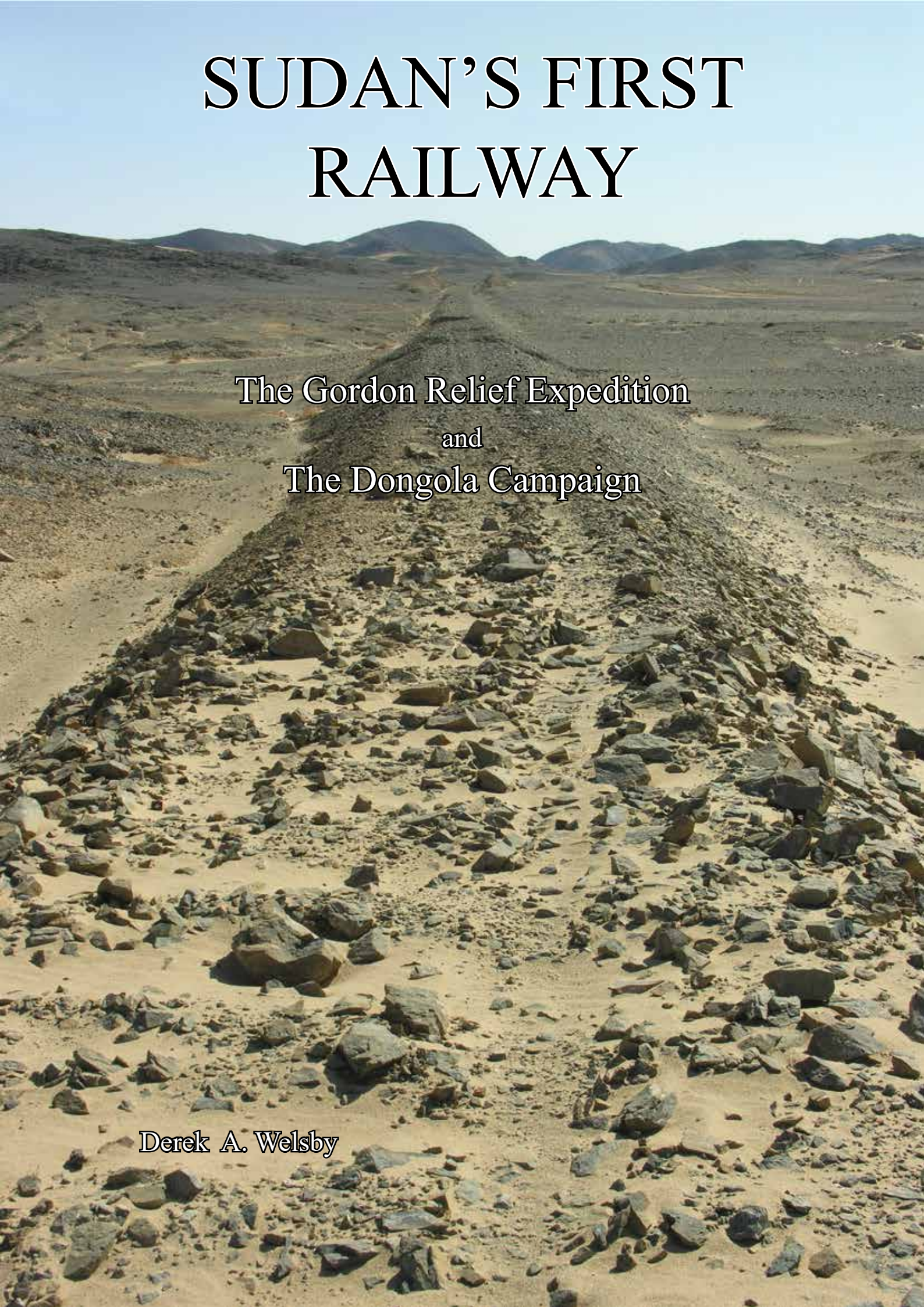
SUDAN'S FIRST RAILWAY



The Gordon Relief Expedition
and
The Dongola Campaign

Derek A. Welsby

SUDAN ARCHAEOLOGICAL RESEARCH SOCIETY
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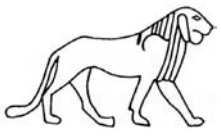

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Back cover: 'Pepper box', redoubt and tent lines at Murrat Wells.
Bridge in the desert between Kosha and Delgo.

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Sudan's First Railway

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Dedication

To my wife Isabella who has suffered much in the cause of Sudanese archaeology

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Acknowledgements

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The excellent service provided by the National Archive in Kew is gratefully acknowledged as well as assistance given by the Royal Engineers Museum, Library and Archive at Gillingham (especial thanks to Amy Adams), the Liddell Hart Military Archive in Kings College, London and the Sudan Archive, Durham.

The Digital Edition - 2021

During the production of the digital edition of this book the opportunity has been taken to correct a few minor errors in the original, to add a few additional references and particularly to include a few photographs of the installations along the railway between Abu Hamed and Atbara constructed in 1897. These were briefly investigated by a SARS team in 2013. The installations are directly comparable to those recorded along the line from Wadi Halfa to Kerma.

Following the publication of the report in 2011 Mr Peter Mackenzie Smith, long time committee member of the Sudan Archaeological Research Society, very kindly donated his copy of the very scarce report by John Fowler on the projected railway, which was submitted to the Egyptian Minister of Works in January 1873, to the Society. This is now available for consultation in the SARS Adams Library housed in the Society's office in the Department of Egypt and Sudan at the British Museum, London.

Brief history of the railway

Inception and construction of the civilian railway

The history of the railway, which ultimately was to extend from Wadi Halfa to Kerma (Figure 1), began in 1860 when the Egyptian viceroy Said Pasha (1854-1863) proposed to connect the Sudan with Egypt by a railway, and Mougel Bey, a French engineer, reported on the scheme. His estimate was so high that the project was shelved. During 1865 and 1866 Messrs Walker and Bray, two British engineers, made rough surveys for a railway from Wadi Halfa to Khartoum, with lines also extending eastwards to Massawa on the Red Sea coast and westwards into Kordofan and Darfur. In 1871 the project was revived by Ismail Pasha and enlarged in later years. In that year another detailed survey was undertaken, executed by engineers under the charge of Mr J. Fowler, between Wadi Halfa and Metemma, the report being submitted to the Ministry of Public Works in January 1873 (Fowler 1873; Gleichen 1888, 69; Harwood 1945, 4). The end result was an elaborate project for a railway from Angash (Wadi Halfa) along the east bank of the Nile to Koya (140 miles),[1] thence by the west bank to ed-Debba, and finally across the Bayuda Desert rejoining the Nile at Metemma opposite the important caravan centre of Shendi. From there it was planned to extend the railway to Massawa.[2] A branch line from ed-Debba to el-Fasher was also considered, the route was surveyed and the site of the terminal station was chosen (Hill 1945, 4). It was estimated that 608m of bridges would be required on the main line, one of 80m, two of 30m and 26 of 18m (Wierner 1932, 588). The scheme having met with the approval of Ismail Pasha in 1873, a British firm, Appleby Brothers, undertook to build the first 100 miles of 3 ft 6 in. gauge railway from Wadi Halfa.[3] Shahin Pasha, an Egyptian trained in France, was appointed consulting engineer for the Egyptian Government. The railway was officially inaugurated at Wadi Halfa in the presence of Shahin Pasha and John Fowler and the first rails laid on 15th February 1875 (Hill 1945, 3; 1965, pl. 1; Day 1964, 42). The gauge chosen differed from that used in Egypt but was adopted on the advice of Fowler who entertained the hope that it might one day be linked to the South African railway system with its identical gauge.

To facilitate the construction of the railway in Sudan the 9 mile Aswan to Philae railway was built in 1874 by Ismail Pasha to convey material around the First Cataract. It was worked by the Sudan Government (Colville 1889, I, 74).

Modifications and alterations to the scheme followed with the decision to construct it only as far as Hannek above the Third Cataract (49 miles from Koya) from which point river traffic would be used upstream to Abu Gus. Here the railway would be resumed for another 268 miles to Khartoum. The estimated cost of this scheme, with a railway 477 miles in length, was £3,500,000. A still further modification of the plan was the result of a government commission of 1881 which had decided on a continuous line of 246 miles as far as Dongola (Nathan 1887, 36).

Plate 1. View looking south from Gemai fort, October 27th 1916 (Bates and Dunham 1927, plate 1).

By 1877, the line had only reached Sarras, a distance of 33½ miles (Plates 1 & 3), and the road bed, excluding bridges, was complete for a further 21 miles, eight miles to the north of Ambigol (Sandes 1937, 99-100). The route followed by the railway was very difficult necessitating a number of cuttings up to 40 feet deep through solid rock, with 24 bridges, most of iron girder construction with stone abutments (Plate 2),[1a] one of three spans 100ft in length, extremely steep gradients up to 1 in 60 and very tight curves with radii of only 500 feet

Plate 2. Bridge over the Khor Abu Dom at Gemai in the early 1960s (photo W. Y. Adams).

[1] At Koya between Amara and Kajbar two islands were to be used in constructing the railway bridge intended to cross the river here (Colville 1889, I, 154). The bridge was to have a central span of 80m, two side spans of 30m and 26 smaller spans each of 18m. The wrought iron girders were to be supported on columns of the same material and cast-iron columns filled with concrete (Fowler 1873, 24; Harwood 1945, 4).

[2] According to Nathan the railway initially was to extend to Khartoum but this was soon abandoned (1887, 35).

[3] Ankash (Angash), 4 miles north of Wadi Halfa, was the northern terminus of the railway (Colville 1889, I, 164).

[1a] For a photo of a single-arched bridge near Gemai see Carlson 2015, fig. 3:1.

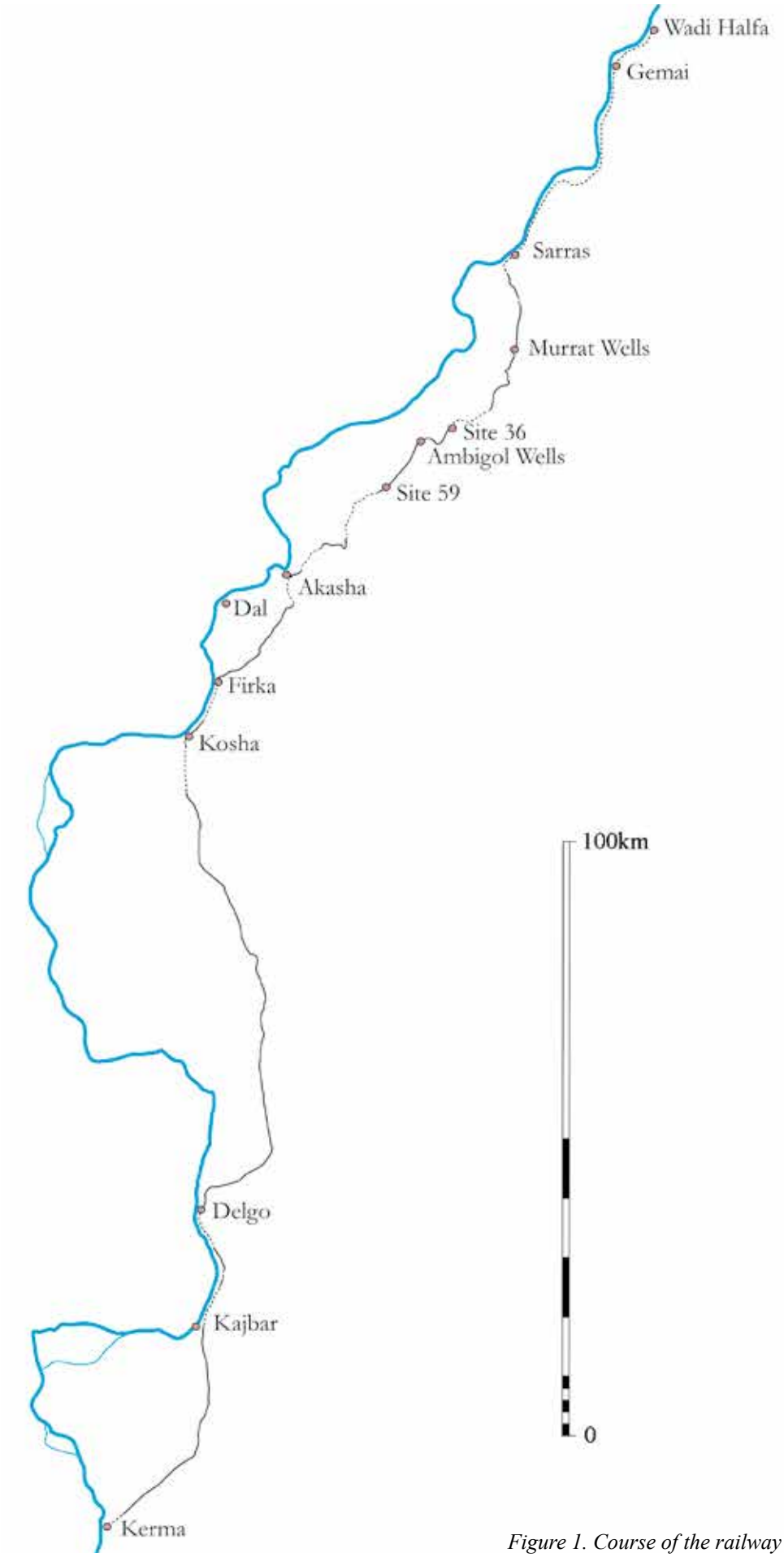


Figure 1. Course of the railway as it survived in 2010.

Plate 3. The railway between Gemai and Sarras photographed in 1935 (Sandes 1937, opp. p. 186).

(Macauley 1901, 181; Sandes 1937, 178). As a result of these difficulties the railway never functioned properly. This was exacerbated because many of the locomotives were never put under steam, they were observed by Budge in 1887 on the river bank at Wadi Halfa tied up in calico and spattered with mud (Budge 1907, II, 462). In 1877 Charles Gordon wrote "If I had the railway off my hands, I would not mind so much" (Hill 1885, 249). Notwithstanding these sentiments initially Gordon was keen to continue the construction of the railway. Work recommenced in 1877, 3,000 labourers being brought from Dongola to assist. The administration of the project, handed over to the Governor General of the Sudan at the beginning of 1877, was based at Wadi Halfa, and the construction materials were stored in a warehouse there (Moore-Harell 2001, 91, 117).

The Khedive in 1874 had entered into a five-year contract with the company of Appleby and Brothers to supply railway material to the value of £E600,000 but, by 1878, Sudan had only taken delivery of £E150,000's worth. In 1878 Gordon was forced to halt construction after £E400,000 had been spent, being unable to pay the 14th instalment of the contract and he informed the company that the project would be frozen. He further advised the Khedive that the material ordered so far amounted to only £E150,000; another $E450,000 was required to fulfil the contract and approximately £E300,000 was needed for wages. The total sum necessary to complete the railway was, therefore, £E750,000 which the Sudan could not pay. He urged the Khedive to pay Appleby and Brothers £E30,000 to cancel the contract as stipulated in the penalty clause whereby the Khedive had to pay between 10% and 20% on any material not purchased (Hill 1885, 321-2). In a further effort to save money he ordered that the service on the line be reduced to twice weekly.

In 1879 Gordon wrote

> "It is evident that on this grand scale the continuation of the line could not be hoped for, so I studied the question ..... and therefore 130 miles remained to be got over before the barrier of the desert was passed."

He proposed instead of the railway to operate steamers on the navigable stretches of the river over this 130 miles with tramways around the impassable cataracts (Hill 1885, 315-6). The financial situation had been exacerbated by the railway proving to be a commercial failure, in 1878 total revenues from passengers and goods only amounted to £E3,620. However in the autumn of that year, when the Sudan's finances had improved, Gordon intended to continue construction up to Hannek but his resignation soon after aborted this plan (Moore-Harell 2001, 118).

What may at the time have appeared to be the last word on the railway came from a government commission report submitted on 24th June 1883

> "The Commission, therefore, feel it their duty to give a decided opinion against the construction of the Nile Valley railway, and they regret that a large sum has already been expended in the hopeless task of developing this route. To expend, however, on this account a still larger sum upon the construction of a railway, the prospects of which are so unfavourable, would, in their opinion, be a mistake from many points of view."
>
> (quoted in Nathan 1887, 53)

The Gordon Relief Expedition

In the early stages of the planning of the Gordon Relief Expedition, as early as the 8th April 1884, Wolseley informed Her Majesty's Government that 'a railway is finished for 33 miles, and only requires the rails to finish 22 miles further'. He proposed 'to complete the Wady Halfa railroad to 100 miles. Even this I do not regard as absolutely essential, but it would be of great assistance, and would reduce the time in which the journey could be accomplished, as well as the labour devolving upon the men'. It was suggested by the engineers that the railway could be completed in about 2 months (Colville 1889, I, 29, 31, 35). Lord Hartington wrote from the War Office on 8th August to Sir F. Stephenson detailing measures to be taken to strengthen the mobility situation on the frontier

> "Measures should be taken to place the Assuan and Wady Halfa railroads in good working order, and in the latter to increase the length of sidings, and to provide some additional locomotives. Stores of coal should also be collected at Wady Halfa."
>
> (Colville 1889, I, 49).

To expedite work the 8th Railway Company of the Royal Engineers, a total of 128 men, was dispatched to Sudan arriving in Wadi Halfa between 4th and 6th October 1884. The railway was at that time already being extended by Major Willberforce Clarke, superintendent of works (Preston 1967, 41) using old material available at Sarras. A detailed inventory of all the railway material available at Wadi Halfa (Angash) and Sarras, dated probably to 30th December 1883, is preserved in the National Archive

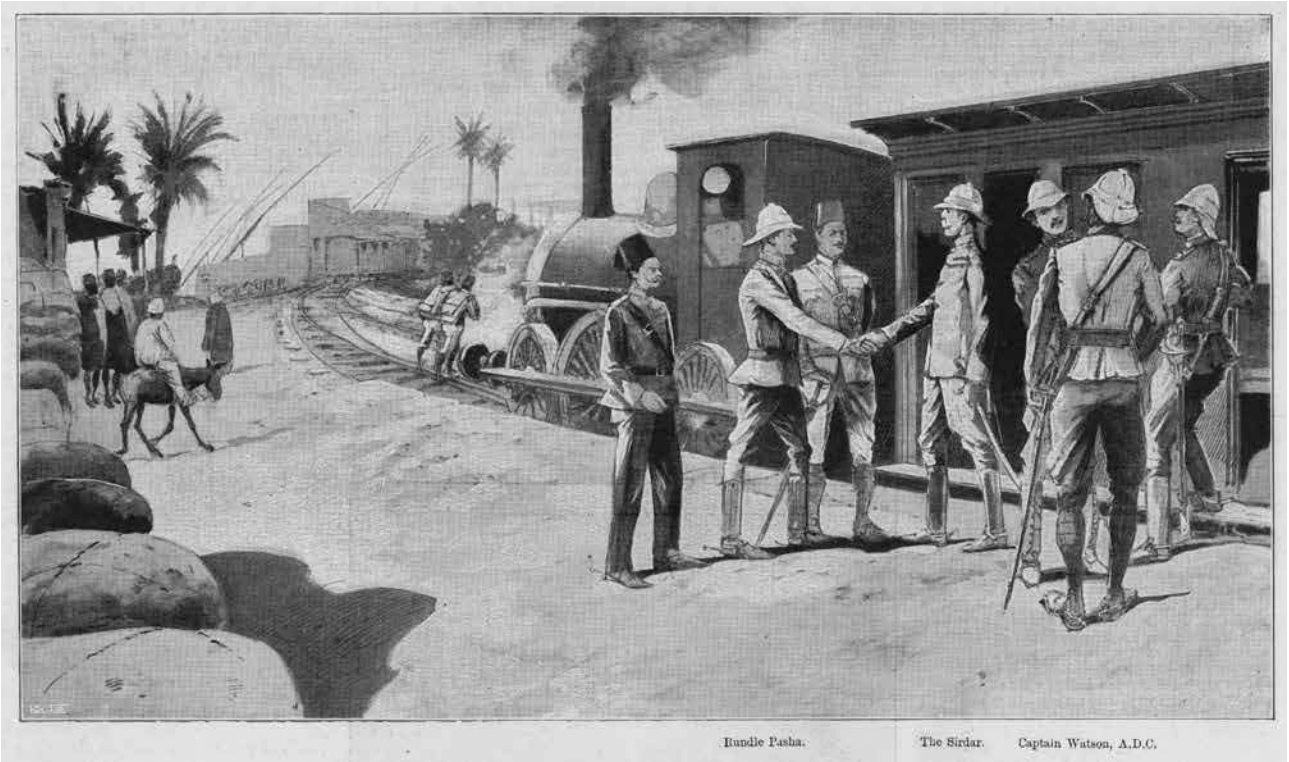


Plate 4. 'The Railway to Akasheh' Sketch by H. C. Seppings Wright published in the Illustrated London News *27th June, 1896 depicting a 2-2-2 locomotive of uncertain type.*

(WO 78/185). This lists amongst other things:

Locomotives -

1 engine in good working order with two side tanks and one tender tank[4]
1 contractor's engine
3 engines in need of considerable repair[5]

Rolling stock (Plate 5) -

4 second class carriages for eight persons each
2 brake vans
20 low-sided wagons
10 box vans
20 wagons with hinged sides
2 travelling cranes

Railroad material -

71,883 wooden sleepers (enough for 10 miles)
22.2 miles of rails
24,100 dog spikes
fish plates for 22.2 miles
fish bolts for 19 miles

Plate 5. Flat car with wheels and axles probably dating to the early 1880s in the Sudan Railway's repair yard in Khartoum, Oct. 2008.

tang bolts for 24 miles

Bridging material -

108 5m span girders
14 10m span girders

How much of this material remained in Sudan is unclear. According to Colville when the decision was taken to abandon Sudan all surplus railway plant had been taken from Halfa to Aswan and in 1884 when it was intended to extend the railway no transport was then available to return it (Colville 1889, I, 89). Locomotive No. 1 was, at that time, in use on the railway around the First Cataract the standard gauge engine being out of operation. A third rail was laid to allow the Sudan Railway's gauge locomotive to run on the track. No. 2

[4] According to the source referenced below, in 1882 two Manning Wardle 0-4-0STs were built for the Secretary of State for War and were used during the Gordon Relief Expedition. These were claimed to be the first armoured locomotives put into service (http://www.manning-wardle.moonfruit.com/#/ebwilson/4516914968). These locomotives are not mentioned by other sources.

[5] What appear to be pre-1884 2-2-2 locomotives are depicted in 1885 and 1896 (see Plates 8 and 4 respectively). No such locomotives are known to have been used on the line.

Table 1. Distances along the line from Wadi Halfa.
(In the various sources the distances vary slightly)

	Kms	Miles
Sarras	54	33½
Murrat Wells	75.5	47
Ambigol Road	81	50½
Ambigol Wells	104	64½
Tanjur Road	121	75
Akasha	140.5	87¼
Kosha	174	108
Kuror	223.5	139
Delgo	280	174
Kerma	323.5	201

was also used on this line, both being returned to Halfa when standard gauge locomotives became available (Maunsell 1945, 6).

The poor state of affairs on the railway is hinted at in an anonymous letter dated 23rd October 1884 written at Wadi Halfa.

> "The REs [Royal Engineers] are in the usual mess with the railway. Here we have a 3' 6" gauge line and 3 rotten engines which break down daily. The line has been laid out some 14 miles beyond Sarris [sic] when even the 34 miles to Sarris [sic] cannot be worked. Some 10 miles of the extra 14 have been made. Today it was discovered that it was going to the wrong spot and that most of the line must be taken up and be laid somewhere else."

Nathan however, records that at this time it was initially agreed to lay out a spur line rejoining the river between Semna and Wadi Attiri, a distance of 5¾ miles to allow the whalers to be taken to this point by rail. This idea was abandoned due to lack of labour and other infrastructure as it could not be completed in the necessary time frame, although by then the cutting had been commenced (Plates 6 & 7) by the 4th Battalion, Egyptian Army (1887, 38).

The problems were exacerbated by the lack of skilled railwaymen as Wolseley found to his cost on 18th October 1884 when returning by train from Sarras to Halfa. In his journal he recounts 'the idiot of a sapper who was driving the Engine allowed the fire plug to burn out' resulting in the train being stranded until another could be sent out from Halfa to haul them in. He was well aware of the dangers inherent in employing unskilled military personnel on the railway and the requirement for a corps 'of Engine drivers, plate layers and other Rl.Rd. servants' (in Preston 1967, 41-2). When the railway servants were first established they consisted of only nine engine drivers and three firemen. These men were all artificers, and were therefore available for work in the workshops (Colville 1889, I, 74-76). Among the problems faced in the operation of the railway the following were noted in a report by Major D. A. Scott R.E.

> " A strange, difficult, and at first dangerous road."
> " Old and broken down engines, rendered unsteady by the removal of their coupling rods, with wheels dangerously worn, and crank pins worn out of centre."
> "Inconveniently complicated engines, packed together so closely that none of the parts could be got at except from a pit, and consequently extremely difficult to clean."
> "A sandy, dusty country, in which it is impossible to keep brass bearings in order, and all the working parts of the engine became clogged with sand."
> "Heat of the climate, which rendered the working of the pump and injectors extremely difficult."
> "Bad quality of coal."
>
> (quoted in Colville 1889, I, 75).

In the autumn of 1884 there were five locomotives at Halfa, a saddle tank and four 28 ton side-tank engines (Table 3). Of these engine number 3 was condemned on 6th October and broken up for spares. Number V was

Plate 6. Locus 30d. The branch line leading towards the river between Semna and Wadi Attiri, abandoned in 1885 before completion.

Plate 7 Locus 30e. The point at which construction of the branch line ceased.

Table 2. Key dates in the history of the railway.

			Distance (miles)
1860		railway first proposed	
1865-6		line surveyed to Khartoum and beyond	
1871		route across the Bayuda from Ambukol to Metemma surveyed	
1873		construction of railway commenced	
1875	15th February	first rails laid	
1877		railway reaches Sarras	33½
1878		project halted by Charles Gordon	
1885			
	early April	railway a little north of Ambigol	
	13th June	railway reaches Ambigol Wells	64½
	12th July	railway reaches Tanjur Roads (Nathan)	75
	2nd July	railway reaches Akasha (Wolesley)	87¼
	7th August	railway reaches Akasha (Nathan)	87¼
	3rd July	decision to push railway south to Firka	
1886	June	destruction of railway Akasha-Ambigol by Dervishes	
1889	11th August	re-occupation of Sarras	
1896			
	end of March	railway pushed south from Sarras	
	21st May	railway reaches Ambigol Wells	64½
	26th June	railway reaches Akasha	87¼
	24th July	first train through Firka	
	4th August	railhead established at Kosha	
	25th and 27th August	destruction of line by violent storms	
	6th September	damaged sections of track restored	
	9th October	beginning of construction south from Kosha	
1897	4th May	line reaches Kerma	203
1903-4		track removed between Kerma and Kosha	
1904	31st December	line officially closed	
1908		final closure of line	

found lying in a ravine at Murshid (mile 24). It was raised onto the line and running again by 19th November (Nathan 1887, 43).

Notwithstanding these problems the arrival of the railway company brought some improvements. New locomotives were ordered from the Cape of Good Hope but the extension of the railway towards Ambigol was delayed from lack of labour obtainable at a reasonable rate (Colville 1889, I, 106). As an incentive to advance the work rapidly the British Government gave each Egyptian soldier engaged in railway construction a shilling a day in addition to his normal pay (Knight 1897, 247). The extension of the line was halted while the Halfa to Sarras section was made good. This was in very bad condition and some of the bridges were unsafe, entailing the expenditure of a considerable amount of labour to bring it back into working order. At the same time the rolling stock was also refurbished.

By the middle of November there were two trains daily transporting troops and supplies to the railhead including some of Wolseley's whalers taken from Halfa to Gemai (Colville 1889, I, 65).[6] At Gemai was a long siding, the only one between Halfa and Sarras. Here all the equipment for the whalers was unloaded from the trains and placed in each boat (Colville 1889, I, 179-180). From Sarras the rails for the extension of the line were hand shunted and the sleepers carried by camel (Nathan 1887, 47).

Only three engines and between 20 and 30 wagons were available but still the railway was always capable of carrying as much material as the other means of transport could provide. Major D. A. Scott, R.E. was managing director of the part of the railway in operation and he was assisted by a superintendent of works, an assistant director, a civilian traffic manager and two railway staff officers. Among the duties of these officers were the general management of the railway, ensuring that as many engines as possible were kept in proper repair, the maintenance of the permanent way, the provision of watering facilities at the different stations and the regula-

[6] Colville (1889, I, 128) records that around this time the railway was working well with three trains per day, each carrying an average load of about 40½ tons, or 828 tons weekly, divided as follows:-

	Tons	Qrs	Cwts
Whaler Stores	313	17	0
Commissariat stores	255	15	3
Various	133	10	0
Passengers	125	0	0
	828	2	3

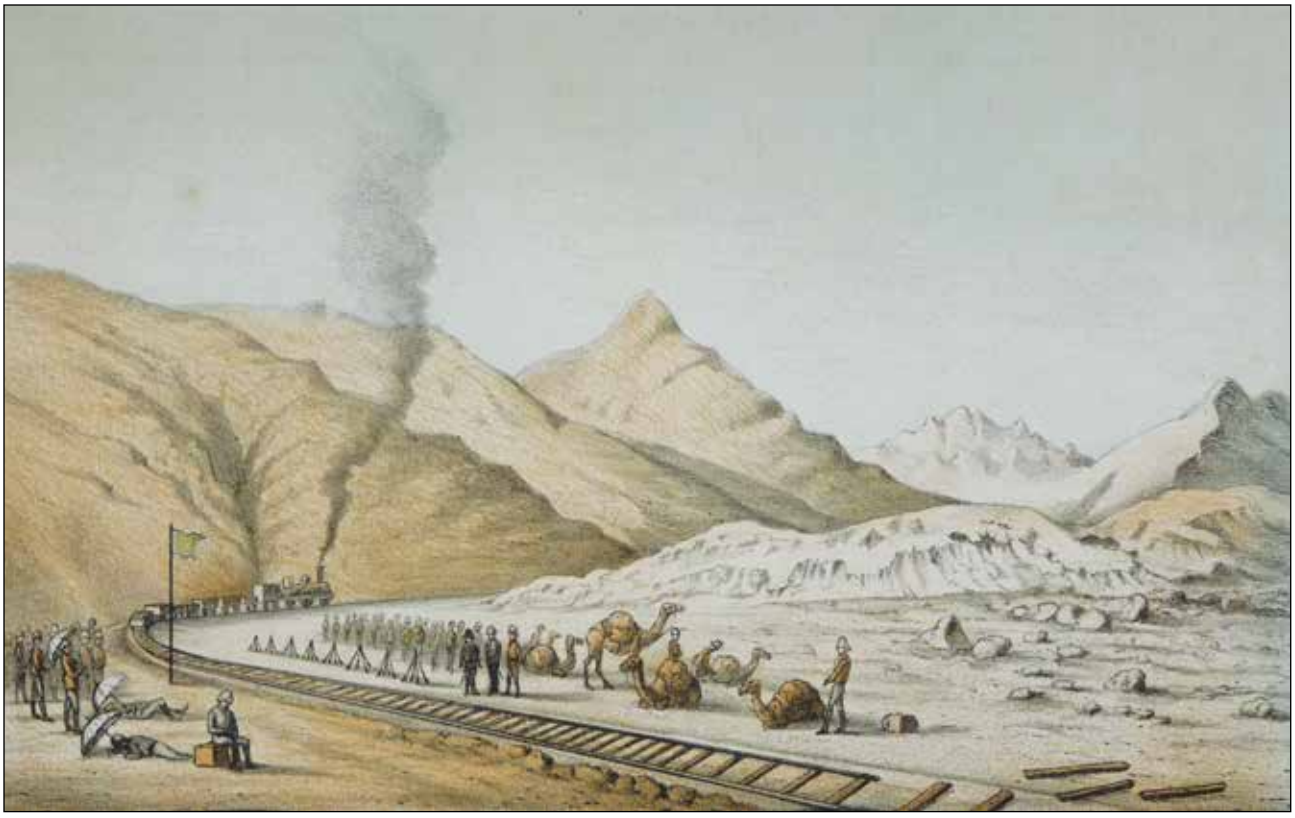


Plate 8. Railhead a few miles north of Ambigol Wells, 11th June 1885 . Lithograph produced from a sketch made in the field by Capt. Willoughby Verner, Rifle Brigade, Intelligence Department, Nile Expeditionary Force (Verner 1885).

tion of the traffic (Colville 1889, I, 74-76).

After the Gordon Relief Expedition moved southwards refurbishment of the existing line was continued and the railway gradually extended. On 4th December railhead was 6 miles south of Sarras; on 18th January it reached Murrat (Moghrat) Wells station and a station was opened at Ambigol Road on 21st February (Sandes 1937, 99ff).

The four 'new' engines from the Cape arrived at Halfa on 10th December and the 1st, 6th and 15th January. They were 6-wheel single bogie tender engines made by the British company Beyer and Peacock with an estimated weight of 23 tons. They were apparently better suited to the conditions in Sudan than their predecessor being easier to clean and using less water (Nathan 1887, 44).

Between 9th and 19th February a rapid survey was undertaken by Captain Wilson, the result of which was the decision to divert from the route proposed by the 1871 survey which would have taken the railway via Ambigol along the river to Akasha. This route would have involved some heavy rock cutting as well as unspecified engineering problems. It was also 6 miles longer than the desert route via Ambigol Wells. It was agreed soon thereafter, on 23rd February, that the line should be extended to Firka, material was ordered from England including four new locomotives and 300 plate layers and mechanics summoned from India (Nathan 1887 39).

From the beginning of March 1,200 Egyptian soldiers from four battalions were employed on constructing the earthworks, being paid three piastres per day on top of their regular wages, six piastres for each Egyptian officer. By early April 1885 railhead lay a little north of Ambigol. Between it and Akasha most of the embankments and cuttings had been completed under the charge of Major Scott R.E. and were awaiting the laying of the track, the first instalment of rails for which was at that time coming up to Halfa. In the second week of May the skilled men from India arrived to assist in the work. By 13th June the line was at Ambigol Wells and at Tanjur Road on 12th July according to Sandes (1937, 103), although Wolesley's correspondence of 2nd July noted that railhead was at Akasha (Figure 2) but that he was proposing an extension to Firka and this was approved by the British Government on 3rd July (Preston 1967, 232-3). As early as 25th February he had telegraphed to London:

> "Proposes to extend the railway 17 miles from Akasheh to Firka. Indispensable to obtain before rails arrive 300 skilled platelayers from India and 3 RE lieutenants. Also needs two more locos and 20 more trucks and one small saddle tank engine for shunting. Also requesting very light tramways or mule trucks at Fatmeh and Kaibar, total length 4 miles, and possibly one of 4 miles at Dal. Wishes to abandon plans to extend railway beyond Firka. Requests gunboats to be sent in sections by rail to be reassembled at the railhead."
>
> (SAD.250/1/184 draft of telegram)

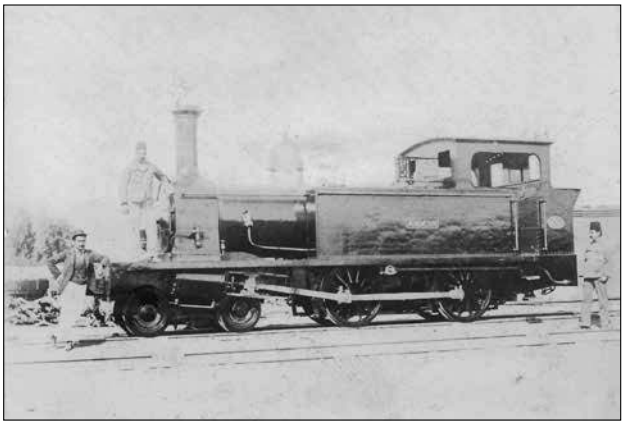


Plate 9. Sudan Railways Hunslet 4-4-0 locomotive 'Ammon' photographed in 1896 (Reproduced by permission of the Royal Engineers Museum Library and Archive, Album no. B10).

Locomotives for the Assuan-Shellal Railway (4' 8½") and for the Sudan Railway (3' 6" gauge) were dispatched on barges or sailing boats from Cairo, as there was no heavy lifting gear at the Assiut railhead (Table 3). The first two Hunslet locomotives[7] (Plates 9 & 10) arrived at Halfa on 21st June. They were four-wheel coupled bogie engines of 36 tons. The greatest problem with them was their long wheel base which was far from ideal when negotiating the tight curves on the railway. The other two engines, six-wheel coupled, single-bogie saddle tank engines made by Beyer and Peacock initially for Cape Railways, were very heavy. They were loaded in Cairo in such a way as to allow them to pass through the First Cataract. The rolling stock from the Cape,[8] which began to arrive in March was sent in the same way. It consisted of the following:-

2	first and second class composite carriages
2	second and third class composite carriages
4	brake vans
13	open trucks
9	cattle wagons - two converted to tank wagons
1	6-ton breakdown crane

These complemented the six brake vans, each with one passenger compartment, five covered goods vans and 50 open trucks (Plate 5) already in service.

The rails, sleepers, fastenings, etc., for the extension of the railway to Akasha and Firka, were sent by rail from Alexandria to Assiut and thence by barge or sailing boats to Assuan. After passing around the First Cataract by railway they were reloaded on boats at Shellal for Halfa.

The first consignment of 300 tons of rails reached Alexandria on 31st March, and was followed by 1,500

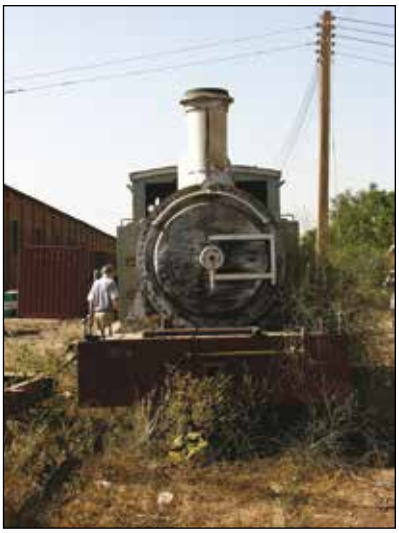


Plate 10a and b. Hunslet 4-4-0 locomotive of 1885 vintage in the Sudan Railways repair yard in Khartoum, October 2008.

tons on 8th and 1,850 tons on 21st April. The sleepers were all obtained by local tender at Alexandria. By the 10th June all the material except 7 miles of rails had been despatched from Assiut, and the remainder was sent up as opportunities occurred (Colville 1889, I, 228).

The steel rails, weighing 41½lbs,[9] were 24 feet in length and were fixed to nine rectangular sleepers with four dog spikes per sleeper. They were connected by fish-plates fixed by two bolts except on curves when four were used.

Nathan records the system employed for laying the rails on the prepared bed

> "As soon as the material train, carrying about a quarter of a mile of permanent way, arrived, it was unloaded and the material packed on trollies by a party of Egyptians, 60 to 90 sleepers to a trolly and 30 rails to a pair. A small material trolly was kept as close as possible to railhead, being pushed forward as the joints (and round the curves and centres also) of each pair of rail, were spiked The remaining trollies followed immediately. The rails and sleepers were carried from them by parties of Egyptian soldiers-six men to a rail and one to a sleeper-and the latter thrown down roughly in position and then arranged by a sapper and four soldiers; the rails were placed

[7] The Hunslet surviving in Khartoum (Plate 10) bears the No. 4.
[8] In 1896 some of these Cape Railway trucks were still in service (Atteridge 1897, 116). All this rolling stock was old before it even reached Sudan and there is no record of any of it surviving after 1898 (Maunsell 1945, 7).
[9] According to Macauley as well as the 41¼lb (not 41½lb) rails were also some 36lb examples (1901, 182).

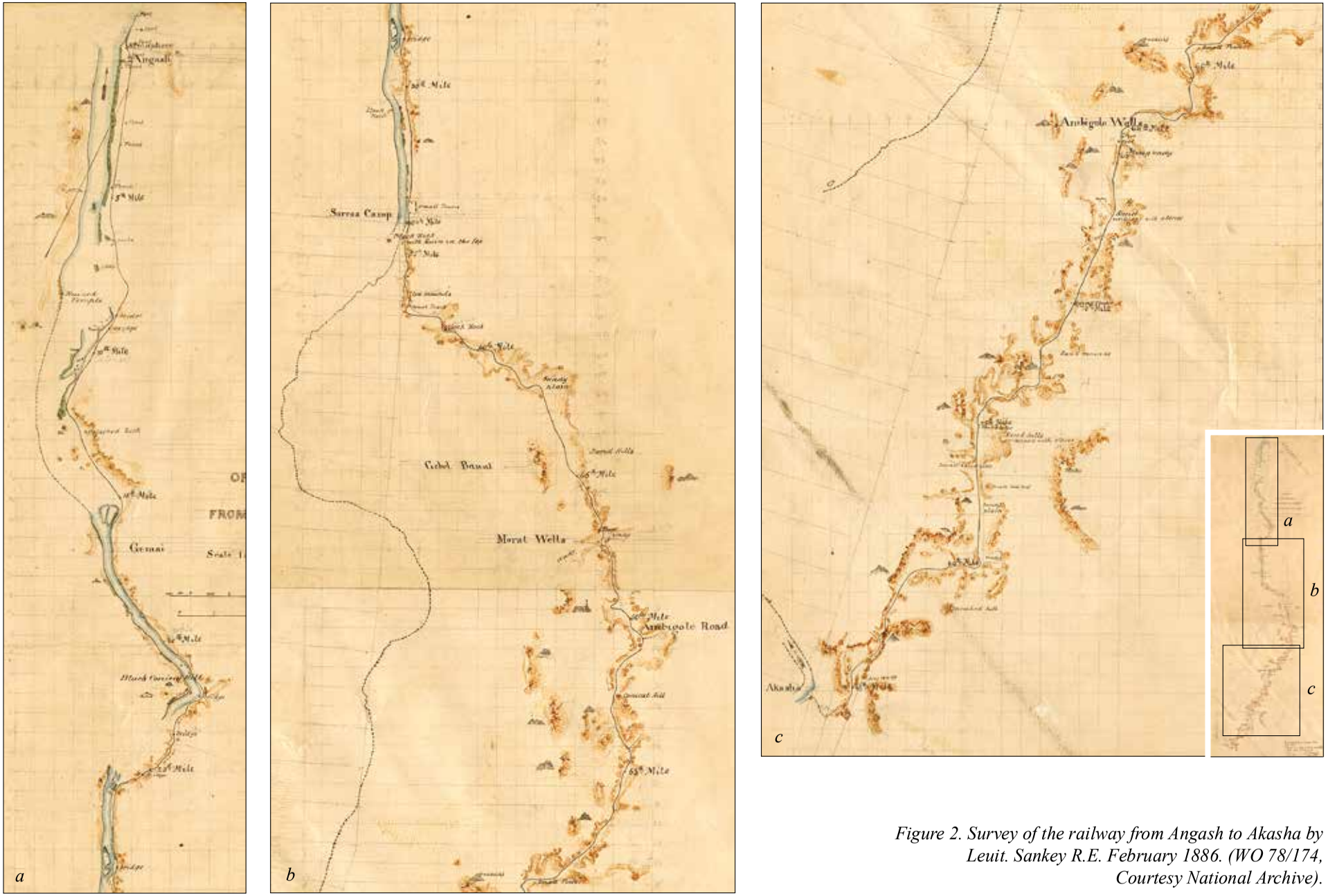


Figure 2. Survey of the railway from Angash to Akasha by Leuit. Sankey R.E. February 1886. (WO 78/174, Courtesy National Archive).

upon them and the small material distributed by two or more men. Directly a trolly was emptied it was run back, being of course taken off the line if it met one with material.

The rails were placed in position, fish-plates put on, and bolts hand-tightened by a party of six Indians, accompanied by a man with a square who looked to the squareness of the joints. They were followed by six spanner-men who tightened the joints, and then came six sleeper squarers, two of whom marked with chalk upon the rails the position of each sleeper. Immediately in front of the material trollies were six pairs of spikers for the joints; round curve two extra men were put on for the centres.

Behind the material trollies were four more spanner-men, who finished up tightening the joints, and then 30 pair of spikers. Each pair of spikers full spiked a rail and then moved on to the corresponding rail fifteen lengths ahead. They were followed by four rough straighteners and the rough packers, about 30 men, who packed the line sufficiently to allow of the material train passing over it. Then came another straightening party of four.

The full packing party of about 40 men followed about half a mile in rear; behind them were the final straighteners - four men - and some 80 Egyptians boxing up. There was also a jim-crow party of four men to take out bad joints."

(Nathan 1887, 41).

By August it was decided that the plate laying would be stopped at Akasha and the Indian plate layers were sent home. The construction of the formation level however, was to be continued to Firka (Nathan 1887, 42). Only 10 miles of the formation level south of Akasha was completed before the project was abandoned.[10] Dongola was evacuated on 5th July but it was considered that the railway to Akasha must be held. As the railway terminus was deemed indefensible on account of the terrain, Kosha was chosen as the most southerly outpost and a strong mud fort was erected there garrisoned by the Cameron Highlanders and a detachment of the 9th Sudanese Battalion (Wingate 1891, 269).

The disposition of Anglo-Egyptian force on the frontier, as recorded on 27th November 1885 was as follows:

- Wadi Halfa - 500 British, 350 Egyptians
- Akasha (railhead) - 600 British, 350 Egyptians
- Sarkametto and Dal (on opposite banks of the Nile) - 200 Egyptians
- Mograka - 266 Egyptians
- Kosha - 600 British, 300 Egyptians

There were also smaller detachments of between 30 to 50 men in forts overlooking the railway at Ambigol Wells, Tanjur Road, Murrat Wells and Sarras (Wingate 1891, 272).

The fort at Ambigol Wells, with a garrison of 50 men, was attacked between the 2nd and 4th December 1885 and the railway line to the north and south was destroyed, the attackers chanting 'Railway finish. Telegraph finish. You finish' (Sandes 1937, 108). The method adopted by the enemy to destroy the line was exactly that described in Wolseley's own *Soldier's Pocket-Book*, the rails being bent by burning the sleepers under them (Haggard 1895, 352).[11] The Mahdist troops advanced via Khange? Wells and attacked the fort from the hills to the east and south east where they set up their one artillery piece. Subsequently some of their troops moved south and occupied the hills to the south west of the fort (WO 78/178). The situation was saved by the arrival of a unit of the Egyptian Camel Corps and mounted artillery, the arrival of a train from Halfa with reinforcements and the advance of a strong force under General Butler (Wingate 1891, 272-3).

According to an eye witness account the train service was very poor at this time due to the condition of the locomotives, with only three trains to Akasha every two days. Owing to the possibility of the line being cut by the enemy one train was always left at Wadi Halfa. Each locomotive was only able to pull a maximum of 10 wagons (Haggard 1895, 353). Haggard who travelled with his unit by train up to Akasha in December 1885 describes the first and second class accommodation, available to the officers, as very comfortable. He notes that the second class carriages were marked 'Midland Railway' but the others were all from Cape Railways (Haggard 1895, 358). The limitations of the railway as constructed up to 1885 were evident in 1901 when Macauley describes it thus:-

"The whole of the country from Sarras to Ferket is one mass of black rock; the railway winds through it in an extraordinary way to avoid cuttings and embankments as far as possible; the result is that there is hardly a straight or level bit of line in this section, which is more an example of what can be done by a good survey than of what a railway ought to be."

(Macauley 1901, 181).

[10] According to Christensen some railway material was returned to the UK at the close of the 1884-5 campaign, being used by the War Department in 1905 to build a railway from Bordon to Longmoor (Christensen 1994).

[11] However Atteridge (1897, 116-7) had a very different view 'By the way, before I left England I saw it stated in a London paper that when the Dervishes tore up the line they twisted and bent the rails precisely after the manner recommended by Lord Wolseley himself in the section of his "Soldier's Pocket Book" which treats of the demolition of railways. This is a legend. I have seen hundreds of rails lying along the track, and only two or three out of the whole lot were bent, and even those had apparently been damaged by being used as levers, with which to start other rails from the sleepers to which they were spiked. The Dervishes after getting the sleepers out, carried off nearly all the smaller and more handy iron-work, leaving the rails near the track.'

On 12th December a Mahdist force bypassed the fort at Kosha and attacked Mograka fort a little to the north. A large Mahdist force subsequently advanced up to the fort at Kosha which they invested on its southern side and continuous fire was poured into the fort from a high rock directly overlooking its southern wall. Some entrenchments and a gun emplacement were also set up opposite the fort on the west bank. The Mahdist artillery fire became increasingly accurate during the month-long siege, and one shell dismounted the fort's Gardner gun on 20th December (Wingate 1891, 273ff).

The Mahdists retreated following severe loses inflicted by a British attack at the Battle of Ginnis, on 30th December which killed one of its leaders 'Abd al-Majid Abu'l Kailak. Soon thereafter all Anglo-Egyptian troops were withdrawn to Wadi Halfa arriving there on 13th April, the railway being abandoned to its fate. Halfa was garrisoned by Egyptian troops, what British units remained in the region being encamped at Aswan by 7th May (Johnson 1977; Theobald 1951, 132; Wingate 1891, 281). In June 1886 the Mahdist forces occupied Akasha and tore up the rails between there and Ambigol Wells (Wingate 1891, 284). By November they temporarily occupied Sarras destroying 1 mile of railway while a small detachment advanced to Khor Musa and attempted to destroy the railway bridge. They were driven from there, after destroying 120 yds of track, by Egyptian troops under Colonel Chermside with a force of cavalry and camel corps supported by an armoured train. On 30th November a working party transported on the armoured train began repairing the line which was undertaken to within 1½ miles of the enemy camp at Abka (Wingate 1891, 287-8). In mid October 1887 the enemy was operating north of Abka and tore up 200 yds of line 3 miles north of that place (Wingate 1891, 322).

Military activities continued in the region around Wadi Halfa with widespread raiding both north and south of the town on the east and west banks, culminating in the invasion of Egypt by Abderrahman Wad en-Nejumi in 1889. The railway played little part in these activities although the armoured train and a second train were used to bring in reinforcements to relieve an attack on the fort at Khor Musa on 29th August 1888 (Wingate 1891, 351). In the aftermath of the abortive invasion of Egypt Sarras was reoccupied by the 3rd Battalion of the Egyptian Army on 11th August 1889 and arrangements were made to repair the railway as far south as Gemai (Wingate 1891, 434).

The Dongola Campaign, 1896

In the initial stages of the planning for the conquest of Sudan the possibility of constructing a railway south from Aswan to Korosko and beyond was considered. The very rough terrain upstream of Aswan caused this idea to be abandoned but steps were taken to begin the construction of a new railway from Korosko, along the line of the caravan route, the Korosko Road, which would cut across the desert via the wells at Murat rejoining the Nile at Abu Hamed. This was to be a light railway of 2' 6" gauge[12] and the railway engineer, Birch claimed that it could be made at a rate of 10-15 miles per day at a cost of something over £200,000. He considered that it would be suitable for transporting gunboats in sections. Around December 1895 men were sent to Ambigol Wells and Akasha to collect sleepers from the old railway[13] to be used on this Korosko to Abu Hamed line and work began under Lieutenants A. G. Stevenson and R. Polwhele. However lack of money forced the abandonment of this project after little had been achieved and in April 1896 the line was dismantled and the material used this time to continue the construction of the old railway (Bowman-Manifold 1939, 277; Knight 1897, 42, 44, 78, 144).

