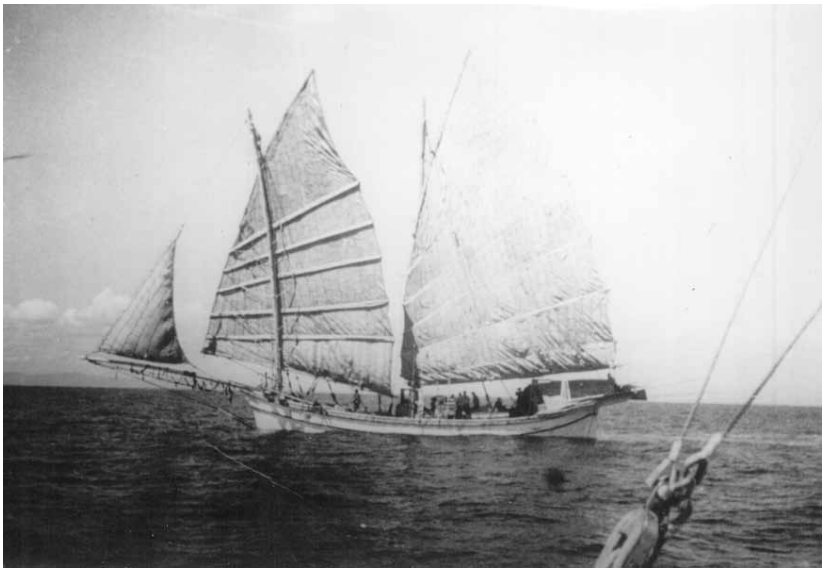
The Bulletin of the Australian Institute for Maritime Archaeology



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Lord Ashley

Adam Wolfe
26 Grey Street East, ALBANY WA 6330

The following history is based on a number of references which range from publications produced by the Peninsula and Oriental Steam Navigation Company (P&O) in the 1860s and 1870s, to recent secondary sources such as *The advent of steam* (Gardiner, 1993). Amongst these references are numbers of newspaper reports of the period. Although some are exaggerated, or grossly inaccurate, most contain enough information, when looked at in the context of other contemporary reports, to provide a reasonably good picture of events as they occurred.

Having said that, thanks needs to be extended to Tim Smith, maritime archaeologist at the Heritage Office, New South Wales, for providing copies of the references relating to New Zealand and a copy of James Entwistle Watkins's diary.

Introduction

The *Lord Ashley* was wrecked on the seaward side of Terrigal Reef on the New South Wales central coast on Saturday, 8 September 1877, while on a voyage from Newcastle to Melbourne. Since that time, the sea has destroyed much of the wreck leaving little but the remains of the lower hull and the engine. The site is protected under the Commonwealth *Historic Shipwrecks Act 1976* (Graham, 1991; *Lord Ashley*. Small Picture File, Mitchell Library [SPF]; *Shipwreck Atlas of New South Wales*, 1995).

The history of the *Lord Ashley* is associated with the wider history of the development of steamship services between Europe and the Antipodes in the second half of the 19th century. Most significantly, the vessel played an important role, in the late 1880s and 1860s, in the development of regular steamship services between Australia and New Zealand.

In 1869, the *Lord Ashley* was sold to Australian interests (*Register of British Shipping*, Port of Sydney, 57 of 1869) and became one steamer among many, plying the waters of the Australian east and north coasts. One highlight of this, perhaps humdrum, existence was a year spent as the branch mail steamer to the French colony of New Caledonia (Parsons, 1981: 123).

By the end of her life, the *Lord Ashley* had had a succession of owners and had passed from being one of the better known, intercolonial mail and passenger steamers, to a humble and nearly anonymous collier (*Register of British Shipping*, Port of Sydney, 57 of 1869). In this context, this later history has the potential to help illustrate the social and economic conditions of Australian coastal shipping services in the 1870s. Of particular interest in this period was the gradual development of procedures and regulations which ensured the safe operation of coastal steamers departing from New South Wales ports.

In Europe, in the first half of the 19th century, there were proposals to establish direct steamship services to Australia and New Zealand. One of the earliest was made in 1837 but nothing came of the idea (Report from the select committee on steam communication with India, 1837 (539): 83, 90).

It was not until the mid 1840s that technological advances made the idea a more practical consideration. These advances were typified by such ships as the paddle steamer *Great Western*, the first steamer built specifically for trans-Atlantic service. Within a short time her technological superiority enabled her to displace all rivals and become, at one stage, the only trans-Atlantic steamer in service. Between 1837 and 1840 she made a record number of seventeen crossings (Gardiner, 1993: 19–20). Steamship technology was taken further with the launch of the screw steamer *Great Britain* in 1843. She was the world's first large, iron steamship, propelled by screw and the first to embody two, of the three, characteristics essential to an economic and efficient steamship—large displacement, sufficient to carry enough coal for long ocean passages, leaving sufficient space to carry an economical cargo; and, a durable hull. Unfortunately the third and critical characteristic, a fuel-efficient steam engine, had to wait for further technological developments over the next twenty years (Gardiner, 1993: 21; Hans & Hurst, 1985: 26).

By 1847, the virtues of developing a steamship service direct to Australia were being openly debated in Great Britain. *The Times* of London reported that such a service would convey immense benefits to the region:

> ...the advantages most prominently calculated upon are, the encouragements to emigration by reducing by nearly one half the period of communication with home, which at present forms the chief set-off against the advantages which Australia presents in comparison with other colonies—the creation of a steam fleet in the Indian seas available for every kind of service in connection with our Eastern possessions—the traffic that might be opened up with various islands on the route, together with that betwixt India and Australia, especially as regards the breeding of horses—and the opportunity for East Indian invalids to recruit their health, the distance to Swan River only occupying 14 days, to Sydney 30 [sic] (*The Times*, 5 Feb. 1847).

The year before, on 17 April 1846, a committee had been formed in London to look at the feasibility of establishing a service to Australia. The committee, chaired by Sir George Larpent, MP and former chairman of the P&O company, looked at three proposed routes. After

much discussion they settled for the route suggested by Thomas Waghorn, a former officer in the Indian Navy and an influential promoter of steam communication between Europe and Asia. He proposed that a branch service could be established between Singapore and Sydney. Ships would steam to Sydney via Batavia (Jakarta), Port Essington, east of the present site of Darwin; and Wednesday Island (*The Times*, 5 Feb. 1847; Divine, 1960: 64–66, 78–80, 82, 89).

While the committee was making its deliberations, the Royal Navy was busy demonstrating the capacity of their steamships to reach Australian waters. The first class paddle sloop HMS *Driver*, sent out to fight in the first China War, was lying at Hong Kong and was ordered home via New Zealand and Rio de Janeiro (Gardiner, 1993: 34). Limited in range by her inefficient and worn out engines, she was forced to steam south through the east Asian archipelago to Singapore where she refuelled. She then steamed out into the Indian Ocean, arriving off Fremantle and the Swan River Colony on 4 December 1845. In the process she became the first steamship to visit that port (*The Inquirer* [I], 10 Dec. 1845; *The Perth Gazette* [PG], 6 Dec. 1845; *The West Australian* [WA], 6 Dec. 1845). Her bunkers were replenished with timber and the voyage continued to Hobart, Sydney, New Zealand and eventually home. On her return to Britain, HMS *Driver* became the first steamship to circumnavigate the world (Parsons, 1973: 1; Gardiner, 1993: 19, 34–35).

Soon after, the second class paddle sloop HMS *Acheron*, under the command of Captain Stokes (RN), was dispatched from Britain, with the Western Australian mails, bound for Australia and New Zealand. After calling at Rio de Janeiro she steamed into the South Atlantic arriving off Cape Town with her bunkers empty and the crew scouring the ship for anything which could be used to fuel the boiler and get the ship into Table Bay. After refuelling and taking on provisions, Captain Stokes steamed eastward across the Indian Ocean to King George Sound in Western Australia, arriving on 21 July 1848. The mails were unloaded while provisions and fuel were taken on board. After a short stay HMS *Acheron* resumed the voyage towards New Zealand (Wollaston, 1851: 43–46, 48, 50, 52, 55).

These and other voyages, technological advancements in steamship technology and suitable commercial incentives from both the British and Colonial Governments, soon led to the establishment of a regular steam mail service to Australia. In 1851 the British Admiralty awarded the Australian Royal Mail Steam Navigation Company (ARMS) a bimonthly contract to carry mails from Britain to Sydney, via the Cape of Good Hope and King George Sound (*The Times*, 16 Sept. 1851; 4 May 1853; Garden, 1977: 112). In the following year the Peninsula and Orient Steam Navigation Company (P&O) was awarded an alternate bimonthly contract to extend their existing mail service from Singapore to

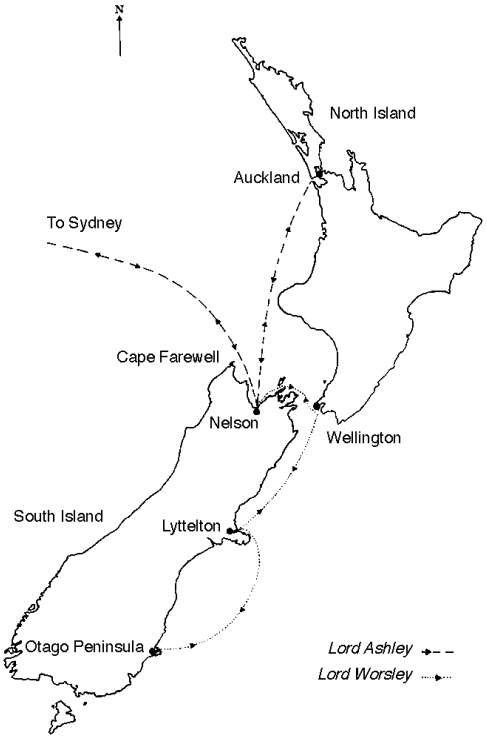

Figure 1. Map of New Zealand showing the route taken by the *Lord Ashley* and her sister *Lord Worsley* in 1858.

Sydney (Anderson & Green , 1879; Garden, 1977: 115; PG 12 Aug. 1853; *The Times*, 4 May 1853).

The ARMS service operated until May 1853 when the contract was withdrawn due to the collapse of their service (*The Times*, 30 July 1852; 25 Nov. 1852; 29 Nov. 1852; PG 5 July 1853; 22 July 1853). The P&O operated until March 1855 when increasing running costs and the contingencies of the Crimean War, brought their operations to a halt. Their ships were requisitioned as troop transports and they closed their Australian coaling stations (Garden, 1977: 121; Divine, 1960: 120–21).

With the end of the War, in February 1856, the British Government once again invited tenders for a steam mail service to Australia. This time the contract was won by the European and Columbian Steam Navigation Company, formed in 1853, which changed its name to the European and Australian Royal Mail Company in recognition of the new service (Parsons, 1973: 4). The company commenced operations at the end of the year but had difficulties maintaining the service and was subsequently taken over by the Royal Mail Steamship Company. The company had four steamers and operated until 1858 when the British Admiralty called for new tenders. The P&O were duly awarded the mail contract in September 1858 with an expectation that services would commence in March the following year (Parsons, 1973: 5-6; Divine, 1960: 124) .

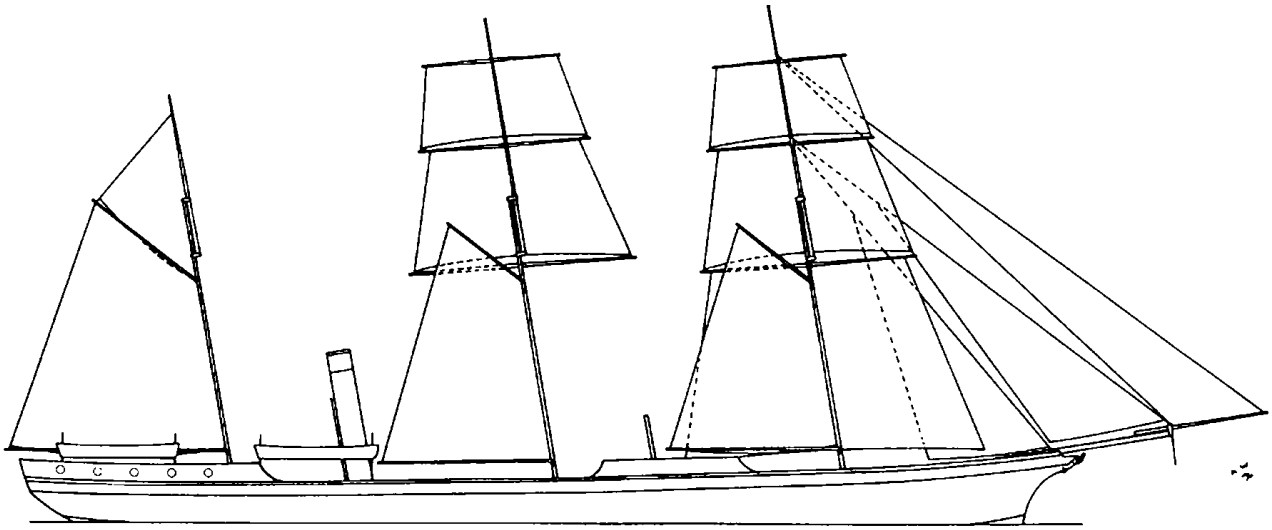

Figure 2. An impression of the profile of the *Lord Ashley* based on a painting from the Alexander Turnbull Library, National Library of New Zealand. Not to scale.

In New Zealand the idea of establishing a branch mail service from Australia had been debated since at least 1855. In that year, the British Admiralty, acting under instruction from the British Post Office, called for tenders for a mail contract via the Cape of Good Hope, King George Sound, Melbourne and Sydney with branch services to New Zealand, Queensland and South Australia. Nothing came of the New Zealand service and it was not until the Colony's treasurer, Henry Sewell, met with the principals of Pearson, Coleman and Company of Grimsby (Zachariah Charles Pearson, James Coleman and James Alfred Jackson), that further progress was made (Wilkinson, 1966: 73–76, 96). The meeting occurred in England in April 1858. A branch service was discussed, but no firm decisions were made. It was not until further discussions had occurred with the British and New Zealand Governments that Pearson, Coleman and Company decided to form the Intercolonial Royal Mail Steam Packet Company, with registered offices at 41 Moorgate Street, London, to operate an Australia–New Zealand branch service (Wilkinson, 1966: 75, 96).

With subsidies from both the British and New Zealand Governments, the new company agreed to run four steamers. One steamer, of 800 tons, would run between Sydney and Nelson, while two smaller steamers of 500 tons would service the New Zealand provinces. A fourth steamer of 300 tons would be employed as a back up to the other vessels and as circumstances required (Wilkinson, 1966: 75–76).

Following this agreement, the Inter Colonial Royal Mail Company purchased two steamers belonging to Pearson, Coleman and Company the *Lord Ashley* and her sister the *Lord Worsley*. These ships were dispatched to New Zealand and were shortly followed by the larger *Prince Alfred* and the smaller *Airedale* (Wilkinson, 1966: 76–77, 84).

Lord Ashley

The *Lord Ashley* was built at Grimsby, Lincolnshire for Pearson, Coleman and Company and was launched in May 1857. She was registered at the Port of London and while under the command of Captain William King, and later Captain R.A Gledow, was employed with her sister in the Baltic trade through the Port of Hamburg (Wilkinson, 1966: 76, 96; Scotter, 1968: 49).

Within a year of being launched Pearson, Coleman and Company sold the *Lord Ashley* to the newly formed Inter Colonial Royal Mail Company (*Register of British Shipping*, Port of Sydney, 57 of 1869). The Company appointed Captain Alexander Stewart in command and, on 27 May 1858, the *Lord Ashley* sailed from Milford Haven with 97 passengers bound for Auckland. One coaling stop was allegedly made at Port Fairy in Victoria (Wilkinson, 1966: 76; SPF/ML; Waters, 1961: 13–14) and Auckland was reached on 14 October 1858 after a voyage of nearly five months. On arrival, the *Otago Witness* and the *Lyttelton Times* hailed the *Lord Ashley* as the first steamer to arrive in New Zealand direct from England (*Otago Witness*, 9 Oct. 1858; *Lyttelton Times*, 20 Oct. 1858).

The *Lord Ashley* was a single deck, screw steamer with a square stern and was built of iron. She was 188 ft (57.3 m) long with a beam of 24.8 ft (8.8 m) and a depth of 13.4 ft (4.1 m). In 1869 she was registered in Sydney with a gross tonnage of 435.37 tons and a net tonnage of 296 tons—the difference being a deduction for the engine and engine room which was 26.7 ft (8.4 m) long. The engine was a two-cylinder, 'trunk' type, generating 80 horsepower. Under steam the *Lord Ashley* was capable of 9 knots. Under sail she could do 11 knots with a favourable wind. The figurehead was the carved image of a man, presumably Lord Ashley (*Register of British Shipping*, Port of Sydney, 57 of 1869).

LORD ASHLEY	
SHIP DETAILS	
Type:	Screw-steamer.
Rig:	Three-masted schooner.
Dimensions:	188' x 24.8' x 13.4'
Construction:	Iron.
Engines:	2 cylinder, 'Trunk'; 80 horsepower.
Gross tonnage:	435.37 tons
Official number:	16670
Port number:	57 of 1869; Sydney.
Signal flags:	MCLH

Table 1. Ship details of the *Lord Ashley*.

The *Lord Ashley*'s rig is of interest. She had three masts, a bowsprit and jib-boom. In 1869, when registered in Sydney, she was described as having a schooner rig (*Register of British Shipping*, Port of Sydney, 57 of 1869). In an undated illustration, possibly made prior to her registration in Sydney, she appears to be rigged as a jackass barque, rigged fore and aft on the mizzen, main and fore masts; and square rigged on the main topmast, foremast and fore topmast (Wilkinson, 1966; *Lord Ashley*, Turnbull collection; Ansted, 1967: 129; Kemp, 1979: 422) (Wilkinson, 1966: 77). James Entwistle Watkins made a voyage on the *Lord Ashley* in 1860 and recorded the fact that a square rig was set in favourable winds (Watkins, 1860, Monday, April 16–26). On this basis it would seem that sometime after 1860 and before 1869 the square rig was removed.

The Inter Colonial Royal Mail Company originally intended to use the *Lord Ashley* on the New Zealand coast to link Nelson with the provincial ports. Unfortunately the intercolonial steamer which was to connect Sydney to Nelson had not yet arrived from Britain so the *Lord Ashley* was appointed to take its place. In the meantime the *Lord Worsley*, which had also arrived in New Zealand, was placed on the coastal route (Wilkinson, 1966: 77).

The planned itinerary was to leave Sydney on the 10th of each month and then steam to Nelson and Auckland before returning to Sydney via Nelson. The two ships were scheduled to meet at Nelson. The *Lord Worsley* would then call at Wellington, Canterbury (Lyttelton), and Otago before returning to Wellington and Nelson, via Canterbury (Wilkinson, 1966: 77).

The *Lord Ashley* made her first trip across the Tasman in November 1858. She left Auckland on the 1st and arrived in Sydney on the 11th. She then returned making a then record crossing of the Tasman in five days (Wilkinson, 1966: 77; Parsons, 1977: 179; SPF/ML).

Within a short time the *Lord Ashley* was withdrawn from this service, probably due to the arrival of the larger intercolonial steamer *Prince Alfred*, and spent most of the next year, 1859, employed on the New Zealand coast (Wilkinson, 1966: 77–78).

In January 1859, the *Lord Ashley* made the first steam excursion trip across Cook Strait. Three hundred passengers boarded in Wellington Harbour and at 9.30 a.m. she steamed out into the Strait bound for Picton and return. Bad weather caused delays while the avarice of the Wellington Harbour boatman, who offered to ferry passengers to and from the steamer, upset many of the passengers. Leaving at 9.30 a.m. the *Lord Ashley* did not return to Wellington until 2.30 a.m. the next day (Wilkinson, 1966: 77).

In March, the *Lord Ashley* was in the news when she nearly ran aground on Seal Rock, off Sinclair Head in Cook Strait, and was then stranded on a mud bank at Nelson. Fortunately no damage was done and she was able to return to service (Wilkinson, 1966: 77; *New Zealand Register* 15 Mar. 1859).

In October 1859, *The Auckland Weekly Register and Commercial Shipping Gazette*, reported that the Lord Ashley was in service between New Plymouth, Nelson, Wellington, Canterbury and Otago and was under the command of Captain Andrew Kennedy. An entry in the shipping summary of the paper described her as arriving in 'the Manukau from Nelson and the south', via New Plymouth, with a cargo of '8 bullocks, 2 horses, sundries and 30 passengers' (*The Auckland Weekly Register and Commercial Shipping Gazette,* 24 Oct. 1859).

In December 1859, the *Lord Ashley* was nearly lost when a leak developed while on a voyage from New Plymouth to Onehunga. The water rose rapidly, flooding the engine room floor plates and threatening to extinguish the fires. If this had happened the pumps would have stopped and the vessel may have foundered. Fortunately the leak was brought under control and she was able to make port safely. Repairs were carried out and soon after she left for Sydney to be over hauled at the Australian Steam Navigation Company's slipway at Pyrmont (Wilkinson, 1966: 86). Eighteen years later similar circumstances would lead to her total loss.

The return voyage to New Zealand was not without incident. Sailing on 11 February 1860 with 26 passengers she ran into a gale and suffered considerable damage. Ten days after leaving, she arrived in New Zealand where the *Otago Witness* reported the arrival and noted that the *Lord Ashley* 'has not enjoyed a very favourable reputation for speed owing to defects in her machinery' (Wilkinson, 1966: 86; *Otago Witness*, 13 March 1860). So much for the record crossing of November 1858!

In April 1860, the New Zealand Government negotiated a new mail contract with the Inter Colonial Mail Company and new schedules were drawn up for the intercolonial

and coastal steamers. As the result of these changes the *Lord Ashley* returned to the intercolonial service to Sydney (Wilkinson, 1966: 80–81).

James Entwistle Watkins made a voyage on the *Lord Ashley* and kept an account of his experience. The account is brief, yet contains enough information to suggest, that even with steam engine, the *Lord Ashley* was still very much dependent on favourable winds to effect timely and economic passages. Calculations based on Watkins' record of the distance steamed each day indicate that the Lord Ashley steamed 330 nautical miles, against headwinds, in one 48-hour period. This compares with a second 48-hour period when, with favourable winds from astern, she was able to steam 420 nautical miles; an increase of 90 nautical miles (Watkins, 1860: 46–47).

In addition, Watkins' references to his fellow passengers being sea-sick, when the *Lord Ashley* encountered head seas and winds, suggests that she may have been prone to pitching. At other times, when the wind and sea were on the beam or astern, Watkins makes no mention of such ailments (Watkins, 1860: 46, 49).

Finally, the reference to an engine breakdown, caused by a broken eccentric, and the subsequent repairs, are reminders of the vulnerability of mid-19th century marine steam engines to mechanical failure and the simplicity and robustness of design which enabled repairs to be carried out at sea (Watkins, 1860: 46, 49).

Watkins stepped on board at 9.00 a.m. Monday, 16 April 1860:

> …left the wharf at 1/4 past 11. cleared the heads at 1/4 past 12. went out in company with steamer "Lord Worsley". fine fresh breeze from N.N.E. set all sail.lost sight of land at 3 pm. 29 passengers, general cargo and 40 horses. set all sail, but came on to blow hard so took in square sails. lightened very much during the night.
>
> Tuesday April 17. Fine morning with a fresh breeze from Eastward which continued all day. under fore and aft canvass.passengers nearly all sick. 230 miles from Sydney to day at noon.
>
> Wednesday April 18. Fine, wind against us. under four and aft canvass.
>
> Thursday April 19th. Fine. wind from eastward. 560 miles from Sydney at noon.
>
> Friday. fine wind from Eastward. 460 miles from Cape Farewell.at night wind changed a point or two which enabled us to carry our square sails. fine sunset.
>
> Saturday April 21st. Fine, fresh breeze N.N.W all sail set. 240 miles from Cape Farewell.
>
> Sunday fine. N.N.W fine day. 40 miles from Cape Farewell at noon. Made out the loom of the land at dark.
>
> Monday April 23rd. Fine: arrived in Nelson at 8 am. tide suited so we steamed right into Nelson Haven. landed about 10 and went to Rev J. Simms (?): where we stayed the night posted letter for Father, Mrs…p. "Airdale" via Auckland.
>
> April 24 Tuesday. went down to steamer at 9 am and found she would not leave until evening so returned to Simms. went with Kate and Mrs Moorhouse a walk to the "Flagstaff" and then to a hill from whence we had a fair view of Nelson. Blind Bay: saw "Wonga Wonga" steam just outside the Haven bound for Wanganui and the "Active" bound for Lyttelton. came on to rain which continued all day: at 6 o'clock embarked on board. at 1/2 p.9. "Airedale" left for Taranaki. at 1/2 p. 10. we left the wharf and steamed out of Nelson. rain ceased and a fine star light night. at 1 oclock the eccentric strop of engine broke and engine stopped. all night…engine: got engine to work at 8 am next morning.
>
> Wednesday April 25th: Fine morning wind N.W engines working well, saw a brigantine supposed to be the "Active". sighted steamer, which proved to be "Airedale": ran up signal for: met with an accident with my engine: we went in company with her for nearly an hour. we parted with her about 11 and she lay her course.
>
> Rounded Stevens Island at 1 pm and met with a stiff S.E . exchanged signals with ship "Blue Jacket" and brig "Margaret Thompson." wind rising. beating up straits at sun down saw a schooner going down straits. very rough night: passengers all sick. blowing hard heavy sea running. towards 1. wind lulled. sea went down at 1/2 p.5 sighted Wellington lighthouse. and at 8 oclock anchored in Wellington: on Thursday morning April 26th 1860" [sic] (Watkins, 1860: 46–50).

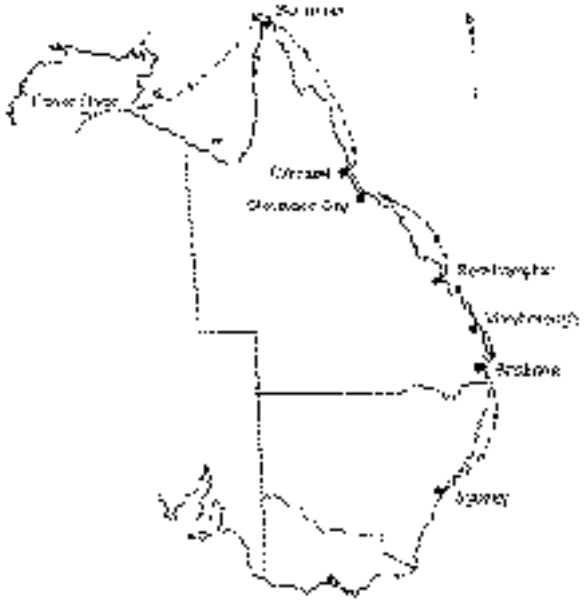

Figure 3. Map of the eastern half of Australia showing the *Lord Ashley*'s ports of call during the South Australia gold rush in 1873.

In the following year, 1861, the *Lord Ashley* completed 15 return voyages across the Tasman and in the following year nine (*Sydney Morning Herald* [SMH], 1861–62. Shipping News).

At the end of 1862, she returned to the New Zealand coast only making one, or two voyages, across the Tasman

each year, to be refitted in Sydney. The media would often report her arrival with stories such as that carried by the *Sydney Morning Herald* on Monday, 9 December 1867. The paper reported that the *Lord Ashley* had arrived in Sydney two days earlier, on 7 December from Hokitika under the command of Captain Worsp. On board she had 142 passengers and 9 191 ounces of gold. After unloading her cargo and disembarking her passengers, she was to go into dock to be refitted and was expected to return to New Zealand on 5 January 1868 (SMH, 9 Dec. 1867; 10 Dec. 1867).

In April 1866 New Zealand Parliament ratified a contract with the Intercolonial Royal Mail Steam Packet Company for a mail service to Europe across the Pacific via the Isthmus of Panama. The Company changed its name to the Panama, New Zealand and Australian Royal Mail Company and continued to employ its existing fleet of ships. Despite tight economic conditions the new company operated until February 1869 when it was forced to wind up its operations. In the process, the *Lord Ashley* was bought by the Circular Saw Line based in Auckland (Scotter, 1968: 51).

On 14 July 1869 the *Lord Ashley*'s register was transferred to Sydney. At the time, she was owned by Shepherd Smith, banker of Sydney, who presumably bought the ship from the Circular Saw Line (*Register of British Shipping*, Port of Sydney, 57 of 1869). Two years later, on 17 July 1871, she was sold to Thomas Henderson and John Lawford of Auckland who attempted, unsuccessfully, to employ her in the trans-Tasman trade (*Register of British Shipping*, Port of Sydney, 57 of 1869; Parsons, 1981: 123). With the failure of their operations, the *Lord Ashley* was put up for sale and, in February 1872, was bought by John Edye Manning of Sydney. He put her into service between Sydney and Rockhampton carrying passengers, wool, agricultural produce, manufactured goods and general cargo (Parsons, 1981: 123; *Register of British Shipping*, Port of Sydney, 57 of 1869; SMH, 8 Feb. 1873).

In April 1873, after a major refit at Morts Dockyard in which 'The screw shaft [was] entirely taken out, triced up and the plummer blocks refixed: new valve seatings to the air pumps [were] supplied, and the engines…received a general and careful overhaul' (SMH, 16 Apr. 1873; 17 Apr. 1873), she was chartered by the South Australian Government to carry passengers to the Roper River and the Darwin gold fields. She sailed from Sydney on 19 April, under the command of Captain Henry Bristow calling at Brisbane, Townsville and Cardwell. On board were 63 passengers (SMH, 10 Apr. 1873, 17 Apr. 1873, 19 Apr. 1873, 21 Apr. 1873; *Sydney Mail* [SM], 26 Apr. 1873).

A later report in the *Sydney Morning Herald* suggests that the *Lord Ashley* was not alone and may have made the voyage in company with the steamer *Enterprise* which was described as 'a tender to the *Lord Ashley*, [and] was left at the Roper River, having been purchased by the South Australian Government' (SM, 21 June 1873).

The *Lord Ashley* arrived at the Roper River and remained for a number of weeks before sailing for Sydney at 4.00 p.m. on Wednesday, 4 June. The next port of call was Somerset, on Cape York, which was reached on Saturday 7th. A cargo of pearl-shell and a number of passengers were taken on board. Four days later, on Thursday 12th, after steaming at an average speed of nine knots, the *Lord Ashley* reached Cardwell. After a short stay the voyage was resumed to Brisbane, via Cleveland Bay, Rockhampton, and Maryborough. Between Cleveland and Rockhampton the *Lord Ashley* steamed through the eye of a cyclone, 'with heavy confused sea and much thunder and lightning and torrents of rain'. Sydney was reached at 8.00 a.m., Friday, 27 June 1873. She had been away for just over two months (SMH, 28 June 1873).

Preparations were soon underway for a second voyage. An advertisement on the front page of the *Sydney Morning Herald*, advised that she would sail on Thursday 10th, 'The passage will be through the Inner Route (inside the Great Barrier Reef) with smooth water, and, avoiding all risks and affording passengers at the same time an opportunity of inspecting the New Mail Route via Torres Straits' (SMH, 5 July 1873).

There may have been problems getting bookings. On Tuesday, 22 July a further advertisement stated that the *Lord Ashley* was still at her berth and was due to sail to Melbourne to secure sufficient passengers (SMH, 17 July 1873, 22 July 1873). This may not have been a sufficient inducement because on Wednesday, 30 July the agents advised that they would refund passage money and deposits (SMH 30 July 1873).

The agents did not give up. On Friday, 22 August they advertised that 'A large number of berths having been secured in Melbourne…she will be dispatched to Port Darwin from Sydney about the 3rd Sept.' (SMH 22 Aug. 1873). This did not work and the charter was cancelled. On Saturday, 6 September the public were told that she would soon be replacing the SS *Blackbird* on the intercolonial service between Sydney, Brisbane, Gladstone and Rockhampton (SMH, 6 Sept. 1873). In the eyes of the owners this was perhaps seen as a more profitable and reliable service, given the recent discovery of gold at the Palmer River near Rockhampton.

Four months later, in January 1874, the *Lord Ashley*, en route from Sydney to the Endeavour River, the nearest port to the Palmer River goldfields in Queensland and under the Command of Captain John D. Harley, passed through the eye of yet another cyclone. Mr D. Little, who had chartered the steamer, was on board and wrote a letter to the owners describing his experience:

> We sailed from Rockhampton Flats on the morning of Wednesday, 21st; passed pilot station at 4pm; and at 3, following morning, with hardly any warning; encountered a really terrific cyclone. The glass fell by half-inch jumps from 30 to 26.80 in two hours. The ship lay on her beam ends; the scudd was so blinding that the funnel was often

> not visible from the bridge; everything above deck broke away; the horses were mostly swept overboard, but three, one after the other, with twenty to thirty tons of water, smashed in the steerage hatch and were [sic] pitched amongst the passengers. The two quarter boats were early carried away… At last with the fires of the wing furnaces washed out and over six feet of water in the hold, Captain Hurley managed to get the fore and main masts cut away.

