

plain the complex history of the oldest building. The conservators proceeded with dating the following construction phases: the first, between late antiquity and early Middle Ages, and the second, the early Middle Ages as far as the eleventh century. This has thrown a new light on the beginning of urban development of Dubrovnik, especially the area around the street Prijeko. Namely, on the site of the pre-Romanesque church the foundations of two older churches were discovered: an early Christian church, the evidence of which has been found in a number of stone fragments (*spolia*) dating from the sixth century. As the fragments in question are of the early Christian origin, and, without doubt, are related to the existing building, this contributes to the corpus of the late antiquity and early Christian fragments excavated in the City. All the unearthed fragments from Sigurata have been carefully classified and presented in the study.

The results of the study lead the authors to the conclusion that the Church of Transfiguration originates from the period spanning between the late antiquity and early Middle Ages. It was built outside the settlement, on the shores of a bay enclosed by a peninsula, where a Byzantine *castrum* had been built in the sixth century.

The most recent reconstruction of Sigurata revealed a succession of alterations carried out over the years, as a result of the changes in style concept and liturgical requirements. A reconstruction was carried out at the turn of the eleventh century, to be followed by another one in the fourteenth century, and the last Baroque adaptations before and after the 1667 earthquake. Thanks to the excellent drawings enclosed to the text, the whole architectural development of the church can be vividly followed.

The value of this book most certainly proves the idea that each restoration of an architectural monument should be rounded off with a scientifically based and documented study such as this one by Peković and Žile.

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Joe J. Simmons III, *Those Vulgar Tubes, External Sanitary Accommodations aboard European Ships of the Fifteenth through Seventeenth Centuries*. Studies in Nautical Archeology I, Second Edition. London: Texas A&M University Press, Chatham Publishing, 1998. Pages xi + 100.

Joe J. Simmons has dedicated his book to all those who have gone at sea, its title being taken from a poem "A Sea Chaplain's Petition to the Lieutenants in the Ward Room, for the Use of the Quarter Galley" attributed to William Falconer and published in *Gentleman's Magazine* in 1758. Joe J. Simmons earned his M.A. in anthropology with a specialization in nautical archeology from Texas A&M University. From 1975 to 1994 he served in numerous nautical archeology projects, the result of which is this devotedly written monograph imbued with humour.

Simmons's book provides historians and anthropologists with a rich view of the rare subject of the development of sanitary facilities, that is, toilets aboard ships from the antiquity to modern age, focusing on European ships of the great era of sail. The disposal of human wastes generated aboard ships has always been an important consideration, particularly in earlier periods. Thus, in the introduction Simmons discusses the use of chamber pots, which were probably

employed more often by officers and privileged passengers than by members of the crew. Chamber pots are often found among the remains of old shipwrecks, such as that of the *Hollandia*, which came to grief off the Isles of Scilly in 1743, and another in the Bay of Cadiz, thought to have sunk in 1805 after the Battle of Trafalgar.

Because of their very nature, waterborne craft have usually been able to accommodate the human need by simply eliminating excreta directly into the sea or by throwing collected materials overboard. Such rudimentary methods of waste removal persisted until the fifteenth century and later. In a scene painted on a Cypriot pitcher dated to the seventh century B.C., a sailor is shown relieving himself from the quarter rudder at the stern of the vessel. A fresco dated to the seventeenth century B.C. from the island of Santorini (ancient Thera) depicts a lavatory for crew and officers. An ivory plaque from Sparta that dates of around 600 B.C. represents a man crouching on the ramlike projection of the vessel, engaged either in a degrading form of contrition or in eliminating his bowels. On Roman merchant ships, the extreme part of the deck was covered so that the ship's officers and important passengers could answer the call of nature. According to Simmons, the earliest literary reference found is that of Porphyrogenitus relating to one thousand *ptuaria* (spitters)—waste buckets—for a fleet of twenty Byzantine dromons in A.D. 949. Each dromon having a crew of approximately two hundred, each waste bucket was to be shared by four men. From the later period (ca. 1380) dates the toilet box from the cog discovered in the Bremen harbour in 1962.