The Dongola Campaign of 1896 saw a resurgence in the fortunes of the railway some sections of which by then were in a sad state of repair. Close to the Dervish camps most of the sleepers had been removed or burnt and many of the rails, nuts and bolts had been carried away. Of the eight locomotives at Wadi Halfa only two were serviceable and there were innumerable breakdowns which severely disrupted traffic on the line. The rolling stock however, was in good condition and available in sufficient quantity (Churchill 1899, 165). The machine shops were inadequate and stores and equipment along with skilled labour were unavailable (Theobald 1951, 199). Owing to the narrow gauge, rolling stock and engines had to be especially ordered from England or from South Africa.[14]

At Sarras the defences had been remodelled in 1894 (Plate 11) and contained barracks and the headquarters of Colonel Archibald Hunter, commander of the district. Stone walls were built from the northern and southern ends of the craggy hill to the Nile enclosing an area for

[12] According to Atteridge it was a full-gauge railway which was laid for a short distance from Korosko southwards in January 1896. He notes 'that a light line, of perhaps the Decauville type, would be more quickly laid, and would be quite as effective for the object in view. Once the line reached Murat, that place could be made to serve as a starting-point for an advance to Abu Hamed' (1897, 332).

[13] This activity was known to the Mahdist governor based in Dongola Mohammed Bishara, who wrote at the end of November, 1895 to Hammuda Idris, the commander of the Dervish forces "I have to inform you ..... news has been received that the enemies of God have lately detailed some camel-men, escorted by soldiers, to transport wood for the railway between Akasha and Ambigol. Hammuda was instructed to intercept these men but the force dispatched to do so failed to make contact (Atteridge 1897, 236).

[14] Among the surviving rolling stock may be a carriage of 1880s vintage currently preserved in the Historic Boatyard at Chatham (Plate 12) which some consider was used by Kitchener on the Sudan Military Railways during the 1896-98 campaigns. If this is so it was subsequently modified to standard gauge for use on the Shoeburyness Military Tramway (see Sandes 1992; *Melik Bulletin* 2004; 2005; and documents in the Royal Engineers Museum and Archive CHARE: 200708.19: 200108.9.21).

Plate 11. The fort as Sarras photographed possibly by G. W. Grabham at some time between 1924 and 1931 (Reproduced by permission of Durham University Library, SAD. 484/10/34).

quartering thousands of men and animals. Wire entanglements on the landward side and in advance of the walls completed the defensive system. A siding ran down to the Nile to allow the engines to fill up with water and it was this line which was extended south. It was from Sarras that the army advanced south beginning on 18th March and Akasha was reached on the 20th. Here an entrenched camp was built and fortified posts were established along the river.

Plate 12. The coach thought to have been used by Kitchener during the campaign now preserved in the Historic Dockyard, Chatham.

The extension of the railway was begun by Lieutenants Stevenson and Polwhele R.E. (died of enteric fever in July 1896) and was later supervised by Lieutenant E. P. C. Girouard, R.E. The chief superintendent of engines and workshops was a civilian, Mr Vallom, who held the post for 11 years at Halfa until his death during the cholera outbreak in 1896. Sleepers[15] were procured from Turkey and Egypt, fastenings were made in Alexandria and Cairo and a railway battalion 800 strong was recruited from Egyptians and Sudanese among them Dervish prisoners. Great efforts were also made to reuse material. Old and bent rails were straightened and relaid while

> "rails were dragged out of mud huts where they had for many years done service as rafters, railway fastenings used as kitchen grates were collected, and everything of the least use was hunted out and worked in."
>
> (Arthur 1920, 193-4).[16]

In May Atteridge (1897, 157) commented upon the great heaps of railway iron, collected at Halfa for the Akasha-Firka extension.

> "An enormous quantity of rails, enough for about twelve miles of single line, had been collected at Halfa in 1885, and was lying there when the construction of the railway was stopped. This material had been used for purposes for which it was never intended, chiefly as supports to roofs, balconies, and verandahs, and occasionally for mere fences and boundary marks. It was now being collected, not without much destruction of house property."

These were augmented by new rails which, at 50lb per yard, were heavier than those used initially (Wierner 1932, 597).

These measures being in hand the railway was pushed south of Sarras towards the end of March 1896, by the 16th April it had been extended three miles (Knight 1897, 23), and reached Ambigol on 21st May being constructed at a rate of ½ mile per day (Plates 13-15; Churchill 1899, 126, 165). This work was facilitated by the generally good condition of the railway away from the Dervish camps, only the sleepers and rails needing to be relaid. To the south of Ambigol Wells 9 miles of track remained intact and had only to be cleared of sand and this situation occurred elsewhere (Knight 1897, 29). Conversely a little south of Ambigol Wells the rails and sleepers had not been removed but the line having been broken into sections by the Dervishes had been turned over bodily so that the sleepers lay on top of the rails. Some of the sections were several hundred yards in length. At Akasha great lengths of the old railway had been turned over in the same way (Knight 1897, 106-7).

When railhead rested at Ambigol Wells a station was established and a depot both protected by the four-gun fort held by a detachment of garrison artillery which also supplied fatigue parties for unloading the trains. A trainload of railway material, about 260 to 300 tons, could be unloaded without the aid of cranes or other gear in twenty minutes (Atteridge 1897, 160).

South of Ambigol Wells progress on the line was

[15] Many of the sleepers were of white wood and creosoted (Pinckney 1926, 8).

[16] A similar fate had befallen the abandoned railway from Suakin towards Berber. At Handub the mosque was an iron building constructed entirely from rails and fish-plates (Wingate 1891, 494).

Plate 13. Constructing the railway, 1896 (photo A. H. Atteridge).

hampered in late May by an accident when two engines went off the line blocking it at a difficult point, and making it impossible to send up railway material for some time as the raising of the engines was a difficult operation (Atteridge 1897, 163).

Among Wingate's papers in the Sudan Archive (SAD.261/1/440) is the following:

Sudan Military Railway. Timetable to take effect from 29th May 1896
A.G. Stevenson
Bimbashi
Traffic Manager, Halfa 29-5-96

Station	1st train AM	2nd train AM
Halfa	departs 5.30	6.15 departs
Gemai	" 6.45	7.30 "
Sarras	arrives 8.00	8.45 arrives
Sarras	departs 8.30	9.15 departs
Moghrat	arrives 10.0	10.45 arrives
Moghrat	departs 10.15	11.0 departs
	PM	PM
Ambigole	arrives 12.15	1.0 arrives
Ambigole	departs 1.0	1.45 departs
Moghrat	arrives 3.0	3.45 arrives
Moghrat	departs 3.15	4.0 departs
Sarras	arrives 4.45	5.30 arrives
Sarras	departs 5.15	6.0 departs
Gemai	" 6.30	7.15 "
Halfa	arrives 7.45	8.30 arrives

A train travelling to Akasha on 2nd June 1896 consisted of open trucks carrying the 10th Sudanese Battalion with two passenger carriages occupied by Egyptian and British officers and correspondents (Knight 1897, 109). The perilous nature of a journey on the newly constructed railway is related in the unpublished autobiography of Percy Girouard, the man responsible for building it

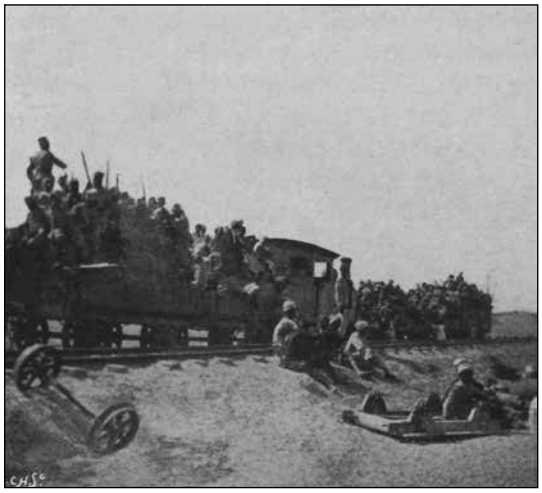


Plate 14. The railway battalion moving camp, 1896 (photo A. H. Atteridge).

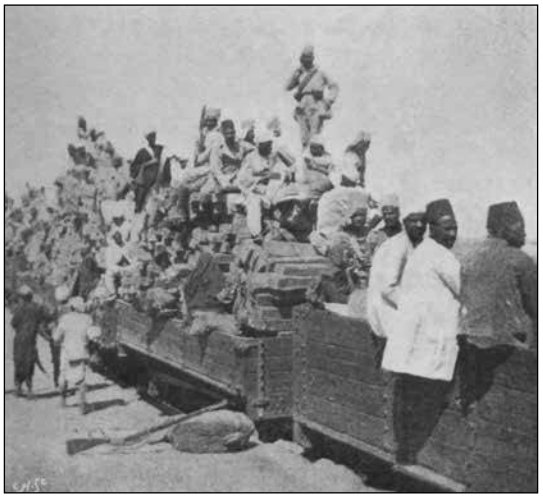


Plate 15. Moving men and construction materials to railhead, 1896 (photo A. H. Atteridge).

who was travelling with senior staff of the Intelligence Department including Wingate and Slatin and several hundred Sudanese infantry just before the Battle of Firka. He recounts:-

"Tootling along just before dark we reached a point 4 miles short of our terminus [at Ambigol]. Ahead of us was a descent of 300 ft and curves of unwarranted crookedness. The engine became my point of lookout; we were soon hurrying to destruction at an alarming pace for the brake blocks would not hold. I did not know which was the better part of valour, to jump in the dark on the rocks, or possibly a sandy patch, or to be buried under the engine. The Sirdar's Saloon illuminated by candles I could see hurtling from side to side at the tail of the train like a wherry in a high sea. Presently with heavier pitch than usual complete extinction of all lights and then crash. Fortune favoured us, 2 miles down there was a short sharp ascent, the tired old engine could not take it in its stride, the native driver and firemen

combined efforts with the Director, [Girouard] and the engine was reversed to slide the remaining mileage to the terminus. After the Intelligence Staff had indignantly disengaged itself from the luggage and documents, some stricture was passed as to the rate of descent. "We were making up time " was the reply. Never were they closer to making up time for all time ……"

(Girouard, 19-20).

Following the defeat of the Mahdist forces at the battle of Firka on 7th June 1896 the railway was advanced to Akasha by 26th June along the old embankment laid in 1885. Here a triangle was provided as also later at Kosha and Kerma (Macauley 1901, 182). Thereafter the work became more difficult with the construction of new embankments and the shortage of materials made matters worse.

By late June the road-bed was completed from Firka to just beyond Sargun Island, and the troops in the camp there were ordered to send fatigue parties to camp between Firka and Akasha, and ready the roadbed, from the point where the work was abandoned in 1885, up to Firka. Atteridge records

"Meanwhile, Girouard's railway battalion would be laying the line along the six miles of road-bed that already existed south of Akasha. But the actual laying of the line could not be pushed on as rapidly as it had been done north of Akasha. There most of the railway iron required was lying ready beside the track. Here every rail had to be brought up from Wadi Halfa and carried out to the rail-head."

(Atteridge 1897, 271-2).

Kitchener secured a mixed assortment of rails from other light railways and from Syria which were laid by inexperienced men and with only enough bolts to affix each fishplate with two rather than the required four leading to many derailments when the bolts shook loose. These rails subsequently had to be replaced by a large consignment from the Luxor to Aswan railway (Sandes 1937, 179).

On 24th July the first train steamed across the battlefield at Firka (Plate 16) and railhead was established at Kosha on 4th August although construction of the line to the south across the desert towards Sadin Fanti was already underway (Knight 1897, 184). According to Knight new engines were expected to arrive soon which would be capable of hauling heavy trains (Knight 1897, 218).

In July among the ruins of the old fort at Kosha the engineers were clearing an area to construct the railway station, the workshops and the landing stage (Knight 1897, 183). It was here that the gunboat, Zafir, which was brought in sections on the railway (Plate 17), the first four sections of which arrived on 16th August, was assembled and launched. Soldiers were engaged in making bricks for the walls of the new railway station, which by late August was nearly completed and was described as quite an imposing structure (Knight 1897, 242).

On 25th and 27th August the worst storms for 50 years hit the region with torrential rain which swept away 12 miles of tracks north of Sarras, part of the line dating from 1874,[17] and damaged it in other sections. Some sections of track were washed up to 70 yards from the line and the railway camp at Sarras was totally destroyed (Knight 1897, 245). Another storm washed away a section of the line near Akasha. Such rainfall had not been considered when constructing the railway which for long sections ran in the bed of *wadis* without any provision of culverts to allow the drainage of water across the line.[18] However this was not the first instance of the line being destroyed by floods. The line was cut in five places in October 1885 and was to suffer similar destruction on occasion after 1896 (Macauley 1901, 181).

With the aid of 5,000 troops under the personal command of Kitchener all was made good within a week notwithstanding the fact that when the work was within two

Plate 16. The railway crossing the site of the battlefield at Firka photographed by the RAF in 1936. The post-Meroitic tumuli excavated by the archaeologist L. P. Kirwan in the winter of 1934-5 are clearly visible (Courtesy Institute of Archaeology, UCL).

[17] According to a **Despatch from Kitchener, dated Dongola, 30th September, 1896** to the War Office the storm caused the destruction of 20 miles of railway line between Sarras and Murrat Wells.

[18] The first bridges, which were not very numerous, had spans of 15m or 9m and were supplemented by culverts of cast iron 600mm in diameter (Macauley 1901, 182; Wierner 1932, 597).

Table 3. Locomotives used on the Wadi Halfa to Kerma Railway (after Macauley 1901; Maunsell 1945; Nathan 1887).

Year entered service	*Quantity*	*Layout*	*Type*	*Manufacturer*	
1871/1872	1	0-6-0	saddle tank	Fox, Walker & Co.	designated No. 1, 13" dia. cylinders, condemmed 8th Jan 1885
1873	4	2-6-0	side tank	?	designated Nos 2-5, flangeless driving wheels, 14" dia. cylinders, weight 22 tons No. 2 condemmed 7th Aug 1885, No. 3 condemmed Oct 1884, No. 4 condemmed 6th Nov. 1884, No 5 on shunting duties from July 1885, scrapped at end of expedition
1875	2	0-6-0	saddle tank	Fox, Walker & Co.	12" dia. x 18" stroke cylinders, 3' 1½" wheels, at least one used on line, vanished by 1884
1884	4	2-4-0	tender engines	Beyer, Peacock & Co.	Old locomotives from Cape Government Railways, returned at the end of the expedition (*The Railway Bulletin* 1942)
21-7-1885	2	4-4-0	side tank	Hunslet Engine Co.	14" dia. x 20" stroke cylinders, 3' 9" dia. coupled wheels, named Sphinx and Hermes, Nos 1 and 3. Large bell-mouthed wood burning chimneys replaced, Hermes receiving the chimney from old no. 3
Nov 1885	4	4-4-0	side tank	Hunslet Engine Co.	named Memnon, Ammon (Plate 9), Tryphon and Gorgon
22-7-1885	2	2-6-0	saddle tank	Beyer, Peacock & Co.	14½" x 22" stroke cylinders, 3' 6" dia. coupled wheels, weight nearly 34 tons, originally built for Cape Government Railways (*The Railway Bulletin* 1942)

days of completion a fresh storm destroyed eight miles of line as well as the station at Akasha. The troops were able to repair these breaks in the line by 6th September.[19]

With the advance to Kerma, occupied on 19th September, and the capture of Dongola the campaign was at an end. The railway was then extended, on 3rd October the engineers, Girouard and Pritchard, engaged in making a survey for the extension of the railway were at Absarat. Work on the line began at Kosha on 9th October with battalions of troops distributed along the line to undertake construction of the embankment. According to a report in *The Times* dated 30th October 1896 the railway had by then been carried 3 miles beyond Kosha and was progressing at a rate of 1,000 yards per day. Work was severely hampered by the state of the engines, frequently only three being in working order, the other five undergoing heavy repairs. Notwithstanding these difficulties the line reached what was to be its terminus at Kerma on 4th May 1897 (Churchill 1899, 167), a total distance from Wadi Halfa of 201 miles.

In 1897 E. A. Wallis Budge, Keeper of the Department of Egyptian and Assyrian Antiquities at the British Museum, describes his journey on the railway from Wadi Halfa travelling in what was known as the Yellow Maria,[20] a four-wheeled coach which had originally been made for Ismail Pasha and had travelled for many years on the Halfa - Sarras line. For the first part of the

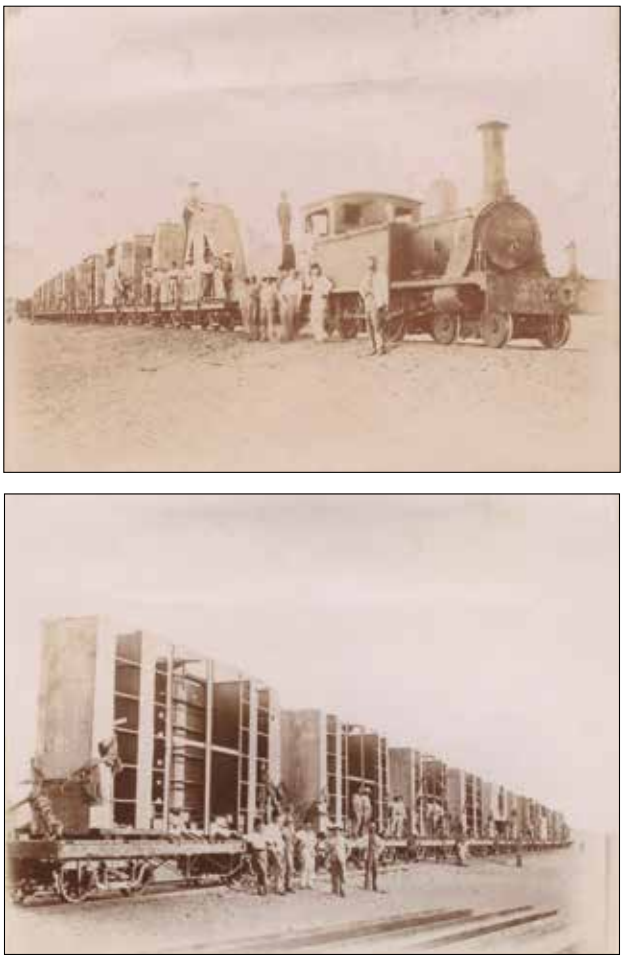


Plate 17a & b. A Hunslet 4-4-0 transporting the gunboat Zafir to Kosha in 1896 (Reproduced by permission of the Royal Engineers Museum Library and Archive, Album no. B10).

[19] For a description of the perilous state of the track in the aftermath of the storm see Sandes 1937, 183.

[20] So named not on account of its colour "but because all traces of paint had disappeared from its sturdy timbers" (Maunsell 1945, 7).

journey the heavily laden train achieved a speed of 15 mph which slackened off as the hilly portions of the route were reached. Journey time to Sarras was 3 hours. He describes the route after Sarras when the line left the Nile as exciting on account of the sharp curves which had led to two engines falling down a 15' bank and caused engines and trucks to be derailed daily. Some of the steep gradients posed real problems, on one the train failed to scale it at the first attempt and had to back down to the level section before building up a head of steam to try again. Going down hill was a roller coaster ride, the rolling stock having no brakes while those on the engine were so worn as to be almost ineffective. The train was watered at Sarras and again from the well at Ambigol. After Kosha travel was quicker on the newly surveyed and laid portion of the track with its good bridges. He notes that at Kerma there was neither a station nor engine sheds, the train simply stopping 50 yards from the end of the line (Budge 1907, 87-98) although by 1901 Macauley notes the presence of a small running shed and workshop (1901, 182).

In civilian use there were two weekly express trains and one for local traffic (Wierner 1932, 597). According to Macauley, writing in 1901

> "Owing to the light rails and bridges on the older sections of the Kerma line, and also to the sharp curves, one class of engine only is used - a four-wheel-coupled side-tank engine, with leading four-wheel bogie. Driving wheels, 3 feet 9 inches in diameter; outside cylinders, 14 inches by 20 inches; weight in working order, 30 tons. There are six of these engines, which were made by the Hunslet Engine Company, Leeds."
>
> (Macauley 1901, 182).

After the railway reached Kosha and Delgo it was used by local merchants to transport sacks of dates to Halfa and considerable quantities of dates and grain, along with a small amount of ostrich feathers, came down the line from Kerma, the grain being sent to Khartoum to feed the garrison there. Two mail trains each way provided a weekly service to Kerma connecting with the European mails, and usually three or four other trains a week each way, were run as required, a total of five or six trains each way weekly. During the date season special trains were provided to accommodate the date merchants. Other trains were involved in improvements to the line (Macauley 1901, 182-3).

Notwithstanding this the line was not well located as an artery for trade. As late as 1901 upgrading of the line with additional bridges and culverts to mitigate the problems caused by the occasional rains were being undertaken (Macauley 1901, 181). However, by 1903 the line was in such bad condition that it required considerable investment and, as it had been running at a loss - running costs in that year were £E18,000 while receipts were only £E11,000 (Budge 1906, 749) – the decision was taken to remove the rails between Kerma and Kosha. These, having only been recently laid were in good condition and were dispatched to Atbara for the construction of the Atbara to Port Sudan railway, or for the Abu Hamed to Kareima line, while the sleepers were stockpiled at Kosha (Budge 1907, 96-7, 464; Sandes 1937, 400).

Although the line was officially closed on 31st December 1904, trains were run between Wadi Halfa and Kosha for administrative purposes only (Budge 1906, 749) and, twice daily, from Halfa to Gemai, apparently a popular picnic spot, until 1908. Until 1924 sleepers were torn up by the locals and floated down to Wadi Halfa for sale to the Railway Department (Sandes 1937, 186).

Plate 18. The railway in the Batn el-Hajar photographed by J. P. Greenlaw in 1938 (SARS Greenlaw Archive GRE P237-04).

I. E. S. Edwards journeyed from Wadi Halfa to Sesebi in 1937 to participate in the Egypt Exploration Society's excavations in the New Kingdom town. He notes

> "At intervals along the way from Soleb I had noticed relatively small stretches of railway track, partly dismantled. In some cases rails had resisted attempts to detach them and they were bent in all directions, sometimes pointing to the sky."
>
> (Edwards 2000, 75).

Here Edwards must be describing the railway immediately north of Delgo as a few kilometres north of the town it heads out into the desert only rejoining the river at Kosha.

The railway and associated installations today

The railway ran along the river from Wadi Halfa to a little south of Sarras then turned inland (Plates 19 & 20) following broad *wadis* where possible to pass through the Batn el-Hajjar avoiding the very broken terrain along the river. It approaches close to the river again at Akasha but then swings into the desert to round the massifs of Jebel Dal and Jebel Firka. Rejoining the river at Firka it follows it closely as far as Kosha. Here where the Nile

Plate 19. Locus 0. The railway in the lower reaches of Khor Ahrusa which was within Lake Nubia in 2008 but visible in February 2010.

Plate 20. Locus 1. The railway in the lower reaches of Khor Ahrusa where it emerges from Lake Nubia in February 2008.

course comes from the west the railway heads up a wide *wadi* due south only rejoining the river immediately downstream of Delgo (Plate 38). From Delgo to Kajbar it is close to the river but again when the river's course is west-east the railway runs south cutting off the bend at the Third Cataract and then points south west direct into the heart of the town at Kerma (Figure 1, Plates 21 & 39). In the tracts between Kosha and Delgo and between Kajbar and Kerma it runs well inland, cutting the corners of the river bends. It is also in these areas that it is best preserved, although it is followed by modern tracks (Plate 22) both inland and by the river.

To hasten the laying of the track, the embankment often followed the course of the *wadis*, which resulted in large sections being washed away by the rains. However, the course of the railway is generally marked either by its embankment or by cuttings.

The railway and the military installations along its line are now, being over 100 years old, protected as antiquities by the Antiquities Ordinance of 1999. Since its demise in 1904 it had been damaged by natural forces, by car and lorry tracks, by the expansion of irrigation and the northern part has been obliterated by Lake Nubia (Lake Nasser). The rails, girders from the bridges, sleepers etc. were either systematically removed for reuse on other railway projects or were taken by the locals. Over the last few years the construction of the Dongola to Wadi Halfa tarmac road has caused considerable damage in certain sectors. In the light of these threats it appeared timely that a survey be undertaken to record what still survives before much is lost. Accordingly between the 6th and 15th February 2008 a team of three archaeologists[21] travelled along the surviving course of the line (Welsby 2008). A further four days was devoted to recording and studying the finds collected. The finds were handed over to the Sudan National Museum in Khartoum at the end of the project.

The principal objective of the project was to make a photographic record of the remains of the surviving railway embankment and associated structures. The first 60km of the railway from Wadi Halfa now lies submerged beneath the waters of Lake Nubia. It emerges from the lake (Plate 19) immediately to the east of the Middle Kingdom Egyptian fortress of Shalfak; the terminus was at Kerma where passengers and goods would disembark and immediately embark on the Nile steamers moored nearby.

During the survey the surviving traces of the railway were extensively photographed, the co-ordinates of each image being recorded. Locations from which photographs were taken were given loci numbers as were all the associated sites. Following the fieldwork a detailed study of the Google Earth imagery allowed the recognition of a further nine construction camps. Some of those noted on the ground are invisible on Google Earth even when their position is precisely known.

In February 2010 the project was continued .[22] By that date the new road to Wadi Halfa was completed and the damage to the railway and its associated installations were clearly visible including the total destruction of one construction camp which had been entirely quarried away when the gentle rise it sat upon was utilised for gravel extraction. Whereas in 2008 the section of the railway between Kosha and Delgo appeared to have been little visited two years later the situation was very different. Much of the area was crisscrossed by vehicle tracks and people with metal detectors, participants in Sudan's gold rush, were observed. Their activities

[21] The team, led by the writer from the Department of Ancient Egypt and Sudan at the British Museum, also consisted of Isabella Welsby Sjöström, archaeologist, and et-Tayeb el-Jak Ruwei, Antiquities Inspector from NCAM.

[22] The team consisted of the writer, Isabella Welsby Sjöström and Mahmoud Suleiman Bashiir, Antiquities Inspector from NCAM. Camp 19 was visited in October 2008 and 2009. Camp 24 was planned by the writer and Yassin Mohammed Saeed in October 2009.

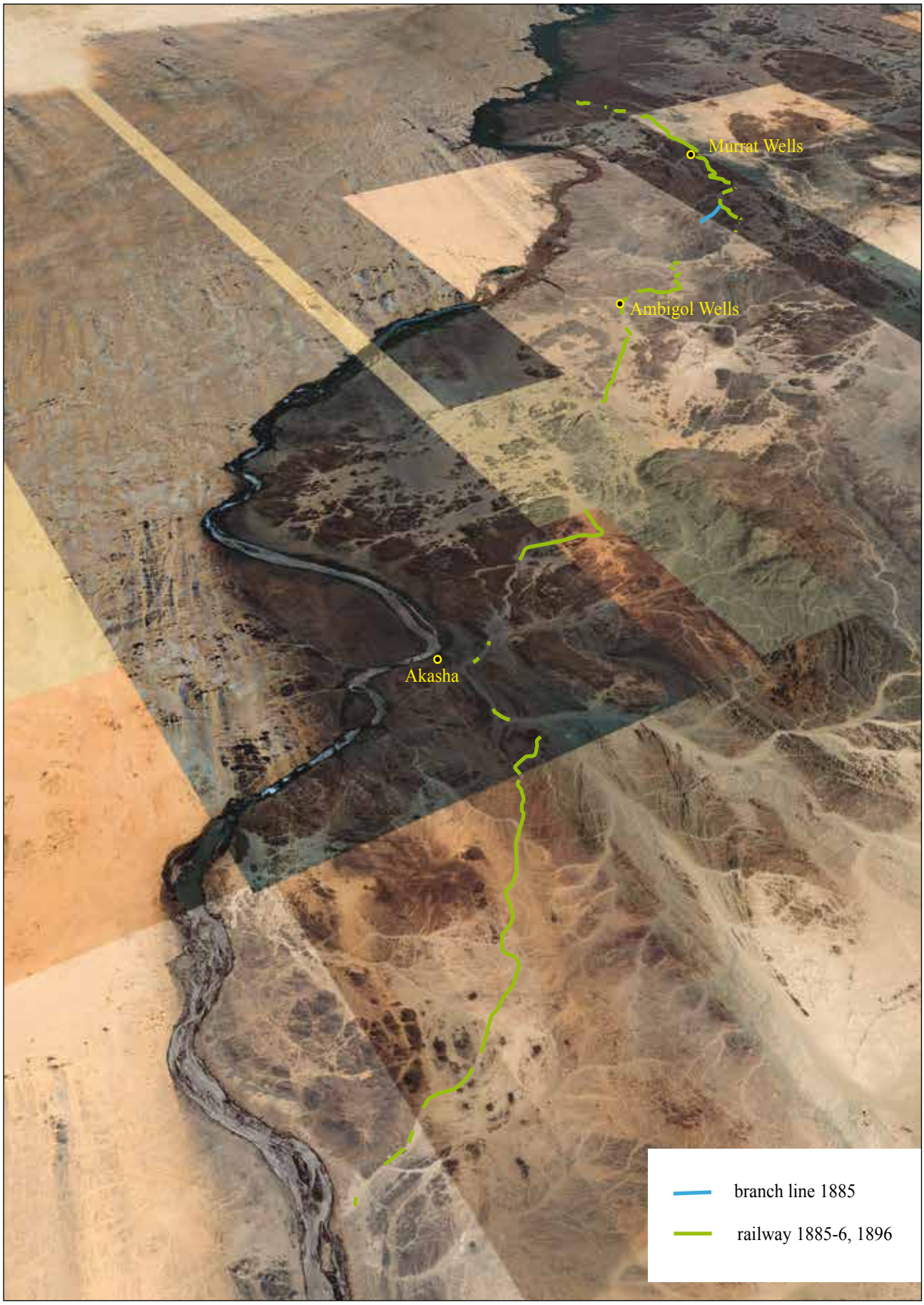


Plate 21. The route of the railway through the Batn el-Hajar as it survived in 2008. Oblique satellite image from Google Earth.

were clearly visible at a number of construction camps where small holes had been dug in several sites. The camps in particular are often very difficult to see when one is driving through the desert yet the remains can be destroyed so easily by vehicles. Their long term survival is far from assured.

In the 2010 season all those sites noted on Google Earth, but not previously visited, were studied and where appropriate artefacts were collected. Additionally several camps were surveyed in detail, sketch plans being made of several more (see below). As well as the railway itself the following structures were also recorded photographically and in some cases measured sketch plans and elevations were made.

Military camps and associated watchtowers	4
Isolated watchtower	1
Isolated redoubt	1
Construction camps	46
Railway huts	2
Station	1
Ticket office	1
Bridges	2

Plate 22. Locus 4. The embankment reused as a vehicle track in a narrow defile in the lower Khor Ahrusa.

The railway line

Contemporary reports talk of the need for constant maintenance on the line and of wholesale destruction by the Dervishes and in particular by the great storm of August 1896. In many of the areas most prone to flood damage no trace of the line remains. The northern section of the railway which followed the river closely for most of its route from Angash to a little upstream of Sarras has been totally destroyed by the waters of Lake Nubia in the 1960s. The railway is now first visible in the lower reaches of Khor Ahrusa (Plates 19 & 20).

Plate 23. Locus 23 The railway, redoubt and Watchtower 3 at Murrat Wells.

At various points along the line different phases of construction can be seen. North of Akasha these may relate to the modifications during the relaying of the old line in 1896. At Locus 39 for example a new and deeper cutting cuts across a tight curve on the earlier line (Plate 25). On the section south of Kosha two phases of construction can clearly be seen in three places where initially the line was constructed in haste but was then realigned over new bridges (Plates 48, 50 & 55), two of which still survive (see below).[23] At a point 8km as the crow flies south-south-west of Murrat Wells traces of the spur line, which was to go down to the river, but was abandoned in 1885 after only 3km of track up a *wadi* were laid out, remain (Plates 6 & 7).

The embankment, originally planned with a formation width of 13 feet and with 2 to 1 slopes (Harwood 1945, 5) is usually of earth and gravel (Plates 24, 27 & 29), sometimes laid on a bed of large stones (Plate 28). In places rough stone pillars are buried within the embankment perhaps to act as reinforcing or as a guide for the railway gangs so as to adhere to the alignments set out by the surveyors. This feature is particularly clear at Locus 46 (Plate 26). Just south of Kajbar at Locus 232 narrow rough stone walls extend right through the embankment at regular intervals. Atteridge records the method of laying out the roadbed between Firka and Kosha in mid June 1896

"The engineers marked out the line with stones, and

[23] By the bridge near Kajbar this realignment entailed cutting away the edge of a rocky hill over some distance (Plate 49). Several vertical holes remain for the insertion of the blasting charges used to break away the sandstone (at locus 230b).

Plate 24. Locus 25. Well preserved rail bed with position of sleepers visible.

Plate 27. Locus 71. The railway crossing the gravel plain between Ambigol Wells and Akasha.

Plate 25. Locus 39. Two periods of cuttings.

Plate 28. Locus 89. Railway traversing particularly rough country a little south of Akasha.

Plate 26. Locus 46. The embankment strengthened with cross walls of stone.

Plate 29. Locus 104 The railway midway between Akasha and Firka.

Plate 30. Locus 54. The railway looking north to the fort at Ambigol Wells in 1986.

Plate 31. Locus 110a. The railway running down the wadi *towards Firka seen from the summit of Jebel Firka.*

raised at intervals small banks of sand to show the exact level of the future track, which for most of the way was only a foot or two above the neighbouring ground. Then on the afternoon of June 14th fatigue parties from the various battalions in camp paraded, some with spades, others with hoes and baskets, the latter being the local substitute for a wheelbarrow ....."

(Atteridge 1897, 265).

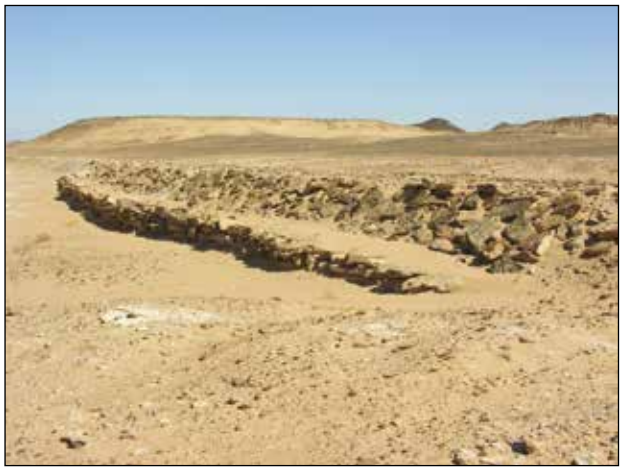


Plate 32. Locus 142. Extra protection against water damage on the wadi *edge.*

Rarely the embankment is revetted in stone as at Loci 20 and 142 to mitigate the effects of water erosion (Plates 32 & 34) as well as in the first phase embankment by the bridge at Kajbar (Locus 230). Between Loci 148 and 149, over a distance of 1.5km, the course of the railway is protected from the outflow of a number of *kheeran* by an mound between 20m and 30m to the south west (Plate 35).

Plate 33. Locus 123. The railway running south from the river at Kosha up a major wadi. *Construction camp 5d occupies the hilltop immediately to the left of the* wadi.

Plate 34. Locus 148. The embankment revetted in stone where it runs along the wadi *edge.*

Plate 35. Locus 148-149. The railway (on the left) running across the gently sloping plain is protected from rain water runoff over a distance of 1.6km by a mound running parallel to it visible on the right.

Plate 36. Locus 179. Cutting with rock upcast mounds.

Plate 37. Locus 185. The railway amongst granite outcrops traversing the gravel plains between Kosha and Delgo 8km to the east of the Nile.

At Ambigol Wells a single rail remains close to the modern track and several lie within the village at Akasha showing evidence for reuse. Yet others, held together with joint bars support the roof of several verandas in the *souk* at Delgo (Plate 40) and many are to be found

Plate 38. Locus 210. The railway rejoining the Nile immediately downstream of Delgo.

Plate 39. Locus 265. One of the last traces of the railway as it heads to the river at Kerma.

Plate 40. Rails with fishplates supporting a roof in the souk *at Delgo.*

supporting roofs in local houses throughout the region. Of the timber sleepers, of course, no trace remain.[24] However, in many sections of the line the impression of the sleepers in the road bed can be seen (Plate 24). At one point they varied in their spacing from 800-970mm centre to centre over a distance of 3.5m.

By the fort at Ambigol Wells is an axle and two wheels from rolling stock (Plates 41 & 42). The wheels are 800mm in diameter and 860mm with the flange. The rims are cast separate from the spokes and hub, the two pieces being bolted together. The rim bears the inscription J. BROWN & Cº. Any continuation of the inscription is buried beneath the sand. Another axle and two wheels of much smaller diameter (460mm, over flange 510mm) lies 1.25km to the west of the line at Kosha (Plate 43).

[24] It had originally been intended to use iron sleepers but timber was used throughout (Harwood 1945, 5).

Plate 41. Locus 54. Axle and wheels at Ambigol Wells.

Plate 42. Locus 54. Wheel, detail.

Plate 43. Locus 124. Axle and wheels near Kosha.

Plate 44. Locus 54a. The stone revetted loading ramp and siding at Ambigol Wells.

Plate 45. Locus 136. The siding by Construction Camp 6.

Plate 46. Locus 136. The mound supporting the buffers at the siding by Construction Camp 6.

Sidings and loading ramps

At various points along the railway sidings were noted and many other had originally been provided. At Ambigol Wells the siding had a well-constructed loading ramp with the side towards the railway, revetted in a vertical wall of stone (Plate 44). The sidings at construction camps 6 and 8 terminated against a mound acting as, or designed to support, a buffer (Plate 45 & 46). At camp 9 there is no siding but a curved ramp leads up the low embankment on which the railway runs (Plate 47).

Plate 47. Locus 145. The loading ramp at Construction Camp 9.

Bridges

Although a large number of bridges and culverts were provided along the line these have been very susceptible to damage from water erosion and few traces remain. During the initial construction of the railway time was of the essence and far from ideal engineering solutions were adopted in some places to speed up the construction work. Soon after the completion of the railway some of the resulting problems were rectified as noted above with the digging of deeper and longer cuttings to remove some of the tightest curves in the line. A number of *wadis* and *khors* were provided with longer and more substantial bridges. This was presumably the case at locus 222 but all traces of both period bridges are no longer extant.

Plate 48. Locus 222. Two periods of embankment at the crossing of a small but deep khor. *No trace of the bridges remain.*

Site WHKRS 230. Here a kilometre to the south east of the Kajbar rapids, a second phase of railway building (Plates 50 & 55) saw the construction of a bridge bearing the inscription 'Founded in 1897' (Plate 53). The steel girder bridge was of four spans 2.95m, 5.14m, 5.4m

Plate 49. Locus 230. Cutting and embankment on the second phase line by the bridge at Kajbar.

and 3.09m in size. The piers, set at a pronounced angle to the roadbed so as to align with the *wadi* had sharply pointed cutwaters both upstream and downstream and massive stone abutments. Each pier was approximately 2.94m thick and about 8m in length (Plates 51 & 52). Three chamfered mouldings reduce the pier dimensions by 100mm each time. The piers survive in excess of 5m in height above the sandy *wadi* fill. They are well constructed of small dressed blocks of yellow sandstone set in a lime mortar with red sandstone used for the mouldings. Curved grooves on the upper faces of the piers were made when the metal girders were dislodged presumably during the organised demolition of the line soon after 1904.

In the vicinity are three stone buildings (Plate 54).

Building A. A single-roomed structure entered by one doorway 775mm wide in its south-west wall and by another 1.32m wide, subsequently blocked, in its south-east wall. It measures externally 4.7-4.68 x 3.8-3.75m and survives to a height of 2.76m. There is a window in the south-west wall, another in the north-west wall and a low *mastaba* along the exterior face of the south-east wall.

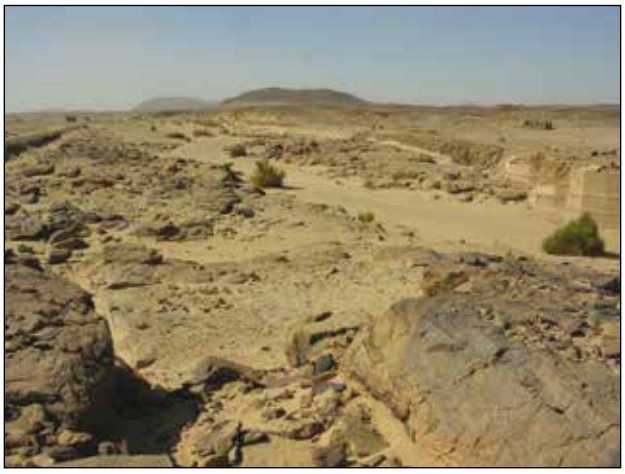


Plate 50. Locus 230. The two phases of railway by the bridge at Kajbar, phase 1 on the left.

Plate 51. Locus 230. The bridge at Kajbar.

Plate 52. Locus 230. Bridge pier.

Plate 53. Locus 230. Building inscription on the south abutment.

Plate 54. Locus 230. Stone buildings presumably associated with the construction of the bridge.

Building B. A single long room entered by a 1.13m wide doorway placed towards the centre of the east wall. It measured externally 22.3-21 x 6.78-6.65m and had walls between approximately 470 and 500mm surviving to a maximum height of 1.71m. The location of no windows was preserved.

Building C. Rectangular single-roomed structure surviving to a maximum height of 2.36m. It was entered by a centrally placed door 1.4m wide through the east wall which was flanked by two windows. A further two windows were spaced along the south wall and another, 635mm wide, was set in the centre of the west wall. The north and south walls were 450mm thick, the east and west walls 530mm and 580mm thick. Two wall stubs project a very small amount to the south from the south-east and south-west corners of the building.

Site WHKRS 197. The remains of a substantial bridge lies approximately 16km north of Delgo where the railway crossed the Wadi Abu Sunt (Hill 1965, pl. 5). It has stone piers and eight segmental arches of fired brick 230 x 115 x 60mm in size (Plates 56-59). The brick-faced arches are 750mm thick. A sample of the stone courses measured 225mm, 220mm and 205mm in height. The spans range between 7.29m and 7.41m supporting the road-bed approximately 4.3m in width. The piers have pointed cutwaters both upstream and downstream and are about 1.85m thick. The whole of the piers and the lower parts of the spandrels were dressed in stone against the concrete core. The stone is carried to a height of four courses above the tops of the cutwaters above which the facing is of brick. The total surviving height measured above the sandy fill of the *wadi* is about 3.4m. Both abutments are faced in stone.

Set in the *wadi* bed close to the bridge was a circular kiln for firing the red bricks (Plate 60). It had a maximum external diameter of 4.2m and a depth to the sand infill of 2.55m. At the top its walls were 800mm thick and the chamber had an internal diameter of 1.87m. A *mescid*

Plate 55. Locus 230. Kajbar, the two phases of railway, the bridge and the associated stone buildings (Google Earth 28th Nov. 2003).

or *msalla* approximately 10 x 7.5m in size, presumably for the benefit of the Egyptian or Sudanese soldiers/ workmen was laid out to the west of the railway and a rectangular single-roomed building with dimensions *c*. 5.7 x 4m, constructed from rough blocks of red sandstone was close by. The quarry for the stone (red Nubian sandstone) was found some three kilometres to the south at Site WHKRS 199 (Plate 61).

Construction camps

In the earlier stages of the construction of the railway in 1884-5 and again in 1896 the line was being pushed into potentially hostile country and the possibility of attack from Dervish raiders was taken seriously. Atteridge describe the scene in mid April 1896 in the lower reaches of the Khor Ahrusa

> "Not far from the groups of workmen their Remington rifles were piled, and close to the rail-head was a post of Martini-armed regulars. Other posts, these being small pickets with outlying sentinels, held the hills right and left and the valley in front. It was railway making in face of the enemy, for it was expected then that sooner or later the Dervishes would have sufficient enterprise to try to rush the rail-head, and the platelayers would have to drop pick and crowbar and take up the rifles that were always piled within easy reach."
>
> (Atteridge 1897, 90).

Those camps directly associated with the railway can be expected to have housed the Railway Battalion of 600 men along with the unit of regulars, at least during the construction work up the Khor Ahrusa to Ambigol Wells. At that time the regulars were formed of the 7th Egyptian Battalion officered entirely by Egyptians, with one commanding officer, three *bimbashi* (majors) along with company officers. The battalion had six companies with a war strength of about 120 bayonets each (Atteridge 1897, 340).

A total of 46 construction/railhead camps and military camps were noted (Figure 3). No regular spacing of the camps along the line was noted, the spacing will presumably have depended on the pace of the construction work although in 1885 the standard practice was to move the construction camp every Sunday, the other days of the week being devoted to the railway's construction (Nathan 1887, 42). On the Akasha-Firka section, as probably elsewhere along the line especially as the security situation improved, several camps were occupied simultaneously,

> "scattered here and there along the khor, one saw the white tents of the camps formed for various detachments of the railway battalion and the large working parties supplied by the 2nd and 7th Egyptians"
>
> (Atteridge 1897, 274).

A pattern may however, be discernible approximately 15-40km south of Kosha where there is the following sequence, the five large camps being spaced approximately at 6-7.25km intervals (see Table 4).

Camps were particularly well preserved in the section between Kosha and Delgo, and here they were also particularly large and complex in plan (e.g. Camp 6 see Table 5, Figure 13). The standard arrangement in a camp occupied by a single unit was for the tents of the ordinary soldiers to be laid in rows, generally six rows of up to 10 tents, each row separated by an alley or street (Figures 6 & 13). The outline of each tent was most commonly marked by a ridge of gravel up to 400mm wide and about 100mm high, occasionally by circles

Plate 56. Locus 197. The eight-arched stone, red brick and concrete bridge.

Plate 57. Locus 197. The bridge, upstream side.

Plate 58. Locus 197. Detail of one of the stone piers and the red-brick arches.

Plate 59. Locus 197. The rail bed on the bridge looking south.

Plate 60. Locus 197. The kiln used for firing the red bricks used in the bridge's construction.

Plate 61. Locus 199. The quarry 3km down the line from the bridge from which the stone was sourced.

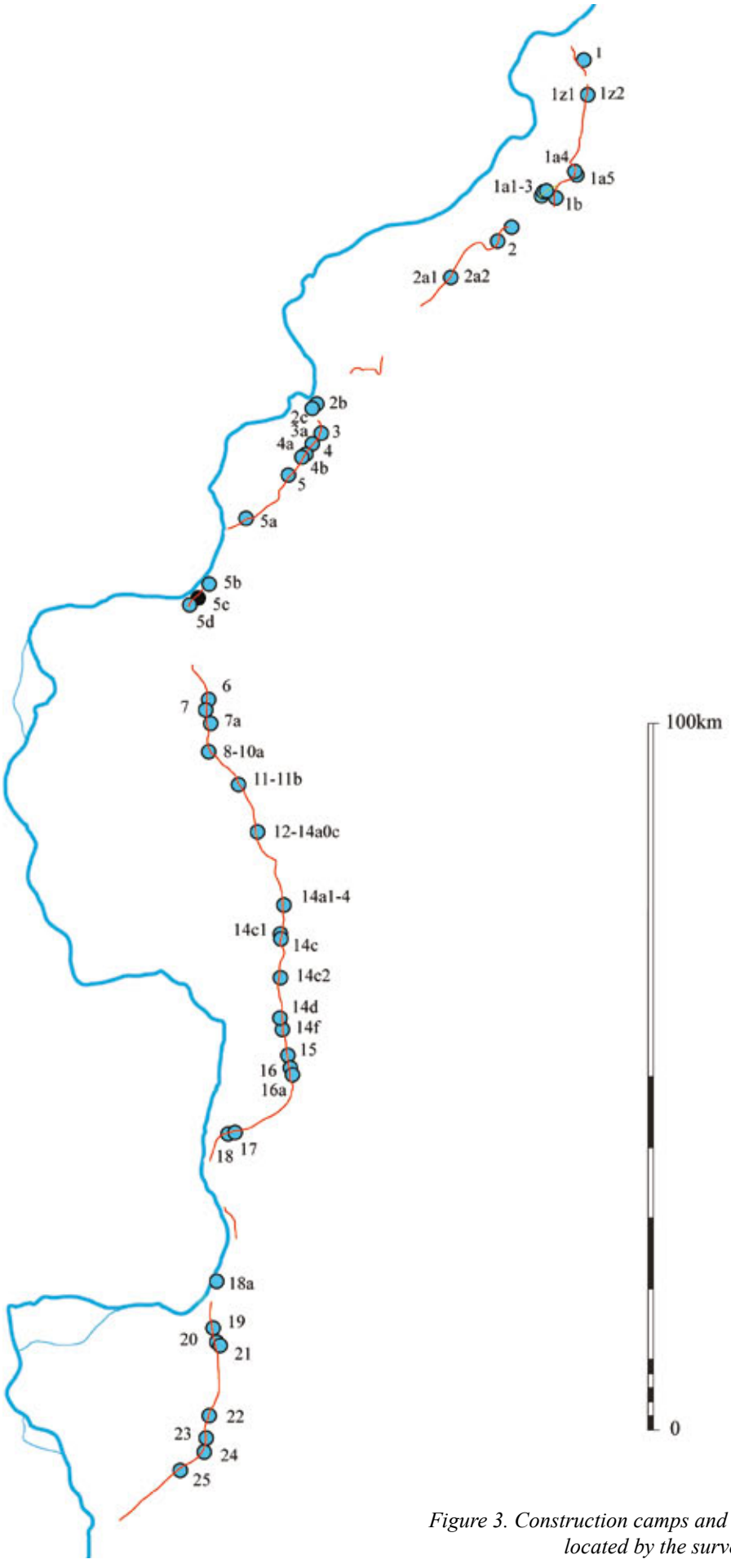


Figure 3. Construction camps and the army camp 5c located by the survey.

Table 4. Spacing of camps south of Kosha. The distances given are between each camp and its neighbour to the north.

	camp	unit(s)
-	6	2 units + commisseriat
1.36	7	1 unit
1.77	7a	1 unit
2.16	8	part of unit
0.67	9/a/10/a	2 units
5.89	11/a/b	2 units + commisseriat
7.27	13/a/14	2 units + commisseriat
6.19	14a1/a2/a3/a4	2 units + commisseriat

of stones (Plates 63-65). Occasionally upright circular timbers 30-40mm in diameter were found embedded in the ring, these were presumably the poles used to support the vertical tent sides rather than tent pegs. In some instances larger stones were used to secure the guy ropes and these were on occasion chosen in alternating white

Plate 62. A camp at Suakin in 1885. Although presumably very similar to those along the Nile there is no indication of the streets and tent plots being demarkated by gravel ridges (Reproduced by permission of the Royal Engineers Museum Library and Archive 779(624)962 "1885").

and black colour. Often within the tent were between one and three low raised platforms approximately the length of a man, sometimes with a further raised area for the head (Plates 72, 75 & 76). An effort was made occasionally to form a roughly flagged floor with small stones. The most elaborate have pebble mosaic floors. One of these had indistinct swirling patterns made from white pebbles and black stones (Plate 95). By far the finest had a very well laid checkerboard pattern of white and black squares (Plate 91 & 92). This tent base was set aside from the rest of the camp with a path leading up to it (see Camp 7 below).

The entrance way to the tent, usually a single entrance but occasionally with a back entrance (Plate 104), was also marked with the same gravel mounds as were the limits of each 'block' (Plate 93). Although these gravel ridges in no way form a barrier their careful layout and the well preserved nature of these very ephemeral features indicated that they were respected as boundaries and that people followed the designated paths and entrances rather than taking the straightest line from A to B. The arrangement of the blocks varied sometimes with:-

each tent occupied a square within the rectangular outline of the block

more than one tent occupies a rectangular area within the block

the individual squares are separated by very narrow alleyways.

A combination of these arrangements was sometimes noted within a single block. On the north side of the camp the officers' tents were placed, the individual tents often placed in a row but generally with no bordering gravel mounds. Table 5 summarises the tent layout in the camps studied in detail in 2010. It can be seen that there was considerable variability in the accommodation provided. Seven rows of tents for the enlisted men is the most common arrangement with six and six and a half rows also being represented each more than once. There are never more than 10 tents per row but frequently considerably less. The total of tent bases within all the rows in a single camp indicates that unit strength was in a constant state of flux presumably with men frequently outstationed or detached to other units.

