

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



what to do with the contradiction of a windlass on Barentsz ship, which in iconography is shown in various guises but always with a built-up forecastle.

Fig.28)

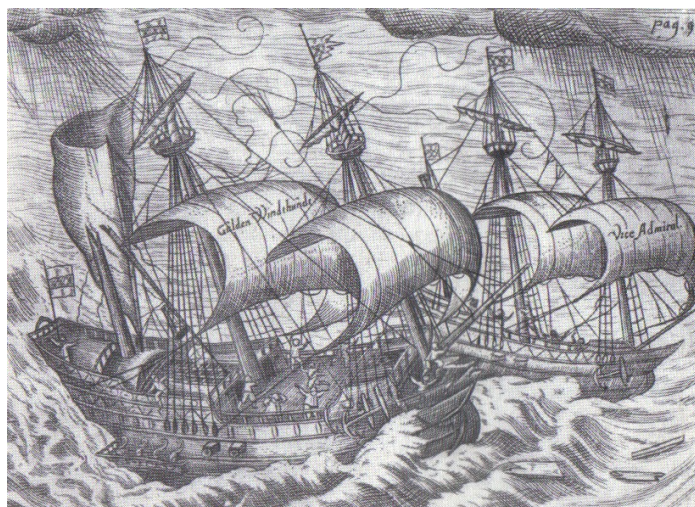
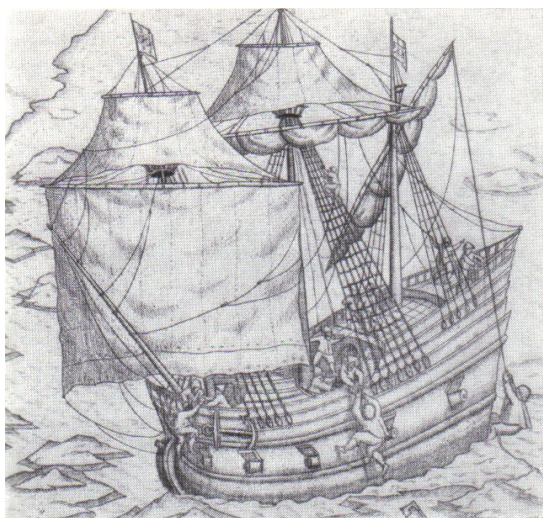


Fig.29)



Fig.30)

The four variant iconographies of Barentsz' apparent ship from De Veer's narrative have: No.27) 6 guns to each side and a very narrow taffrail, No.28) is with 2 guns to a side, one with a wide taffrail and a balcony, the other with a narrow one, No.29) with 4 guns a side, a near pointed stern top and no balcony, while No.30) provides two tiers of 4 + 2 guns, a narrow stern top, the foremast is set abaft the beak-bulkhead (a slight indication that this picture is about 30 years younger as the others), no balcony but a round tuck is indicated. All six ships have a bulkhead forecastle with no possibility

of placing a windlass. Alone the variety of documented ships tells us that the artists, probably illustrating several editions of that narrative, never knew the actual ships and had their imagination running free by following the story with a number of fanciful pictures.

Barentsz' ship broke up in ice off Novaya Zemlya and actual knowledge of the ship was merely with the survivors. With no first hand knowledge support for a forecastle, we can only accept as fact De Veer's report about a windlass aboard and this indicates an open fore ship (no built-up forecastle). Those narrative pictures can not be used as positive evidence for the arrangement of *Duyfken* 'replica's' forecastle and windlass. Unlike a captain, ordering a painting of his ship and thereby controlling the outcome, Gerrit de Veer, a sailor, would not have had any influence on the illustrative side of his narrative. He probably received some kind of remuneration for the story and then went back to what he always did best, being a sailor.



*There are several pictures of Barentsz' square-sterned jacht but none show the windlass.<sup>41</sup> With De Veer's statement an accepted fact, the idea that something could be wrong with the illustrations of De Veer's story should have been a wake-up call for the designers.*

## 5.) Armament

The placement of *Duyfken* 'replica's' armament is another strong case in point. Let's again begin with evidential 16<sup>th</sup> century literature; first by looking into Captain J. Smith's 1627 writings: *Lay the Orlop with good planke according to her proportion. So leuell as may be is the best in a man of Warre, because all the Ports may be of such equall height, so that every peece [cannon] may serve any Port without making any Beds or platformes to raise them<sup>42</sup>.*

This is followed up with A Treatise on Shipbuilding 1620: *The orlop, which is the first deck above the hold, is chiefly for the use of ordnance; upon which there are diverse port holes cut through the ship's sides to place them in.<sup>43</sup>*

*The next thing to be considered when the decks are laid, is the due placing [of] the ordnance and cutting out of the port holes for them. Let the lower edge of the two midship ports lie two foot 10 inches above the breadth [not equaling the construction water line] and then will the muzzle of the piece lie 6 foot at least from the water, which is enough to bear them out all weather<sup>44</sup>.*

This was written for a ship of 100 feet length of keel; however the 6 foot muzzle height was accepted by sailing ships of all nations throughout the centuries, except for small vessels of the period in question which had their small caliber guns at a level suitable, but placed in a dry condition below upper deck.

