Introduction

No one who has seen the gaiassa under way can fail to be impressed by the length and power of its great lateen sails, and no picture of Egypt is perfect without that tall pyramid-point of white canvas gliding along the sky-line. But with her strange combination of clumsiness, of serviceableness, and of beauty, the gaiassa is undoubtedly not the least of the wonders of Egypt.

H. Warington Smyth 'Mast and Sail in Europe and Asia' (London 1906)

The sail is one of the oldest and most important inventions of mankind. For millennia, it was used for discovery, trade, colonisation, and conquest. While oars are of limited use in high seas, the sail made moving on water a particularly quick and efficient way of travel. Harnessing the power of the wind and replicating the principle of a bird's wing, the sail is in deep harmony with nature. Modern civilisation brought about heightened speeds to all environments, including on water.[1] And yet, a real sailor would never trade for anything the pure feeling of flight that may only be experienced on the deck of a sailboat. Today, even the unsentimental business sphere turns to high-tech projects relying on modern types of sails for both merchant and passenger ships in order to reduce both transportation and environmental costs.[2] Some of these projects combine the adventure of sailing with commercial interests.[3]

In Egypt, the sail appeared on the Nile in immemorial times, as the natural conditions on this country's main transport artery were generally favourable to navigation. The Nile's current pulled the boats downstream,[4] while the dominant winds from the north made it possible to use a sail when moving south against the current.[5] Interestingly, this is reflected in ancient Egyptian writing and iconography. Thus, for the phrase 'to go upstream', a pictogram of a sailing ship was used, while the determinative for the phrase 'to go downstream' was a ship without a sail.[6] However, navigation on the Nile was never a straightforward affair, not only due to the river's changing hydrological regime (characterised by periods of flood and drought) but also because of the presence of numerous drifting shoals.[7] In addition, at any time of the year, sailors could be faced with dead calm or major storms.[8]

Although iconography remains the main source of information on ancient Egyptian rigging, written sources are helpful too. Some of them contain information about the dimensions of the various parts of the rigging, and some ship logs mention the time of the journey, which allows for roughly estimating the speed of travel.[9] The rare finds of ancient Egyptian ship rigging and sail fragments will be discussed separately. Since the sail was actively used on the Nile until very recent times, the ethnographic material is not negligible either (Figure I.1).[10] For example, the famous *dahabeah* of the first Egyptologists was a sailing and rowing vessel.[11] In its turn, the *dahabeah* was the offspring of the Nile's *gaiassa*, a lateen-rigged vessel of exotic appearance.[12] Modern-time testimonies convey some very curious details of Nile sailing that bear witness to the tremendous inventiveness and power of observation of Nile boatmen. For their originality, these techniques find their parallels in ancient records.

Nowadays, the sail is mainly used in Egypt for traditional fishing[13] and as a tourist distraction.

[1] The following citation from the book of Warington Smyth 1906 (p. 1), would be pertinent here: 'Notwithstanding the introduction of iron steamers in the trawling and drift-net fisheries of our own coasts, and the increasing use of steam in handling nets, the sail still holds its own bravely. The sailing fishing-boats of the world, and the coastwise traders, those cradles of maritime strength, still perform their part, almost untouched by the roar and rush of this age of machinery, still following the laws which have brought about their various developments. To them the romance of the sea is not past; rather it is infinitely increased by the presence of that new monster the iron steamship, roaming the seas and leaving sudden death so often in its wake.'

[2] E.g. https://fr.wikipedia.org/wiki/Canop%C3%A9e_(cargo); https://escalecroisiere.com/2023/01/13/orient-express-silenseas-futur-paquebot-a-voile-du-groupe-accor/; https://www.theguardian.com/environment/2017/mar/14/spinning-sail-reboot-cut-fuel-make-ocean-tankers-greener; https://www.towt.eu/flotte/navigation-decarbonee/ (all last consulted 5 August 2025).

[3] https://graindesail.com/fr/ (last consulted 5 August 2025).

[4] Before the construction of the Aswan dam, the Nile flowed at the speed of 1 knot, which increased to 4 knots during the flood (Vinson 1994: 7).

[5] More information about wind direction on the Nile may be found in Cooper 2011: 197–201.

[6] Gardiner 1950: 498–499 (signs P1 and P2).