The six companies of 120 bayonets each[25] known to have occupied Camp 1z2 in 1896 suggests that these men occupied the six rows while the 10 officers were each housed in a separate tent in the northernmost row. This would give a complement of perhaps 12 men per tent although presumably at no time would all the men be off duty together. *Mastaba* are not present in the majority of

Table 5. Morphology of Camp CC6.

Units	Rows	Tents per row	Tents total	Entrance facing	Alignment of rows	
A	6½	9-10	62	E	N-S	Northern group
A	-	-	7	N&S, N, W, NE&SW, NE, NW&SE	E-W	Officers' tents to N
B	7	6-8	47	N&S, N, NW	E-W	Central group
C	2	7	14	S, SE	E-W	Southern group
			6			Miscellaneous tent bases

[25] A full strength Egyptian Battalion consisted of six companies of 150 men each (Featherstone 1993, 11).

Table 6. Summary data on the camps studied in detail.

Camps	*Rows*	*Tent bases per row*	*Tent bases in the rows*	*Additional tent bases*	*Total no. of tent bases*	
1	7	7-9	42	6	52	1 row empty
1z1	7	2-3	16	1	17	1 row one rectilinear feature and one windbreak
1z2	7	9-10	60 + 5?		60 +5?	
1a4	7	9	45 +	3 +	48 +	Probably many additional tent bases
1b	7	9	50 + 8?	13	63 + 8?	The row of officers tents is not included in the data on the rows
2	12	10	67 + 8?	12+	79 + 8?	The row of officers tents is not included in the data on the rows
4	6	3	18	24	52	The row totals refer only to those in rectangular frames
4a	3	4-7	14	2	16	
4b	2	7-10	17	1	18	North group
	2	7	14		14	Central group
	2	7	14	3	17	South group
5	5	8-9	43	9	52	
5a	5	9	45	9	54	
6	6½	9-10	61	9	70	North group
	7	7-8	47		47	Central group, where tent bases not visible entrances counted
	2	7	14	5	19	South group
7	6	9-10	59	15	74	
7a	6½	8-10	58	7	65	
8	1	8	8	11	19	
9	8	6-10	67	13	80	Two rows of officers tents not included in row data
9a	-	-	-	4	4	
10	6½	10	66	8+	74+	The rows of officers tents not included in the data on the rows
10a	4	5-6	23	3	26	
11b	2	7-8	15	1	16	
14a2	2	7-8	15	1	16	

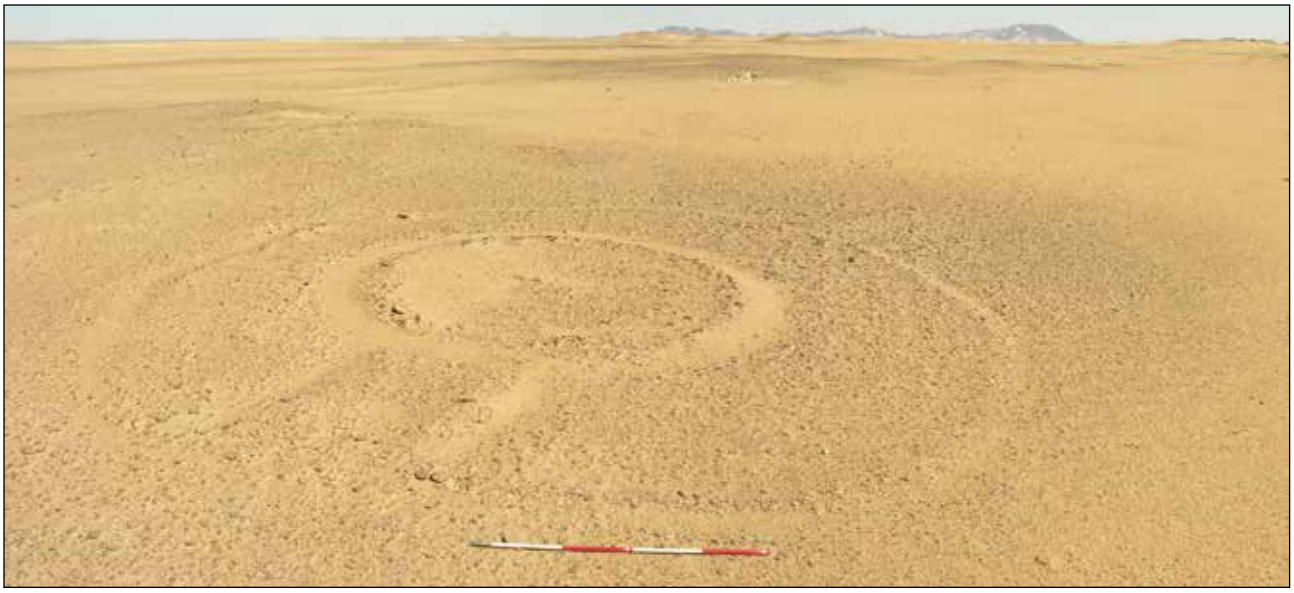


Plate 63. Camp 14c. Tent base with funnel entrance within circular enclosure.

Plate 64. Camp 13a. Rectangular enclosure.

Plate 66. Camp 14. Tent bases with funnel entrance within circular enclosures.

Plate 65. Camp 14a1.

Plate 67. Camp 25. Destruction of the camp during the quarrying activities associated with the building of the Dongola to Wadi Halfa highway in 2007-9.

tents and are much more common in those reserved for officers. Up to four *mastaba* were found in a single tent but whether all were used as beds is uncertain.

A visitor to the construction camp at what was then the railhead 5 miles north of Ambigol Wells on May 24th 1896 records that it had an orderly and permanent appearance, with a number of tents and huts occupied 'by young railway engineer officers and men of the railway battalions, plus a congregation of little shelters for native camp followers and Greek store keepers and canteen proprietors' (Knight 1896, 96).

Some camps were occupied for a considerable period of time, particularly that at Kosha which was constructed out in the desert around 22nd July 1896 in an effort to combat the virulent cholera epidemic. The troops moved from there to continue the advance to Dongola on 11th September. This desert camp (Camp 5c), of tents and circular huts (*tukl*) was spread out as much as possible to aid in stopping the cholera epidemic (Knight 1897, 203, 239).

Many camps had traces of more elaborate structures. At Camp 9 was a large rectangular cleared area with 'gateways' marked by large stones around its perimeter (Plate 97). In Camp 6 is a large rectangle with a central rectangular cleared area from which radiate four "streets" meeting the enclosing rectangle in the centre of each of its sides (Plate 87). At Camp 13a is a not dissimilar feature but probably originally with a rectangular tent in the centre as it has the typical gravel mound of a tent base delimiting the central rectangular area (Plate 64). The most unusual camp, if that is what it was, is that at Camp 12 (Plate 103, Figure 21). Here are a number of well laid out streets which run on a wide range of alignments and intersect each other. No associated tent bases were noted.

At several of the camps, hearths with wind breaks were found on the south side (Plates 73 & 84), presumably to minimise the risk of fires starting from the sparks from the cooking fires, the prevailing wind coming from the north.

Frequently located close to these cooking installations are double rows of tent bases each set within a circular enclosure. They are set apart from the rest of the camp as at Camp 4b (Figure 10), Camp 6 (Figure 13), Camp 11b (Figure 20), Camp 14 (Plate 66) and Camp 14a2 (Figure 22). Within and around tent bases of this type are many nails and banding iron (Plate 101) suggesting that these areas were associated with the unpacking of stores from the wooden crates, the timber presumably being used to fuel the cooking fires. A small number of isolated tent bases of this type were noted close by the railway line (Plate 63).

Occasionally there were dry-stone walled huts on the limits of the tented areas and also semi-circular shelters with high stone walls and rectilinear ones open on one side which may have been sentry posts.

Several camps were studied in detail and are described below. Camps 1a5, 4, 6, 7, 8, 12, 14a2 and 24 were accurately surveyed using a Leica Total Station while detailed sketch plans of camps 1, 1b, 2, 4a, 4b, 5, 5a, 7a, 9, 9a, 10, 10a, 11b and 19 were made. Utilising the detailed sketches it has been possible in many cases to produce reasonably accurate plans of these camps by transposing the sketch plan data onto the scaled image from Google Earth.

Camp 1 (Locus 6). This is the first surviving camp as one progresses along the railway from the point where it appears from the waters of Lake Nubia. It lies on gently sloping ground on the north side of the *wadi* with a steeply sloping ridge to the north east up which some of the installations extend. The railway here is sweeping in a tight curve following the *wadi* which brings it very close to the southern side of the camp. A shallow *khor* cuts through the camp and a large quartz outcrop sits within it. The layout of the tent bases is far from clear in places but it is laid out in seven rows with the second row from the east devoid of tent bases (Figure 4). The central row is not flanked by streets while those to either side are. The western row is not set within a rectangular frame and includes two tents with a penannular annex attached to one side. At the north ends of the two western rows are three-sided square features a similar size to the tent bases. A further four tent bases are terraced into the steep slope of the hillside. Almost all the tent bases are penannular rings, with only two having a funnel-shaped pathway leading up to them. One row has clear evidence for a central pole in most of its eight tent bases. Although the basic arrangement of the tent lines is regular there are a number of tent bases that are offset into the intervening streets suggesting the possibility that there is more than one period of occupation here. To the south east close to the *wadi* is a line of four hearths, each rectangular with three sides composed of upright slabs, the fourth open to the south.

Across the *wadi* a roadway leads up over a col into a small valley in which are 16 parallel ridges of gravel each about 1m apart (Plate 68).

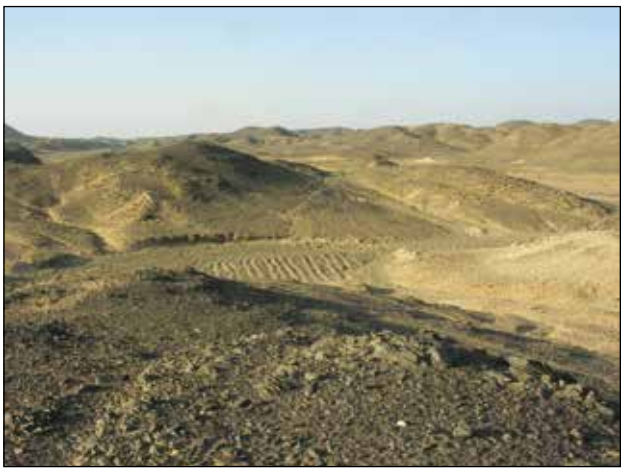


Plate 68. Locus 6. The parallel ridges in the wadi *close to Camp 1.*

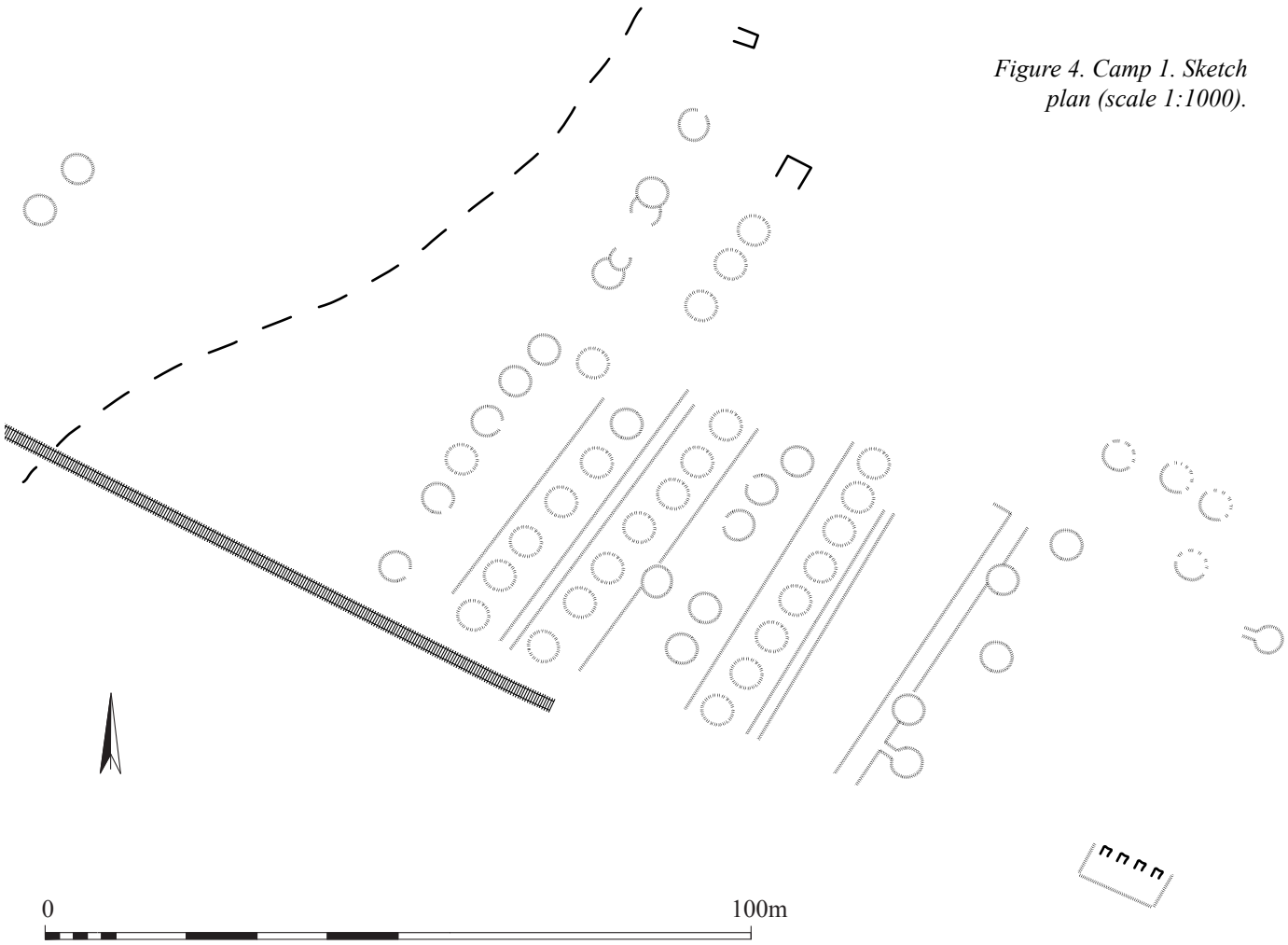


Figure 4. Camp 1. Sketch plan (scale 1:1000).

Camp 1z1 (Locus 15a). On flat ground and on a low rise on the west side of the railway immediately opposite camp CC1z2. It consists of seven short rows of tent bases set at right angles to the railway. Around the low gravel ridges are a number of quartz blocks in many cases. The third row from the south contains one crudely made semi-circular stone shelter up to two 'courses' high and traces of a rectilinear features. All the tent bases are penannular rings. Further to the west are several hearths, small arcs of low walling and one small rectangular structure formed of a single line of stones.

Camp 1z2 (Locus 15b). This camp lies on flat ground on the east side of the railway. Running parallel to the railway embankment are seven rows of tent bases, the southern four set within rectangular frames but with no divisions between the individual tents (Plate 69). All the tent entrances faced to the north. The northern row had the bases outlines in large stones (Plate 70) and two had *mastaba*, a single *mastaba* in one case and two forming an L-shaped arrangement in another. Tent bases are in all cases penannular rings.

These two camps were visited by the correspondent A. H. Atteridge in May 1896. He noted that on the west side of the line (Camp 1z1) the railway battalion was encamped under Girouard's command while on the other side was the camp of the 7th Egyptian Infantry Battalion, commanded by Colonel Fathi Bey (1897, 118-9). He goes on to describe the camp thus

> "The most curious sight in the camp was the bivouac of a number of camp followers and civilian workmen on its western side. In the gathering darkness one saw them moving in the red glare of their fires, which showed, instead of tents, a collection of ingeniously

Plate 69. Locus 15. View over Camp 1z2 occupied by the 7th Egyptian Infantry Battalion in 1896 towards Jebel Bringo, the site of a heliograph station.

Plate 70. Locus 15. View along one of the tent lines in camp 1z2 occupied by the 7th Egyptian Battalion in 1896.

Plate 71. Camp 1a4. View along the 'main' street with its circular feature.

> constructed huts and shelters of straw, odds and ends from the railway line, scraps of canvas, and a few palm leaves. Every race in Upper Egypt and the northern Soudan was represented. Some of them were provided with Remingtons, but most of them had only spears and other native weapons."
>
> (Atteridge 1897, 125).

Camp 1a4 (Locus 27a). This is now cut in two by the embankment of the new tarmac road. It has been partly destroyed by road construction vehicles and also by erosion on its north-east side where it extended into the *wadi*. On the east side of the road there are many finds among them a dump of tin cans but few structures. There is one large L-shaped feature formed of a single line of stones, one rectilinear structure open to one side and with an internal partition, again formed by a single line of stones, and a small circular feature, too small to be a tent base.

On the other side of the road there is a complex of structures. There are seven rows of tent bases formed of small stones, the eastern ends of which are much disturbed by recent activities. All seem to have been set within rectangular frames separated in most cases by narrow alleyways although one pair is separated by a wide street. Towards the north the features extend up onto the ridge which forms the edge of the *wadi*. Along the top of this ridge is a street (Plate 71) with entrances opening off both sides of it. Those going to the north run down into the *wadi*; the tent bases to which they may have led have been destroyed. Towards the west end of the street it passes through a circular area, the size of a tent base (Plate 71). Immediately to the west of this a narrower street branches off to the north and at least two tent bases front onto this street. The row of tent bases immediately to the south of the street along the ridge is trapezoidal, aligned on the other tent rows to the south and on the ridge to the north. It is much wider than the norm and its tents are entered up long pathways from the south but there are also pathways leading into the

Plate 72. Camp 1a4. A mastaba *within one of the tent bases.*

row from the ridge street. Towards its west end there may be a square area entered along four pathways as on the western side of Camp 6 (see Figure 12). Some of the pathways from the ridge street do not appear to be aligned on the tent bases suggesting the possibility that there were two periods of use here. Immediately adjacent to one of the standard tent bases is a rectangular base with a small rectangular niche on its north side. Most of the rows terminate to the west on the edge of a small *khor* but at least one row, which for no apparent reason starts further to the west than the others, extends across the *khor*. Some tents have well-made *mastaba* within (Plate 72). To the south is one tent base with opposed funnel-entrances possibly within a square enclosure. There are also three rectangular stone structures, two open to one side, the other forming a building with a doorway towards one corner. These are substantial structures with walls standing to a height of approximately 1m. Extending for several hundred metres along the base of the hills to the north are many windbreaks for cooking fires (Plate 73) while on top of the hill which dominates the site from the south west is a small watchpost formed

Plate 73. Camp 1a4. Windbreaks.

of three sections of drystone walling.

Camp 1a5 (Locus 27b). This camp was located on flat ground adjacent to a broad *wadi* 800m south of Camp 1a4 (Figure 5, Plate 74). It consisted of a subrectangular enclosure divided into three with those at either end entered via four opposed entrances from the perimeter path, the central one is entered from each side and has another entrance leading into a rectangular feature projecting from the units south-east side. Immediately to the north west, separated by an alley, are three tent bases within square enclosures with a perimeter path around each. To the north is a deposit of cans and another of stoneware

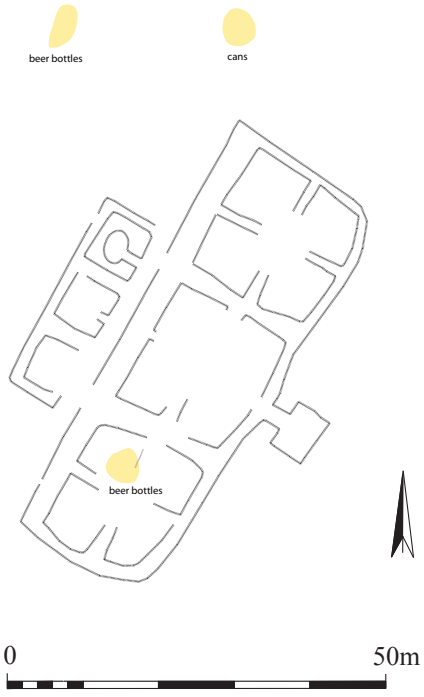


Figure 5. Camp 1a5 (scale 1:1000).

Plate 74. Camp 1a5.

beer bottles. Another extensive deposit of stoneware beer bottles was found within the southern area of the main enclosure. All the bottles appear to be of the same type and had contained Pale Ale made by Tennents of London (Cat nos 1, 3, 6-9).

Camp 1b (Locus 32a). On the east side of the railway on the flat land by the *wadi* edge and occupying the

Plate 75. Camp 1b. Tent base with its floor covered with quartz fragments and with mastaba.

Plate 76. Camp 1b, Tent base with mastaba.

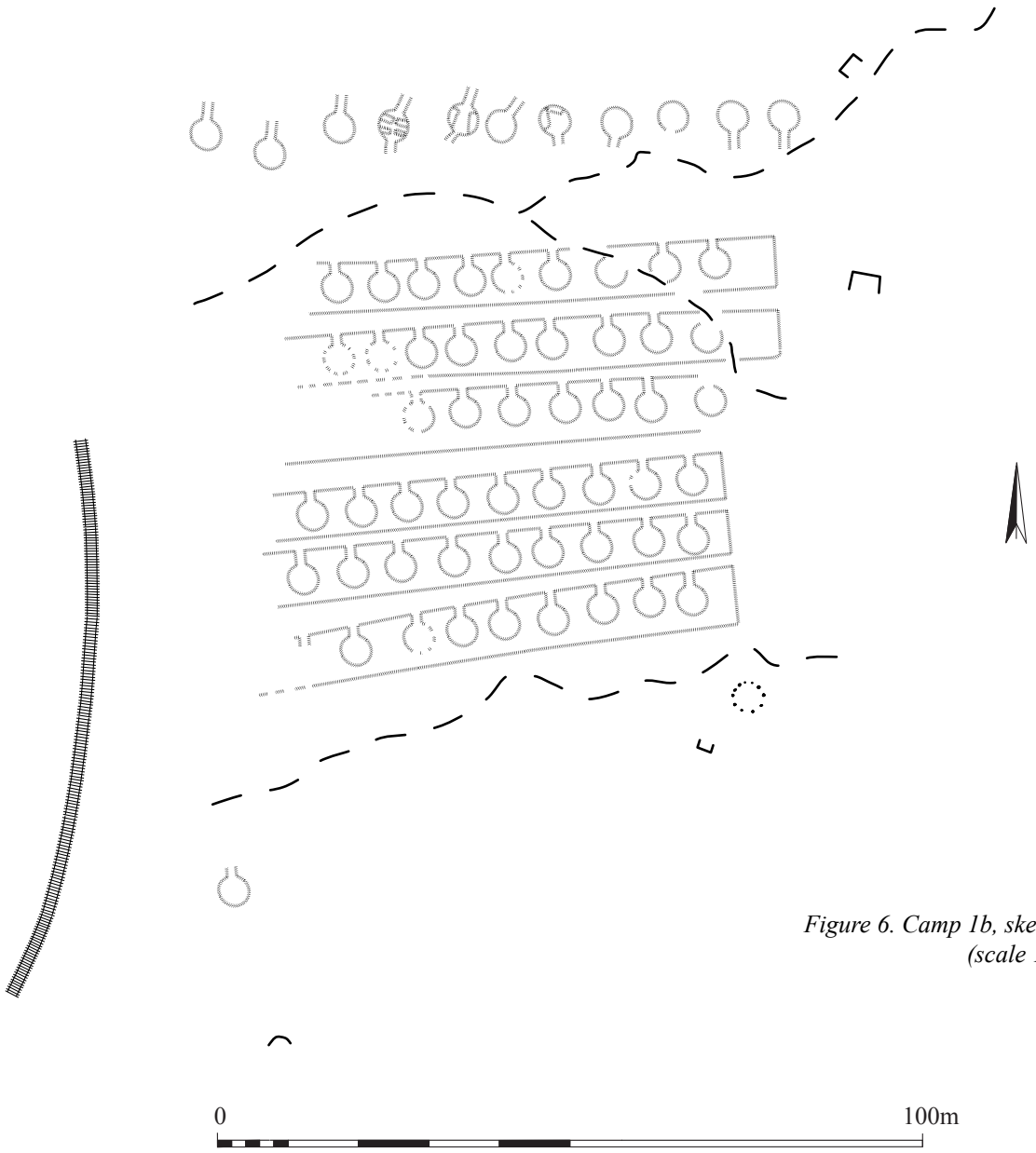


Figure 6. Camp 1b, sketch plan (scale 1:1000).

gradually rising slope. The officers' tents occupy an area on the north side of a *khor* which cuts through the site. There are six rows of tent bases within rectangular frames separated by alleys some of which are narrow (Figure 6). All the tents in these rows open to the north and have funnel entrances. Across the *khor* is a further row of 11 tent bases with long funnel entrances, the three at the west end opening to the north, the five at the eastern end opening to the south and, of the three in the middle, the western two open to north and south, the eastern to the north. Several of these have pavements of black stones or white quartz (Plate 75) and contain *mastaba* which are carefully constructed (Plate 76). One tent base has four *mastaba* set end on to the tent sides. At the east end of this row is a more substantial rectangular structure open to the south and another stands beyond the end of the next row to the south.

To the south of the tent rows are two isolated tent bases and many small stone windbreaks over a considerable area (these are not included on Figure 6).

Camp 2 (Locus 35). On the north side of the railway on the flat plain immediately adjacent to the north bank of the broad *wadi*. In the recent past the camp has been cut by a modern track and partly destroyed by activities associated with the construction of the new road. There are 12 rows of tent bases, each within a rectangular frame. All the tents have tunnel entrances and face west apart from one which faces both east and west. In the western three rows some of the tents are separated from their neighbours by a gravel ridge or by a very narrow alleyway. The five western rows are approximately the same length, the sixth row starts further to the south and the subsequent rows are even further offset to the south. At the southern end the rows extend to the edge of the *wadi*. Beyond the eastern row are at least two tent bases which may be part of an additional row but the modern disturbance here has removed all further traces. Beyond the western framed row is the officers' row of 10 tent

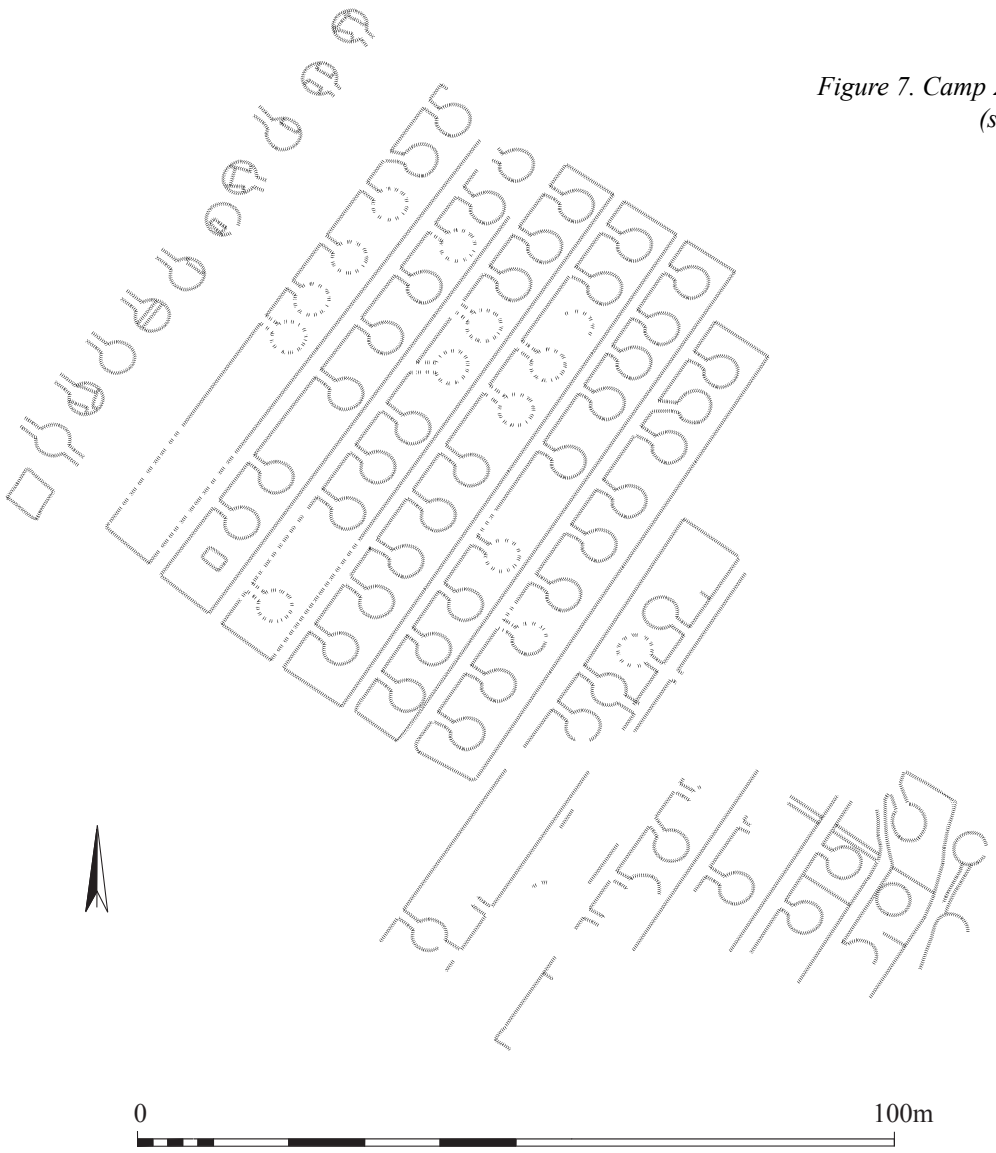


Figure 7. Camp 2, sketch plan (scale 1:1000).

bases some facing east, some west and one with entrances to east and west. Several have very clear *mastaba* within, from one to three per tent. A single tent has a broad raised area of stone pavement/*mastaba* running right across it at right angles to its entrance (Plate 77). At the south end of the row is a square tent base and there is a rectangular feature delimited by a single line of stones within the rectangular frame of one of the other rows.

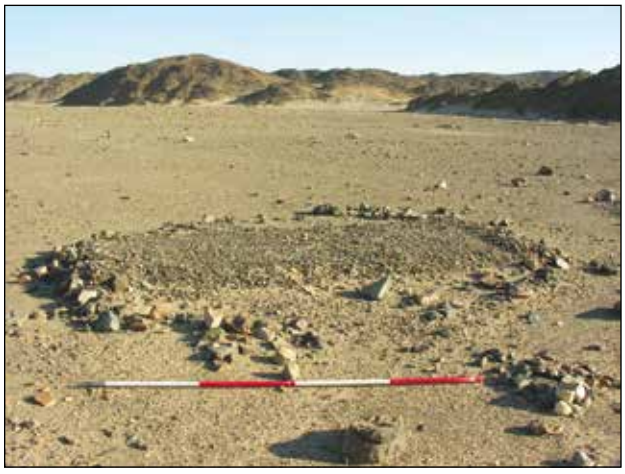


Plate 77. Camp 2. Tent base with mastaba *running right across its interior.*

Camp 4 (Locus 90). The bulk of the camp is set on the flat valley floor at a point where the railway runs east west on a high embankment climbing steeply towards a cutting (Figure 8). The northern edge of the tent rows has been destroyed by water erosion. It consists of six rows, aligned north-south, probably originally of three tents each. Each pair of rows are within a single rectangular frame with the funnel entrances of the tents facing outwards to the streets between each pair of rows (Plate 78). Within each double row each back to back pair of tents are delimited to north and south within rectangular enclosures. Immediately to the south are two east-west rows without rectangular frames. The northern row is of one tent base with funnel entrance and five penannular tent bases. Close by to the south the parallel row of 13 tent bases extends well to the east and west of the main block. Many of these tent bases are ill-defined but most if not all appear to have been penannular. Some contain

Plate 78. Camp 4, tent bases.

mastaba among which are several set with their long axis extending into the centre of the tent. Forty metres to the east is a three-sided rectangular stone windbreak open to the north. On the north bank of the *wadi* on the reverse slope of the levee are two further tent bases, one penannular, the other with a funnel entrance and partly enclosed by a curved enclosure. Sixty metres to the east on a terrace on the hillside are three further funnel-entranced tent bases.

Camp 4a (Locus 92a). Set on the gently rounded summit of a hill amongst the undulating landscape much of which is covered by red quartzite pebbles. There are three rows of tent bases at right angles to the railway which runs at this point in the *wadi* to the east (Figure 9). None of the rows have frames. The southern row has six penannular tent bases and one with a funnel entrance all facing north (Plate 79). The other two rows are of four bases each, the three western ones being funnel-entranced, the western tent bases are penannular but one of these has an unusual inturned entrance (Plate 80). At the east end of these two short rows are two stone windbreaks, one circular, one C-shaped. Two further penannular tent bases lie between 42m and 57m to the north.

Camp 4b (Locus 93a). This extensive camp is set on the

Plate 79. Camp 4a, tent bases.

Plate 80. Camp 4a, tent base with inturned entrance.

gently sloping flat top of a north-south ridge and on its lower slopes close to a broad *wadi* (Figure 10). To the north are two parallel north-south rows of eight and six tent bases all with funnel entrances to the north, that is facing towards the rear of the next tent in the row. After a small gap the rows continue with two and one further tent bases, two of which have prominent drainage gulleys outside of the gravel ridge (Plate 81). Several have *mastaba* including one with its long axis pointing into the centre of the tent.

Forty six metres to the south, there is another group again of two parallel rows of seven tent bases with each tent laid out as in the northern group. Within the gap between the two groups is one isolated tent base.

Plate 81. Camp 4b, tent base with surrounding drainage ditch.

The southern group is a further 56m to the south west of the last tent base in the central group. It consists of two rows of seven tent bases each within its own circular enclosure. Most have short funnel-shaped entrances facing south, i.e. into the rear of the next tent. To the west is another tent base of the same type and a further two lie across a small *khor*. The circular enclosures around these consist of a line of large stone blocks.

Figure 8. Camp 4, plan (scale 1:1000).

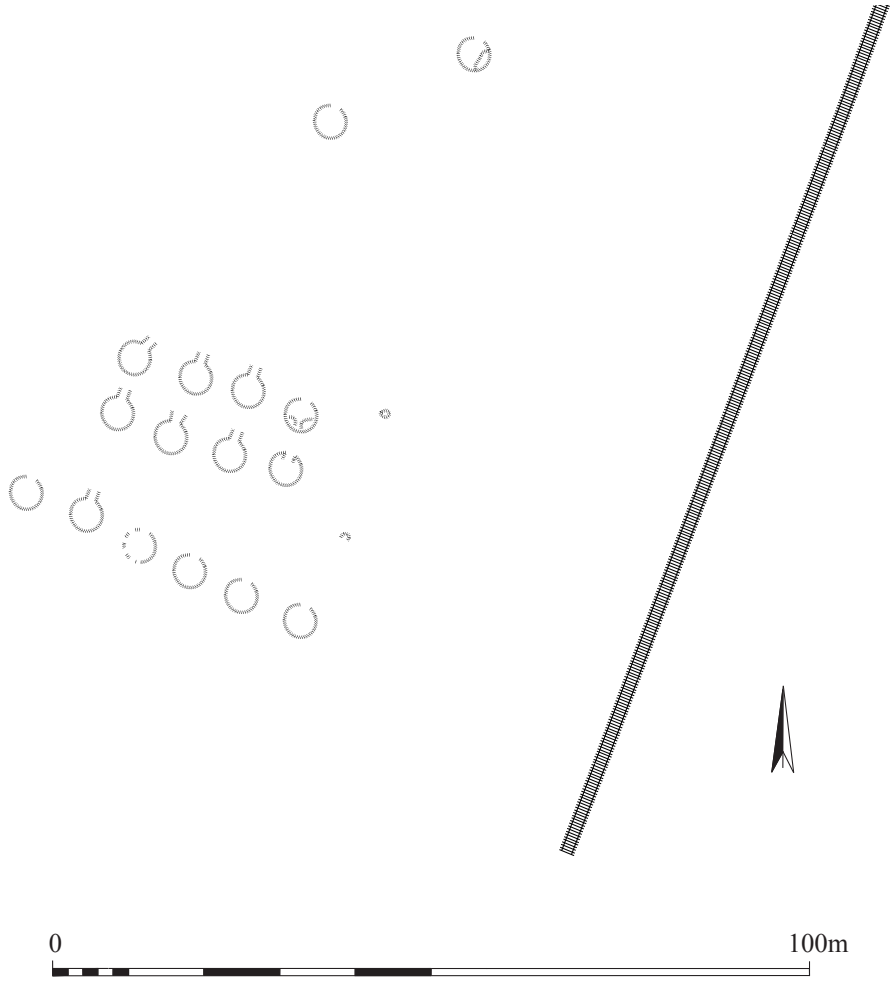


Figure 9. Camp 4a, sketch plan (scale 1:1000).

Camp 5 (Locus 96). The camp sits on gently undulating ground rising from a broad *wadi* in the bed of which runs the railway (Figure 11). It consists of five east-west rows of tent bases in rectangular frames (Plate 82). All the tent bases within the rows apart from one have funnel entrances facing south. The three northern rows are parallel each separated from its neighbour by a street. The southern row is also parallel. The fourth row is set at a markedly oblique angle the street to the north widening significantly to the west, that to the south widening to the east. In the parallel rows most of the tent bases occupy square enclosures although this is not invariably the case. In the oblique row there are no subdivisions of the rectangular frame. In the south row one tent base has a circular enclosure. The eastern tent base on the middle row is delimited by larger stones rather than by the gravel and small stone ridges seen elsewhere. Immediately beyond the east end of the northern row is a penannular tent base. To the north and south of the rows are gravel ridges. To the west across a wide street is a north-south row of five tent bases within a rectangular frame. Each of these tent bases is entered along a long curving path (Plate 83), one of which bifurcates to serve two tent bases. To the west is a very long straight path which then turns at its north end ending in a tent base, Two more tent bases with funnel entrances are isolated features. There is one L-shaped stone windbreak abutting a rock outcrop and open to the south and a substantial stone shelter (sentry post?) with drystone walls over 1m in height. Adjacent to the latter is a rectangular 'tent' base', open on its fourth side to the east.

Plate 82. Camp 5, rows of tent bases.

Plate 83. Camp 5, curving path leading to a tent base.

Camp 5a (Locus 110a). On the flat terrace immediately adjacent to the *wadi* on its south side at a point where the railway runs down the *wadi* bed (Figure 12). There are five rows of tent bases with streets between running north east - south west parallel to the *wadi* each with a

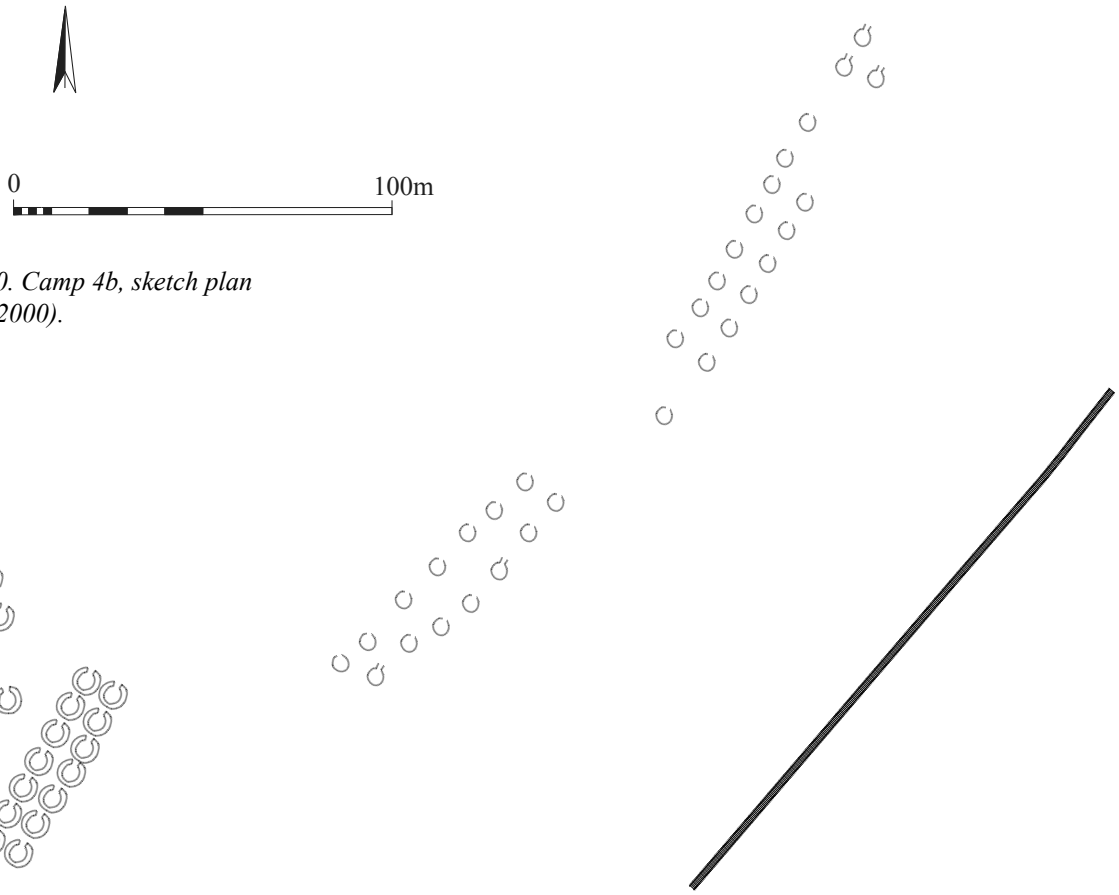


Figure 10. Camp 4b, sketch plan (scale 1:2000).

rectangular frame.[26] In almost all cases each tent base stands within a square enclosure. The southerly tent base in the second row from the north is separated from its neighbour by a very narrow alleyway. All the tent bases have funnel entrances and face south east. In line with each row at their north-eastern ends is a single penannular tent base, the two with entrances visible face south.

Along its north-east, south-east and partly returning around its south-west side is a gravel mound delimiting the extent of the camp. This is pierced by a continuation of the road between the two northernmost rows. This road crosses a small *khor* and approaches a single tent base which appears to be a complete circle. Running south from this is another short section of road pointing towards another circular tent base. A little north east of this is a strange arrangement of cleared paths with two circular areas (tent bases?). A penannular tent base with central post-hole lies close by.

Immediately south west of the tent rows is a D-shaped base at the end of a cleared path and a little beyond that some rectangular features of a type not seen elsewhere and one tent base.

On the edge of a small *khor* to the south is a row of four stone-built hearths open to one side with abundant ash and charcoal around them (Plate 84). Running up

Plate 84. Camp 5a, row of fireplaces in a small khor *close to the camp.*

Plate 85. Camp 5a, cemetery? with tumuli on the small knoll to the south of the camp.

[26] Many features of this camp are indistinct on Google Earth. It has not proved possible to add the features west of the camp with any degree of accuracy so they have been omitted.

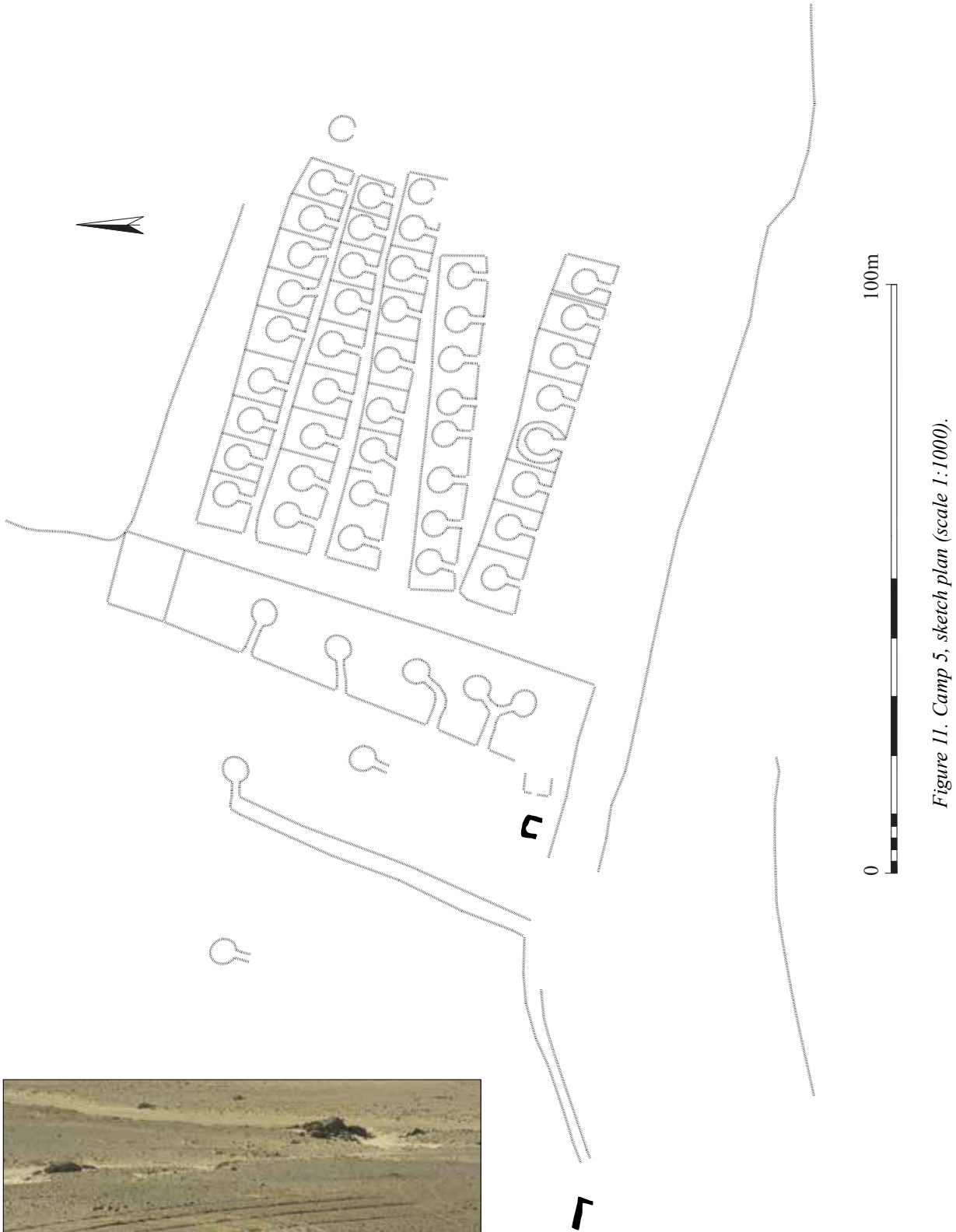


Figure 11. Camp 5, sketch plan (scale 1:1000).

Plate 86. Camp 5a, parallel lines of stones.

the adjacent hill is a path which curves round the back of a small knoll to a group of five small tumuli (Plate 85) one of which has a stone-lined hole in the centre presumably to support an upright. Against the north side of the knoll towards its base is a penannular tent base or hut delimited by a row of large stones and abutting the rock outcrop. On the top of the hill behind the tumuli is a sentry post of dry-stone walling with loopholes open towards the camp.

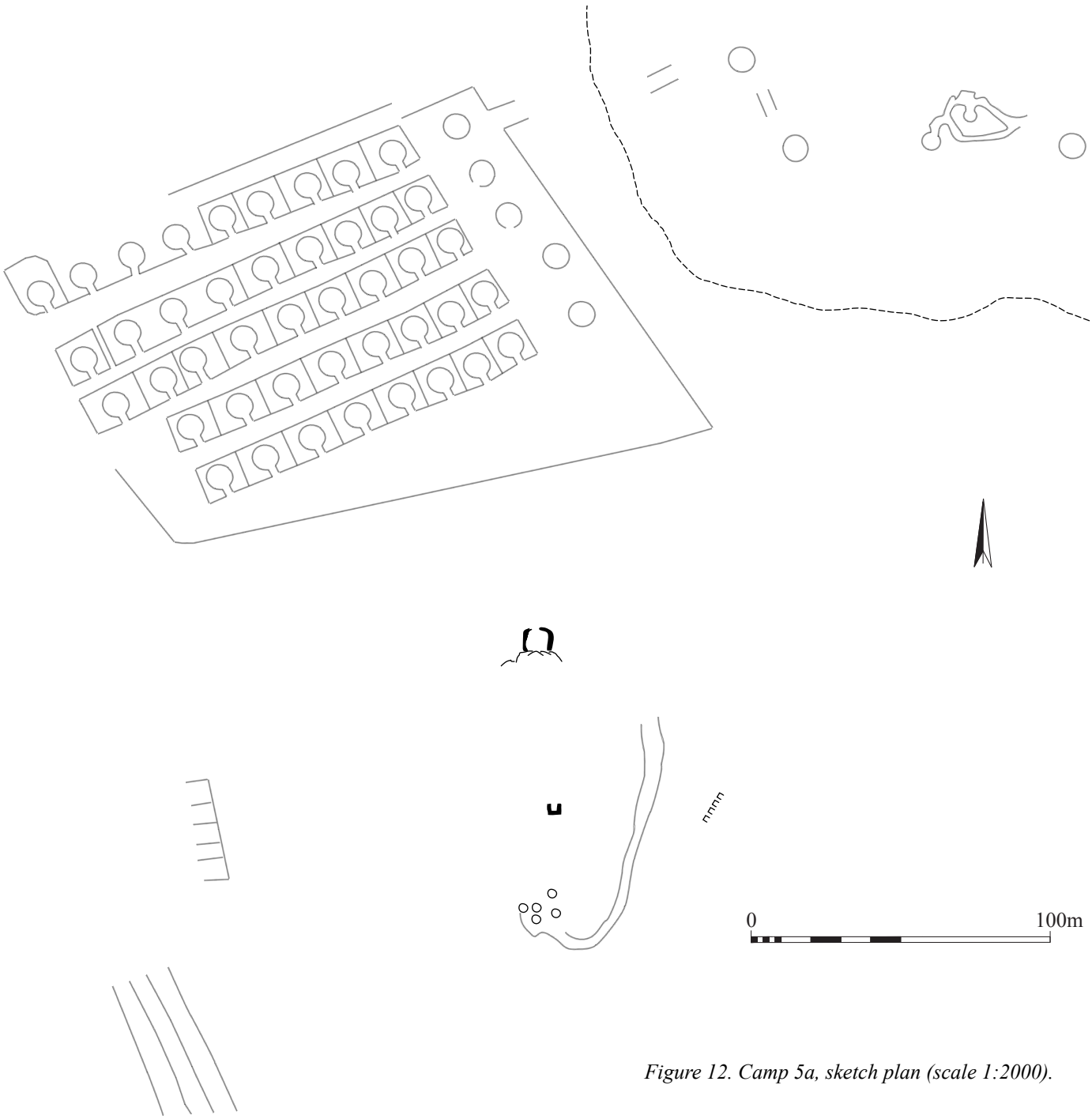


Figure 12. Camp 5a, sketch plan (scale 1:2000).

To the west is a large rectangular cleared area delimited by gravel ridges and divided along its length by two further ridges (Plate 86). A little north is a rectangular structure divided into five bays, each open to the west.

Camp 6 (Locus 136). This large camp lies on the flat gravel terrace on the west side of the *wadi* alongside the railway which is here on a low embankment. It consists of three main elements (Table 5), to the north five rows of tent bases aligned north-south, in the centre seven rows of tent bases aligned east - west and in the south two rows of tent bases again aligned east- west.

North Group – Six rows of tent bases within rectangular frames with a seventh row devoid of any traces of tents. This seventh row, unlike the others is not separated from the adjacent row by a street. All the tents have funnel entrances and face east towards the railway. The rows are aligned at their north ends but three of them are a little longer and include an additional tent base while one of the shorter rows has an additional tent at its south end outside the frame. Many, but not all, of the tent bases are within square enclosures. Part way along one row one tent base is missing, the gravel ridge is carried right across where one would expect its entrance to be. Immediately to the west of the western row is another partial row with two tents at its north end in an irregular frame separated by a street. However, the three tents to the south are not in a frame and two have

Plate 87. Camp 6, large rectangular enclosure to the west of the central group looking east.

entrance passages that open directly against the back of the adjacent frame. One tent base lies yet further west of this partial row.

