AUSTRALIA'S FIRST SHIP AND A SCURVY LIFE AT SEA

Nick Burningham

The *Ditty Bag* section of the MHA Journal **10**(4) contained some interesting observations on the terrible effects of scurvy and the treatment of that disease. It was noted that Anson's circumnavigation of 1740 to 1744 had been terribly afflicted by loss of life through scurvy, yet some earlier voyages (such as James Lancaster's noted in *Ditty Bag*) were much less severely afflicted. This is very much what I have learned in researching life at sea in *Duyfken*'s time, and it has lead me to a wider study of the question. The conclusion I have reached is that the control of scurvy was widely and understood with impressive precision in the 16th century, but during the 17th century the development of medical science actual vanquished much of the "pre-scientific" knowledge with terrible consequences for the mariners of the 17th and 18th centuries. Mariners were not alone in suffering from that battle between competing epistemologies early in the "Age of Reason".

Life at sea during the 16th century was certainly not comfortable, especially in the spice trade from the Indies.

Francois Pyrard was describing a Portuguese ship returning from Goa when he wrote:

> "The [weather] deck of our ship was so laden with goods that they reached halfway up the mast. Outboard as well — on the railings and the ledges on either side you could see nothing but goods, provisions and bunks, that is little cabins where the sailors and other people lie down, covered with ox or cow-hides. In short the whole deck was so arranged that you could hardly move around on it ..."

Even allowing for some literary license, we can see that sailors were living as if they were camping on board. They were allowed to build their own shelters out on the weather deck. The idea of the crew living in tiny leather boxes (like cubby houses made from cardboard boxes) is extraordinary! We might construct an example on *Duyfken* but cluttering all the decks like the most desperate kind of refugee camp is probably taking authenticity too far.

Raleigh and others wrote condemning this building of these "kennels" that bred vermin and disease, but did not propose how the crew could be more satisfactorily accommodated.

Another practice that Raleigh condemned was building the galley (without a chimney) down in the bottom of the hold. Apart from the smoke, it filled the bilge with spilled food-stuff which caused terrible stench and rotted the timbers of the ship. However, Dutch ships like *Duyfken* had their galley fire in a large box on deck.

These kinds of details are seldom recorded and rarely survive in the archaeological record. We learn that Dutch ships did not normally have their galleys in the hold because when arctic explorer Willem Barentsz.' ship was trapped in the ice at Nova Zembla in 1597 his journal records that the men coming up on deck to aid their shipmates chased by a polar bear were blind from smoke because the galley fire had been moved down into the hold to counter the terrible cold.

Reading ships' journals to understand life on board reveals many fascinating details, not least in the area of shipboard health, scurvy and diet.

On 9th December, 1599, two Dutch ships, *Gelderlandt* and *Zeelandia*, returning from the East Indies reached the island of Saint Helena in the South Atlantic and quickly dispatched a landing party:

> ". . . some of our people running up into the land to seeke after Cattell, brought some aboard our Shippes with them which made our mariners very gladde: but wee found no Orenges, whereof wee had most neede, for those that were trubled with the scurvie disease."

The following day they found a valley with orange trees and picked some 4000 fruit "which marvellous refreshed and cheered us all."

Contrary to popular belief, the value of citrus as a cure for scurvy was understood by those 16th century mariners and the planting of orange trees on St Helena attests Portuguese knowledge. Almost as soon as the Portuguese discovered the uninhabited island they stocked it with cattle and goats and planted citrus trees so that their ships on long voyages to and from the Indies could take provisions and refreshment there.

Other anti-scorbutics were widely known in the 16th century. The survivors of Willem Barentsz.' last attempt to sail north around Russia to the Indies spent a long autumn, winter, spring, and most of a summer, trapped by ice on the arctic island of Nova Zembla, living on ship's stores, arctic fox and the occasional polar bear. By the time summer's slight thaw allowed them escape in the ship's boats they were suffering from scurvy and their first concern on reaching vegetation was to search for "leple leaves".

> ". . . we found great store of Leple leaves, which served us exceeding well, and it seemed that God had purposely sent us thither : for that as soons as we had eaten them, we were presently eased and healed . . . we eate them by whole handfuls together, *because in Holland wee had heard much spoken of their great force*, and as then found it to be much more than we expected." (emphasis added)
>
> The next day they collected more leple leaves:
>
> ". . . & still more recovered our healths, and in so short time, that we could not chose but wonder thereat, so that as then some of us could eate bisket againe, which not long before they could not do."

