

*The Rake forward is neere halfe the length of the keele and for the Rake aftward, about the forepart (fourth part) of her Rake forward; but the fore Rake is that which gives the ship good way, and makes her keep a good wind.*<sup>23</sup>

These two early English works describe what drawings of other nations demonstrate also. Around 1600 the common stem shape of ship or vessel was a semi-circle and the length of keel not more then 3 x extreme breadths. That this was a very closely adhered to principle can even be seen on models and drafts of large V.O.C. ships e.g. *Prins Willem* of 1649<sup>24</sup>, a Dutch two decked 68 gun ship of 1660/70<sup>25</sup> and ship *Boekenrode*<sup>26</sup> of similar size of 1729. Declaring these English instructions as of no use for the reconstruction of a Dutch ship has already been proven strange by the three mentioned examples; even more so with these in defense of the replica presented extracts of contemporary Dutch documents, providing stem dimensions and depth of curvature:

- 1.) A 73 feet long 1594 vlieboat with 28 feet long stem, **5 feet depth of curvature** and a 13 feet or more rake,
- 2.) A 85 ½ feet long 1593 pinas with a 28 feet long stem and **5 feet depth of curvature** by 15 feet rake
- 3.) A 65 ½ feet long 1598 buss with a 26 ½ feet long stem, having a 16 feet rake and **6 feet depth of curvature**.

When reading the **depth of curvature** correctly, all three describe a semi-circular stem as cited in the ‘*of no use*’ English instructions. This lack of early written Dutch evidence let them forget that even by not having such; Dutch mid-seventeenth century drawings and Witsen’s first Dutch book on shipbuilding of 1671 followed the same circular rule. Yet by being in possession of and although talking of it, however disregarding not only one but three contemporary written affirmations of stem depth of curvature ( Depth of curvature can be measured by drawing a line from the stem’s heel to its head and take at right angle the largest distance from that line to the rabbet curvature) on Dutch vessels of slightly larger size from the end of 16<sup>th</sup> century, (A 1593 pinas of 85 ½ feet length with a 28 feet long stem and **5 feet depth of curvature** by 15 feet rake would have given them the right idea) and Witsen page 66: *Tot het vallen van de voorsteeven neemt men 28 negen en twintigste deel, van de hoogte van de steven, in de winkel. De voor-steeven heeft bucht 5 voet,* (For stem rake shall 28 / 29<sup>th</sup> of the stem’s vertical height be taken. The stem has a depth of curvature of 5 feet. (Translation by Author)), That these time documents were a proof of the replica stem’s correctness by stating that the dimensions of the 1999 yacht *Duyfken*, 70 feet long: *the stem post 16 feet 3 inches high [not long] with 2 feet depth of curvature... the fall [rake] 7 ½ feet, are similar to those of the vlieboat and pinas* is therefore way of the mark. This again expresses lack of knowledge by not recognizing the significance of depth of curvature in these documented dimensions. *Duyfken* ‘replica’ was built as a pinas and they should have looked for pinas documentation where the given

dimensions point to a semi-circular shaped stem. The second designer’s claim in regard to curvature was even more interesting: *We did not design DUYFKEN’S stem until a strongly curved oak tree trunk had been acquired.*

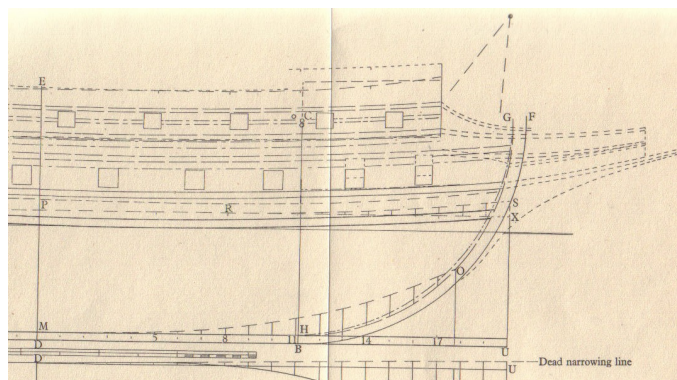


Fig.16) This draught detail is of an English ship of 100 feet length of keel; the drawing part of the Treatise on Shipbuilding from 1620.