She then passed through the eye of the storm:

> …on the other tack, and when the storm broke again the steerage had been battened down, and we rode out the remaining two hours, rolling frightfully and shipping tremendous seas but in comparative safety. We then lay-to for 36 hours to rest crew and pump ship. Our second officer is a trump; a Captain king, on board, also did good service. The ship herself is none the worse, and has not leaked an ounce of water since. The machinery escaped too, and is now working as smoothly as when we sailed, but otherwise the old Ashley is a terrible wreck. She is a splendid ship in a heavy sea, and every passenger in her, amongst them many old sailors, speak of her in the highest terms; in fact had she not been so, no human skill could have saved us. After staying two days at Townsville we prepared for a start to the Endeavour, when the sailors refused to do any more work that day, as "they had worked their eight hours" [sic] (SMH, 13 Feb 1873, 14 Feb. 1873).

Captain Harley's latter account of the voyage is perhaps more accurate and provides a description of conditions which may have been similar to those experienced by less fortunate vessels, lost, sometimes without trace, in the northern waters of Australia.

> ...the Lord Ashley left Rockhampton on Tuesday , the 20th ultimo, at 11pm . Made all sail, wind E.S.E, steering N.1/2 E. At 10 pm., wind increasing and looking very gloomy, took in fore topgallant sail, mizzen and jib. At midnight, owing to the gale increasing, took in all sail from the ship to; ship running before the wind, with thick dirty weather, wind about S. At 2 a.m. on Thursday, the 22nd, hove the ship to, head to the eastward. Gale increasing, and very dirty-looking weather, glass fallen to 28.50 [inches], secured the sails a fresh-sea rising, and the vessel rolling and lurching heavily. At 5 a.m., the gale increased to hurricane force; wind still from the S. At 6 a.m., furious squalls, with blinding rain , vessel on her beam ends, and enveloped with heavy sea fore and aft, washing horses and every available thing off the decks-blowing starboard lifeboat from the davits and carrying it clean over the masthead like a lucifer matchbox, and disappeared out of sight in an instant to leeward; at 6.30 a.m, fearful gusts; impossible to stand in deck without lying down to it. Went below to look at barometer, and found the aneroid at 29.90 and oscillating between that and 29.78. Went on deck again, and found the ship enveloped in a complete mass of sea and lying on her beam ends, and water up to the main hatches, vessel falling off in the trough of the seas, and all the canvass having disappeared, even the tarpauline in the main rigging. The ship was in imminent danger of foundering, and ordered the foremast to be cut away. Before the mast could be cut away, the sails had all disappeared from the yards, and were blown away like pieces of tinder. After the lanyards were out off the weather rigging, the mast disappeared under her bottom; was obliged to stop the engines until the wreck got clear of the screw. In the meantime, the wind was screeching and howling, and rain and sea tumbling on board in all directions. After the mast was cut away, the vessel came more head on to the sea and behaved better. At about 7 a.m. the wind lulled for about five minutes, and expecting a sudden change, got the vessel's head round to meet the N.W. change in time, when the wind came down with renewed vigour, and blew with an awful hurricane force for an hour, vessel lying at the mercy of the elements. At 8 a.m. glass gradually rising and gale abating. Noon: More moderate weather, but vessel hove to. Wind veering to N.E, hove to all night. Friday: More moderate at daylight, and steamed on our course, thankful to God for His preservation over us during that fearful hurrican. Arrived at Townsville on Saturday at 11 p.m. without loss of human life [sic] (*Brisbane Courier* , 16 Feb. 1874; SM, 21 Feb. 1874).

The return voyage to Sydney was not without incident. After leaving Brisbane strong gales from the south-west and south-east forced the *Lord Ashley* to seek shelter in Port Stevens on the New South Wales north coast. When the weather abated the voyage was continued to Sydney. Arriving on 27th, the *Lord Ashley* was soon docked at Morts Dockyard, where new masts and spars were fitted, while the bulwarks, deck houses and deck were repaired (64–SMH, 28 Feb. 1874, 24 Mar. 1874).

Returning to service in March, the *Lord Ashley* was nearly wrecked on the Black Rocks (Rocky Island), about five miles south of Cape Capricorn, on the evening of the 5th. She was on a voyage from Brisbane to Rockhampton, under the command of Captain Bristow, with 90 passengers and a general cargo. At the time, visibility was poor and the weather was squally. She was steaming under sail. Land was sighted on the port and starboard bow and about 9.30 p.m. breakers were seen ahead.Captain Bristow immediately ordered the engines full astern and the sails taken in. Despite these precautions she struck a number of times but fortunately appeared to suffer no damage and was got off (Report of the President of the Marine Board of New South Wales, 14 April 1875. New South Wales Maritime Services Board Library. Letter to the President of the Marine Board of New South Wales from Mr Cruikshank, Engineer Surveyors Office Sydney, 5 April 1875. New South Wales Maritime Services Board Library).

Back in Sydney, she was dry docked at Morts Dockyard and her hull inspected. A small hole, approximately one inch in diameter was found on the port side of the bilge, while the paint had been scraped off the hull for

a distance of 100 feet (Report of the President of the Marine Board of New South Wales, 14 April 1875; Letter to the President of the Marine Board of New South Wales from Mr Cruikshank, Engineer Surveyors Office, Sydney, 5 April 1875).

A Marine Board of Enquiry set up to enquire into the incident held that the *Lord Ashley* was carelessly navigated and reprimanded Captain Bristow, ordering him to be more cautious in future (Report of the President of the Marine Board of New South Wales, 14 April 1875. New South Wales Maritime Services Board Library. Letter to the President of the Marine Board of New South Wales from Mr Cruikshank, Engineer Surveyors Office, Sydney, 5 April 1873).

Captain Bristow and the *Lord Ashley* were again in trouble in the early part of 1875. In January or February, (the date is uncertain), the propeller shaft and stern gland broke, flooding the after compartments. At the time, allegations were made that Captain Bristow had been drunk while in command of his vessel. Two cabin passengers said that after the shaft broke, Captain Bristow had come on deck and behaved like a 'drunken hog' (Letter to the President of the Marine Board of New South Wales from Mr J. Manning, 8 April 1875. New South Wales Maritime Services Board Library).

John Manning, the owner of the *Lord Ashley* subsequently charged Bristow with being drunk, on this, and a number of earlier occasions. A Marine Board of Enquiry was convened to hear the complaint. In a letter to the President of the Marine Board, Captain Francis Hixson, Manning requested that the charges be considered before the '*Lord Ashley* proceeds to New Caledonia with the mail' (Letter to the President of the Marine Board of New South Wales from Mr J.Manning, 8 April 1875). [Francis Hixson served as a surveying officer on board HMS *Herald*, commanded by Captain Henry Mangles Denham (RN), during a series of hydrographic surveys of the Australian coast and the south-west Pacific between 1852 and 1861. After HMS *Herald* returned to England, Hixson emigrated to New South Wales where he worked as an assistant to Commander Sidney (RN) on the survey of the New South Wales coast. In 1863 Hixson retired from the Royal Navy and became the Superintendent of Pilots, Lighthouses and Harbours of New South Wales. He was also commissioned to organise the Volunteer Naval Brigade. In 1872 he was appointed to the Marine Board of New South Wales and served as its President until 1900. He established an observatory at Goulburn in New South Wales to observe the transit of Venus in 1874, was a member of the New South Wales Fisheries Commission and was co-designer of the New South Wales state flag. He died in 1909 (David, 1995:430).]

One wonders if the increasing age of the *Lord Ashley* and the resulting mechanical problems, plus the stresses and strains of commanding a small ship, may not have contributed to Captain Bristow's unfortunate situation.

One does not know how sympathetic Manning was to Bristow's problems. Later, in his letter to the President, Manning mentions that he only retains Bristow 'out of consideration of his family [and] the difficulty of replacing him' (Letter to the President of the Marine Board of New South Wales from Mr J.Manning, 8 April 1875). Perhaps the latter argument was more true!

The findings of the Board are unknown. However, a letter from Captain Bristow to Captain Hixson, dated 6 November 1878, suggests that he may have eventually lost his Master's certificate. In the letter he states, 'after a long life and holding as I do several testimonials of character I find myself utterly ruined in reputation and circumstances' (Letter to Captain Hixson, Chairman of the Marine Board of New South Wales from Captain Bristow, 6 November 1878. New South Wales Maritime Services Board Library).

In mid 1875, Manning won the contract to carry the European mails to Noumea in French New Caledonia. He ran the service for a year, employing the *Lord Ashley* not only to carry mails to Noumea, but also to carry return mails to Sydney and then on to Sumatra and Singapore, to connect with steamers bound for Suez (Parsons, 1981: 123; SMH, 4 Feb. 1876; 13 Mar. 1876).

In typical fashion, the *Lord Ashley*'s departures and arrivals from Noumea were announced in the shipping columns of the Sydney papers. On Saturday, 1 April, the *Sydney Morning Herald* advised that she had arrived under the command of Captain Woods with 23 first class passengers and a cargo consisting of:

> …174 tons of nickel ore, 2 tons old rope, 37 bags , 4 bales of cotton, 18 sacks, 8 bales wool, 130 hides, quarter casks port wine, 62 bags fungus, 45 bags beche-de-mer. 2 cooks tallow, 1 bundle skins, 94 bags bark, 33 casks, 41 hogsheads, 4 cases cordials, 50 packaged sundries (SMH, 3 Apr. 1876).

Later in the month she was due to sail for Noumea with the following exports:

> …115 cases of kerosene, 23 packages tobacco and cigars, 322 packages wine and spirits, 47 casks of beer, 1913 packages oil stores, 3?5 bags potatoes, 98 packages hardware, 56 bags onions, 5 packages furniture, 106 packages beef, 4 horses, 27 bags biscuit, 10 sheep, 10 coils of rope, 14 packages of drapery, 12 cases of fruit, 66 bags of flour (SMH, 19 Apr. 1876).

In June 1877, the *Lord Ashley* began a new career as a collier. She was chartered by George R. Dibbs and Company of Newcastle and refitted, in Sydney, at a cost of £2 000. It was intended to employ her, under contract to the Victorian government, between Newcastle and Melbourne. Most of her passenger accommodation was removed and she was fitted with friction steam winches and extra hatches. On completion of these alterations, which also involved enclosing most of the upper deck, she was described as 'a better sea risk than ever' (Parsons, 1981: 123; SMH, 3 July 1877).

She retained her Marine Board Passenger Certificate and offered limited passenger accommodation, at a reduced rate. It was expected that she would carry 600 tons of coal while having enough for her own use. On 30 June 1877 she sailed to Newcastle under the command of Captain Randall (Parsons, 1981: 123; SMH, 17 July 1877).

Arriving in Newcastle, a cargo of coal was loaded and the *Lord Ashley* sailed for Melbourne. Arriving in Port Phillip Bay she unloaded her cargo at the Port of Melbourne and sailed on Thursday, 12 July, in ballast, for Newcastle. Approaching Cape Howe, on the New South Wales and Victoria border, the *Lord Ashley* ran into a storm. The sails were set and with the engines going ahead dead slow, a course was set to clear the coast and to get sea room (SMH, 17 July 1877). Arriving off Newcastle Captain Randall found the harbour entrance barred by heavy seas breaking at the entrance and was forced to run south down the coast to Sydney. Later in the month the *Lord Ashley* ran into another storm shortly after leaving Newcastle and was forced to return. The local papers picked up the story and reported that the *Lord Ashley* was forced back, not only because of the weather, but also because of the 'incompetency of some of the crew' (SM, 4 Aug. 1877). At the same time, allegations were made in Newcastle that she and other colliers had sailed 'overloaded and unseaworthy' (Callen, 1986: 57).

In early August, the *Lord Ashley* was again in Sydney awaiting clearance to sail for Melbourne with a cargo of coal. Before sailing, marine surveyors from the Marine Board of New South Wales and the New Zealand Insurance Company came on board at the request of the owner. The surveyors inspected the ship and reported that they found every thing in order (SM, 4 Aug. 1877).

For the rest of the month the *Lord Ashley* made a number of voyages between Newcastle, Sydney and Melbourne without major incident. On 30 August, while *Lord Ashley* was in Melbourne, Captain Randall was charged with unlawfully employing a Negro cook, without entering into a formal contract, as required under the *Merchant Shipping Act*. The man, Joseph Watson Southman told the court that, after a voyage of 27 days to Portland, Melbourne and Sydney, he had been discharged without being paid any wages. Captain Randall, in absentia, was fined £5 with 2 guineas costs. The *Lord Ashley* sailed for Newcastle on 29 August 1877 (SM, 8 Sept.1877).

The Wrecking

At 2.00 p.m. on Saturday, 8 September 1877, the *Lord Ashley*, under the command of Captain Donald McAuley, sailed from Newcastle with 484 tons of coal. Before granting clearance to proceed to sea, harbour officials had came on board and inspected the ship. At the conclusion of their inspection, they pronounced that everything was seaworthy. Also on board was one of the ship's owners, John Manning, who was travelling as a passenger (SM, 15 Sept. 1877; SMH, 10 Sept 1877).

Once clear of the harbour, the *Lord Ashley* steamed south with a following north-east wind and a rising swell. At 5.00 p.m. it was noticed that the ship was making water. The pumps were started and the donkey boiler fired up to provide additional power. Despite these efforts the water continued to rise, flooding the stokehole plates and ashpits. The crew were then forced to take dry coal out of the main hold and pass it down to the Chinese firemen in the engine room, who continued to work the fires, while working up to their waists in water. Soon after, the rising water exstinguished the fires and the engines and pumps stopped. The firemen and other engine room staff then cleared the engine room and came on deck. By this time, the ship, rolling heavily in the swell, was unmanageable (SM, 15 Sept. 1877; SMH, 10 Sept. 1877).

The *Lord Ashley* was north-east of Terrigal. Captain McAuley consulted his officers and then decided to abandon ship. The crew, including Mr Manning and Captain McAuley got into the boats and rowed clear of the ship. When they left, the water was over the engine room floor (SM, 15 Sept. 1877; SMH, 10 Sept. 1877).

The boats stood by for some time as the *Lord Ashley* slowly drifted south-west, towards the east side of Terrigal Reef. The crew and Mr Manning then rowed ashore and landed at Terrigal. Shortly after, Captain McAuley rowed back to the ship and climbed back on board. The main deck was awash and it looked as though the vessel would founder at any moment. Captain McAuley worked his way forward and let go the anchors in a final attempt to prevent the *Lord Ashley* running aground. He then returned to the shore (SM, 15 Sept. 1877; SMH, 10 Sept. 1877).

The anchors did not hold. The *Lord Ashley* swung head to wind and drifted astern, striking a rocky point east of the reef before swinging broadside on to the north-east swell. At about 9.00 p.m. a heavy sea swept over her and she broke in two, 'at the fore gangway—the noise being heard half a mile away' (SM, 15 Sept. 1877; SMH, 10 Sept 1877). The bow sank while the stern section remained visible above the driving spume. During the night, 'could be heard the grinding of her keel and plates on the rocks' (SM, 15 Sept. 1877; SMH, 10 Sept. 1877). In the morning, the remains of the ship were still visible from the shore, awash and being battered by huge waves. There was no hope of saving her. At 8.00 a.m. the funnel went over the side. The *Lord Ashley* was abandoned as a total loss (SM, 15 Sept. 1877; SMH, 10 Sept. 1877).

The cargo and all the crews' possessions were also lost. On shore the crew were taken into the care of Mr Davis, the shipbuilder at Terrigal (SM, 15 Sept. 1877; SMH, 10 Sept. 1877).

The cause of the leak remained unknown although it was suggested at the time that, while the *Lord Ashley* was loading coal at Newcastle, she may have grounded and holed herself on some underwater obstruction (SM, 15

Sept. 1877; SMH, 10 Sept. 1877).

A Marine Board of Enquiry convened to investigate the circumstances of the loss found that Captain McAuley was not at fault and acknowledged the magnificent effort of the second engineer, Mr Joseph Hourigan who spent two hours, working up to his waist in water, in a vain attempt to keep the pumps going and save the ship.The ship was insured with the New Zealand Insurance Company for £7 000 (SM, 15 Sept. 1877; SMH, 10 Sept 1877; Loney, 1982: 82).

Despite the possibly sanitised newspaper version of events, several questions remain unanswered. Why did the ship's owners request a marine survey in early August 1877, less than a month after a major refit and hull inspection? Why did the survey happen amidst allegations that the *Lord Ashley* and other colliers often sailed from Newcastle overloaded and with incompetent crews? Was there an element of fraud in the sinking, or was it all coincidence and ultimately, misfortune?

All that can be said is that, in early October 1877, the Marine Board of New South Wales appointed Captain Augustus Bertram, as an 'inspector and surveyor of ships' at Newcastle, to prevent cleared and 'overladen and unseaworthy vessels' going to sea (SM, 6 Oct. 1877).

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The *Lord Ashley* wreck site

John Riley
GPO Box 52, BONDI NSW2026

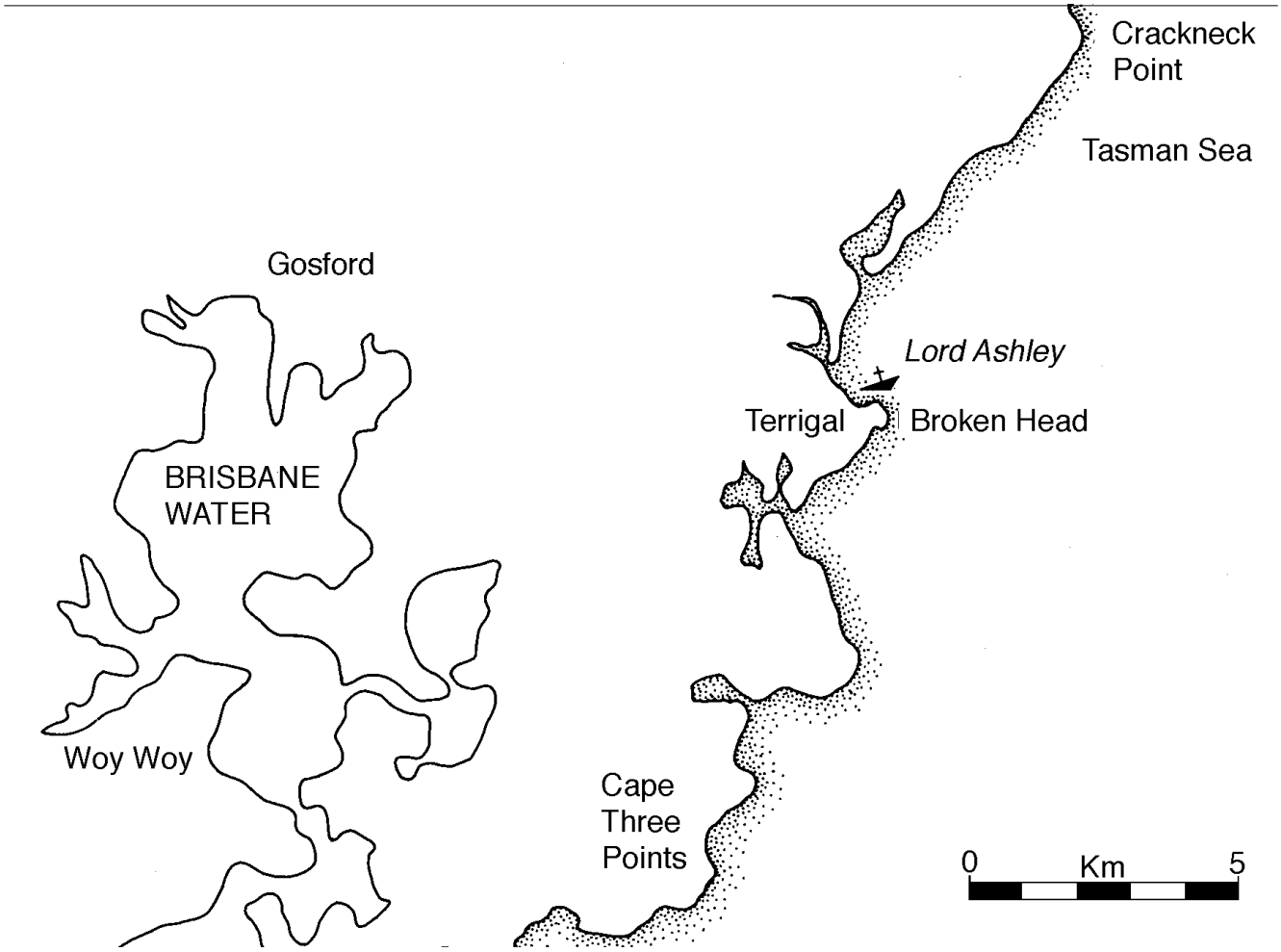

Figure 1. Wreck location map.

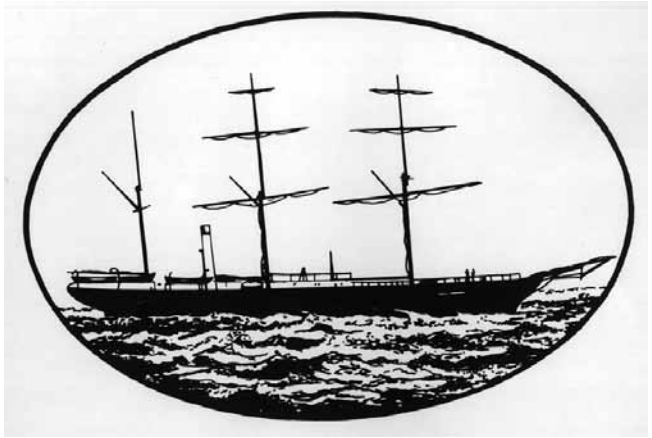

Figure 2. Vessel profile sketch.

The *Lord Ashley* wreck site has suffered badly. Located along the seaward side of Terrigal Reef at Terrigal, New South Wales, the area has proved to be a hostile environment for an iron wreck. Most of the hull has corroded away, leaving the bow area only recognisable by a pile of anchor chain to the east.

The stern to the west is largely marked by the remains of the half-trunk steam engine. The engine is one of the oldest examples located in New South Wales, having been built in 1857. Although partially destroyed, one cylinder is intact and the innards of the other can be seen along with a very bent propellor shaft. Between the bow and the stern lie the scattered fragments of the iron hull plating along the reef.

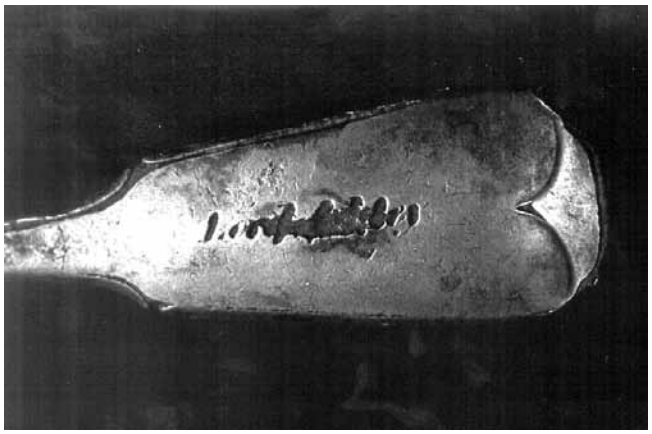

Figure 3. Fork handle marked '*Lord Ashley*', recovered from the wreck site (photograph by Tim Smith).

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Tracing artefact trajectories—following Chinese export porcelain

Mark Staniforth
School of Cultural Studies, Archaeology, The Flinders University of South Australia, GPO Box 2100 ADELAIDE SA 5001

Introduction

Grant McCracken has argued that 'Consumer goods have a significance that goes beyond their utilitarian character and commercial value' and that 'this significance consists largely in their ability to carry and communicate cultural meaning' (McCracken, 1988: 71). Furthermore, Arjun Appadurai has suggested that the meanings of objects 'are inscribed in their forms, their uses, their trajectories' (Appadurai, 1986: 5). This paper attempts to follow the trajectories of certain artefacts in order to look at some of the processes by which consumer goods were created, transported, bought, used and disposed of.

Ceramics in general, and Chinese export porcelain in particular, have long been recognised as playing an important role not only for utilitarian purposes but also as a means to display socio-economic status (or class), to demonstrate 'good taste' and to allow people to negotiate and construct their place in society (see, for example, Deetz, 1977: 46–61; Otto, 1977: 91–118; Curtis, 1988: 20–31). This paper examines the consumption of a particular type of material culture—Chinese export porcelain by focussing on part of the cargo of the merchant vessel *Sydney Cove* which was wrecked on a voyage to Port Jackson in 1797. However, in order to follow the processes of consumption it is necessary to trace the trajectories of Chinese export porcelain from the sites of production through trade, transport, selection, purchase, use and disposal to its excavation from archaeological sites.

Figure 1. Chinese export porcelain being sold in Canton during the second half of the eighteenth century (photograph courtesy of the Victoria and Albert Museum, London).

The trade in Chinese export porcelain

The vast majority of the underglaze blue painted porcelain exported to the West was made at Jingdezhen (Ching-tê Chên) in Jiangxi (Kiangsi) province in factories producing wares for the Imperial, domestic (Chinese) and the export markets. Arlene Palmer has suggested that after 1757, when foreign trade was restricted to Canton, the export market in Chinese export underglaze blue porcelain was 'almost exclusively supplied by the potteries at Jingdezhen' (Palmer, 1976: 11). However, blue painted wares were also made at places other than Jingdezhen including the Minnan districts of Fujian province (see Ho, 1988). The decoration which appears on these so-called 'folk', 'provincial' or 'Kitchen Ch'ing' wares appears to be simple and indistinct designs painted in pale blue or grey blue underglaze (see Willets & Poh, 1981). Consequently, it is usually easily distinguished from the underglaze blue wares made at Jingdezhen.

The porcelain ware destined for export from Jingdezhen was transported to Canton by one of two routes. The first was down the Yangtse-kiang River to Nanjing (Nanking) where it was transhipped into junks for the sea voyage to Canton: this particular route gave rise to the naming of particular border designs as 'Nanking' in the mistaken belief that these porcelains had actually been made at Nanking. The alternate route was up the Kan river through Nanchang, then overland via the Meiling Pass and down river to Canton, which was considerably shorter but in some respects more difficult (see Medley, 1976). At Canton, the blue hand painted export porcelain was sold to foreign merchants and to the representatives of the various East India companies (see Keay, 1991).

The importance of the role played by British merchants resident in India (the so-called Country trade) in the Chinese export porcelain trade during the last decades of the eighteenth century has been seriously underappreciated. For example, in 1792 twenty Indian (or Country Trade) ships carried 30 000 *Taels* worth of Chinese export porcelain to India (and then reshipped much of it to other places) while only four American ships exported just 700 *Taels* worth (Hyde, 1964: 27).

The Country trade was of particular importance in supplying the needs and wants of the early Australian colonies. Between the arrival of the first British convicts and colonists in 1788 and the Age of Macquarie (1810), there were a total of 30 arrivals from ports in India (Madras, Bombay and Calcutta); the majority of them were Country trade vessels. The first, in 1792, was not a Country trader but a merchant vessel, the *Atlantic,* which was hired by

Governor Phillip at Port Jackson to make the voyage to India and return with cargo. This voyage demonstrated to the British merchants in India that there was a market in the Port Jackson colony; so, Country trade ships began to arrive in 1793, with the *Shah Hormuzear*, continuing well into the 1820s.

The *Sydney Cove* cargo

In recent years, the archaeological excavation of the *Sydney Cove* wreck site has revealed the remains of a shipment of Chinese export porcelain (Strachan, 1986: 62–74; Nash, 1991: 45; Staniforth, 1995: 159–63). In total, about 250 kg of hand-painted Chinese export porcelain was excavated consisting of 160 kg of underglaze blue and 90 kg of polychrome overglaze in the so-called *famille rose* decorative style.

There is very little historical information which may help to indicate the quantity, quality or even the source of this part of the cargo—the earliest newspaper, the *Sydney Gazette*, was first published in 1803, some six years after the vessel sank. Consequently, the available documentary evidence is restricted to a brief mention in Captain Hamilton's protest which states that three cases of 'Chinaware' were salvaged from the wreck and successfully transferred to Sydney. In Sydney, when part of the cargo was sold, David Collins wrote that a single cup and saucer sold for twenty-two shillings (Strachan, 1986: 74).

Archaeologists are always interested in the possible function or use of an object and this is a subject which can result in endless argument. The first point that needs to be made is that there appear to be three functional groups represented in the underglaze blue Chinese export porcelain ware part of the cargo of the *Sydney Cove*—tea ware (tea cups and saucers), dinner ware (plates and hot water plates) and toiletry ware (chamber pots, washing water bottles and bowls).

Figure 2. Chinese export porcelain from the wreck of the *Sydney Cove* (photograph courtesy of the Queen Victoria Museum, Launceston).

Toiletry wares

Within these functional groups there are examples where the form unambiguously reveals function (at least, to most twentieth century Westerners) such as the chamber pot. In some cases, however, the form may have a slightly less obvious function such as a globular-bodied vessel with a long slender neck which has been variously described in the literature as a flask, bottle, vase, ewer, pitcher or gugglet/goglet.

Comparative evidence from similar period Chinese export porcelain and other evidence suggests that these pieces came as part of a toiletry set such as the matching pair, consisting of a water bottle and a washing bowl, which is reputed to have belonged to George Washington and is now held in the Lewis collection at the National Museum of American History at the Smithsonian Institution (Detweiler, 1982: 161). This particular pair has been dated to approximately 1775–85 and Detweiler suggests that these may be an example of the '6 Wash hand Guglets and Basons' which George Washington ordered in 1785 (Detweiler, 1982: 209). Other examples include the gugglet and basin from the *Diana* (1817) collection (Christie's, 1995) and an eighteenth-century Dutch example made of brass held in the Koopmans de Wet House in Cape Town.

Figure 3. Brass gugglet and basin held in the Koopmans de Wet house, Cape Town, South Africa (photograph by Mark Staniforth)

Dinner wares

At least 182 (or more than fifteen dozen) dinner plates were raised during the excavation; this figure is based on the weight of fragments alone and almost certainly represents an underestimation of the total number of plates carried. Unfortunately, not one plate was complete and intact although some were found broken but still stacked *in situ* and so were able to be largely reassembled after excavation.

In some respects, the importance of the Chinese export porcelain part of the *Sydney Cove* cargo lies as much in what was not present as what was there. The point about these plates is that they do not appear to have formed a part of a larger 'dinner set' or 'dinner service'—in fact there appears to have been no other material in the cargo which matches these plates. This is despite the fact that dinner services in Chinese export porcelain were quite clearly available much earlier as a set from the wreck of the *Geldermalsen* (1752) demonstrates (Christie's, 1986).

Furthermore, the way in which these pieces were stacked with the remains of straw in and around them suggests that these plates were transported not in cases but as a roll. Consequently, the plates may have been sold individually or in groups (or sets) of plates such as half dozens or dozens but they were not a part of a dinner set or dinner service.

In addition to the ordinary plates, there were also 48 octagonal hot water plates (also called warming plates or chafing dishes) raised during the excavation. Mudge (1986: 149) illustrates a very similar hot water dish which is (probably incorrectly) dated *c.* 1740–1760. This particular type of hot water plate has a long history, being seen in the form of pewter hot water plates dating from earlier centuries. As a form, it was introduced to the Chinese during the eighteenth century and was commonly reproduced in underglaze blue, polychrome overglaze and other decorative styles particularly during the nineteenth century. Long-established British cultural attitudes about the necessity for keeping food hot can be discerned in the form of these hot water plates.

Tea wares

Tea was first introduced into Europe from China in the early seventeenth century. Tea drinking became a widely practised social ritual during the next two centuries in Great Britain and the British colonies such as America and Australia. Integrated research on tea drinking in America during the eighteenth century has demonstrated the links between more elaborate tea sets, increasingly ritualised behaviour and notions of social status (see Roth, 1988: 439–62; Emmerson, 1992: 1–42). Anne Yentch, for example, has suggested that Chinese export porcelain tea wares added 'touches of Chinese elegance' to 'sociable dining and drinking at the governor's mansion' in Annapolis, Maryland during the first half of the eighteenth century (Yentsch, 1994: 133). Generally, the incidence of porcelain teawares has been interpreted by archaeologists as having status implications (usually associated with higher status) and as indicative of everything from something as simple as the presence of women on sites to more complex notions about the ritualization of family meals and increasing gentility (see, for example, Wall, 1994: 122–25).