The illustration of a carrack (Kraeck) by the Flemish artist "masterWA" dated around 1470, clearly shows the barrel-like attach-

ments above the transom called "steep-tubs", closetlike additions that project out from the sterncastle, and "soil-pipes" within the sterncastle. Steep-tubs were wooden barrels, or half-barrels, used to steep salted meats aboard ships from the fourteenth to the nineteenth century, their alternative function being that of sanitary accommodations. In the fifteenth century the same term is applied to both devices, sometimes associated with the salting of fish. Unlike the ships of the north, southern ships were equipped with a container lashed to the stern or fitted above the counter, resembling jars for the storage of oil, water, or wine. Between the jarlike containers appear structures known as "hen coops" and small cratelike galleries, which R.M. Nance classifies as the equipage of peculiarly southern ships. An analogy can be drawn between these sanitary structures and the ones of modern Arab *dhow*s, *booms*, and *abubuzes* from the end of the nineteenth and the beginning of the twentieth century described by D. Howarth. This data illustrates the long life of these additions which could have been removed and converted into gun slots. It has been stated that Vasco da Gama's caravels of 1497, were probably equipped with similar facilities. These stern additions were modelled after garderobes of medieval castle architecture. Terrestrial garderobes projected beyond the perimetric walls and served the same purpose, draining into the moat round the castle or into a special pit (or upon the enemy). Another interesting feature apparent in depictions of master WA are the stern turrets and bartizans also observed on Gozzoli's painting entitled "The Rape of Helen". Soil-pipes can also be seen on the stern of a carrack in Breydenbach's "Journey to Jerusalem" from 1483.

Sixteenth-century ships underwent significant changes in the bow configuration.

Beakheads were ideal platforms for the establishment of external sanitary accommodations aboard Spanish galleys. An important development related to the removal of human wastes was the appearance of stern and quarter galleries. Around 1550 external “necessary tubs” rested on the chain wale and were lashed to the hull or dead-eyes. An excellent depiction of this arrangement can be found on a Portuguese ship engraved by Frans Huys after Pieter Brueghel. It has been suggested that necessary tubs on English vessels were also employed in the event of fire, but filled with sea-water. The painting by an anonymous artist, entitled “The Embarkation of Henry VIII”, represents the *Great Bark* and a garderobe at the starboard stern quarter. Simmons assumes that garderobes may have been the predecessors of enclosed quarter galleries, which appeared early in the seventeenth century. According to Simmons, the disappearance of garderobes could be explained by the emergence of the “open balcony” style of stern and quarter galleries. The latter took the form of an extension around the quarters of the unroofed stern galleries between 1530 and 1555. The representation of the *Ark Royal*, flagship of the anti-Armada campaign of 1588, exhibits turrets and latrines mounted at the stern so as to allow unhindered drop of the effluent into the sea. Soil-pipe or disposal chute is represented at the stern of a ship on a Dutch woodcut of a wharf scene, dated circa 1520.

Seats-of-ease made their appearance in the seventeenth century. Archeological evidence from the *Wasa* (c. 1628) proves the existence of these rectangular boxes. On the English forty-six-gun ship from 1681 seat-of-ease consisted of three levels (the upper two were probably steps) with the hole in lower level. *Boyne*, an eighty-gun English ship from 1692, was equipped with a mere

two single keyhole seats, accommodating the crew of as many as 650 men. The depiction of the French ship *Navire Royale* from 1626, reveals the fore turrets located just above the beakhead. A similar construction was found on the ship *La Couronne*, built in 1638. Roundhouses, or “semicylindrical hygienic accommodations”, as the author also calls them, were placed to port and starboard of two English ships. The one from 1703 even had three semicircular galleries. The ninety-six gun English vessel *Charles* was fitted with three semicircular galleries projecting from the bow. *Suffolk*, another English ship from 1765, was facilitated with a set of sanitary accommodations including the roundhouse, corner seats, and a hole for free-standing seat. In larger ships, pissdales were added at locations amidships, on upper and middle decks, making their appearance around 1680. A side-shelf with three steep-tubs can be observed in a painting of a ship by an English artist A. Willaert (ca. 1613). Simmons holds that the change in the appearance of ships’ sterns, the adoption of the baroque round-shaped hull, may have hastened their retirement from common use by about 1700. At the beginning of the seventeenth century, garderobes were depicted at the forward end of ships’ quarter galleries, open or partly enclosed. The first third of the seventeenth century witnessed the increasing enclosure of the quarter galleries. Sanitary accommodations on two-level quarter galleries were also to appear later (ca. 1670).

In the eighteenth and nineteenth centuries hygienic facilities were incorporated into the construction of the hull and no longer represented extensions. Thus, installed in the bow of the English *Princess Royal* of 1773 were two roundhouses and four freestanding seats with square trunking. The eighty-gun ship *Collingwood* (1841) was fitted with

a four-hole settle with pisse-dale, while the soil-pipe extended to the waterline. In the collection of the National Maritime Museum, Greenwich, examples of pisse-dales on unidentified ships are known to exist. Flushing water closets were first installed in the quarter galleries of British ships of the line in 1779, but their extensive use appears to have taken place after 1800. In the conclusion, Simmons submits a flow diagram showing the development of external sanitary accommodations on the bow, amidships, and stern between 1400 (and earlier) and 1900. The location and form of hygienic accommodations are closely related to the development of ship construction and the increase in the size of the crew. Also, maritime sanitary accommodations cannot be viewed separately from the development of their terrestrial counterparts.

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