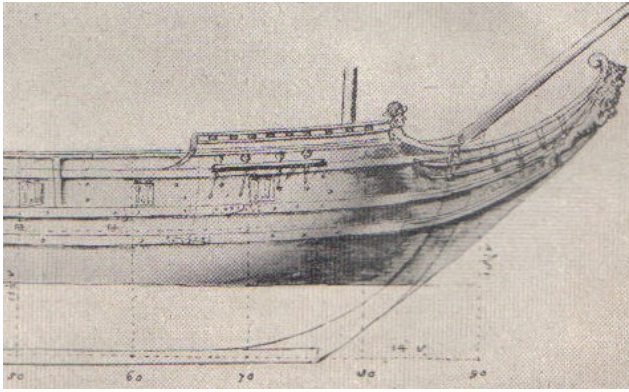


Fig.17) illustrates the bow of a Dutch pinasship from about 1650 with a length between stem and sternpost of 90 feet and a breadth of 24 feet. With a rake of approximately 18 feet or  $\frac{3}{4}$  of the breadth and curvature of 5 feet this is similar to the provided contemporary figures of a 1593 pinas.

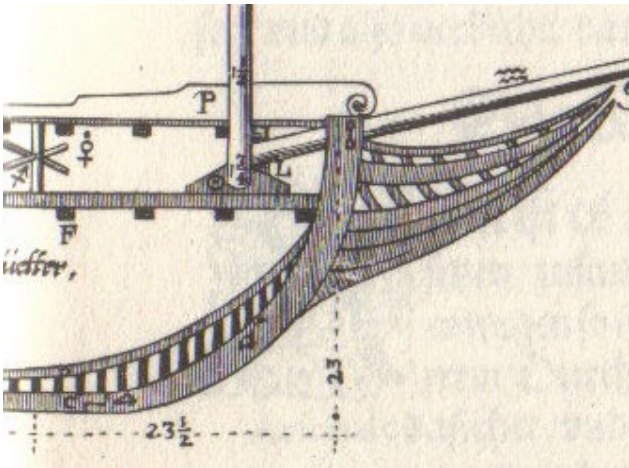


Fig.18) Joseph Furttenbach drew in 1629 in his ARCHITECTURA NAVALIS the stem of a Nave, a Dutch merchantman, of 125 palmi. Stem curvatures of the here shown three different European ships are similar and could for comparison be repeated dozens of times. With these in defense of the 'replica's' stem offered excerpts of contemporary documents countermanding already their arguments, the four contemporary illustrations makes this even visually obvious.

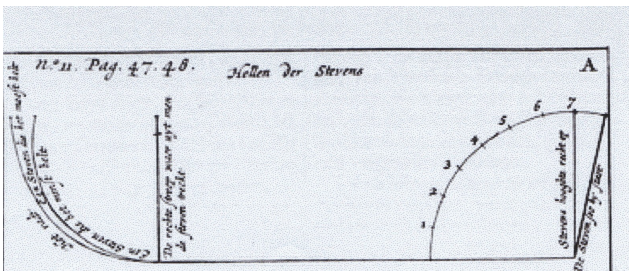


Fig. 19) Nicolaes Witsen gave us 1671 as part of plate XVIII in AELOUDE EN HEDENDAEGSCHE SCHEEP-BOUW EN BESTIER this diagram of stem rake, length of keel and degree of sternpost fall.

The following response to stem rake by the replica's leading designer can therefore only be explained with too much reliance on limited iconography and not accepting written evidence. *Stem rake is usually given as a fraction of keel length in English texts and there is no evidence that the Dutch made use of such ratios. Marquardt would give the replica a stem shape from later in the 17<sup>th</sup> century than when the original ship was built. Also he would give the replica English shape since he cites Sir Anthony Deane's 1670 Doctrine on the question of stem rake. At the end of the 16<sup>th</sup> century Dutch ship stems were generally only moderately raked and sometimes they actually recurved inboard. There is considerable variation in stem shapes to be seen in the iconography<sup>27</sup>. How can it be that written contemporary Dutch advice was in their hands and nobody recognized its significance?*