Both the teapot and tea bowl were of Chinese origin but were progressively altered for, and by, Western usage; the addition of handles to the tea bowl and the locating depression on the saucer to create the recognisably modern teacup and saucer together with the concept of matching sets were two of the changes which occurred over time, often in response to changes in European fashion. The Chinese had made cups with handles for centuries but preferred the handless variety for tea drinking (see Hobson, 1976: 277). At the end of the eighteenth century tea cups (with handles) were about twice as expensive as the traditional tea bowl as well as being both wasteful of space in their packaging and more easily broken.

As far as the tea ware in the *Sydney Cove* collection is concerned there were only tea bowls (cups) and saucer-dishes (saucers) of the traditional (Chinese) form—small tea bowls without handles and saucers without the locating indentation for the tea bowl. However, it should be noted that most of the tea bowls and saucer-dishes did come as a matching pair. During the excavation no teapots nor any of the associated items such as sugar bowls (Fr.*sucriers*), milk jugs or cups with handles which went to make up a 'tea-set' were located.

Taphonomic processes need to be considered as contemporary salvage was one issue which contributed to the way in which the wreck site of the *Sydney Cove* was formed. What do we know about the three cases of Chinaware which were salvaged at the time and transported to Sydney after the wreck event—generally, what was in those cases and specifically, were there any teawares? The only evidence which we have is in the form of two broken handles located on Preservation Island—one is a single handle about the right size for a cup handle and the other is part of a crossed (or strap) handle about the right size for a teapot handle. These may have been from contemporary salvage operations—broken and discarded at the time although it is also possible that these were personal items which belonged to the master, officers or passengers. This reminds us that, although we have a significant proportion of the Chinese export porcelain cargo present in the *Sydney Cove* collection, we do not have all of it and that other forms about which we know little or nothing may well have been present in the cargo.

The sale of Chinese export porcelain in early Sydney

In 1803, mention of the arrival of the *Castle of Good Hope* from Calcutta, belonging to the House of Campbell and the largest ship to arrive in the colony to that date, appeared in the very first edition of the *Sydney Gazette* (5 March 1803: 1–3). Detailed evidence about the importation of ceramics in general and Chinaware in particular is somewhat more difficult to locate in the newspaper. One of the greatest difficulties is knowing what the early nineteenth century residents of Sydney actually meant by 'China' or even the seemingly unambiguous 'China ware'—the usual assumption is that it refers to ceramics from China and specifically to Chinese export porcelain (see Corcoran, 1993: 35) However, it is necessary to consider evidence such as that provided by an English newspaper of 1760 which advertised 'a good assortment of Foreign China and a great variety of useful English China of the newest

improvement' (*The Leeds Intelligencer*, 28 Oct. 1760 quoted in Emmerson, 1992: 28). This suggests that, as early as the mid-eighteenth century, the term 'China' was not necessarily restricted to ceramics which came from China.

Bearing in mind the potential problems associated with emic meaning, a comprehensive examination of the *Sydney Gazette* for the years 1803 to 1810 is currently being undertaken for evidence about the importation and/or sale of 'China'. This research has come up the following results about what was being sold, how it was being sold and who was selling it:

* evidence for the sale of second-hand 'China' comes from an advertisement for a sale by private contract of the household furnishings from a house which included:
'A quantity of China' (*Sydney Gazette* [SG] 10 April 1803: 4);
another advertisement for the household furniture of a dwelling house included the comment that it was
'…well furnished with China etc' (SG 5 Feb. 1804: 4);
and the sale of the property of Captain William Kent on his departure from the colony included:
'…one China spice box, a China work box' (SG 7 April 1805: 1).

* evidence that 'China' could still arrive in Port Jackson from London comes from an advertisement for the sale of the 'capital investment' brought by the ship *Cato* which included:
'China...in sets' (SG 17 April 1803: 3);
'China...of every description' (SG 17 April 1803: 4);
'China plates and dishes, Ditto Tureens and Sauce-boats' (SG 15 May 1803: 4).

* In 1803 Simeon Lord advertised for sale at his 'long-established' shop:
'…an extensive assortment of China' (SG 24 April 1803: 4);
and Lord appears to have purchased part of the cargo of the *Cato* in order to resell it at auction as he lists the following in a subsequent advertisement:
'China plates, dishes, tureens, &c' (SG 22 May 1803: 1).

* J. Driver operating from a house in Chapel Row advertised a variety of ceramics including:
'China in tea sets, very cheap
Ditto in odd table pieces' (SG 21 Aug. 1803: 2).

* Ann Grant advertised for sale at her house at the centre of Pitt's Row:
'Large handsome blue and white Water and other jugs. Some elegant Table China' (SG 14 Aug. 1803: 1).

* Sergeant Packer, also operating from a house in Pitt's Row, advertised for sale:
'A set of blue China dishes and plates' (SG 25 March 1804: 3).

Chinese export porcelain from archaeological sites in Sydney

The current phase of this research is to examine the Chinese export porcelain from terrestrial archaeological sites as it does occur in small (and sometimes large) quantities on a number of sites in early Sydney (see Corcoran, 1993). For example, there is a small quantity of Chinese export porcelain in the assemblages from the 1983 and 1990/91 excavations at the First Government House site—home of the early Governors.

The vast majority of this material consists of sherds of plates, however, there are also fragments of tea wares, pieces of bowl and sherds from what appear to be tureen stands or meat platters which were all found in the early phases of occupation. In addition there are fragments of toiletry ware sets identical to the *Sydney Cove* examples; classified in the artefact catalogue as an 'Oriental porcelain covered bowl' was a piece of Chinese export porcelain chamber pot and described as an 'Oriental porcelain footed bowl' was a group of fragments which once formed a gugglet.

More recently there has been a considerable amount of Chinese export porcelain excavated from Cumberland Street in the Rocks. Among the fragments of plates, bowls, teawares and tureens are pieces of identical chamber-pots and gugglets which came from the securely dated pre-1815 context of a well on the property of George Cribb who was an emancipated convict and butcher (Karskens, 1994).

Having established that the *Sydney Cove* (certainly) and other Country trade vessels (probably) were supplying toiletry sets, also that sherds of very similar individual items which made up toiletry sets have turned up on sites including First Government House and Cumberland Street, what does this say about attitudes to cleanliness and personal hygiene in early Sydney? Ordinarily the wash sets consisting of a jug, bowl and chamber-pot have been associated with the Victorian era when they became extremely common. It is interesting that such sets should have been available at the end of the eighteenth century and their consignment to Port Jackson may reflect British merchants' ideas about washing and living in hot climates. More generally objects associated with the development of personal appearance and hygiene (such as tooth-brushes and hairbrushes) have been interpreted both as supporting structures of domination and social differentiation as well as symptomatic of the increased importance placed on outward appearance in modern society (see Shackel, 1993: 143, 152–57).

Grace Karskens has argued that the residents of the Rocks were 'very materially minded people' and the evidence provided by the variety, types and quality of Chinese export porcelain from sites like First Government House and Cumberland Street supports this argument (Karskens, 1994: 1). Furthermore, this evidence suggests that, from a very early date, emancipated convicts, such as George Cribb, had gathered sufficient economic capacity (or wealth) to be able to afford to purchase not only

individual Chinese export porcelain plates but in some cases tea sets and dinner wares in addition to plates and even toiletry sets.

Conclusion

This paper has attempted to trace the trajectories of some Chinese export porcelain artefacts from their place of production through the processes of transport, consumption and disposal to their archaeological excavation. This approach has used artworks, archival documents and newspapers employing both quantitative and qualitative historical and archaeological methodology as well as comparative artefact analysis of material from museum collections and archaeological assemblages. It has suggested that it was possible for people in the past to attach different meanings to artefacts and for archaeologists to read artefacts in different ways.

The point is that it is important to go beyond a simple description of the objects that are excavated from an archaeological site. The words which are used in some (and perhaps many) artefact catalogue descriptions can sometimes do more to hide or obscure the meaning of an object in it's original historical and cultural context. The detailed study of material culture including comparison with similar objects in other collections is a key feature of understanding and interpreting the past. This point has been made before, of course, for example by Mary Beaudry when she suggested that the categories used to describe Chesapeake ceramics were too general to allow comparison between artefacts (Beaudry, 1988: 43–50).

The level of description which appears in some artefact catalogues will only permit a comparison at the most simplistic level of flatware versus holloware—which in effect means nothing. Consequently, it has been necessary to individually examine each sherd and to develop a more complete description of both form and decoration before being able to use the data. The results demonstrate that it is possible to distinguish between dinner wares, tea wares and toiletry wares with their separate and distinct associated cultural meanings.

The archaeology of the *Sydney Cove* is an example of an archaeology of the event—the wreck was an important historical event in terms of the early settlement history of Australia but the wreck site also represents an opportunity to incorporate the archaeology of the event into larger issues and themes such as consumption and colonisation as well as reflecting on cultural attitudes associated with dining, tea drinking and personal hygiene. The study of the cargoes of shipwrecks like the *Sydney Cove* provides us with opportunities to look in detail at cargoes which did not make it to their destination. By extension to the many other cargoes which did arrive in the Australian colonies at the time and by careful comparison with what has been found on terrestrial archaeological sites, and what is held in museum collections, it may be possible to gain a better appreciation of the ways in which cultural attitudes were established in the early Australian colonies, communicated, maintained and mediated through the material culture imported.

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The *Solway* (1837): Results of the 1994 test excavation

Cosmos Coroneos
46 Gale Road, MAROUBRA NSW 2035

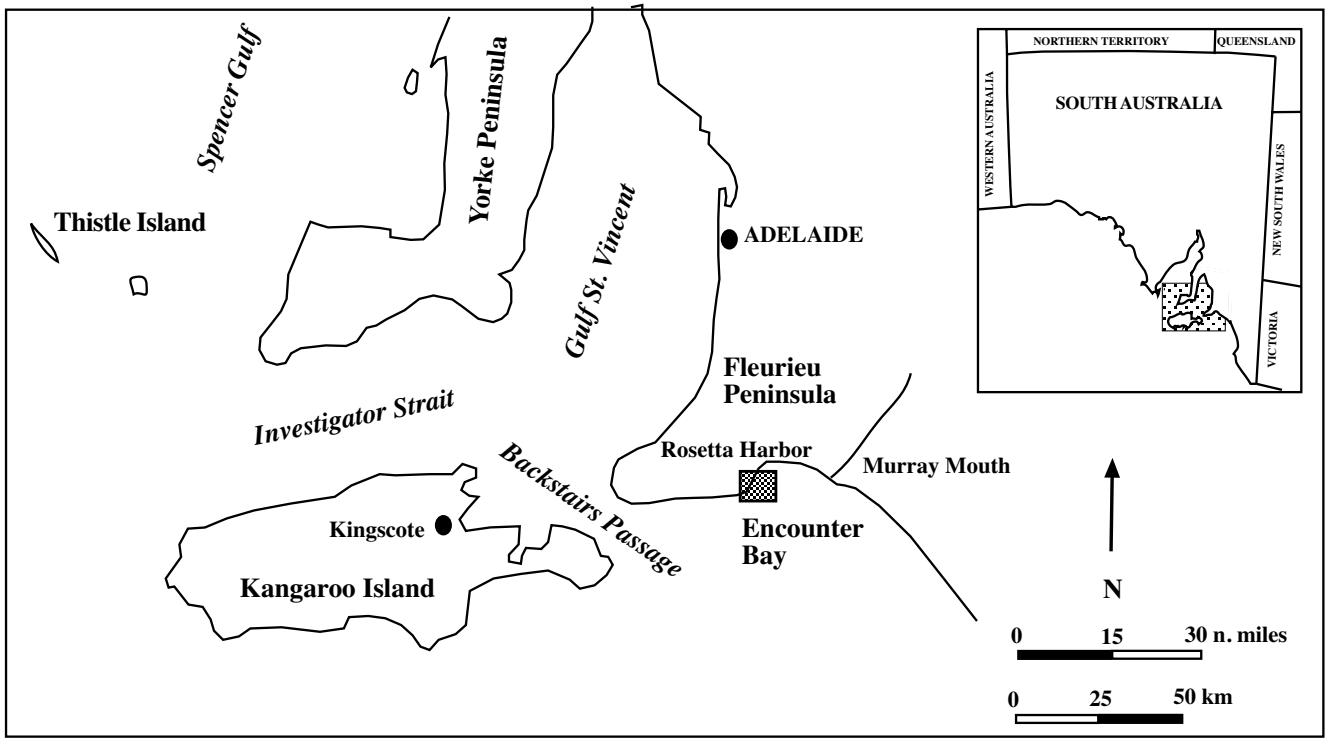

Figure 1. Area map.

Introduction

The ship *Solway* was wrecked in December 1837 during a violent storm in Rosetta Harbor, a few kilometres west of present day Victor Harbor, South Australia. The site, discovered by SCUBA divers in the early 1960s, was re-inspected by the author in early 1994 as part of the State Heritage Branch of South Australia regional shipwreck survey program. The site appeared to be relatively well preserved and anecdotal evidence concerning the variety of artefacts retrieved from the site prior to its declaration as an Historic Shipwreck in 1982 encouraged the decision to conduct a test excavation to assess the site's archaeological potential.

The 1994 pre-disturbance survey and test excavation of the S*olway* took place over two field trips in the months of April and May. Additions to the site plan were made during routine site monitoring visits for the remainder of the year and the early part of 1995. Trenches 1 and 2 were excavated and the major part of the site plan completed between 7 and 14 April. Poor weather conditions allowed for only three days of excavation and planning which amounted to 29 diving hours. Trench 3 was begun on 23 May but abandoned the following day, again due to bad weather (just under 13 hours diving time). Conditions did not improve over the assigned period of this second field trip and the planned excavation was aborted. This article is a report on the results of these few days of excavation.

Historical background

The establishment of the colony of South Australia in 1836 was founded on hope and commercial expectation. Unlike the other settlements that had taken place in Australia previously, the colony was populated with free settlers with the intention of exploiting the natural resources of the region. The driving force behind the colony was the South Australian Company, and one of the resources that was in plentiful supply was the southern right whale (*Eubalaena australis*).

The South Australian Company had first tried its hand at pelagic whaling in the years between 1836 and 1841 but it met with failure due to the inability to find the whales and the loss of its vessels (Parsons, 1986: 24). In conjunction with pelagic whaling, the Company established two shore stations in South Australia, at Thistle island at the entrance to Spencer Gulf and at Rosetta Harbor, Encounter Bay, in February 1837 (Parsons, 1986: 25) (Fig.1).

In May 1837, the cutter *William* and the barque *South Australian* brought supplies and equipment to Rosetta Harbor from the South Australian Company's headquarters at Nepean Bay, Kangaroo Island, for the

start of the whaling season (Parsons, 1986: 26). For the lack of any suitable alternative, the *South Australian* remained and was re-fitted as a 'cutting-in' vessel—an unusual solution to compensate for the drawbacks of Rosetta Harbor, the harbour situated at the western end of the long and exposed Encounter Bay. The position as a staging post to intercept whales entering the bay was perfect as it was close to a freshwater source and the hill overlooking the harbour, The Bluff, was an excellent look-out. The advantages of the location were overshadowed by its fatal flaw—it was, and still is, a dreadful place to moor large vessels. Though The Bluff protects the anchorage at Rosetta Harbor from westerly winds, the prevailing westerly swells wrap around and buffet vessels at anchor. Furthermore, the winds in summer swing to the south and east leaving the anchorage totally exposed. Worse still, directly north of the anchorage runs Blacks Reef in an almost unbroken line east–west from Wright Island to the shore giving vessels little room to manoeuvre. The shoreline itself is rocky, with low tide exposing large expanses of reef prohibiting captured whales from being brought ashore and tried out; and thereby necessitating the use of an offshore platform, in this case the *South Australian*, for processing. The poor choice of locating the whaling station was to be shown by the dramatic events before the year was over.

The wrecking of the *Solway*

On 9 June 1837, the *Solway*, under charter to the South Australian Company, sailed from Hamburg with 52 German migrants and cargo under the command of Captain Pearson (Sexton, 1990: 34).

The *Solway* was built in 1829 by J. Storey in Monkswearmouthshire, Sunderland, England (*Lloyd's Register* 1830–1837). Rigged as a ship, the vessel measured 31.5 m (103.0 ft) in length by 8.3 m (27.3 ft) in breadth with a depth of 6.0 m (19.6 ft). Of single deck with beams, iron knees and copper fastened, the *Solway* was measured at 337 ton (old measurement). It was re-sheathed in 1832 and again, with copper on hair sheathing, in 1834, as well as being re-caulked.

The *Solway* was registered in London and owned by I. K. Graham and Company. Between 1830 and 1832 it was engaged in the Atlantic trade being insured for voyages to Jamaica, Saint Lucia and Brazil. In the years prior to its arrival in Australia it was already familiar with the Indian Ocean having possibly made trips to Manila and Mauritius (*Lloyd's Register*, 1830–1837).

The cargo on board the *Solway* was extensive and varied as is shown on the invoice of sundries (BRG 42/90):

Shipped from London

5	bales containing 20 tents	
	Packaging 20 [roofs] in 2 parcels	
	" " 20 sides and ends 3 " "	

Shipped at Hamburg

45	~~111~~	Bricks	£51 15

100	Tierces India Beef
50	Tierces [mess] Beef
60	barrels [mess] Pork
250	barrels Indian Pork
17	cases superfine flour
113	barrels superfine flour
49	casks extra superfine flour
12	barrels extra superfine flour
14	casks cabin bread
34	Midling cabin bread
2	casks Pearl barley
25	Boxes Dutch cheese
2	Boxes 100 window glass 6 by [8]
2	Boxes 100—window glass 6å by 7å
2	Boxes 100—window glass 7–9
2	Boxes 100—window glass 7å–8å
2	Boxes 100—window glass 8–10
2	Boxes 100—window glass 8å–9å
2	Boxes 100—window glass 9–11
2	Boxes 100—window glass 10–12
2	Boxes 100—window glass 9–12
2	Boxes 100—window glass 10–14
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2	Boxes 100—window glass 15–17
2	Boxes 100—window glass 14–18
2	Boxes 100—window glass 16–17
1	box 2000 å pint tumblers
1	box 1000 wine $^{2}/_{6}$ 100 [Porter] $^{33}/_{9}$ 300 wine glasses $^{15}/_{1}$
1	box 200 decanters ^{42}/6 100 decanters 33/9
1	cask of hams
1	box of looking glasses
1	dozen best sorted glasses No. 1/1–14/6
1	dozen best sorted glasses No. 2/3–9/6
1	dozen best sorted glasses No. 1/2–7/3
1	dozen best sorted glasses No. 1/3–5/6
1	dozen best sorted glasses No. 1/4–4/6
1	dozen best sorted glasses No. 1/5–3/9
1	dozen best sorted glasses No. 1/6–3/
1	dozen Jus [?] Glasses No. 1/1 - 10/8
1	dozen Jus [?] Glasses No. 2/3 - 7/6
1	dozen Jus [?] Glasses No. 1/2 - 4/10
1	dozen Jus [?] Glasses No. 1/3 - 4/

1 dozen Jus [?] Glasses No. 1/4 - 3/9
1 dozen Jus [?] Glasses No. 1/5 - 3/1
1 dozen Jus [?] Glasses No. 1/6 - 2/9
6 Pocket glasses No. 4/ - 1/6
6 Pocket glasses No. 3/ - 1/3
6 Pocket glasses No. 2/ - 1/1
6 Pocket glasses No. 0 - 1/
6 Pocket glasses No. 1 - 11
6 Pocket glasses No. 2 - 10
6 Pocket glasses No. 3 - 9
6 Pocket glasses No. 4 - 8
25 Toy mirrors
30 Kegs Tongues
12 Rams
12 Ewes
4 Pens & Tarpaulins
2 Tin Troughs & 1 tin dipper

Fodder
40 bags of oats
Rock salt

From London
Hay 60 bales, 5 loads, 15 quarters, 2 bush, Bags for [?]
Oil casks (no numbers given) £382 17 8

There was also an invoice for:
17 casks for flour 160 gallons, 49 casks for flour 40 gallons, 48 casks for bread 300 gallons, 2 casks for barley 150 gallons, 1 cask for hams 180 gallons, 25 casks for water 250 gallons, 10 casks for water 300 gallons.

[Note, the significance of the symbols ℔ and are unclear, the word Jus with a [?] indicates that the word is not clear in the manuscript.]

In addition to the above, the vessel had on board boilers and machinery for the establishment of a flour mill (BRG 42/28/1; 4 Nov. 1837: 96,115). It should be stressed that the complete contents of the cargo is not known at present. The cargo was referred to in some Company correspondence as 'provisions and stores' for the whalers while in another letter as 'machinery stock and general merchandise' (BRG 42/89 and BRG 42/28/1; 4 Nov. 1837: 96).

The *Solway* arrived at Kingscote on 16 October. The landing of the cargo took almost two months; 'a most vexatious tedious—expensive—business' (BRG 42/28/1; 4 Nov. 1837: 115). This was due, in part, to the unsuitability of Kingscote Harbor as a deep water port, the *Solway*'s crew shirking work and disputes between the Captain and the Company's Manager over the terms of the charter.

By 4 November the stock, passengers and four-fifths of the cargo, mostly related to the flour mill, had been sent to the mainland (BRG 42/28/; 4 Nov. 4 1837: 96). It appears, however, that only some of the window glass, as well as other general cargo, had been off-loaded; this situation continuing well into November (BRG 42/28/1; 4 Nov. 4 1837: 291; 18 Nov. 1837: 295).

After its cargo was discharged, the *Solway* was initially tasked to take beef and pork to Hobart in company with the *South Australian* (BRG 42/28/1; 4 Nov. 1837: 101). It was later decided that the *Solway* was to deliver its cargo of pork and beef to Encounter Bay before taking 'home' (England?) the oil from Kingscote and Encounter Bay. The vessel was then to proceed to Sydney or Hobart Town (BRG 42/28/1; 4 Nov. 1837:115, 116).

On 23 November, the *South Australian*, which had returned to Kingscote in the meantime, sailed to Encounter Bay to prepare the season's takings, 200 tuns of oil and 10 tons of bone valued at £6 600, for shipment on the *Solway* (BRG 42/28/1; 4 Nov. 1837:119). The *Solway*'s orders were again revised with the vessel to depart from Encounter Bay to Hobart and then onto London (BRG 42/28/1; 4 Nov. 1837: 120).

By early December, the bricks were unloaded from the *Solway* (BRG 42/28/1; 12 Dec. 1837: 122). This suggests that most of the cargo must have been removed as the bricks were most likely stowed at the very bottom of the hold. By 15 December the *Solway* was finally ready to sail. As preparations for the *Solway*'s departure were being made, news arrived from Rosetta Harbor over the total loss of the *South Australian* during a storm on 8 December (BRG 42/28/1; 12 Dec. 1837: 126). Plans had changed again. In addition to the whale oil cargo, the *Solway* was now to take on *South Australian*'s cargo—beef and pork—which was also destined for Hobart (BRG 42/28/1; 13 Dec. 1837: 158).

The *Solway* finally departed Kingscote on 17 December arriving at Encounter Bay three days later (Sexton, 1990: 34). On 21 December, while the vessel was moored at Rosetta Harbor, a severe southerly gale blew up.

> I was literally awed. From the Bluff to the nearest island, from thence to shore, and again to the Seal Rock and Granite Island, there was one mass of whitened foam. The heavy roll of the sea was so tremendous that it was frequently impossible, from the decks of the *Pirie*, although lying near the *Solway*, to see the lower masts of that vessel…I am sure that no one who witnessed the awful scene which I have described would at such a moment have been mad enough to have deemed that anchorage a place of safety (Gouger, 1838: 40–41).

The *Solway* parted its three-point mooring and went upon Black Reef, which had been fatal to the *South Australian*. It struck the reef heavily several times before being carried over, the hull being breached (Fig. 2). There were no fatalities.

This incident, coming so quickly after the loss of the *South Australian* less than two weeks before, dispelled any doubts about Rosetta Harbor.

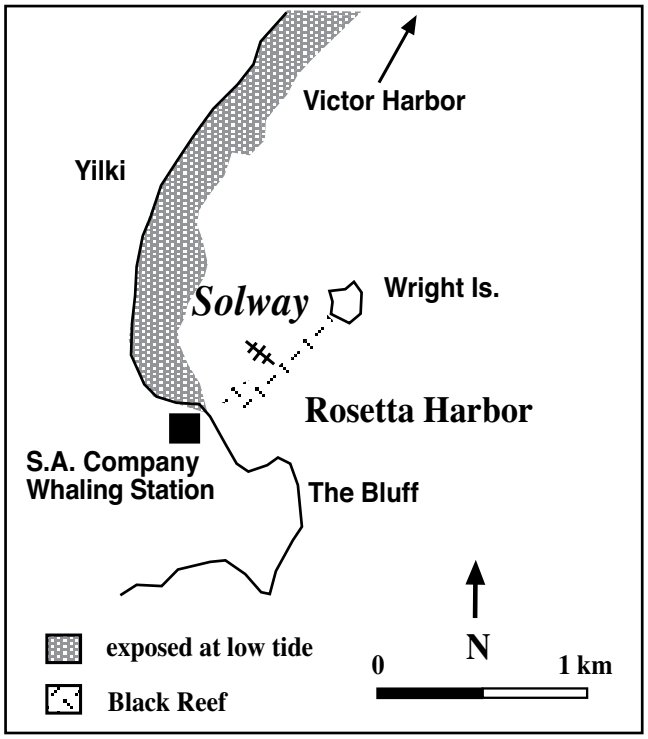

Figure 2. The wreck location of the *Solway*.

> Captain Pearson, who is a man of great experience in the Demerara trade, and other parts of the world should not have taken the *Solway* to such a place without previously going to look at it, for his charterers, Bishopsgate-street Company, must have been great losers by the accident (Horton James, 1838: 99).

Such was the bitterness of the prickly Captain Pearson over the loss of his vessel that he is reported to have said:

> If he could only see the *Sarah and Elizabeth* [another vessel present at the time of loss] lying on the reef alongside the *Solway* he should die in peace (BRG 42/28/1; 15 Feb. 1837: 135).

Post-wrecking cultural interaction prior to excavation

The vessel was surveyed on 22 December, the day after it was lost, and declared a wreck (BRG 42/28/1; Jan.1838: 130). By 15 January most of the cargo from the *Solway*, including all the whalebone, had been supposedly recovered (BRG 42/28/1; 15 Jan. 1838: 132). Two hundred and twenty provision casks were on the *Sarah and Elizabeth* and another 50 to 60 were thought to be still in the hold. However, the *Sarah and Elizabeth* sailed for Hobart in early February with only 168 barrels of beef and pork on board (BRG 42/28; 14 Feb. 1838: 219). Of what remained it was 'impossible to give the numbers of the casks accurately or even determine with certainty the different kinds'. It appears, however, that another 45 provisions casks, some of which were in poor condition, were recovered with a revised figure of 45 still remaining in the wreck (BRG 42/28; 14 Feb. 1838: 219 and BRG 42/28/1; 15 Feb. 1838: 136).

The wreck, stores, sails, spars, anchors, cables, ropes, blocks and provisions were auctioned during mid February and the whole lot was bought by an agent of the South Australian Company (*South Australian Gazette and Colonial Register* [Reg.] 3.2.1838: 2a; 24.2.1838: 3d). It was anticipated that the wreck could be bought and used as a replacement cutting-in vessel for the *South Australian* but the costs of doing so were thought to be prohibitive (BRG 42/28/1; 15 Feb. 1838: 135). It would seem to be a reasonable assumption that, with the wreck in the hands of the Company and its proximity to the whaling station, much of it would have been salvaged, especially as the materials that the *Solway* could supply were urgently needed.

SCUBA divers discovered the site in the early 1960s. From 1962 to 1964 rudimentary excavation work (hand-fanning) was carried out on the site by a diving association. Clay pipes, copper bolts, lead shot, knives, forks, plates, cups, leather shoes and a concreted musket or pistol were reputedly recovered (Panglis, J., pers. comm.). These were donated to the Whalers Haven Museum at Rosetta Harbor which has since closed. After some investigation by the author, the whereabouts of these artefacts could not be positively ascertained.

In early 1982, some dredging was carried out for half a day on the site by J. McGovern and I. O'Donnell. Two complete bottles were recovered. One of the bottles has been lost but the other has been photographed and recorded by the State Heritage Branch. What appeared to be a large, partially intact, brick structure, straddling the keelson at approximately midships, was also uncovered. This structure was not in evidence in 1994.

The first archaeological inspection of the *Solway* took place in 1982. Its significance, enhanced by its apparent good state of preservation, led to the site being declared an Historic Shipwreck under the South Australian *Historic Shipwrecks Act 1981.*

The significance of the *Solway*

The most apparent and, at the same time, superficial significance of the *Solway* is that it is the earliest located shipwreck in South Australia and the State's second oldest known shipwreck, by two weeks. Though the age of a shipwreck should never be a primary criterion for significance, especially archaeological significance, the temporal context in which the vessel was lost is of relevance to the early development of the colony of South Australia; and for any study into patterns of settlement and how colonising cultures in economic and geographical frontiers managed their resources.

The wreck of the *Solway* occurred the year following the establishment of an official and permanent European settlement in southern Australia. The settlement's isolation placed the utmost reliance on seaborne communication and supply. The lack of infrastructure, people and resources in turn put a strain on what shipping was available to the colony and outlying whaling stations. Vessels were pressed into performing roles and functions that they were unsuited to. The significance of the *Solway* lies very much in the fact in that it is a representative example of these developments in the early years of European colonisation of South Australia, both in terms of conveying immigrants and cargoes to a new colony and the tasks it performed whilst in the colony.

The aspect of the function that the vessel was undertaking at the time of loss will be examined first and briefly in context with the time and environment in which it was lost, and its relationship with the other vessels lost in the area over a fifteen-year period.

At the outset, the directors of the South Australian Company realised the importance of small coasting vessels in the new colony. So much so, that the *South Australian*, in April 1837, brought out four shipwrights with the appropriate stores and tools for shipbuilding (Ewens, 1952: 4). There appears to have been some difficulty experienced in trying to construct small craft, a combination, it would appear, of a lack of suitable building materials and conflicts between the Company's management and the shipwrights (BRG 42/28/1; 4 Nov. 1837:103 and 2 Jan. 1837: 131).

Whatever the reason, or reasons, behind the South Australian Company's failure to supply small coasting vessels for its activities, the reality was that the Company was overstretched. The inevitable result was that the *South Australian* and *Solway* were pressed into conveying the whaling station's produce to other centres before final export. It is obvious now that this was not a wise decision. These vessels were too large and ill-suited in the exposed anchorage of Rosetta Harbor. Furthermore, the employment of these vessels in such dangerous activities meant that a considerable amount of capital was risked not only in the loss of the vessel but also in the cargo they carried. When the *South Australian* and *Solway* were wrecked they had on board almost the whole season's takings. This could easily have been lost—as was realised at the time:

> The wreck of the *Solway*, and as we think of the *South Australian*, were, according to our information, caused by an attempt to drive a Jewish bargain with Captain Pearson of the *Solway*. According to the worthy captain's own quiet remark, £5 000 has been lost by the company's agents in an attempt to save £170. The truth is "candle ends and cheese parings" are valuable things in the eyes of certain economists, although savings of that sort are clearly upon the "penny wise and pound foolish" principle, and will return but poor dividends (Reg. 24.2.1838: 62c).

The mention of £170 may allude to the cost of ship's tackle which would have been required to fit out a small vessel, or for the chartering of a small tonnage vessel. After the loss of the *South Australian* and *Solway* smaller tonnage cutters and schooners were used to convey the station's produce to Port Adelaide and Kinsgcote. This was a more sensible solution. Smaller vessels could operate with more safety in Rosetta Harbor and the risk of loss of capital was spread over a number of vessels. The loss of one vessel meant the loss of only a small portion of the season's takings. This change in the management and application of shipping is reflected in the subsequent wreck history of the Encounter Bay bay whaling industry, which lasted until 1854. In this period three more vessels were lost, *St Vincent* (1844), *Alpha* (1847) and the *Jane and Emma* (1852) (Coroneos, in press). All three vessels were under 40 tons and had been built in South Australia, Western Australia and New South Wales respectively.

The loss of the *Solway* can be seen as an example of the folly of false economy and the risks involved in an under-resourced and ill-conceived enterprise.

The other, more archaeological, aspect of significance is the question of the cargo that the *Solway* brought out from Europe. The invoice of sundries mentioned earlier provides an illuminating list of items that were required by a remote European colony in just over the first year of its existence. Bricks and foodstuffs are understandable imports. The array of window panes, spectacles and glass receptacles indicates attention was also being paid towards luxury items. It is unclear, however, whether this cargo was bought out by the South Australian Company on speculation or to satisfy orders and/or demand. It is also possible that portions of the cargo may have been intended for re-export to the eastern Australian colonies.