Leple leaf, *lepelblad* in Dutch, is *Cochlearia*, probably *Cochlearia officianalis*, sub species *groenlandica* on Nova

Zembla, also known as spoonwort and scurvy grass. The interesting thing is that these explorers had obviously been briefed in Holland about the most effective anti-scorbutic plant they could expect to find in arctic regions. This was not haphazard application of folk medicine; rather it was application of part of the knowledge that had been acquired before a well-planned voyage of Arctic exploration. Not only the Dutch had this knowledge.

Dr Woodall's "The Surgeon's Mate" published in 1617 described scurvy and listed "Lemmons, Limes, Tamarinds, [and] Oranges" as particularly efficacious cures. Woodall recommended the English East India Company provide lemon juice for their sailors. Although the chemistry of vitamin C would not be unravelled for another three hundred years, Dr Woodall was essentially right.

So, how have we come to the idea that the problem of scurvy was only solved in James Cook's time? James Cook was actually elected to membership of the prestigious Royal Society for his work in finding the cure for scurvy.

During the 17th and 18th centuries the formal study of science made huge advances. Scientists such as Newton and Huygens were famous and influential, admired and imitated. A certain amount of "hype" surrounded the pratice of science and practitioners were sometimes tempted to make their science seem even more complex than it really was (Sir Anthony Deane, the great naval architect of the late 17th century was certainly guilty obfuscating pseudo-science at times). Along with other branches of science, medical science developed in complexity, enabling theorists to propose wonderfully unlikely experiments in a search for more arcane, poisonous and unpleasant-tasting cures.

Joseph Banks, sailing with Cook on *Endeavour*, recorded on his journal for 16 June 1770 that Tupaia the Tahitian chief who had sailed with them had "every symptom of inveterate scurvy notwithstanding acid, bark and every medicine our Surgeon would give him . . . "

Tupaia had his own cure, as Banks noted just two days later:

> "Tupia who had employd himself since we were here angling & had livd intirely on what he Caught was surprizingly recovered."

Other crew members who remained under the surgeon's regime of acid and other medicines were not so healthy.

As noted in *Ditty Bag*, the terrible example of Anson's circumnavigation prompted the Royal Navy to look into the problem of scurvy.

In 1749 a long voyage provided Dr Lind, a Royal Navy surgeon, with a good sample of scurvy sufferers to experiment on. The following potential curatives were tried, each on two men: cider, seawater, vinegar, elixir vitriol, a concoction "of garlic, mustard seed, rad. raphan., balsam of Peru and gum myrrh", and two lucky men were treated with oranges. Lind reported unequivocally that nothing had any effect except the oranges which worked powerfully and almost immediately.

The problem with this simple observation, and many similar observations before and later, seems to be that it didn't adequately accord with current medical theory. Put very simply, oranges didn't make you vomit, micturate, squirt or perspire — so they couldn't get rid of the cause of the disease, and there fore would only make it worse on the long run. That is my analysis, anyway. Gideon Harvey, a physician, argued against the use of quinine containing bark for the treatment of fevers:

> "Since *per se* it neither operates by Vomit, Stool, Urine, or Sweat, we may safely conclude its cheif Energy consists only in stopping the Ague fits, whereby worse Diseases are engendered". (Cited in Jarcho, S. 1993. *Quinine's Predeccesor: Francesco Torti and the early History of Cinchona*. John Hopkins University Press, Baltimore. p.55)

In the 17th century, science was making great advances, and some of the most notable scientists, such as Robert Hooke, dabbled in medicine by experimenting on themselves. Part of the problem seems to be that they were seldom feeling well. Since they drank beer and wine at every meal, and never drank water, this is not surprising. Bladder stones were so prevalent that one might conclude that most people were suffering from dehydration. Hooke experimented on himself with substances we now know to be very poisonous, particularly antimony. He was pleased with the multiple purgative effects of the antimony, ascribed the other symptoms of poisoning such as migraine, dizziness and paralysis to other (pre-existing) health problems, and when the poison wore off and he felt better, he could then ascribe the recovery and unacustomed clear-headedness to the antimony.

Most self-sacrificing amongst the scurvy theorists was William Stark (1741?–1770). Born in England of Scottish parents he studied medicine at Edinburgh, London and Leyden. Returning to London in 1769, Stark began dietary studies on himself that culminated in his death after seven months. He began with a diet of just bread and water for thirty-one days, he then added other foods one at a time: olive oil, milk, roast goose, boiled beef, fat, figs and veal. He recorded that after two-months the gums of both jaws were red and swollen and bled when pressed, this was undoubtedly the onset of scurvy.