Central Group – Separated by approximately 60m from the northern group the seven rows of tent bases all in rectangular frames in many cases do not preserve traces of the tents themselves but the funnel entrances are generally well preserved. Were these laid out for tents which were then not erected? Some positions one would have expected to be occupied by tents have no gap in the frame to allow access to them. One tent in the fourth (central) row from the south was entered from the south, most of the others faced north apart from four in the northernmost row which faced north and south. In the central row the tents have curved entrance passages and actually face north west.

South Group – Two rows of seven tent bases separated by a street and all facing south. These tent bases are each in a circular enclosure but most abut their neighbours' enclosure.

Plate 88. Camp 6, curving paths to the north of the camp.

As well as the three groups of tent bases there are many other features of this camp. Beyond the south row are five isolated tent bases, one penannular, two with funnel entrances facing south and one penannular in a circular enclosure facing south and associated with a funnel-entranced tent base facing north. Adjacent or immediately to the south of these are many stone wind-breaks for cooking fires. To the west are two rectangular 'tent' bases open to the south.

At the west end of the third row from the south in the central group is a place for a tent base within a circular enclosure facing north, although traces of the tent itself are wanting. At the opposite end of the row is a C-shaped 'tent base', constructed of stone blocks. Another similar structure lies a little to the north. Separating the tent base rows from the railway is a gravel mound pierced by two entrances. A similar gravel mound serves to delimit a street along the north side of the central group. Opening off it to the north is a rectangular feature accessed by four entrances where paths join the feature. Such four-way rectangular junctions are known at a number of camps but their function is unclear. To the west of the central group is a large rectangular enclosure entered by paths through the middle of each side giving access to a central rectangular cleared area, presumably the location of a tent (Plate 87). In the open space between the north and central group is a slightly trapezoidal enclosure 19.6 x 16.7-17.9m in size entered by a centrally-placed opening in the east side. The corners are marked by large upright stones.

To the north of the North Group is an east-west path which extends across the railway to the east. Off it to north and south are paths giving access to tent bases one of which is a double tent base, Some of these have a funnel entrance, some have two opposing entrances. They face in many different directions. Towards the west end the path branches to north and south and describes

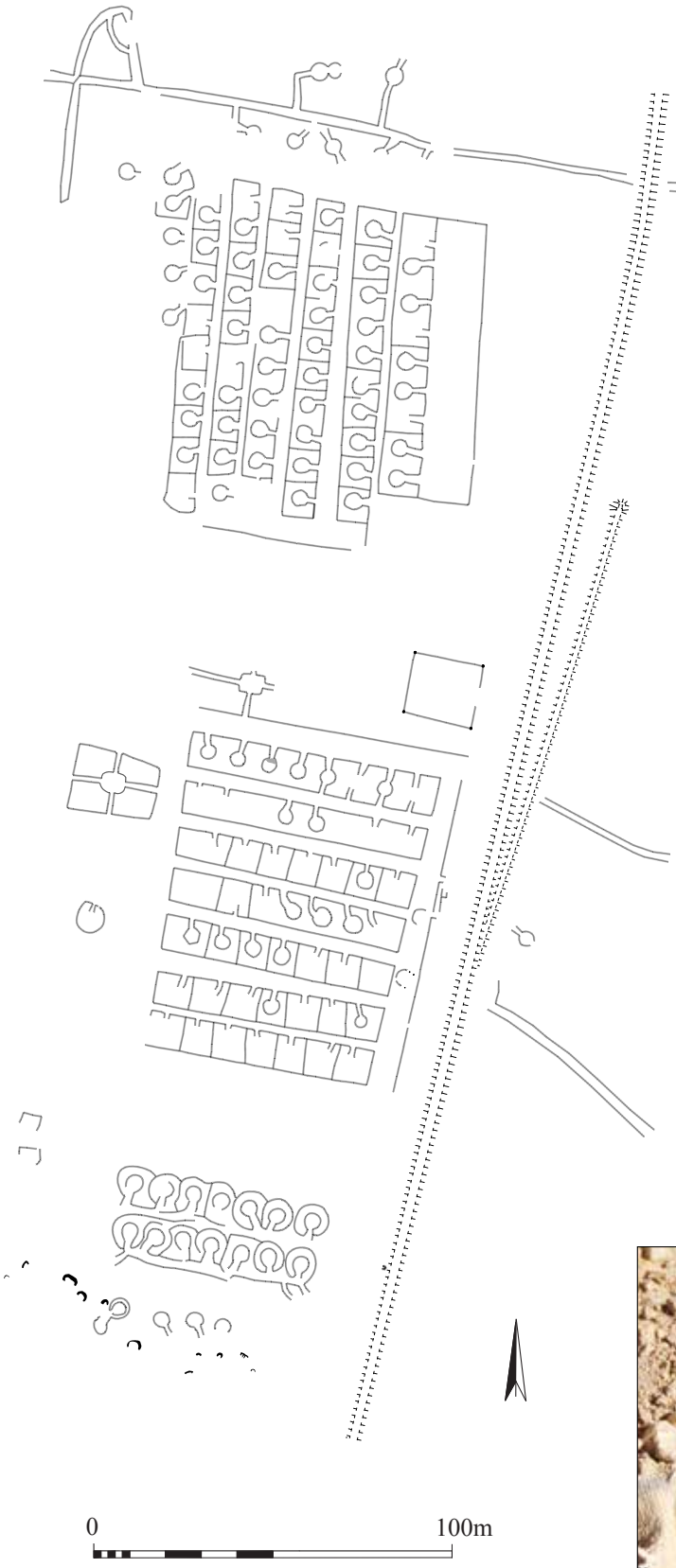


Figure 13. Camp 6, plan (scale 1:2000).

a route that defies explanation (Plate 88).

On the east side of the railway opposite the Central Group two paths lead down towards the *wadi* and between them stands a single funnel entranced tent base facing north west. It lies close to the siding. One of the 'ritual' deposits (Plate 89) came from this camp (see Cat. no. 368).

Camp 7 (Locus 139). This camp like the nearby camp 6, lies on the flat gravel terrace on the west side of the *wadi* alongside the railway which is here on a low embankment. There are six rows of tent bases in rectangular frames aligned north-south parallel to the railway and separated by streets (Figure 14). Almost all the tent bases are in square enclosures and face to the east apart from that at the south end of one row which has its entrance from the narrow alleyway to the north. It is one of only 10 tent bases to be separated from its neighbour by a narrow alleyway. The rows are roughly aligned at the south ends but to the north two rows extend further with tent bases in square enclosures separated from the rest of the row by alleyways. In line with them and aligned with the eastern three rows are three penannular tent bases facing the rows to the south. The western street is continued to the north across the *khor* and ends in a tent base with a gravelled rectangular floor within (Plate 90). It is in line with five other tent bases stretching to the east, one penannular facing north, one penannular facing south, one with a funnel entrance facing north, one with a funnel entrance facing south and one with funnel entrances facing north and south. Further north again is an east-west path with one tent base at its west end facing down the path. Three paths branch off to the south ending in further tent bases. One of these contains a fine pebble mosaic floor, a checkerboard pattern of white quart pebbles and small black stones (Plates 91 & 92). Further west is a stone sentry post with substantial walls and in a *khor* a small shelter which may have been associated with a toilet.

Plate 89. Camp 6, one of the 'ritual' deposits found in a number of camps, this buried in a tent row dividing mound in the central group.

Figure 14. Camp 7, plan (scale 1:1000).

Plate 90. Camp 7, tent base with gravelled rectangle within looking south.

Plate 91. Camp 7, tent base with pebble mosaic floor.

Plate 92. Camp 7, detail of the pebble mosaic floor.

Camp 7a (Locus 141a). This camp occupies the south side of a tributary *wadi* on the terrace which gradually slopes up the hill to the south. It lies close to the railway on its east side. It has seven rows of tent bases in rectangular frames aligned north-south (Figure 15). All the tent bases face to the west and most are within square enclosures although up to three tent bases occupy the same area in some rows. The western row is a little shorter both at its north and south ends than its neighbour. The number of tent bases per row varies, from west to east the arrangement is:

row 1 - 9
row 2 - 10
row 3 - 10
row 4 - 8
row 5 - 9
row 6 - 8 + one empty square area
row 7 - 5

The eastern row is only half the length of its neighbours. Beyond the western row is a rectangular area while to the north of the rows is a path. North of the half row is another rectangular area with another path leading off to the east. South of the north-south rows on the gentle slope upwards is another tent row running east-west in a rectangular frame. It has five tent bases, four facing north and one entered from north and south (Plate 93). As was often the case with tent bases with two opposed funnel entrances only one leads to a break in the tent base, the gravel ridge of the tent base being carried across the other, in this case across the southern entrance. Further up the slope across a wide 'street' is another tent base facing north. This street joins a path running obliquely up the slope and then extends several hundred metres to the east.

Camp 8 (Locus 144). Set on the gentle slope up from the railway the plan of this camp is highly unusual (Figure 16). It has an east-west street with eight long paths leading off its south side to tent bases. Two of these have north and south funnel entrances while one is penannular facing east, there being no gap in the tent base where the path from the north abuts it. At the east end of this street is a rectangular space with four opposed entrances (Plate 94). That to the north connects with a path which runs a little north then turns to the west parallel with the street. That to the east extends as a path only for a few metres. To the south a path leads a short distance into another rectangular feature of the same type, the entrances connecting with paths again only extending a few metres. To the south roughly delimiting a large rectangle measuring 63 x 95m are 11 tent bases, two with funnel entrances, the others penannular. Extending to the east of the camp is another path which runs up to a vertical rock face immediately before which it branches to north and south. The function of this arrangement of paths is unclear. Adjacent to the camp is a siding. Camp 8 is approximately 550m to the north of Camp 9.

Camps 9, 9a, 10 and 10a are set close together and presumably form one complex to which may also belong Camp 8 (Figure 17). Camps 9 and 9a are separated by the railway as are Camps 10 and 10a. Between Camps 9/9a and 10/10a is a gap of approximately 200m.

Plate 93. Camp 7a, general view of two of the tent rows with a double funnel-entranced tent base in the foreground.

Plate 94. Camp 8, rectangular four-entranced feature.

Camp 9 (Locus 145). Located on the flat terrace on the east side of the railway which occupies a low embankment. The camp has eight rows of tent bases aligned parallel to the railway, here north west - south east (Figure 18). All the tents face to the north east apart from those in the north-eastern row which all face south west. The tent bases in this row are fronted by a gravel mound delimiting the side of the street and are linked to the street by funnel entrances. However, there is no rectangular frame around the row and no dividing mounds between the tents. The western row is of individual tent bases, one with a long funnel entrance, three with very short funnel entrances and two poorly preserved formed of a line of stones. The other rows all have tent bases within rectangular frames usually with each tent base within a square area, several of which are separated from their neighbours by a narrow alley. Several tent bases contain *mastaba*, at least one with its long axis extending into the centre of the tent.

To the north west are two north east - south west rows of tent bases flanking a street. The southerly row with its back towards the street has six tent bases with funnel entrances facing south east. One of these has a black and white pebble floor (Plate 95). At the north-east end of the row is another tent base in a circular enclosure facing north west. The northerly row of five tent bases have long funnel entrances communicating with the street (Plate 96). At the eastern end is an isolated tent base in a square enclosure facing south west (Plate 97). To the north of this row is a large rectangular area with the west and south angles marked by large stones as are the three gaps through its south-eastern side.

Starting about 120m to the north of the northernmost tent base is a straight line of stone cairns 75m in length, six cairns spaced at intervals of 14.3m, 13.6m, 13.6m, 13.3m and 16.9m parallel but 42m from a cleared pathway (Plate 98). Another stone cairn is isolated to the north west. A little further north and closer to the railway is an north-east - south-west aligned path about 80m long

Plate 95. Camp 9, tent base with floor of small black stones and white pebbles.

Plate 96. Camp 9, tent base with long funnel entrance.

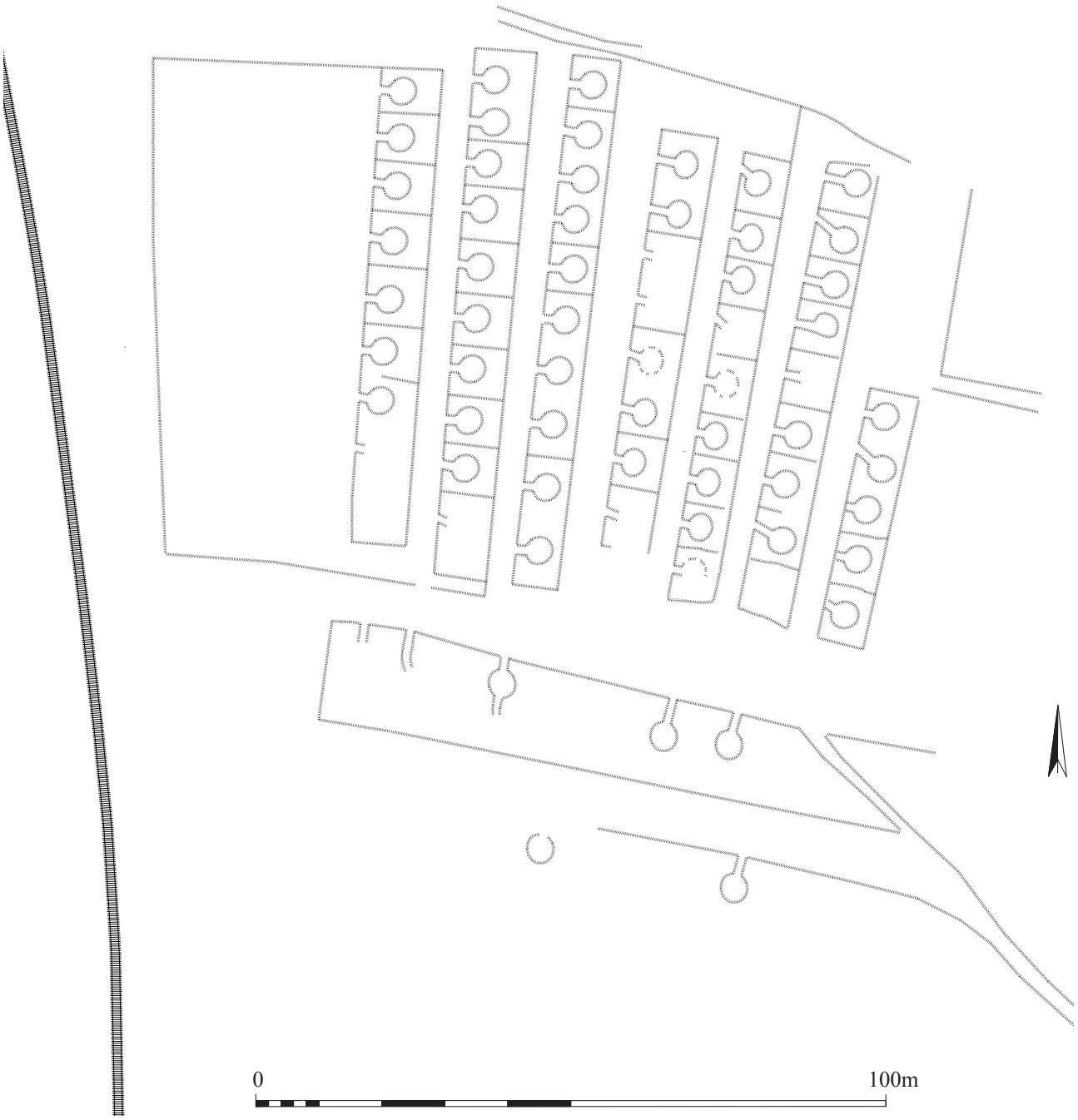


Figure 15. Camp 7a, sketch plan (scale 1:1000).

with a tent base at its eastern end and close to its other end a paved area with one right angle but with irregular edges on the other two sides.

Camp 9a (Locus 145a). Across the railway on its western side the camp occupies a narrow area between the line and the *wadi* edge and is delimited by a small *khor* to the south. It consists of a path running parallel to the railway then turning at right angles towards the *wadi* (Figure 19). At its southern end is a tent base, two more are connected to it by paths and one by a funnel entrance, this latter formed of a row of large stones. Another tent base of this type, probably penannular, lies close by. Outside the angle formed by the paths is a circular stone pile.

Camp 10 (Locus 146). On the terrace at the side of the *wadi* occupying much of the ground between the *wadi* edge and the railway. There are six rows of tent bases within rectangular frames aligned parallel to the railway each separated from its neighbour by a street (Figure 19). Many of the tent bases are within square areas although as many as six in one row are not in subdivided plots. All face to the north east. On the western side there is a seventh half row of five tent bases within a rectangular frame and one further tent base outside the frame. These tent bases also face north east with their funnel entrances but as there is no intervening street these entrances are accessed through gaps in the rear of the rectangular frame of the next row to the north east.

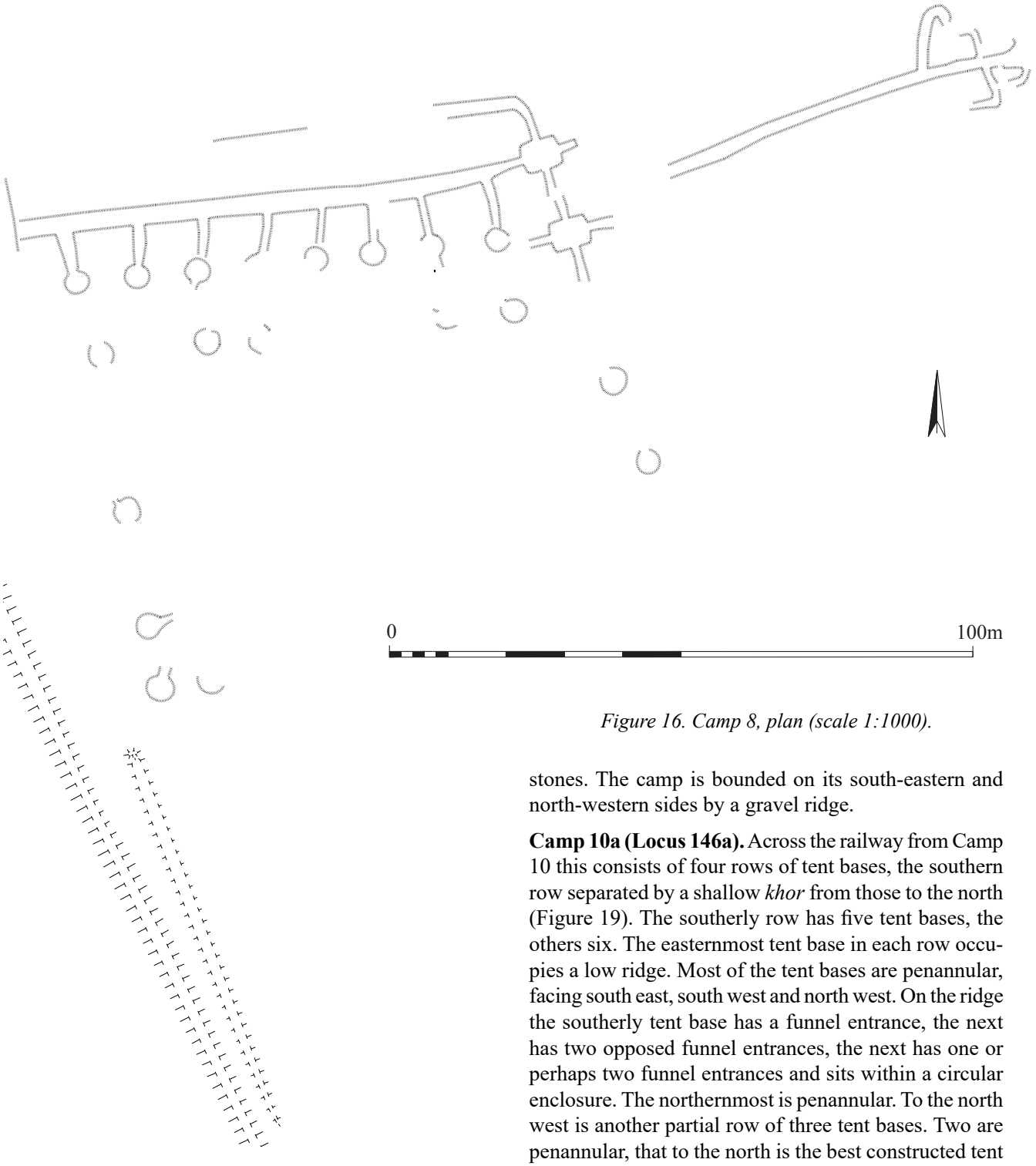


Figure 16. Camp 8, plan (scale 1:1000).

To the north west of these rows is another row of six tent bases at right angles within a rectangular frame divided in half by an alleyway. Four of the tent bases face north west, one has opposed funnel entrances leading to gaps in the rectangular frame while another has the same arrangement but the southerly entrance does not pierce the rectangular frame. North west of this row may be a further row but only one tent base is clear with opposed funnel entrances to east and west and surrounded by stones presumably making the positions of tent pegs. The next tent base is only represented by this ring of stones. The camp is bounded on its south-eastern and north-western sides by a gravel ridge.

Camp 10a (Locus 146a). Across the railway from Camp 10 this consists of four rows of tent bases, the southern row separated by a shallow *khor* from those to the north (Figure 19). The southerly row has five tent bases, the others six. The easternmost tent base in each row occupies a low ridge. Most of the tent bases are penannular, facing south east, south west and north west. On the ridge the southerly tent base has a funnel entrance, the next has two opposed funnel entrances, the next has one or perhaps two funnel entrances and sits within a circular enclosure. The northernmost is penannular. To the north west is another partial row of three tent bases. Two are penannular, that to the north is the best constructed tent base noted in the entire survey with the ridges formed of carefully placed stones (Plates 99 & 100). It has a funnel entrance, the northern side of the funnel linked to the southern side of a path which does not communicate with this tent bases but further to the south west turns at 90º towards one of the penannular tent bases the entrance of which does not however, face towards the path.

Camp 11b (Locus 153b). This camp is presumably a component part of a large installation comprised of camps 11 and 11a. It lies a few hundred metres south of the former and on the east side of the railway opposite the

Plate 97. Camp 9, tent base in square enclose with rectangular area beyond.

Plate 98. Camp 9, line of stone cairns looking south towards Camps 9 and 10.

Plate 99. Camp 10a, the best constructed tent base noted in the survey.

Plate 100. Camp 10a, the very well constructed tent base with its long funnel entrance.

Plate 101. Camp 11b, nails, banding iron and a tin can within one tent base.

latter. It is a little over 100m from the railway. It consists of two rows of tent bases on either side of a street with many of the tents facing each other across the street although those at the eastern end of the southern row face south (Figure 20). All are set within circular enclosures,

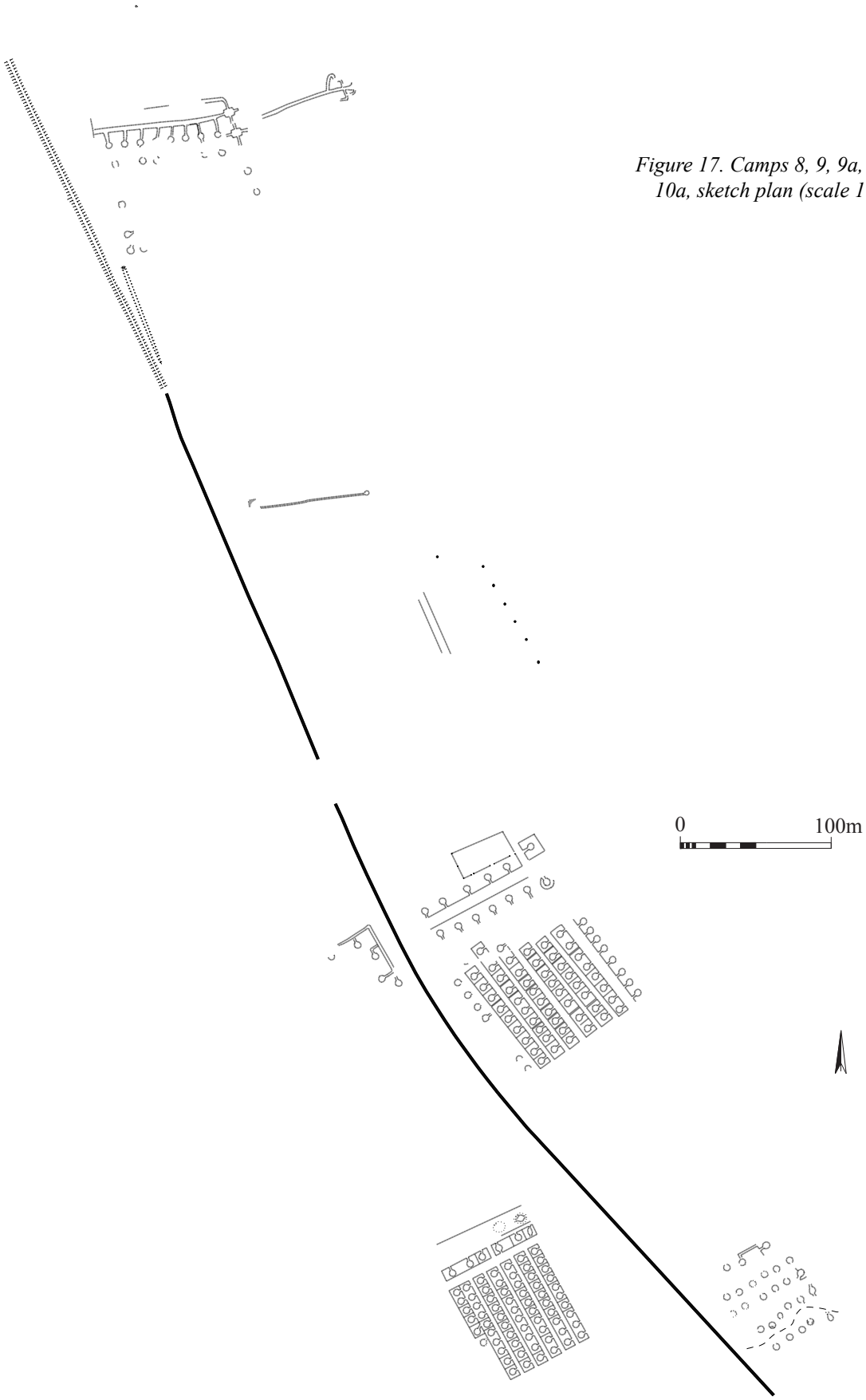


Figure 17. Camps 8, 9, 9a, 10 and 10a, sketch plan (scale 1:4000).

Figure 18. Camps 9 and 9a, sketch plan (scale 1:1000).

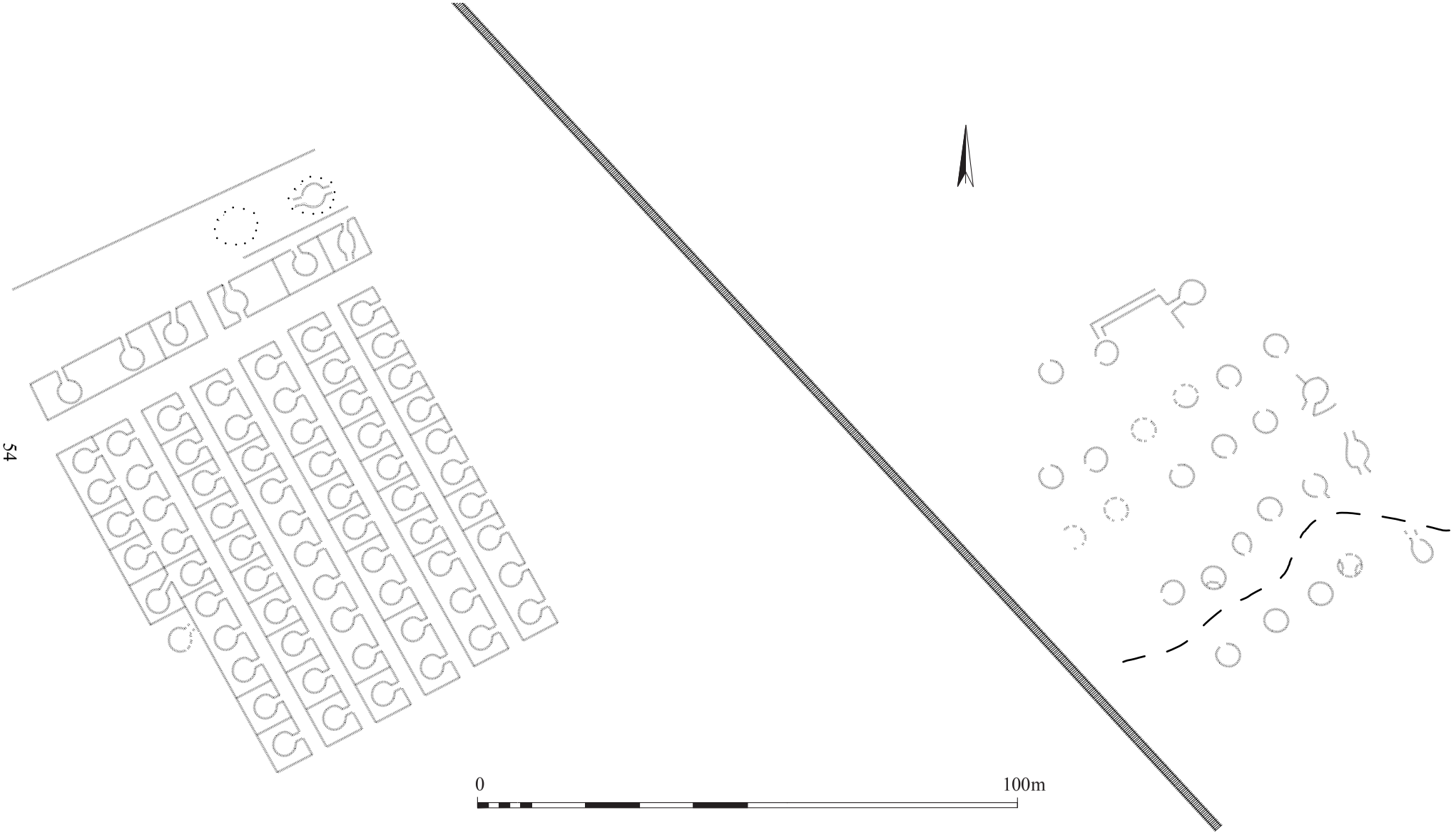


Figure 19. Camps10 and 10a, sketch plan (scale 1:1000).

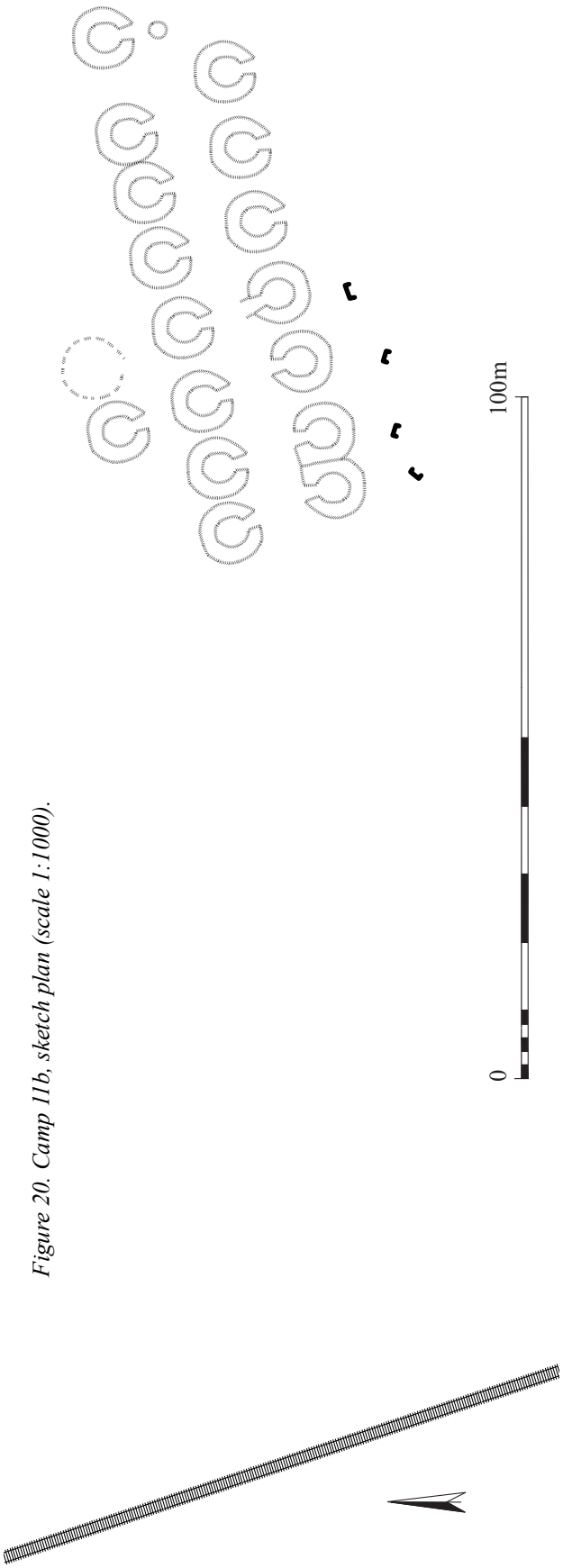


Figure 20. Camp 11b, sketch plan (scale 1:1000).

only two of which abut. North of the northern row is an additional tent base in a circular enclosure facing south with perhaps another one to one side of it. To the south are four stone windbreaks.

Camp 12 (Locus 157). This is an extremely unusual installation. No tent bases are visible but there are cleared paths flanked by gravel mounds which delimit a large triangular area and other areas (Figure 21, Plate 103). Associated with a sparse scatter of typical artefact material its use defies explanation.

Camp 14a2 (Locus 167a). One component of a large installation which also includes Camps 14a1, 14a3 and 14a4. Camp 14a2 is similar to Camp 11b. It consists of two rows of tent bases to either side of a street, each tent base within a circular enclosure, most of which abut their

Plate 102. Camp 14a2, general view looking south south east.

neighbours (Figure 22). The exception is the last tent in the north row at its east end which does not appear to have a circular enclosure. The northern group of eight tent bases open onto the street, the southern row of seven tents all face south (Plate 102) and some are connected to paths, some of which lead to stone windbreaks of which there are eight in a rough line. The main street passes through the tent lines and extends over 100m to the east.

Camp 19 (Locus 234). The sketch plan of this camp was drawn in October 2008 as a preliminary stage in the surveying of the site with a total station. However, when the survey team returned to the site in October 2009, it was found to have been totally destroyed by quarrying activities (Plates 104 & 105) associated with the construction of the Khartoum to Wadi Halfa road which passes several hundred metres to the north. Here there was a total of 44 tent bases arranged in nine rows roughly aligned east-west with a maximum of seven tent bases per row. The form of the tent bases varied markedly. Two (features 9 and 50) had the tent base set within a square enclosure. Feature (9) (Plate 104) had two opposed funnel entrances from the north and south, that on the south side leading through a gap into the tent while on the north side there was no gap into the tent base. Feature (50) was disturbed on the side adjacent to the railway embankment but only had one entrance from the south. The tent bases at the western end of the rows

Plate 103. Camp 12, general view looking south.

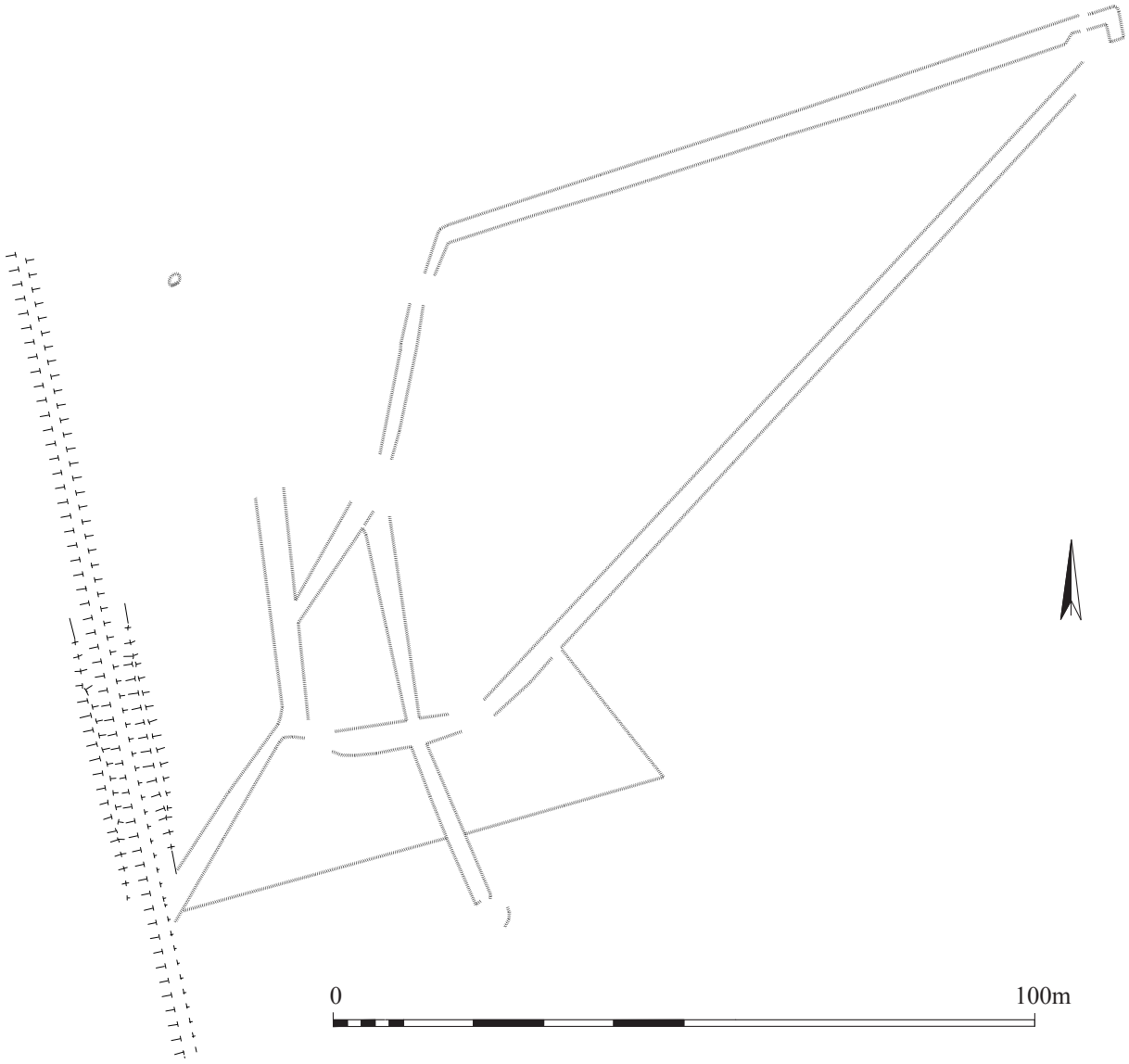


Figure 21. Camp 12, plan (scale 1:1000).

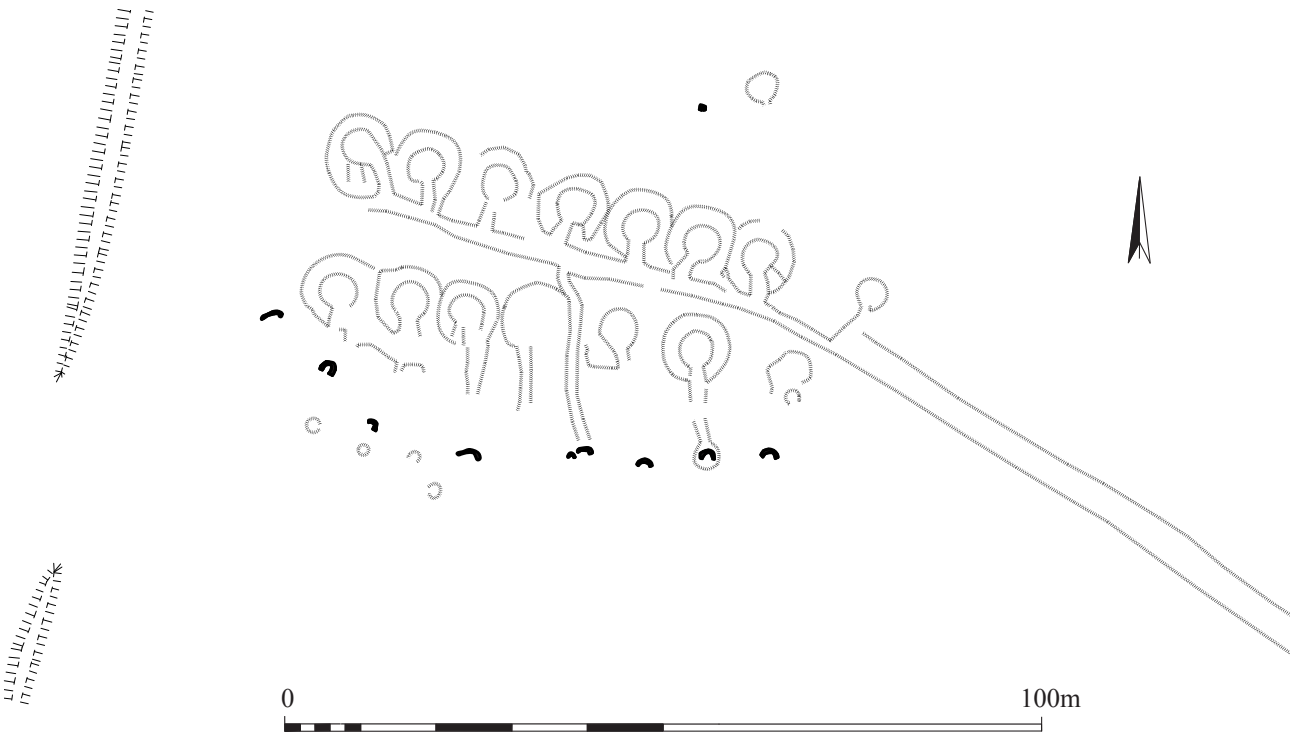


Figure 22. Camp 14a2, plan (scale 1:1000).

Plate 104. Camp 19, general view over the camp in Februray 2008. Double funnel-entranced tent base (9) within a square enclosure in the foreground.

Plate 105. Camp 19. General view after total destruction by quarrying activities associated with the construction of the Dongola to Wadi Halfa highway.

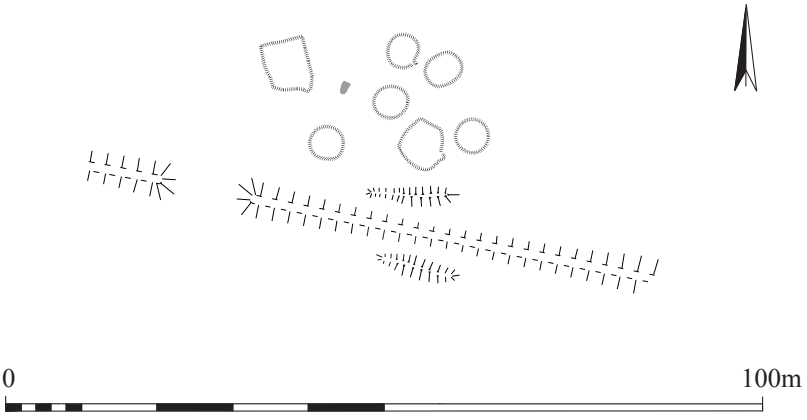


Figure 23. Camp 24, plan (scale 1:1000).

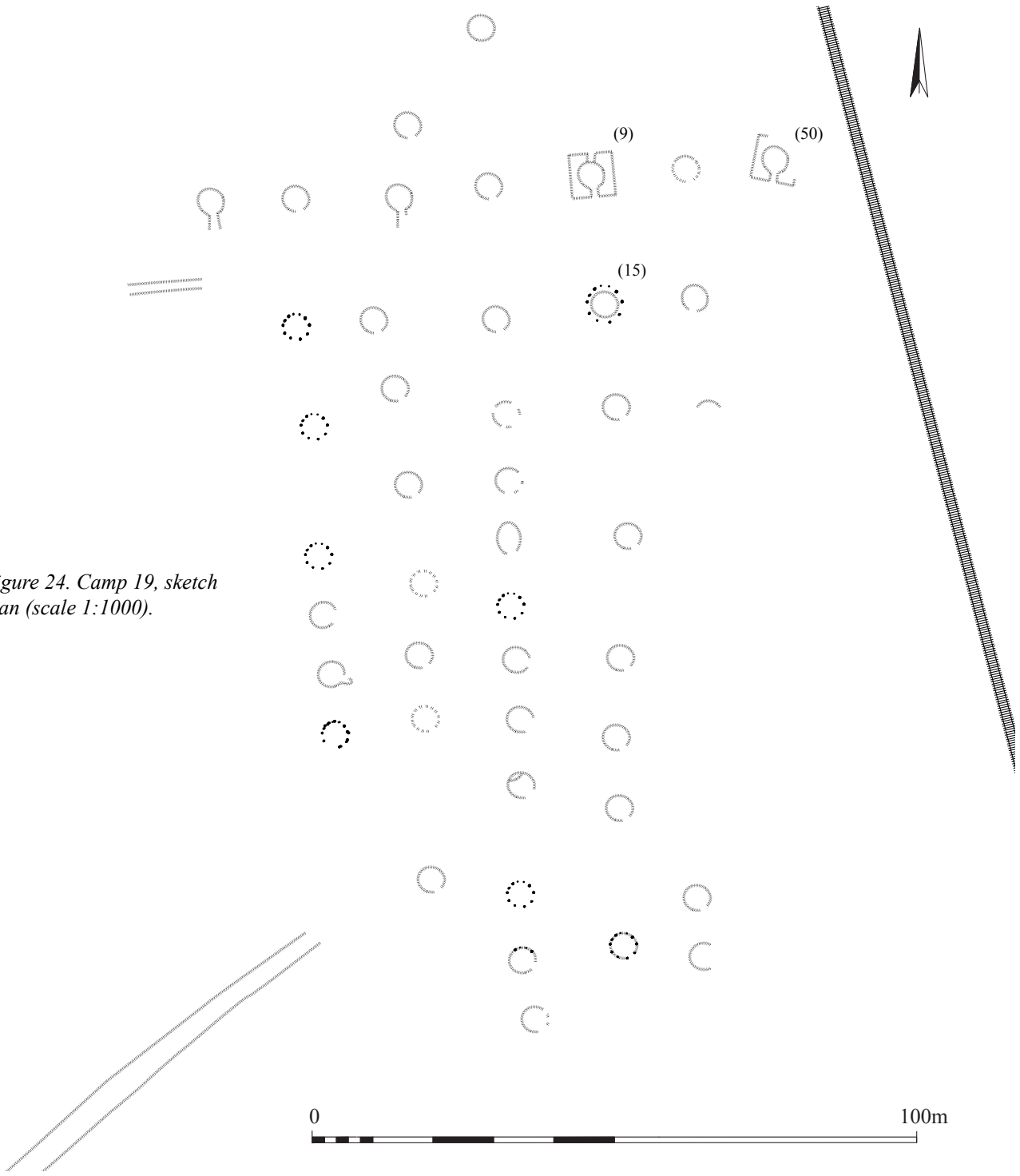


Figure 24. Camp 19, sketch plan (scale 1:1000).

were of a different type, with the outline of the circle formed by large stones and a similar arrangement was found in a few of the other tent bases. Feature (15) had a very clear tent base of the low mound type surrounded by nine small mounds marking the position of the tent pegs. There were also three concentrations of stones, perhaps wind breaks. Two cleared pathways led for some distance away from the camp towards the west.

Camp 24 (Locus 252). This very small camp consisted of five tent bases, one roughly rectangular feature and another of irregular shape (Figure 23). These are generally much less well defined than usual being delimited by very thin gravel mounds (Plate 106)

Along the proposed branch line down to the river upstream of Semna, which was never completed, leaving the main track 8km south south west of Murrat Wells (41¼ miles along the railway from Angash), there are remains of three camps. At the railhead where construction was abandoned was a single tent base (Camp 1a3) and a number of substantial short stone walls arranged in pairs with the walls parallel. These do not seem to be suitable as windbreaks. They, and some broken *zir* nearby, may be associated with the camel route which follows along the railway line rather that with the railway

Plate 106. Camp 24. General view.

construction crews. A little under a kilometre further up the line (at Camp 1a2) were three penannular tent bases, a single row of stones marking the position of each tent, and three small stone windbreaks (Plate 107). Close by

Plate 107. Camp 1a2. General view.

was a large area cleared of stone which may mark the preliminary clearance of the site designated for a substantial camp which was abandoned when the line was rerouted. On the other side of the *wadi* 600m to the east was another penannular tent base, small quartzite stones forming the mound around it, a substantial semi-circular windbreak and a well-constructed L-shaped *mastaba* presumably but not obviously within a tent base (Camp 1a1). These installations are to be dated to 1885 but are of very similar character to those dating to the Dongola Campaign 11 years later.

A few isolated tent bases were found along the line. In 1897 Budge travelling by train on the section between Kosha and Delgo wrote

> 'we passed a tent on the right side of the line, and soon after saw a young Royal Engineer officer, Lieut. Micklem, I think, engaged in taking levels and inspecting portions of the line. The appearance of this solitary officer in the heart of the desert was a convincing proof of the constant vigilance with which the Sirdar caused his line of communication to be watched.'
>
> (Budge 1907, I, 97).

Railway huts

Site WHKRS 16. A well-built rectangular stone hut (Plate 108) has a single doorway facing towards the railway giving access into a rectangular room with a *mastaba* approximately 600mm in height along its southern wall. On the north side of it was another room or enclosure now much ruined.

Plate 108. Railway hut at locus 16.

Site WHKRS 196. A single-roomed hut three walls of which are very denuded. It is built of *jalous* with many large quartzite pebbles and some stones set into it. The single doorway is set slightly off-centre in the wall facing towards the railway.

Railway stations

In August 1885 when the railway reached Akasha the stations at Gemai, Ambigol Road and Tanjur Road were closed, leaving those at Sarras, Ambigol Wells and at the railhead, Akasha, in operation (Nathan 1887, 42). Following the extension of the line from Kosha across the desert to Delgo in 1896 a station for crossing trains was provided at the halfway point (Macauley 1901, 181). During the survey the only station noted was that at Ambigol Wells presumably dating to 1896.

When first observed in February 2008 it was missing its roof, doors and windows although the walls survived in most places to their full height (Plate 109). Between then and mid February 2010 the whole building had been refurbished (Plate 110) and used by the road construction company, a large vehicle park being laid out in front of it. By 2010, the road having been completed, the building was again largely abandoned.

The station building at Akasha survived in living memory in the irrigated area on the banks of Lake Nubia but all trace of it have now vanished. That at

Plate 109. Ambigol Wells. The station in February 2008.

Plate 110. Ambigol Wells. The station in February 2010 after refurbishment by the road construction company.

Wadi Halfa was in 1945 used as a store on its ground floor and housed the Halfa Sports Club on its first floor (Harwood 1945, 6).

Ticket office

Site WHKRS 267. A local man in 2008 identified a rectangular single-roomed whitewashed building on the main street in Kerma as the railway ticket office. It lies just north of the main *souk* area across from the Police Station and across the street from the banks of the Nile. The building today houses the offices of a bus company (Plate 111). The only thing that sets it apart from more modern structures is the presence of a rectangular niche set in one corner of the room (Plate 112).

Plate 111. Kerma. The railway ticket office.

Plate 112. Kerma. The railway ticket office, interior.

Military installations

Almost all of the military installations described below appear to date to the 1896 campaign. Virtually no traces of the earlier installations, constructed during the Gordon Relief Expedition and in its immediate aftermath, were noted although in the light of maps and plans which have been consulted in the National Archive at Kew it may be possible in the future to recognise further traces of the earlier defensive works.