The added interest relating to the cargo was that it was shipped in Hamburg suggesting that it was of German origin or, more loosely, central and northern European manufacture. It is interesting as one would expect such imports, especially bricks and foodstuffs, to have been supplied from Britain. Generally in the nineteenth century, the economic benefits of colonies centred on their providing a market for the consumption of the domestic manufactures of the colonising country in return for raw materials. Such questions arise as to whether these articles could not be procured in Britain or, more importantly, whether they were cheaper. Cost and quality are interlinked and it is an open question as to whether availability or cost (or both) were the primary reasons for shipping the Hamburg cargo.

Apparently,the quality of some of the manufactures was not a major consideration as it was discovered that the casks were 'very bad', particularly the bread casks. The 'difficulty connected with being foreign manufacture may trouble us' (BRG 42/28/1; 4 Nov. 1837: 116). Also, the flour and bread received was in such poor condition that 'pigs would not eat it'. The casks, it seems, had not been charred and the wood was green, that is, they were

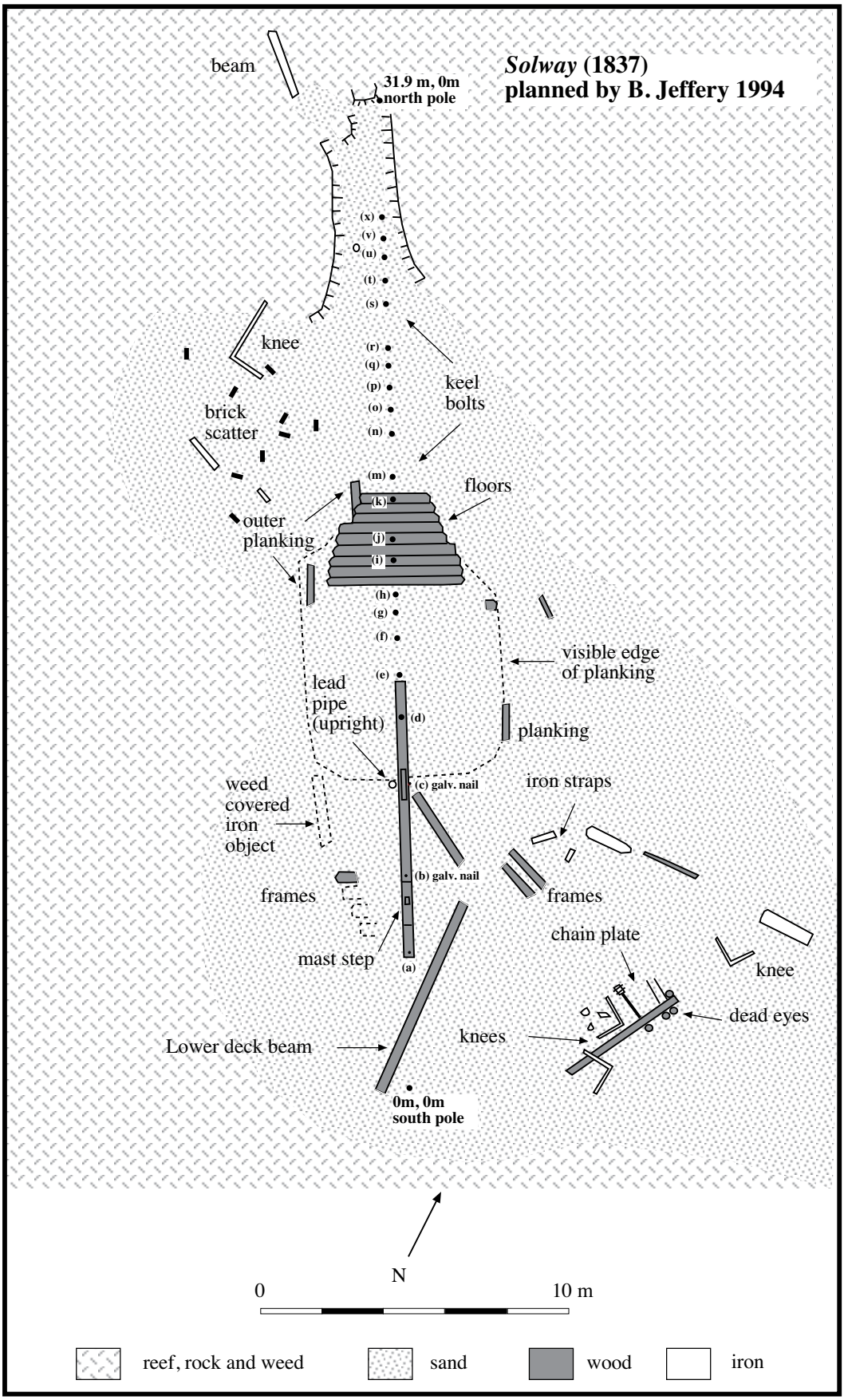

Figure 3. Site plan of the *Solway*.

poorly made (BRG 42/28/1; 4 Nov. 1837:129).

Of further interest, still relating to the likely German origin of the cargo as well as the German immigrants on board, is the extent of German influence in the early development in the colony. German colonists were brought out by the South Australian Company primarily as farmers and vine growers. Apart from the German presence as a source of labour, how much did German material culture—manufactured imports—contribute to the development of South Australia in the initial years of colonisation?

Prior to the commencement of the test excavation it had not been established as to whether the *Solway* had been wrecked with its cargo and immigrants on board. Subsequent research has established that the immigrants had left for Adelaide soon after the vessel reached Kingscote (Sexton, 1990: 35). Much of the cargo, with the exception of the foodstuffs, according to South Australian Company correspondence, was off-loaded at Kingscote. If this information had been available earlier the test excavation may never have gone ahead. However, artefacts recovered during the test excavation indicate that some of the original cargo may have remained on board and was not salvaged (see Results: Artefacts). A destination for this apparent fraction of the Hamburg cargo may have been for the whalers at Rosetta Harbor, or even Hobart, where the *Solway* was to take its cargo of whale oil.

Based on the above discussion regarding the cargo of the *Solway* the following research questions were asked:

- Can the study of the *Solway* cargo contribute to the understanding of the lives of South Australia's European settlers and whalers within the initial years of settlement?

- Can the study of the *Solway* cargo contribute to the understanding of patterns of trade on a frontier?

- Can the study of the *Solway* cargo lead to a comparison of the relative quality of German or central/northern European manufactures with comparable British products?

- Through the study of the *Solway* cargo, is it possible to distinguish between artefacts of German and British manufacture? To do so would assist in the interpretation of the extent of the diffusion of German material culture in the terrestrial archaeological record of South Australia.

Objectives

Given the lack of knowledge of the physical remains of the *Solway*, the above research questions could not be addressed without a test or preliminary excavation taking place. The 1995 test excavations on the *Solway* were undertaken with the following objectives:

- To determine the range and quantity of artefacts, namely cargo and personal possessions remaining on the site. Determine how much was salvaged soon after loss and how much of the site has been disturbed by divers.

- To determine the extent of intact structure and the bow–stern orientation of the wreck site.

Methodology

With these aims in mind the priority was for the planning of the visible features of the site in conjunction with well-defined trenches at suitable locations on site.

The exposure of most of the keelson with keel bolts protruding and the low relief of the wreck site allowed for a relatively simple method of recording. A tape measure baseline was run along the line of keel bolts. Small wooden posts were fixed at either end of the baseline well away from the visible wreckage. The keel bolts were then tagged with pink flagging tape and individually lettered, A through to X (with the omission of letter L), from south to north (Fig. 3). Reference points (b) and (c) are galvanised nails which were hammered in for this project. This row of fixed reference points, as well as the posts marking the north and south ends of the baseline were designated as the x-axis. The location of each bolt along the x-axis was measured relative to the post at the northern end of the baseline, 0.0 m.[1] These references points and the exposed keelson were later plotted on graph paper. All subsequent measurements were done by trilateration of two or more of the tagged keel bolts. Measurements were appended with E (east) or W (west) to signify on which side of the baseline the recorded object was situated. The low relief on site did not necessitate the need for creating a height datum.

The objective in establishing the site plan did not only include the exposed remains of the vessel but also plotting concentrations of bricks, glass and other artefacts, as well as natural features such as reef rock and sea-grass patches.

This measuring system continued to be employed during regular site monitoring inspections. Later additions to the site plan are shown in this article.

The trenches were laid out perpendicular to the axis of the keelson for ease of recording. They were delineated by corner pegs and fenced by a string line. The mechanics of the excavation were undertaken by a dredge. The aim for each trench was to expose as much of the wreckage as possible. No intact vessel structure was to be dismantled. For each trench, separate bags were allocated for glass, ceramics, copper sheathing tacks and sheathing. For Trench 1 this was further differentiated by Trench 1 E and W, signifying on which side of the keelson the artefacts were recovered. These were kept in a bucket on site. Larger artefacts were kept in a separate bucket. Artefacts of special interest were bagged separately. Because of the quantity of bricks on site only

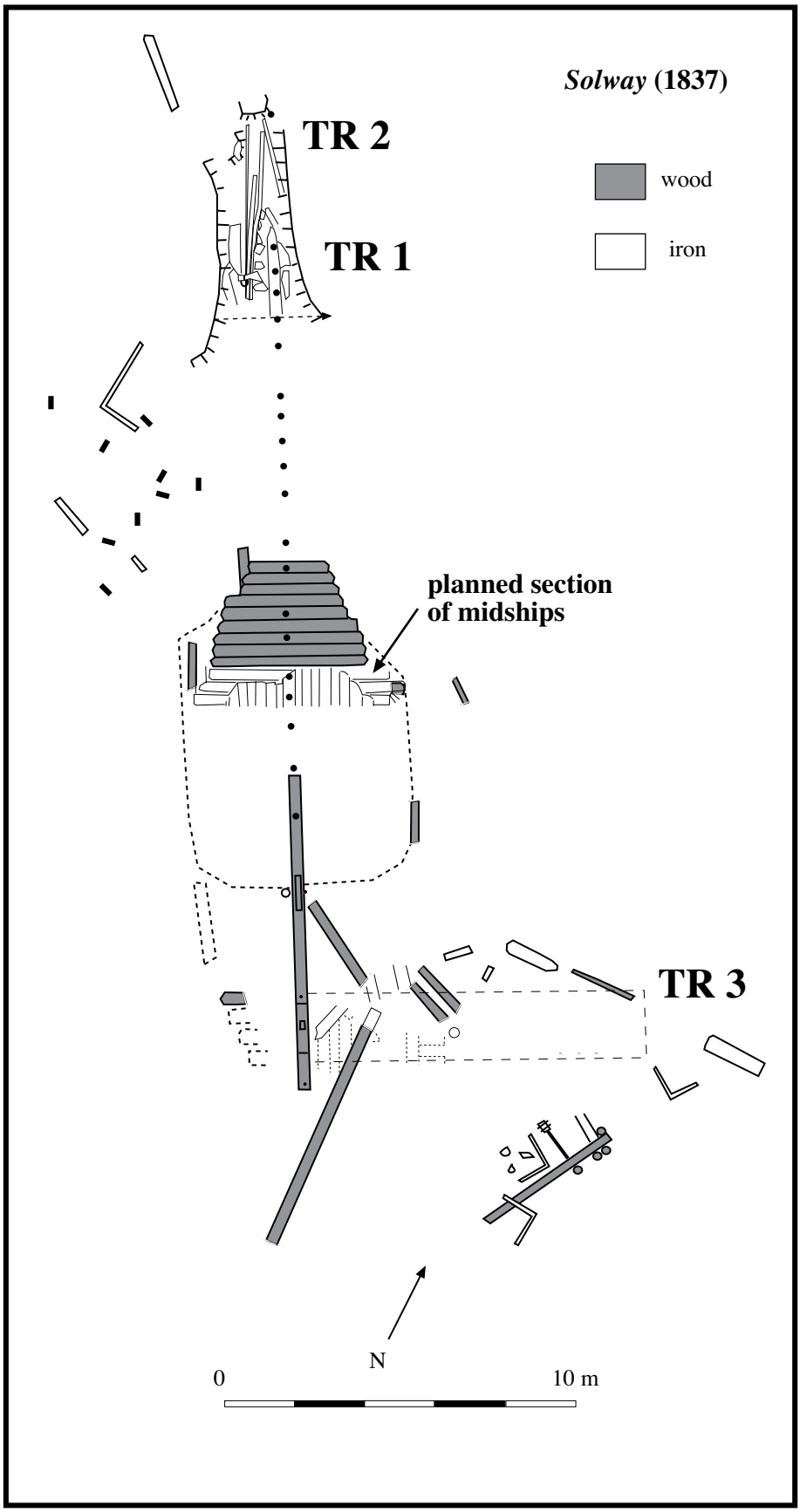

Figure 4. Trench locations : 1994.

a representative sample was recovered from each trench. Particular care was taken to recover complete bricks and bricks of apparently different fabric. All copper sheathing was collected as a closer inspection back in the laboratory could possibly reveal gauge stamps which would assist in interpreting the bow-stern orientation of the vessel. The majority of the brick fragments and loose timbers were placed at the edges of the trenches and were replaced at the end of the excavation. The exact position of an artefact was not to be recorded unless it appeared at the time that its position would help in the interpretation of the formation of the site.

Because of the exploratory nature of the excavation, no site datum was established. All depth measurements given are relative to the top of the exposed keelson, or rider keelson for that particular trench.

During the excavation, artefacts were raised at the end of each day or when the buckets and bags were full. All artefacts recovered were taken back to the 'dig house' for registration. As it turned out, one trench was worked on each day so there was no need to tag buckets on site. Each artefact was a given a unique number with the prefix SOL. Its trench number, plus E or W for Trench 1, date recovered, position if measured and description were recorded in the back pages of the field diary. Smaller delicate artefacts were placed in perforated plastic bags which in turn were stored in plastics tubs of fresh water. Larger artefacts were placed in onion bags and then stored in 'Nally' bins (strong plastic tubs). The exceptions to this were the non-diagnostic fragments of glass and ceramics of a similar fabric and type. They were bagged together and given a single registration number. At first, pink flagging tape marked with the identification number was placed, tied on where possible, in the bags with the artefacts. These were later replaced with stainless steel tags with the number imprinted.

With the completion of excavation, trench plans and final photography were carried out. This could not be done with Trench 3 because of bad weather.

Site description

The wreck site of the *Solway* is situated in 3 to 4 m of water in a sand patch midway between the boat ramp at Rosetta Harbor and Wright Island, approximately 150 m inshore from the seaward edge of Black Reef. The surrounding sea bottom is composed mostly of low relief calcareous reef rock with moderate sea-grass cover and extensive sand patches.

The visible remains consist of approximately 25 metres of the ship's keelson, lying on a NW–SE axis. There are approximately 5 m of ceiling planking and floor timbers either side of the keel at the centre of the site. Copper bolts protrude along the keelson and the floors. Fragments of bricks, copper sheathing, nails, ceramic and glassware are concentrated at the northern end of the site. The southern end of the site is covered with sand for most of the year except for the summer months when more frames and planking, as well as rigging, are exposed. The orientation of these frames, which are in poor condition due to marine borer attack, runs parallel with the axis of the keel, suggesting that a large part of the hull as broken away. The site has now been covered with over 1 000 sandbags to reduce damage from marine borers on the exposed timbers.

Away from the main part of the site, artefacts associated with the wreck have been observed. To the north-west scattered at the base of a reef rock ledge which runs along a large sand patch are brick fragments and other artefacts. Approximately 50 m to the south-east an iron knee and brick fragments have pooled in a small sand gully. Twenty-five metres to the north of this concentration and 50 m east of the site, a heavily concreted length of stud link chain runs along the sand in a ENE direction for a distance of 12 m. At the seaward end of this chain is a very large iron concretion that may be a capstan or a lump of chain. Given the direction of the chain and its relation to the wreck site it is possible that it may not belong to the Solway but to the *South Australian*. In February 1995, a large iron knee, length of arm 1 m, was discovered buried in the beach on the north east side of Wright Island. The size of the knee suggests that it could belong to the *Solway* rather than the *South Australian* (see Results: the vessel).

The trenches (Fig. 4)

Trench 1

Situated at the northern extremity of the exposed wreck site Trench 1 was excavated with the intention of determining whether the northern end of the site was the bow or the stern. Furthermore, the surface scatter of artefacts, bricks, copper alloy sheathing and bolts, and glass present at this part of the site signalled the possibility that more artefacts would be found below the surface.

The northern and southern edges of the trench ran perpendicular to the keel at approximately 3 m and 6 m respectively from the post marking the northern end of the baseline. The east and west edges of the trench were bounded by the distinct edges of reef that run roughly in a north–south direction.

The first 0.15 to 0.20 m, relative to the top of the keelson, of sediment removed was 'clean' white (aerobic) sand. The remnants of the keelson and other timbers were exposed in this strata but no other artefacts were recovered. The timbers were soft and friable due to marine borer infestation. The condition of the timbers and the aerobic state of the sediments signify that this part of the site is regularly uncovered for some lengths of time.

Uniformly across the trench, dark grey anaerobic sediments were reached at -0.15 to 0.20 m relative to the keelson. A bottle neck and ceramic fragments were recovered at the interface of the aerobic and anaerobic strata. The materials observed within this anaerobic strata were mostly fragments of reef rock and brick. No *in situ* ship structure was observed to the east of the keelson

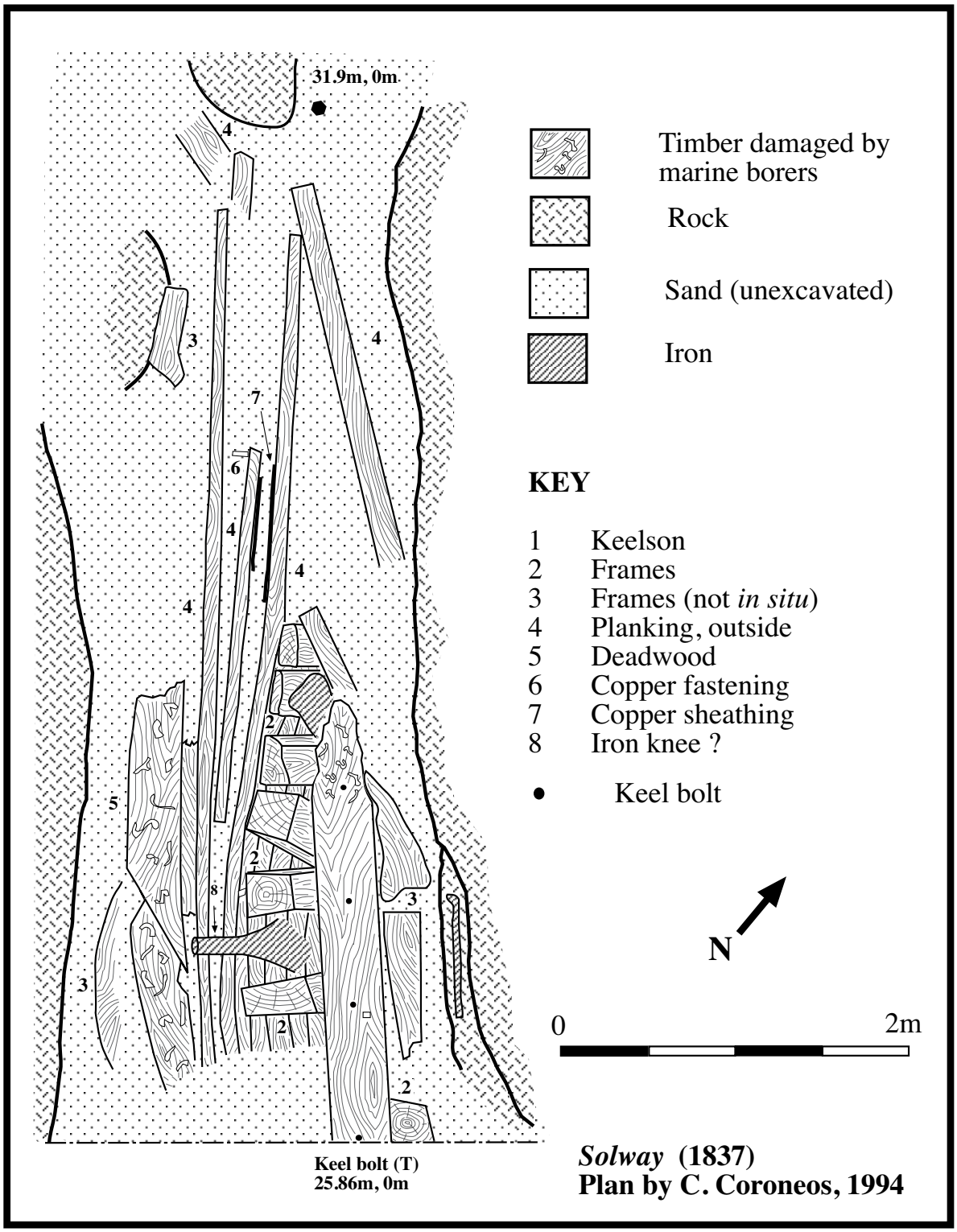

Figure 5. Trenches 1 and 2 : 1994.

(Figs 5 and 6). To the west of the keelson the opposite was the case. Copper-sheathed outer planking was still attached to near vertical frames, confirming that Trench 1 was located at one of the extremities of the vessel (Fig. 7). Between the outer planking and the rock reef scarp were poorly preserved scarphed timbers that may have been deadwood or what now appears to be the scarph for the sternson and keelson (see Results: the vessel). The trench bottomed out onto intact reef rock, the lowest point -0.35 m relative to the top of the keelson, which sloped upwards gradually to the east and west until the slopes gave way to sharp vertical scarps (Fig. 8).

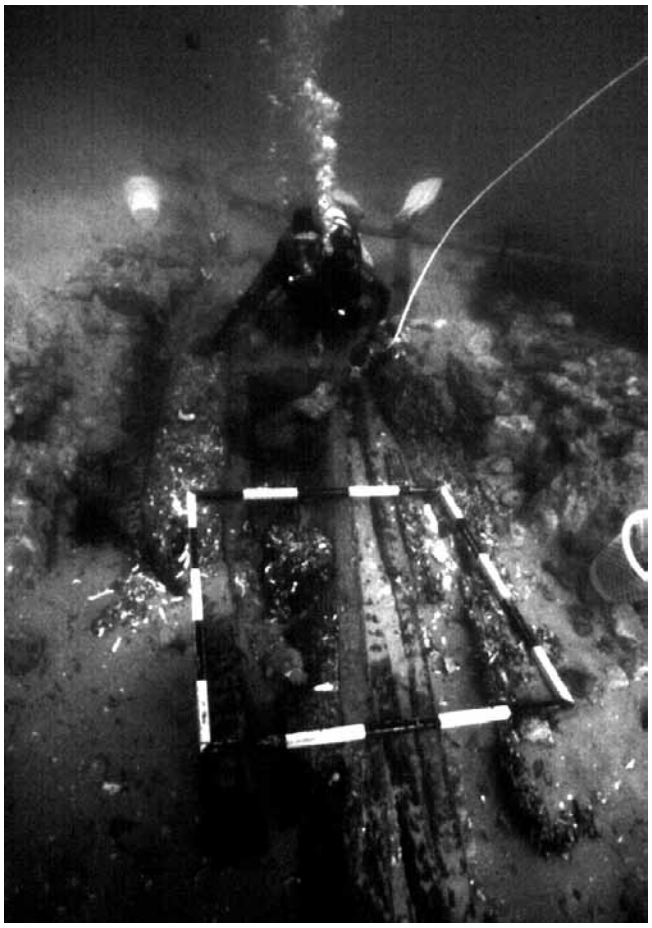

Figure 6. View of Trench 1 from north (B. Jeffery 1994).

Trench 2

With the completion of Trench 1 it was decided to continue northwards in order to uncover more of the vessel's structure. The north boundary was the post marking the north end of the baseline; the east and west boundaries were the reef rock scarps.

Excavation northwards uncovered the outer planking revealed in Trench 1. The keelson, or remnants of, did not extend into this trench nor were there any remains of the keel. Both have been worn away through constant grinding into the reef rock and exposure to marine borers. The remaining ship's timbers in this trench were a jumble of planks and frames. The trench, as in Trench 1, bottomed onto reef rock.

The remains of the vessel found in these two trenches did not give any indication as to whether this was the bow or the stern. Given that the vessel parted its cables during the storm it is most likely that the northern end of the site is that of the stern (see Results: the vessel). The retrieval of artefacts was somewhat disappointing as the trenches bottomed out relatively quickly onto reef rock.

Trench 3 (Fig. 9)

Trench 3 was laid toward the southern end of the site at the location of the only visible mast step and on the east side of the keelson. This area was chosen as it appeared

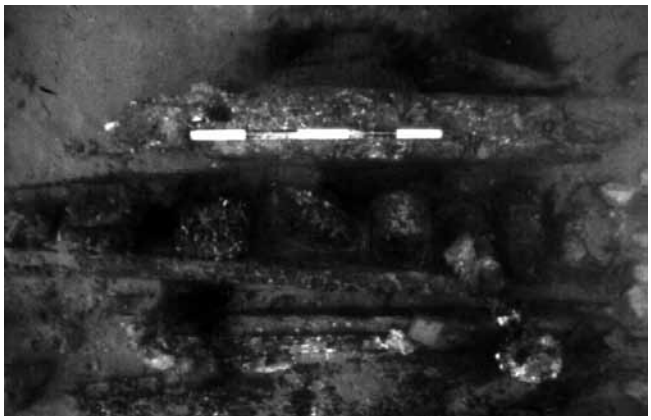

Figure 7. View of Trenches 1 and 2. Keelson, frames and outer planking (B. Jeffery 1994).

that this part of the wreck site had the greatest covering of sand which presented the better opportunity to uncover more intact vessel structure as well as recover more artefacts. The trench extended 10 m eastwards to where reef rock was exposed. It was intended to excavate the whole trench in a one-week period.

Excavation began adjacent to the keelson. The first 0.3 to 0.4 m were of aerobic sands with no artefacts

Figure 8. View, looking west, of Trenches 1 and 2 showing reef rock scarp (B. Jeffery 1994).

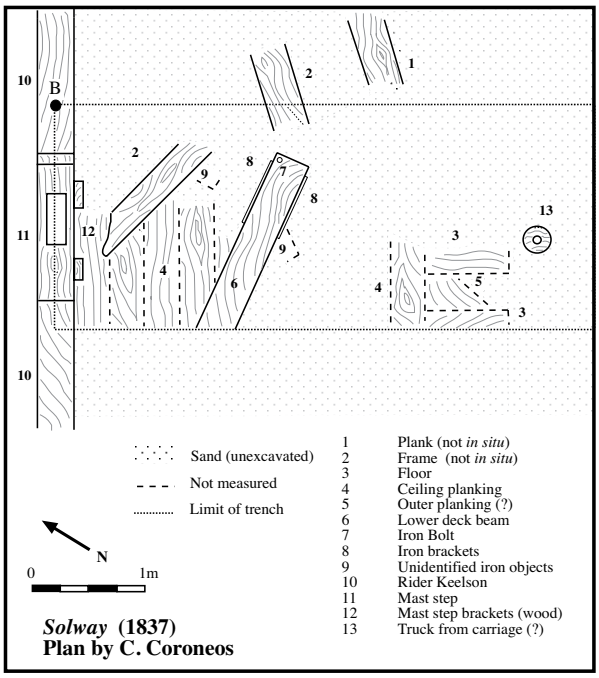

Figure 9. Trench 3 : 1994.

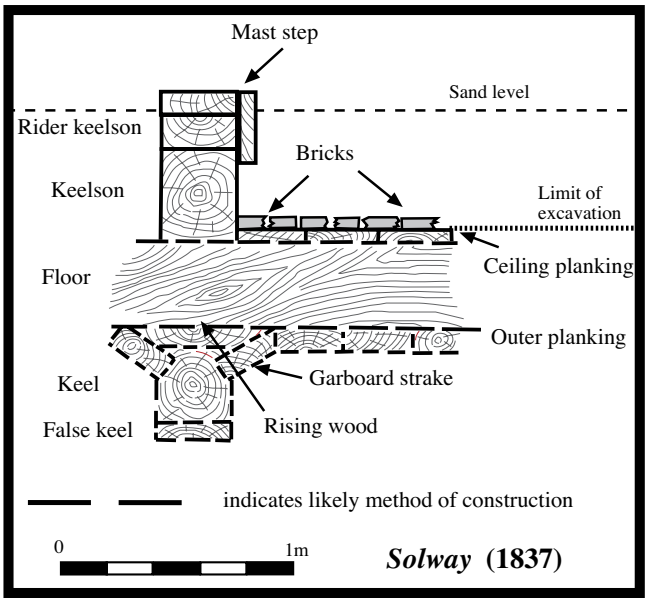

Figure 10. Trench 3 cross section : 1994.

recovered. The aerobic strata was followed by anaerobic sands which were mixed with broken up reef rock. There were few artefacts in this matrix, mostly brick and copper sheathing fragments. The mast step and the keelson were well preserved indicating that this part of the site is not usually uncovered. A number of large timbers protruded into the trench. Two of these were loose frames while the third (6 in Fig. 9) appears to be a lower deck beam (see Results: the vessel).

At a depth of approximately 0.45 m below the top of the keelson a layer of broken bricks was uncovered. They were lying flat and closely packed together (Fig. 10). The breaks showed no sign of wearing from water action. Both types of bricks found on the site were represented (see Results: cargo and possessions). This brick layer lay immediately on ceiling planking. The arrangement of the bricks suggested that they had been purposely placed, possibly with the intention of protecting the planking from being damaged by shifting cargo. In and above this brick layer were found organic materials, principally hessian, leather and a lice comb (see Results: cargo and possessions). Glass and ceramic artefacts were conspicuously absent. The seemingly undisturbed brick layer and the artefacts recovered suggested that this part of the site had not been disturbed by divers.

With ceiling planking being uncovered adjacent to the keelson excavation proceeded further eastward. *In situ* frames were uncovered approximately 3 m east of the keelson. Tentative probing under the frames found what appeared to be a loose frame. No outer planking was observed. Some of the timbers had sustained marine borer damage. At this point the weather turned dramatically for the worst and the excavation was abandoned before any detailed planning could be undertaken. Towards the end of the final dive a wheel-shaped wooden object, was exposed. Through its centre was a wooden shaft, fastened or chocked with a ferrous pin. The shaft, round where it entered the wheel and then squared, continued directly down into the sand. This assembly appears to be part of a larger structure as the wheel and shaft could not be moved (see Results: the vessel).

Trench 3 revealed that a considerable part of the vessel structure was intact, at least to a point 3 to 4 m east of the keelson. The relative absence of artefacts associated with cargo and possessions was disappointing, however, very little of the trench was excavated. The abrupt end of the frames 3 m east of the keelson and the apparent absence of outer planking suggest the possibility that artefacts may have been swept and concentrated under the bilge.

Results: the vessel

Keel and keelson

During the course of the excavation the keel was not revealed. In Trench 2 the keelson has eroded away revealing the absence of the keel at this point. Given that this end of the vessel bore the impact of the wrecking and subsequent rubbing into the reef rock it is likely that the keel at this point either broke off from the body of the vessel on impact or wore away gradually.

The Lloyd's surveyor's report, 1834, for the *Solway* gives the length of the keel as 28.04 m (92 ft) (SHB file *Solway*). The total length of the keelson, preserved in sections, is 24.6 m (80.2 ft). For a vessel of comparable size the bark *Earl of Pembroke*, later to become James Cook's *Endeavour*, the length of the keelson is 25.7 m (82.34 ft)

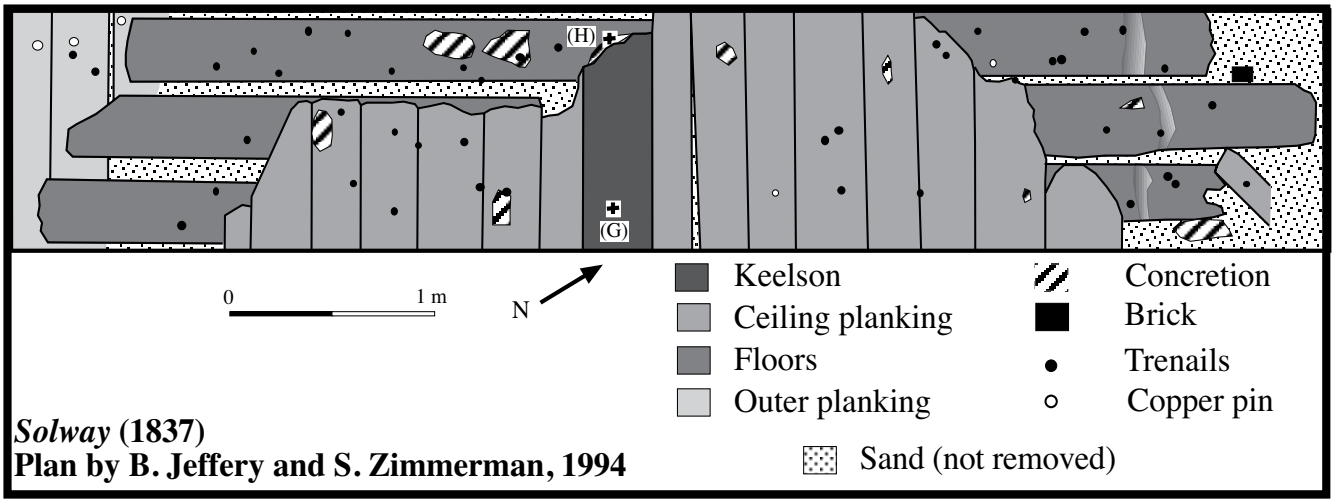

Figure 11. Plan of midships, points (g) to (h).