Dr Lind had noted in his experiments that the men given oranges ate them "greedily". Their bodies were telling them what they needed. The hunger for vitamin C is equally evident in Richard Dana's "Two Years Before the Mast" when he describes how the scurvy afflicted men on the *Alert* ate raw onions acquired from a passing ship:

> "And a glorious treat they were. The freshness and crispness of the raw onion, with the earthy taste, give it a great relish to one who has been a long time on salt provisions. We were perfectly ravenous after them. It was like a scent of blood to a hound. We ate them at every meal, by the dozen; and filled our pockets with them, to eat in our watch on deck . . . "

James Cook and his crew on *Endeavour* were keen on onions. For example: 17 September 1768 "Issued to the Whole Ships Company 20 Pounds of Onions per man" and

only two days later "Issued to the Ships Compney 10 pounds of Onions pr Man".

Cook has been lauded as the discoverer of the cure for scurvy and sometimes discounted as the man who set back by twenty-five years the implementation of the known cure by recommending malt (no vitamin C) and sauerkraut (little vitamin C) as particularly efficacious anti-scorbutics. Although it is true that Cook made those mistaken recommendations, his practice during Endeav*our*'s voyage suggests greater insight or intuition. While on the coast of New Zealand Cook recorded on 27 October, 1769: ". . . the other place I landed . . . I got as much Sellery and Scurvy grass as loaded the boat." The wild celery was *Apium prostratum* or *A. filoforme* and the New Zealand species identified as scurvy grass was probably *Lepidium filiforme*. The following day Cook explains that:

> "Sellery . . . boiled with Portable Soup and Oatmeal every morning for the Peoples breakfast . . . I looked upon it to be very wholesome and a great Antiscorbutick."

The cure for scurvy had long been obvious, the problem was acquiring and preserving adequate quantities of anti-scorbutics for very long voyages. James Lancaster, leading a fleet to the Indies in 1601, issued three spoonfuls of lemon juice to his men every day until it ran out. But adequate quantities of lemon juice would have been hard to come by. And if the popular stereotype is correct, the sailors would have been much more concerned to see adequate quantities of beer and wine go aboard at the start of a voyage.

In fact the beer and wine were important to their health. Water stored in wooden barrels quickly became "blacke as kennel [sewer] water" as the journal of *Gelderlandt* notes on 20th September, 1598. It could be used for cooking but it was only regarded as a beverage in the most extreme circumstances. The *Gelderlandt* had been at sea for five months when the water was first sampled:

> 2nd August We dranke the last Beere, and we beganne our first allowance to drinke water, four mutskins or measures everie day, and three of wine. [Four mutskins were equal to one pint; a mutskin was about 150 mm or a standard drink of wine.]

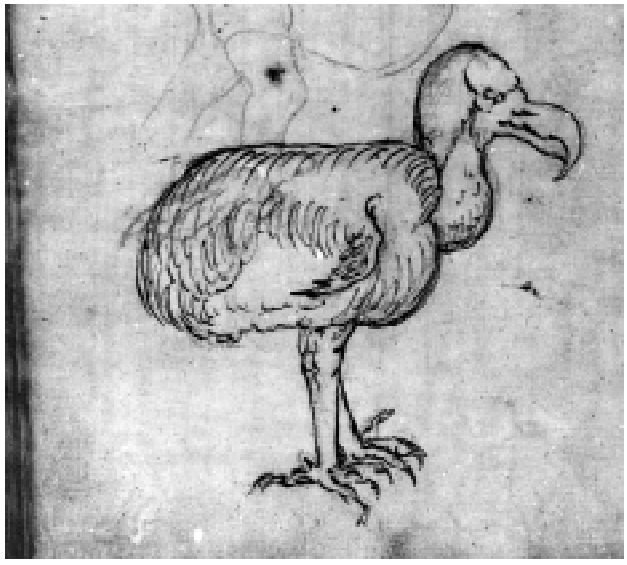
What was the diet of a seaman on a long voyage to or from the Indies at the beginning of the 17th century? The Age of Reason and the development of modern *Homo inventorenis* — the compulsive listmaker — were just beginning, so archived comprehensive lists of provisions are rare. The most complete list of foodstuffs can be compiled by noting everything that the ships ran out of according to their journal records.