Much could be said about stem development from the 16<sup>th</sup>/17<sup>th</sup> century's idea of a compass sweep as forward rake that *gives the ship good way, and makes her keep a good wind<sup>28</sup> and draw a circle up to a quadrant for the rake of the stem<sup>29</sup>* to the 18<sup>th</sup> century recognition that a longer keel was serving the ship better than a long stem rake. It was in the third quarter of that century that, because of constant keel enlargement during the decades before, the French master shipwright Olivier built two large ships, the *Mars* and *Aleiden*, with completely vertical stems and sternposts and discovered very positive aspects in this. Ch. G. D. Müller commented 1791 in his German translation of the great French Inspecteur Général de Marine M. du Hamel de Monceau's work 'Elémens de l' Architecture Navale de la Construction des Vaisseaux' of 1752: *A ship from the size of MARS would have had at the begin of this century [18<sup>th</sup>] 75 feet of stem rake, soon after 40½ feet, then 26½ feet, in between 21*

to 22 feet, now 18 to 19 or only 14 to 15 feet; with others having given similar ships only 12 feet, and Mr. Olivier fitted the stems vertically ( translated by Author)<sup>30</sup> It was therefore not during the centuries before, but the enlightened 18<sup>th</sup> century which brought this big change in stem shape and length to width ratio.

Nothing further needed to be added to *Duyfken* 'replica's' stem not being of end 16<sup>th</sup> but of 18<sup>th</sup> century style.

### 3.) Forecastle

Situated above and aft of the wrongly shaped stem was the forecastle. It is unfortunate that it has become a rather disputable part of the 'replica's' hull construction. The Treatise from 1620 supplies a short but precise description of its positioning: *Above this deck [the upper deck] is the fore castle. The deck thereof may lie at the height of the half deck set out in the midship bend; the length may be 2/3 of the inward rake and must be cut off at the 3<sup>rd</sup> timber forward on, for more conveniency in placing the bowsprit and fashioning the head.*<sup>31</sup>

Another short sentence: *The forecastle is the uppermost part of the foreship directly over the chase and contained between the bulkhead thereof and the stem.*<sup>32</sup>

Captain John Smith writes in 1627: *It were not amisse now to remember the Fore-castle, being as usefull a place as the rest. This is the forepart of the Ship, above the Decks, over the Bow. There is a broad Bow & a narrow Bow, so called according to the broadnes or the thinnesse. The Bow is the broadest part of the Ship before, compassing the stem to the Loufe, which reacheth so farre as the Bulk-head of the Fore-castle extendeth.*<sup>33</sup>

Most obvious about the 'replica's' forecastle is its noncompliance with any historic data. It is not 'as usefull a place as the rest,' neither is it of similar deck's height to the half deck, it has no bulkhead in the waist and is not cut off at the 3<sup>rd</sup> timber from the bow or extended to the [missing] bulk-head at the 'loufe or chase'. Loof-frames or timbers were in earlier shipbuilding these fore or aft frames (balance frames) of a ship, which were equal in width. The 'replica's' forecastle is a totally open construction, an invention of the 'replica's' designers (**a World's first!**). They denied out of convenience even their strongest 'evidence' - the 'Iacht of 30 Last', 'R. de Baudous etching from 1610' and other iconography, which all present a bulkhead to the waist and a closed up cut off at the 3<sup>rd</sup> timber. Not even one in all 16/17<sup>th</sup> century iconography of Dutch or other nation's ships confirm a forecastle with an open (flying) platform above the bow. The explanation for that 'invention' is strange: *Bulkheads would obstruct the working of the windlass. The forecastle deck is there to allow sail handling above the clutter of windlass, bitts, mast and bowsprit*<sup>34</sup> and, not entirely in unison: *The criticism that Duyfken's forecastle lacks bulkheads is valid. It was intended that there would be bulkheads, and they could be fitted, but it is more convenient to work the ship, particularly stopping the anchor cable to swift it on the windlass, and tending the spritsail rigging, with the forecastle open.*<sup>35</sup>

It may be more convenient, but is historically incorrect for ships with a built-up forecastle. In the way the forecastle has been constructed it is of no use for anything and could easily have been left off. It is wet, nothing can be stored and the gun ports in its sides are only ornamental. Everything was done for the use of a windlass which has no function on a ship with built-up forecastle.





Fig. 20 & 21) the two photos illustrate the openness of her forecastle for a reader without firsthand experience of the 'replica'



Fig. 22) Next to the completely open forecastle, the waist bulkhead for the half-deck with its two large open doors and four half-high window openings can only be accepted as charade. Being only several feet above the waterline even larger ships had closed doors and no windows in this bulkhead. This is complete fantasy.

Any reproduction of a period ship should be built as close as possible to all available evidence of her time, not to follow the whims of modern designers.

