

steer properly.⁵² Here is how thorough he has read Witsen⁵³, 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 18th century, such were at home in deep water harbours and could not sufficiently operate in Dutch waters. Johann Röding, the foremost 18th 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)⁵⁴

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*⁵⁵.

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 1705⁵⁶, on the French 108-gun ship *Le Royal Louis* of 1692⁵⁷, on a contemporary Dutch model of a 60-gun ship of about 1660⁵⁸ and on Herman Ketting's draught of the V.O.C. ship *Prins Willem* from 1649⁵⁹ which was one of the largest 17th 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.

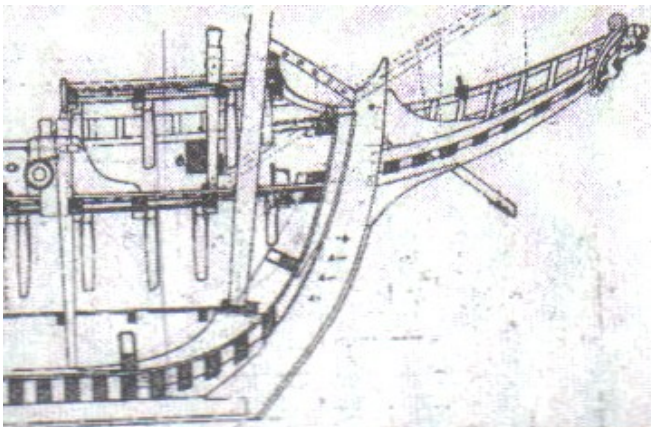


Fig. 35) this detail of the *Duyfken* 'replica' draft clearly shows the foremast drawn aft of the foremost forecastle deck beam.

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

shipbuilding history here a very brief outline about the positioning of the foremast during the 16th and 17th century. In pursuance of foremast development up to mid-sixteenth century on carrack styled ships with a multi-level forecastle the foremast was situated inside the forecastle near its fore bulkhead. With forecastle level reduction, first to two and then one (Galion), the foremast, especially on ships from the northern half of Europe, was from about 1560 to approximately 1610 situated afore the foremost bulkhead and went, first on larger ships, after around 1610 back to inside the forecastle.



At the turn of the century was the foremast definitively situated forward of the forecastle unlike the lower left fore ship detail indicates. By looking for iconographic evidence probably hundreds and not only Dutch pictures from this period of shipbuilding history can be found.

Fig. 36) makes the foremast's position on the replica obvious. The foremast is sitting right in the middle of the foremost forecastle deck beam and by cutting this beam in half severely weakens the structure.

The original draught by A. de Jong from 1998 (Fig.35) proves that the historically correct stepping of the foremast was not even anticipated for the 'replica', since the mast is drawn aft of the foremost forecastle deck beam.

The next picture (Fig.36) indicates

how this was messed up entirely. The foremast is neither wrongly situated aft of the foremost deck beam as the drawing indicated, nor rightly forward as in that contemporary etching (Fig.37) but half way in between. If one looks to the blacked-out square afore the foremast draft (the foremost forecastle deck beam) and then to the next picture it is easy to assume that this deck beam was weakened by at least $\frac{3}{4}$ of its thickness or cut completely to recess half the mast's diameter. No shipwright in his right mind would have ever anticipated such undertaking.