The ships *Amsterdam* and *Utrecht* were running short of provisions when they reached the island of Ternate hoping to load a full cargo of cloves in May 1599. Negotiations to barter European goods such as woollen cloth for cloves proved difficult and perhaps too little effort was put into provisioning.

> "The 10. day [June] our dyet was shortened, to wit, every day once flesh or fish, and the other three meales Ryce."

Four meals a day seems copious but only rice and meat or fish would be dull. I'm reminded of the head steward on Terry Southern's uproarious S.S. *Magic Christian* announcing after three days at sea that due to an oversight in the catering department there is nothing left except potatoes.

A few weeks later the journal records that there is nothing left except dried bread, yet between then and 16th November when fresh provisions were finally acquired, they also note that they finished their last supplies of fish, flesh, oil, cheese, honey and smoked meat.



Dodos, such as this were not good eating.

Working back through the list of ration tightening we can see that the normal arrangement was four meals a day with meat or fish (which could be fresh, pickled, or smoked) in at least two meals — in other words, frequent meals, lots of protein, and plenty of drink, much like the majority of passengers on a modern cruise liner.

As I said at the beginning of this article, the development of medicine within the scientific epistemology seems to have had a retrogressive effect on the treatment of scurvy in the 17th and 18th century. Whether that has any message for us in the early 2000s is an open question.

Pathophysiology of scurvy

Humans share with other primates and with guinea pigs the inability to synthesis ascorbic acid (vitamin C) and therefore require it in their diet. The enzyme which in other species would catalyse the conversion of L-gluconogammalactone to L-ascorbic acid is defective due to a mutation.

Vitamin C is a redox agent, reducing metal ions in many enzymes and removing free radicals, in particular, the Fe2 ions required for collagen synthesis change to the more stable Fe3 in the absence of vitamin C. Lack of collagen causes capillary fragility, poor wound healing and other symptoms of scurvy's onset.

Today, according to a medical text, scurvy is not much a problem for mariners but is mostly seen in elderly people "who may be on a tea and toast diet".

Notes on the Design and Building of the “Sloepie”.

A year or two back I was asked to look a the possibility of Geraldton building a replica of the “sloepie” — the vessel built by the shipwrecked grew of the Zeewyck on Gun island in the Abrolhos. There are a number books and papers written about the shipwreck of the Dutch east India Company ship Zeewyck and I did not set out to undertake original research, but with my friend and former Duyfken coleague, I looked at transcriptions and translations of the two journals that record events after the shipwreck, and it seemed that there was another way of looking at the Zeewyck/Sloepie story which probably casts some light on how the Batavia story was perceived by VOC crews.

There are two journals which describe the events after the wreck of the Zeewyck including the building of the Sloepie. One is anonymous and the other is a more detailed testament kept by Under Steersman van de Graeff.

The former has been translated by Lous Zuiderbaan, the latter by Kees de Heer.

The anonymous journal is a day out in its dates for some weeks but otherwise details given by the two journals are fairly consistent. The language of Anon. is plainer and some things are seemingly clearer. It is apparent that the crew were in complete control over arrangements for the first expedition sent to try to reach Batavia — they were insistent that they should choose who was to go. Riotous incidents such as those on 11th July seemingly persuaded the majority of the crew to accept some hierarchy in preference to complete anarchy. However, the decision to build something big enough to sail to Batavia with everyone on board seems to have come from the crew. Anon, who must have been an officer, says “there seemed no other solution for us”. It was increasingly obvious that the boat sent to get help had come to grief.

Materials and tools that might be used for building a vessel start to appear in lists of things brought from the wreck in the entries for 23rd October, on 29th it is recorded that they are getting timber by breaking up the forecastle and aft cabins, but not until the 30th is the decision to build a vessel recorded in either of the two officers’ journals. Presumably there were unrecorded discussions about what was to be built, or the crew decided informally to get on with it, and the officers recorded the decision to build a small ship when that course of action became obvious to them.

Perhaps the crew were concerned that the skipper would accuse his crew of mutiny in order to exculpate himself if he or his officers were allowed to go to batavia to get help. That is what the officers of the Batavia, wrecked in the Abrolhos had done a century earlier. All the officers had gone off in the ships boat, ostensibly looking for water; but they didn’t look very far before deciding to go to Java leaving hundreds of passengers and seamen marooned on a desolate island. When Captain Pelsaert and officers returned on a rescue mission they seem to have decided before the reached the Abrolhos that Cornelisz, the most senior man left behind, and some of the seamen, had mutinied. Who Cornelisz coud have muntinies against was never clear — none of his superiors had remained on the island. This is not to say that Cornelisz had not been responsible for terrible attrocities on the island, but Pelsaert might have been as interested in shifting the blame for a lost ship as in getting justice for the wronged shipwrecked passengers and crew.