(Adams *et al.*, 1990: fig. 145).[2] This confirms that the lower structure of the vessel, below the turn of the bilge, has more or less survived.

The keelson is preserved at the southern and northern ends of the site. The southern part is excellently preserved with the end of the keelson well defined, point (a). The keelson assembly, as revealed by the excavation of Trench 3, is composed of the keelson and a rider keelson (Fig. 10). Upon the rider keelson rests a mast step (see below) and further along a mortise, 0.1 x 0.5 m, has been cut into the rider keelson. It most likely housed the pillar or stanchion for a hold beam. The rider keelson abruptly breaks off at point (e) probably at a scarph joint. From point (e) to (h) the keelson is still present and visible but from (h) to (k) this too has been lost revealing the floors. From point (m) to (t) the site is buried with only the keel bolts exposed. It can be assumed that the keelson from here on is present as part of it was uncovered in Trenches 1 and 2.

The centre of the site, from points (h) to (k) where the keelson is missing, sits higher and is always exposed. It is obvious from this observation that the back of the vessel, the keel, has been broken in at least two places, at points (h) and (k)–(m).

The copper alloy keel bolts that are visible, and average 0.026 m in diameter on the shank, are spaced at 0.6 to 0.7 m intervals. Only two keel bolts, (a) and (d), protrude from the rider keelson. The narrow spacing of the keel bolts, (s) to (x), at the northern end of the site suggests that the rider keelson could have overlain the whole length of the keelson.

Floors and frames

The floors of the *Solway* according to the Lloyd's surveyor's report were made from oak (SHB file *Solway*). They are visible, and subsequently badly damaged by marine borers, in the centre of the site. The spacing between them is 0.06 m (2.4 in) while the siding or width is 0.3 m (11.8 in) (Fig. 11). This conflicts with the Lloyd's surveyor's report which states that the sidings of the floors in the middle of the vessel are 13 in (0.33 m). The *Vade-Mecum* recommends a siding of 12 in (0.305 m) for merchant vessels of 330 tons (*Vade-Mecum*, 1822: 274). Not all floors pass under the keelson as is evidenced by the middle floor to the left of points (g) and (h) in Figure 11.

Trenches 1 and 2 revealed floors apparently *in situ* (Fig. 5). Almost vertical, the shape of these timbers are quite irregular and decrease in size toward the end of the keelson. The non-appearance of the floors on the other side of the keelson suggests that they may not have been one continuous piece but may have been checked into the side of the keelson as has been observed on the site of the *Lady Lyttleton* (Vosmer & Wright, 1990; Figs 10 and 11).

Planking

Both ceiling and outer planking survive on the site. The moulding of the bilge planks as can be seen in Trenches 1 and 2 varies from 0.06 m (2.4in) to 0.08 m (3.1in). The planks, both ceiling and outer, are fastened to the floors predominantly by treenails which range in diameter from 0.028 to 0.04 m (Figs 5 and 11). Copper alloy pins, 0.018 m in diameter on average, have also been used.

Sheathing

The sheathing recovered during the excavation had not been examined at the time of writing this report.

Rigging

Two wooden pulley sheaves both of 0.125 m diameter and 0.24 m in thickness were recovered during the excavation of Trench 1. During routine inspections of the site after the excavation, a portion of the standing rigging consisting

Figure 12. Lower deadeyes and chainplate (B. Jeffery 1994).

of the lower deadeyes with iron binding, chain plate and fore(?)channel were partially exposed in the south-eastern corner of the site (Figs 3 and 12).

Hold beam

The timber referred to as the lower deck beam in Trench 3 is visible, at times, for its whole length of approximately 6 m (Fig. 3). At both ends of the beam are the remains of staple straps which once would have passed around the frame upon which it abutted (Fig. 13). The ferrous remains of the bolt still visible would have secured the beam to the beam shelf. The apparent absence of any other fastenings, at least the section exposed in Trench 3, indicates that it was not decked and confirms that it was not supported by a knee. The *Vade-Mecum* recommends that the sided dimensions for the beams of a 330-ton merchant vessel should be 12 in (0.305 m) (*Vade-Mecum*, 1822: 290). The sided dimension of the lower deck beam in Trench 3 is 0.32 m (12.6 in). According to the Lloyd's surveyor's report the lower deck beams, 12 in sided, were of African oak (SHB file *Solway*).

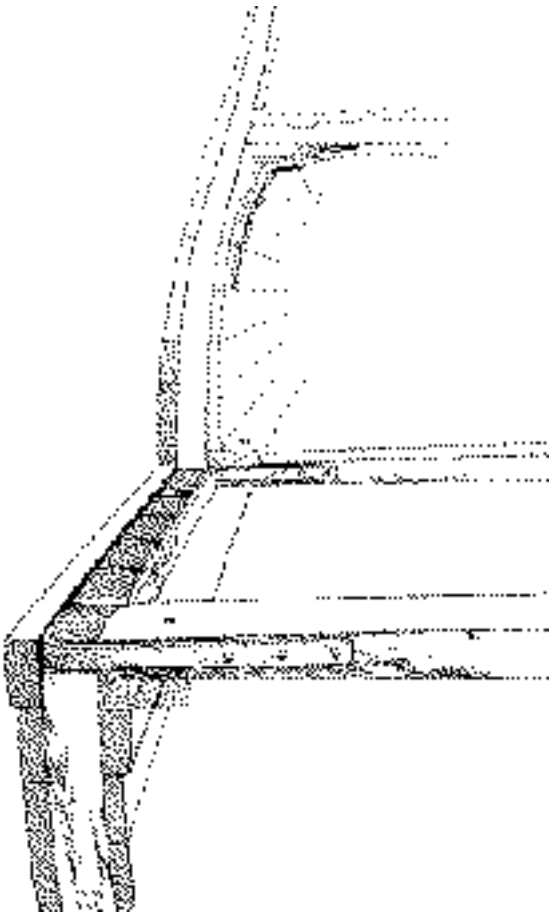

Figure 13. Hold beam reconstruction. (From Adams, van Holk and Maarleveld, 1990: fig. 104.).

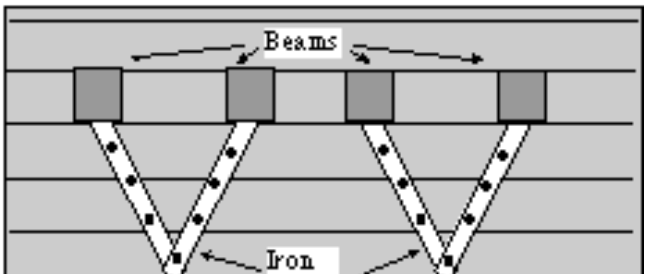

Figure 14. Placement of *Solway*'s hanging iron knees. (Adapted from Lloyd's Surveyor's report.)

Knees

Only the *Solway*'s iron knees have been observed so far on site. According to a diagram in the Lloyd's surveyor's report the vessel had iron hanging knees supporting the upper deck beams and were placed diagonally (SHB file *Solway*) (Fig. 14). The *Vade-Mecum* recommends that the length of the arms of the knees should be 3.75 ft(*Vade-Mecum*, 1822: 292). The arms of the knees on site vary in length from 1.0 m (3.1 ft) (knees in the south eastern portion of the site) to 2.2 m (6.7 ft) (knee west of point) (Fig. 3).

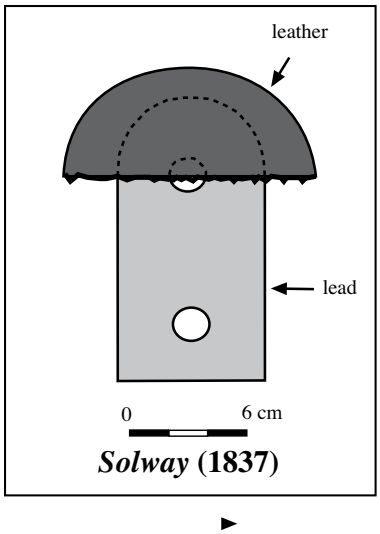

Figure 15. Fragment of *Solway*'s pump (?).

Figure 16. Mast step (B. Jeffery, 1994).

Pump

During an inspection visit to the *Solway* in mid 1995 a small object had been uncovered, but not recovered, westwards of point (m) which may have belonged to the ship's pump (Fig. 15). It is composed of a flat rectangular lead strip, pierced through at either end. Attached at one end was the semi-circular remains of a leather flap. This object may have performed function of a valve either at the overflow port of the pump or been part of the chain and valve assembly of a chain pump (Strachan, 1986: 39; Oertling, 1982: 121). The total length of the lead and leather flap, 170 mm (6.69 in), approximates to the diameter of the bore, 178 mm (7 in), for a 330-ton merchant ship of the early nineteenth century (*Vade-Mecum*, 1822: 300). However, the complete object would have been oblong in shape not circular.

Lead pipe

Adjacent to the keelson at point (c) a lead pipe, approximately 40 mm in diameter, protrudes from the sand (Fig. 3). A similar pipe, bent over, is almost completely buried and was located on the other side of the keelson. No definite identification has been made but it is possible that they were part of the plumbing for an internal lavatory system. Lower deck lavatories were common fixtures in vessels fitted out to carry immigrants (Staniforth, M., 1994: pers. comm.).

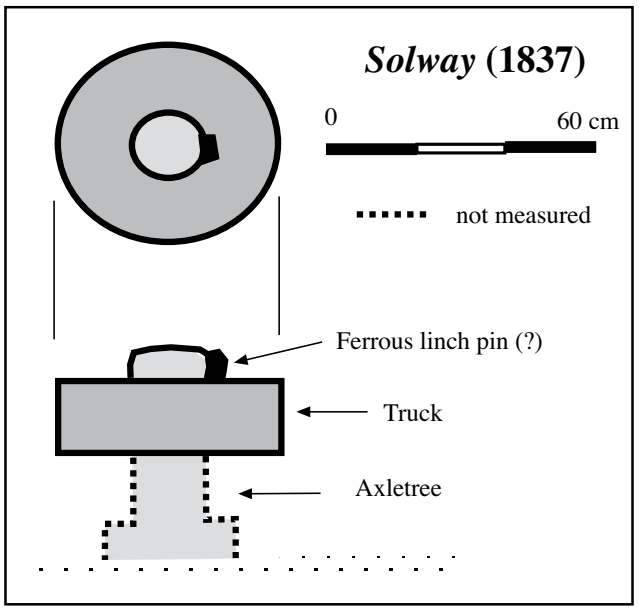

Figure 17. Truck and axletree, Trench 3 : 1994.

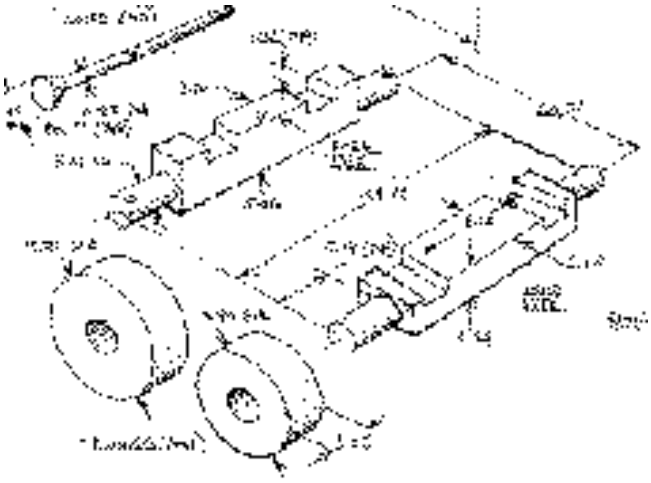

Figure 18. Excerpt from plans for 4-pounder gun carriage. (From Ruhge, 1987: fig. 3).

Mast step

The mast step, point (b) is formed by a block of timber, bevelled at its northern end, attached lengthways to the rider keelson (the method of attachment was not recorded) (Figs 10 and 16). The mast would have been cut to a rectangular shape at its base and stepped in. The mast step was further secured to the rider keelson and keelson by two sets of wooden slabs on both sides bolted through to the keelson assembly. A similar mast step is found on, SL 4, a vessel of similar age and construction excavated in Holland (Adams *et al.*, 1990: 84, figs 90 & 94).

Gun carriage

One of the most exciting and, at same time, frustrating finds was the wooden 'wheel' uncovered at the end of the final dive in Trench 3. It was, for all appearances, a truck from a gun carriage. The truck was still connected to the axletree and held in place with the remains of a ferrous linch pin (Fig. 17). The shaft of the axletree was rounded where it penetrated the truck and then changed to squared sides. The truck and the axletree could not be moved indicating that there was considerably more of the structure buried, perhaps only the axletree not the whole carriage.

The diameter of the truck, 250 mm (9.8 in), and its width, 80 mm (3.1 in), matches the dimensions of the fore truck of the carriage for a 4-pounder cannon (Fig. 18) (Ruhge, 1987: 227–30). It could also be the hind

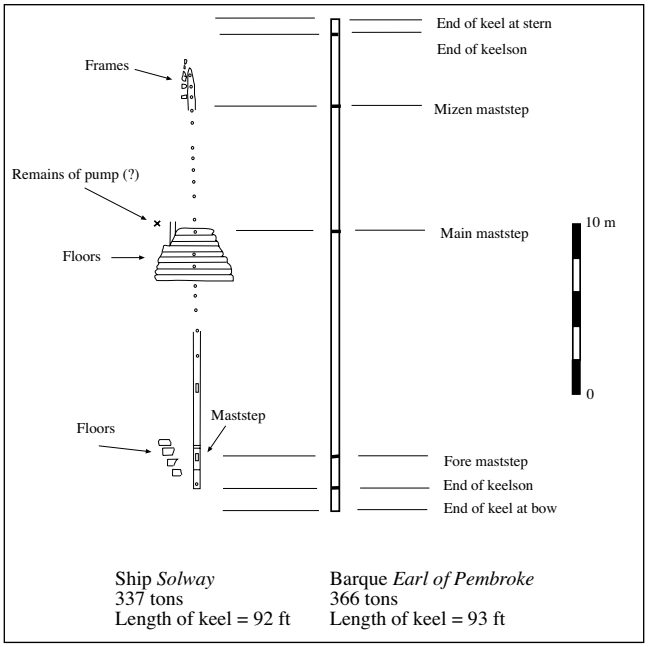

Figure 19. Comparison of the *Solway* with the *Earl of Pembroke* (taken from Adams, van Holk and Maarleveld, 1990: fig. 145).

truck of larger calibre cannon as the fore truck tended to be of a greater diameter.

The presence of a small calibre cannon on board a merchant vessel in the first half of the nineteenth century should not be considered as unusual. It may have served as a means of defence and/or signalling. It is unusual, however, that the remains of the carriage should still be on site considering the *Solway* was salvaged.

Orientation of vessel

The excavation provided no conclusive evidence as to the orientation of the wreck, however, subsequent research utilising the visible remains has provided an interpretation. The historical account of the wrecking points to the *Solway* having hit Black Reef stern first. This does not necessarily mean that the vessel would have continued over the reef and finally grounded in the same orientation. The main piece of physical evidence on the site to help determine the orientation of the wreck is the mast step between points (a) and (b). The absence of the other two mast steps makes it difficult to determine whether it housed the mizzen or fore mast. However, by comparing the remains of the *Solway* with the plan of the barque *Earl of Pembroke* it becomes apparent that this is the fore mast step (Fig. 19). Further confirmation of the relevance of the comparison is the location of the pump valve in relation to where the mainmast would be situated.

In summary, it is very likely that the wreck is lying on an approximate north (stern)–south (bow) axis. This realisation assists in the interpretation of the artefacts recovered during the excavation as to whether they

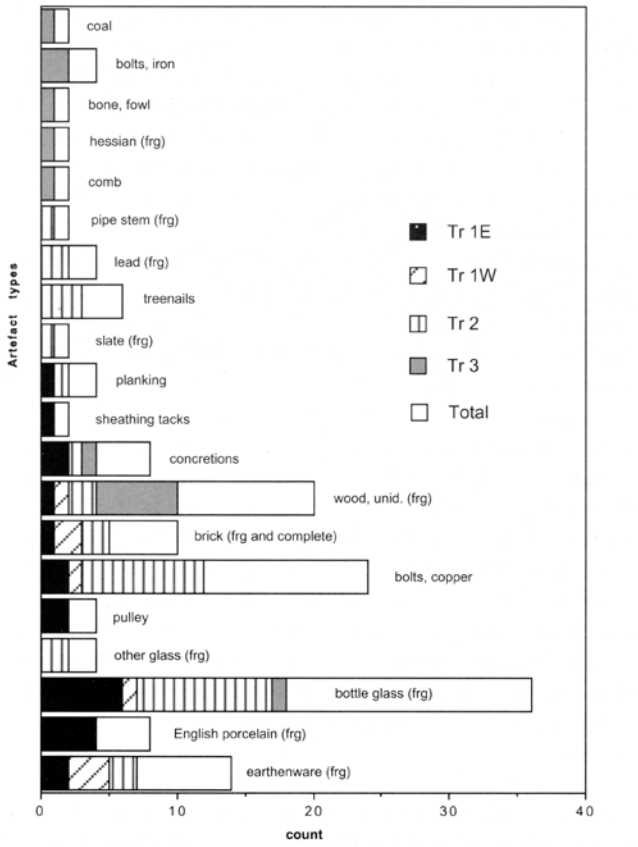

Figure 20. Distribution of type and number of artefacts recovered.

may have belonged to the cargo, or have been personal possessions of ship's officers or the average sailor.

Results: cargo and personal possessions

A total of 68 artefact registration numbers were allocated during the excavation. Seventy-nine artefacts, excluding the fragments of copper sheathing, were recovered. The type and distribution of these artefacts are provided in Figure 20.

Packaging

A fragment of soft wood, 324 x 108 (max. width) x 7 mm thick, knotted and extremely fragile was found in Trench 2. It would appear that this was either dunnage or part of a packing crate.

Hessian

The fibre from the sample of hessian recovered from Trench 3 was analysed by M. Jose of Artlab Australia as being that of jute (SHB file *Solway*).

Bricks

Bricks were by far the most common artefact type on the *Solway* wreck site. Two types of pressed bricks were identified. The more common variety were of a orange/red-brown exterior colour, poorly reduced, coarse in

texture with a substantial proportion of stone inclusions. These bricks were much more easily waterworn than the other type. The dimensions of a complete brick ranged from 222 x 108 x 50 mm to 232 x 110 x 47 mm. The other type has a dark brown exterior with a red-brown core surrounded by bands of lighter brown. It is better moulded, fired and slightly larger overall than the other variety. A half brick example measures 115 x 112 x 53 mm.

Trench 3 revealed that some of these bricks, of both types, lined the inside of the hold to protect the ceiling planking. The *Solway* bought out to Australia at least 45 000 bricks which had been loaded in Hamburg. These bricks, according to South Australian Company correspondence, were off-loaded at Kingscote. It is an open question as to whether the bricks on site were associated with the vessel prior to its arrival in Australia or they were part of the Hamburg cargo. It is most likely that a small fraction of the brick cargo stayed on board the *Solway* not only to serve a functional purpose on the vessel but also destined for the Company's whaling station where such building material would have been in short supply. The South Australian Company was in the process of setting up a brick works on Kangaroo Island at the time of loss (BRG 42/28/1; 4 Nov. 1837:103).

Glass

Most of the glass recovered is small and undiagnostic but there is quite a variation in types represented. The majority, 18, of the fragments are bottle glass. Both cylindrical and case bottle shapes are present.

Of the cylindrical shaped bottle fragments four fragments are of black/dark olive colour. All are body fragments with the exception of one base fragment. The diameter of the base is 80 mm and the height of the kick-up 31 mm. There is no obvious seam. A further nine body fragments are of a lighter green hue. There are two light brown glass fragments, a shoulder piece with no seams visible and a neck with a laid on lip, 21 mm in diameter. This last piece is curious as it has two prominent and two faint seams running down the length of a bulging neck. The laid on lip and the neck seams suggest a date for the bottle from the mid-nineteenth century (Hutchison, 1981: 156). This fragment was found in Trench 1E in the interface between the anaerobic and aerobic zones. It, and the other light brown glass fragment, are no doubt later intrusions either having rolled off the reef into the sand depression created by the *Solway* or been deposited by people fishing over the site. Three green glass fragments, either shoulder or base, belong to a case or perhaps an 'onion' shaped bottle.

The remaining two glass fragments which do not belong to a bottle are of particular interest. One fragment, 37 x 66 x 3 mm (max. thickness) and 1 mm (min. thickness), is a clear glass rim of an open mouth, *c.* 200 mm in diameter, vessel, possibly a bowl. The other fragment, 22 x 13 x 1 mm, is flat/straight clear glass. Unfortunately, it is a small piece and only one was found. It is too thin to be a body fragment from a case bottle. The *Solway* had carried a large consignment of window glass from Hamburg. The South Australian Company correspondence referred to earlier mentions that part of the window glass consignment had been put ashore but it is unclear whether the whole lot was unshipped before the *Solway* sailed for Rosetta Harbor. The same argument that was made for the presence of bricks on the site could also be put forward for the appearance of window glass, that is windows as with bricks would have been items in short supply and probably sought after. However, a good argument cannot be made for this on the presence of one small fragment of window glass. The vessel itself may have had an interior window or the glass may have belonged to an artefact such as a barometer or timepiece.

Ceramics

The ceramics as with the glass were mostly small fragments but representative of at least four different fabrics. The most representative, and largest, fragments are associated with salt-glazed stoneware jars. Three body and one rim fragment, all possibly from the same vessel, are of a brown coloured fabric with dark brown salt-glaze. Some fragments are ribbed on the interior. The diameter of the mouth of the rim fragment is 150 mm. The thickness of the body fragments ranged from 6.5 mm to 14 mm. Another fragment was of a lighter brown to yellow fabric with brown mottled salt-glaze on the exterior and light brown glaze on the interior. These fragments belonged to large vessels of a type that were ubiquitous to the period and commonly used for storage, most probably liquids.

Another type of ceramic present was a poorly reduced earthernware of a dark grey to black core with a brown slip on the interior and a mottled brown and grey non-glazed exterior. Only two body fragments were recovered. The presence of a slip on the interior of the fragments suggests that the vessel(s) contained liquids as well.

Four fragments of what are loosely described as European porcelain in this article were also recovered. These fragments with a fine white fabric and white glaze on both sides do not belong to the one vessel. The diameter of one rim fragment, 19 x 20.5 mm, is 127 mm suggesting that it was part of a bowl. There are remnants of black/blue design over the glaze. Another rim fragment, 24.5 x 17 x 4.5 mm, with part of a flower (underglaze and blue) motif in evidence on the exterior and an unidentifiable design on the interior has a diameter of 76 mm which may have been a cup.

The most interesting piece is that of a fragment, 67 x 34.5 x 4 mm, of the base, 127 mm, of a small plate or saucer (Figs 21 and 22). The underglaze design (blue) on the face of the plate is that of a woman in a long dress and apron wearing a broad rimmed hat. She is possibly holding a child. In the background to her right there is a three storey building in amongst trees. A close examination shows the application of bat printing, a form of transfer printing, because of the appearance of

Figure 21. SOL 013. Fragment of plate. European porcelain, blue and white (B. Powell).

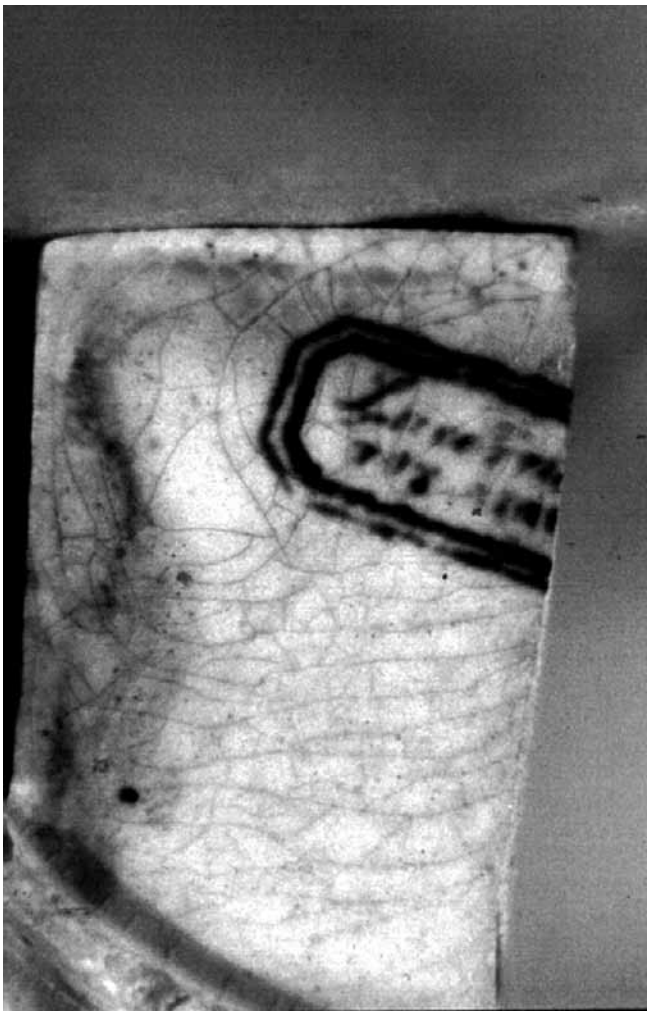

Figure 22. SOL 013. Underside (B. Powell).

very fine stippling (Sandon, 1989: 154). On the base of the plate there is a design (underglaze and blue) which appears to be the pattern or maker's mark (Fig. 22). It is composed of a double cartouche with two lines of script. Unfortunately only part of the mark has survived and only the first few letters of the top line can be read with certainty—'LUCERN[E]'.

It is quite possible that the first line of the mark refers to the scene depicted on the plate, a practice common on English porcelains during the first half of the nineteenth century especially by the Staffordshire potters (Hakkak, 1996: pers. comm.; Little, 1987: 37).

Lucerne is the capital of the Swiss canton of the same name. A pattern referred to as 'Lucern' or 'Lucerne' is recorded by Coysh and Henrywood (1982: 232; 1989: 128). No illustration is given, but the pattern is said to have been a copy of a Minton design 'Genevese' which featured alpine chalets in a romantic setting. The latter design was used by Thomas and Benjamin Godwin, *c.* 1809–34 (Coysh & Henrywood, 1982: 151).

The application of the design using bat printing again points to the Staffordshire potteries as the source as this method was most commonly used by these potteries in the early nineteenth century (Southeby's, 1990: 194).

Slate

A small fragment, 54 x 30 x 3 mm, of slate from Trench 2 is bevelled along one edge and has two parallel lines etched into it. It may be part of a slate log similar to that recovered from the wreck of the *Lady Lyttleton* (Vosmer & Wright, 1990, fig. 4).

Lice comb

One of the more interesting and personal finds of the excavation was the lice comb made out of tortoise shell (Fig. 23). It is slightly translucent and predominantly dark brown in colour with a light brown/yellow streak on one side. The teeth, 90 in number and approximately 8 mm long, are complete on one side. The number and grade of teeth are the same on both sides. This artefact most likely belonged to one of the crew.

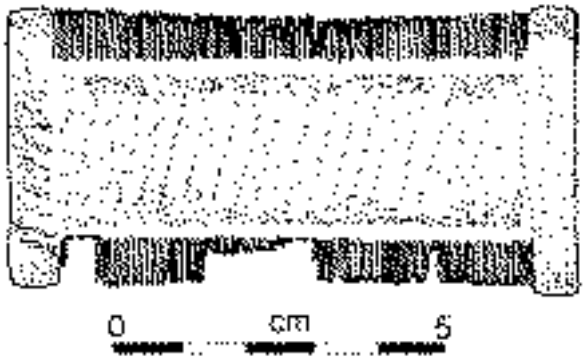

Figure 23. SOL 58. Lice comb.

Site formation

Based on observations made during the survey and test excavation some deductions can be made concerning the site's formation. Historical and site evidence shows that the *Solway*, after parting its cables, drifted stern first onto Black Reef. Scrapping across the reef and perhaps losing part of its keel the vessel settled into approximately 4 m of water shoreward of the reef. The vessel sat almost upright, there is a very slight lean of the keel bolts to the port side, and appears to have been relatively intact as there were thoughts of using it as a work platform. Salvage operations took place two months after the wrecking and it can be assumed that the rigging, masts, spars and all fixtures above deck as well as the upper timbers to the waterline would have been removed. The presence, however, of some of the standing rigging on site questions the thoroughness of the salvage. There is the possibility that the wreck may have been used as a working platform in association with the whaling station for a short time.

From the time of impact until the breakdown of hull integrity, from marine borer infestation and wave action the keel and bilge of the vessel would have been grinding down the soft calcareous reef rock upon which it rested, the weight of the hull given momentum by the constant southerly swells. This is clearly shown by the vertical reef rock faces uncovered in Trenches 1 and 2. This would have had the effect of creating a depression in the reef which was filled with sand thereby preserving the wreck from the turn of the bilge to the keel.

At least twenty years after wrecking there must have been some relief on the site as the presence of bottle fragments from after the middle of the nineteenth century point to the site as being a fishing location. When divers found the site in the 1960s it seems that the site was covered by a thin layer of sand as structure was revealed and artefacts recovered by just hand-fanning. In 1982, the diver who dredged the site for just half a day told the author that the keelson for the whole length of the site was buried (McGovern, J., pers. comm.) Comparing these anecdotal accounts it would appear that the *Solway* was more exposed in 1994 than at least the decade before.

The collation of measured observations on site, made throughout 1994 and the first half of 1995, show that the greater part of the site becomes exposed during the summer months. Some measurements in the southern part of the site showed sand movements of over 0.5 m over a month. This seasonal exposure of the site reveals timbers damaged by marine borers as well as 'fresh' uninfested timbers. This suggests that parts of the site, especially the stern, to the north, and the south-east portion remain, or have remained exposed for longer periods of time. The depth of the aerobic zone, 0.15 to 0.20 m indicates an active sea bottom stirred by wave action. The condition of the exposed keel bolts, worn to sharp points with constant sand abrasion not allowing bronze disease to form verifies this. Great periodic storms most likely expose the whole of the site. This would have the affect of pushing/rolling artefacts along the relatively flat surface of the vessel remains and reef rock shorewards, as is the case in the northern part of the site, or downwards and pooled as is possibly the case in the southern part of the site where the sand deposit is substantially deeper.

Conclusion

The results of the 1994 test excavation of the *Solway* proved to be inconclusive with regards to the established aims. The artefacts recovered were few, but of interest. However, it was not possible to tell whether any of these, with the exception perhaps of the bricks, once formed part of the Hamburg cargo or were the personal possessions of the crew, ship's officers and captain. This result was also mitigated by the weather conditions and the siting of the trenches themselves. Trenches 1 and 2 in hindsight were not well sited to fulfil the aims of the excavation and Trench 3 was abandoned due to weather just as things were becoming interesting.

The survey and excavation, however, revealed much more of the vessel's structure than was initially thought to have survived. Research for this article has shown striking similarities of the *Solway* with the wreck known as SL4 in Holland (Adams *et al.*, 1990: 130-31). This realisation has resurfaced an often overlooked area of inquiry.

> Although contemporary handbooks do contain a lot of information on early 19th century shipbuilding and shipping it is only through the study of archaeological material that this information can be checked and enlarged (Adams *et al.*, 1990: 130–31).

Future work

The site of *Solway* has been covered with sandbags in an attempt to preserve the exposed timbers and is subjected to periodic inspections which measure sand levels. The site warrants further investigation not only for research purposes but also for public interpretation. Intensive development along the foreshore of Encounter Bay has

obliterated almost all the remains of the area's whaling heritage. The *Solway* remains the only tangible physical link with that past. Artefacts recovered from the *Solway* with supplementary interpretation on underwater archaeological work displayed in the local museums would promote the value of shipwrecks in the understanding of the past.

