 1622 or to have attracted the interests of the *Buen Jesús*. Cacao cultivation accounted for a lowly 0.5% of Caracas's exports in 1607 (compared to 42.9% for tobacco, the leading regional commodity). By 1650, levels had escalated to 50% of the town's exports. The Caraqueños may have realized that local cacao beans could be sold to Indian consumers for profit in the 1620s, but Dutch exports in that decade were minor. The earliest cacao beans exported to Mexico were shipped by the Basque Liendo immigrant family in 1628, whose Caracas estates boasted 12,382 trees by 1653 (Ferry, 1989: 3, 45-6; Klooster, 1998: 182). Before then cacao was used solely for small-scale barter.

Alongside the commercial attractions of pearls and tobacco at Cumana, plus the *Buen Jesús's* strategic role in 1622, several other products identified on the Tortugas wreck could have been readily collected at journey's end. Both finished tortoiseshell combs and comb cases, plus apparent examples of blanks for cutting and processing, were excavated from the site. All would have been widely available at Cumana.

Ethnohistoric and other documentary sources indicate that turtles were systematically exploited along Venezuela for eggs, meat, oil and carapace in the 16th to 18th centuries and that nesting beaches were renowned off Margarita. The region was home to the green turtle (*Chelonia mydas*), the hawksbill turtle (*Eretmochelys imbricata*), whose translucent carapace plaques have traditionally been used to produce diverse articles and implements, and thirdly the loggerhead turtle (*Caretta caretta*), which was the most common species in eastern Venezuela. At the beginning of the 16th century Fernandez de Oviedo y Valdéz described the nesting of "many gigantic turtles, with as much meat as a six months calf" on Cubagua and the other eastern islands of Venezuela, clearly referring to green turtles. The volume of meat obtained from the marine turtle is relatively

large: green turtles can weigh up to 275kg, with its flesh constituting about 40% of its total weight (Antczak *et al.*, 2007: 63-5). ‘Tortoises’ (presumably including turtles) were also recognized sources of nutrition obtained by Europeans for return voyages (Thompson, 1958: 334). Perhaps similar consumption, followed by functional reuse of the shell for comb production, was practiced by the *Buen Jesús*’s crew.

To complete the possible links between the Tortugas wreck and Venezuela, Philip Armitage’s identification of two bones as originating from the blue-headed parrot, *Pionus menstruus* (Armitage, 2012), bring to mind José Agustín Oviedo y Baños’s reference to the country in the last quarter of the 17th century, where “The fields are always full of birds, delightful for their beautiful plumage and their melodious songs, as well as their delectable flesh” (Johnson Varner, 1987: 8). Of course both turtles and parrots would have been equally readily available in Havana, the final port of call where fleet ships took on fresh supplies of food, water and firewood for the 115-day long haul back to Spain (Macleod, 1986: 353; de la Fuente, 2008: 13, 53). Such are the reconstructed parameters – probable and tentative – for the deep-sea Tortugas shipwreck.

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