[7] Arnaud 2015b: 107–108 cites papyri that mention damage to rigging, while Cooper 2012, 2014 discusses navigation difficulties on the Mediaeval Nile. Ancient Egyptian sources on this subject are discussed in Somaglino 2015.

[8] Somaglino 2015: 134–135.

[9] This is useful for estimating the speed of sailing at sea, but as far as the Nile is concerned, these documents are most often tacit as to the means of propulsion: sailing, rowing, punting, or towing. The exact speed of the Nile at that time also remains unknown and thus cannot be used for accurately determining the speed of ships when sailing upstream. See ibid: 143–148.

[10] It is fascinating to note that in 1830, a sailing ship of a particular construction, *Louqsor*, was built by the French to bring the obelisk of Ramesses II from Luxor to Paris. This ship was a three-master that sailed up the Nile, loaded the obelisk, descended the Nile, and then was towed across the Mediterranean, along the coast of the Atlantic Ocean, and up the Seine until Paris, covering some 12,000 km. See Solé 2004.

[11] The *dahabeah* was a type of flat-bottomed rowing and sailing boat used on the Nile from the beginning of the 19th century to the beginning of the 20th century for voyages by wealthy Europeans. For the construction of these curious boats, see Rieth 2015. According to L. Basch (1993: 26), the *dahabeah* originates in the Coptic ship types.

[12] Warington Smyth 1906: 289–295.

[13] See Collet and Pomey 2015; Gaubert and Henein 2015; Koutkat *et al.* 2017.

Figure I.1. David Roberts, 'Approach to the fortress of Ibrim, Nubia'. Original lithograph in the author's private collection. Published by F.G. Moon in 1847, London.

The evolution of rigging is connected to the evolution of the ship's hull since both are determined by the same natural, economic, and social factors.[14] In some periods of ancient Egyptian history, the shape of the hull was subject to radical modifications,[15] although, in general, it does not show a very strong variability. At any rate, a short summary of the characteristics of the hull for each historical period can be found at the beginning of each chapter.

It seems appropriate to provide here a short description of the square rigging in its simplest form,[16] as this type of sail dominated the maritime landscape throughout the greater part of Egyptian history (Figure I.2).[17] Traditional ancient Egyptian rigging had two yards: the boom (or lower yard) and the upper yard.[18] Each of them was normally composed of two spars of equal length, which were lashed in the middle. The upper yard was hoisted in its working position by one or two halyards (Figure I.2, '4'). The boom always remained at the same height. A parrel connected the lower yard to the mast, which allowed it to pivot horizontally (Figure I.2, '6').

The rigging is classified into 'standing' rigging, which is normally fixed and immovable when sailing, and 'running' rigging, which is constantly adjusted to achieve the optimal performance of the ship. The topping lifts (or simply lifts) of the lower yard (Figure I.2, '5') were part of the standing rigging. The lifts were used to suspend the yards and to support their extremities; otherwise, a yard could break under its own considerable weight. Ancient Egyptian rigging included two types of lifts. The 'running' lifts (Figure I.2, '1') supported the yard in its upper position, but they were also sometimes used together with the halyards (or instead of them) to hoist the yard. The upper yard sometimes had 'standing' lifts that worked like lifts of the lower yard. When the upper

[14] Whitewright 2008: 174.

[15] The most striking example of such phenomenon would be the change from the angular hull of the Old Kingdom to the spoon-shaped hull of the Middle Kingdom.

[16] The square rigging of the 16th century and later times evolved into a complex and well-balanced system that included ropes such as tacks, bowlines, preventer braces, clewlines, buntlines, leech lines, different tackles, etc., most of which were absent in ancient rigging.

[17] The first evidence for lateen sail dates to Byzantine time. However, rare representations from the 6th dynasty (2345–2181 BC) and 18th dynasty (rule of Amenhotep II) show boats and rafts rigged with triangular sails. See Davies 1902a: pl. 19 and Wachsmann 1998: 32, figs. 2.43–44. See Figure 3.24 below.

[18] The first attempts to abandon the lower yard seem to date back to the Amarnian period and will be considered below.