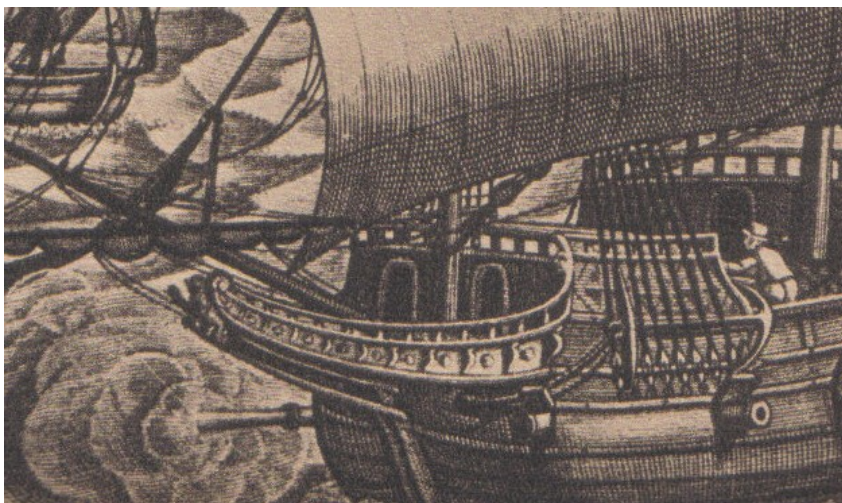
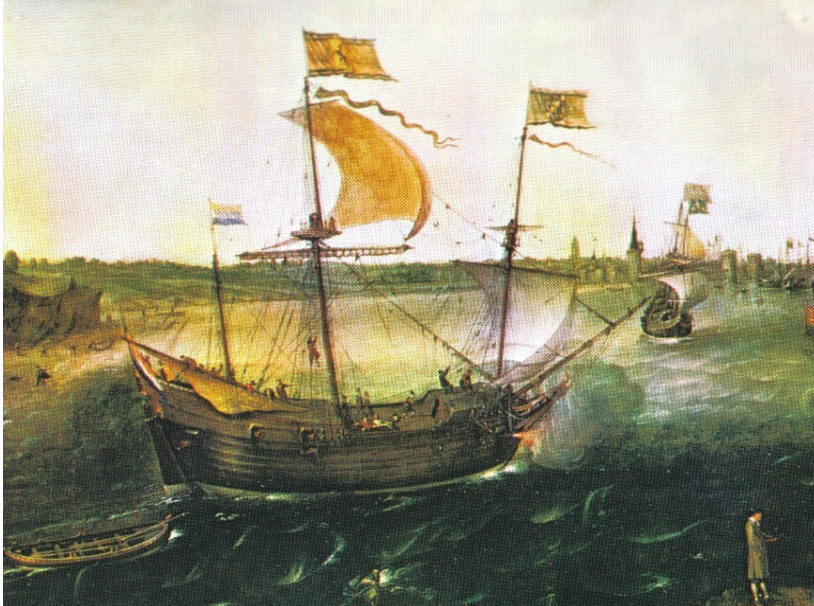


Fig. 37) This contemporary picture of a Dutch ship indicates the foremast as it should have been stepped according to this and many other not only Dutch iconographies around 1600.

The designer's answer to this dilemma: *It is true that the foremast on the replica touches the forward side of the forecastle and is slightly recessed into it, but the strength of the structure is not impaired. Marquardt believes it to be a unique arrangement but he should look more closely at both the fore and mainmasts depicted in the painting, which is his Figure 3.*⁶⁰ How fine can one split a hair? The *Duyfken* enigma article's Fig.3 is a three-quarter stern view painting by CC van Wieringen, where the



foremast is seen as definitely placed forward of the forecastle, while the mainmast is naturally very close set to the half-deck, a mast not in question. However, a painting is not an actual ship and does not excuse this grave error. This is not only a question of structural impairment, it is historically utterly wrong.

Fig.38) a part of the Wieringen painting mentioned as Fig. 3.

Conclusion

Combining the foremast's positioning with all the other points raised, this is another '**World first**' and '*Duyfken* replica' an excellent example of what can go wrong when reconstructing a historic vessel. Coming now to an end, I thoroughly understand that everybody can come to wrong conclusions and unfortunately, even the defense of *Duyfken* 'replica's' design lacks a certain understanding in regard to shipbuilding history. The closing words in the 'replica' chief designer's justification article will underline this; words which could only be written by somebody so fond of himself that he could not see beyond his own shadow and would not know what others are doing.

*My thanks to K H Marquardt to whose article [The DUYFKEN enigma, The Great Circle, Australian Association for Maritime History Sydney 2007 Vol. 29. No.1] I have greatly enjoyed responding. It is always easier to criticize other's work than to come up with something original, and in this case it was gratifyingly effective.*⁶¹

Picture credits: 1.) 3.) 4.) 5.) 6.) Rijksarchief Den Haag, 2.) 10.) 17.) 25.) Nederlandsch Historisch Scheepvaart Museum Amsterdam, 11.) 12.) 13.) 14.) 15.) 20.) 21.) 22.) 36.) Author, 7) University Library Leiden, 8.) Koninklijke Bibliotheek Brussels, 9) 23.) 24.) 33.), Rijksmuseum Amsterdam, 38.) National Maritime Museum Greenwich, 16.) A Treatise on Shipbuilding & Rigging 1620 -1625, 18.) Architectura Navalis by J. Furttenbach 1629, 27.) 28.) 29.) De Veer, Reizen van Willem Barents nar her Norden 1594/97, 30.) New York Public Library, 34.) 35.) A. de Jong, 19.) 26.) 31.) 32.) Scheeps-Bouw en Bestier 1671 N. Witsen.