Acknowledgments

My sincere gratitude goes to those who participated in the planning, excavation, registering and sandbagging which was often undertaken in cold and difficult conditions. They are: Bill Jeffery, Bob Powell, Mark Staniforth, Stefan Zimmerman, Bob Ramsey, Stephen Kretschmer, John McGovern, Emma McGovern, Noah, Julie Castro, Volka Scholl and Chris Halstead from National Parks, Ron, John, Lindsey and Charles from the Fleurieu SCUBA Club, Oonah Nicholson, Mike McCabe (also for some of the research on the ceramics), Darren Griffin, Charles Parkinson, Simon Cootes and Sue Anderson from The Flinders University of South Australia, Ian Milne and Ian Eats. Ian Eats' first experience on the *Solway* was in zero visibility. He was ecstatic afterwards saying that his dream of seeing (read–feel) a 'real' shipwreck had been fulfilled. It is this sort of passion and sense of wonderment that often makes this line of work rewarding. A thank-you also to Bob Sexton who provided some copies of research notes on the background surrounding the loss of the *Solway* and *South Australian*. A final thanks to Myra Stanbury whose precise research on the identification of SOL 013 surpassed my previous fumbling efforts.

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Endnotes

[1] Though no longer of much relevance, for the purposes of this article the 0,0 m mark has been placed at the south post to coincide with the lettering.

[2] Though the tonnage, 364 of the *Earl of Pembroke* is 8% greater than that of the *Solway*, the small difference in the length of the keels, approximately 93 ft compared to 92 ft for the *Solway*, makes the *Earl of Pembroke* a useful guide to the interpretation of the *Solway's remains*.

Bulletin of the Australian Institute for Maritime Archaeology (1996), **20**.1: 39–64

Drawings of ships in caves in Thailand

Warren Blake.
80 Jalan Daud, #02-04 Windy Heights, SING 1441, Republic of Singapore

Introduction

In three caves on the neighbouring islands of Phi Phi Le and Phi Phi Don off the west coast of Thailand are some drawings of various ship types, done in soot and brown dyes.

Since these drawings display some appreciation of nautical design and since they appear to be inspired by ship types of the 19th, and possibly back to the 17th centuries, this author took the opportunity of a necessarily brief visit to each of these caves to record in sketch and photographic form the most interesting of these pictures. There is a single mention of similar ships in an article on Neolithic cave paintings in the same area (Boulbet, 1985).

One of these caves is visited daily during good weather by tourists, both Thai and foreign, and another is open to any inquisitive and active visitor. The possibility exists, therefore, that the drawings have been added to, imitated, defaced, or have even originated, in the 20th century. The impression of crudity in some of the drawings, with primitive stick figures wielding swords, might add to this suspicion in the mind of a non-nautical viewer. This author is convinced, however, that the variety of ship types, the attention to details possibly not portrayed elsewhere, and the liveliness of line indicates that some of the various artists knew their subjects well. This conclusion is reinforced by the author's discovery of similar drawings, deep inside the third cave, after several arduous climbs, where the likelihood of modern interference is far less.

Since the question of provenance must arise, however, it is worth describing the physical environs of the five locations, and classifying the drawings by their place of execution, in order to assess the contemporary nature, or otherwise, of these depictions of historical craft.

The islands of Phangnga Bay and those off the coast of West Thailand down to Langkawai in Malaysian waters are mostly a marine extension of the Permian limestones of the Kra Isthmus. They are underlain by Carboniferous shales, chert and conglomerates (Stevens, R., 1987, pers. comm.).

These limestone islands, sitting in a shallow sea of 15–20 fathoms (27.45–36.6 m), form precipitous cliff faces and isolated stacks by the erosive action of the sea at their base, and by the ease of solution of the resultant debris in the sea-water. The strata have been considerably deformed and thus the underlying Carboniferous rocks come to the surface as discrete, rounded, islands interspersed between the slab-sided limestone ones. The cliffs show limestone up to 400 m in thickness. Many cave entrances are visible in their sheer faces.

This author visited numerous such caves on many islands in the area in the hope of finding more ship drawings, and in the further hope of finding extensive, unexplored cave systems. With the exception of Cave Three, described below, all these entrances led nowhere. Most form vertically linked cavities in the cliff face, perhaps where surface water has penetrated vertical fault lines. Cave Three alone appears to be a fossil river cave.

Many of these caves have become the resort of the cave swift, *Aerodramus fuciphagus* (Siggurtson, J., 1987, pers. comm., National University of Singapore). The edible nest of this bird has been relished, and imported from Southeast Asia, by the Chinese since the T'ang period (Cheng Te-K'un, 1969). The nests have been harvested from their cliff and cave sites, with great skill and daring, for hundreds of years. The gatherers were possibly the sea-going nomadic people variously described as 'Sea-Gypsies', 'Saleiters', 'Orang Laut', 'Selungs', and specifically in this region, as 'Mawken', which is how they describe themselves (see Sopher, 1977: 50 ff).

The Mawkens of the offshore islands that stretch from the Similans through the Mergui Archipelago, are recorded as being experts at climbing for the nests in the 1920s (Ainsworth, 1930).

This author tentatively suggests that it was the 'Sea Nomad' bird-nesters who admired and depicted these ships, perhaps when they called at the islands to pick up the harvests of nests.

Background

Talks with the modern harvesters of bird's- nests revealed little of interest. An initial wall of suspicion on the part of armed guards at isolated islands had first to be overcome, because of the high commercial value of the nests, (the present value in the local market is roughly one fifth that of an equal weight of gold), and because the rule of the gun is the only sanction known in the trade. At one island we were warned that the climbing ropes in place on the cliffs were booby-trapped with fragmentation grenades to deter poachers.

Fortunately, it was possible to talk with some of the men who actually climbed for the nests, rather than the goons who guard them, especially at the three caves where drawings were found, where they, and the owners of the nesting franchise, proved helpful. It became apparent that they did not know of any further ship drawings and that they had only the vaguest notions about who drew them. They did not display any particular knowledge of boats and the sea, a heritage that runs deep in the pagan Sea Nomads. These workers are all Muslims from the Satun area and they have been harvesting the nests for 'several generations'. They did not know of any additions to the drawings during their time.

Figure 1. Cave One entrance from seaward.

Figure 2. Cave One wall.

It occurs to this author that these people may have taken over the trade some time ago, say early this century, from a different group who had traditionally harvested the nests. The pagan Sea Nomads, well known for their timorous nature, may have been the displaced group, and as born seamen, may have had both the interest in ships, and the artistic inclinations, to portray what they saw.

One interesting point arose: Cave Three is known as Wang Long Cave, which translates as: 'Wang was lost here'. It is said that, 'about one hundred years ago', the unfortunate Mr Wang entered the cave, and 'has not yet emerged'. The exploring team saw no sign of him, but sympathized, it would be very easy to become forever lost in those gloomy and sometimes featureless passages. Our informants saw our photographs, and were adamant that the disembodied figure of our Chris Edwards, (401-7, 409-10), who was handling the flash illumination, was that of Mr Wang!

Cave Number One (Figs 1 and 2)

This is on the north-east coast of Koh Phi Phi Le in latitude 7° 41.3' north and longitude 98° 46.5' east. The cave floor is about 3 metres above the reach of the sea and is covered in guano from a long occupation by the swifts.

Figure 3. Cave Two wall.

This cave is visited by tens or hundreds of tourists every day during the calm season from January to March. The visitors do not appear to have defaced the paintings in any way. The pictures are at eye level on the north wall near the entrance.

In view of the three locations in another cave, this site is called Location One.

Cave Number Two (Figs 3 and 4)

This is in a scenic inlet on the south-west coast of Koh Phi Phi Don, in latitude 7° 43' north, longitude 98°46' east. The inlet is regularly visited by tourists in small boats but in smaller numbers than Cave One. Cave Two requires a 4 m vertical climb up a rickety bamboo ladder from the beach and so is open to any active person. This is called Location Two.

Cave Number Three

This is much more difficult to enter. It lies close to Cave Two, but further inland up a narrow gorge between precipitous cliffs, in itself a difficult scramble over sharp karst rocks. At the end of the gorge is a vertical face several hundred metres high. The cave opening is barely visible in the face 35 m above the valley floor. A near-vertical ladder of rotan and bamboo, rotten and overgrown by vegetation, reaches to the cave. This was scaled by a light and very agile member of the author's crew who let down a line for the others who climbed the rock face.

This would not be an easy climb, even when the ladder was new, and it is unlikely that the drawings have been influenced by modern, casual, visitors. The modern bird's-nesters were certainly the makers of this ladder, and of two others inside the cave, which they renew when necessary.

The plan and elevation of Cave Three were done by the author using compass, inclinometer and tape measure (Fig. 4).

Location Number Three

This is just inside the entrance and contains only a few drawings.

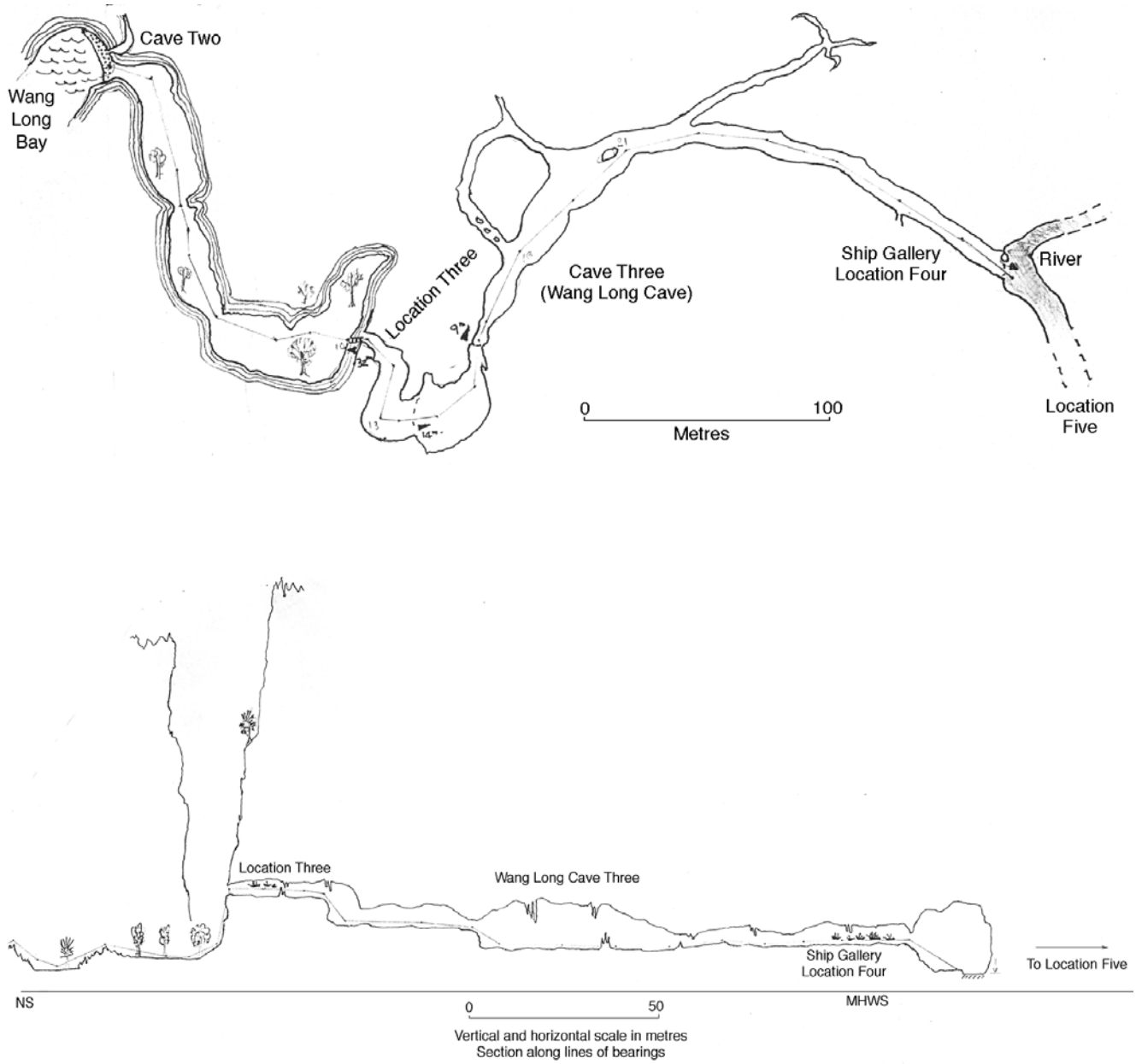


Figure 4. Pan of cave complex (above) and cross-section (below).

Location Number Four

Deep inside Cave Three, at a distance of approximately 400 m further in, and involves the descent of two overhanging pitches of 12 m and 9 m respectively, in addition to the initial 35 m ascent. Again these were descended using the author's climbing gear, to avoid damaging, or trusting, the half-rotten bamboo ladders in place. There are about 40 drawings of ships spanning about 50 m along the wall of a natural gallery, where the rock is light coloured and fine textured.

Location Number Five

Even further inside Cave Three, about 150 m along the river to the south-east. There are two walls with ship drawings in a gallery to the north of the river passage. This gallery was chosen for its fine, light coloured rock, similar to Location Four. The rest of the cave walls were mostly gloomy and dank.

This gallery was not discovered by this author, but its existence was subsequently brought to his attention by Mr Eric Valli who was working on a pictorial representation of the Bird's-nesters' work (Valli, 1990). Mr Valli very kindly supplied photographs of the ships there.

Figure 5. Entrance to bay (right) where Caves Two and Three are located. Author's ketch in foreground.

Figure 6. A newly built *perahu bedar* named *Naga Pelangi* photographed by the author in 1986.

Figure 7. A *bedar* at sea off Trengganu, Malaysia, in 1965 (photo author).

The ships (see illustrations)

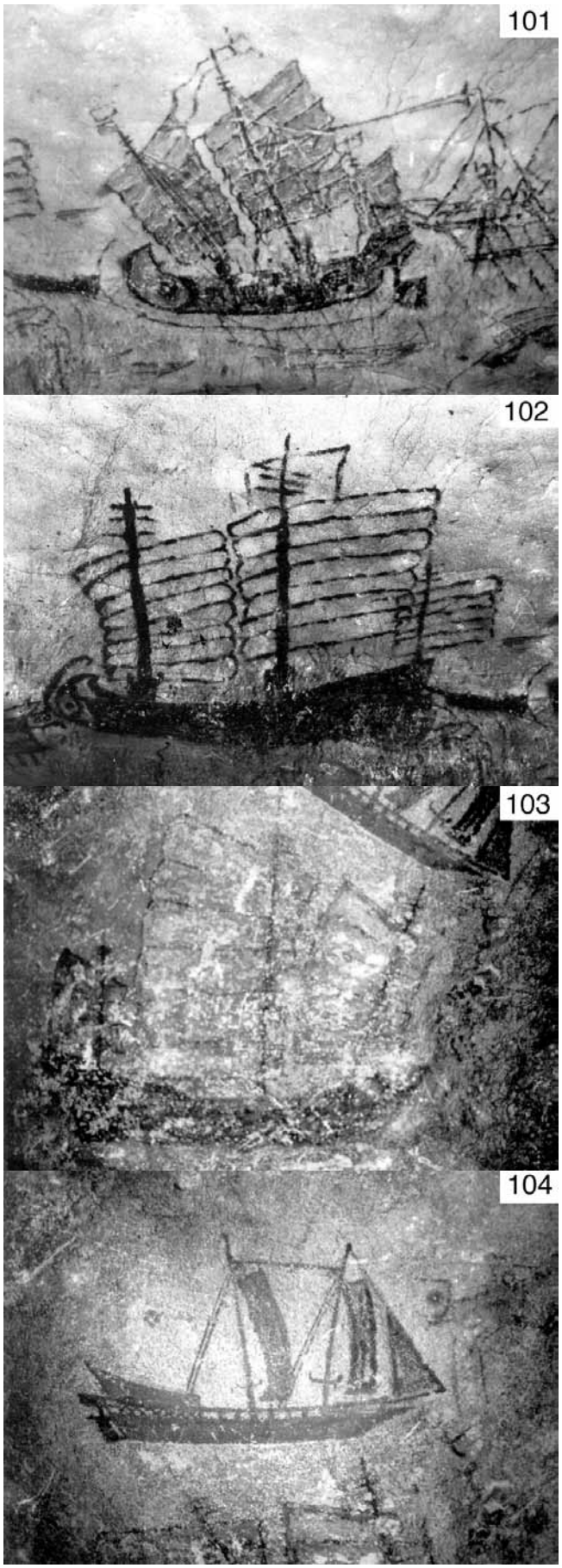
All but the most insignificant drawings have been illustrated and described below in order that any future tampering with them should be noticeable.

The drawings are numbered 101, 102 *et seq.* for Cave One; 201, 202 *et seq.* for Cave Two, etc., 401 *et seq.* for Location Four, etc. Photographs of these drawings on uneven rock faces show a view from a single point. The human eye is more able to allow for the distortion produced by the uneveness of the surface and so gets a more balanced, ship-like shape, with less exaggeration of curves. On the other hand, the dim light of the explorers' lamps was insufficent to show detail that emerged in the flashlit photographs, especially the order in which the drawings were arranged on the walls. The sketch of the mural painting at Location Four may not be completely accurate, for these reasons.

A string marked at 10 cm intervals was used for scale, since a rigid measure could not be carried during the climbing.

Terminology

To describe details, the author has attempted to use 19th century English nautical terminology (Falconer, 1780; Steel, 1818). This is not very satisfactory, but in the absence of a standardised nomenclature for the Southeast Asian vessels of many different language groups, there seems to be no other means—modern yachting terms being even less appropriate. Thus 'beak-head' has been used for an apparent extension forward of the hull planks or wales, although some of these illustrated may just be heavily drawn 'bowsprits'. A further extensin of a genuine pole



bowsprit should then be called a 'jib-boom', a spar clearly illustrated in Paris (1842) Plates 82 and 84) (labelled *'lantcha')* and in Plates 85 and 89 (*'prao mayang'*), and less certainly portrayed in 401, 417, 429, 502 and 507, where 'beak-head and bowsprit' may be an alternative to 'bowsprit and jib-boom' (Burningham, N., 1996, pers. comm.).

Because the drawings are done in profile only, and with a fairly blunt drawing instrument, some details can only be inferred from comparison of many examples. In the case of various bow extensions, some of the thicker 'beak-heads' could be bifurcate bow galleries, with the tips of the 'wings' spread wide to allow for athwartships control of the tack of a rectangular foresail on its boom, as illustrated in the '*lanchang*', in the model collection in the Smithsonian Institution (Burningham, N., 1996, pers. comm.).

Figure 6 is a photograph taken by the author in 1986 of a *perahu bedar* named *Naga Pelangi*, newly built at Pulau Duyung, Kuala Terengganu. Although she was built as a yacht for a German owner, she should display much of the traditions remembered by her builders, as both they and the owner expressed the wish to retain such features. Here we see quite clearly that the bow extension, called *sudu* ('Duck's Bill' or spoon) by the seamen of Terengganu, is the 'cutwater', or 'forefoot', carried forward and upward. This is a traditional form that started as a decoration in small paddled boats, and so any practical use in a large sailing vessel is fortuitous. Other elegant bow and stern extensions decorate other east coast working craft, such as the *kolek, kueh, tempayang* and *sekuci*, without serving much definite purpose (Puan Rohani Longuet, 1996, pers. comm.). This decorative extension is another possible form the numerous 'beak-heads' in the drawings may have taken, and illustrates the difficulties of applying foreign terminology.

Cave One

Ships 101, 102 and 103 are three-masted Chinese ships with Chinese lugsails. 102 is done in soot alone; 101 and 103 in a reddish dye in addition to soot. 103 has a faded, mouldy look which suggests great age, perhaps more than any of the others, but this may be due to being more exposed to light from the cave entrance. Ship 101 features in a picture postcard as 'one thousand years old', and these vessels are described fatuously in a local guidebook as 'believed to be of Viking ships'. A Swedish film team who included the drawings of Cave One in a documentary film of the area some years ago, were credited by local people with applying the Viking label, and it has stuck without any critical discussion. Each of these ships carries at the mast-heads triple crosspieces that are characteristic of Chinese vessels illustrated in the literature, although of purpose unknown to this author, television not being broadcast in that area at the time.

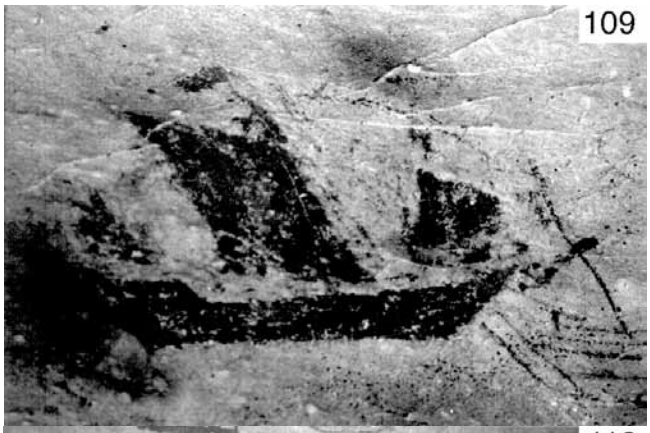
Ships 101 and 102 give the impression of being 'from China', with their curved, persumably bifurcate, bow profiles and painted eyes, and it is interesting to speculate


105


106


107


108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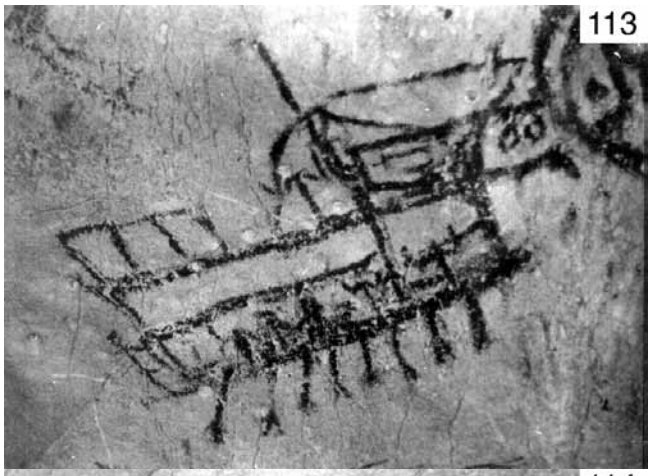
111


112



whether such visitors from far away actually came to these islands. 103 could also be 'from China', but could equally be a Singapore *tongkang*, one of the charcoal carriers of the Malacca Straits, owned and manned by Straits Chinese, that, until very recently, could be seen in ports from Riau to Penang (see Gibson-Hill, 1952).

Ships 104, 105 and 106 are a Southeast Asian design, with two masts (except 106, which has only one), each with one rectangular sail, and with a Western style steering jib set on a bowsprit. The deck-line rises toward the stern where there is an elegantly curved deck-house. The poop deck is extended in the Asian fashion out over what appears to be a canoe or sharp stern. A midships rudder is hung on the stern, with gudgeons visible in 106. The rudder stock extends up to deck level with a possible tiller projecting into the deck-house. All three feature a railing above the sheer-line, with X-shaped posts alongside the deck-house. The hulls have a sharp beak-head, and the bowsprit is above, separate from, and longer than, the beak.

The two masts are curved, and raked in the Chinese style, (foremast forward, mizzen aft or upright), but the sails, at least where they are plainly drawn (104 and 115) are rectangular, not the Chinese lugsail. 104 and 115 are the only drawings which show an upper yard supporting the sail, and 104 may have a lower yard or boom, the only example. 104, running down-wind, has the yards braced horizontally athwartships, in the position of a true Western square sail.

Ship 104, if it had Chinese lugsails, would bear close resemblance to the modern *perahu bedar* (Gibson-Hill, 1949) of Trengganu off the east coast of Malaysia (see Fig. 7). If both its masts were raked aft, and curved aft, on the other hand, and it had no jib, 104 could be the Philippines trading vessel described as *parao mercante* in Mouleon (1890).

Another characteristic detail is the upward curved crosspiece on each mast above the deck, which occupies the same position as a belaying-pin rail on a Western ship. These could be boom crutches, but the evidence is contradictory (see the discussion below).

There are many similar ships illustrated in the drawings at the four locations, and it is proposed to call this type Southeast Asian Type II. (Type I is described later, and almost certainly antedates Type II).

Ship 107 shows some similarities but has no deck-house, no railings and no bowsprit. It may be a smaller version. It does have an upward extension of the stern-post with a curved head, and perhaps a large steering oar or quarter rudder shipped on deck aft.

Ship 108 has a similar hull, railings, deck-house, midships rudder and beak-head without bowsprit, but has three masts with gaff-headed Western sails and two overlapping headsails.

Ship 109 is faded, done in reddish brown clay(?), perhaps haematite, or ochre. The very indistinct fore and aft sails just might be Chinese, but the sail on the midships mainmast, which rakes aft, looks like a gaff-headed Western sail, not laced to the mast, but whose foot projects further forward.

Ship 110 is certainly a Western-style schooner.

Ship 111 is a four-masted Western barque done in a very crude manner in a brownish pigment.

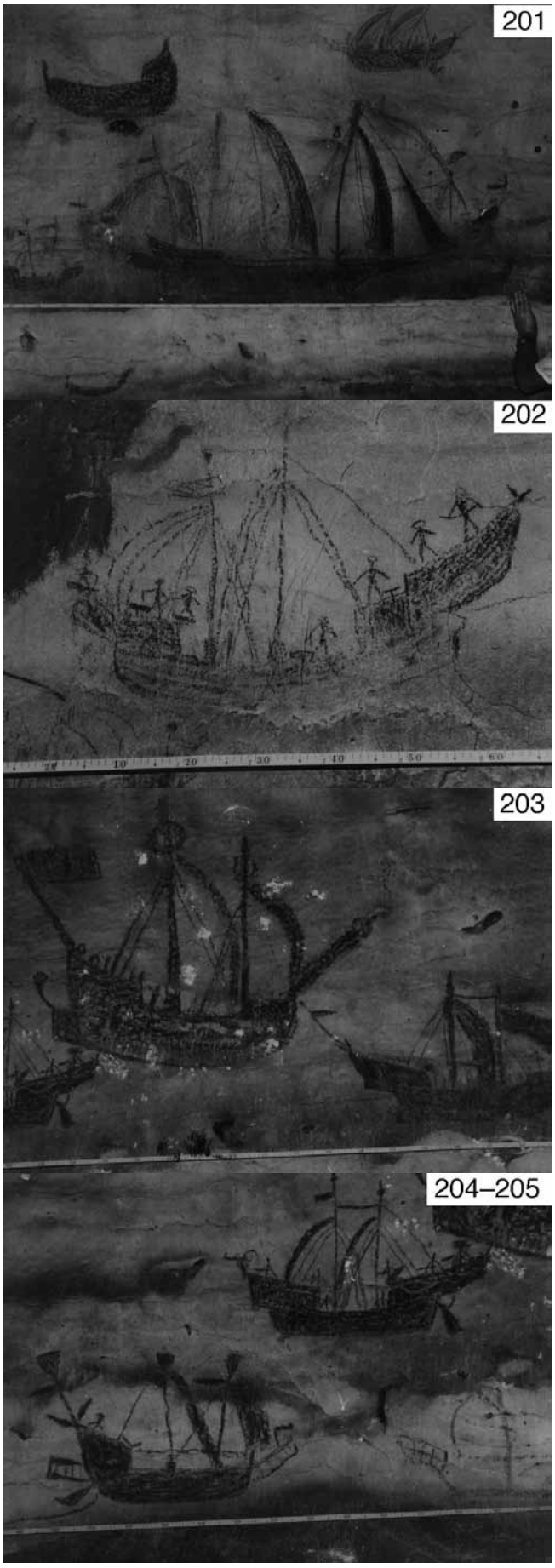
Ship 112 has a bowsprit, bobstay, dolphin striker, raised stern and forecastles, a midships rudder and a possible row of gunports, all of which suggest a Western ship. However, the masts are curved, raked more in the Chinese manner (non-parallel), and the sails look like Asian rectangular ones. The sterncastle projects well out aft of the transom and rudder, which is definitely not a Western feature. The lines separating the 'gunports' might be considered as stanchions supporting what would then be an upper deck. Such a deck is discussed below.

Ships 113 and 114 are crudely drawn open boats with eight sweeps a side each. 113 appears to have a bank of rowers low down in the hull, while there is a raised platform above them, perhaps for fighting men, as in the 'Garay of the Balangingi' (Warren, 1981, from Mouleon, 1890). 113 appears to have a midships rudder at the left end and a mast forward with a sail furled on a spar jutting out over the bow. A flag(?) flies at the bow. Ship 114 also has eight oars a side with a short bowsprit, two masts each with triangular sails (or rigging?). The crude figures of the crew are gesticulating and manning a cannon (?) in the waist. A flag flies at the stern.

Ship 115 is an indistinct Type II done in red pigment, with Western type gaff mizzen sail. The mainmast has a long yard canted and braced forward. The sail is outlined but only the forward half back to the mast is blocked in with colour, perhaps because the artist felt he would obscure details of standing rigging if he shaded it all in. This is the best indication that Type II sails were rectangular on an (equal-sided ?), upper yard.

Ship 116: there are two unfinished drawings of hulls with swept up ends. Near them is a hunting scene done in soot, with three men with a spear and a bow(?) chasing a deer. This may be much older than the ship drawings.

Ship 117 is a clearly depicted Type II with curlicues at



the mast hounds, 'boom crutches' which curve upwards, and a railing which runs from the outer end of the beak-head to the deck-house aft.

Ship 118 is a nicely drawn Type II with two masts. The mainsail being rigged higher than the foresail, there is a jib on a beak-head with no obvious bowsprit. Small 'boom crutches' curve upward, two curlicues adorn the mast hounds and the rudder is obviously separate from the stern, and has an aftward extension below deck level. On deck, there are two unidentified projections, one of them on the deck-house. In the light of drawings described later, these may be swivel cannons—*lelahs*, in Malay.

Ship 119 is a small, indistinct Type II with railings and stanchions from the outer end of the beak-head to the stern.

Ship 120 is a roughly done European sailing vessel with crossed yards on two masts, a paddle wheel (?) in a fanciful position under the keel and a funnel between the masts.

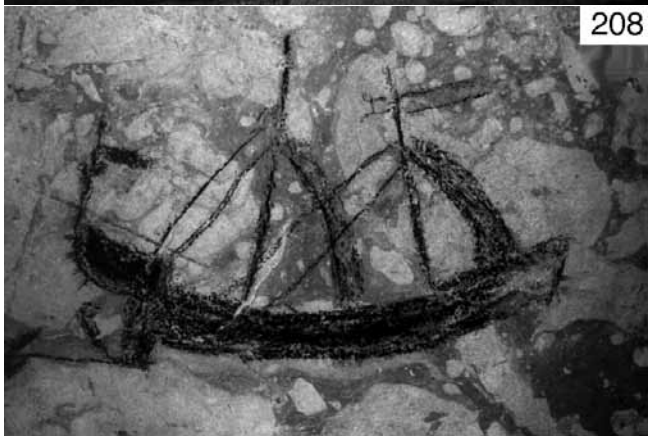
Cave Two

The results of photography in Cave Two were less than satisfactory. The majority of the drawings might seem to depict European vessels, perhaps early Portuguese ones, but they have several Asian features. They seem to have been done by a completely different hand to those of Caves One and Three, which seem to share some style of drawing in common, unlike Cave Two. Some of them are described below:

Ship 201 is similar to Southeast Asian Type II, exemplified by 104. It has an extended beak-head with separate bowsprit and jib, an overhanging poopdeck, curved deck-house aft, foremast and mainmast curved and raked in the Chinese fashion with the curved 'boom crutches' evident. In addition, it has a short mizzen mast with a Western gaff-headed mizzen sail, laced to the mast. The sails on the fore and mainmasts are merely symbolic, thin strips billowing forward with no evidence of yards or booms or clear evidence of shape.

Ship 202 is a small, crude figure of a hull, which at first sight looks like that of a Portuguese *nao* of the 16th or 17th centuries. It has a beak-head, raised fore- and sterncastles, except that the sterncastle projects aft past the stern in an Asian fashion. The two masts are positioned in the well, and are straight, in the European style, but the sails (?) are again mere symbolic lines. There is no sign of yards or Western rigging. A rather menacing crew of stick figures mans four swivel guns along the rails and a cannon in the waist, and one man brandishes a cutlass. This ship could perhaps be an Asian type, based on the aft 'house' and lack of Western sails and rigging, although the raised forecastle, mounting swivels, suggests otherwise.