Murrat Wells[27] **(**Site WHKRS 23)

The 1884-5 installations

In December 1885 the 'Stone Sunga' here was garrisoned by 12 men (*Maps and Plans* ... 1982, 350). It was a circular tower 15 feet in diameter (Figure 25). On the map of the railway produced in February 1886 (Figure 2) this tower is shown overlooking the *wadi* on a hilltop to the south and east of the line.

The 1896-7 installations

Here there are several structures which includes five isolated watchtowers, a redoubt, an area of tent bases

Plate 113. Murrat Wells. The redoubt from the wadi*, April 1986.*

[27] Called Moghrat on the older maps of the British Intelligence Department. By 1896 Murrat was used but should not be confused with Murat Wells on the Korosko - Abu Hamed route.

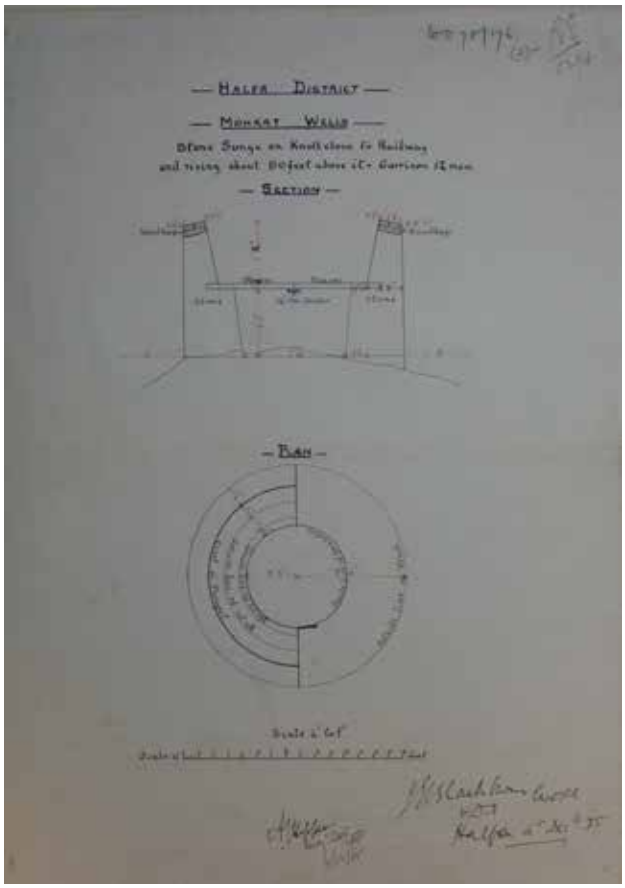


Figure 25. Murrat Wells. Plan and elevation of the 'sunga' drawn in 1885 (WO 78/176(2) Courtesy National Archive).

Plate 115. Murrat Wells. The redoubt, watchtowers 5 and 3 and the railway embankment, April 1986.

Plate 116. Murrat Wells. Watchtower 3.

Plate 114. Murrat Wells. General view of the redoubt, the enclosure wall and watchtower 3.

and linear walls partly closing off the approaches to the living accommodation (Figure 26, Plates 113-120). The redoubt is set on the hilltop which falls off very steeply down to the *wadi*. On the reverse slope of the hill a central street is flanked by tent bases, four to the west and five to the east opening onto the street (Plates 118-120). Other paths lead up to the redoubt, and to additional tent bases set to one side. The central street and a number of the paths along with the tent bases are covered with white quartzite pebbles. The main path down to the *wadi* is terraced into the side of a valley. Where it debouches into the *wadi* it is protected by a rectangular building set into a wall which runs along the base of the hill and then turns up the very steep slope at both ends until if becomes too steep for construction to continue.

The watchtowers vary in design. Watchtowers 1 and particularly 2 are poorly constructed with the wall describing a U-shape facing out from the edge of the hill. Watchtower 4 is of similar construction but is almost totally enclosed and the walls attain a greater

Plate 117. Murrat Wells. Google Earth satellite image, 23rd Feb. 2003
(key: green - railway embankment, yellow - military installations, blue - cleared paths).

Plate 118. Murrat Wells. The redoubt and tent lines from watchtower 3.

elevation. Watchtowers 3 and 5 are well-constructed cylindrical structures like that at Locus 36 (Plates 115 & 116). Watchtower 3 may have an entrance with its sill about 1m above the external ground surface. There is a well-defined scarcement extending around the interior walls of Watchtower 5.

Plate 119. Murrat Wells. Path between the tent lines surfaced with quartz fragments looking towards the redoubt.

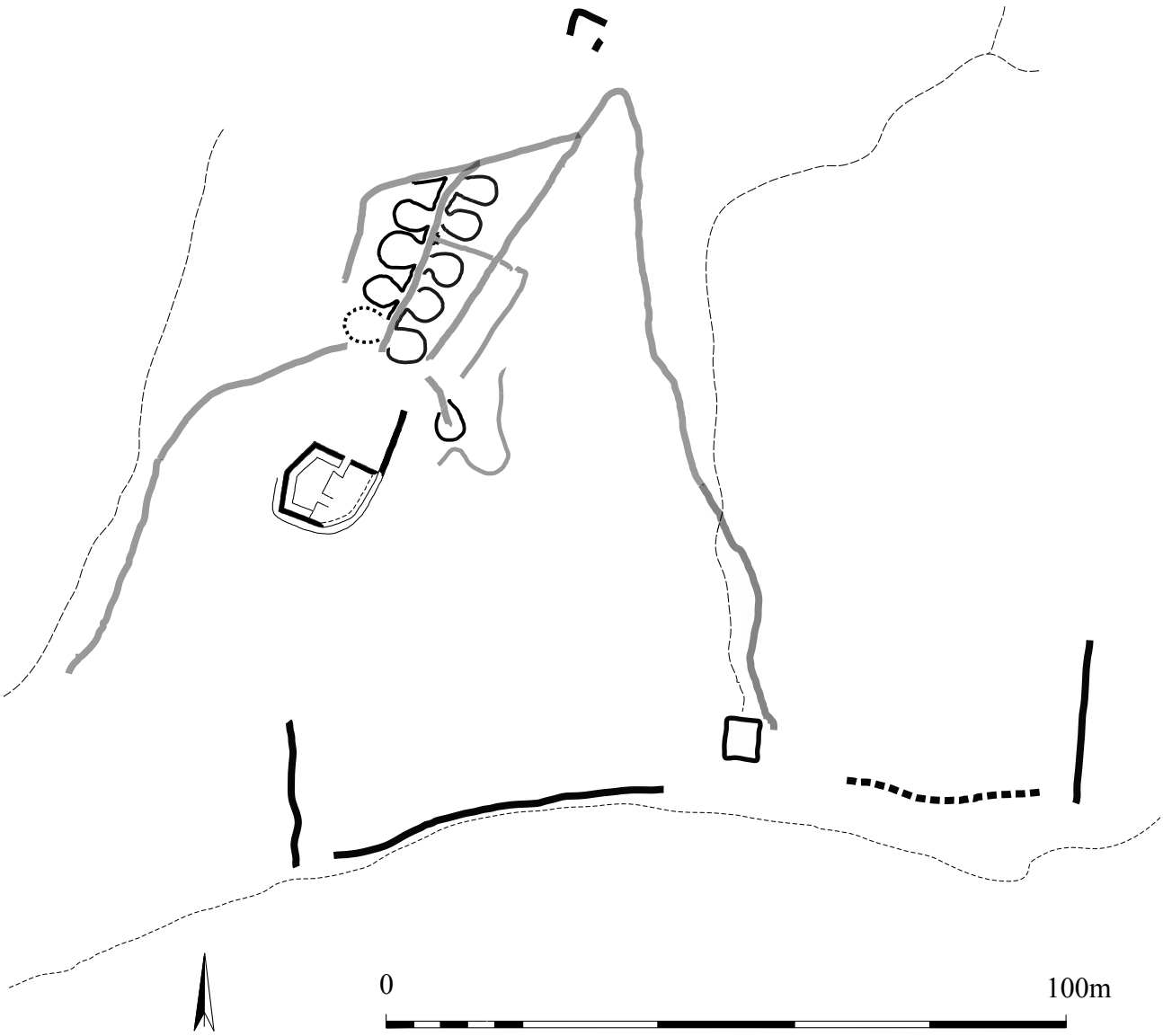


Figure 26. Murrat Wells. The redoubt, and associated installations, sketch plan (scale 1:1000).

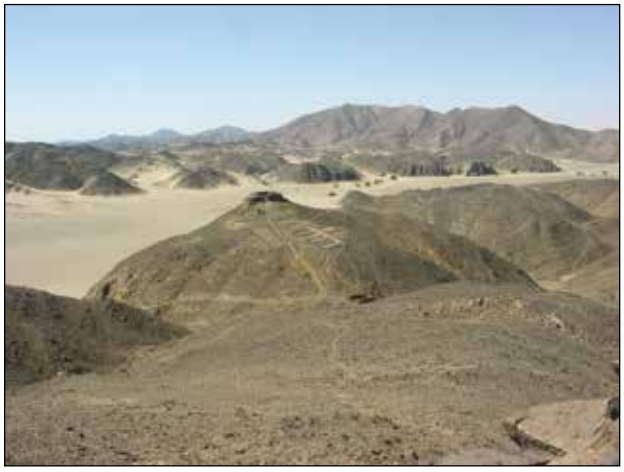


Plate 120. Murrat Wells. General view from watchtower 3 over the redoubt and associated features.

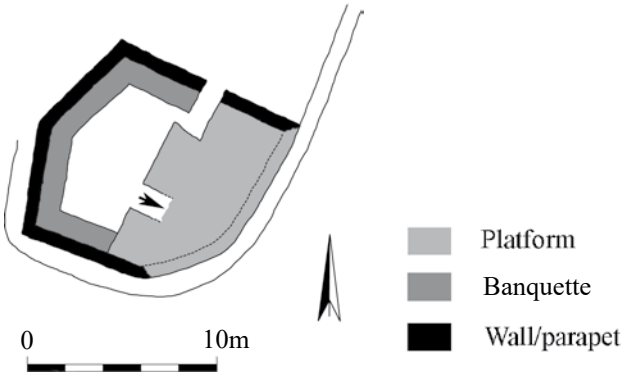


Figure 27. Murrat Wells. The redoubt, measured sketch plan (scale 1:400).

The redoubt is roughly rectangular approximately 12m in length and tapering from 10.5 to 6m wide (Figure 27). Around the southern part of the west wall, the south wall and along the east wall the walls are constructed on a

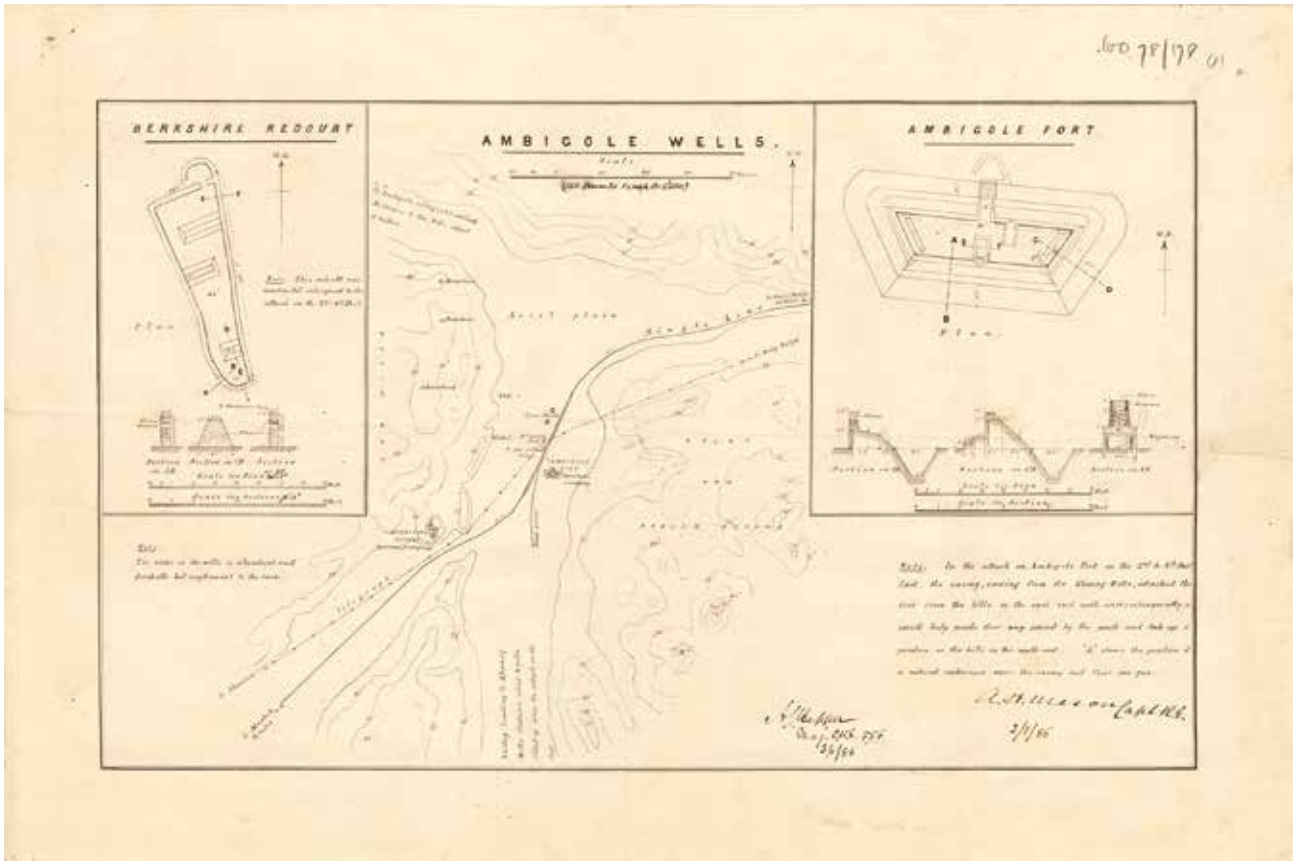


Figure 28. Ambigol Wells. Plan of the installations in January 1886 (WO 78/178 Courtesy National Archive).

terrace used to level up the hilltop which at this point is sloping steeply down. The platform extends a maximum of 1m beyond the wall lines. The redoubt is entered by a single doorway 1.17m wide a little east of centre in the north wall. This gives access via a right-angled passage into the western part of the building. From there a ramp or stairway 1.45m wide gave access onto a raised platform 1.1m above the floor level and 460mm above the level of the banquette which runs around the walls on the western side of the building. The banquette, 640mm above the floor level, is approximately 1.2m wide and the parapet, 700mm thick, is preserved to a height of 1.04m above it. From the north-east angle a wall extends for several metres to the north.

Ambigol Wells (Site WHKRS 54)

The 1884-5 installations

In December 1885 the fort here, set in the *wadi* bottom immediately to the south east of the later railway station, was designed for a garrison of 40 to 50 men. It consisted of a trapezoidal enclosure entered through a centrally placed gate in the north wall and defended by an earth bank 11ft thick revetted on the interior with timber and commanding 6ft. It was fronted by a V-shaped ditch 8ft wide and 6ft deep (Figure 28). On completion it was then suggested that if time permitted the parapet should be raised to 6ft and the traverse to 11ft and the ditch be increased to 14ft wide and 7ft deep (*Maps and Plans ...* 1982, 347).

Following the attack on the fort between 2nd to 4th December 1885 a redoubt was built on a knoll on the west side of the *wadi* (Figure 29). This, the Berkshire Redoubt, was defended by a dry-stone wall and entered through a narrow doorway on its north side protected by an external *clavicula*. A Gardner gun was mounted at its

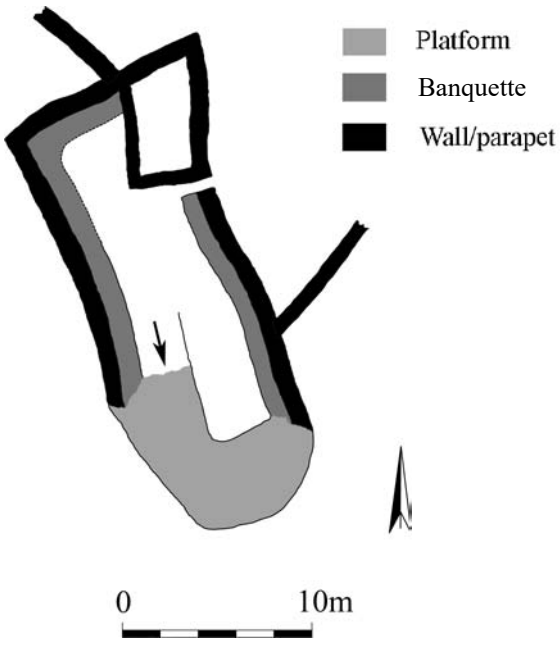


Figure 29. Ambigol Wells. The Berkshire Redoubt abutted by the walls of the 1896 fort, measured sketch plan (scale 1:400).

Plate 121. Ambigol Wells in 1885 (Reproduced by permission of the Royal Engineers Museum Library and Archive. The photograph is in a sketch book with material associated with Sapper John Reid RE. It is uncertain whether or not he took this photograph).

Plate 122. Ambigol Wells. The south wall and postern gate looking west.

south end. Three breastworks occupied the hills to the north. In 1896 the ruins of the 1885 fort were still visible, the site of the former camps indicated by the multitude of empty meat tins (Knight 1897, 99). In 2010 it was possible to see the position of the surrounding ditches which remain as very shallow linear depressions.

The 1896-7 installations

The curtain wall, approximately 900-760mm thick, links

Plate 123. Ambigol Wells. The Berkshire Redoubt and the walls of the 1896 fort.

Plate 124. Ambigol Wells. General view from the north.

Plate 125. Ambigol Wells. The west wall of the fort from the north redoubt.

Plate 126. Ambigol Wells. Tent bases within the fort.

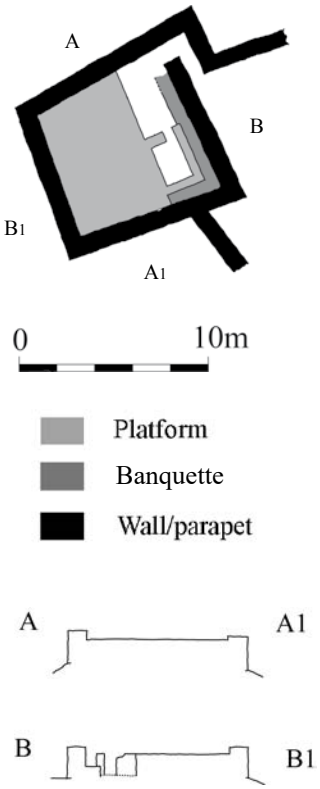


Figure 30. Ambigol Wells. Measured sketch plan and sections of the south-west redoubt (scale 1:400).

Plate 127. Ambigol Wells. The south-west redoubt, interior with gun platform on the right.

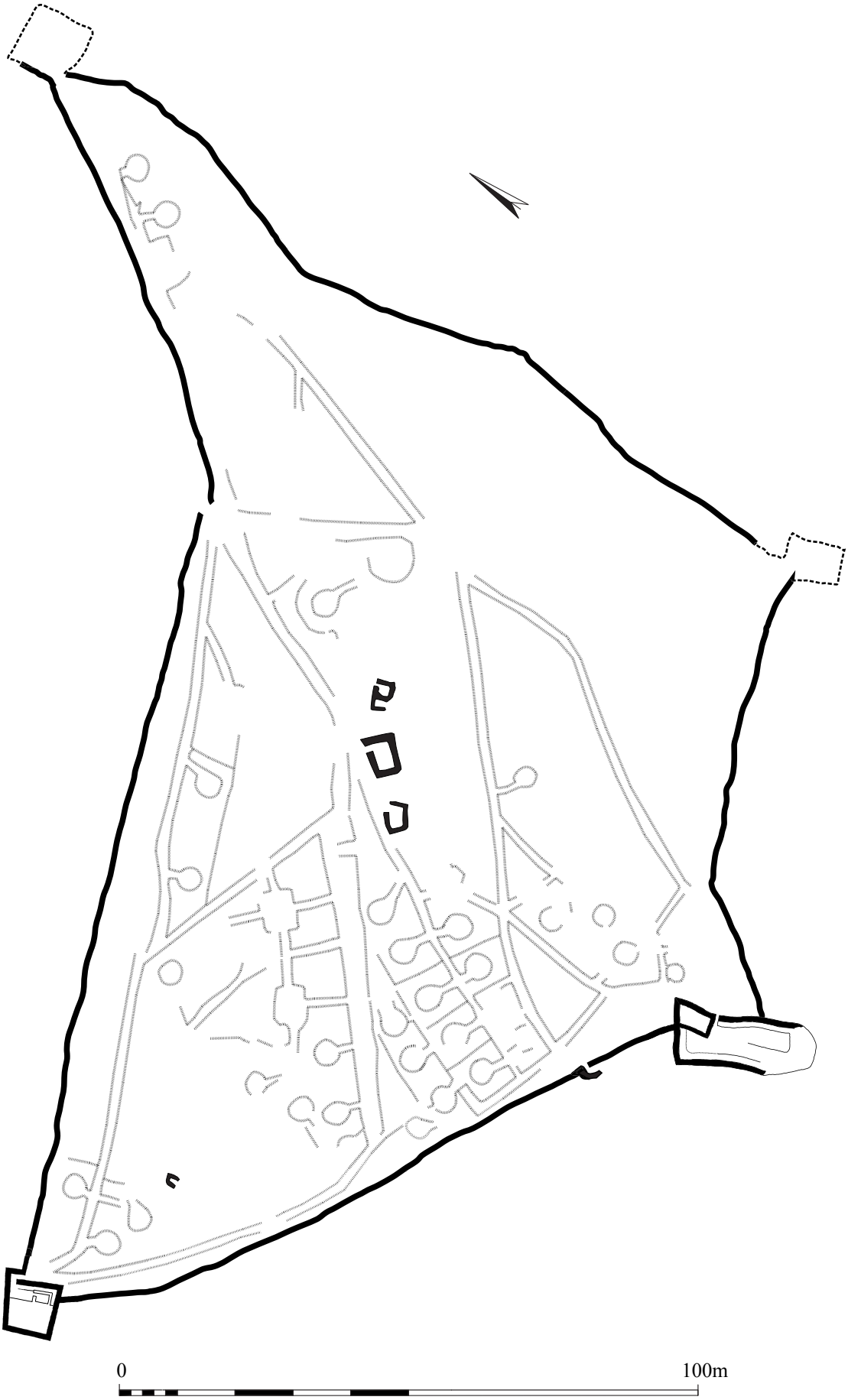


Figure 31. Ambigol Wells. The Berkshire Redoubt and the 1896 fort, plan (scale 1:1000).

Plate 128. Ambigol Wells. Satellite image of the 1896 fort and other installations.

together four small knolls each crowned by a redoubt (Figure 31, Plates 122-125 & 129). Each of these was presumably an emplacement for an artillery piece: it is described by Churchill as a four-gun fort (Churchill 1899, 126). The garrison in 1896 was 150 men of the garrison artillery with an Egyptian commandant, Bekker Bey, in command (Atteridge 1897, 282; Knight 1897, 99). The redoubts at the north and east angles are not well preserved and their plans are ill-defined. The north redoubt occupies a rocky outcrop, the ground falling off steeply into the *wadi*.

The West Redoubt (Figure 30) is well constructed with straight walls delimiting a trapezoidal area, the west wall being extended to the north and then turned to the east to provide an angled entrance. The northern third has a small room, 2.02 x 1.53m internally, constructed within it built from stones set in mud mortar and liberally rendered in similar material. Around the side and back of the room runs the banquette while on its south side its south wall is incorporated into the platform 1.1m above the internal floor surface, filling the whole of the rest of the redoubt. Along the north wall the parapet survives to a maximum height of 940mm above the banquette.

Plate 129. Ambigol Wells, the fort with the railway station and well in the distance; photo dated 1924-31 possibly by G.W. Grabham (Reproduced by permission of Durham University Library, SAD.484/10/31).

The South Redoubt (Figure 28) is much more irregular in shape to conform to the steep-sided knoll which it occupies and reflects the plan of the Berkshire Redoubt built here late in 1885. It is entered by a very narrow doorway only 590mm in width which retains no trace of fittings for a door and has no jambs, the same situation as observed in the western redoubt. The north-east angle is occupied by a

roughly rectangular room measuring internally 5.24-4.8 x 3.22-2.74m. This is abutted by the banquette on the western part of the north wall. The banquette, fronted by a parapet surviving to a maximum height of 1.14m runs along the east and west walls merging into the platform which occupies the southern part of the redoubt accessed up a 2.55m wide ramp.

The fort is entered by three gates. That to the north is a simple gap through the wall at a point where the alignment is staggered leaving an opening at right angles to the wall line. The gate in the south-west wall is close to the south redoubt. It is a narrow postern gate protected on the exterior by a curved wall (Plate 122). That in the south-east wall is today poorly preserved.

The interior is occupied by three roughly constructed stone buildings in the centre, by carefully laid out pathways and by tent bases in serried ranks where the topography permitted such a regular arrangement (Plates 122 & 126). The basic layout is very similar to what is to be found in the construction camps with tent bases in rows within rectangular frames frequently with each base within a square enclosure. There are also two of the rectangular four-way junctions as seen at Camp 8 and elsewhere. A few of the tent base are not in rectangular frames and at least two are in circular enclosures. The total number of tent bases is uncertain as some areas of the fort where it would have been possible to erect tents are empty. Either the tents were never placed there or the tent bases have been disturbed. A total of 30 tent bases can be recognised.

Akasha (Site WHKRS 84a)

The 1884-5 installations

There was a complex of defensive structures at this site (Figure 33). The River Fort was located on a long narrow north-south ridge very close to the east bank of the Nile and now presumably lies under the waters of Lake Nubia. It consisted of defensive towers at the north end and mid-way along the ridge and a roughly pentagonal area, a blockhouse, enclosed by buildings the outer walls of which acted as the exterior face of the fort to the south. It was constructed throughout of mud brick. Another tower lay on the hill approximately 500m to the south-south-east with wooden blockhouses to east and west (Figure 32). These latter, originally erected at Suakin, were moved to Akasha and, on the abandonment of the area in 1887, were removed and re-erected on the west bank of the Nile opposite Wadi Halfa (WO 78/171(1), 78/246). On the west side of the *wadi* was a dry-stone breastwork overlooking the railway station and Fort Maidstone, a two-storey dry-stone tower, on the hill later occupied by the 1896 fort.

Some of these installations at Akasha were recommissioned in 1896, the mud-walled fort, described as a not very formidable citadel, was refurbished and garrisoned by Collinson's Soudanese. Other traces of the Gordon Relief Expedition

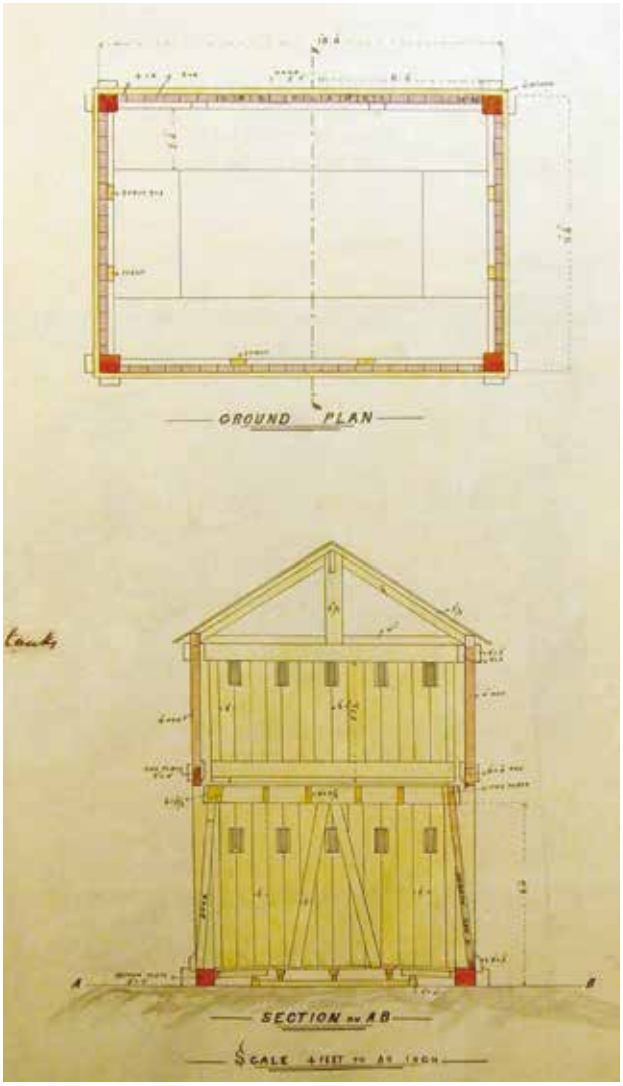


Figure 32. Akasha. Plan and elevation of one of the wooden block houses (WO 78/173, Courtesy National Archive).

> "were some ruinous buildings with thick walls of sun-dried brick, which once were offices and stores, and the road-bed of the railway curved round the valley to the river bank. Here and there lay the old metals; the sleepers were all gone. Close to the river stood the framework of an engine-shed made of railway iron, and some small bridge girders were lying by what was once a siding."
>
> (Atteridge 1897, 145).

The 1896-7 installations

Akasha was strongly defended in 1896. Atteridge describes the

> "screens of railway iron, dry stone walls topped with sandbags, wide zereba fences of desert thorn, little redoubts with walls of clay and stone, and north and south of the camp, at the highest points of the line, a solidly built two-floored blockhouse that would be impregnable against anything but artillery. The

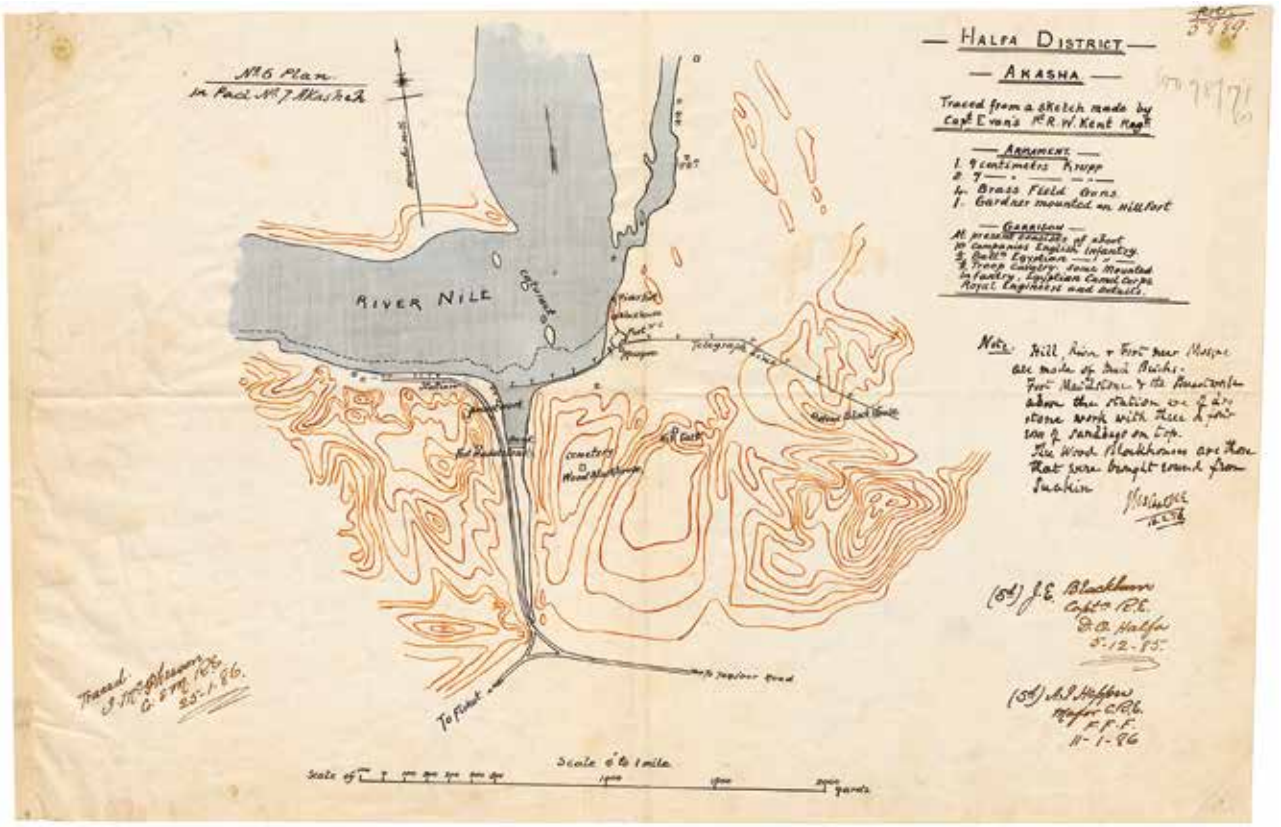


Figure 33. Akasha. Plan of the military installations and railway in the winter of 1885-6 (WO 78/171(1), Courtesy National Archive).

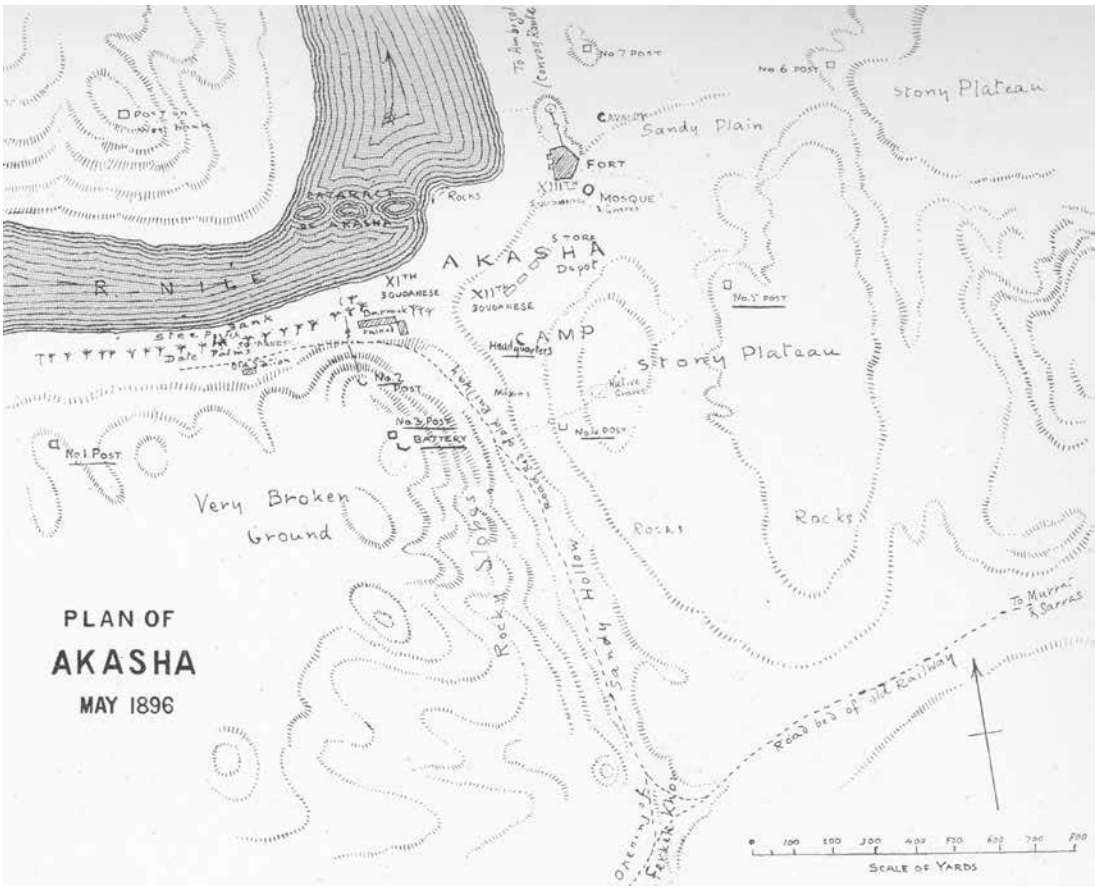


Figure 34. Akasha. Plan of the military installations and railway in May 1896 (Atteridge 1897).

Plate 130. Akasha. Fort Maidstone; south bastion (Blockhouse No. 3) and wall running down to the wadi *now filled with the waters of Lake Nubia.*

Plate 131. Akasha. Fort Maidstone; the south bastion (Blockhouse No. 3) and south wall.

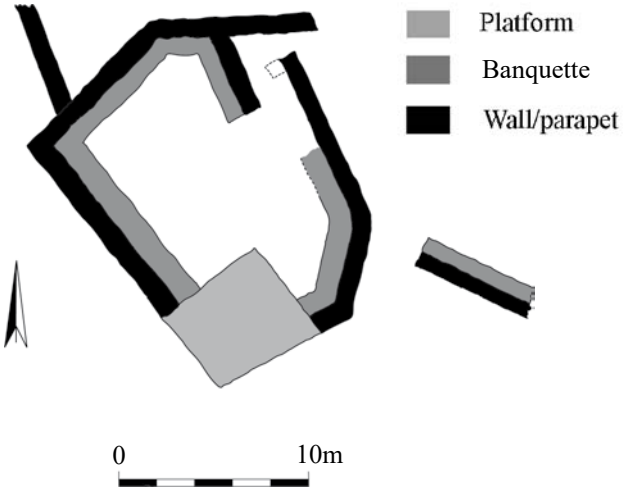


Figure 35. Akasha. Fort Maidstone; the south bastion (Blockhouse No. 3), measured sketch plan (scale 1:400).

Plate 132. Akasha. Fort Maidstone; the south wall with its banquette.

Plate 133. Akasha. Blockhouse No. 3 in 1896 (photo A. H. Atteridge).

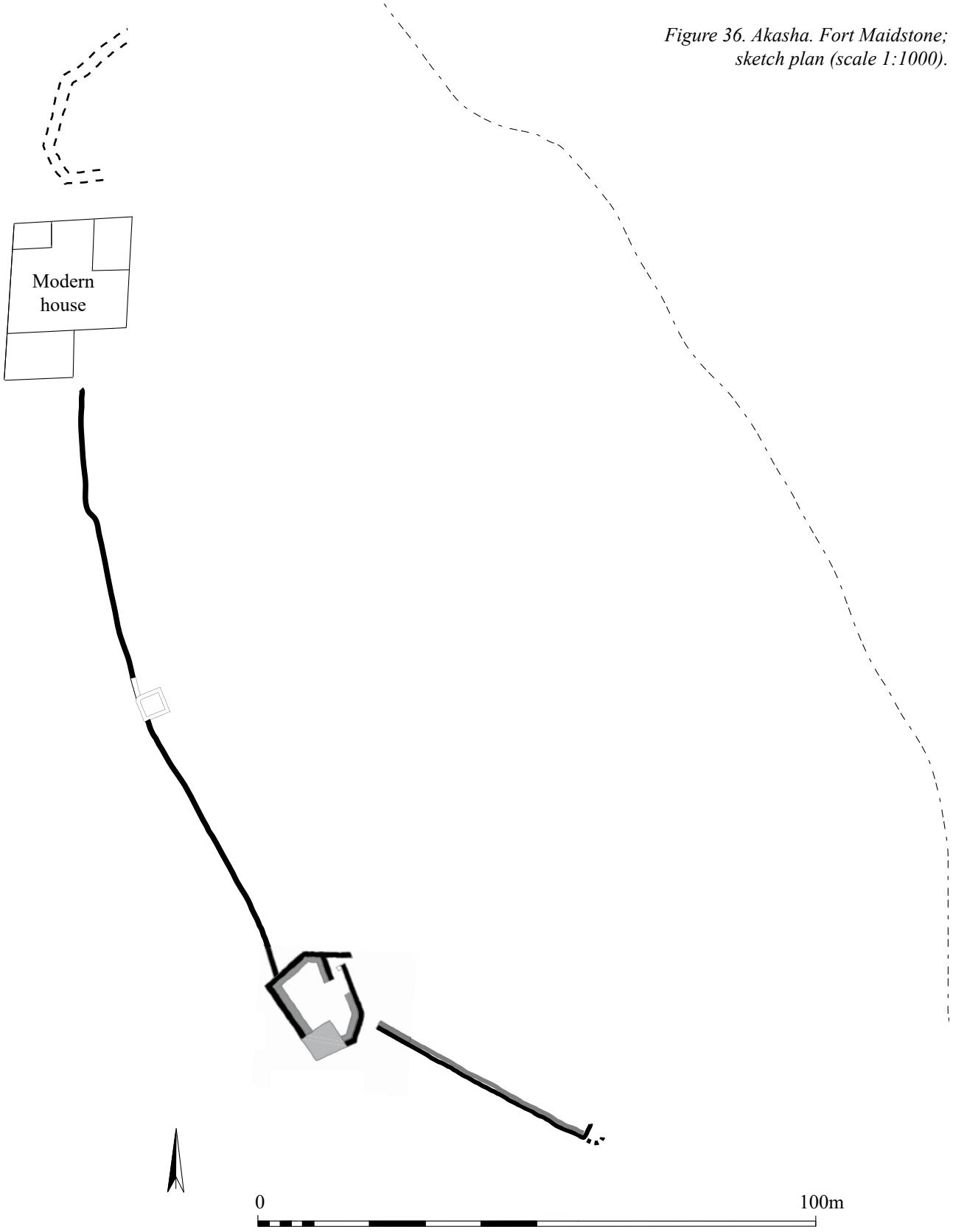


Figure 36. Akasha. Fort Maidstone; sketch plan (scale 1:1000).

southern blockhouse looked down the long *khor* towards Ferkeh, and on its south side there was a sandbag battery where an officer and some gunners were always ready to bring the Krupp guns into action."

(Atteridge 1897, 147-8).

Today the fort, built on a high ridge and on the steep slope down to the *wadi* to the east still dominates the landscape (Figure 36, Plate 130 & 131). The curtain wall, between 760 and 900mm thick, only survives along the ridge; whether it continued down the steep slope and along the edge of the *wadi* is uncertain from the

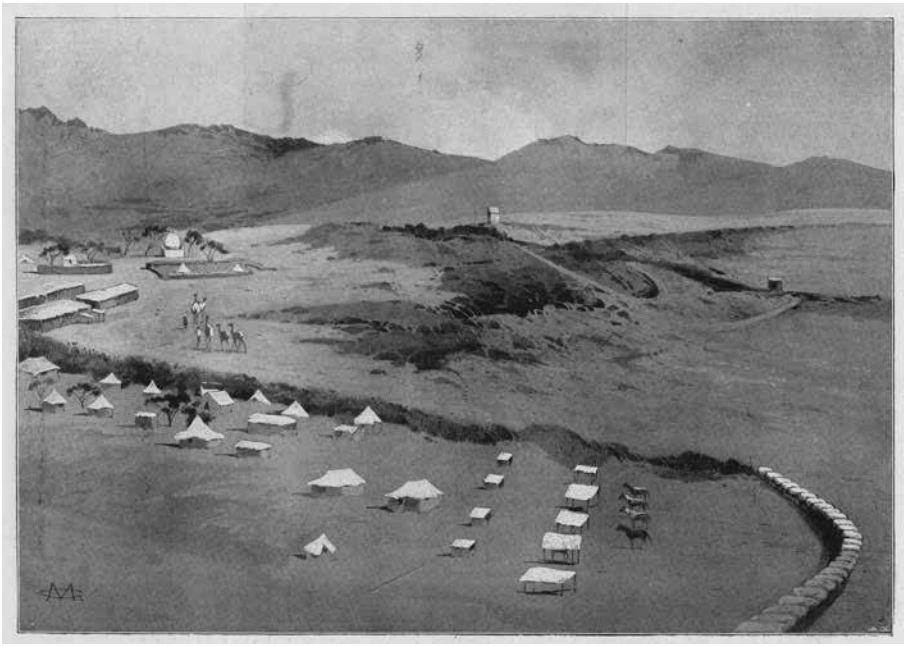


*Plate 134. The camp at Akasha (*Illustrated London News *27th June 1896).*

platform, the walls of which are revetted in mud. This was the lower part of what was a substantial high tower photographs of which were published by Atteridge, one is reproduced here as Plate 133. A banquette runs around the rest of the walls perhaps with steps on the south side giving access onto the top of the platform. The parapet survives to a maximum height above the banquette of 610mm. Part way along the west curtain is a small roughly square room which appears to have been incorporated into, or possibly has been inserted into, the curtain wall. It measures 4.97 x 4.75m over the walls which are between 750 and 660mm thick.

Plate 135. Akasha with the 1896 fort in the background, 1906-10
(Reproduced by permission of Durham University Library, SAD.766/8/78, T. A. Leach Collection).

remains on the ground today. A photograph taken early last century shows that there was not a substantial wall here, but what may be a slight mound or the edge of a terrace is visible. The wall terminates at its south-east end with a right-angled return into the fort 2.4m from the inner face of the curtain. At this point there are traces of a curved foundation, perhaps the remains of a small D-shaped post. On this section of curtain the line chosen is overlooked by sloping ground. Here a banquette approximately 780mm wide, has been provided along the whole length of wall which steps down the slope. The parapet stands to a maximum height of 1.34m. There were two redoubts, that at the north is very badly destroyed. There is a modern house immediately adjacent to it and a large metal water tank occupies its interior. The south-western redoubt is in a much better state. The walls describe an irregular hexagon with an angled entrance from the north east (Figure 35).

The south-west angle is occupied by an earth-filled

In 1896 the installations at Akasha were described as comprising three forts and blockhouses, with Maxim guns, Nordenfeldts and seven Krupp mountain guns (Knight 1897, 103).

As well as the military installations it was an important railway centre with "two stations, one (locally known as "the triangle") south of the fortified camp, at the point where the line branched off to Khor Kerkeh; the other close to the ground occupied by the old station in 1885, near the river bank. This was the spot where the engines got their water supply, and beside the line a couple of huge water-tanks had been raised upon a kind of dwarf pyramid, and the Nile water was raised into them by a powerful pump, worked by fly-wheel gear, and manned by fatigue parties of Egyptian soldiers." (Atteridge 1897, 275). No traces of these installations were noted in the survey. Much of 'the triangle' is flooded

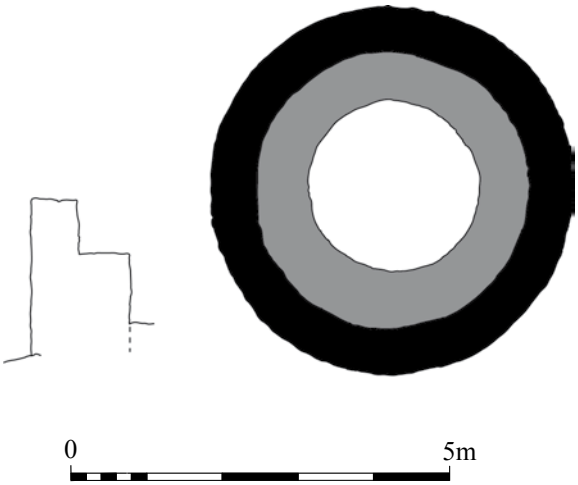


Figure 37. Watchtower at locus 36; measured sketch plan and section (scale 1:100).

Plate 136. Watchtower at locus 36.

Plate 137. Watchtower interior with banquette.

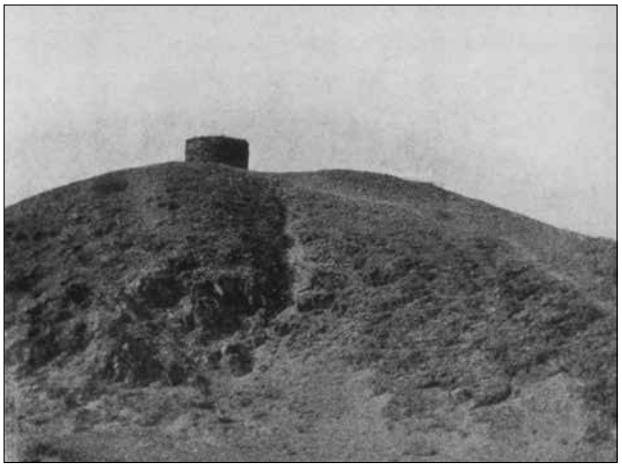


Plate 138. A watchtower along the railway line (photo A. H. Atteridge 1896).

when the reservoir's water level is high.

Isolated watchtower (Site WHKRS 36)
This watchtower occupied the summit of a low flat-topped hill 750m west of Camp 2. It was a well-built circular structure 5m in diameter and surviving to a height of 2.05m measured from the external ground surface (Figure 37, Plate 136). In the centre was a circular 'well' 2.2m in diameter surrounded, at a height of about 1.35m, by a banquette 700mm wide topped by a parapet varying from 720-600mm thick and surviving to a height of 700mm (Plate 137). There was no entry at ground level nor a means of access down into the central well. This installation appears on the survey map of the railway produced in February 1886 where it is described as a 'Small Tower' (Figure 2).

Isolated redoubt (Site WHKRS 59)
Occupying the summit of a prominent hill (Plate 139) at a point where the railway was forced to cross a low saddle between the hills the redoubt enjoys excellent views along the line to north and south (Plate 141). The north, west and south walls delimit a rectangular area 4.9 x 6.75m in size. The east wall is angled so as to pass be-

Plate 139. The redoubt crowing a prominent hilltop where the railway negotiates a narrow low col.

Plate 140. The redoubt and features cut into the hillside.

Plate 141. The redoubt enjoys extensive views along the railway, here to the north.

yond the end of the south wall leaving a doorway 1.51m wide beyond which the wall curves round to the west to protect the doorway (Figure 38). The walls, of rough

Plate 142. The army camp 5c at Kosha, general view.

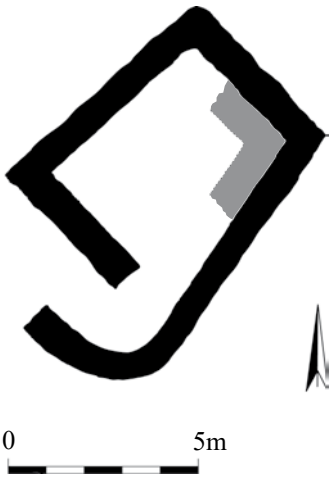


Figure 38. Redoubt; measured sketch plan (scale 1:200).

stone, range in thickness from 700 to 860mm. Around the interior, but only clearly visible towards the north-east angle is a banquette 850mm wide. Immediately to the south of the redoubt are several rectangular depressions 2.7 x 1.15m in size with sides sloping down to a flat

Plate 143. Dal. Camp, general view.

horizontal bottom (Plate 140). On the sloping hillside into which they are cut the maximum depth is about 600mm. At this point on the 1886 survey map (Figure 2) another 'Small Tower' is marked. This was presumably demolished and its stones reused to build the redoubt.

Military camps

Designated Camp 5c the massive sprawling camp near Kosha (Plate 142) is not directly connected with the construction of the railway but is the site occupied by the army from approximately 22nd July until 11th September 1896 after it was decided to move from close by the river bank in an attempt to halt the cholera epidemic which was causing such loss of life. The camp, of tents and *tukls* was spread out over the landscape as an aid to arresting the epidemic (Knight 1897, 203, 220, 239) and

Figure 39. Dal. Camp, sketch plan (scale 1:1000).

Plate 145. Detail of the debris including many fragments of shell casing.

was occupied by the army during its wait for the waters of the Nile to rise which was necessary to facilitate the operations of the gunboats which were expected to play an important part in the advance to Dongola.

Dal (Site WHKRS 268)

This small camp is far from the railway on the banks of the Nile a little north of Jebel Firka (Figure 39, Plate 143). It may be the camp where Atteridge stayed in 1896. He describes it thus:

> "I spent the night and next morning at a camp at the foot of the Dal Cataract, where a captain of the 8th Battalion, the Yuzbashi Mohammed Farad, was in command. ..... the little camp, occupied only by his company, was a model of military order-the neatest camp I have ever seen. His men were engaged in getting stores, chiefly telegraph poles, along the portage road, ..."
>
> (Atteridge 1897, 290).