Any doubts that the crew of Zeewyck had about their skipper, Jan Steyn, would have been entirely justified. When the “Sloepie” reached Sunda Strait, Steyn secretly sent a message ahead to Batavia with a patrol boat saying that his crew were mutinous. Fortunately, his claims were not supported by a council held in Batavia and Steyn was eventually demoted and publicly shamed.

The Buiding of the Sloepie.

Various materials and tools are recorded as being brought from the wreck, the rigging or the neighbouring islands. They include:

Saws, Whetstone, Planks, Ribs, Trees, Beams, Deck timbers, Knees, Barrels of Pitch, Moss (Sphagnum for caulking), Nails, Iron work,

Topsail yard, Sprit topsail yard, Spare topmast, Foreyard, Spritsail yard, Stump of mizzen, Bowsprit, Foremast,Topmast top, Foremast top,

Rolls of sailcloth, Sail yarn, Hawsers, Ropes, Cables, Shrouds, Blocks, Mast cheek, Pump gear, Swivel gun.

Presumably some of the larger spars were used as launching rollers, not for masting the “sloepie” and the mast cheek is collected at a time that suggests it was used as a sternpost knee.

The vessel was built on keel blocks or “staple blocks” which must have been made from fairly substantial timbers.

Sequence of construction.

7 November	Keel laid
14th November	A scow returned with "17 pieces of curved timber suitable for knees" (de Heer), but curved pieces would not be suitable for "knees" in the technical sense; they were more likely bilge futtocks or "sitters".
15th November	Sternpost erected
3 December	Mast cheek taken for use on vessel
20 December	20 knees brought from island (de Heer) or 20 trees brought from island (Zuiderbaan) Original text says "kromhout" or compass timbers
31 January	Foreyard used to make mast.
19th February	Commenced caulking
27 February	Placed on rollers
4 March	"carpenter finished laying the deck on our yacht." (de Heer)
10th March	Moved from 4ft to 6ft of water because constantly grounded at low tide.
16 March	Stepped mast in "our yacht".
19 March	Set up standing rigging
21 March	Fitted rudder and bent sails
22 March	Moved to 9ft of water. Stowed victuals.

Several lists of provisions for the voyage are given. Using barrel to mean any size of hooped wooden vessel there would seem to be some 60 barrels of various sizes containing provisions plus water barrels. In the original texts the terms used for barrels are fairly vague: vaten, vatie, etc and perhaps do not allow accurate calculation of the volumes or weight involved but approximately 15 tonnes is possible. (See Adriaan de Jong's paper on the barrels.)

The log of the voyage is not very informative.

Steering was not light. The tiller broke on the first night out and had to be reinforced with bands but gave no trouble after that.

The best day's run was 30 leagues (120 nautical miles, average about 5 knots). They made a total of 334 leagues in twenty days before sighting Java. The average daily run was not impressive, but there were days of calm, some head-winds, and the prevalence of southwesterly winds as they approached Java make it clear that the doldrums transition from the northwest monsoon to the southeast trades was hampering progress.

1st and 2nd reef are often mentioned. On one occasion (6th April) 3rd and 4th reefs are mentioned but that might be a mistake.

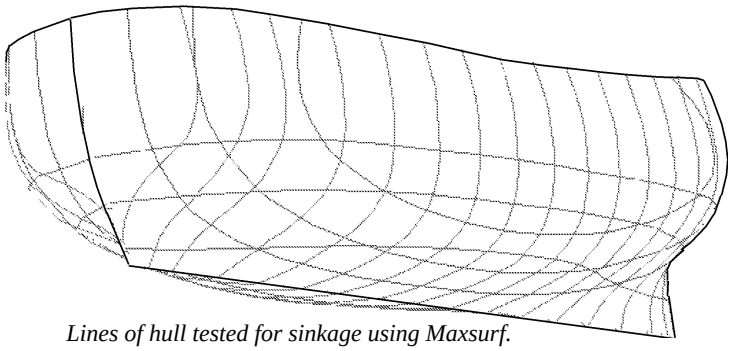
They seem to sail fairly cautiously, reefing at sunset and only setting the topsail in light weather.