Ship 203 is also a disconcerting mix of European and Asian features, with raised sterncastle, upward raked jib-boom, and two straight masts, with crow's nests or tops, a huge raked flagstaff and ensign. The sails are once again symbolic thin strips from mast-head to deck, without spars or shape. The underwater shape is depicted with a



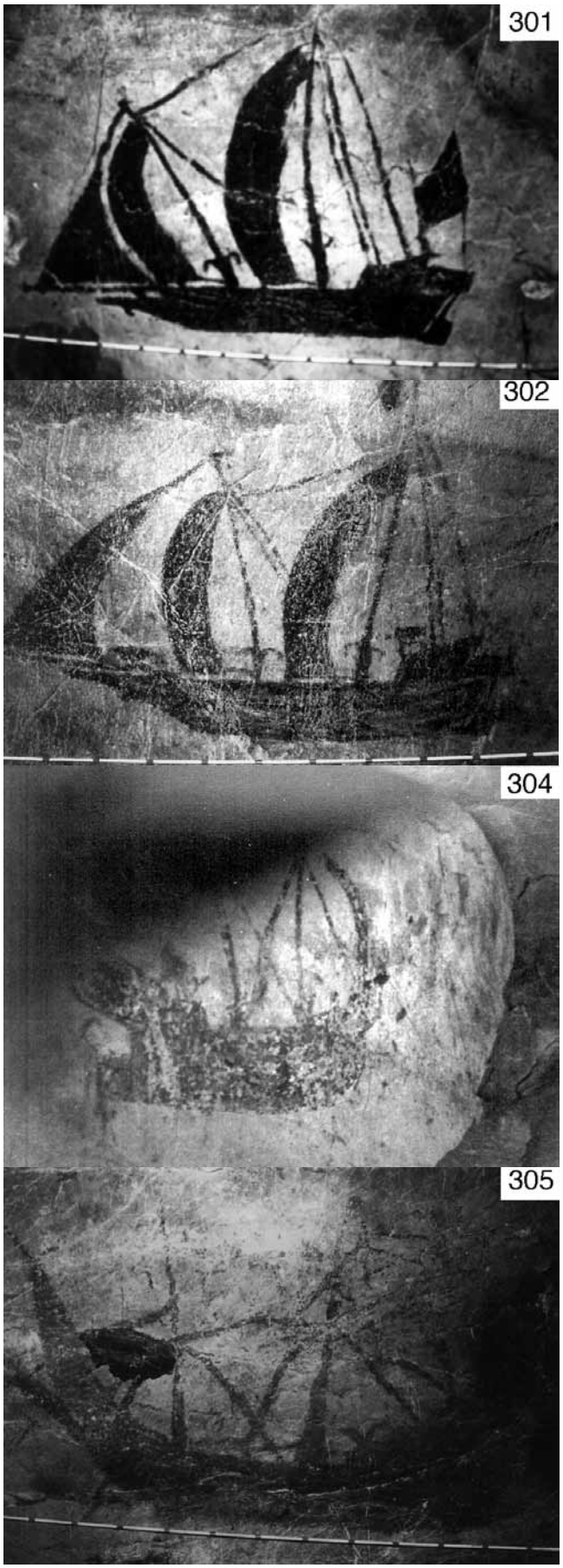
pronounced rocker in the keel, and an Asian, or Chinese, style rudder juts well aft, with a strange, decorative(?) addition. Here, the sterncastle does not extend aft of the stern.

Ship 204 is another strange mix, with raised castles, extended sterncastle, straight masts, flags, symbolic 'Asian' sails and stick figures manning swivel guns. Neither stern nor aft castle looks like an Asian house, although the latter projects well aft. A detached rudder might just be a quarter rudder in Asian style, with a curled decorative addition.

Ship 205 is extremely crude with exaggerated rocker and high poop, or roofed house, ending in a tree-like addition, with two roughly drawn masts, and Asian sails. The prow is swept up, a *dandan*, or stern gallery, extends aft below the raised house, a detached rudder might be a quarter one, some crude lines extending out the bow might form a framework for a beak-head, and a fore and aft line might indicate a raised deck. Most of these features could depict a Type I Asian vessel (described later).

Ship 206 is the only certain European ship of considerable antiquity, seen in oblique perspective. Although extremely crudely done, this hull has an enormous square sterncastle, with tumblehome, a lower forecastle, and only one mast is shown, which has three crossed yards one above the other, with suitable rigging. A huge jib billows forward from the foremast-head. A huge lantern(?) decorates the top of an enormous flagstaff.

Ship 207 is a stylized Asian vessel, with exaggerated ends, two straight masts support symbolic sails with no



yards. Faint crew members possibly brandish swords.

Ship 208 is an Asian vessel with an midships rudder, beak-head and house extending over the stern.

Ship 209 is another mix of Eastern and Western features, with fore and aft castles extending well over the ends.

Ship 210 is crudely rendered with a large curved Asian house aft, and a projection over the bow.

Cave Three

Ships 301 to 305 are just within the entrance, with daylight still visible.

Ship 301 is a very lively rendition of the 'Southeast Asian Type II' running downwind. Along with ship 104 and similar ones she shares the same curve and rake of masts, the enigmatic 'boom crutches', rectangular sails, with Western steering jib, beak-head and jib-boom, with a small mizzen. The rudder stock clearly extends up for a tiller to enter the deck-house.

Ships 302, 303 and nearby ones are variations on the same theme.

Ship 304 is a very indistinct depiction of what may be an early European ship similar to 203. She has the same bluff bows and squarish beak-head, two straight masts, exaggerated sterncastle, which in this case hangs well aft of the stern. She has the same Chinese rudder type with curved addition as 203.

Ship 305 is an indistinct picture of an Asian-looking vessel with elegant sheer and a large extension of the stem upwards (or a sail?)

Ship 306 and 307, (not illustrated) are dim pictures, respectively, of a European square-rigger and a modern fishing boat. This last was not photographed, unfortunately, since in style and medium of execution may have been relevant to the question of age of the other drawings.

Location Four (Fig. 8)

Ships 401 to 433 occupy the wall of a passage of Cave Three under an overhang, 400 m in from the entrance. The wall here is very fine-grained, light coloured rock, forming an attractive gallery. The photographs and sketch show most of the ships in general views, at least up to 431. Ships 432, 433 and 434 are more spread out and did not allow a general view. Some of the smaller, more crude drawings visible in the general views are not further described. It is worth noting that the flashlit photographs presented here reveal considerably more detail than was apparent in the electric lights worn by the exploring team, at least more than was noticed during the brief time available at each drawing. This suggests that the artists also were 'working in the dark' to some extent, especially since their light must have been from burning natural resin, with a flickering flame. A rotan wicker torch holder was picked up in the cave.

Ship 401 is a long (relative to the height of the masts) version of Asian Type II. The rudder is visibly separate from the hull. There is a box-like extension above the rudder

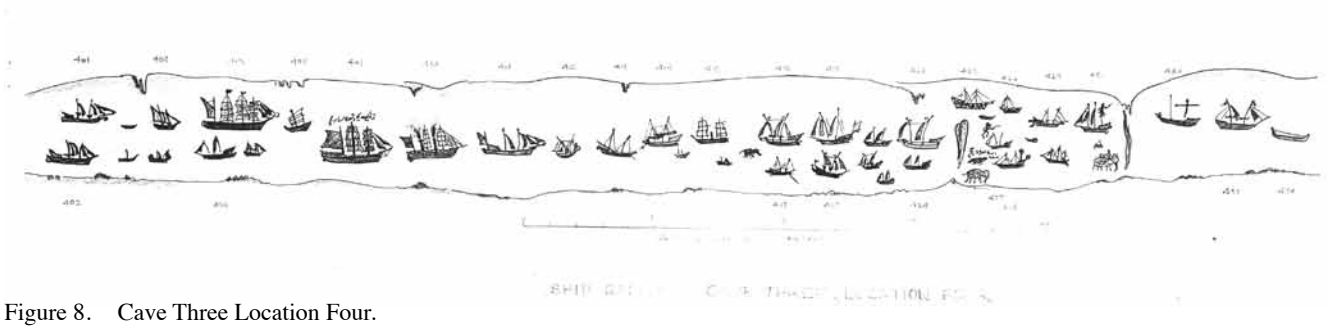
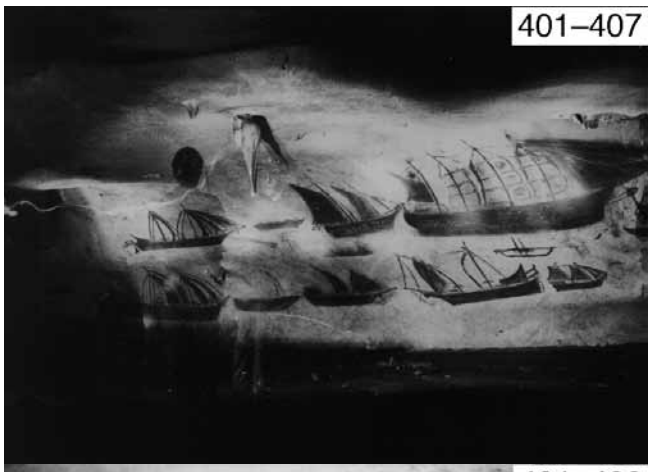
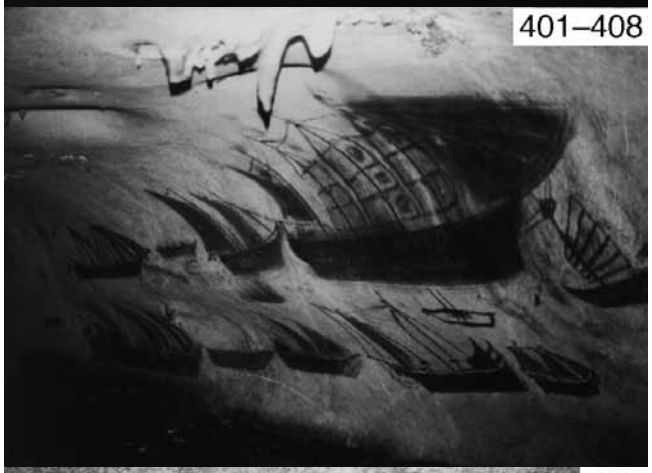
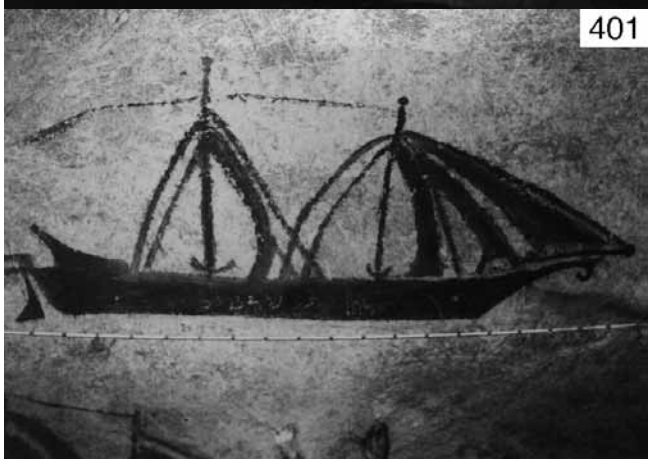
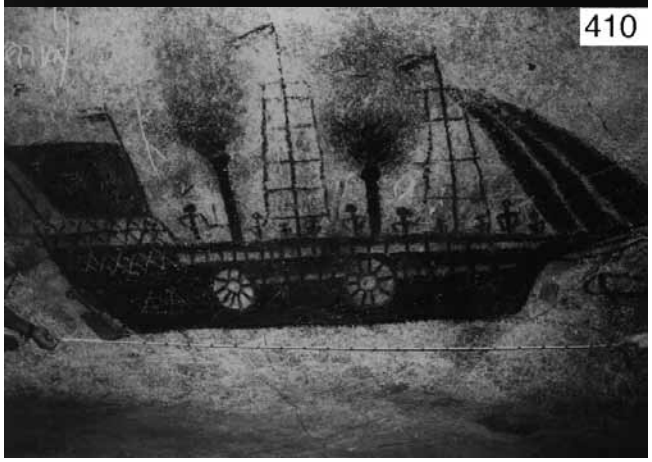


Figure 8. Cave Three Location Four.









(the heads?, or a helmsman's shelter). The beak-head is long and pointed with a curled addition. The bowsprit is clearly separate from the beak-head. The 'boom crutches' are placed near the deck and curl upwards. The two masts are nearly straight and nearly vertical, unlike the typical Type II. Two jibs are carried in addition to the rectangular sail on the fore-mast.

Ship 402 is very long (relative to the height of the masts), high-wooded, and with little sheer. Its hull and bowsprit look rather European, but it has the usual Asian deck-house and (rectangular?) sails, two of them on the aft mast. The masts are very straight and vertical, a European feature. A spar at the aft end of the typically Asian deck-house looks like a mizzen mast, but no sail is set. There are three human figures on deck with two swivel cannons (?).

Ship 403 is a European-style schooner, with aft-raked masts. A thick prolongation of the hull planking looks like the other beak-heads, but would surely be a bowsprit on a European schooner. There is an inscribed figure on the mainsail, and inscibed Thai script along the hull (see illustration). This reads 'Punjatagmit', a Thai family name. This and other Thai inscriptions (405, 409, 418 and 431) are presumably graffiti added after the execution of the drawings.

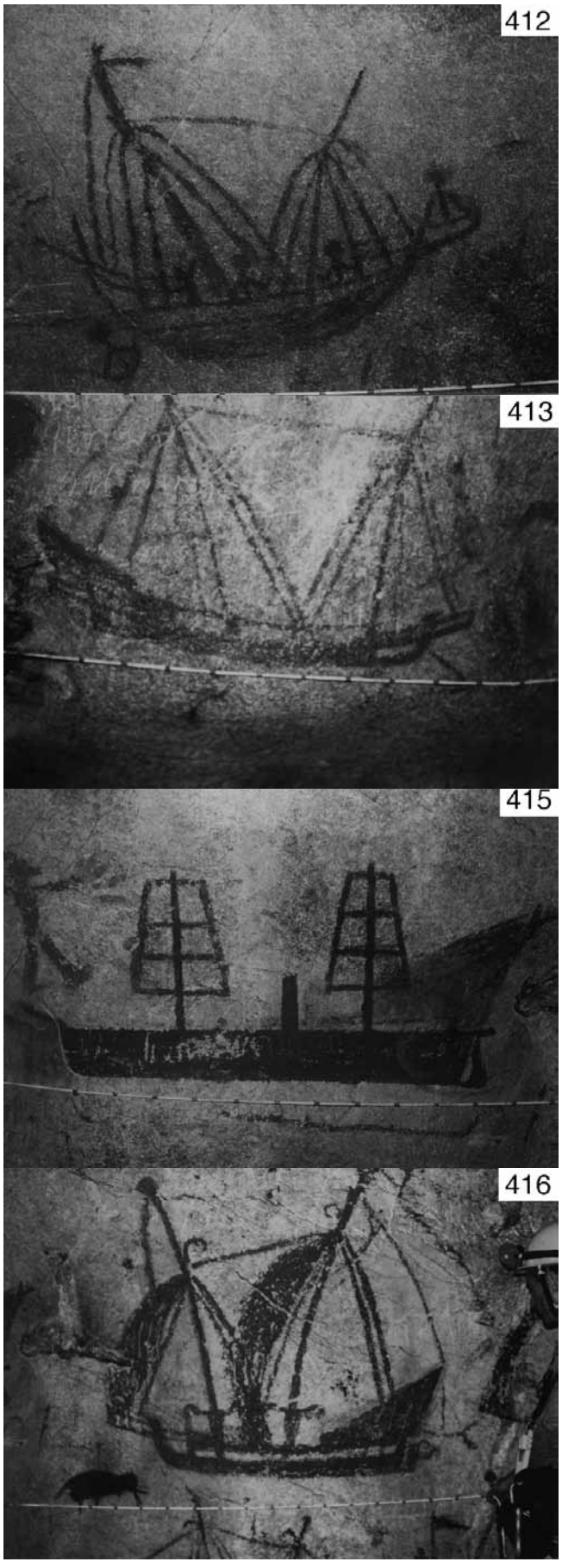
Ship 404 is not described.

Ship 405 is a four-masted barque with inscribed Thai script.

Ship 406 is a long version of Asian Type II, with exaggerated curve and rake to its two masts. The sails are roughly done, a 'box' extends half over the stern, and there is a curlicue on the rudder. The 'boom crutches' curve downwards. A long beak-head, with a circular decoration at its end, supports a bowsprit with dolphin-striker and bobstay.

Ship 408 is a crudely done, single-masted Chinese vessel, with characteristic junk-type rig and hull. This is the only Chinese vessel depicted here.

Ship 409 is a three-masted barque with Thai graffiti purportedly done in 1945. Above the ship is an inscription



in Jawi script . Doctor Liaw Yock Fang (Fang, L.Y., 1995, pers. comm. National University of Singapore) interpreted part of this as, reading from right to left: 'Illegible, illegible, *juwak sarang*' meaning '…reach up [for] nests'. Dr Liaw suggested the illegible words may be a name in an unidentified language rendered into Jawi script. Dr Miksic suggested that the name could be 'Jalal bin Karim' (Miksic, 1990 pers. comm.)

Ship 410 is a three-masted paddle steamer underway with all sail set and smoke pouring from the funnels. This is a distinctly mid-19th century European ship. Despite the reasonably accurate features, the drawing has a curiously childlike flavour. There is an inscribed floral (?) pattern on the spanker, and unarmed figures line the rail. The fact that it has two wheels each side may narrow the field of candidates with respect to date and nationality. A ship like this would have a bowsprit and jib-bbom, but here the bowsprit is drawn thicker, and looks like a beak-head, thereby further confusing the issue of bow extensions of the Asian ships.

Ship 411 is a long, three-masted version of Asian Type II with a Western gaff-mizzen set on the aft mast at the aft end of the deck-house. She carries two jibs on a bowsprit which is separate from the beak-head (?) below it, which has a downward curved curlicue. The 'boom crutches' curve upwards. A small boat under the bow, and another off the starboard quarter, apparently crowded with men, suggest that the ship is under attack, if the arrow-shaped objects above the headsails could be interpreted as projectiles.

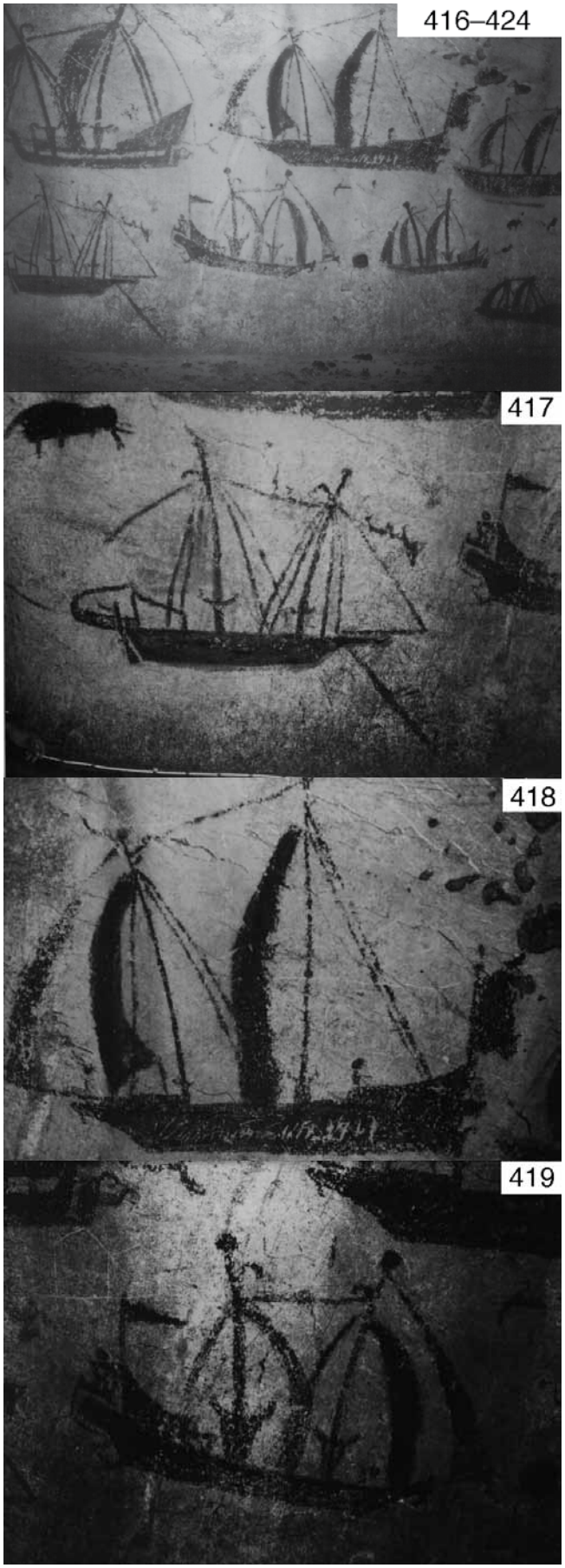
Ship 412 is a crudely drawn two-masted vessel, with a deck-house and a beak-head (?). Several human (?) figures peer over the gunwale. This may be an open boat (a sea nomad one?) or a poorly done larger ship.

Ship 413 is at anchor, with no yards shown, and is the first example of what the author proposes to call Asian Type I. This type is described under Ships 416 and 423, below.

Ship 414 is another example of Asian Type I, which is notable in that, being at anchor, with cable shown, it also has its sails furled and its yards struck down. These could be simple rectangular sails on upper and lower yards. The furled sails do not rest upon the 'boom crutches', showing that the function of the latter is not as named, at least in this example.

Ship 415 is a European steamer with two masts, square rigged on both, one funnel, and no evidence of paddle-wheels, perhaps a screw steamer. There is evidence of an older, brown drawing behind the black steamer, and partly obscured by it, reinforcing an argument the the use of the brown medium may predate that of the black one.

Ship 416 can be described as Asian Type I. The rig is very similar to Type II, but carries no jib or gaff-mizzen, which, along with the complete absence of other Western features, (with its midships rudder not necessarily Western) suggests that this Type I antedates Type II. Another notable difference is that the six Type I vessels (413, 414, 416, 423, 434, 504) are done in ochre or a similar brown pigment, whereas virtually all the Type II



ships, except for 427, 433 and 435, are drawn with soot or a similar black substance. It seems possible that the torch-lights used by the earlier bird's-nesters did not provide a suitable drawing medium, and they therefore carried a brown pigment in with them to while away the non-working hours in artistic, or more purposeful, expression, whereas later artists found their medium directly at hand in the soot of their torches.

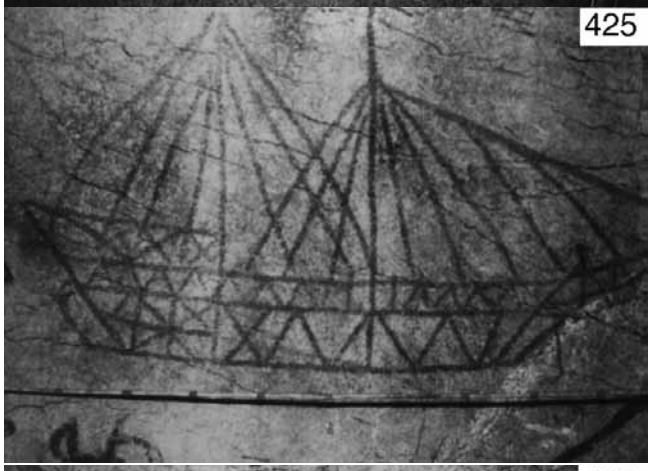
The hull of this proposed Asian Type I is very different from that of Type II, and difficult to describe. It appears to be a long, low hull, with turned-up bow and possibly stern, like a large Amerindian canoe, at least in profile. A curved line occupies the exact position where the sheer-line of the deck might be expected, but is separated from the hull underneath by a gap, through which can be seen parts of the rigging, the bases of the masts, etc. However, the deck-house sits on, and does not project below, this curved line suggesting that the line is more probably a separate deck rather than a side railing.

Amongst Asian vessels fitted out for fighting, a raised deck was not uncommon whence armed men could hurl projectiles down into an enemy craft, in the same way as the first castles were used on European ships. Such an extra deck would facilitate the employment of two banks of sweeps, another essential for heavily manned fighting vessels, especially pirates, who are several times reported pulling away rapidly upwind from an approaching sailing man-of-war. Among many Asian examples is the *Garay* of the Balangingi (Warren, 1981). In 414 the 'upper-deck' line might be interpreted as an outrigger float, but not in the others.

A beak-head represented by a hollow rectangular box projects ahead of the curved-up stem piece. There is an elegantly curved deck-house aft, and an midships rudder, as in Type II, but with a curled, (decorative?), extension on top of the rudder-blade. The masts have large circular knobs on top and there are pronounced curlicues at the mast hounds, the forward one facing aft, the aft one forward. The 'boom crutches' are large, curl upwards and then down, and the forward one has an extension down to the deck.

Ship 423, another Type I, is virtually identical with more detail. The elegant sheer-line of the lower hull, and that of the 'upper deck' both continue forward to form the top and the bottom of the box-like beak-head, which supports a mast-head forestay. Two sets of shrouds extend down to the 'lower deck' line, reinforcing this interpretation. The 'boom crutches' have lost their curls and are continued down to the lower deck as wedge-shaped solids. Here they look more like mast tabernacles than boom crutches. The sails billow forward with the usual lack of detail of shape or of yards. There is an object sitting forward on the 'upper deck', which may be a horizontal, athwartships, windlass in the Chinese style. This ship was drawn with a very sure hand.

Ship 434 is done in a brown pigment, is incomplete, with no masts or rigging, and no deck-house; but the



hull looks like a Type I. Both ends of the hull curve up, especially at the stern. A single curved line appears to delineate the 'upper deck'.

Ship 417 is a crude form of Type II, with a straight sheer-line. It lies at anchor, has a long bowsprit (or beak-head?), visibly separate jib-boom, and 'boom crutches' that curve upwards. The deck-house is outlined only, rather than blocked in, and has an apparent roof-like extension over the stern. Under this roof, the rudder stock clearly extends above deck-line, and is fitted with a tiller that points aft, rather than the more familiar one that points forward. The modern Bugis *Pinisi* retains this style of tiller on its twin quarter rudders.

Ship 418 is a Type II with mizzen sail set on a small mast right at the stern, a jib set on a bowsprit separate from a beak-head and merely symbolic 'boom crutches'.

Ship 419 is a very pretty picture of Type II, with decorative(?) balls at the mast-heads, curlicues at the mast hounds, under the beak-head and under the bowsprit, very prominent 'boom crutches' that curve upwards but also continue down to the deck as solid wedges, suggesting that they form mast tabernacles. Only a flag flies on a small spar aft. On the extended poop-deck there is a man either steering with an aft-pointing tiller, or answering the calls of Nature.

Ship 420 is a crude and incomplete Type II.

Ship 421 is a Type II with balls on the mast-heads, curlicues at the mast hounds and jib-boom and a large aft 'boom crutch' looking like a mast tabernacle.

Ship 422 is a small and crude Type II.

Ship 423 is described above.

Shio 424 is a a crude Type II.

Ship 425 is crudely done, with puzzling features. It has two masts with an unlikely forest of stays. There is a deck-house aft, a midships rudder set on a sloping stern, and a beak-head. Many internal frames(?) are depicted in a trellis-like fashion.

Ship 426 is also crude, with one mast supported by many stays, a sloping stem post projects high above the sheer-line, and a double set of railings(?) extends from stem to stern. An awning(?) shelters a helmsman aft.

Ship 427 is a crude Type II, done in brown, rather than black. A figure above it suggests one of the anthropoid characters from the *Ramayana*, such as Hanuman.

Ship 428 is a strangely adorned, roughly done vessel. Above it is an insription in Jawi that reads in Malay, from right to left: '*Ini perahu yang*…[illegible last word in second line]' meaning: 'This is the ship that…' (Miksic, 1990, pers. comm.; and Dr Liaw, 1995) It is a pity the last word can not be recognized, as this might give some clue to the motives of the artists in drawing these ships.

Ship 429 is a stylized version of Type II with no sails set. The deck-house is very curved, a box extends over the stern, above a detached rudder, there are small curlicues above the mast hounds and at the jib-boom. The 'boom crutches' curve upward, and the separation of bowsprit and jib-boom is marked by three vertical lashings.

Ship 430 is another crudely done Type II in brown, and with upward curving 'boom crutches'.

Ship 431 is a stylized Type II; strongly rendered. The fore and main mast-heads are decorated(?) with triangular blobs, there are aft curving curlicues at both mast hounds, and all three masts are straight and vertical. The bowsprit extends all the way from the foremast, and is clearly separate from the beak-head. There is the usual curved deck-house. Graffiti have been incised on the hull in the form of a curly pattern and some Thai script. The rudder is hung on gudgeons and pintles. A larger than life human figure perches atop the aft mast-head wielding a pointed object.

Figure 9. Ship illustrations from wall of Cave Three, Location Five (501–508).

Ships 432 to 435 are separated from the main gallery, and are all drawn in brown pigment. Ship 432 is indistinct, in dark brown pigment, and appears to be a long hull with one (or two?) masts. The clearly apparent mast is crossed by a long yard. This may be a crude rendition of a Chinese ship.

Ship 433 is a roughly done Type II in brown pigment, with very high boom crutches, and pennants at the mast-heads.

Ship 434 is described above.

Ship 435, whose position on the wall is uncertain, is a Type II done in brown pigment with a blunt instrument, such as a finger.

Location Five (Figs 9 and 10)

Ships 501, 502, 503 are standard Type II vessels. Ship 501 has a small gaff mizzen perched directly over the rudder, which would have to be sheeted from the small gallery shown extending over the stern. 502 is a larger ship with a higher gaff mizzen stepped forward of the deck-house. A large stick figure of a man stands between mainmast and mizzen. 503 is unusual in having a railing extending from the deck-house forward, apparently to the end of the bowsprit or beak-head, like 117.

Ship 504 is an interesting example of a Type I Asian vessel, again done in a lighter brown colour, while the others, Type II, are all in black. The two masts curve considerably forwards and aft. They reach much higher than the point where the yards are hoisted to, for no apparent purpose, and their mast-heads are decorated with large round balls. At the hounds there are curling extensions very similar to those of ships 416 and 423. There is a hint of a mast-head forestay to the beak-head, as with 423. There are shrouds to both masts, and a 'triatic' stay between the masts at the hounds. The 'boom crutches' are rather wide, and curve up and then down. An enigmatic line is secured on the top of the deck-house, passes upwards through a pulley block (?) secured to the mainmast above the hounds, and thence forward to the yard. This could conceivably serve as a weather brace to the mainyard.

The hull, shown blocked in, has more freeboard than 416 and 423, lessening the canoe-like impression given by the latter two. It projects sharply upwards at the bow, but this does not support the inner forestay of 416 and 423. The enigmatic upper deck is shown here by two lines (strakes?) running from the stern to form the beak-head at the bow, although there is a slight break in the lines at the 'windlass', suggesting that only the upper strake extends forward to form the base of the beak-head. Once again, these strakes are distinctly clear above the hull, and the masts descend below them, while the deck-house sits on top. There is a large T-shaped device forward of the foremast, similar to that of 423, which may be a windlass. This object projects below the 'upper deck', which would be necessary for a windlass, whereas that of 423 sits upon it. A curled attachment decorates the rudder, like the other two.

Ship 505 is a rough Type II notable only for having three crude crewmen standing on deck, with one peering over the top of the deck-house, possibly the helmsman using a tiller pointing aft. There would seem to be no other way to steer a vessel as Type II with such an upcurving deck-house blocking the view. Dr Pierre Yves-Manguin has suggested that the tiller may project to one side for this purpose (Manguin, P-Y, 1995, pers. comm.). Burningham (1996, pers. comm.) suggested that the yoke lines, or tiller ropes would be used more likely for steering.

Ship 506 is a crude drawing of an unknown ship type, with enormously curved-up ends, two masts in the well with shrouds and crossed yards, and a flagstaff (?) perched at the stern.

Ship 507 is a nicely depicted Type II. It has a gaff mizzen very near the stern that is sheeted to a stern gallery. The midships rudder appears to be shipped on gugdeons and pintles, and has a slight curling addition on the top of it. The bowsprit is raked up and separate from the beak-head below it but is braced down to it with lashings.

Ship 508 is a roughly drawn Type II with several crewmen depicted, and two T-shaped objects atop the deck-house, like several other similar ships. Only here, however, does one of these objects look convincingly like a

Figure 10. Ship illustrations from wall of Cave Three, Location Five (601–602).

swivel cannon, with its 'tail' curving upwards like the *rabo* of the 17th century Portuguese *falcoe*, or swivel. A high mounting is ideal for such an anti-personnel weapon, and although it seems doubtful that an *attap*, leaf-roofed deck-house, could support even a light gun. Warren (1981) definitely depicts one on the *parao mercante*, in the frontispiece (Warren, 1981, reproduced from Mouleon, 1890). If this object on 508 is a swivel cannon, then this is the only definite example in these caves of an Asian vessel being armed.

Ships 601 and 602 are the only ships worth commenting on in detail in the other wall at Location Five, whose position, relative to the wall with ships 501 to 508, is uncertain.

Ship 601 is very perfunctorily sketched, but does show an upturned prow, and an extra deckline, or strake, separate from a lower (gunwale?), both attributes of Type I. It is also done in light brown pigment.