No other camps in this area are mentioned in the contemporary sources to the author's knowledge.

The camp was defended by a stone wall on the east side and along the steep slope down to the *wadi*. Towards the river it has an earthen bank which turns through a gentle curve before running up to the base of the rocky hill where no additional defences were constructed. There is a gate in the east wall, no details of which survive, leading up to which from the exterior is a cleared track. There is another gate through the earth mound by the north-west angle. Traces of possibly two rectangular buildings can be seen in the interior of the camp. The interior has recently suffered from the depredations of antiquities thieves (?), many small holes having been dug across the area of the camp, seemingly at random, but possibly guided by the use of a metal detector. Two or more previously invisible Islamic period graves, one of a juvenile or infant, have been disturbed.

Plate 144. The site of the explosion with debris strewn across the road-bed.

The explosion

At one point on the line, to the north of Delgo, there is evidence of an explosion, presumably of a wagon containing ammunition and other explosives (Plates 144 & 145). Exploded as well as intact shells were found in abundance, along with parts of the rolling stock, buckles, tins, and a twisted donkey shoe still with a nail in it. For the finds from here see the finds catalogue nos 161-167, 169, 170-176, 250-253, 273, 278, 298, 300, 313-315, 332-334, 336, 345 and 357.

War memorials

At various points along the route of the Sudan campaigns, small war memorials in the form of pyramids were constructed. These all bore an identical inscription

TO THE MEMORY
OF
BRITISH OFFICERS AND MEN
WHO DIED HERE
IN THE
ANGLO EGYPTIAN CAMPAIGNS

These pyramids were noted at Sakamotto, Akasha (Plate 146), Kosha, Sabu and Merowe. Another stood close to the battlefield at Kirbekan, but this had been destroyed at some time before 2002 when visited by the author.

Plate 146. Pyramidal war memorial at Akasha.

Military installations associated with the Gordon Relief Expedition to the south of Kerma

The survey detailed above was focussed on the line of the railway between Wadi Halfa and Kerma but other military installations survive to the south which are directly comparable. Recently the Gdańsk Archaeological Mission has visited the remains of Wolesley's base camp (Plate 149) in the region of Ambigol near Korti (called Tani by Verner, an Intelligence officer who lived in the camp), the point at which the Desert Column of the Gordon Relief Expedition set off across the Bayuda Desert during its advance towards Khartoum (pers. comm. Dr Mahmoud el-Tayeb). Strong-walled redoubts were constructed on the three hills immediately to the south of the camp (Verner 1885).

Midway across the desert are the impressive remains at Jakdul Pools which, providing the only permanent standing water in the whole region, was of considerable strategic significance. At that site three forts were constructed between 3rd and 10th January 1885 (Figure 40, Plate 147), Fort Stewart overlooking the pools, Fort Boscawen on an isolated hill a little to the south with a small outpost flanking them.[28] When Sir Evelyn Wood took over command at Jakdul he added a chain of small 'pepper-boxes' crowning every ridge (Plate 148) to

Plate 147. Jakdul. The pools and Fort Stewart from Fort Boscawen.

Plate 148. Jakdul. One of the 'pepper boxes' built on surrounding hilltops.

[28] For the only 'archaeological' description of these installations see Crawford 1953, 21-23.

Plate 149. The camp at Tani. Lithograph produced from a sketch made in the field by Capt. Willoughby Verner, Rifle Brigade, Intelligence Department, Nile Expeditionary Force (Verner 1885).

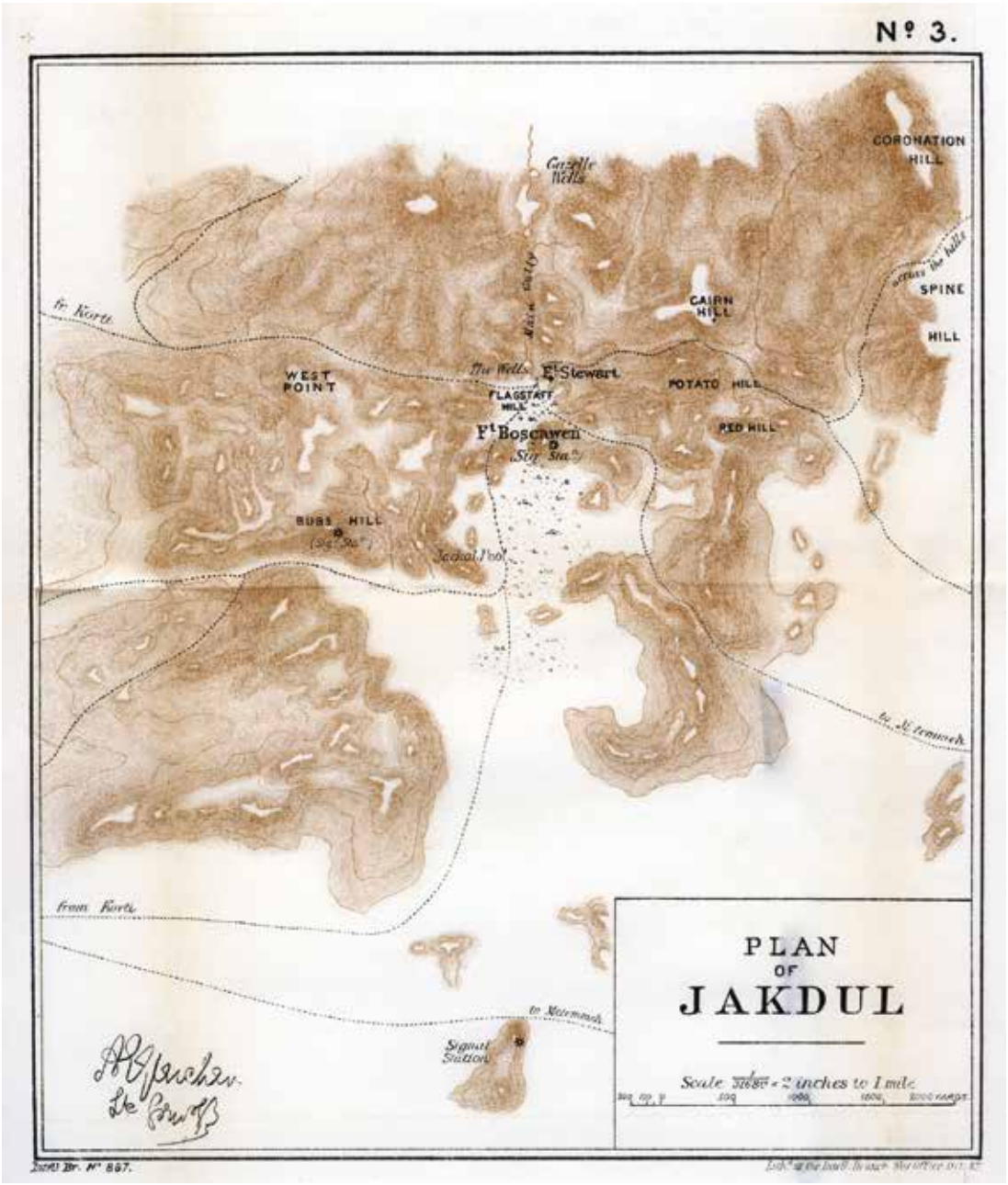


Figure 40. Plan of Jakdul published by Colville 1889.

Plate 150. Jakdul. Camel lines?

Plate 151. Sir Herbert Stewart's tomb at Jakdul. Lithograph produced from a sketch made in the field by Capt. Willoughby Verner, Rifle Brigade, Intelligence Department, Nile Expeditionary Force (Verner 1885).

replace the two big forts as the main elements of defence. The installations were further improved by the construction of paths linking the forts (Dawson 2009, 13-14). Jakdul was abandoned by the Gordon Relief Expedition on 3rd March 1885 (Colville 1889, II, 75). It was here that Sir Herbert Stewart, commander of the Desert Column, who was mortally wounded near Metemma, was laid to rest (Plate 151).

At Abu Klea (Abu Tulayh) is a war memorial set up on the battlefield along with a war cemetery (Plates 152-154). Other installations along the line of the Desert Column's march presumably remain among them the fortified camp at Abu Klea (Snook 2010, 94ff), and the three 'pepper boxes' and other military installations constructed at Megaga on 25th and 26th February 1885, located 30 miles north of Jakdul (Colville 1889, II, 75).

On the route taken by the River Column a series of parallel lines of stones at Site no. 8 near Jebel Kulgeili a little below

Plate 152. Abu Klea. War memorial.

the Fourth Cataract may be associated with the passage of the troops (Abdel Rahman Ali and Kabashy Hussein 1999, col. pl. XXXI). A little downstream of Kirbekan a few circular features at sites 4-L-217 and 4-L-228, which appear very similar to tent bases noted in the railway survey, may also date to this campaign. The shell casing from the post-Medieval village at site 4-M-79 recorded by the Sudan Archaeological Research Society's Amri to Kirbekan Survey in 2006 can be closely paralleled by material from the railway and presumably came from the nearby battlefield.

Along the railway from Wadi Halfa to Abu Hamed built in 1897, which was ultimately extended to Khartoum, there are presumably many construction camps of similar character to those associated with the Wadi

Plate 153. Graves at Abu Klea. Lithograph produced from a sketch made in the field by Capt. Willoughby Verner, Rifle Brigade, Intelligence Department, Nile Expeditionary Force (Verner 1885).

Plate 154. Abu Klea, war cemetery in 2005.

Halfa to Kerma line. Some of these camps have recently been visited by the National Corporation for Antiquities and Museums' staff during their survey of the region to be affected by the proposed Dagash Dam (pers. comm. Mahmoud Suleiman Bashir). Others are visible on satellite imagery on the section of line between the Fifth Cataract and Abadiya where, as originally constructed, the railway left the river heading out into the desert a maximum of 22km from the Nile. The line was soon replaced by that followed by the present-day railway which runs much closer to the river serving the villages along its route (Pinckney 1926, 6).

The section of the line in the desert near the Fifth Cataract was briefly investigated by an archaeological team from the Sudan Archaeological Research Society in 2013 when a number of camps (Plates 154a & 154b),

Plate 154a. Construction camp CS0.

a quarry associated with the railway, two bridges and the railway station at Abu Salam (Plate 154c) were visited. One of the camps was surveyed in detail (Welsby 2013, 132, fig. 1, pl. 6).

Plate 154b. Construction camp CS3.

Plate 154c. Abu Salam railway station.

The finds†

Throughout the survey a surface collection of material was made along the line of the railway, in the construction camps and military installations and on the site of the explosion. In some areas where the camps lie close to modern habitation presumably many objects have been collected over the years and removed from the sites. In the sections of the railway where it runs well out in the desert there will have been much less 'looting' but no site will have been totally immune as is made clear from a report by Atteridge who witnessed the striking of a construction camp in early May 1896

> "After breakfast the railway battalion struck its camp, and the irregulars came prowling round, looking for empty bottles, tin boxes and other objects that might be added to their slender camp equipment. I got a snapshot photograph of one of them with a rifle in one hand and a bottle in the other ..."
>
> (Atteridge 1897, 125-6).

All the material discussed in this report was collected from the surface. Although most of it is contemporary with the various phases of the construction and use of the railway a few objects may be of later date. Among these are Cat. no. 289 which appears to be a valve from a pneumatic tyre and Cat. no. 224 a tin lid from a well-known manufacturer of sweets, a company founded in Khartoum in 1950. The Shell petrol can, Cat. no. 209, long post-dates the demise of the railway.

Ceramics

Bottles and jars

1.+ Cream stoneware bottle. The oval stamp (Plate 160, St. 2) on the side at the base reads

GROSVENOR
2
GLASGOW

H:274mm, Rim D:32.5mm, Max D:85mm.
SF:311, WHKRS 27b, CC1a5

2. Part of the lower part of a stoneware bottle with a small chamfer at the base. An oval stamp on the side at the base as Cat. no. 1.
H:107+mm, Max D:88mm.
SF:201, WHKRS 27a, CC1a4 O

3. Cream stoneware bottle identical to Cat. no. 1, slightly oval at the base. The poorly impressed oval stamp (Plate 160, St. 1) on the side at the base reads

GROSVENOR
1
GLASGOW

A small fragment of the yellow Tennents Pale Ale label remains along with the wire to hold the foil covering the cork.
L:90mm, W:87mm, H:272mm, Rim D:31mm.
SF:306, WHKRS 27b, CC1a5

4. A stoneware bottle missing the upper neck and rim with a small chamfer at the base. An oval stamp (Plate 160, St. 3) on the side at the base reads

GROSVENOR
3
GLASGOW

H:217mm, Max D:88mm.
SF:203, WHKRS 27a, CC1a4 F

5. Base and lower part of the wall of a cream stoneware bottle with an oval stamp (Plate 160, St. 4) on the side by the base. In the band around the edge is written

* H.KENNEDY *
GLASGOW

and in the centre

BARROWFIELD
42
POTTERY

H:79+mm, Max D:94mm.
SF:276, WHKRS 27a, CC1a4

6.+ Sherd from the wall of a cream stoneware bottle as Cat. no. 1. It retains most of its oval yellow paper label bearing a large red T in the centre containing the words TRADE MARK and with J & R Tennent. written across it. Beneath is

TENNENT'S
PALE ALE

Around the edge of the oval label towards the top is

REG[……]CT and WELL[PARK BRE]WERY

Construction of the new Tennent brewery at Wellpark by Hugh Tennent began in 1889 and was completed in 1891.
H:89+mm.
SF:221, WHKRS 27b, CC1a5

7.+ Rim and neck of a stoneware bottle as Cat. no. 1 retaining some of the foil held in place by a thin ferrous wire. On the foil is a large red T and in a much smaller font

BOTTLED BY [….
THE BREWERS […….
[J] R Tennent

in raised red letters.
H:78+mm, Rim D:32mm.
SF:371, WHKRS 27b, CC1a5

8.+ Sherd from the wall of a cream stoneware bottle as

† Catalogue numbers followed by a * and/or by a + indicate that the object is illustrated in the report by a drawing (*) or photograph (+).

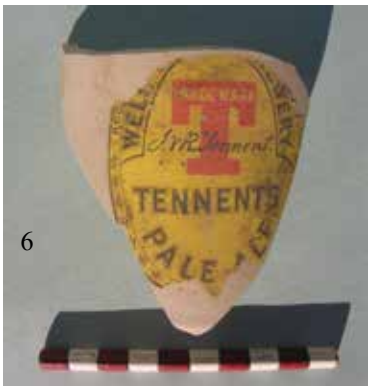
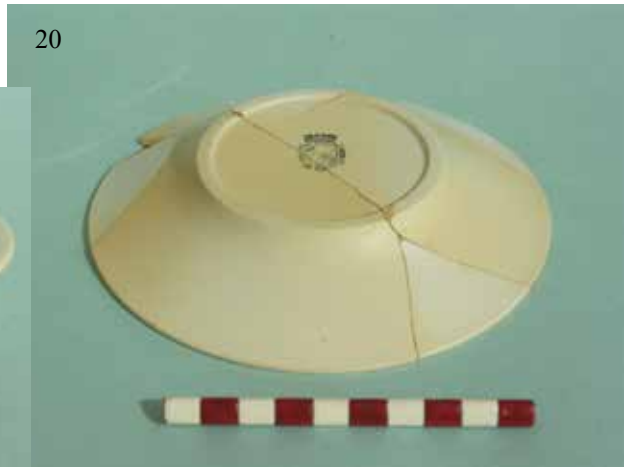
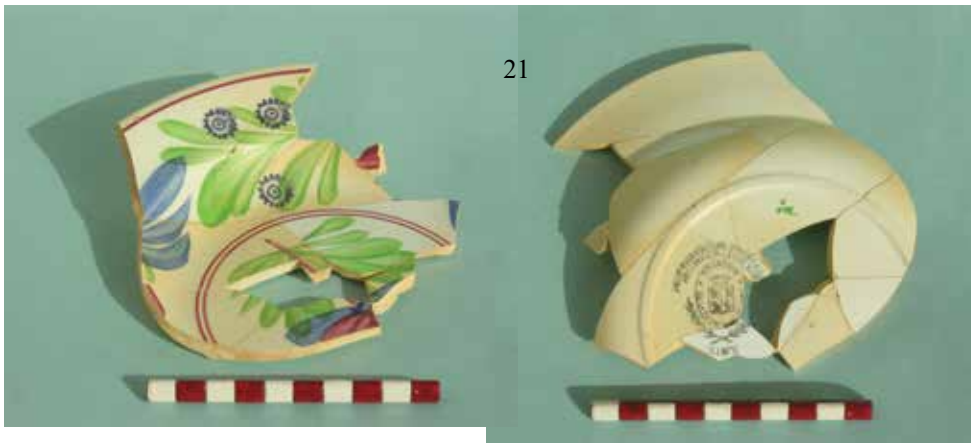
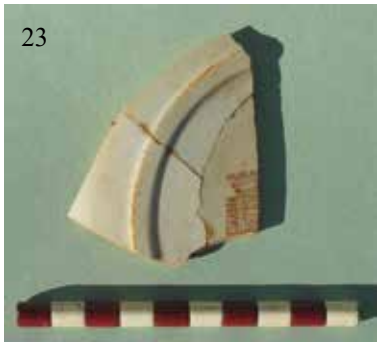


Plate 155. Stoneware jars, catalogue nos 1-13.

Plate 156. Stoneware jars and plates, catalogue nos 14-20.







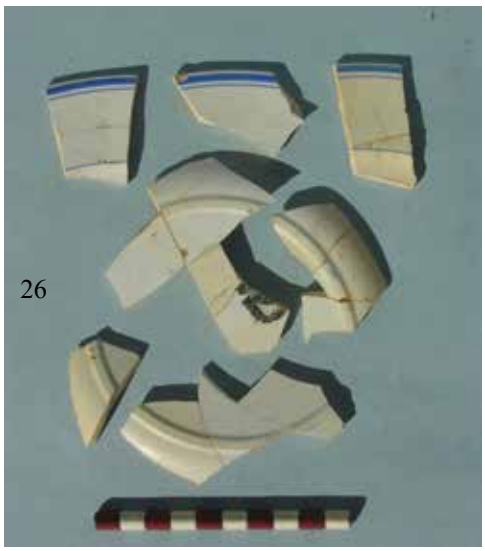
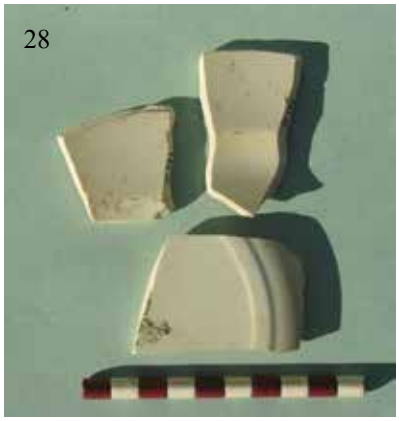
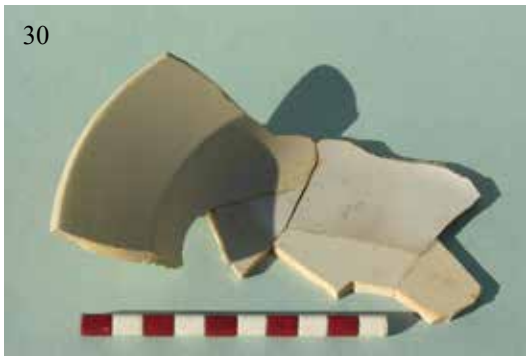
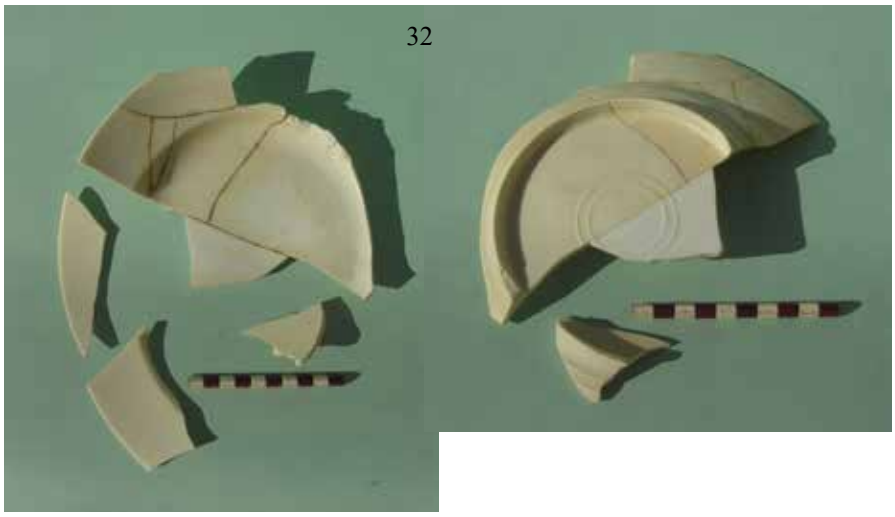
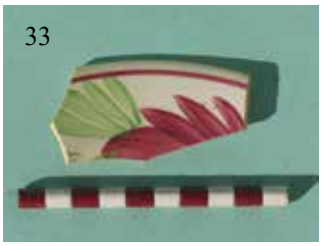


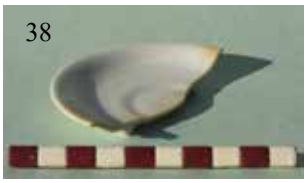
Plate 157. Ceramic plates, catalogue nos 21-30.

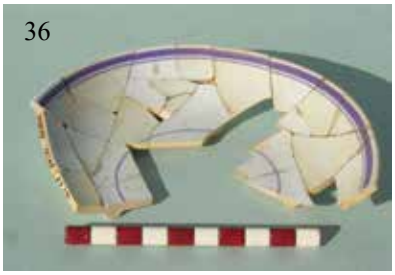


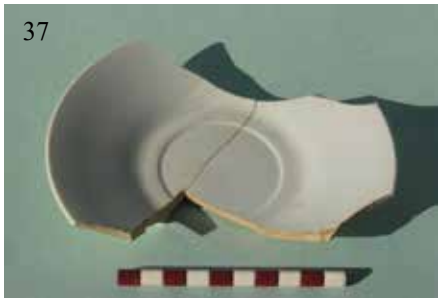












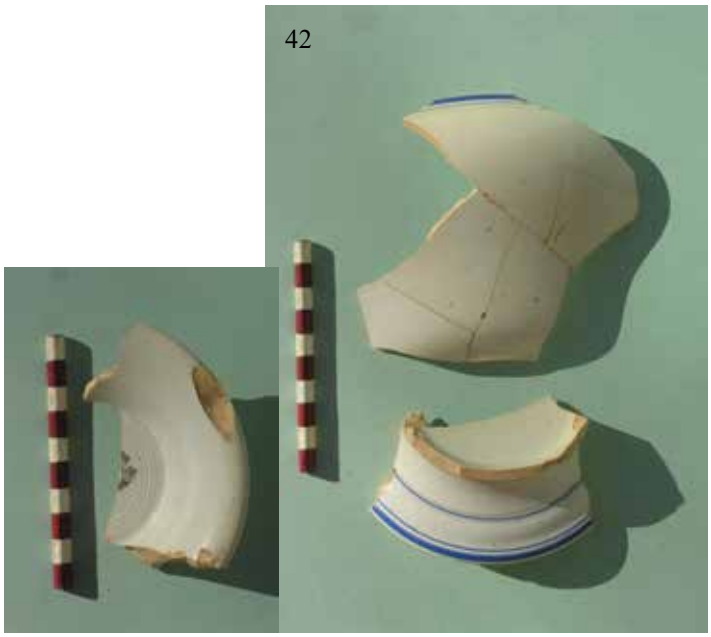


Plate 158. Ceramic plates, saucers, bowls and tourine, catalogue nos 32-42.

Cat. no. 1. It retains most of its oval white paper label with a broad red band towards the edge. Within, written in cursive red script, is

…] guarantee
was brewed from
…] Malt and Hops
[……]

The text on the last line is illegible. Written across the label in a black font is [J] R Tennent.
H:118+mm.
SF:369, WHKRS 27b, CC1a5

9.+ Rim and neck of a stoneware bottle as Cat. no. 1 retaining some of the foil held in place by a thin wire. On the foil can be read [J] R Tennent in raised red letters.
H:91+mm, Rim D:32mm.
SF:214, WHKRS 27b, CC1a5

10.+ Mottled brown stoneware jar with a pourer at the rim. On the side by the base is a stamped 5-pointed leaf, and part of another motif of uncertain form along possibly with a rectangular stamp (Plate 160, St. 8). On the base the wire mark where it was cut from the wheel are clearly visible.
H:220mm, Rim D:32.5mm, Max D:76mm.
SF:307, WHKRS 153a, CC11a

11.*+ Mottled brown stoneware jar, cylindrical with a pronounced shoulder. Rim pinched to form a spout. Marked immediately above base (Plate 160, St. 10). Smooth glazed interior.
H:218mm, Rim D:28.5mm, D:78mm body.
SF:89, Site WHKRS 192, CC15

12.+ Jar as Cat. no. 11, rim missing. Marked close to base (Plate 160, St. 11).
H:201+mm, D:77.5mm body.
SF:90, Site WHKRS 192, CC15

13.+ Cream stoneware jar with a pourer on the rim, Traces of the white paper label remain with traces of decoration and text in orange. It bears a poorly impressed rectangular stamp (Plate 160, St. 7) on the side by the base which is unreadable.
H:183mm, Rim D:37.5mm, Max D:82.5mm.
SF:304, WHKRS 172aa, CC14c1

14.*+ Small stoneware bottle with dark brown external surface, buff within. There are remains of a rectangular white paper label with red and blue decoration.
H:146mm, Rim D:30mm, Max D:70mm.
SF:164, WHKRS 157, CC12

15. Upper part of neck and rim of a stoneware bottle. As Cat. no. 4.
H:74+mm, Rim D:32mm.
SF:206, WHKRS 27a, CC1a4 P

16.*+ Small stoneware bottle with a buff fabric and pale blue surfaces. On the side at the base it has three zeros or letter Ooo's in decreasing font size.
H:73mm, Rim D:42mm, Max D:55mm.
SF:265, WHKRS CC13a3

17.+ Cylindrical stoneware jar with a flat base and a prominent internal lid seating. A little below the plain upright rim on the exterior is an impressed band with oval dots in relief. The lower part of the exterior and the interior is covered in a buff glaze, the upper part of the body with the decorated band and just over the neck is brown. On the side at the base is an oval stamp (Plate 160, St. 6)

STI[….]
LAMB[ETH]

H:156mm, Rim D:123mm.
SF:309, WHKRS 146a, CC10a

18.+ Flat base (D:114mm) and lower part of the splayed body of a stoneware vessel in a red fabric. The interior surface is brown and it is cream on the exterior. Wheel-made.
H:88+mm.
SF:305, WHKRS 27a, CC1a4

19.*+ White stoneware jar, cylindrical with a pronounced shoulder. Rim pinched to form a spout. Stamped (Plate 160, St. 5) on the front close to the base is

GRAY
1
PORTOBELLO
MB

Paper labels on front and back partly survive and indicates that it had contained ink. Front label – white background, decorative border in black/grey. Panel in green with BLUE BLA[… in large block letters. On the back is a rectangular white label with decorative border and text in black faded a little to grey. There are 23 lines of text divided into three sections, only partly legible. Central section letters in italics.

The label reads

Ordered
Majesty's St of the
….]ck fluid of vari[….
BLACKWOOD
Fluid and R[…
invited to tender
…]ders for all the
accepted they are used in the

– – – – – – – – – – –

"He Majesty's
as 22nd Dec

accept your [duty] to supply
Copying Red Ink under the conditions
letter of the 14th instant
"Signed " W
To Messrs Blackwood & Co

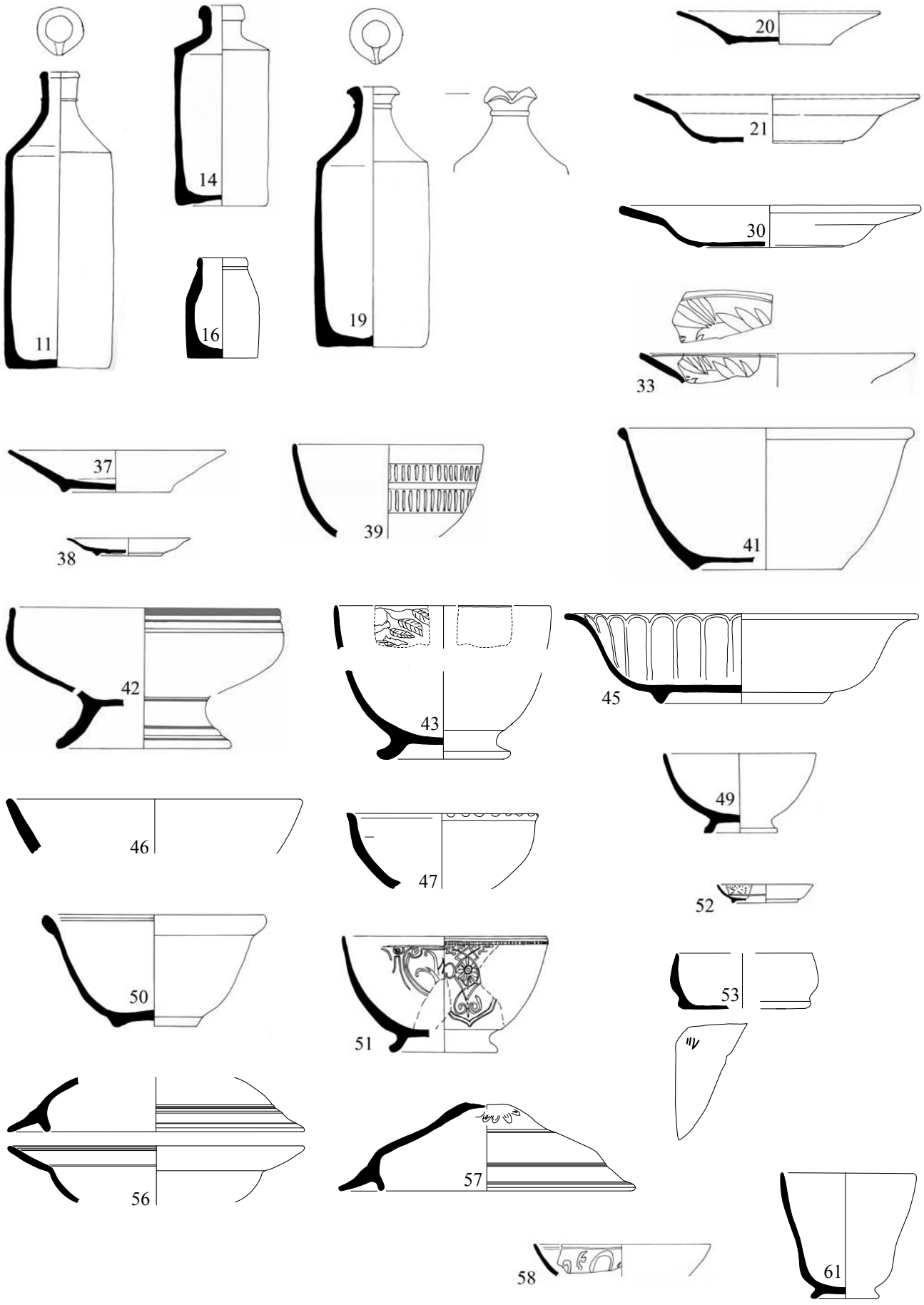


Figure 41. Ceramic plates, saucers, bowls and tourine, catalogue nos 11-61 (scale 1:4).

18 Bread Street Hill

Our tender for Pure Black Writing
And without the co[…..] admixture Indigo or
accepted August 1880{?} O. I manufactured
The required the Government O
Old English Record W[……

Blackwood and Co. of 18 Bread Street Hill, London, EC4 were still in business in 1922 when they are listed as 'Manufacturers of Ink (Writing, etc.), Adhesives, (Gums and Pastes), Sealing Wax, Self-inking Stamp Pads, Marking Ink for Linen, etc.' (http://www.gracesguide.co.uk/wiki/Blackwood_and_Co)
H:192mm, Rim D:38mm, Max. D:82mm.
SF:88, Site WHKRS 192, CC15

Tableware

20.*+ White glazed saucer, fine white fabric. Surface of some sherds yellowish. Almost complete. Printed maker's mark in centre of base on underside (Plate 161, Mm. 1a)

OPAQUE DE SARREQUEMINES

around a heraldic shield beneath a crown.

The pottery at Sarrequemines was established around 1770 by Paul Utzchneider. Between 1871 and the end of the First World War it formed a part of the German province of Alsace-Lorraine being then returned to France.
H:25mm, Rim D:152mm, Base D:79mm.
SF:1, Site WHKRS 151, CC11

21.*+ Cream glazed plate, fine cream fabric. Decorated on upper surface with floral design in blue, red and green with blue roundels. Red painted line immediately below rim and double concentric line enclosing a central decoration. Shallow footring and printed mark off centre on underside (Plate 161, Mm. 4)

ANC^{NE} MANUFACTURE IMPER^{LE} & RO[….
ANCI MOUZIN LECAT & CL[……
NIMY

Within oval

S^{TE} ANONME
DE LA FAIENCE DE NIMY

The heraldic shield is divided into four with each quadrant containing a rampant lion. The shield is topped by a crown and three laurel leaves beneath the oval.

The pottery at Nimy, close to Mons in Belgium, was established in 1833.
H:36mm, Rim D:204mm.
SF:8, Site WHKRS 139, CC7

22.+ Rim of a plate in a fine cream fabric. Identical to Cat. no. 21.
Rim D220mm.
SF:51, Site WHKRS 145, CC9

23.+ Part of the base of a saucer or plate in a white fabric with white-glazed surfaces. It has a printed mark on the base (Plate 161, Mm. 2), a heraldic shield with a castellated structure within beneath a crown and with the inscription

POMCELN[…….. .

SF:274, WHKRS 153a, CC11a

24.+ Rim sherd from a plate in a cream fabric with cream glazed exterior and a blue and white glazed interior.
Rim D:190mm.
SF:34, Site WHKRS 96, CC5

25. Parts of the broad flat rim and the base from a plate with a very shallow footring in a white fabric with white glaze. It has a printed mark in the centre of the base on the underside as Plate 161, Mm. 1a.
SF:200, WHKRS 27a, CC1a4 D

26.+ Plate in a white fabric with white-glazed surfaces. It is decorated towards the tip of the wide flat rim with a broad and a narrow blue band and by a narrow band at the carination. Well off centre on the underside of the base is a very blurred printed mark (Plate 161, Mm. 1c).
Rim D:210mm.
SF:215, WHKRS 15a/b. CC1z1/2

27.+ Plate in a white fabric with white-glazed surfaces. On the centre of the base it has a printed mark (Plate 161, Mm. 7)

MEDAILLES D'OR
DIPLOMES D' HONNEUR

and within the oval roundel

FAIENCERIE DE GIEN

a mark first used in 1875 (http://www.tableideas.com/Service_Pages/gien-marks.htm). To one side it is stamped 3 and with a symbol like a Y.
H:28mm, Rim D:223mm.
SF:312, WHKRS 27b, CC1a5

28.+ Base, wall and part of the wide flat rim of a plate in a white fabric with white-glazed surfaces. A fragment of the printed mark in the centre of the base survives. The rim tip is missing.
SF:288, WHKRS 190a, CC14f

29.+ Part of the base from a plate or perhaps a shallow bowl covered in a slightly mottled bluey-white glaze. On the exterior is a very shallow footring. The upper surface is decorated with a repeating design of sunflowers(?) in blue with their stems and leaves rising from a circular blue ring in the centre of the base. At the junction of the wall and base are at least two narrow concentric blue bands.
SF:197, WHKRS 27a, CC1a4 L

30.*+ Plate with a wide flat rim in a white fabric with white-glazed surfaces. In the centre of the base it bears the printed mark as Plate 161, Mm. 7.
H:31mm, Rim D:220mm.
SF:209, WHKRS 146, CC10

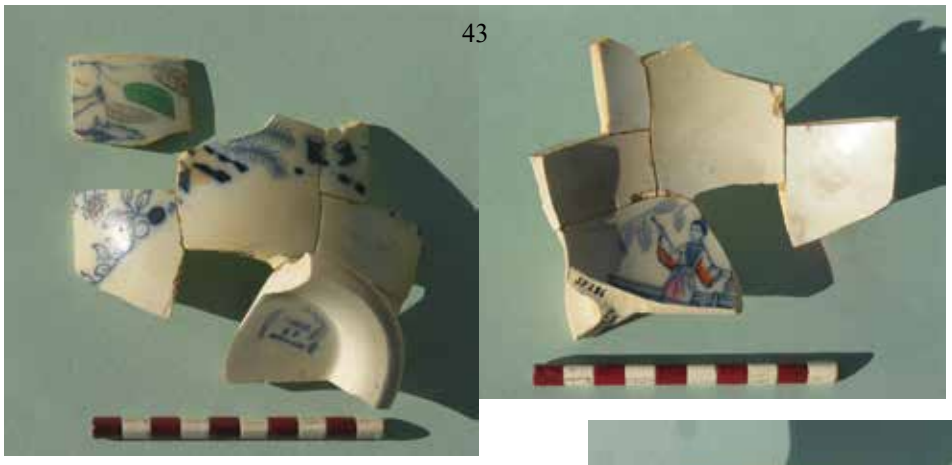
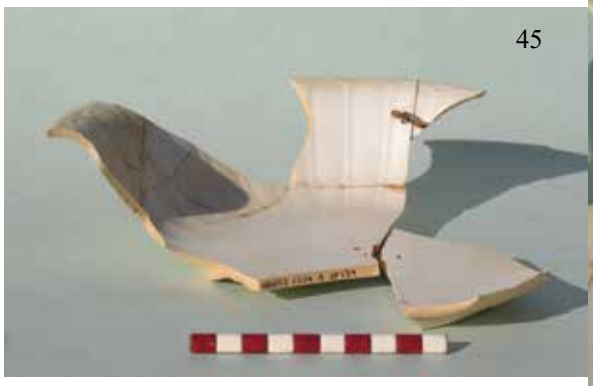


Plate 159. Ceramic bowls and cups, catalogue nos 43-51.



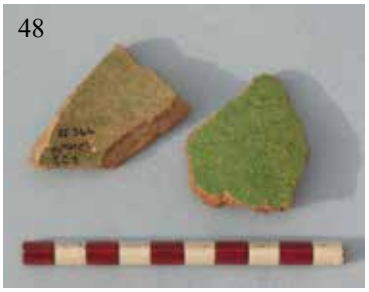


Plate 160. Stamped makers' marks.

31. Plate in a white fabric with white glazed surface. The wide flat rim is angled upwards.
Rim D:220mm.
SF:226, WHKRS 27b, CC1a5

32.+ Plate in a white fabric with white-glazed surfaces. It has a high footring with two concentric ridges immediately above the base on the exterior and a wide flat rim angled upwards. It is not marked on the base but there are two concentric circular ridges in the centre on the underside of the base 48mm and 37mm in diameter.
H:45mm, Rim D:230mm.
SF:285, WHKRS 190a, CC14f

33.*+ Wide flat rim from a plate or bowl in a white fabric with white-glazed surfaces. It is decorated with a narrow maroon band close to the rim tip and lanceolate red and green leaves.
H:20+mm, Rim D:200mm.
SF:184, WHKRS 139, CC7

34. Small plate or saucer in a white fabric with white glazed surface. Fragments only of rim preserved.
Rim D:150mm.
SF:375, WHKRS 27b, CC1a5

35.+ Saucer in a white fabric with white-glazed surfaces. By the rim is a broad and narrow green band and another narrow green band around the depression to take the cup. On the underside of the base it has an impressed stamp of a letter E.
H:27mm, Rim D:148mm.
SF:157, WHKRS 144, CC8

36.+ Saucer in a white fabric with white-glazed surfaces. It is decorated by the rim tip with a wide and narrow purple band with another narrow purple band towards the centre. On the underside of the base is a purple mark which is only partly preserved (Plate 161, Mm. 8).
H:21mm, Rim D:145mm.
SF:377, WHKRS 27b, CC1a5

37.*+ Saucer in a white fabric with white-glazed surfaces. It has on the centre of the base a green Mercury Mettlach mark (Plate 161 Mm. 5), a type used between


Mm. 1a


Mm. 1b

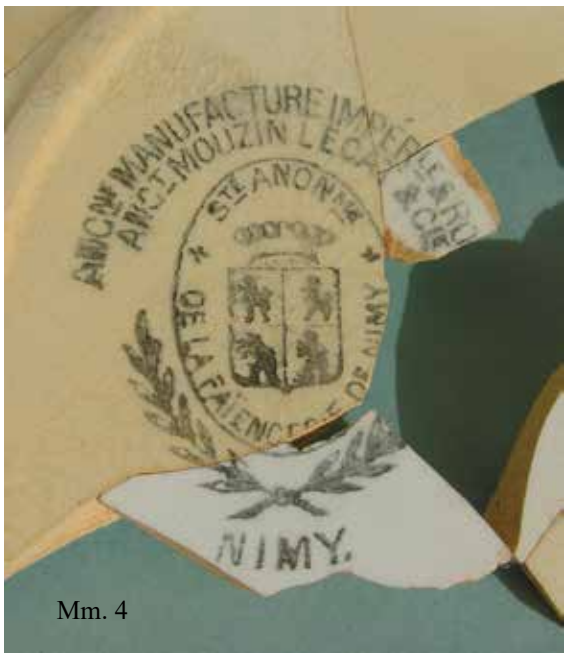

Mm. 1c


Mm. 2

Mm. 3a


Mm. 3b


Mm. 3c



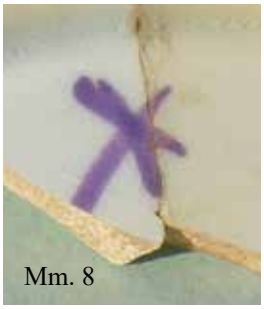
Mm. 4

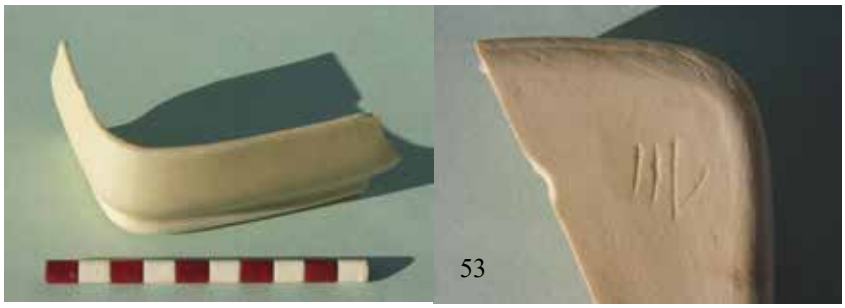
Mm. 5

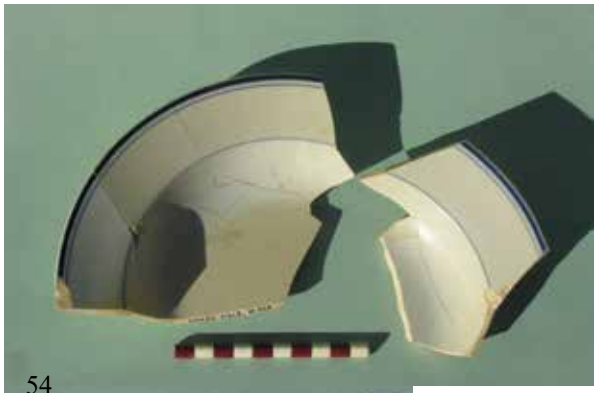
Plate 161. Printed makers' marks.

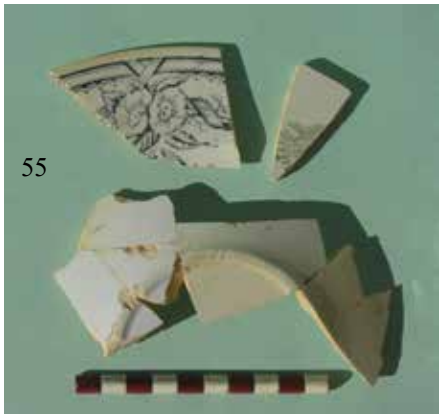
Mm. 6

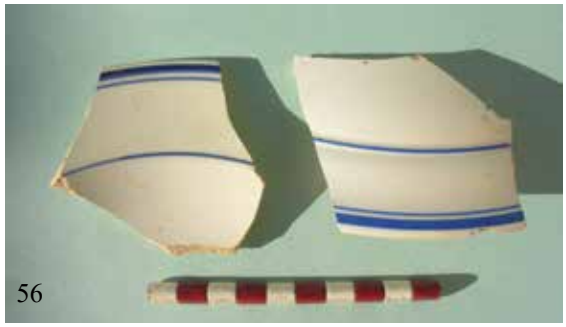
Mm. 7

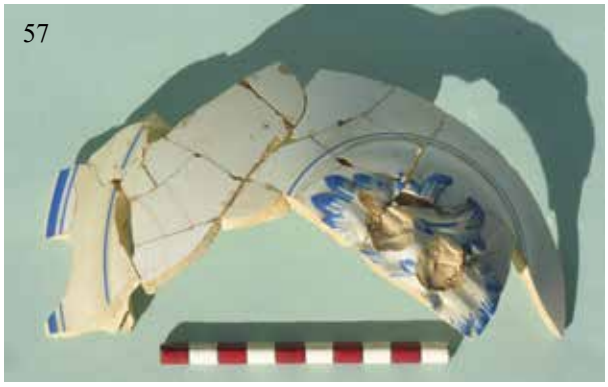

Mm. 8











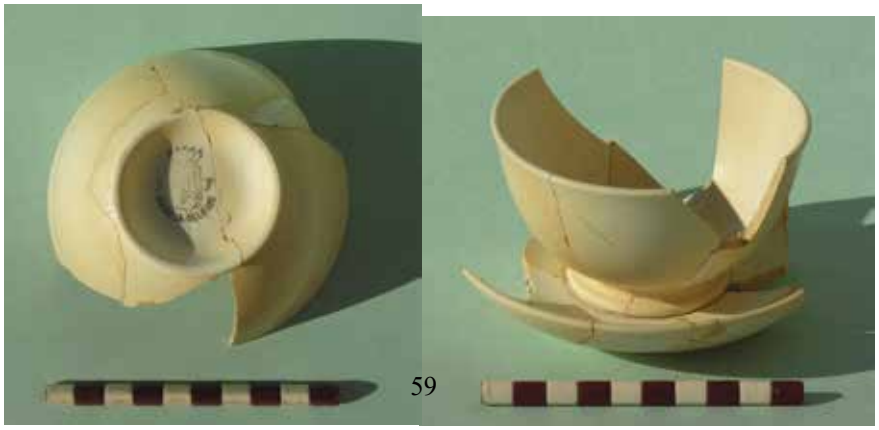
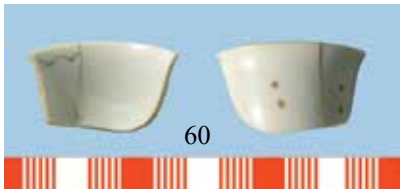


Plate 162. Ceramic plates, bowls, tourine, cups and saucer, catalogue nos 44, 52-60.



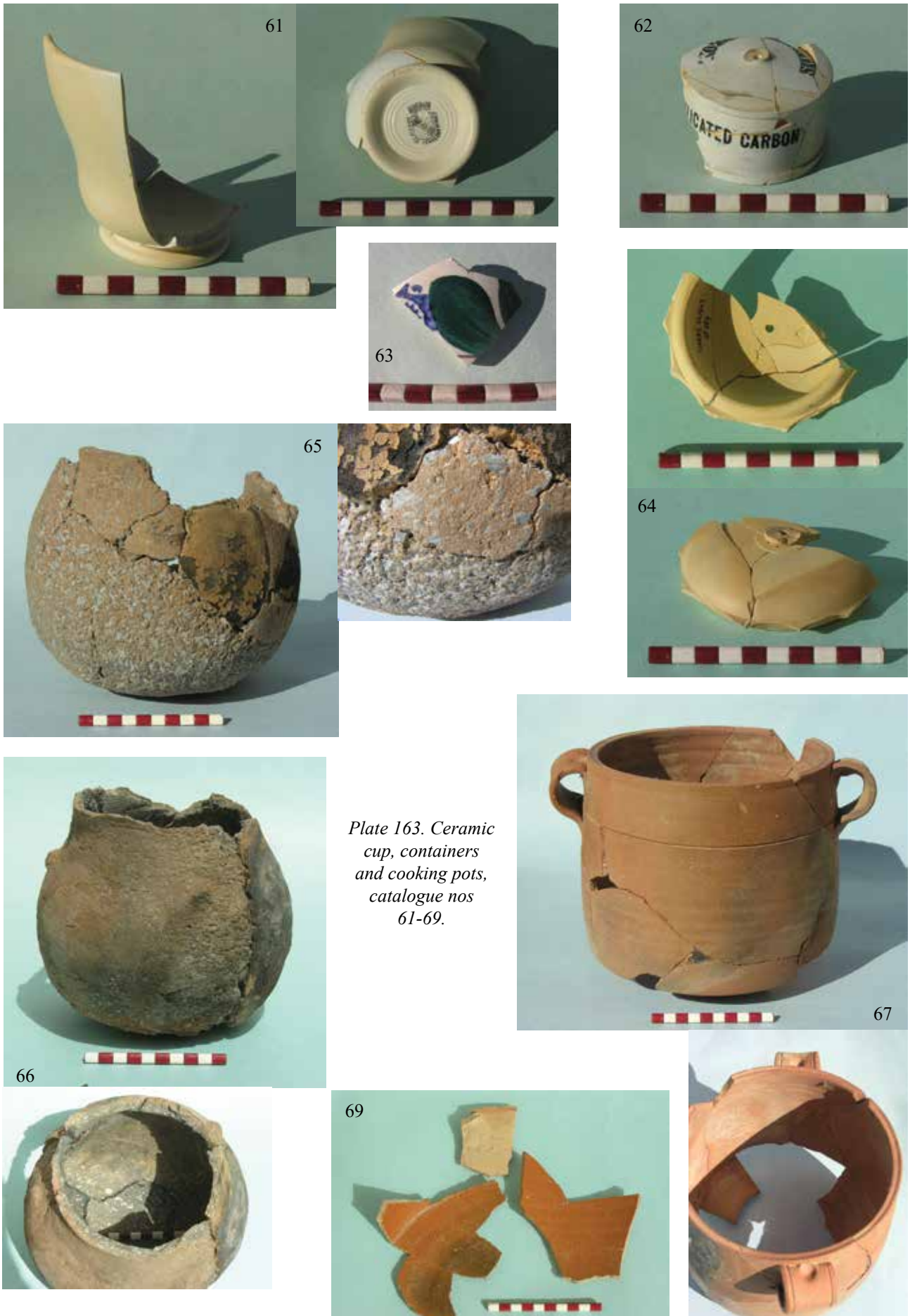


Plate 163. Ceramic cup, containers and cooking pots, catalogue nos 61-69.

1874 and 1909 with

VILLEROY & BOCH
METTLACH

H:28mm, Rim D:161mm.
SF:237, WHKRS 32a, CC1b A

38.*+ Saucer in a white fabric with white-glazed surfaces.
H:13mm, Rim D:90mm.
SF:170, WHKRS 141a, CC7a

39.*+ Bowl in a white fabric with white-glazed surfaces. The exterior is decorated in relief with two registers of vertical depressions.
H:68+mm, Rim D:140mm.
SF:190, WHKRS 153a, CC11a

40. Rim and upper part of the wall of a bowl in a white fabric with white-glazed surfaces. It is from an identical vessel to Cat. no. 39.
H:24+mm, Rim D:14mm.
SF:329, WHKRS 81b, CC02c

41.*+ A little under half of a deep bowl with a bead rim and a slightly raised base in a white fabric with white-glazed surfaces.
H:104mm, Rim D:22mm.
SF:193, WHKRS 27a, CC1a4 K

42.*+ Bowl with a high footring in a white fabric with white-glazed surfaces. Immediately below the rim on the exterior are a broad and narrow blue band and similar decoration is found close to the lip of the base along with two other thin bands a little further up towards the bowl. The underside of the base bears a fragmentary printed mark as Plate 161, Mm. 1a.
Base D:130mm. H:104mm, Rim D:20mm.
SF:236, WHKRS 32a, CC1b A

43.*+ Sherds from a bowl in a white fabric with white-glazed surfaces. It is decorated on the exterior with a floral design amongst which are two boots and a human arm holding a branch and the other holding a spear on which a fish is impaled. Within on the base part of a scene is preserved, of a Chinese lady with foliage and architectural elements. Off centre on the underside of the base with its high footring is a printed mark (Plate 161, Mm. 3a)

TIMOR
B.F.
KERAMIS

with a floral border above and to each side.