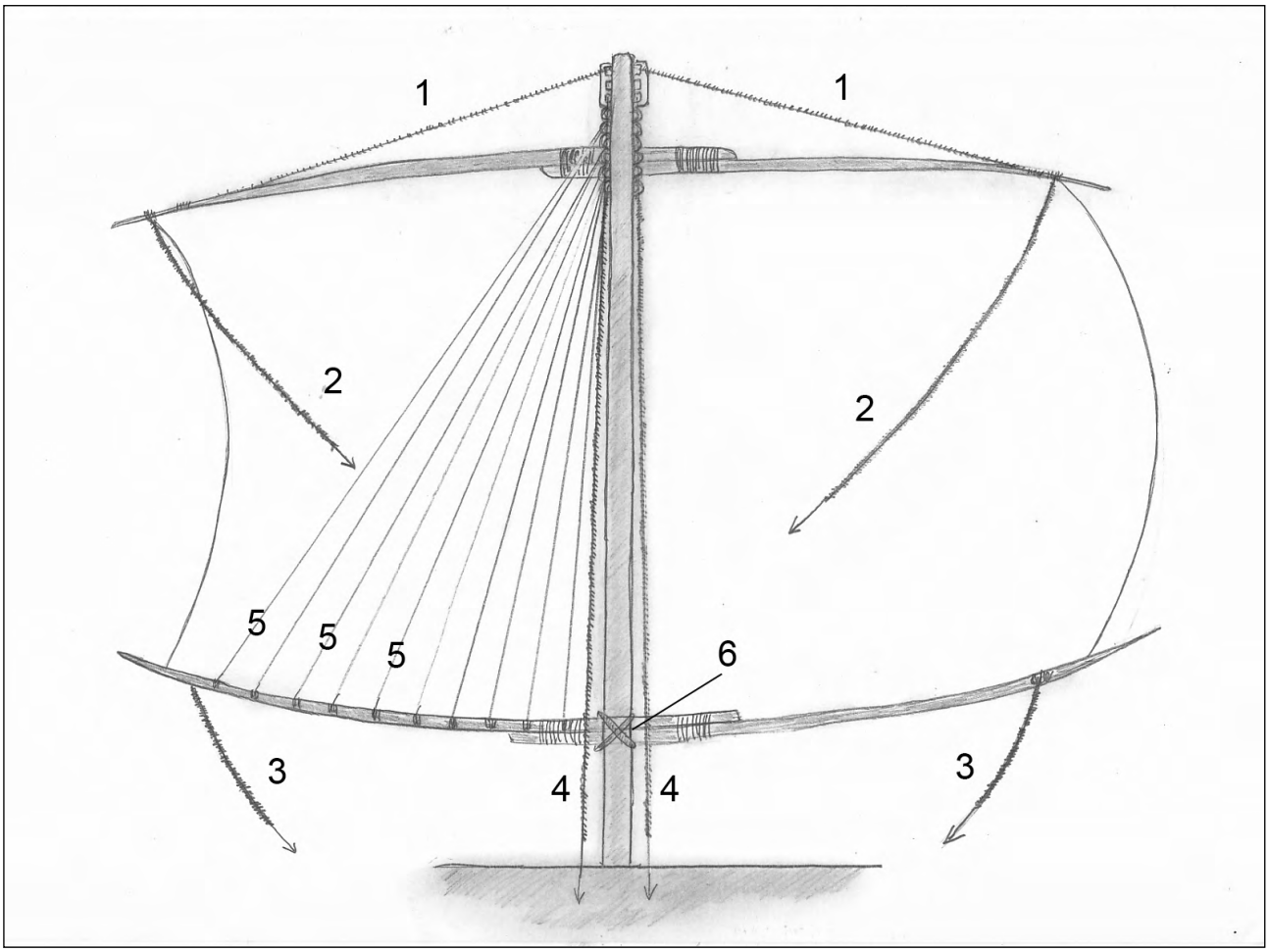

Figure I.2. Boom-footed square rigging. 1– topping lifts of the upper yard, 2 – braces, 3 – 'sheets', 4 – halyard, 5 – topping lifts of the lower yard (boom), 6 – parrel. Author.

yard was hoisted, they were hanging loose under it in long curves. To achieve the optimal angle to the wind, the yard was pivoted horizontally by the braces (Figure I.2, '2'). The sheets are the ropes for controlling the lower corners (clews) of the sail. In the presence of the lower yard, they were actually not real sheets but a sort of lower braces. In ancient Egyptian iconography the foot of the sail is laced to the lower yard, and in the reliefs, it is represented by the same continuous line.

Where possible, the rigging elements of each period are considered according to the following points: major peculiarities, spars, standing and running rigging, the sail's geometry, and rigging performance.