The term *sloepie, meaning "little sloop"* is never used in the journals. The vessel is either referred to as a vessel (vartouw) or a yacht (*jacht*). However the term *sloep* is used on a map of the island drawn by Jan Steyn, and the term *sheloupe* is used once in the original text of van der Graeff's journal. Steyn used the name *Sloepie* in a letter written in Batavia. Since the vessel was obviously more than a small sloop, he may have been trying to devalue the efforts of his crew in building the vessel (and salvaging several chests of silver for the VOC) or his intention may have been facetious. The name with its diminutive ending seems to be intentionally ironic. Perhaps reflecting the fact that the crew and soldiers were not prepared to let the officers decamp in a smaller boat and insisted on something more than a *sloepie* being built.

The Size of the Vessel

Without mast and empty the vessel was "constantly aground" in 4ft of water. She was moved into 6 ft of water and then into 9ft of water before loading, this suggests a moderately deep draft and also that the load of men and provisions increased her draft quite significantly — an approximate sinkage rate (cm per kg) can be calculated which would give the approximate area at the water plane.

For example: if 30 tonnes cause 60cm of sinkage the sinkage rate is 500 kg per cm, the area of the hull on the waterplane is therefore just under 50^2m and the block area (length x max beam) of the waterplane might be 55^2m. If the length beam ratio is taken as being 3.5:1, for example, then the length and beam can be calculated as 15.75m x 4.5m. This calculation assumes moderately full lines. Does it give enough space for sleeping? If significantly greater dimensions are necessary for accomodation, the sinkage rate should be lower unless the lines were very fine (which seems unlikely).

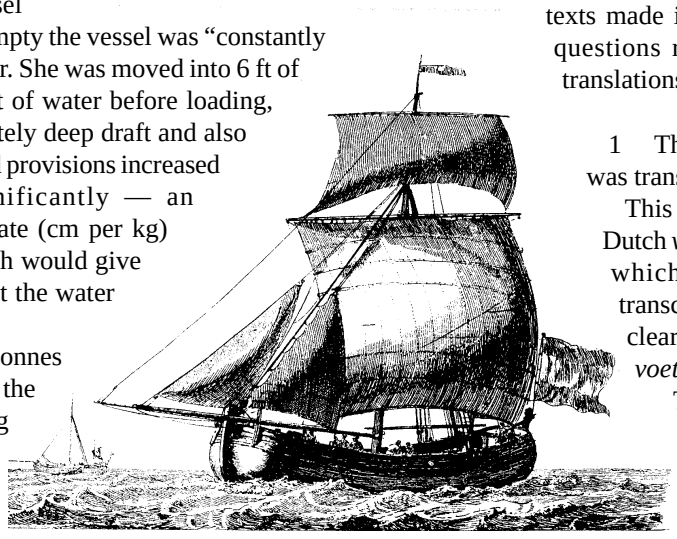


Lines of hull tested for sinkage using Maxsurf.

A full-lined double-ended design 15.5m x 4.5m created using *Maxsurf* gives a sinkage rate of 512kg/cm at 1.2m draft and 34.6 tonnes displacement. Displacement is 50 tonnes and sinkage 560kg/cm at 1.5m draft and 70 tonnes, 582kg/cm at 1.8m draft.

For all the crew to lie down at the same time about 50^2 would be required. This would be all the deck space of a vessel 15.5m x 4.5m.

Nick Burningham



re: "When is a barrel not a barrel" from Peter Worsley.

This was written back in 1997 by Adriaan de Jong in response to questions asked by our current editor Peter Worsley about various barrels mentioned in the journals relating to the Zeewyck and the Sloepie. It somehow got lost in the transition between foremer editor Chris Buhagiar and Peter.

The Maritime Museum at Fremantle has on microfilm the two journals from the *Zeewyck*. Checking the handwritten texts made it possible to clarify some of Peter's questions regarding barrels mentioned in the translations of those journals.

1 The draft of the *Zeewyck* forward and aft was translated as $17^1/_2$ barrels and $19^1/_2$ barrels. This must have been translated from the Dutch *vaten*, the plural of *vat*, meaning barrels which seems to have been an error of transcription because the handwritten text clearly reads *voeten* which is the plural of *voet* meaning foot.

The draft is given as:

agter $19^0/_4$ voeten (aft $19^0/_4$ feet)

voren $17^1/_2$ voeten (foreward $17^1/_2$)

2 Much effort must have gone into trying to establish the volumes of containers named in the English translation of the *Zeewyck* journals.

Again, this is unfortunate because the translator has taken the liberty of suggesting a whole range of specific containers whereas the original Dutch text is much simpler in that respect.