Let's the closing words of this chapter come from the famous Captain John Smith's SEA

GRAMMAR of 1627: *A Bulks head is like a seeling [ceiling] or a wall of boords thwart the Ship, as the Gunroome, the great Cabin, the bread roome, the quarter Decke, or any other such division; but them which doth make close the fore-castle and the halfe Decke, the Mariners call the Cubbridge heads, wherein are placed murtherers; and abaft, Falcons, Falconets or Rabinitis, to cleare the Decks fore and aft, so as well as upon the ship's sides to defend the ship and offend an enemy*<sup>36</sup>. Smaller ships will not have had all armament mentioned, many, especially merchantmen had probably none, but otherwise not much differed in their way of construction.

#### 4.) Windlass

To fit a windlass where the forecastle bulkhead supposed to be is a definite No-No for pinas-style ships like *Duyfken* 'replica'. All particular arguments by the designers are based on a wrong interpretation of a certain historic text. A windlass could only operate in an open space and not with a bulkhead in front of it, this was even recognized in the designers own statements. The following examples of 1600 iconography explain where and on what types of vessel windlasses were situated.





Fig.23) Left: Detail of an etching by Cornelis

Liefrinck 1622 'Leyden militia' Arrows point to windlass. Fig.24) Right: Detail of a Robert de Baudous' 1618 Etching 'autumn' where a windlass is visible in the bow.

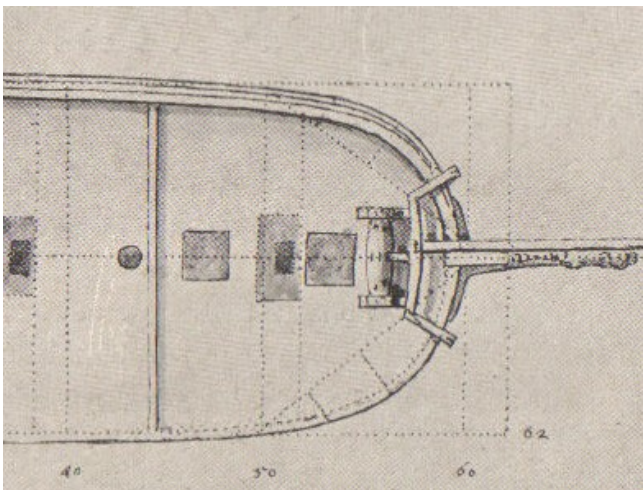
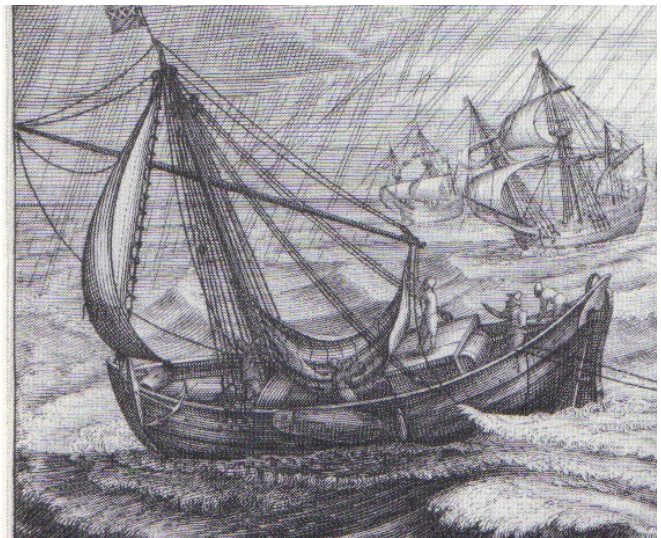
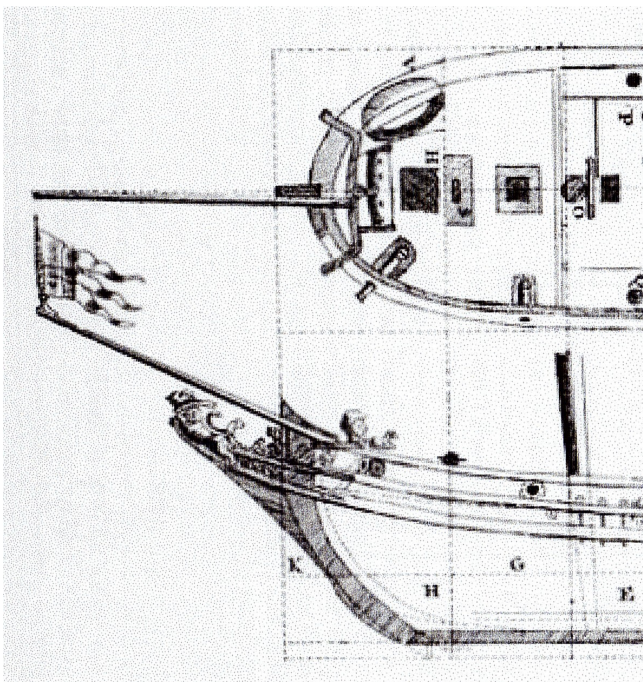