After the partition of Luxembourg and Belgium in 1839, Belgium members of the Boch family moved to La Louvière (Saint Vaast), establishing the Keramis factory in 1841, trading as Boch Frères.
Rim D:160mm.
SF:138/286, WHKRS 190a, CC14f

44.+ Rim of a bowl in a white fabric with a white-glazed exterior and over the rim. On the interior below a thin black band the maroon surface is decorated with a white design (cf. Cat. no. 58).
H:23+mm, Rim D:130mm.
SF:327, WHKRS 146, CC10

45.*+ Large bowl with a cavetto rim in a white fabric with white-glazed surfaces. It has arcaded relief decoration on the interior and a printed mark (Plate 161, Mm. 3b) off centre on the underside of the base with a heraldic shield with lion rampant under a crown and surrounded by the inscription

BOCh ….. LA LOUVIÉ[R]E

The bowl has split in half and has been repaired by drilling holes either side of the break through which thin wire has been threaded.
H:68mm, Rim D:260mm.
SF:129, WHKRS 153b, CC11b A

46.*+ Rim and upper wall of a plain-rimmed bowl in a red fabric with red-burnished surfaces.
H:40+mm, Rim D:250mm.
SF:217, WHKRS 15a/b, CC1z1/2

47.*+ Bowl in a red fabric with a red-burnished surface. The tip of the triangular rim is notched.
H:55+mm, Rim D:140mm.
SF:343, WHKRS 6, CC1

48.+ Two sherds in a red fabric with green-glazed surfaces. Possibly from a bowl. Wheel-made.
SF:344, WHKRS 6, CC1

49.*+ White-glazed bowl with a footring, fine cream fabric.
H:58mm, Rim D:112mm, Base D:53mm.
SF:42, Site WHKRS 6, CC1

50.*+ Off-white glazed bowl now discoloured to cream. Bulbous rim and shallow footring. Fine cream fabric. Interior decorated with a maroon line immediately below the rim, exterior with floral decoration in green, blue and maroon.
H:82mm, Rim D:164mm, Base D:62mm,
SF:45, Site WHKRS 144, CC8

51.*+ Bowl in a fine cream fabric with white-glazed surfaces. Decorated on the exterior in relief. Plain rim with high footring at the base. Bears a printed maker's mark on the base as Plate 161, Mm. 1a. Most of the heraldic shield is missing.
H:85mm, Rim D:150mm, Base D:79mm.
SF:53/191, Site WHKRS 90, CC4

52.*+ Very small dish in an extremely thin ware with a white fabric and white-glazed surfaces. It has a small foot ring. The interior is decorated with a narrow black rim stripe beneath which is a pale blue band delimited by a thin red line at the bottom and decorated with black and white dots and red crosses. A fragment of more decoration survives towards the centre of the dish.

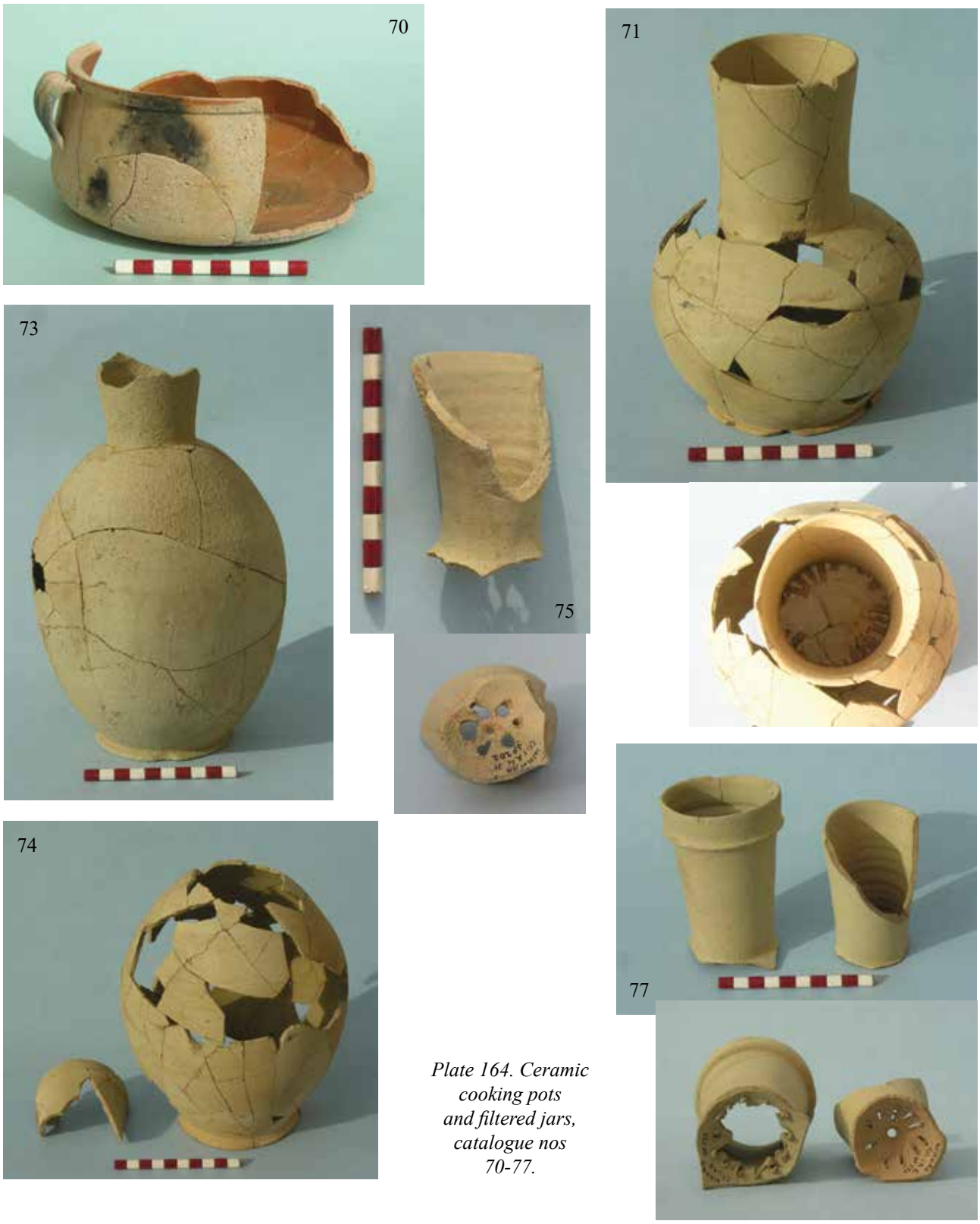


Plate 164. Ceramic cooking pots and filtered jars, catalogue nos 70-77.

H:13mm, Rim D:70mm.
SF:172, WHKRS 141a, CC7a

53.*[+] Rectangular dish with rounded corners in a white fabric with cream-glazed surfaces. Scored on the base is IIV.
L:100+mm, W:64+mm, H:42mm.
SF:182, WHKRS 151, CC11

54.[+] Dish in a white fabric with white-glazed surfaces. The rim towards the tip is decorated with a broad dark blue and a narrow band of the same colour. Another narrow band runs around the rim by the bowl. On the base it has a printed mark as Plate 161, Mm. 1a and to one side has an impressed stamp (Plate 160, St. 9), a number 3 followed by another number most of which is missing.
H:39mm, Rim D:230mm.
SF:225, WHKRS 27b, CC1a5

55.+ Dish in a white fabric with white-glazed surfaces. The wide flat rim is angled upwards and is decorated with a floral design in black with pairs of flowers and a branch wrapped around by a ribbon. The decoration extends into the dish. Part of the base and another sherd with a Mercury Mettlach mark as Plate 161, Mm. 5 may be from the same vessel.
Rim D:250mm.
SF:376, WHKRS 27b, CC1a5

56.*+ Fragments of a tourine and lid in a white fabric with white-glazed surfaces. The dish is shallow with a wide flat rim with a concentric broad and narrow blue band and another thin blue band where the rim meets the wall. The lid has a prominent seating flange and blue bands as the dish.
Lid H:31+mm, Dia:220mm; Dish H:35+mm, Dia:220mm.
SF:204, WHKRS 27a, CC1a4 K

57.*+ Tourine lid in a white fabric with white-glazed surfaces. The rim is decorated with a wide and a narrow blue band with another narrow band a little above. The top of the lid bears the scars of a circular-sectioned handle and is decorated with a blue and white floral design in relief.
H:65+mm, Rim D:220mm.
SF:198, WHKRS 27a, CC1a4 B

58.*+ Rim and part of the wall of a cup or small bowl in a white fabric with white-glazed surfaces. On the exterior delimited by a black band above and below is a wide maroon band with a white crescent and star. Part of the same tea service as Cat. no. 44.
H:34+mm, Rim D:110mm.
SF:349, WHKRS 190a, CC14f

59.+ A cup and saucer in a white fabric with a white glaze. The handle is missing. On the base of the cup is a printed mark (Plate 161, Mm. 3c) of a heraldic shield with a lion rampant flanked by the letters B and F and surmounted by a crown. Below the shield is MADE IN BELGIUM.
Cup - Rim D:103mm, H:59mm; saucer - Rim D:132mm, H:26mm.
SF:208, WHKRS 146, CC10

60.+ Coffee cup in a white fabric with white-glazed surfaces. On the exterior it is decorated with widely spaced pairs of orange dots. The interior has a black zigzag immediately below the rim.
H:26+mm, Rim D:60mm.
SF:163, WHKRS CC01a

61.*+ Beaker in a white fabric with a white glaze. The base has a prominent flaring footring with three concentric ridges on the underside within which is a printed maker's mark as Plate 161, Mm. 1a. One sherd bears a fragment of a rounded handle.
H:94mm, Rim D:105mm.
SF:256, WHKRS 169a, CC14b1

62.+ Sherd in a white fabric with white-glazed surfaces. On the exterior it is decorated with large oval green leaves and blue flowers.
L:54+mm, W:43+mm.
SF:302, WHKRS 167, CC14a1

63.+ Lid of a cylindrical container with a slightly domed top and a central knob which is missing. On one side half way down it bears the inscription

[SIL]ICATED CARBON

and an identical inscription on the other side in a smaller font on the upper part of the side. The same inscription runs around half of the top.
H:42+mm, Rim D:65mm.
SF:130, WHKRS 93a, CC4b

64.+ Lid in a cream fabric with cream-glazed surfaces. The lower part of the central knob remains within a slightly raised ring. A small hole pierces the lower part of the knob but may have been closed off at the top. There is a prominent lid seating but the rim is missing. A number 2 is impressed on the underside of the lid. As it is immediately adjacent to the sherd edge it may have been part of a longer number. An F in a slightly smaller font is also impressed but it is not associated with the 2 and is orientated at 180 degrees to it.
Outer diameter of lid seating 96mm, H:26+mm.
SF:254, WHKRS 167a, CC14a2

Cooking pots and water containers

65.+ Handmade cooking pot with a very thick schist-tempered brown fabric; the lavender-coloured inclusions are of considerable size. It has a plain squared-off rim and four small lug handles. Only a small fragment of the rim remains.
H:192mm, Max D:209mm.
SF:310, WHKRS CC11c

66.*+ Cooking pot in a very coarse fabric with abundant large lavender-coloured schist inclusions. It has three small bosses equally spaced around the shoulder and a rounded base. The rim is missing.

Vessels in this very distinctive fabric with its large schist inclusions have been found at several sites in the Middle Nile Valley. The fabric was used at least from the late 19th well into the 20th century (pers. comm. Isabella Welsby Sjöström). For examples from Kulubnarti see Adams and Adams 1998, 25, (Ware H15).
H:174+mm, Max D:168mm.
SF:60, Site WHKRS 159, CC14

67.*+ Cooking pot in a reddish-brown fabric with a reddish-brown glaze on the interior. It has two opposed strap handles each with a circular depression in the top and a sagging base. High on the side of the vessel is an 8 stamped before firing.
H:190+mm, Rim D:220mm.
SF:308, WHKRS 153a, CC11a

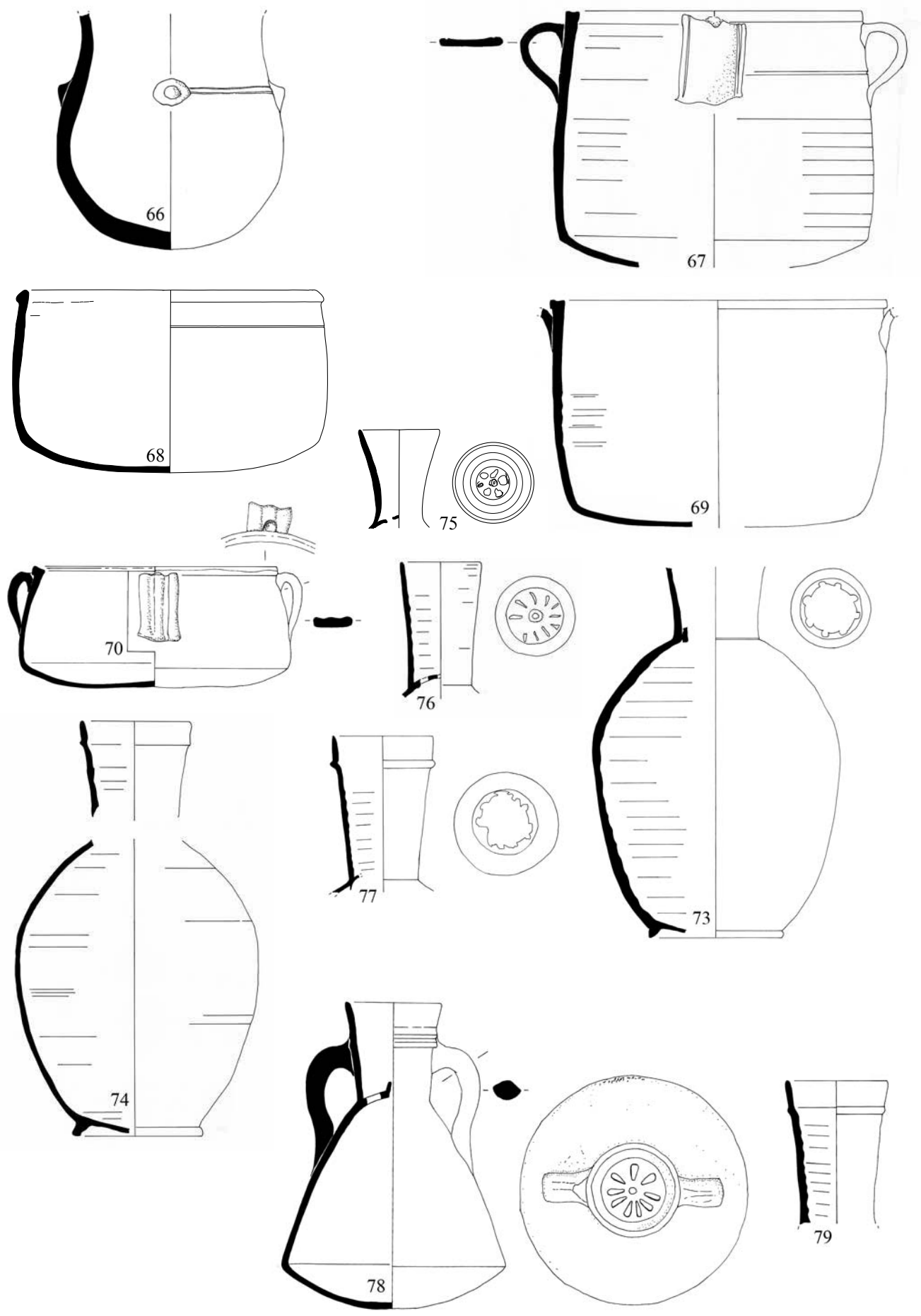
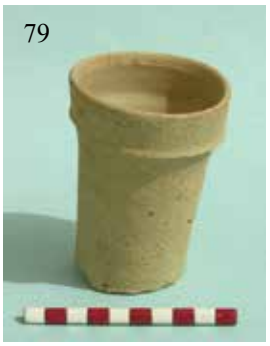


Figure 42. Cooking pots and qulla*, catalogue nos 66-79 (scale 1:4).*



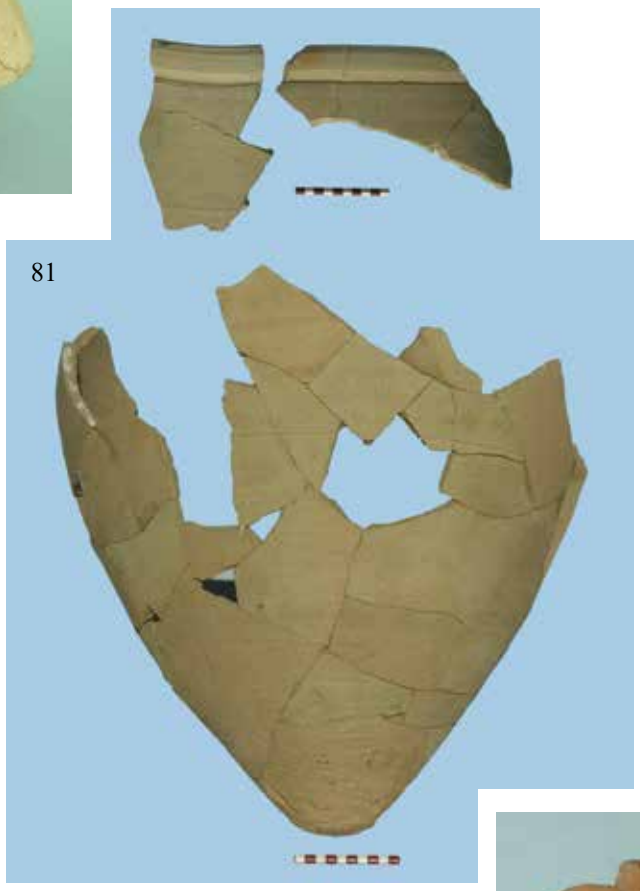
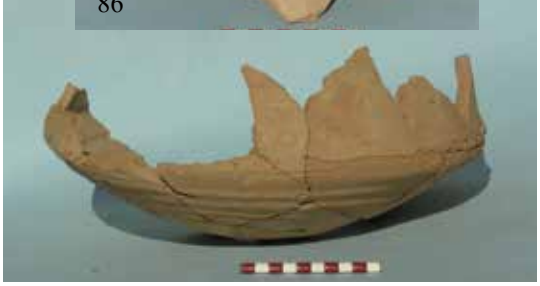


Plate 165. Ceramic filtered jars, zir *and two-handled jars, catalogue nos 78-86.*



68.* Cooking pot with a triangular rim and a sagging base in a reddish-brown fabric with a reddish-brown glazed interior.
H:104+mm, Rim D:230mm.
SF:142, WHKRS 81b, CC2c

69.*+ Cooking pot with vertical sides, a slightly sagging base and a lid-seated rim. Handle attachment immediately beneath the slightly projecting squared rim. Brown glazed internally. Fabric cream towards exterior, pink towards interior. Incomplete.
H:250+mm, Rim D:250mm.
SF:13, Site WHKRS 230, Kajbar

70.*+ Cooking pot, same style as Cat. no. 69 but shallower. Vertical strap handle immediately below the rim. Fabric cream towards the exterior, pinkish towards the interior with unidentified sub-angular white inclusions 0.5mm pink (grog), red inclusions *c.* 1-0.5mm, sub-rounded sorting average, also grey sub-angular inclusions 0.5mm average size, probably quartz. Hard and well fired. Brown-glazed interior and on outer edge of rim but not on rim top. Lid seating on rim.
H:90mm, Rim D:180mm, Max D:202mm.
SF:65, Site WHKRS 199, quarry

71.+ *Qulla* with a bulbous body, tall neck and broken filter.
H:215mm, Rim D:75mm, Max D:147mm.
SF:158, WHKRS 121a, CC5c

72. *Qulla* with an ovoid body, tall slightly flaring neck and a small footring at the base. It is in a pale green fabric and is wheel-made. The shoulder and lower part of the neck with the filter is missing.
H:207+mm, Rim D:72mm, Max. D:*c*. 152mm.
SF:383, WHKRS 27b, CC1a5

73.*+ *Qulla* complete apart from the rim and the broken filter. Pale greenish fabric.
H:276+mm, Max D:182mm.
SF:188, WHKRS 146, CC10

74.*+ *Qulla* with an ovoid body and a tall neck. The junction of the neck and shoulder along with the filter are missing.
H:292+mm, Rim D:83mm, Max D:179mm.
SF:187, WHKRS 27a, CC1a4 C

75.*+ *Qulla* rim, neck and filter in a pale greenish fabric.
H:99+mm, Rim D:60mm.
SF:202, WHKRS 27a, CC1a4 H

76.* *Qulla* neck, filter and rim in a pale greenish fabric.
H:98+mm, Rim D:60mm.
SF:234, WHKRS 32a, CC1b

77.*+ *Qulla* neck and rim in a pale greenish fabric. The centre of the filter is missing. It was found by the cooking hearths.
H:117+mm, Rim D:75mm.
SF:233, WHKRS 32a, CC1b

78.*+ Water jug in a creamy-yellow fabric. Tall slightly flaring neck with a plain rim and a filter at the base. A little below the rim is a horizontal incised groove. Two handles from half way down the neck to the body. Body flaring out to a marked carination into the gently rounded base.
H:227mm, Rim D:72.5mm, Max D:165mm.
SF:14, Site WHKRS 35, CC2

79.*+ Neck and rim of a *qulla*, fabric as Cat. no. 78. No handles or filter at base of neck.
H:108+mm, Rim D:76mm.
SF:62, Site WHKRS 159, CC14

80.+ Rim and upper part of the neck of a large jar/*zir* in a pale greenish fabric. The outer surface is decorated with groups of parallel deeply scored grooves forming inverted 'V' shapes. Very similar to Cat. no. 83.
H:108+mm, Rim D:240mm.
SF:270, WHKRS 118a, CC5b

81.*+ Large wheel-made *zir* in a pale greenish fabric.
H:765mm, Max D:525mm, Rim D:280mm.
SF:125, WHKRS 27a, CC1a4 A

82. Rim and upper part of the neck of a large jar/*zir* in a pale greenish fabric. The outer surface is decorated with groups of parallel, deeply scored, grooves.
H:87+mm, Rim D:260mm.
SF:154, WHKRS 6, CC1

83.*+ Rim and upper part of the neck from a *zir* in a cream fabric with cream surfaces. The exterior is decorated with groups of parallel incised lines forming an inverted V.
H:91+mm, Rim D:27mm.
SF:342, WHKRS 6, CC1

84.*+ Rim, neck and one handle of a jar in a pink fabric with a cream-slipped surface.
H:106+mm, Rim D:100mm.
SF:199, WHKRS 27a, CC1a4 I

85.*+ A large jar with a shallow rounded base and a sharp carination into the straight walls which are markedly angled in towards the base of the neck. There are two opposed strap handles. It is made from a pink fabric with cream-slipped surfaces decorated with three horizontal bands of decoration on the wall of repeating incised 'double' crescents and with two adjacent bands of 'rope' decoration at the carination.
H:391mm, Rim D:98mm, Max D:329mm.
SF:124, WHKRS 32a, CC1b C

86.*+ A large jar with a shallow rounded base and a sharp carination into the straight walls which are markedly angled in towards the base of the neck. There are two opposed oval-sectioned handles. It is made from a pink fabric with a red surface.
SF:123, WHKRS 32a, CC1b D

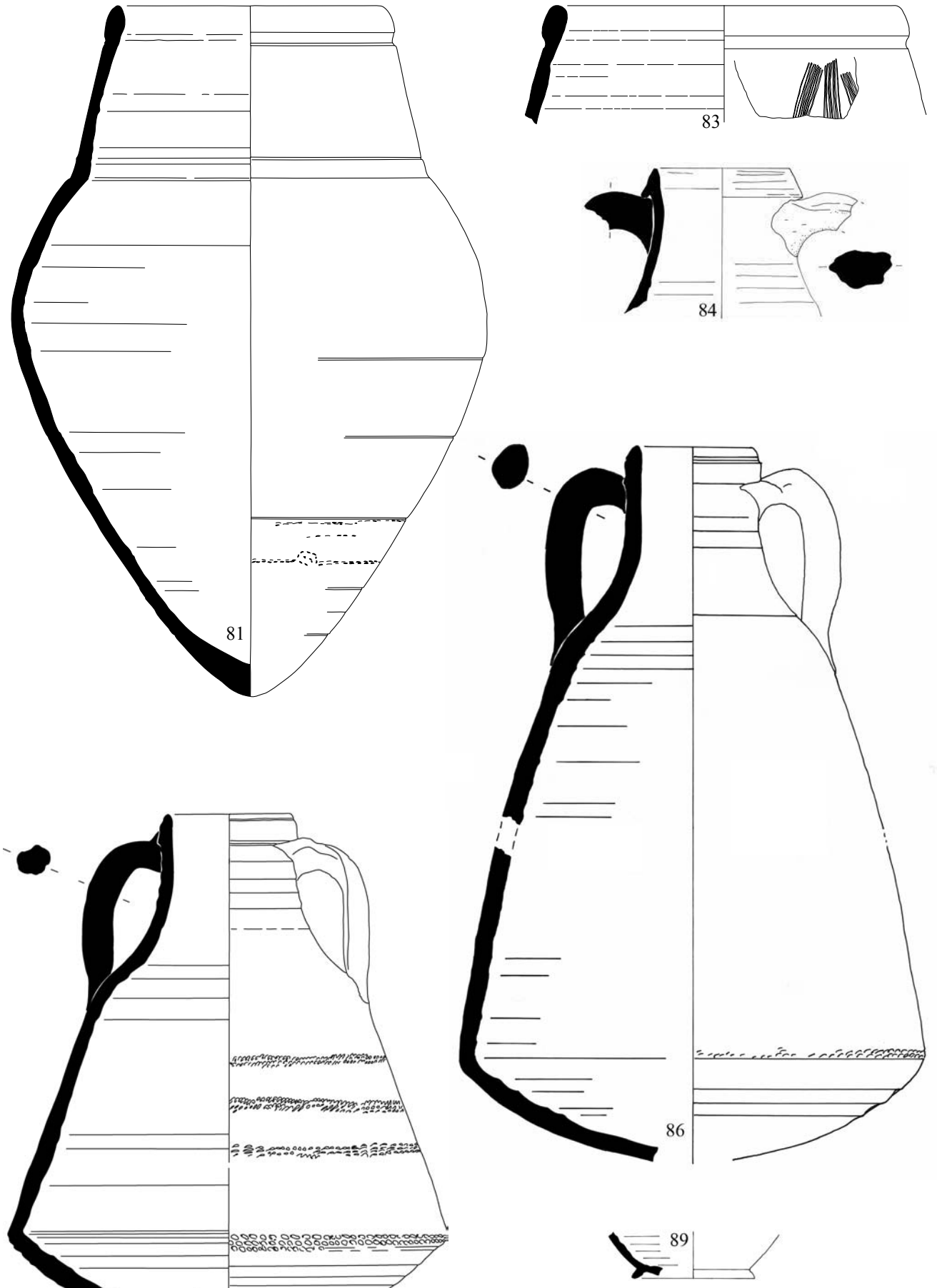


Figure 43. Zir, *Catalogue no. 81 (scale 1:6),* zir *and water jars, Catalogue nos 83-89 (scale 1:4).*

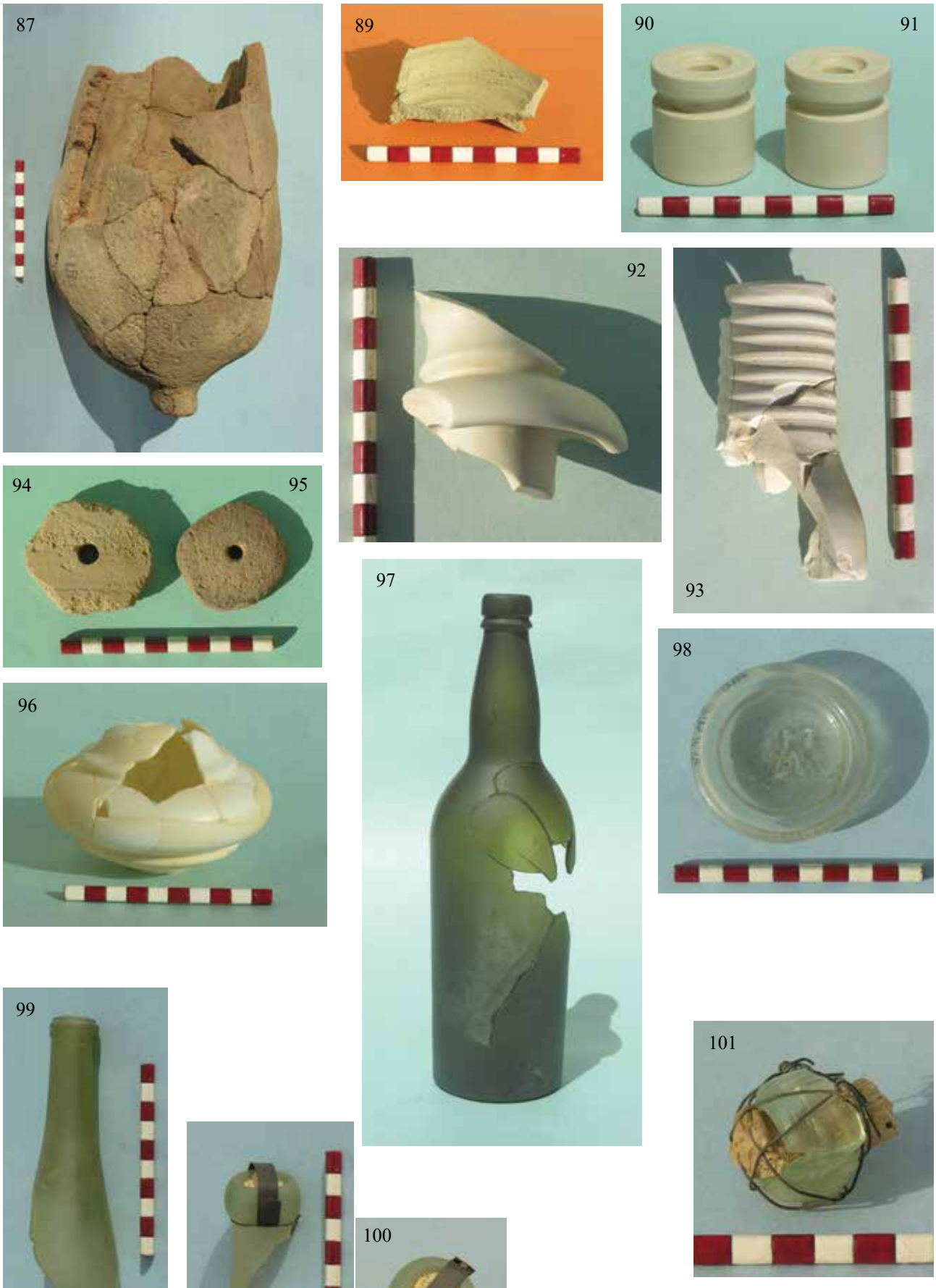


Plate 166. Ceramic qadus *and miscellaneous objects, glass shade and bottles, catalogue nos 87-101.*

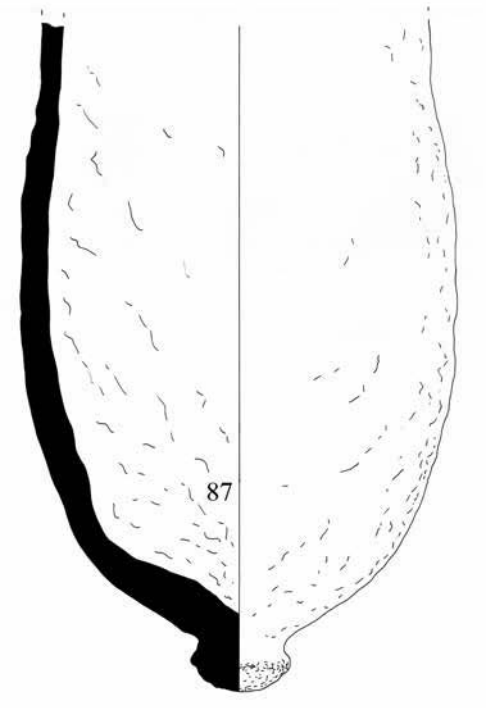


Figure 44. Qadus, *Catalogue no. 87 (scale 1:4).*

87.*+ *Qadus* in a very coarse handmade thick red fabric with a small poorly formed knob in the centre of the base. The rim is missing.
H:341+mm, Max D:209mm.
SF:122, WHKRS 32a, CC1b E

88. Badly eroded rounded rim of a vessel in a red fabric. Possibly wheel-made.
H:52+mm, Rim D:220mm.
SF:287, WHKRS 190a, CC14f

89.*+ Base with a prominent footring of a jar in a yellowish marl fabric with common inclusions – sub-rounded grey quartz sand, unidentified red/brown sub-rounded 1-0.5mm inclusions and sparse rounded black inclusions 0.2mm plus some air holes, wheel-made.
H:35+mm, Base D:90mm.
SF:85, Site WHKRS 268, Dal camp

Ceramic objects

90.+ Porcelain insulator from the telegraph line. Pierced by a central hole set in a dished recess at the top. Groove 4.25mm deep part way down for the wire.
W:7mm groove, H:48mm, Rim D:44mm, Hole D:13mm.
SF:87.1, Site WHKRS 192, CC15

91.+ Identical to Cat. no. 90.
SF:87.2, Site WHKRS 192, CC15

92.+ Insulator in a white fabric with white-glazed surfaces. It is broken off at top and bottom. As preserved it is cylindrical with a wide dished flange.
H:79+mm, Max D:90mm.
SF:298, WHKRS 190a, CC14f

93.+ Insulator in a white fabric with white-glazed surfaces above the rilled section. It is cylindrical closed off at one end to form a flat 'base' and with a bowl-shaped section at the other. The exterior of the cylinder has parallel grooves running around it.
Cylinder D:41mm. H:103mm, Rim D:65mm.
SF:334, WHKRS 27a, CC1a4

94.+ Sub-rectangular spindle whorl in an orange fabric with a grey core. The hole is drilled from both sides.
L:51mm, W:49mm, Th:9mm, Hole D:7mm.
SF:148, WHKRS 110a, CC5a

95.+ Spindle whorl fashioned from a thick pottery sherd in a cream fabric. Roughly oval in shape with a circular hole.
L:61mm, W:55mm, Hole D:10mm.
SF:195, WHKRS 27a, CC1a4 E

Glass

96.*+ Lamp shade in opaque white glass, largely complete but top missing.
H:78+mm, Th:2mm, Max. D:120mm, Base ext. D:34mm, Base int. D:27mm.
SF:3, Site WHKRS 257, CC25

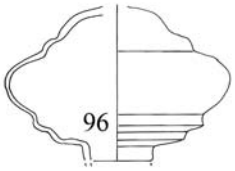


Figure 45. Glass shade, Catalogue no. 96 (scale 1:4).

Bottles and jars

97.+ Bottle in dark green glass with a flanged rim and an omphalos base. Long neck slightly bulbous. Profile complete. Many sherds much abraded.
H:286mm, H:17mm omphalos base, Rim D:28mm, Max D:78mm.
SF:6, Site WHKRS 193, CC16

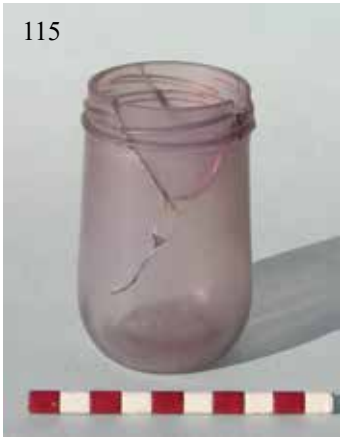
98.+ Slightly raised base of a very pale green cylindrical bottle, with a letter M within a roundel.
H:17+mm, Max D:75mm.
SF:296, WHKRS 190a, CC14f

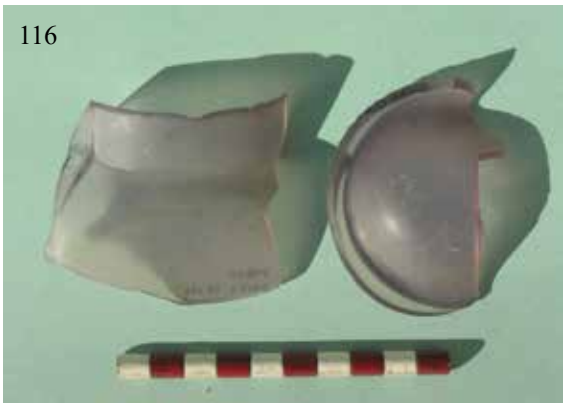
99.+ Neck and part of the wall of a pale green bottle.
H:175+mm, Rim D:25mm.
SF:211, WHKRS 146, CC10

100.+ Pale green bottle rim and upper part of neck retaining its cork held in place by a strip of metal fixed by a twisted wire immediately below the rim. The metal strips were a common find in a number of the camps.
Metal strip W:9mm, H:73+mm, Rim D:34mm.
SF:176, WHKRS 153b, CC11b

101.+ Pale green bulbous rim from a bottle retaining the cork held in place by a wire cage.

Plate 167. Glass bottles, catalogue nos 102-113.





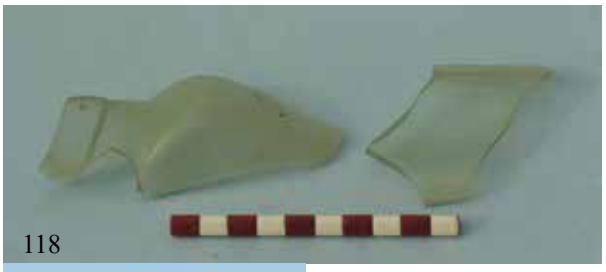


Plate 168. Glass bottles and jars, catalogue nos 114-121.

Cork L:42mm, Rim D:34mm.
SF:224, WHKRS 27a, CC1a4 J

102.+ Base and part of the wall of a dark green bottle. The prominent ompholos base bears in raised letters the inscription

6 TO THE GALLON

H:139+mm, Max D:75mm.
SF:149, WHKRS 110a, CC5a

103.+ Base of a dark green bottle very similar to Cat. no. 102 but with a shallower ompholos and a thicker base. It bears the same inscription.
H:62+mm, Max D:75mm.
SF:189, WHKRS 153a, CC11a

104.+ Pale green cylindrical bottle rim, neck and shoulder.
H:118+mm, Rim D:44mm, Max D:*c*. 86mm.
SF:350, WHKRS 190a, CC14f

105.+ Dark green bottle with a high ompholos base with a central nipple. This is presumably a champagne bottle.
H:307mm, Rim D:29mm, Max D:88mm.
SF:301, WHKRS 167, CC14a1

106.+ Small wall sherd from a pale green bottle with the raised letters ..]ART[…
H:32+mm.
SF:367, WHKRS 27b, CC1a5

107.+ Pale green bottle with a shallow ompholos base on with is a number 1. The cork and paper-like material has been pushed inside the bottle.
H:284mm, Rim D:29mm, Max D:72mm.
SF:280, WHKRS 27a, CC1a4

108.+ Torpedo-shaped green glass bottle with the wire to secure the foil cap in place.
H:238mm, Rim D:26mm, Max D:73mm.
SF:250, WHKRS 167a, CC14a2

109. Base of a green glass bottle, the rounded point curving into the sides of the bottle.
H:98+mm, D:71mm.
SF:15, Site WHKRS 35, CC2

110.+ Pale green glass bottle with thick bulbous rim. The body rounds into the pointed base. Largely complete.
H:240mm, Rim D:33mm, Max. D:72mm.
SF:63, Site WHKRS 159, CC14

111.+ Wall sherd from a small clear bottle with remains of a paper label. It is too badly preserved to see what was on the label.
H:60+mm.
SF:370, WHKRS 27b, CC1a5

112.+ Part of the base and wall of a cylindrical green bottle embossed in a vertical register

LEA & PE[RRINS]

On the shallow ompholos base is an embossed K.
H:56+mm, Max D:51mm.
SF:314, WHKRS 145, CC9 B

113.+ Small pale green bottle flaring out a little from its circular base towards the marked shoulder. The neck and rim are missing. It has a high ompholos base. It bears remains of a green paper label with a white oval roundel in the centre divided in two by a horizontal line. In the upper part is

[….] vi[..]
[……]
[…]bree[.].

In the lower part is

[PE]RFUMÉRIÉ
[..] PROGRÉS

H:91+mm, Base D:41mm, Max D:46mm.
SF:330, WHKRS 193a, CC16a

114.+ Purple cylindrical jar with an ompholos base. On the side immediately above the base are the embossed letters PATENT and there is a 1 in the centre on the underside of the base.
H:127mm, Rim D:58mm, Max D:76mm.
SF:266, WHKRS CC13a3

115.+ Screw-top pale purple jar with a slightly raised base. On the underside of the base are the large but shallow embossed letters CI and in a much smaller font and at 90 degrees 0·
H:98mm, Rim D:53mm, Max D:62mm.
SF:218, WHKRS 15a/b, CC1z1/2

116.+ Two sherds perhaps from the same purple jar. One has a plain upright rim, ground smooth on the top, with a pronounced shoulder where it meets the square-sectioned body. A rib runs down the vessel on the exterior from the rim along the point of junction of the flat sides. The shallow ompholos base (D: *c*. 75mm) is circular and bears on the underside the embossed letters LL 5[…
H:60+mm, Rim D:80mm.
SF:297, WHKRS 190a, CC14f

117.+ Octagonal bottle in a pale green glass. Rim and most of neck missing. Neck circular and approximately 26mm in diameter. Slightly raised base. In the centre of the base are four numbers in relief, perhaps 1916.
L:60mm 38mm long sides 21mm short sides 14mm 'chamfer', W:40mm, H:126+mm, H:4mm ompholos base.
SF:7, Site WHKRS 193, CC16

118.+ Rim, short neck and part of the octagonal body of a pale green bottle. One wall sherd preserves the following inscription in raised letters

ENO [..
...]RVES[..
[FR]UIT S[ALT]

The manufacture of Fruit Salt, a remedy for upset

Plate 169. Glass bottles and jars, a stopper, drinking vessels and a button, catalogue nos 123-140.

stomach, began about 1880 at Eno's Fruit Salt Works, Hatcham, London, S.E. It was made from sound ripe fruit made into a health-giving, invigorating beverage. Rim D:40mm.
SF:228, WHKRS 27b, CC1a5

119.+ Pale green bottle with the lower part octagonal, the wider sides and the 'chamfered' corners being markedly concave in plan. Above the shoulder it is cylindrical but with eight facets while above a cordon it is circular up to the slightly thickened rim.
L:46mm, W:42mm, H:233+mm, Rim D:4.25mm.
SF:351, WHKRS 190a, CC14f

120. Two sherds from a small polygonal clear bottle with an inscription in embossed letter running vertically from near the base E[…. …]ND. Before the N is either a D or O.
H:80+mm.
SF:169, WHKRS 123a, CC5d

121.+ A large number of sherds from a minimum of five green glass and one clear glass jars. All are square with rounded corners in plan, their height is uncertain. They have a short vertical plain rim which has been ground flat on the top. The two partially reconstructable bases measure 111 x 110mm and 93+ x 88+mm and have a recessed circle in the centre. One bears an embossed number 891[., the other ..]S & Cº Lº . A fragment of another has part of LONDON on it. Many sherds from the flat sides of the bottles bear embossed inscriptions. None are complete but by assessing them all together the following three arrangements of letters on a side can be reconstructed:

a.

LEO[.....
BAR[...
PATENT
L & Cº (in oval roundel)
LONDON

b.

FOLANCHÉ
...]R.BIER

c.

R[.....
LON[DON]

Whether these came from three sides of a single bottle or each came from different bottles is unclear.
H:123+mm, Rim D:95mm.
SF:207, WHKRS 81a, CC2b

122. Wall sherd from a purple glass vessel.
L:63+mm, W:37+mm, Th:2.25-3mm.
SF:22, Site WHKRS 136, CC6

123.+ Pale green glass bottle, upper part of neck and rim missing. Relief decoration of branches with leaves and circular fruit. L. ROSE & Co in relief forming an arc.
H:250+mm, D:74mm.
SF:46, Site WHKRS 144, CC8

124.+ Pale green glass bottle neck and shoulder. Rim with a wide cordon below.
H:155+mm, Rim D:27.5mm, cordon D:31.5mm.
SF:47, Site WHKRS 144, CC8

125.+ Pale green glass bottle with thick bulbous rim. Base rounded into the sides.
H:228mm, Rim D:34mm, Max. D:61mm.
SF:58, Site WHKRS 144, CC8

126. Base of a clear glass bottle, slightly omphalos. Number 8 in relief. (not collected)
SF:93, Site WHKRS 6, CC1

127. Rounded conical base of a glass bottle, very pale green glass. Raised ring on base with letter K within. Other sherds from green glass bottles noted by the base. (not collected)
SF:94, Site WHKRS 6, CC1

128.+ Rim, neck and shoulder of a clear glass bottle. Tall slightly bulbous neck with rounded shoulder and two steps below the plain rim. (not collected)
SF:95, Site WHKRS 6, CC1

129. Rounded conical base of a glass bottle, green glass. As Cat. no. 127 but no ring or letter. (not collected)
SF:105, Site WHKRS 35, CC2

130. Bottle neck, rim and shoulder. Identical to Cat. no. 128. (not collected)
SF:108, Site WHKRS 136, CC6

131.+ Rolled rim from a purple glass bulbous? glass jar. (not collected)
SF:96, Site WHKRS 6, CC1

132.+ Base a lower part of the body of a clear glass bottle bearing in relief

ZAMZAM
REGISTERED TRADE MARK

It is waisted immediately above the base which bears vertical convex flutes. Above the inscription part of a raised oval ring is visible. Named after the well of that name located within the Masjid el-Haram in Mecca, 20m east of the Kaaba. (not collected)
SF:101, Site WHKRS 16

133.+ Base of a glass bottle with a thickened footring around the edge and N & Cº opposite 1837 in raised relief. Also raised dot in centre of base. This is a product of the English firm, Nuttall and Company of St. Helens, Lancashire, a manufacturer of many types of bottles. This mark predates 1913, when Nuttall merged with other plants to form United Glass. (not collected)
SF:109, Site WHKRS 136, CC6

134. Several bottles as Cat. no. 128 and 133. (not collected)
SF:111, Site WHKRS 192, CC15

135.+ Purple glass bottle of triangular form with a circular neck and rim. There is a pronounced cordon at the base of the neck. On each of the three sides there is a recessed panel. One of these is plain, the other two bear in raised relief

COLLE
LIQUIDE
SENEGALINE

and

ADRIEN
MAURIN
PARIS

The triangular base has a circular ompholos with the number 350 in raised relief in the centre
H:96,5mm, Rim D:26mm, Max. W:71mm.
SF:121, Site WHKRS 234, CC19

136. Triangular purple bottle identical to Cat. no. 135. Embossed in the centre of the shallow ompholos base is the number 350.
SF:325, WHKRS ?

The bottle Cat. no. 125 is known as a round-bottomed soda, Cat. nos 109, 110 and 126 are torpedo bottles again used for soda water. Both types date approximately between 1870 and 1910, but the more pointed torpedo types are restricted to the 19th century (see http://www.sha.org/bottle/soda.htm#Round%20Bottom/Torpedo%20Styles). The shape of the torpedo bottle is designed to ensure that the cork is kept damp to maintain a good seal.

137.+ Stopper broken off at the top.
H:36.5+mm.
SF:144, WHKRS 139, CC7 Deposit IV

Drinking vessels

138.+ The upper part of the stem and bottom of the bowl of a purple wine glass with thick walls.
H:69?mm.
SF:232, WHKRS 27b, CC1a5

139.+ A tumbler in purple glass shading in some areas to clear glass. On the underside of the base it has a radial etched design. The rim, base and many of the wall sherds are not conjoining.
Base D:63mm, Rim D:88mm.
SF:366, WHKRS 27b, CC1a5

Buttons

140.+ Biconical white button with four holes in the centre for attachment. White thread survives in the holes.
Th:4.25mm, D:11mm.
SF:41, Site WHKRS 6, CC1

141. White button pierced by four holes in the dished centre.
Th:4mm, Max D:11mm, Hole D:0.75mm.
SF:378, WHKRS 93a, CC4b Deposit II

142. White button pierced by four holes in its dished centre. Similar to Cat. no. 141.
Th:3mm, Max D:11mm.
SF:379, WHKRS 139, CC7 Deposit IV

143. White button pierced by four holes.
Th:3.5mm, Max D:11.5mm, Hole D:0.75mm.
SF:279, WHKRS 27a, CC1a4 F

144. White button with four holes. Identical to Cat. no. 143.
Th:3.5mm, Max D:10.5mm.
SF:179, WHKRS 167b, CC14a3

All these buttons are very smooth and are probably made from glass.

Metalwork

Weaponry

145.+ Brass cartridge case stamped on the base with B and P.
L:58.5mm, D:19mm flange, 16.5mm case.
SF:2, Site WHKRS 151, CC11

146. Brass cartridge case with no marks on the base.
L:58mm, D:19mm flange, 16.5mm case.
SF:17, Site WHKRS 35, CC2

147.+ Brass cartridge case marked on the base above the anvil with G·K and below B. No mark of firing pin on the anvil.
L:59mm, D:19mm flange 16.5mm case.
SF:61.1, Site WHKRS 159, CC14

148.+ Brass cartridge case. No marks of firing pin on the anvil. Marked on base G·K and B.
L:59.5mm, D:19mm flange, 16.5mm case.
SF:86, Site WHKRS 192, CC15

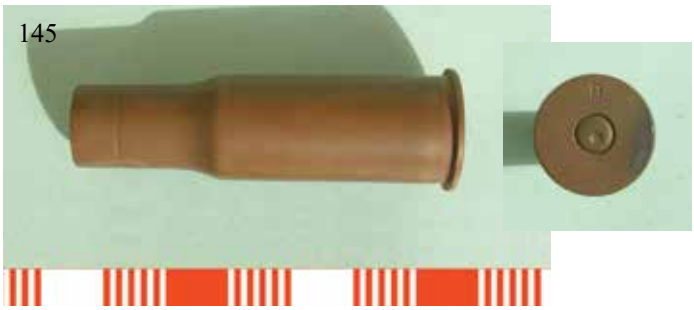
149.+ Brass cartridge case stamped on the flange G·K and B.
L:59mm, Max D:19mm.
SF:180, WHKRS 151, CC11

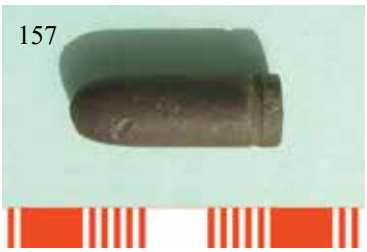
150.+ Brass cartridge case stamped on the base
G·K and B.
L:58.5mm, D:19mm flange, 16.5mm case.
SF:257, WHKRS 110a, CC5a

151.+ Brass cartridge case. No mark of firing pin on the anvil.
L:59mm, D:19mm flange 16.5mm case.
SF:61.2, Site WHKRS 159, CC14

152.+ Brass cartridge case. Unmarked on the base.
L:59mm, D:19mm flange, 16.5mm case.
SF:273, WHKRS 172a, CC14c

153.+ Brass cartridge case stamped on the base with a B and II. The round has not been fired but the bullet has been removed.
L:59mm, D:19mm flange, 16.5mm case.
SF:252, WHKRS 167a, CC14a2





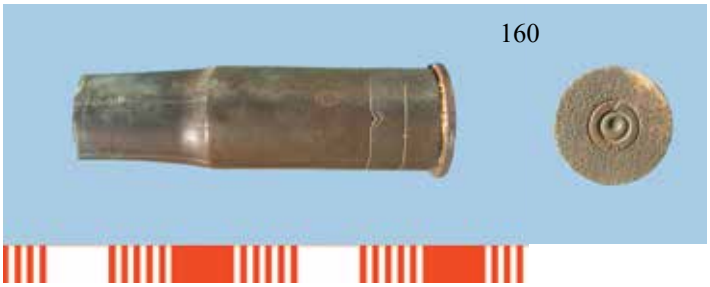


Plate 170. Cartridge cases and bullets, catalogue nos 145-160.