- ¹ De Groot I, & Vorstman R. ed. *Sailing Ships* The Viking Press New York 1980 p.11
- ² Marquardt K.H. *Die DUYFKEN 1606 Replik*, Das Logbuch, Arbeitskreis Historischer Schiffbau E.V. Köln 2000 36. Jg. H.4 pp.174 – 181
- ³ Marquardt K.H. *The DUYFKEN enigma*, The Great Circle, Australian Association for Maritime History Sydney 2007 Vol. 29. No.1
- ⁴ Marquardt K.H. *VOC-Jacht DUYFKEN, eine echte Replik?* Das Logbuch, Arbeitskreis Historischer Schiffbau E.V. Köln, 2008 44. JG. H.1 pp. 4 – 15
- ⁵ Burningham N. *Round sterns and circular arguments* The Great Circle, Australian Association for Maritime History Sydney 2007 Vol. 29, No.2 pp. 16 – 28
- De Jong A. *Back to square one: The DUYFKEN strikes back*. The Great Circle, Australian Association for Maritime History Sydney 2007 Vol. 29, No.2 pp. 3 - 15
- ⁶ Crone G.C.E. *De Jachten der Oranjes* N.V. Swets & Zeitlinger Amsterdam 1937 p. 2
- ⁷ I Crone, G.C.E. *De Jachten der Oranges*, N.V.Swets & Zeitlinger, Amsterdam 1937,p.1. Jacht is nooit een scheepstechnische soortnaam geweest, het was eene kwalificatie voor vaartuigen van bijzonderen aard, die tot geheel verschillende soorten konden behooren, en naam,die nit het soort, maar het karakter uitdrukte.
- ⁸ Nederlandsch Historisch Scheepvaart Museum Amsterdam, Platen-Album 1941 p.7.. *Verhael vande Reyse by de Hollandtsche Schepen gedaen naer Oost Indien etc., Ghedruckt voor Barent Langenes, Boeck-vercooper tot Middelborgh, Anno 1597*
- ⁹ Art Maritim *Schiffahrt und Kunst aus den Niederlanden* Schiffahrts Verlag Hamburg 1997 p. 62
- ¹⁰ Marquardt K H . *The DUYFKEN enigma*, The Great Circle, Australian Association for Maritime History Sydney 2007 Vol. 29. No.1, Fig.2
- ¹¹ Ibid, Fig.3
- ¹² Ibid. Fig. 4
- ¹³ De Groot I, & Vorstman R. ed. *Sailing Ships* The Viking Press New York 1980 p. 45
- ¹⁴ Burningham N. *Round sterns and circular arguments* The Great Circle Vol. 29, No.2 p. 21
- ¹⁵ Ibid, p. 18
- ¹⁶ Ibid , p. 23
- ¹⁷ Salisbury W. & Anderson R.C. ed. *A Treatise in Shipbuilding & Rigging, written about 1620 to 1625* The Society for Nautical Research, Occasional Publications No. 6, London 1958 p. 4
- ¹⁸ Sutherland W. *The Ship-builders Assistant*, London 1711, p. 87 *In the next place he says, to take the Length of the Keel, Breadth of the Beam, and Depth of the Hold, multiplying them together, and dividing by 95, gives the true Burden for Merchant Ships; but for Men of War, which carry Guns, Mast and Sails, the Divisor must be 100.*
- ¹⁹ Salisbury W. & Anderson R.C. Ed. *A Treatise in Shipbuilding & Rigging, written about 1620 to 1625* The Society for Nautical Research, Occasional Publications No. 6, London 1958 p. 4
- ²⁰ Witsen, Nicolaes. *Aeloude en Hegendaegsche Scheeps-Bouw en Bestier, Amsterdam 1671*, Canaletto-Alphen aan den Rijn, 1979 pp. 65,66,67
- ²¹ De Jong A. *Back to square one: The DUYFKEN strikes back*. The Great Circle Vol. 29, No.2 p. 7
- ²² Salisbury W. & Anderson R.C. Ed. *A Treatise in Shipbuilding & Rigging, written about 1620 to 1625* The Society for Nautical Research, Occasional Publications No. 6, London 1958 p.p. 6, 22, 23
- ²³ Smith, J. *A Sea Grammar*, London 1627 edited by K. Goell, London 1970 p.p. 2, 5