These are the terms used:

Singular	**Plural**
legger	leggers
speckvat	speckvaten
vleesvat	vleesvaten
vat	vaten
vatie	vaties
aem	aemen

The Dutch *vat* means barrel or vat, of course, and *vatie* means small vat.

Speck-vat, or *vlees-vat* can simply means a barrel containing *speck* (fatty bacon) or a barrel containing *vlees* (flesh or meat of unspecified type).

In keeping with this meaning there is only a distinction between vat and a small vat (*vatie*). So only four different container sizes are identified: *legger*, *aem*, *vat* and *vatie*.

In some cases the English translation reads something like: 3 barrels meat and 5 barrels bacon "all crans". As a cran is a barrel for fish, particularly herring, one might expect to find something like "alle haringtonnen" in the Dutch text ("all herring tuns").

Instead the Dutch text reads "alle cantig". The meaning of this is that the barrels were not completely full, having been de**canted** somewhat.

The other terms "cant", "cask", "keg" and "butt" are not warranted by any specific expression in the Dutch text which uses *vat* and *vatie* only.

3 Volumes and dimensions of containers used on VOC ships circa 1700.

The main source for this is Pieter van Dam's work "Beschryvinge van de Oost-indische Compagne" completed in 1701.

In 1927 Dr F. W. Stapel edited the printed version of this massive work (Publisher: Martinus Nyhoff-'s-Gravenhage). It is one of the major sources on the many aspect of VOC history.

In Book 1, part 1, pp 517, 527, and the glossary pp 741–742 we find several specifications of barrel volumes then in use.

From the note on p 517:

Aem: 1 aem = 128 mingelen

1 mingelen = 8 mutjes (English "mutskin")

(1 mutje = 0.15 ltr.)

Therefore 1 aem - 128 x 8 x 0.15 l = **153.6 litres**

In a resolution dated 26 march 1692 (found in van Dam, p.527) dimensions for types of barrels are given. First it is stated that the *legger* will not be changed in size because a barrel of this size is "deemed necessary for the preservation of wines." Thus some *leggers* were wine barrels.

"Spanish wine in *toelasten* each containing [the volume of] 4 *aemen* ..."

This would ammount too 4 x 153.6 = 614.4 ltr.

A "*toelast*" would thus be a large barrel, but laid on its side it would be called a *legger* (the word means "a thing that lays").

There is another volume possible: ... French wine in "pipes" (from the Portuguese *pipa*). The pipe as a wine barrel is a large, though narrow, barrel of 435 ltr.

So, depending which wine barrels were used, a *legger* could be either 614.4 ltr or 435 ltr. The former seems more common than the latter.

In victual lists barrels are often referred to as "*groftonnen*", or "*dubbel tonnen*", as well as "smal tonnen".

The *grofton*, or *dubbel ton*, is said to be the commonly used barrel, which was twice the volume of the *smal ton* .

It is likely that when in the *Zeewyck* journals references are made to vat that this is the common barrel (*dubbel ton*) and when reference is made to vatie that this is the smal ton.

The above mentioned resolution of 26 March 1692 gives the precise dimensions for the following barrels: All dimensions are Amsterdam feet (0.2831m) and *duim* "thumbs" or inches (11 per foot!)

The respective metric dimensions are

Vleesvat	952mm	725mm	627mm
Speckvat	952mm	614mm	516mm
Biervat	952mm	606mm	508mm

Assuming these are outside dimensions, with staves 18mm thick, effectively reducing the diameter by 36mm, and lids also 18mm thick set twice that thickness from the end effectively reducing the height by 108mm, internal volumes were calculated using:

$V = 1/12.\pi.h. (2D^2 + d^2)$ where h = inside height

D = max inside diameter

d = min. inside diameter.

Results were *vleesvat* ~ 287 litre

Speckvat~ 199 litre

Biervat ~ 193 litre

If the legger of 600 litre had the same ratio of h:D:d, as given for the *biervat*, internal dimensions would be: h ~1240mm, D ~830mm, d ~690mm.

Maintaining the same same internal height for the smaller legger or pipe of 435 ltr and varying only D and d,, but maintaining the ratio D:d, gives the internal dimensions:

h ~1240mm, D ~710mm, d ~580mm.

Adriaan de Jong

A Nit-Picking Curmudgeon Writes

Dear Sir,

Congratulations on another very fine edition of the Maritime Heritage Association Journal (and may I add how glad I am that it was not presented as a “Millennium Issue”).