Ship 602 could be a crude Type II hull without any projection over the bow, and with its yards struck down, without any evidence of 'boom crutches'. The notable point is that the midships rudder appears to be fenestrated in the Chinese fashion, with horizontal openings. A horizontal object set on a vertical prop on top of the deck-house does not look like a swivel cannon.

The other drawings accompanying 602 on this wall can be divided into two classes. Two are Type II vessels done in black charcoal, while the other nine, including 601 and 602, are all drawn in the different brown pigment similar to those of Type I. All nine are crude in that they show little useful detail, but are consistent in showing no Western influences such as gaff mizzens and jib foresails, although four of them show misdhips rudders, a possibly pre-Colonial, Asian invention. This distribution of pigments helps to support the theory that the older vessels are done in brown pigment, before those in black.

Other depictions of similar craft

Jean Boulbet (1985) shows a two-masted, definitely European ship. He describes it as one of some '*caravelles… datable du XVIIIième siècle'*. It certainly looks 18th century in style, although it is not a *caravela* in the Portuguese sense. This ship, and some other *caravelles* are drawn in a cave on a small island a few miles to the north-west of Phi Phi Don Island.

Warren (1981) reproduces several craft from Mouleon (1898). His frontispiece, described as a heavily armed trading *prahu* (*parao mercante* by Mouleon) employed in the Philippine coasting trade, has a clipper-bow, canoe stern, two curved masts with simple rectangular sails set on a yard at the top and a boom at the foot. The curvature aft of each slender mast seems to be brought about by the tension of two permanent shrouds, forming a tripod in effect, and obviating the need for a forestay on either. This would appear to allow the ship to be tacked in the same manner as a Western square-rigger, by bracing the yard (and boom in this case) around forward of the mast, rather than 'dipping' it down and aft of the mast. This possibility is enhanced by the yards being apparently equal sided about the mast. No braces are shown, however, along with a complete absence of any running rigging.

This vessel has an midships rudder on a pointed stern, an *attap* house at the stern, and stern gallery. All these features appear in various Type II ships in the cave drawings. In addition, there are three swivel cannons mounted, one on the *attap* roof, (as possibly in 508), and five oars on each side. A full bulkhead projects up to form a decorated, defensive bulwark in the bows, surmounted by a swivel. On larger craft this bulwark might be pierced for a muzzle-loading piece of greater calibre. The top-most gunwale strake is projected forward on each side (to form a platform for anchor handling? or for bowsing down the tack of the foresail?—the drawing does not inform us). A

higher strake is extended aft to form the stern gallery, in a manner similar to Type I drawings. The rudder-head is pierced athwartships for a simple yoke to take tiller ropes (which may lead to a wheel?). The rudder is mounted on gudgeons on the sloping stern-post.

Warren's figure 20 (1981) depicts the 'Garay of the Balangingi', of the Sulu Archipelago. (Mouleon's description is *'Panco Pirata Malayo*'.) This type has a raised framework which could be easily decked over for carrying fighting men, with banks of oars on both upper deck and along the gunwale, three boom crutches on posts, separate from the (single, tripod) mast, which has a curled decoration at the truck (but which faces forward), and which carries a simple square sail on two yards, to name the similarities with the cave drawings. Figure 16 (Warren, 1981) shows a Balangingi *garay* with two banks of sweeps each side, the upper bank being worked from the 'upper deck'. This hints at a possible similar use for the 'upper-deck' of Type I.

In the Sarawak Museum in Kuching are some models of native sailing craft. One of these is illustrated (Fig. 11). It bears considerable resemblance to ship 104, and the many other similar drawings. The similarities include the following: the model has a foremast which is raked and curved in the same way, (the mainmast, however, is straight and vertical). Both masts have decorative balls at the mast-head, each supports a rectangular sail set on an equal ended yard at the head, (the model also has a boom across the foot, an attribute for which the only evidence in the cave drawings is 104). It has a similarly shaped hull in profile with a beak-head and bowsprit. The model carries no jib, but it obviously could do so, it has a midships rudder on a pointed stern, under a European, rounded counter, or 'clipper stern', which would look quite like an Asian extended poop in profile. It has a deck-house aft, although rectangular in shape. The deck projects out from the side of the ship, (to facilitate the use of oars by increasing the scope of the loom inboard?). When viewed from the beam, and when sailing down-wind, the sails almost vanish into mere strips billowing forward, as in many of the drawings of this type. If it were not for the presence of forestays on both masts, these sails could be tacked about as in a Western square-rigger, the yards and booms being equal-sided. Both yards have braces, with a two-part purchase through pulley blocks, and permanent shrouds on both sides, all features of Western square sails. Burningham (1996, pers.comm.) suggests, however, that the sails of this model may be incorrectly set. The model shows other definitely European features, such as steering wheel and helmsman's shelter.

The hull of this model answers reasonably well to the depiction of the *lancha* or *lanchang* in Warington-Smyth (1906b) although the rig is described differently (Warington-Smyth, 1906a). The Malay word *lanchang* to this day denotes a swift sailing vessel. Neither the model nor Warington-Smyth's depiction, however, suggest any great turn of speed.

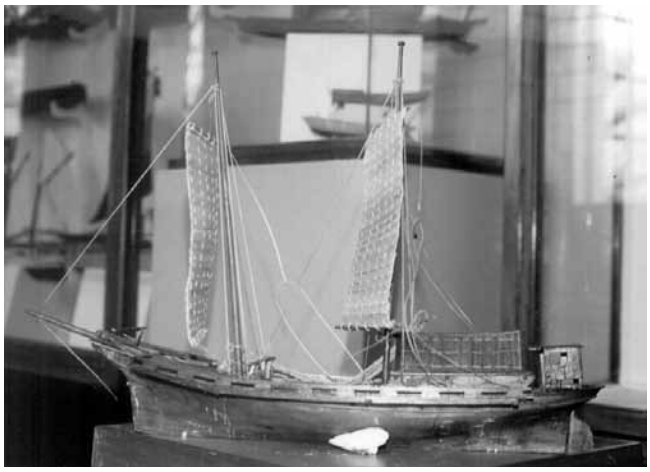


Figure 11. Model of native sailing craft in the Sarawak Museum, Kuching.

Unfortunately, this model in the Museum was unlabelled and the staff were temporarily unable to supply a description or information about the origin, save that it was thought to have been made as recently as 1954. It is likely, however, that this represents a typical coastal cargo vessel, perhaps of early this century, and probably Malay. It is quite possible that such craft sailed to West Thailand in the bird's-nest and other trades, and it is likely that the Asian Type II of the drawings is an earlier form.

Early documentary evidence for boom crutches exists: the Javanese *mayang* drawn by Thomas and William Daniell around 1800 has its yards resting in one. The Javanese *pencalang* drawn by Paris in 1842 has a pair of crutches exactly like those of Ship 104, without their purpose being explicit. These two drawings are reproduced in Horridge (1985: viii, 49). There are, of course, many modern examples in Indonesia of boom crutches in use.

Some of the features depicted in the cave drawings appear on otherwise dissimilar vessels in the historical records. To account for these differences between roughly contemporaneous vessels, it may be that the cave drawings represent ships which frequented the Malacca Straits, and not the Java Sea, the source of most of these examples, some of which follow, in chronological order:

A chart from the J. V. Mills Collection in the National Library of Singapore shows a small drawing of a Southeast Asian ship in the waters of eastern Indonesia (Fig. 12). This ship has the curved-up prow of Type I, a similarly shaped house, and a hint that there could be a gap between gunwale and an upper deck. The rig is different in having straight, vertical masts, with two sails shaped more like the Arab Lateen than the rectangular sails of Type II. There is no indication of any rudder. This chart is tentatively labelled 'Visscher 1617, Nationality?' in the collection, but looks more Portuguese than Dutch, and of a slightly earlier period.

This vessel in turn shows affinities with a series of ships on other charts of the late 16th and early 17th centuries, such as Landgren (1598), Blaeu (1647), and

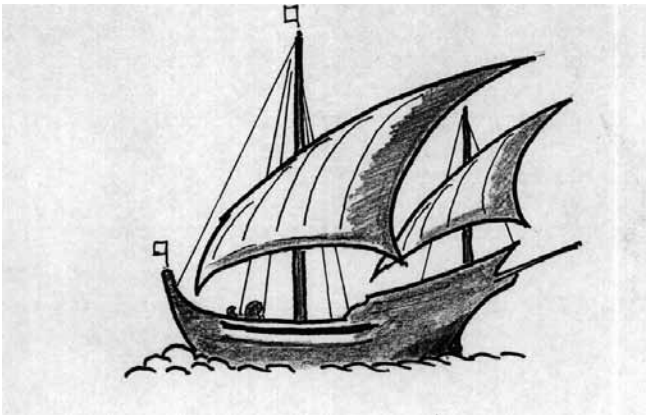


Figure 12. Sailing vessel depicted in East Indonesian waters on a chart of *c*. 1600.

in Lodewijcksz's *D'eerste Boeck* of 1598 (Lodewycksz, 1915). These vessels have been described as *jonque*, and as *jong*, and represent a smaller form of the very large trading vessel type described by the Portuguese on their first arrival in Southeast Asia, and which later disappeared from the scene (Manguin, 1980). These images show quarter rudders, and canted square sails, with a spritsail on a yard set under a bowsprit, and a highly swept-up poop on a pointed stern without a gallery. The only apparent ancestral contributions to Type I are a beak-head formed by the extended wales of the hull, and the position, and rake of the two masts.

Another model, that of a *bintak* of 1850–60, is illustrated in Matthes' *Ethnographischer Atlas* (1889: plate 17, fig 1). Two canted rectangular sails are set on two straight masts, both of which have curled decorations facing aft at the mast-head, not the hounds, and which clearly do not support the halyards. A jib is set on a pole bowsprit, showing the early use of such a Western innovation. As in Type I, a house sits on a raised deck, whence six oars per side are rigged. A lower bank of five shorter oars are rigged from below the raised deck. There is no evidence of a main deck in the hull proper. The lower bank of oars have long blades, like a Western one, whereas the upper oars have only small, but wide, rectangular blades at the ends, to avoid fouling the lower bank.

Horridge (1985: 76) also shows a model of a *padewakang* of 1860, a substantial cargo vessel, presumably from south-west Sulawesi. It has an upper deck (that does not project forward even as far as the bow, and has oars rigged from it), decorative curls at the top of all three masts, and a bowsprit with two jibs, but no other similar features to the cave drawings. Instead, this ship has quarter rudders, canted quadrangular sails, and a stepped-down bow.

A vessel called *penjajap* was described as a common type of cargo vessel of the east coast of the Malay Peninsula (Warington-Smyth, 1906a). That author describes them as 'an imitation of European build, with transom stern'. The cave drawings, being beam-on silhouettes, do not show for certain whether the stern is transom, or pointed, but the curves of the hull suggest the latter. Puan Rohaini Longuet, an historian of traditional vessels in Trengganu, does not recognize the name *penjajap,* nor the vessel illustrated by Warington-Smyth, as an east coast Malay tradition, and her informants among retired *nakhodas* in Trengganu concurred in this opinion (Puan Rohaini, 1996 pers.comm.). But the ships illustrated must represent a Southeast Asian vessel of some type, and both the hull shape and the rig show some similarities with the cave drawings.

Warington-Smyth's *penjajap* are nicely illustrated in sketches, as sometimes having a bowsprit, but no jibs, two rectangular sails on yards and booms, with the tack of each sail secured down when close-hauled, and the mainsail is slightly larger than the foresail. In profile she would look quite like the cave drawing Type II, but without the latter's jibs and mizzen. This seems to suggest that, if they are related, then Type II should post-date the *penjajap* of the turn of the century, although it is depicted amongst earlier European steam and sailing ships. Perhaps these vessels of the west coast of the Malay Peninsula developed European attributes earlier than the less colonized east coast. Puan Rohaini warns against assuming any close relationship between Malay vessels of the east coast and those of the west, as the *Banjaran Titiwangsa*, the central spine of mountains on the Peninsula, long kept the two coastal communities from influencing each other. They each have received different nautical influences, the east coast from China, Indochina (especially old Champa) and Siam, while the west coast from India and Indonesia, especially through Aceh, in Sumatra.

Amiral Paris, (1842), depicts *'pindjajaps'* in Plate 79, and relates that they visit the English ports of the Straits of Malacca. He describes them as narrow, with tapering ends, with extending top strakes forming a bow platform, under which there is a long extension of the stem. This bow-platform is shown supporting forestays. They have one to three slender, curving masts carrying rectangular sails of 'cotton or rush-matting', set on yards and booms. 'They are also propelled by many oars, and this and their lightness suits them for piracy' (Paris, 1842).

Logan (1849: 582) relates how, 'in 1806 passes were withheld [by the Dutch?] from all vessels of the description *penjajap, kakap,* or *balloor* because of their employment in piracy'.

Baron Carnbee, in *Moniteur des Indes*, (1846), describes the *penjajap* as a 'long, narrow boat with two masts, quadrangular sails, rowed with 20 to 30 oars, armed with two fixed cannon facing forward…which attacked in groups of up to twenty or thirty'.

Paris also depicts a Malay *lantcha* at anchor, (Paris, 1842: plate 82). The hull is pointed at both ends, with a clipper bow, jib-boom and bowsprit, stern gallery and three slender masts. The mainsail is furled and lowered, the foremast has no sail, and a gaff-mizzen sail is furled by being brailed to the mast and gaff-yard. The stern gallery is built upon the extended upper and lower wales of the hull, all of which end in a curved decoration. Unlike the

drawings of Type II, there are quarter rudders. The text describes a false deck built up on stakes and crossbeams, along the side of which is a bank of oars, although this deck is not clearly illustrated.

A modern form of Malay trader existed on the east coast of Malaysia until recently in the ships called *perahu pinis* and *perahu bedar*, described in Gibson-Hill (1953). These Trengganu-built ships sailed in the salt trade from Bangkok to Trengannu, and other coastal trades, until quite recently. The main difference between the two lay in their stern, the *pinis* had a rounded, 'clipper' stern, while the *bedar* were pointed at both ends. By the 1950s they were using Chinese lug sails exclusively, with battened panels (see Fig. 7, a *bedar,* taken by the author at sea off southern Thailand in 1965). Haji Wan Ahmad Wan Cik, a *nakhoda* retired at Pulau Duyung, identified the name of this vessel from the photo as *Setia* (1996, pers. comm.).

An example at anchor in Trengganu harbour some years later, was described in its Licence of Native Sailing Ship (*Merchant Shipping Act, 1952*) as follows:

Name: DAPAT
Length: 72 feet.
Breadth: 23 feet.
Depth: 9 feet seven inches.
GRT: 115 tons.
Built: Trengannu, 1950.

There was no official entry under 'Description and Rig', but her *nakodah,* Encik Ngah bin Muda, described her as a *'bedar'*. The DAPAT was loaded with '120 tons' (!) of salt from Bangkok, stowed in two holds separated by a 'watertight' bulkhead. Haji Wan Ahmad identified the builder as Haji Embong Haji Leh, the same that built *Setia*, at Kampung Duyung Kelab Aya.

An engraving from Marryat's *Borneo and the Indian Archipelago* (Marryat, 1848,) shows a view of Brunei with a *penjajap* type vessel coming to anchor. She has raked clipper bow, with bowsprit without any visible jib, two slender masts, the fore raked forward, and rectangular mat sails on yards. A raised deck, whereon four crew are shown, extends forward nearly to the bow and one can clearly see through below this deck. The stern may be a transom type but there is no indication of a midships rudder nor of a supporting frame for a quarter rudder.

A painting entitled *Penang from the Harbour 1856*, by Captain Charles Cazalet, includes a ship with a rig very similar to Type II, with three curved masts, long yards struck down, but not on boom crutches. It has a bowsprit, and a pointed bow or beak-head, with a dolphin striker and bobstay added. This vessel has a transom stern, with little or no overhanging gallery. The house is little more than a temporary awning. This ship is reproduced in Figure 13.

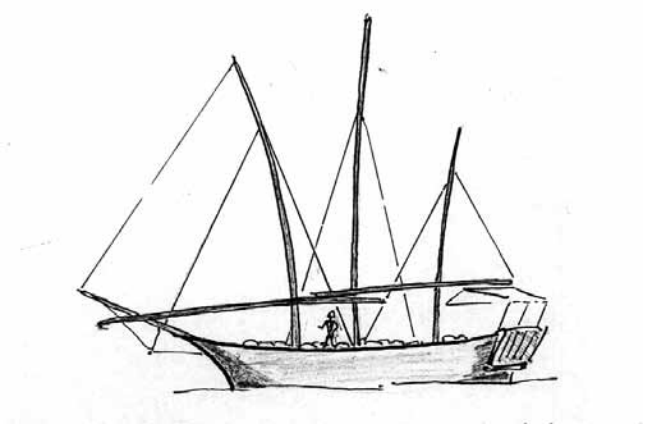


Figure 13. A local vessel depicted in Penang Harbour in 1856.

Discussion

These cave drawings are largely crude and lacking in detail. They may not all truly depict what they appear to be. Nevertheless, this author believes that some of them show more than a hint of genuine insight into long forgotten vessels.

The drawings do not add anything to our knowledge of early European or Chinese ship design. They may give a hint of relationships between the artists' people and the Europeans: the earliest possible Western ships that are portrayed, the Portuguese *naus*, have armed men lining the rails and manning cannons, either reflecting the insecurity felt by those early interlopers, or the menace perceived by the artists. It must be remembered that that the Sea Nomad people, if these were the artists, were politically unorganized and reportedly very timid, and were preyed upon by slave traders of all more organized nations, possibly including the Portuguese. It is worth noting that the figures lining the rail of a later European ship, (No. 410), of the mid-19th century are unarmed, perhaps reflecting the more ordered, lawful, conditions prevailing then.

The various artists' motives for depicting ships can only be guessed at. Their consistency and attention to technical detail suggests more than mere doodling to pass the time. The tantalizing hint in Jawi script at ship 428, 'This is the ship that…' might suggest that the ships depicted had individual importance to the artists. Perhaps each picture might have told of some accounting with that vessel, such as: 'This ship paid fairly for its cargo', or something similar. The use of Jawi indicates an educated Muslim rather than an illiterate, pagan Sea Nomad.

The idea that foreign ships might have called at these islands in order to directly take on bird's-nest cargoes is hinted at by the very existence of these numerous drawings. However, it is hard to justify in terms of the trading pattern of those days. The normal practice was for local produce to be collected at emporia such as Phuket (Junk Ceylon), Penang or Malacca, and thence shipped in foreign vessels. Siamese authorities at Phuket, and their occasional Chinese commercial agents, maintained a tight grip on export trade, and were, and still are, notorious for levying high taxes on exports, especially tin, and for thereby crippling trade (Forrest, 1792). Was it possible that the vessels depicted called secretly at the islands to avoid the levies? This conjecture could be reinforced by the absence of references to an official trade in bird's-nest

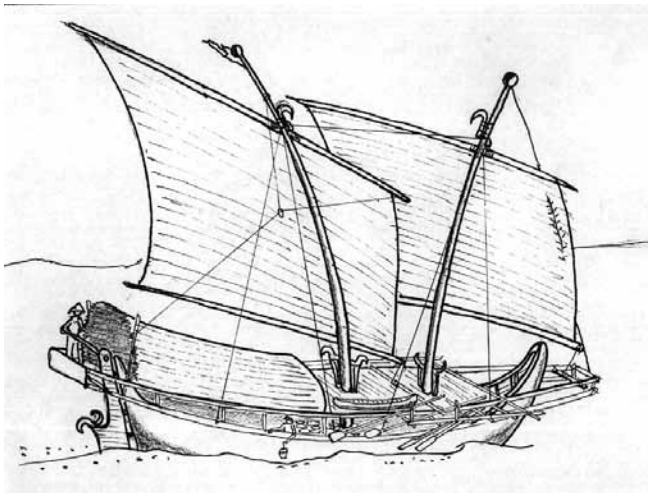


Figure 14. Conjectured reconstruction of Asia Type I vessel.

at Phuket by visitors who did note the tin trade (discussed below under 'Southeast Asian Type I').

It is the illustrations of Southeast Asian vessels that enable us to draw some conclusions about design. The drawings give no indication of materials used, the ships are represented in profile only, and the sails are scarcely portrayed with any real shape. Nevertheless, it is possible to identify enough definite features to be able to synthesize a 'typical' vessel showing all such features, where they are not contradictory.

Southeast Asian Type I

We can clearly identify one certain type as represented by Ships 413, 414, 416, 423, and 504, and already labelled as Southeast Asian Type I. This type appears to be an earlier design than Type II, which probably derives from it, because Type I shows no Western influence at all, (supposing the midships rudder here to have had an Asian origin), and perhaps because the drawings are done in a brown pigment, unlike nearly all the obviously more recent designs.

Figure 14 is an attempt to portray all the recognizable features of Type I in sketch form, along with some likely, even necessary, additions that are not portrayed. The enigmatic 'upper-deck' has been shown as just that, because the deck-house in each case rests on it and does not protrude below it. It extends over the side somewhat, following a suggestion by Manguin (1995, Feb., pers. comm.), and here it is primarily used (without evidence from the drawings) to operate an upper bank of oars, with small blades, as in Matthe's (1889) *bintak*, in order not to interfere with a lower bank of oars. In addition to allowing an upper bank, the extended deck also permits a greater scope for the inboard loom of each oar. No main deck below is shown, making this essentially an 'open boat'. Some supporting stanchions have been added, without evidence from the drawings, and a 'cargo' has been shown below the deck, in order that the structure can be visualized. The masts are shown below the deck, as in the drawings.

The box-like beak-head of the drawings has been shown here as a continuation forward of the structural members of the upper deck and of the gunwales of the hull, both outboard of the raised stemhead. The only purpose of this beak-head that can be deduced from the drawings is for supporting a mast-head forestay clear of the foresail. It has been utilized in the reconstruction for bowsing down the tack of the foresail, following the *lanchang* models of the Smithsonian collection. The beak-head would also help in anchor handling.

The sails have been shown as quadrangular sails, with shorter luffs than leaches, as being more likely than strictly rectangular ones, although the latter certainly have been used in Southeast Asia. They are set on an upper yard and lower boom, based on the evidence of Ships 104 and 115, Type II designs. A weather brace has been added to the end of the main yard, based solely on the evidence of 504. Two windward shrouds have been shown for each mast, based on the drawings. Presumably the lee rigging has been slacked off to allow for the belly of the sails, without supporting evidence. The sails of the drawings are not well portrayed, because it is possible that the artists depicted them as mere symbolic strips billowing forward, so as not to obstruct the portrayal of the masts and rigging, given the limitations of the art medium.

The 'boom crutches' have been drawn curving up so that they could serve their named purpose. However, as shown in Ship 414, they are not necessarily intended to support spars and furled sails, indeed they curve downwards in examples 301, 303, 406, and the ends recurve down in other ones, making it difficult to securely support a horizontal spar. These objects may serve different purposes in different ships, despite the outward similarity. There are plenty of examples of similarly shaped crutches in use in Indonesia today, naturally they curve upwards to support the spars.

Ships 413, 416, 423, and 601 show the stern-post extending up to meet the upper deck, and they show the great curved house extending over the stern. All these drawings apparently show a midships rudder on the stern-post, rather than the quarter rudders so widely used in the Malay Archipelago from the first records to the present day. This by itself might argue against the antiquity of this Type I ship, but, based on the other evidence, it still appears that Type I predates all the other Asian ones depicted. It is possible that midships rudders, perhaps invented locally, or adopted from the Chinese example, may have co-existed with quarter rudders for several centuries in the past, just as they do to this day. The quarter rudders of the modern Bugis *Pinisi*, and the Maduran *golekkan*, do their job to the complete satisfaction of their *nakhodas*, despite the fact that their neighbours from Butung use the 'more advanced' midships rudder in their *lamboks*. A major factor in the successful use of a midships rudder hung on the stern-post is the necessary use of iron gudgeons and pintles. It may be that an isolated community, such as the builders of the Bugis *pinisi* and *palari* at Bira, in south-west Sulawesi, having

all the wooden and plant materials necessary for a hull, fastenings, and caulking at hand locally, might eschew the use of iron imports, and continue to build their quarter rudders from wood only, in robust self-reliance.

The drawings show a curled decoration projecting aft on the top of the rudder blade. Amiral Paris' *lantcha* (Paris, 1842: plate 82) shows that the wales which form the aft gallery have similar additions at the aft end. These could be mistaken, in profile, as being attached to a midships rudder, if the ship had one. The speculative sketch of Type I shows such a decoration on the rudder.

The author's sketch shows the rudder stock extending up with an athwartships tiller pointing to leeward. Manguin (1996, pers. comm.) suggested that there is evidence for such an athwartships tiller and this would certainly maximize the view forward round the edge of the house. It is unlikely that the tiller would enter the hull below the upper deck, since the helmsman there would have an obstructed view forward, and no view of the sails. On the Bugis *Pinisi* the helmsman normally sits at the quarter rudder on the leeward side (Burningham, 1996, pers. comm.), giving him a view forward past the deck-house, and up at the sails. This author has seen Maduran *leti-leti* and *golekkan* steered from either windward or leeward sides, and this can be a matter of choice, and anyway has less hydrodynamic significance when the rudder is amidships. On the modern *tongkang* charcoal carriers of the Malacca Straits the helmsman sits in an opening cut in the windward side of the huge deck-house and handles the midships tiller with tackle, although the size of the house demands a watchman to leeward in crowded waters.

The curved additions above the hounds of the masts are shown as decorations only. Similar extensions appear on the outrigger vessels depicted in stone at Borobodur. A modern, wooden model of one of these ancient vessels, on display in the Singapore National Museum, interprets this curved piece as supporting the yard. In the cave drawings, only the one on the aft mast faces forward in a position to act in this way. The one on the forward mast faces aft, and so could not support the yard. Such a modification of the traditional method would have to be very strong to do this job, and would seem to serve little useful purpose, except perhaps avoiding chafe of the yard against the mast.

The antiquity of these Type I drawings relative to Type II has been discussed above, and is further suggested by their association with European ships of the mid-19th century (409, 410), and possibly of the 17th century (202, 203, 204, 206).

In order to suggest that it was bird's-nest hunters who drew these pictures long ago it would help to find early references to this trade in the area of Phuket Island. Some examples (mostly negative), follow:

Early European visitors to, or commentators on Junk Ceylon, as they called Phuket, included Linschoten in 1590 (Linschoten, 1598), Gervaise (1688), Hamilton (1727), Dr Koenig in 1779 (Koenig, 1894), James Forrest in 1784 (Forrest, 1792), Milburn (1813), James Low in 1824 (Low, 1833), among others. They leave little doubt that the island was for long an important trading port and all of them remark on the tin export trade and its volume, as well as sundry other exotic exports, but with no mention of bird's-nests.

Valli and Summers (1990), in their study of the nest gatherers of Rimau Cave (Cave One), report that the trade in southern Thailand was initiated about 1770 by a Chinese settler named Hao Yieng, who recognized the nests on two islands off the (west?) coast, and was given the right to harvest them by the King of Siam.

Sopher (1977: 97–98) relates that the Singapore newspapers of 1833 reported an expedition of twenty pirate boats from the Riau Islands plundering in the Straits of Malacca: 'They used to make annual visits to the northern end of the Strait of Malacca and the Mergui Archipelago in quest of birds' nests and slaves'. Carrington (1906) states 'from the islands off Trang and Kedah edible birds' nests are taken, at a value of 32,000 ticals each year'.

The trade in bird's-nests from the Phuket area would thus seem to have started in 1770. The true antiquity of the trade to China from Southeast Asia is shown in Cheng Te-K'un (1969), who states that 'traders from abroad, mainly Chinese...bartered for native products such as rhinoceros horns,...birds' nests...at Santubong (Borneo), during the T'ang and early Sung times'.

Hamilton (1727) further mentions the Sea Nomads as 'Freebooters, called Salleiters, who inhabit islands along the sea coast [near 'Jonkceyloan'] and take people for slaves'.

Many writers, from the 16th century to quite recently, lump all the various Sea Nomads together as brutal pirates. Collis (1936) remarks on this same passage from Hamilton and equates the Salleiters with the Salons (Mawkens) of his day, although by 1936 they had become 'a timid, slinking race…their warlike manner of life interrupted'.

For the Mawkens to have been the nest-gatherers and artists who produced the cave drawings, it seems necessary to believe that they were not practising professional piracy at the same time, for then they would have been mistrusted by ship captains and buyers of the nests. This author believes strongly that the Mawkens, and other Sea Nomad groups, have been unjustly accused of piracy.

It is extremely dificult for a modern visitor to the Mawkens of the west coast of Thailand to imagine these inoffensive people as descendants of pirates, being much more apologetic than offending. In this author's experience, the same observations apply, at least during the last three decades, to other marine peoples of Southeast Asia who still retain some aspects of Nomadic culture, such as the Orang Laut of the islands of the south end of the South China Sea, and of the Johor estuary. Professional piracy requires a large measure of social organization, with shore bases, numerous fighting men, and vessels specially designed, outfitted and armed, as well access

to sources of capital, and to markets for the disposal of slaves and stolen goods. The Illanuns exemplified such piratical virtues. The genuine Nomads have, and had, none of these dubious distinctions, congregating, as they did, only in small, unarmed groups, and living largely on their tiny boats, encumbered with household paraphanalia and children—hardly suitable pirate vehicles.

Nevertheless, the literature is full of references linking 'Orang Laut' and 'Sea-Gypsies'. Accounts however, equate 'Orang Laut' with 'pirates' (e.g. Tarling, 1978) so often that this author wonders whether the Orang Laut cited were at all nomadic. It seems more likely that this use of the term embraced maritime Malay groups such as the Galang, rather than Sea Nomads (see Sopher, 1977: 93). A slow evolution from a nomadic mode of life to a shore-based, more organized form of culture capable of professional piracy is quite conceivable, but a reversion of organized pirates to a nomadic life, as suggested by Collis (1936), and implicit elsewhere, seems highly unlikely. Sopher (1977: 92–93) suggests, however, that various groups of Sea Nomads may have participated as crewmen in piratical expeditions under the leadership of Malay nobles.

Southeast Asian Type II

We can summarize the observable features of this type of which there are many more examples than Type I. The typical example shows two rectangular sails on yards as in Ships 104 and 115, double backstays on the windward side, one of which may well be a halyard; a jib set from near the mast-head to the end of the bowsprit. The windward capability of the rectangular, dipping lug sails would be improved by the jib headsail (Gibson-Hill, 1949: 109), with its increased airflow over the back of the foresail.

A beak-head, probably formed by strakes extending forward from the hull on each side, serves to brace down the inboard half of the bowsprit. The masts are braced by 'tabernacles' (?) extending above the deck, and surmounted by the 'boom crutches'. A railing runs from bow to stern with x-shaped trellis pattern from the deck-house aft, as in Ship 104 and others. This suggests that the vessel may well be flush-decked, without bulwarks, like the modern *pinisi* of the Bugis. The rudder stock extends up to a tiller pointing aft, (see ship 417), where the helmsman stands in the *dandan*, the extended aft deck so characteristic of Asian shipping to this day, (see ships 417 and 419). Curling additions decorate the mast hounds, the beak-head and the extended lower wales aft, for unknown, but probably decorative purposes.

Conclusions

These drawings do not offer any new information on Chinese or European ships. As regards their history, the drawings may show that ships of both cultures called directly at these islands to collect bird's-nest cargoes, perhaps to avoid high levies at Phuket. It may be that the artists portrayed the European ships as menacing in earlier times, but not in the 19th century.

The pictures of Southeast Asian ships of Type II suggest a variation of the general type of Malay trader that included the *penjajap, lantcha* and *pinis/bedar*, common for a long time in these waters.

The drawings of Type I vessels show features that are not reproduced elswehere, within this author's knowledge. There is evidence for their antiquity relative to the Type II vessels. It is possible that these depict a design that predated the spread of European nautical influences, if the midships rudder can be regarded as a Southeast Asian invention. They may have been employed to carry bird's-nests to emporia in the South China Sea frequented by Chinese vessels. This type is possibly ancestral to the class of Malay trading vessels that include the *penjajap, lantcha* and *pinis/bedar*.

It is certain that the artists who portrayed these ships in such detail were seamen themselves, and there is no better candidate than the Sea Nomads of the area. This conclusion is supported by little direct evidence.

During a visit to Cave One the author was pleased to meet a team from the Fine Arts Department of Thailand, led by Mr Suwit Chaimongkol, of the South Thailand Archaeological Research Project (STARP). This project covers all cave sites of human habitation or art work in the area. They were busy recording the ship drawings in Cave One by tracing their details on clear plastic film in a very professional manner. The author was delighted to be able to lead some of the team to see the newly discovered drawings in Cave Three. The work of this team will obviously be the definitive authority on the cave drawings and this article serves merely as a preliminary notice of one aspect.

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