Fig.25)

Detail from a 1667 drawing of a Dutch Statenjacht by Jacobus Storck. The jacht is with 62 Amsterdam feet of length and 20 Amsterdam feet of breadth slightly larger than *Duyfken*, but without forecastle. Placed in her bow is a windlass.

Fig.26) below: Another detail of a Dutch (Stillwater) pleasure jacht from N. Witsen's Work, plate LXXII. Again we can see a windlass in front of the (dark) fore under (foc'sel).



Evidence as shown can be repeated many times and if one looks for further period vessels of similar size without forecastle but with a windlass, one excellent example is the contemporary model of the Wadden-Convoyer, A. Willaerts' painting from 1642 being another. From Hercules Segers 1620 etching of 'The small Ships' and van Wieringen's painting *Sea-battle off Gibraltar 1607* can also be concluded that such ships without forecastle will have existed around 1600 and are not a later invention.

Captain John Smith wrote in 1627 a few words about a windlass which is probably one of the earliest descriptions of its placement aboard: *A windas is a square peece of timber, like a Role, before the fore Castle in small ships, and forced about with handspikes for the same use as is the Capstaine.*<sup>37</sup>



With no room for a windlass – to set up and operate – even in front of a large three-deck ship's forecastle, his expression *before the fore Castle* can only suggest *before the foc'sel*, sailor slang for forecastle and used for that “fore under” on any vessel where even in modern times deckhands were housed. Entrance to that space was the foremost hatchway behind the windlass, therefore *before the fore Castle*. (See Fig.25& 26)

The designers' reasoning for having an open forecastle springs from De Veer's narrative: *Reizen van Willem Barentsz naar het Norden. 1594/97*. Gerrit de Veer, one of the 12 survivors of Barentsz ill-fated search for a north-east sea passage across the top of Russia, tells in his narrative of an ice bear trying to climb on board: *and boldly stepped towards them/ to climb up forward at the ship / but the mates had rigged the schuyt's sail above on the ship / and with four calivers lay forward upon the windlass. The bear was shot [and] so walked away* (translation by de Jong).<sup>38</sup>

*The presence of a windlass forward in Barentsz' ship and the apparent openness there also are, as a little tribute, a feature of the reconstructed Duyfken*<sup>39</sup>. Her designer-invented openness of *Duyfken's* forecastle is therefore rectified as being; ‘a little tribute to Barentsz' ship.’

How was the shape of Barentsz' ship? Already in 1599, the publishing date of De Veer's narrative, it was an enigma for artists to fantasize over and as we can see, at no time were limitations set to fantasy. Willem Barentsz sailed 1596 with two ships to the Arctic Sea in an attempt to find a north-east passage to Cathay. After reaching Spitsbergen the ships split up and the second returned to Holland. Barentsz continued his voyage until his ship became ice-locked at the northern tip of Novaya Zemlya and gravely damaged. The remaining 17 men of the expedition built then a hut to survive winter, two died and in May 1597 the survivors planked up two boats, loaded them with their left over provisions and sailed south. Willem Barentsz died soon later and was buried on Novaya Zemlya. After 80 days of sailing, twelve survivors reached a Dutch trading post on the Russian coast and returned 17 months after onset of their ill-fated voyage on a Dutch ship to Holland.

Fig.27)  
An illustration from De Veer's narrative of Willem Barentsz' ships. number of guns point to relatively large ships length of at least 90 when compared to a ship draft from about



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De Veer established with his *forwards upon the windlass* that Barentsz' ship was fitted with a windlass, which factually implies that this ship did not have

a built-up forecastle. To use De Veer's statement together with these contradicting illustrations of the narrative as justification for a ‘**World first**’ open forecastle and remarking: *This indicates a windlass somewhere forward and not inside the forecastle*<sup>40</sup> is something nobody expects to be seriously spoken. As pointed out and demonstrated before with contemporary iconography, a windlass could only operate on an open deck. A fact even the designers had to accept, however they just didn't know