- ²⁴ Ketting H. *PRINS WILLEM* Hinstorff Verlag Rostock 1981. Loose drawings
- ²⁵ Winter H. *Der Hollaendische Zweidecker von 1660/1670*, Delius, Klasing & Co. 1967. Loose drawings
- ²⁶ Nederlandsch Historisch Scheepvaart Museum Amsterdam *Beschrijvende Catalogus der Scheepsmodellen en Scheepsbouwkundige Teekeningen 1600 -1900*, Amsterdam 1943 pl. 16
- ²⁷ Burningham N. *Round sterns and circular arguments* The Great Circle Vol. 29, No.2 p. 26
- ²⁸ Smith, J. *A Sea Grammar*, London 1627 edited by K. Goell, London 1970 p.5
- ²⁹ Salisbury W. & Anderson R.C. Ed. *A Treatise in Shipbuilding & Rigging, written about 1620 to 1625* The Society for Nautical Research, Occasional Publications No. 6, London 1958 p.p. 6, 22, 23
- ³⁰ Duhamel du Monceau, H. L. *Elemens de l'Architecture Navale ou Traite pratique de la Construction des Vaisseaux 1752* German translation by C.G.D. Müller 1791 *Anfangsgründe der Schiffbaukunst oder praktische Abhandlung über den Schiffbau*. Reprint H. Hamecher Kassel 1973 p. 134
- ³¹ Salisbury W. & Anderson R.C. Ed. *A Treatise in Shipbuilding & Rigging, written about 1620 to 1625* The Society for Nautical Research, Occasional Publications No. 6, London 1958 p. 28
- ³² Ibid. p. 13
- ³³ Smith, J. *A Sea Grammar*, London 1627 edited by K. Goell, London 1970 p. 11
- ³⁴ De Jong A. *Back to square one: The DUYFKEN strikes back*. The Great Circle Vol. 29, No.2 p. 9
- ³⁵ Burningham N. *Round sterns and circular arguments* The Great Circle Vol. 29, No.2 p. 21
- ³⁶ Smith, J. *A Sea Grammar*, London 1627 edited by K. Goell, London 1970 p. 13
- ³⁷ Ibid. p. 9
- ³⁸ De Jong A. *Back to square one: The DUYFKEN strikes back*. The Great Circle Vol. 29, No.2 p.9
- ³⁹ Ibid. p. 9
- ⁴⁰ Burningham N. *Round sterns and circular arguments* The Great Circle Vol. 29, No.2 p. 25
- ⁴¹ Ibid p.25
- ⁴² Smith, J. *A Sea Grammar*, London 1627 edited by K. Goell, London 1970 p. 6
- ⁴³ Salisbury W. & Anderson R.C. Ed. *A Treatise in Shipbuilding & Rigging, written about 1620 to 1625* The Society for Nautical Research, Occasional Publications No. 6, London 1958 p.12
- ⁴⁴ Ibid. p. 27
- ⁴⁵ Cannenburg W. V. *Beschrijvende Catalogus der Scheepsmodellen en Scheepsbouwkundige Teekeningen 1600 – 1900*, Amsterdam 1943, p. 15
- ⁴⁶ Burningham N. *Round sterns and circular arguments* The Great Circle Vol. 29, No.2 p. 24
- ⁴⁷ De Jong A. *Back to square one: The DUYFKEN strikes back*. The Great Circle Vol. 29, No.2 pp. 6,7
- ⁴⁸ Ibid. p. 13
- ⁴⁹ Burningham N. *Round sterns and circular arguments* The Great Circle Vol. 29, No.2 p. 22

⁵⁰ Duhamel du Monceau, H. L. *Elemens de l'Architecture Navale ou Traite pratique de la Construction des Vaisseaux* 1752, German translation by C.G.D. Müller 1791 *Anfangsgründe der Schiffbaukunst oder praktische Abhandlung über den Schiffbau*. Reprint H. Hamecher Kassel 1973 p. 113

⁵¹ Cannenburg W. V. *Beschrijvende Catalogus der Scheepmodellen en Scheepsbouwkundige Teekeningen 1600 – 1900*, Amsterdam 1943, pl. 3

⁵² Burningham N. *Round sterns and circular arguments* The Great Circle Vol. 29, No.2 p. 23

⁵³ Witsen, Nicolaes. *Aeloude en Hedendaegsche Scheeps-Bouw en Bestier* 1671 Amsterdam p.85, *Achter de groote knecht, staed en pomp, en komt 1 3/4 voet van 't luik, voor de loos. De twee achterste pompen zijn op the stuer-plecht, van de bezaens mast 5 duim..*

⁵⁴ Röding J. H. *Allgemeines Wörterbuch der Marine Vol.I* Hamburg 1794, reprint Monumenta Nautica Historica Selecta, Amsterdam 1969 p.p. 57,58

⁵⁵ Smith, J. *A Sea Grammar*, London 1627 edited by K. Goell, London 1970 p. 10

⁵⁶ unknown *Der Geöffnete See-Hafen, Hamburg 1705-1706* reprint Zentralantiquariat der DDR Leipzig 1989, pl. 2

⁵⁷ Paris, E. Admiral, *Souvenirs de Marine Vol.3*, Paris 1886 pl.135

⁵⁸ Winter, H. *Der Holländische Zweidecker von 1660/1670*, Bielefeld 1967

⁵⁹ Ketting H. *PRINS WILLEM* Hinstorff Verlag Rostock 1981. Loose drawings

⁶⁰ Burningham N. *Round sterns and circular arguments* The Great Circle Vol. 29, No.2 p.23

⁶¹ Ibid. p.24