I hope you will not mind if I mention a few small points that I thought questionable or in error.

In respect of the five-masted barque FRANCE II, a 24 hour run of 420 miles is cited. I wonder, what is the source of that claim and how reliable is it? It would be about the best 24 run for a sailing ship, certainly the best for a post-clipper sailing ship. I was not aware that FRANCE II was noted for speed.

Another piece of information that did not accord with what I had previously understood was the assertion that the rate system (first-rate ship, second-rate, etc) of classifying RN ships was not introduced until the 1750s. I would suggest that the system had been in use for many decades by the 1750s, but that a new “Establishment” was introduced then. An establishment was the specifications that stated the number and caliber of guns carried by ships of each rate, and this was changed from time-to-time.

Certainly the records of the Board of Ordnance (which issued ordnance to both the Army and the Navy) show the rating system in use at an earlier date

A quick web search using the phrase “Establishment of rates” through the British Public Records Office shows the following document from the records of the Board of Ordnance:

WO 55/1650 Remains and Issues, Sea Service, 1662-4. Establishment of rates and auxiliaries, 1677.

And on the same web page one can find the following statement: “By Queen Anne’s reign the establishment of guns and stores for each rate was becoming standardized, so that it was no longer necessary to note any more than that such a ship had shipped the establishment of her rate.” In other words, if a particular ship was, for example, a third-rate ship it could be assumed that she had shipped a certain number of guns of the requisite size and the munitions to go with them. Back in the 17th century, although ships of the same rate carried approximately the same number and size of guns, the guns were not standardized and therefore shot and gear had to be issued to fit the particular guns on a ship.

The first "Establishment of Men and Guns to the Whole Royal Navy of England" appeared in 1677 and corresponds to the Ordnance Board document cited above. However, the six rates were used and understood during the Commonwealth.

There was a set of standard hull dimensions introduced with the 1677 Establishment but apparently only with respect to a single building program. In 1706, the Navy Board made the mistake of having the Admiralty establish a set of dimensions to remain in force until further notice. There were a number of changes to this establishment up to the final establishments of hull dimensions in 1745 -- by which time Anson was becoming a force in the Admiralty. The idea of such standardization of details by policy direction was abandoned in 1755, largely because the French were so clearly building better ships by allowing their master shipwrights enough scope to develop new ideas. All of the establishments which specified dimensions for RN ships produced ships which were rather too small for the ordnance they carried.

A couple of the details given in the comparison of the tea clippers THERMOPYLAE and CUTTY SARK are questionable. THERMOPYLAE’s quarter deck was not as much as 81ft long. It appears to be about 58 ft long in the plan published by David R. MacGregor. Also, CUTTY SARK’s yards, like those of all Willis’s ships at that time, were painted black, man-of-war fashion, not white.

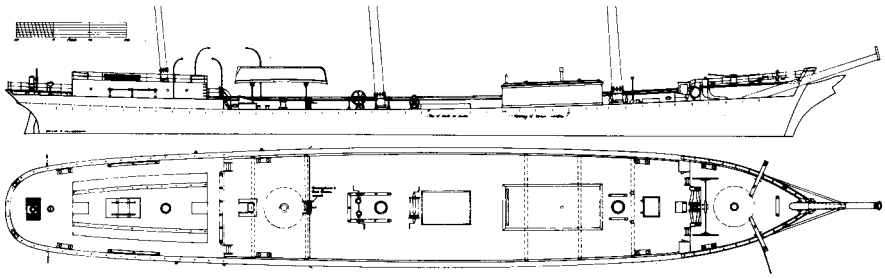
The piece by Nick Burningham about his first acquaintance with Bill Brown was, I suppose, a reminiscence rather than a researched article, so errors of fact might be excused. Burningham does not say when these events are supposed to have occurred. I can find no record of the ship SEREALITY making a voyage to any Yugoslavian port in any year when she was owned by Everards. She did take an unspecified cargo to Varna, Bulgaria in 1968, but surely Burningham was approaching middle-age by that date?

His statement that the “historical importance” of the cargo of powdered eggs has been forgotten is not quite true. In O’Rourke, P.J. 1988. “Holidays in Hell” page 83, one can find the following sentences:

“Commies love concrete, but they don’t know how to make it. Concrete is a mixture of cement, gravel and straw? No? Gravel, water and wood pulp? Water potato and lard?”

It seems that O’Rourke nearly guessed the significance of that cargo.

N.P. Curmudgeon



Thermopylae, general arrangement and deck plan