The late W. Voorbeijtel Cannenburg, Director of the Nederlandsch Historisch Scheepvaart Museum Amsterdam, wrote 1943 about a pinas ship model in the museum's catalogue: *De pinasschepen onderscheidden zich – in tegenstelling met het fluitschip – door het platen achterschip, waarop de huidgangen eindigen. Zij werden in the 17e eeuw gebruikt as oorlogschip en ook as koopvaardijship in the groote vaart op Oost- en West-Indië. Het model heeft twee doorlopende dekken, het verdek en de overloop, waarop het grootste deel van het geschut is opgesteld<sup>45</sup>.* (Translation by Author: The pinas ships differentiate – in contrast to a flute ship – by their flat stern, on which the outer planks end. They were used in the 17<sup>th</sup> century as warship and also as merchantmen on voyages to the East- and West-Indies. The model has two flush-decks, the upper deck and the orlop on which the largest part of her guns are standing.) Witsen's large picture of a 24-gun pinas on plate XLV has all guns on the orlop deck and he demonstrates on cross-sections also guns on orlop deck, only on larger two-deck ships are such deployed on upper deck.

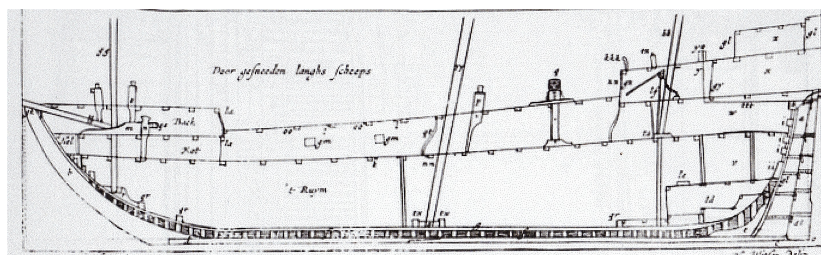


Fig.31). Excerpt from Witsen plate XLII. Please note the gun ports on orlop deck and the sunken decks of forecastle and steerage.

These contemporary statements and one of an earlier Dutch museums director (expert), and all

the iconography around 1600, Dutch, English, French etc. etc., point to guns on orlop deck if only one tier of guns is visible. Guns were also mounted beneath a bulkhead closed half-deck, but all were covered by a deck, therefore in a dry position, able to be used when necessary.

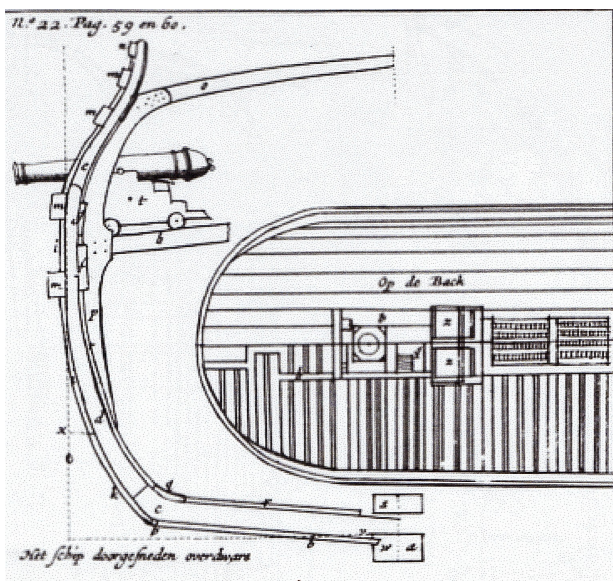


Fig. 32) Cross-section of a one tier gun mounting on 17<sup>th</sup> century ships. Guns were below upper deck on orlop deck. Witsen excerpt of plate XLIII



Fig. 33) Replica stern

When citing responding statements by the replica's designers, it is only to let the reader be aware of their reaction to pointed criticism. By relying mainly on iconography they even quickly disregard their own design base when it did not adhere to their line of thought, neither would contemporary written evidence (Dutch included) convince. Two of their best disregarding statements were:

*The iconography is unhelpful. It seems to be a convention of Dutch marine art c. 1600 that decks are shown entirely free of the ship's boats, spare spars, galley boxes, capstans and windlasses and other gear that might clutter them in real life<sup>46</sup>.-----The apple-banana dictum applies equally to the English language sources that Marquardt employs to demonstrate alleged shortcomings in the reconstructed Duyfken. The use of English treatises on shipbuilding and shipwrightery for the construction of a Dutch ship is not acceptable, and, in principle, forbidden; the outcome would be an English ship. And, as no English sources were used, the lack of conformity to them is only to be expected<sup>47</sup>.*



Even such contemporary Dutch documents as: Depth of curvature and Witsen's work, which definitely contradicts the 'forbidden use of English language sources', were neither read properly nor understood and their importance ignored. One does not finish up constructing an 'English styled' ship by comparing and finding similarities in English text and Dutch iconography; foreign text can still be helpful in solving certain technical problems if no Dutch equivalent is available. However, available for the placing of *Duyfken's* armament was not only iconography but also a statement from an eminent Dutch marine historian.

Fig. 34) *Duyfken* in action

When researching for the replica, the designers had not only general iconography at hand but also various



pictures of Barentsz' ships and one, *Duyfken in action in the road at Bantam, 1601*<sup>48</sup>, where she fired on Portuguese galleys. All pictures had one common denominator; their guns were at orlop deck (dry) level. Yet, this and all the other available evidence were ignored because it was not fitting their narrowly fixed concept. In contrast to evidential material are most of 'replica's' guns deployed on upper deck and exposed to the elements. The foremost gun ports were set into the forecastle sides, the second two sets were deployed in the waist and even those guns placed under the half-deck cannot be called dry because of that open bulkhead.

The only guns in a dry place have their ports cut into the square tuck (see Fig.33) and are for lack of space in a wrong spot. Gun ports needed a certain space between each other to give gun crews room to work and there is no evidence for having stern guns in a small ship like the 'replica'. The 1620 treatise states in regard to the size of ports and distances in between: *Let every port be 8 ½ foot asunder, or where you are straitened by reason of the bulkheads &c. 7 foot at least.* The German translation of Duhamel du Monceau's famous *ELEMENS DE L'ARCHITECTURE NAVALE OU TRAITÉ PRATIQUE DE LA CONSTRUCTION DES VAISSEAUX 1751* provides distances for 4 pdr carriage guns from each other and also the width of ports for that size of gun. Width of port was 1 foot 6 inches and distance between ports 5 feet 9 inches French measure. In metric dimensions would this be for *Duyfken* a minimum of half a distance between ports is 92 cm from inboards to the first port, a port width of 49 cm, between ports 184 cm, again a port width of 49 cm and distance to board 92 cm, altogether 4 m 66 cm inner space, with the 'replica's' inner dimension across the square tuck just 2 m, not even half the required space!

*Marquardt feels there is not enough room for the guns in the stern. There could be no space for the guns in the aft peak unless the wing transom were wider and that would be wrong for a ship of Duyfken's time. The wing transom is correctly half the main breadth and there is nothing unorthodox about the position of the aft gun ports.*<sup>49</sup> Would it have been too unorthodox to study one of the replica construction mainstays: R. de Baudous' pinas from about 1610? Even this larger ship does not carry stern guns, I wonder why! The answer was given by Henri Louis Duhamel du Monceau already in 1752: *It is not up to the discretion of a shipbuilder to reduce that distance according to his pleasure, because enough room for working the guns must remain. There are even some cases in which it is good to enlarge it.* (Translation Author)<sup>50</sup>

When comparing these English dimensions from 1620 of 8 ½ feet (2.59m) to minimum 7 feet (2.13m) with French from 1751 of 7.3 French feet (2.37m) to minimum 6,6 feet (2.14m) for a similarly sized ship one can say that in 130 years nothing much has changed. From the 1650 draught of a Dutch pinas ship<sup>51</sup> of about 90 Amsterdam feet length and probably 6 pdr guns can be ascertained that the width of a gun port was about 1.9 Amsterdam foot (53 cm against 49 cm for a 4 pdr) and the distance between ports 7-8 Amsterdam feet (198 cm to 226 cm against 184 cm for a 4 pdr). This is only a small excursion into the comparison of gun port proportions, but it tells us that throughout the 16<sup>th</sup> to 18<sup>th</sup> century nothing much did alter in analogous differences between gun port size and distance in ships between England, France, Holland and other nations and one could not just place them willy-nilly, neither then nor now.

## 6.) Pumps

Pumps must be discussed because of their set up on *Duyfken* 'replica'. An account towards this is given by her chief designer: *Marquardt says the pumps should be athwart the main mast and promiscuously cites an English authority of 1780. Duyfken's pumps are aft because the keel is deepest aft, as it normally was on Dutch sea-going ships. Witsen certainly shows that pumps were just fitted forward of the mizzen mast and specified that ships had to trim by the stern (stuurlast) to*

steer properly.<sup>52</sup> Here is how thorough he has read Witsen<sup>53</sup>, it was actually written: *Behind the main knight and in front of the hatch by 1 ¾ feet stays a pump. The two aft placed pumps are in the steerage, 5 thumbs away from the mizzen mast.* He also cited that Nicolaes Witsen (1671) recommended in his work one-foot drag for every 50 feet length of keel, while our designers thought that at *Duyfken's* time this could have been more because of a higher stern having greater windage affecting the steering. By taking their drawing and checking it's drag it would come to about 1 ½ foot (within Witsen's rule) and by chastising my drawing for having no drag, they overlooked that this vessel's length of keel was less than 50 feet, therefore a drag of 1 foot was correct. Dutch shipbuilders had to be very careful when applying more then normal draught by the stern. Let's remember that the Dutch invented ship-camels, floating docks, which were attached to the sides of incoming ships to lift them over many sands and mudflats of the Wadden Sea to arrive safely in harbour.

Pumps in the rear of a very small ship, like these positioned on the 'replica', can only be found on those with a large stern draught like sharp built, over rigged and fast sailing cutters, schooners or sloops of the 18<sup>th</sup> century, such were at home in deep water harbours and could not sufficiently operate in Dutch waters. Johann Röding, the foremost 18<sup>th</sup> century German maritime encyclopaedist, wrote 1794 in a review of Witsen's work: *His work still remains in Holland of value, especially since the Dutch, more than other nations, remain true to their old construction method mainly for reasons of having their ships running over many shoals and the Dutch harbours are not as far as deep as the English and French. One can therefore in regard to shaping the ship's floor not step very far outside the accepted principles and sharp lined ships, which have more than those flat ones all characteristics needed for sailing would there not make any headway.*(translation Author)<sup>54</sup>

The original *Duyfken* would have had a typical Dutch flat bottom and the usual normal draught by the stern, wind pressure into the sails would have pushed her very much into sailing on an even keel. Her two pumps were certainly positioned athwart the main mast and some vessels as Captain J. Smith (1627) explained would have carried extra burre pumps: *The Dutch men use a burre pompe by the ship side, wherein is onely a long staffe with a Burre at the end, like a Gunner's sponge, to pompe up the Billage water that by reason of the ship's floore cannot come to the well*<sup>55</sup>.

I certainly agree that Witsen described in his work pumps located before the mizzen mast and can assure the 'replica' designers that this was not only Dutch custom, it could be found on ships of several nations. One can find such pumps on the profile of a 104-gun ship in a German book from 1705<sup>56</sup>, on the French 108-gun ship *Le Royal Louis* of 1692<sup>57</sup>, on a contemporary Dutch model of a 60-gun ship of about 1660<sup>58</sup> and on Herman Ketting's draught of the V.O.C. ship *Prins Willem* from 1649<sup>59</sup> which was one of the largest 17<sup>th</sup> century V.O.C. ships. All these were large ships and all had their main pumps placed in the well athwart the main mast. To look in such places for guidance in

fitting pumps to a small Dutch vessel is not very well advised.

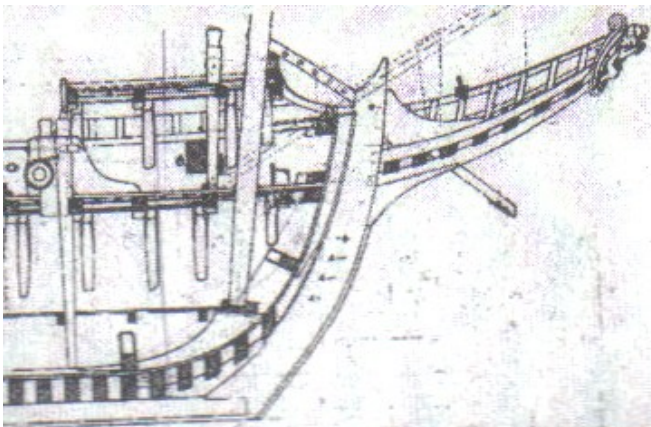


Fig. 35) this detail of the *Duyfken* 'replica' draft clearly shows the foremast drawn aft of the foremost forecastle deck beam.

## 7.) Foremast

Towards a better understanding of the importance of fore mast placing on *Duyfken* 'replica' for all those readers not so aware of the subtleties of