154. Brass cartridge case with lead bullet *in situ*. Not stamped on the base.
Bullet D:11mm. L:68mm, D:16.5mm flange.
SF:258, WHKRS 110a, CC5a

155.+ Brass cartridge case with lead bullet *in situ*.
L:79mm, case L:69mm, D:19mm flange, 16.5mm case.
SF:48.1, Site WHKRS 145, CC9

156.+ Brass cartridge case and lead bullet as Cat. no. 155.
L:79mm 69mm case, D:19mm flange, 16.5mm case.
SF:48.2, Site WHKRS 145, CC9

157.+ Lead bullet with a groove near the base, base slightly hollowed out.
L:32.5mm, D:11mm.
SF:43, Site WHKRS 6, CC1

All the above cartridge cases were of .45" (11mm) calibre.

158.+ Fragment of a cartridge case. Iron flange wrapped around with multiple strips of thin brass. No mark of firing pin. Object much distorted.

This is a Short Chamber Boxer-Henry .45" caliber cartridge, a type invented by Colonel Edward Mounier Boxer, Chief Superintendent of the Woolwich Royal Arsenal. These cartridges were made from a thin sheet of brass rolled around a mandrel and soldered to an iron base. Boxer in his patent application made the following claim

> "My invention has for its object to construct the cases of cartridges for breechloading firearms and ordnance in such a manner that they shall rapidly expand by slightly uncoiling and stretching on firing so as to fill the chamber and will contract slightly after firing so as to admit of the empty case being easily removed."
>
> (Boxer's Patent No.137 1/15/1866)

They were easily damaged, and produced inferior muzzle velocities, both problems being solved by the introduction of the solid drawn brass type as Cat. no. 145. During the Gordon Relief Expedition this type of ammunition must have been used extensively. In 1896 on the plateau at Kosha, which had been occupied by the Anglo-Egyptian contingent during the battle of Ginnis in 1885, were little heaps of the Boxer cartridge-cases marking the spots where volleys had been fired (Atteridge 1897, 295).
L:21.5+mm, D:19mm flange 17mm case.
SF:84, Site WHKRS 268, Dal camp

159.+ Brass percussion cap and part of thin ferrous metal wall from a Boxer-Henry cartridge inscribed on the base

ELEY LONDON
No 2
GASTIGHT

The Eley company was founded by William and Charles Eley in London in the 1820s. Its premises were moved to the Grays Inn Road in 1864, and it developed the Boxer cartridge designed by Colonel Boxer which was adopted by the Government in 1866. In 1894 the company transferred production to enlarged premises at Angel Road which included a tramway to its wharf on the nearby River Lee. Twice the War Office removed the company from their Approved List of suppliers due to poor quality .303 British ammunition, much of it returned from abroad as unusable. (Source Wikipedia)
L:20+mm, Max D:22.5mm.
SF:168, WHKRS 123a, CC5d

160.+ Boxer-Henry cartridge case with a ferrous base to which is attached the thin sheet brass sections. No marks can be seen on the corroded base apart from on the outer ring of the brass anvil where there are two opposed ⩚.
L:59.5mm, Max D:19mm.
SF:192, WHKRS 90, CC4

161.+ Steel shrapnel shell with three pairs of projecting copper studs. The nose cone is affixed by two sets of four rivets. Small chamfer at base and by step for nose cone. Stamped towards base

VIII
R⩚L

On base

9 17
PR 7

and R⩚L. Copper studs, each pair slightly angled and staggered to induce spinning.
L:158mm, 147mm to inset for nose cone, 19mm studs, W:17.5mm studs, Th:9.5mm 3.5mm studs, D:75mm, nose cone D:66mm.
SF:66, Site WHKRS 162

162.+ Steel common shell with copper studs as Cat. no. 161. One piece casting with screw thread in top for the fuse. Cylindrical body has clear rill marks, not present on ogival section. Small chamfer at base. Marked on side below top stud

IV
R⩚L

On base

9 4
PR 12

and R⩚L. Stud marked 12/76 and above it U.C.
L:200mm 134mm cylindrical section, D:74.5mm 43.5mm at tip 28mm threaded hole.
SF:67, Site WHKRS 162

163.+ Phosphor bronze(?) fuse, cylindrical with lower part threaded to screw into top of a shell of type Cat. no. 162. Square depression in top 2.5mm deep, three holes in bottom. Wire ring protruding from side. Marked on top 10/84 R⩚L at right angles.


161


162


163


161 162


161

Plate 170a. Shell cases and fuses, catalogue nos 161-165.


164


165

L:13mm recess, H:32.5mm, H:12mm unthreaded part, D:34mm, D:4mm of holes.
SF:68, Site WHKRS 162

164.+ Phosphor bronze(?) fuse from shells of types Cat. nos 161/167/168. Cylinder threaded inside to its full length, tapering on outside from shallow domed head. Remains of solder around outside of cylinder immediately below flange of head. Screwed into the top a fuse with a square socket in the top. Outside of fuse stamped

z R⩚L

stamped in centre underneath

R

o

R⩚L

where the o is the centre point not a letter.
H:44.5mm, H:16mm plug, D:46.5mm head 36-28.5mm ext 26mm int 30mm plug 13.75mm hole.
SF:74, Site WHKRS 162

165.+ Fuse in phosphor bronze(?) from a 9 pounder muzzle loading shrapnel shell. Marked on the underside

Y

R⩚L

The lower part of the object has been shattered on the explosion of the shell.
H:35+mm, Max D:46.5mm.
SF:284, WHKRS 162

166. Phosphor bronze(?) fuse and ferrous metal nose cone from a 9 pounder muzzle loading shrapnel shell. There are eight holes close to the base some retaining the rivets for affixing the cone to the cylindrical shell case. On the underside of the fuse it is marked

R⩚L

On the outer ring of the fuse it is stamped with a dot.
H:56mm, Max D:77mm.
SF:358, WHKRS 162

167.+ Phosphor bronze(?) fuse and ferrous metal nose cone from a 9 pounder muzzle loading shrapnel shell very similar to Cat. no. 166. On the outer ring of the fuse it is stamped

-x-

and on the underside of the fuse it is marked

R⩚L

H:54,5mm, Max D:71.5mm.
SF:359, WHKRS 162

168.+ Nose cone from a 9 pounder muzzle loading shrapnel shell in ferrous metal with four rivet holes towards its base and four slots equally spaced between them in the lower edge of the cone. The central hole to receive the fuse is not threaded.
H:48mm, Max D:70mm, Hole D:34mm.
SF:300, WHKRS 167, CC14a1

169.+ Part of the mechanism in phosphor bronze(?) from a 9 pounder muzzle loading shell? A threaded shaft with a flange ending in a disc pierced by four holes.
L:32.6mm, Max D:27.5mm.
SF:363, WHKRS 162

170.+ Part of the mechanism in phosphor bronze(?) and ferrous metal from a 9 pounder muzzle loading shrapnel shell identical to Cat. no. 171. This is the push plate and flash tube, the latter to transmit the flame from the primer charge in the fuse down to the gunpowder in the base of the shell, the former then to expel the lead balls. On the flash tube is stamped

R⩚L

The sheet metal sleeve is much distorted and almost blown off the end of the tube.
L:105mm, Max D:53.5mm.
SF:365, WHKRS 162

171.+ Part of the mechanism in phosphor bronze(?) and ferrous metal from a 9 pounder muzzle loading shrapnel shell with a thick circular push plate (D:53.5mm, Th:9.5mm) screwed onto the end of the threaded flash tube (D ext.:17mm) into the other end of which is screwed a plug pierced by three small holes. The tube is wrapped around by a piece of sheet ferrous metal.
L:82mm, Max D:53.5mm.
SF:364, WHKRS 162

172.+ Thin ferrous metal washer? with a raised lip. On one side it is stamped

7 OR 9 PRML

referring to its use with a 7 or 9 pounder muzzle loading artillery piece.
Th:0.5mm, H:3mm, Max D:44.5mm, Hole D:16mm.
SF:347, WHKRS 162

173.+ Iron disc bent towards one edge. Inscribed on one side

IV
R⩚L
9PR
ML

Th:1.5mm, D:72mm.
SF:72, Site WHKRS 162

174. Ferrous metal lid stamped in centre from within

№33
R⩚L

within a circle.

Plate 171. Shell cases and components, ammunition tins, catalogue nos 167-176.

H:8mm of flange, Th:0.5mm, D:104mm.
SF:73, Site WHKRS 162

№ 19
R⅄L

175.+ Circular ferrous metal lid with a central roundel within which is stamped

H:8.5mm, Max D:98mm.
SF:283, WHKRS 162

176.+ One end and part of the wall of a cylindrical ferrous metal can. The sides of the can, which is roughly cut off at one end, are formed from a piece of sheet metal rolled into a cylinder and inserted into the lip of the lid where it is held in place by a metal strap with a loop at one end. On the top of the lid in the centre is a roundel with

№10
R⩚L

Lid - D:81mm, H:8mm; strap - W:20mm, H:98+mm.
SF:361, WHKRS 162

The metal cans and lids as Cat nos 177-176 were the containers for the shells of the types represented by Cat. nos 161 and 162.

Comments on the armaments kindly provided by Keith Miller, formerly Head of Weapons, Equipment and Vehicles, National Army Museum, London.

"The items found were supplies for the Egyptian army whose arms were inferior to those of the British.

The Egyptian army was composed of both Egyptians and Sudanese and their main rifle was the Martini Henry in .45 inch (11mm) calibre. As the British army no longer used this obsolete weapon the ammunition was provided by commercial ammunition manufacturers. Some of the cartridges were made by the firm of George Kynoch of Birmingham (G·K on the base).

The larger ammunition was all manufactured by the Royal Laboratories at Woolwich (R L on the base). The ammunition was issued to 9 Pr RML guns (rifled muzzle loaders). From the dates on the shell cases they appear to have been issued between December 1876 and October 1884. This means that the ammunition was old by the time of the 2nd Sudan War, but this was quite normal in colonial forces where artillery was not employed that often. Also by the 1890s the 9 Pr was totally obsolete but kept on in colonial forces where they would not be fighting sophisticated enemies. The shells were designed for the 9 Pr Mark II introduced in 1874 as a lighter weight gun for colonial service. The studs on the outside of the shells lock into the rifling as the shells were eased down the barrels of the guns. By 1890 breech-loading was standard and little further muzzle-loading ammunition would have been made. The fuses for the shells were also made at Woolwich and would have been used to ignite common or explosive shells and shrapnel shells which sprayed metal balls on the enemy when they burst."

Buttons

177.+ Shallow domed brass button with a flat back in the centre of which is an attachment ring. Front decorated with a star and crescent in high relief. Back inscribed with

J. HAMMOND & Cº· NEWCASTLE UNDER LYME

Th:8.5mm, D:23mm, D of attachment ring:7.5mm.
SF:4.1, Site WHKRS 257, CC25

178.+ Button identical to Cat. no. 177.
SF:4.2, Site WHKRS 257, CC25

179. Button identical to Cat. no. 177.
Th:8.5mm, Max D:23mm.
SF:245, WHKRS 136, CC6

180. Button identical to Cat. no. 177.
Th:6.5mm, Max D:23mm.
SF:332, WHKRS 145, CC9

181. Button identical to Cat. no. 177.
Th:8.5mm, Max D:23mm.
SF:171, WHKRS 141a, CC7a

182. Button identical to Cat. no. 177.
Th:6.5mm, Max D:23mm.
SF:153, WHKRS 6, CC1

183. Button identical to Cat. no. 177.
Wire ring D:8mm. Th:6mm, Max D:23mm.
SF:336, WHKRS 121a, CC5c

184.+ Shallow domed brass button with a flat back in the centre of which is an attachment ring. The front is decorated with a star and crescent in high relief, the back is stamped with

HAMMOND & Cº· NEWCASTLE ·STAFF

(not collected)
SF:119, Site WHKRS 234, CC19

185.+ Button identical to Cat. no. 177 apart from the inscription on the back

C & J WEBB & Cº LONDON

Th:8mm, Max D:23mm.
SF:339, WHKRS 6, CC1

These buttons belong to the uniforms of officers, the Egyptian rank and file on campaign wore a garment without buttons. A button of this type was recovered from Fort Fadli on the island of Meinarti during excavations in 1963. No mention of an inscription on the reverse is made in the publication (Adams 2002, 112, pl. 35e).

186.+ Button with shallow domed face and a flat back with central attachment loop. Face decorated with central circular boss surrounded by 'sunburst'. Inscription on back

H·D·H&Cº ·SUPERIOR

Th:6.5mm, D:25mm, D of ring:6mm, D of wire:1mm.
SF:40.1, Site WHKRS 6, CC1

187.+ Button with shallow domed face with flat back with central attachment loop. Face decorated with central circular boss surrounded by 'sunburst'. Inscription on back FEIN above ring, W and P flanking ring and motif below.

Two buttons of this type were found during excava-

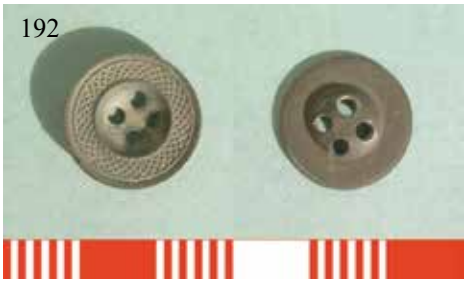
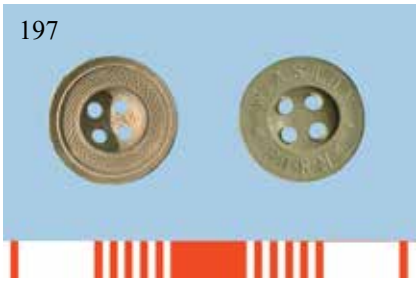
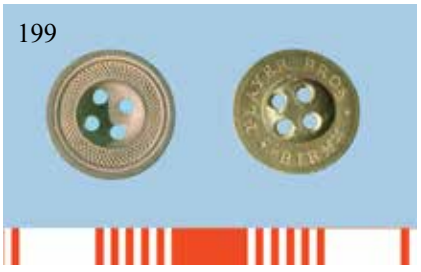
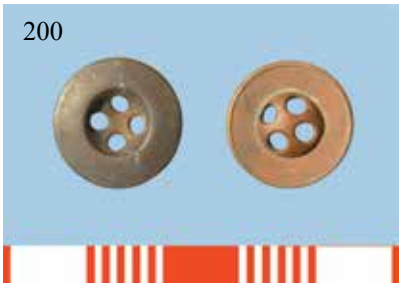
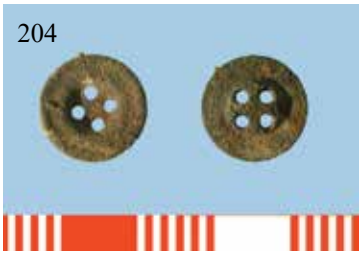


Plate 172. Metal buttons, catalogue nos 177-204.









tions at Kulubnarti and are now in the collections of the British Museum EA 77415 and 78193. The former was recovered from site 21-S-9, House A1, Room 1-1, the latter from site 21-S-43, House 1, Room 1. If these are military buttons it is uncertain to what units they belong.
Th:6.5mm, D:25mm, ring D:6mm, wire D:1mm.
SF:40.2, Site WHKRS 6, CC1

188. Button identical to Cat. no. 187.
Th:6.5mm, Max D:25.5mm.
SF:340, WHKRS 6, CC1

189. Button identical to Cat. no. 187.
Th:6.5mm, Max D:25.5mm.
SF:341, WHKRS 6, CC1

190.+ Button identical to Cat. no. 187.
Th:6.5mm, D:25mm, ring D:6mm, wire D:1mm.
SF:40.3, Site WHKRS 6, CC1

191. Button identical to Cat. no. 187.
Th:6.5mm, D:25mm, ring D:6mm, wire D:1mm.
SF:40.4, Site WHKRS 6, CC1

Buttons with the 'starburst' decoration have a backplate and ring of brass while the front is a ferrous metal with some corrosion.

192.+ Disc button with recessed centre pierced by four holes for attachment. Disc decorated with fine incised lattice. Made from a grey metal.
Th:2.75mm, D:17mm, D of recess:9.5mm.
SF:5, Site WHKRS 257, CC25

193. Button identical to Cat. no. 192.
SF:12, Site WHKRS 139, CC7

194. Button, identical to Cat. no. 192.
Max D:17mm, Hole D:2.5mm.
SF:185, WHKRS 139, CC7

195. Button, identical to Cat. no. 192.
Th:2.75mm, D:17.25mm.
SF:44, Site WHKRS 144, CC8

196. Button identical to Cat. no. 192.
Th:3.5mm, D:17.5mm.
SF:50, Site WHKRS 145, CC9

197.+ Button as Cat. no. 192 but stamped on the back

W. ASTON
BIRM[M]

Th:3mm, Max D:17mm, Hole D:2mm.
SF:335, WHKRS 27a, CC1a4

198. Button as Cat. no. 192 with inscription on the back

PLAYER BROS
BIRM[M]

Th:3mm, Max D:17mm, Hole D:2mm.
SF:337, WHKRS 121a, CC5c

199.+ Button identical to Cat. no. 198.
H:2.5mm, Max D:17mm.
SF:333, WHKRS 141a, CC7a

200.+ Brass button as Cat. no. 192 but with no decoration.
Th:3.25mm, Max D:17mm, Hole D:3mm.
SF:239, WHKRS 32a, CC1b B

201.+ Bi-metal disc button with recessed centre pierced by four holes for attachment. Obverse of copper? crimped around edge over iron core. (not collected)
SF:120, Site WHKRS 234, CC19

202. Bi-metal button with a ferrous metal back and core and a silver-coloured metal ring forming the front. The centre is pierced by four holes. Around the rim on the front is stamped

NE COURANT PAS LE FIL

followed by a star.
Th:3.5mm, Max D:16.5mm, Hole D:1mm.
SF:302, WHKRS 146a, CC10a A

203.+ A ferrous metal button pierced by four holes. On the front it has a raised ridge close to the edge with a bead-motif register within. On the reverse it bears a stamped inscription which is partly masked by the textile to which it is sewn. It appears to read DOUGHERTEYS over H T […..] The base metal is gilded over its whole surface but only traces now remain.
Max D:14mm.
SF:374, WHKRS 90, CC4 Deposit VIII

204.+ A corroded ferrous metal button pierced by four holes. Probably originally the same as Cat. no. 203.
Th:3mm, Max D:14.25mm, Hole D:2mm.
SF:373, WHKRS 90, CC4 Deposit VIII

Ferrous metal cans

205.+ Square top of a large ferrous metal can from which it has been roughly cut. There is a square plate (153mm) in the centre to which are soldered four strips with mitred ends. On the central plate are stamped

C TRADE MARK C

CH PREVET PARIS

Beneath this is a rectangular panel with chamfered corners containing the following

CHOLLET & C[IE]
CH PREVET & C[IE] SUCCII[.]
PARIS
SAISON 1884·
[.]ET 979

An entry in a list of patent applications in the London Gazette of 21[st] April 1865 records under item 979 that a

Martin Diosy, of Fenchurch-street, in the city of London, Merchant, was acting on behalf of Reni Charles Jules Prevet and Maximilian Louis Joseph Chollet, both of Paris, France. In the *British Medical Journal* for November 28th 1885 (pg 1030) is the following 'PROFESSOR STIRLING, in his present course of lectures on Foods, gave a very interesting account of the newer methods that are being used in the preparation of foods, especially for military purposes. He showed a beautiful collection of compressed vegetables, as made by Chollet and Prevet, of London …….'.
L:225mm, W:220mm, Th:0.5mm.
SF:348, WHKRS 27a, CC1a4 M

206.+ Top of a square ferrous metal can roughly cut off. In the centre it has the fixing for a wire loop handle. It has a circular raised lip towards one corner to allow the piercing of the top to drain the contents. In another corner an oval patch has been affixed to seal a roughly cut circular hole. In a third corner the metal has been peeled back. In the fourth corner is a circular stamp with the text arranged concentrically around a large &. It reads

BUSH & DENSLOW WORKS [.]E[……..]RK
REFINERS
PACKERS

Part of the text is obscured by another metal patch.

Rufus T. Bush financed the establishment of the company Bush and Denslow with its refinery on the Brooklyn waterfront. It was taken over by Standard Oil in the 1880s (source Wikipedia http://en.wikipedia.org/wiki/Rufus_T._Bush#Oil_and_Standard_Oil).
L:220mm, W:220mm, Th:0.5mm.
SF:139, WHKRS 193a, CC16a

207.+ Square top from a large rectangular ferrous metal can similar to Cat. no. 206. In the centre is an oval wire handle (wire D:4mm). It has a circular raised lip towards one corner to allow the piercing of the top to drain the contents. In the two other opposite corners is a stamped roundel containing the words

HIGH
FIRE
TEST

and elsewhere

MARK
PHILADELPHIA, WARDEN
FREW
& CO, AGENTS
PAT. 24-1882
METHOD ..]R. CAN

In the fourth corner there is a triangular patch and the upper layer of metal is peeled back and bears the word

ATLANTIC
RE[…….]NY
PHILADELPHIA

Warden along with his partners Lockhart and Frew founded a crude oil commission house in Philadelphia in 1865 and built a refinery called The Atlantic. It merged with Standard Oil and a number of other companies in 1874.
L:235mm, W:235mm, Th:0.5mm.
SF:140, WHKRS 193a, CC16a

208.+ One side of a square ferrous metal can lid with the circular recessed disc to aid opening. It is stamped

BEST PETROLEUM

L:224mm, W:59+mm, Th:0.5mm.
SF:145, WHKRS 139, CC7

208a.+ One side or top of a square? ferrous metal can folded over along its edges. It is stamped

X
PETROLL
D
BATOUM

This is a product of the Baku oil fields exported through Batoum in Georgia on the Black Sea. (not collected)
L:185mm, W:179mm.
SF:386, WHKRS 153b, CC11b

209.+ Red ferrous metal can painted red, bearing the Shell logo and …….] OIL. Flattened. This design of logo was used from 1961 to 1971 (Source http://www.andrewkeir.com/shell-logo-designs-past-and-present/). (not collected)
SF:103, Site WHKRS 16

210.+ Square can bearing in raised letters on the top

BEST PETROLEUM, 1887, RUSSIA and [……]

Cap remains in place. (not collected)
SF:112, Site WHKRS 196, hut

211.+ Small part of a square top of a ferrous metal can of the same type as Cat. no. 212. Stamped on one side of the central hole is the word YORK.
L:160+mm, W:113+mm, Th:0.5mm.
SF:355, WHKRS ?

212.+ Square lid from a ferrous metal can with a large hole in the centre. It bears the inscription EMPIRE REFININ[G], at 90 degrees COMPA[NY] and with NE[…… on the other side.
L:*c*. 210mm, W:170+mm, Th:0.5mm, Hole D:*c*. 120mm.
SF:165, WHKRS 27a, CC1a4

213.+ A cylindrical ferrous metal can which has been flattened along its rim after the removal of the lid and pierced by holes at each end. On the underside of the base within a roundel it bears the stamped inscription

MOIR & SONS
LIMITED
ABERDEEN

Plate 173. Ferrous metal tin lids, catalogue nos 205-208a.

Plate 174. Ferrous metal cans, catalogue nos 209-216.

&
LONDON

A red residue with fabric impressions adheres to the exterior and is visible within.
L:116mm, H:84mm, Max D:75mm, Hole D:3.5mm.
SF:289, WHKRS 190a, CC14f

214.+ Lid of a small cylindrical ferrous metal can with a ridge to accommodate the push-on base. The top is decorated and bears much text which is illegible.
H:19mm, Max D:61.5mm.
SF:219, WHKRS 15a/b, CC1z1/2

215.+ Circular tin lid for boot polish with on the top an image of a dog sat upright with a long boot behind him, admiring his reflection in another well-polished boot.
H:8.25mm flange, Th:0.25mm, D:56mm.
SF:32, Site WHKRS 96, CC5

216.+ Lid of a circular ferrous metal can stamped with

W.D.& H.O.WILLS BRISTOL LONDON

and within the central roundel

TRADE

MARK

H:9.5mm, Max D:68mm.
SF:186, WHKRS 139, CC7

217.+ Small cylindrical ferrous metal can with a inset base and a shallow domed top pierced by a central roughly cut hole where a narrow neck(?) has been broken off.
H:65+mm, Max D:56mm.
SF:353, WHKRS ?

218.+ A circular ferrous metal lid which has been folded over twice and flattened. Stamped onto the lid are the letters

EST
1884
LONDON

L:99mm, W:42mm, Max D:86mm.
SF:155, WHKRS 6, CC1

219.+ Base and lower part of the wall of a cylindrical ferrous metal can stamped on the bottom within a roundel

CROSSE & BLACKWELL LONDON

The upper part of the can has been roughly cut away.
H:56+mm, Max D:75.5mm.
SF:253, WHKRS 167a, CC14a2

220.+ Cylindrical ferrous metal can with the lid peeled back. On the base it bear in stamped letters

CROSSE & BLACKWELL

and on the lid 12 and C
H:87.5mm, Max D:75mm.
SF:222, WHKRS 167, CC14a1

221.+ Small circular ferrous metal tin with a key recess in the base.
H:24.5mm, Rim D:72mm.
SF:134, WHKRS 190a, CC14f

222.+ Circular ferrous metal tin lid with BATOUM stamped in large letters across it (cf. Cat. no. 208a).
H:19.5mm, Max D:96mm.
SF:136, WHKRS 190a, CC14f

223.+ Part of a flattened ferrous metal tin(?) with an ankh-like symbol.
L:62mm, W:57mm.
SF:137, WHKRS 190a, CC14f

224.+ Lid of a cylindrical ferrous metal can with a large impressed S above an inscription in Arabic حلويلن سعد which can be translated as Saad Sweets, a well-known manufacturer of tahaniya.
H:9mm, Max D:88mm.
SF:220, WHKRS 15a/b, CC1z1/2

225.+ A cylindrical ferrous metal tin with decoration on the side. Within an oblique rectangular band is

P. GERAUD & Co
NANTES (France)

Above the band is IN[……..] and in a smaller font SURFINE. Around the side in a decorative frame is USINES SUR LE LIEUX DE PECHE and another identical frame with the same inscription occurs on the opposite side.
H:40mm, Max D:82mm.
SF:175, WHKRS CC13a1

226.+ Lid of a small circular ferrous metal tin with a ridge against which the base fitted. On the top of the lid which is slightly raised it has a narrow red painted band close to the edge. Within this is a large amount of text again in red paint very little of which can now be read.
H:16.5mm, Max D:55mm.
SF:174, WHKRS CC13a1

227.+ Small cylindrical ferrous metal tin with the top roughly cut away. On the underside of the base is the inscription

CROSSE & BLACKWELL LONDON

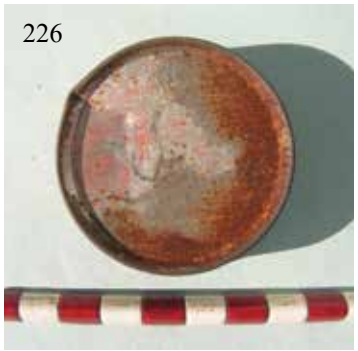
H:62.5mm, Max D:49mm.
SF:243, WHKRS 136, CC6

228.+ Circular ferrous metal tinned lid from a filter with a slightly domed centre and a wire loop by the edge. On the side opposite the loop is an ‘L’-shaped notch to allow the lid to be twisted and locked in place onto the lower part of the filter. In the centre of the lid is a circular copper-alloy(?) plate bearing an stamped inscription. In the centre it reads

PATENT LONDON FILTER

while around the edge in smaller letters is

Plate 175. Ferrous metal cans, catalogue nos 217-227.



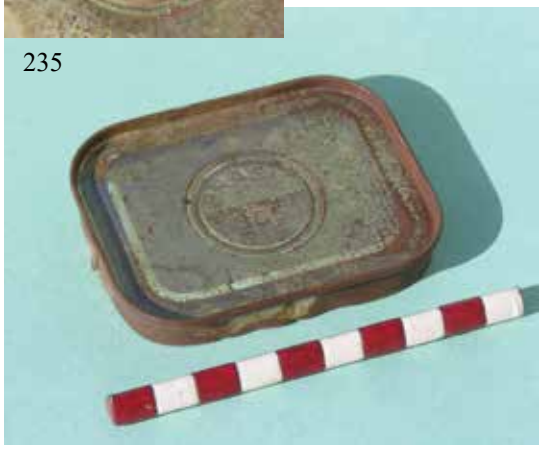


Plate 176. Ferrous metal water filter and cans, catalogue nos 228-238.

THE ATKINS FILTER AND ENGINEERING
COMP^{Y} LIM^{D} *

Height of 'flange' 24.5mm, H:35mm, Max D:90mm.
SF:205, WHKRS 27a, CC1a4 R (by hearths to north of camp)

229.$^{+}$ Base of a cylindrical ferrous metal can with LONDON stamped into it. (not collected)
SF:97, Site WHKRS 6, CC1

230.$^{+}$ Base of a ferrous metal tin lid painted turquoise and stamped

CROSSE&BLACKWELL · LONDON

(not collected)
SF:98, Site WHKRS 6, CC1

231. Base of a ferrous metal tin lid identical to Cat. no. 230. (not collected)
SF:118, Site WHKRS 157

232.$^{+}$ Rectangular ferrous metal tin lid with rounded corners. The following letters are stamped into the lid

….] A N S
….] TRATED
….] D OIL
OR
...] MATISM

L:40+mm, W:44mm, Th:0.5mm.
SF:238, WHKRS 32a, CC1b B

233.$^{+}$ Shallow rectangular ferrous metal tin with a hinged lid. The front of the lid and the corresponding part of the side of the tin are pierced by a rough hole to allow something to be threaded through to hold the lid closed. There are two narrow vertical slots (L:5mm, W:0.75mm) in the back side of the tin which are machine made. Their function is unclear.
L:160mm, W:86mm, H:22mm.
SF:357, WHKRS ?

234.$^{+}$ Rectangular ferrous metal tin with rounded corners and part of the matching slightly domed lid originally attached by a hinge along one long side. The lid bears relief decoration divided originally probably into four triangular sections, two adjacent to the short sides with parallel rows of a string-like motif.
L:90mm, W:64mm, H:26mm.
SF:317, WHKRS 145, CC9 D E

235.$^{+}$ Upper or lower part of a rectangular ferrous metal tin lid with rounded corners probably from a container opened by a key like a sardine can. Embossed in a roundel in the centre is written

BRASIL
INSPECIONADO
385
S I F

L:82mm, W:63mm, H:10.5mm.
SF:196, WHKRS 27a, CC1a4 Q

236.$^{+}$ Rectangular ferrous metal tin with rounded corners and a key recess on the base. The top has been peeled back. On the silver sides it has the name ROBERT, a large R and SARDINES IN OIL twice each within a rectangular frame.
L:102mm, W:76mm, H:23mm.
SF:259, WHKRS 110a, CC5a

237.$^{+}$ Rectangular ferrous metal tin lid with rounded corners of a type not opened by a key. It is stamped in the centre with

L.M.& L
CHICAGO

L:105mm, W:60mm, H:11.5+mm.
SF:241, WHKRS 40a, CC2a

238.$^{+}$ Rectangular ferrous metal tin. In the centre of the square top is an impressed roundel within which is a circular hole giving access to the interior. Traces of two hinges on one side of the top indicate the presence of a square lid. On one side is a scene of a Japanese lady with parasol examining flowers, in black on the tinned surface. Subsequently the tin has been roughly cut in half along its vertical axis.
L:92mm, W:*c*. 92mm, Th:0.75mm, H:158mm, Hole D:38mm.
SF:146, WHKRS 167c, CC14a4

239.$^{+}$ Rectangular ferrous metal tin decorated over the whole of its top with a checkerboard pattern of black and gold rectangles.
L:116mm, W:72mm, H:39mm.
SF:264, WHKRS CC13a3

240.$^{+}$ Large rectangular tin with rounded corners and the lid roughly cut away on three sides and bent back. It has a square hole punched through one side. On the underside of the base is a stamped roundel with the words

CROSSE & BLACKWELL LONDON

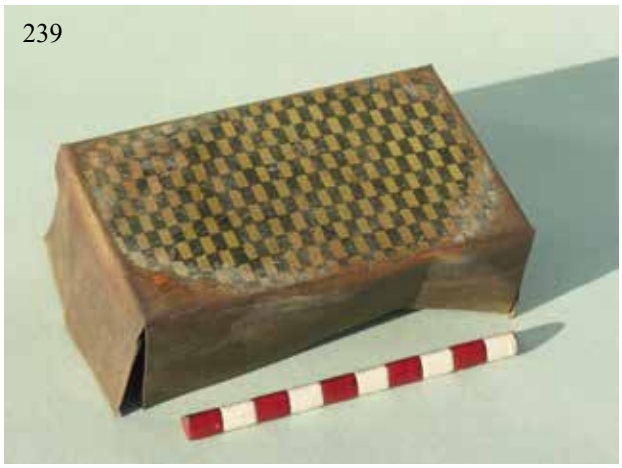
L:121mm, W:97mm, H:37.5mm.
SF:346, WHKRS ?

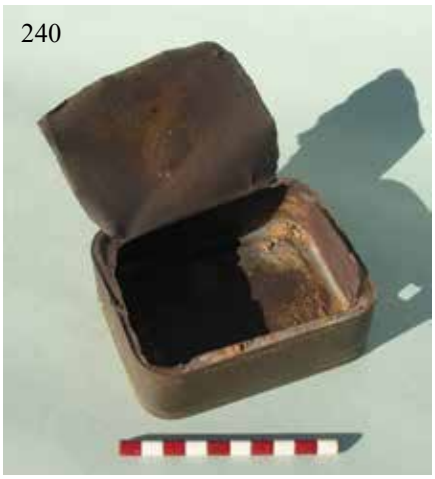
241.$^{+}$ Rectangular ferrous metal tin with rounded corners and the lid peeled back. There is a recessed depression for the key on the underside which also bears the stamped inscription

PRODUITS [IM]PORTES

L:108mm, W:76mm, H:24.5mm.
SF:173, WHKRS 167b, CC14a3

242.$^{+}$ Perhaps half of a lid sub-rectangular in shape with decoration in relief impressed from within. A complex floral design with a rectangular central panel down the length of the lid perhaps with a circular area in the centre.
L:47+mm, W:54mm, H:10mm flange, Th:0.5mm.
SF:11, Site WHKRS 139, CC7





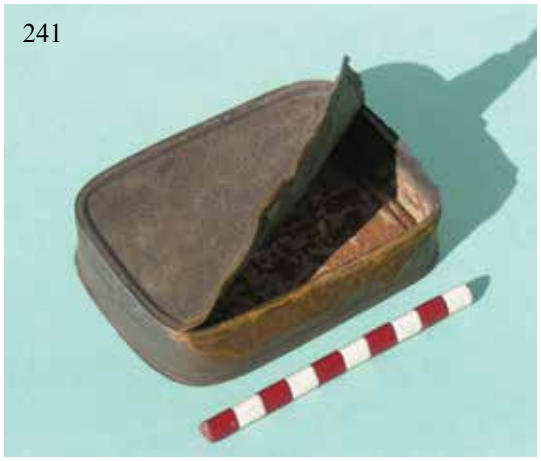


Plate 177. Ferrous metal cans, bottle top and lead foil, catalogue nos 239-249.

243.+ Slightly 'kidney'-shaped ferrous metal tin with a small key recess (38 x 31mm) in the base as well as a deep oval recess with vertical sides 51 x 26mm by 6mm deep.
L:142mm, W:75mm, H:19mm.
SF:260, WHKRS 110a, CC5a

244.+ Sardine can retaining its tinning on the underside with the recess for the key visible. (not collected)
SF:106, WHKRS 96, CC5

245.+ Sardine can with top rolled back. (not collected)
SF:116, Site WHKRS 145, CC9

Miscellaneous

246.+ Crimp-type ferrous metal bottle top.
H:8mm, Max D:39mm.
SF:331, WHKRS 27b, CC1a5

247. Foil and wire from beer bottles. A piece from the side of the bottle bears stamped letters highlighted in red

…]OTT[..
…]NE BREW[…
R. Tennent.

From the top of another piece of foil is the inscription

BARKI[...
[T]ENNEN[T].

The A and I of BARKI are uncertain.
SF:230, WHKRS 27b, CC1a5

248.+ Foil stamped in the centre with a dotted roundel within which is a dove with outstretched wings holding a sprig of foliage in its beak and perched on a leafy branch. Around it is the inscription

C H MUMM & Co
C do BARY

Around the roundel outside its dotted border is written

BETTS • PROTECTIVE

and

PARIS LONDRES BORDEAUX

Top of foil D:43mm, L:54mm, W:46mm, Th:0.5mm.
SF:223, WHKRS 27a, CC1a4 K

249.+ Distorted piece of foil from the top of a bottle with a stamp identical to Cat. no. 248 along with another unstamped piece.
SF:368, WHKRS 27b, CC1a5

250.+ Eye and washer of copper, ring metal uncertain. Eye with flange. Shaft square-sectioned at top then circular. Round end passes through washer over which its end is splayed (riveted). Ring passes through eye, ends cut at 45º and slightly overlapping. The eye had been attached to something 13mm thick. The washer is marked with ∧ as is the shaft of the eye.
L:36mm, eye 18.5mm, shaft 49mm, ring, W:42mm ring, Th:8mm shaft, 4mm washer, D:24mm flange, 8mm shaft, 8mm of hole, 23.5mm washer, 6.5mm ring wire.
SF:77, Site WHKRS 162

251.+ Top of a cuboid copper container, much deformed. Central circular opening with a reinforced lip. Angles of top rounded. One of many examples to which lid Cat. no. 252 belongs.
L:227mm, Th:0.6mm, D:125mm opening.
SF:78, Site WHKRS 162

252.+ Lid fitting container of type Cat. no. 251. Flange with tapered lid seating. Double skinned. Central 'D'-shaped loop held in place by oval plate riveted through lid. Ridge around lid top. Lid dished on underside. Top of lid marked WD.
D:136.5mm, Th:20.2mm max. Loop – L:54mm, W:43mm, D of wire:5mm.
SF:79, Site WHKRS 162

253.+ Cuboid copper container, much deformed. Central circular opening with a reinforced lip. Angles of top rounded. It is stamped on the top towards one corner B∧O. Cat. nos 251 and 252 come from containers of this type. (not collected)
SF:110, Site WHKRS 161

The function of the containers Cat. nos 251 and 253 is uncertain. Cat. no. 253 is stamped with the mark of the Board of Ordinance which was abolished on the 25th May 1855, its duties being transferred to the Secretary of State for War at the War Office, and thus pre-dates that year. The lid Cat. no. 252, although fitting container Cat. no. 251, of very similar form to 253, bears the War Office mark and, therefore, is of later date.

254.+ Metal tube? made by rolling a sheet and fastening it with wire. The sides have been pierced with small square holes – nails? and one end has been 'feathered'. Function uncertain. (not collected)
SF:114, Site WHKRS 139, CC7

255.+ Rectangular iron water tank with carrying handles at each end and a brass filler with a wide flange (D:87mm) attached by six iron rivets to the top half way along its length. The hole (D:40mm) is threaded to accept a cap as Cat. no. 256 and a loop is provided to hold the retaining wire which stopped the cap being lost when unscrewed. The tank is rivetted together along the centre line on the upper face and the recessed ends are rivetted to the sides. At one end of one side arranged vertically is stamped HESTER and 10 GALLS.

This may be one of the 'iron camel tanks' which had been shipped back to the UK in great numbers from the Berber-Suakin railway in 1885(?) and were returned to Sudan with other railway stores soon thereafter (Grant 1886, 22). It was however, discovered along the section of railway whose construction only began in the summer of 1896.

Plate 178. Metal object, containers, etc., catalogue nos 250-258.

L:727mm, W:175mm, H:355mm.
SF:117, Site WHKRS 151, CC11

256.+ Brass screw cap for a 10 gallon water container as Cat. no. 255. There is a central knob around which is wrapped a circular sectioned iron wire (D:3.5mm) to retain the cap after it was unscrewed.
H:23mm, Max D:55mm.
SF:141, WHKRS 193a, CC16a

257.+ Cylindrical brass object with a rilled central section. At one end an iron tube is screwed(?) on. The cylinder is hollow and at the brass end has a plug screwed in. Function uncertain.
L:50mm, Max D:10.5mm.
SF:261, WHKRS 110a, CC5a

258.+ Slightly spayed cylindrical copper-alloy object closed off at one end where it is pierced by a hole. Function uncertain.
H:25mm, Max D:37mm, Hole D:13mm.
SF:162, WHKRS 155a

259.+ Handle from a fork or spoon.
L:132+mm, W:19mm, Th:3mm.
SF:315, WHKRS 146a, CC10a C

260.+ Cylindrical mug made from ferrous metal with a strap handle.
H:105mm, Max D:69mm.
SF:290, WHKRS 190a, CC14f

261.+ Cylindrical ferrous metal mug with a strap handle.
H:95mm, Rim D:73mm.
SF:262, WHKRS CC13a3

262.+ Cylindrical ferrous metal mug with a strap handle which tapers towards the point of junction with the side.
H:80mm, Max D:73mm.
SF:263, WHKRS CC13a3

263.+ Small ferrous metal funnel with long spout and a loop handle. It is much distorted and the rim diameter is approximate.
H:106mm, Rim D:*c*. 70mm, Hole D:12mm.
SF:268, WHKRS CC13a3

264.+ Large and crudely made sheet metal funnel with a loop handle.
H:120mm, Rim D:210mm, Hole D:62mm.
SF:242, WHKRS 136, CC6

265.+ Iron strainer with a circular, slightly dished sieve pierced by circular holes 2.5mm in diameter attached by two rivets to a long rectangular-sectioned handle looped over at the end. Handle tapers along its length from the sieve.
L:299+mm, W:12-18.5mm, H:2mm handle, D:100-110mm sieve.
SF:64, Site WHKRS 159, CC14

266.+ Bottle opener with a cap opener at one end, a corkscrew at the other. Elements hinge and fold back into the handle. Inscribed on one side

Skyline MADE IN BURNLEY ENGLAND
BOTTLE-BOY

It looks more modern than the rest of the material yet was recovered from within a camp.
L:164mm extended.
SF:33, Site WHKRS 96, CC5

267.+ Slightly oval ferrous metal tubular handle, neck or spout slightly increasing in diameter towards one end. The other end has a narrow flange which holds the object within a largely circular plate pierced by four holes for affixing it to curved body. The point of junction has been sealed with a grey material. Handle/neck/spout
L:78.5mm, Max D:36-34mm.
SF:212, WHKRS 146, CC10 Deposit I

268.+ Mattock head of ferrous metal with a wide blade splayed towards the cutting edge and a circular hole for the attachment of the wooden handle.
L:297mm, W:173mm, Th:19mm, Hole D:40mm.
SF:316, WHKRS 27a, CC1a4

269.+ Part of an oval wooden handle preserved within a metal sleeve stamped on one side with a motif representing a conical mountain with the word ÆTNA. On the other side is stamped

SPEAR & JACKSON
MAKERS
SHEFFIELD

The end of the wooden handle is splayed by a wooden wedge driven into it to grip the metal sleeve. Spear and Jackson moved to the Aetna Works in 1852 and remained there until 1968.
Wood L:142mm, W:45-55mm, Th:28mm; metal sleeve L:137mm, W:59-68mm, Th:33-39mm, Th of metal max. 5mm .
SF:352, WHKRS ?

270.+ Small ferrous metal heart-shaped padlock missing its front plate and most of the locking mechanism within.
D of hasp 3.5mm. W:36mm, Th:7.75mm, H:36mm.
SF:128, WHKRS 153b, CC11b D

271.+ An oval metal label with a raised ridge around the edge. It is embossed with the numbers ١٤٧ [147] in Arabic to be read from the front above 598 in western numerals to be read from the back. A small hole (D:3mm) has been punched through the metal from the front.
L:62mm, W:48mm, Th:1mm, Hole D:3mm.
SF:324, WHKRS 27a, CC1a4 F

272.+ Iron chain of four welded oval links and one figure-of-eight link.
L:120mm 27mm link, W:17mm, D:4mm wire.
SF:29, Site WHKRS 238, CC21

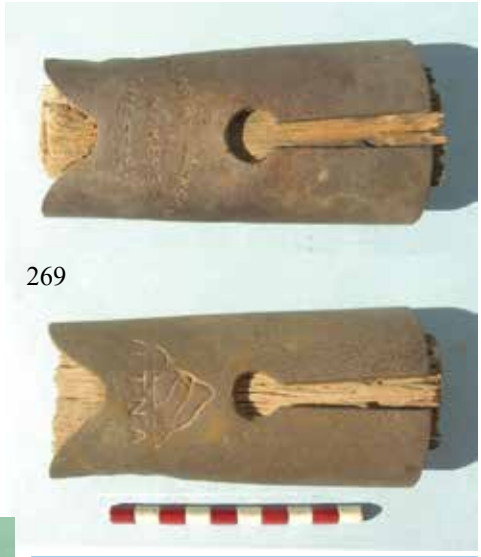
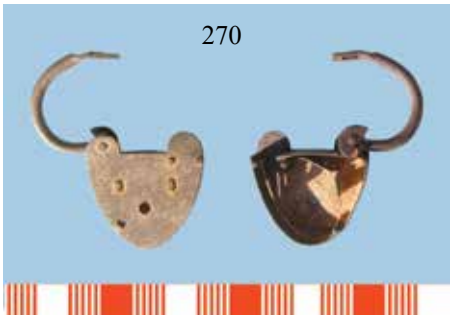


Plate 179. Miscellaneous metal objects, catalogue nos 259-270.



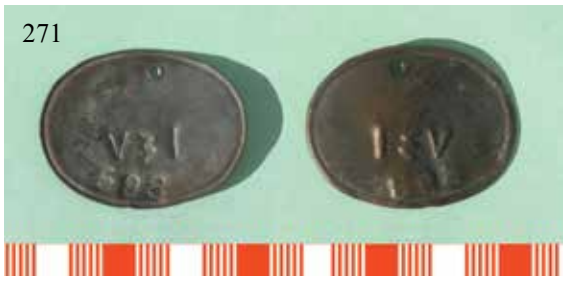


Plate 180. Miscellaneous metal objects, catalogue nos 271-286.

273.+ Coil spring with a ferrous metal rod down its centre. At the end of the spring it is looped round the rod between two flanges.
Rod D:3.5-4.5mm, L:66mm, Max D:33mm.
SF:362, WHKRS 162

274.+ A pair of ferrous metal scissors with one half broken through the pivot hole.
L:113mm, W:42mm, Th:6mm.
SF:249, WHKRS 136, CC6

275.+ Bodkin with a short wooden handle into which is set a ferrous metal rod tapering throughout its length to a sharp point. The tang is square in section.
Handle L:30mm; L:107mm, Max D:17mm.
SF:248, WHKRS 136, CC6

276.+ A bodkin with elongated ferrous metal diamond-shaped blade of rectangular section set into a wooden cylindrical handle.
Handle L:82mm; blade L:105mm, Max W:8.5mm L:155mm, Max D:22.5mm.
SF:247, WHKRS 136, CC6

277.+ Needle of ferrous metal with a long oval eye, a cylindrical shaft flattened out towards the point. [found with SF:355, 356, 357, 352 and 353, provenance not recorded]
L:117mm, Max D:2.75mm.
SF:354, WHKRS ?

278.+ Disc of sheet metal affixed by four rivets to a thicker ring with an outer bevelled edge. In the centre of the disc it is stamped with a 2.
Th:4.5mm, Max D:72mm.
SF:360, WHKRS 162

279.+ Length of ferrous metal wire (D:1.2mm) on to which are threaded two objects. A rectangular metal strip (L:47mm, W:19mm, Th:0.5mm) stamped 601 and an equal-armed cross (H:28mm, W:28mm, Th. 0.3mm) with a raised border of thin sheet metal stamped

WWW
8

SF:356, WHKRS ?

280.+ Ferrous metal dish with crinkled edges with one side pulled out to form a spout.
L:110mm, H:26mm, Max D:89mm.
SF:133, WHKRS 93a, CC4b

281.+ *Ibriq* of ferrous metal stamped on the neck with a half sun disc with rays on one side and on the other with the word MADE in mirror image. On the handle are large stamped numbers 125 again in mirror image.
H:265mm, Rim D:47mm.
SF:161, WHKRS 155a

282.+ Coarsely threaded iron loop for affixing to a wooden object. An iron sleeve covers the junction of the loop and the shaft.
L:60.5mm, Max D:21mm.
SF:181, WHKRS 151, CC11

283.+ Tent peg made from 'T'-sectioned ferrous metal rod with a point at one end and a semicircular notch cut out from the base of the 'T' 42mm from the other end.
L:283mm, W:21 & 23mm, Th:3mm.
SF:267, WHKRS CC13a3

284.+ Trefoil iron ring of circular section.
L:83mm, W:80mm, Max D:11mm.
SF:194, WHKRS 27a, CC1a4 B

285.+ Roughly circular iron ring roughly cut by chisel from a piece of sheet metal. It is pierced by four holes *c*. 5mm in diameter. Found with Cat. no. 286 along with offcuts from the manufacture of other sheet metal objects.
L:94mm, W:87mm, Th:2mm, Hole D:50mm.
SF:272, WHKRS 172a, CC14c

286.+ Circular iron disc roughly cut by chisel from sheet metal and pierced by two holes. Found with Cat. no. 285.
L:38mm, W:36mm, Th:2mm, Hole D:5mm.
SF:326, WHKRS 172a, CC14c

287.+ Roughly circular-sectioned iron rod bent towards one end to form an 'L'-shape. The other end is flattened to a point and a hole pierces the rod half way along.
L:88mm, W:41mm, Max D:c. 14mm, Hole D:6.5mm.
SF:328, WHKRS 155a

288.+ Two fragments probably of zinc or a zinc alloy. It may be from the end of a 50mm bore pipe with a dished flange to receive the plain end of another pipe section. The pieces do not conjoin and the original form of the object is unclear.
L:100+mm, Rim D:100mm.
SF:277, WHKRS 27a, CC1a4

289.+ Tyre valve angled at 90 degrees with a large flange at one end and stamped just below the threaded other end

ALLIGARO
135GDN7775
MADE IN GERMANY

Tube D:8mm. L:148mm, Max D:27mm.
SF:240, WHKRS 40a, CC2a

Donkey and horse shoes

All are made of ferrous metal.

290.+ Donkey shoe of rectangular section pierced by six rectangular holes with two nails remaining *in situ*.
L:73mm, W:76mm, W of band:11mm, Th:5mm
Holes – L:6mm, W:3.5mm
Nails – L:23mm, W:3.5mm nails, Th:2.2mm.
SF:10.1, Site WHKRS 139, CC7

291.+ Donkey shoe as Cat. no. 290. Countersunk nail holes a little irregular in size.
L:78mm, W:71mm, W of band:11.25mm, Th:4mm

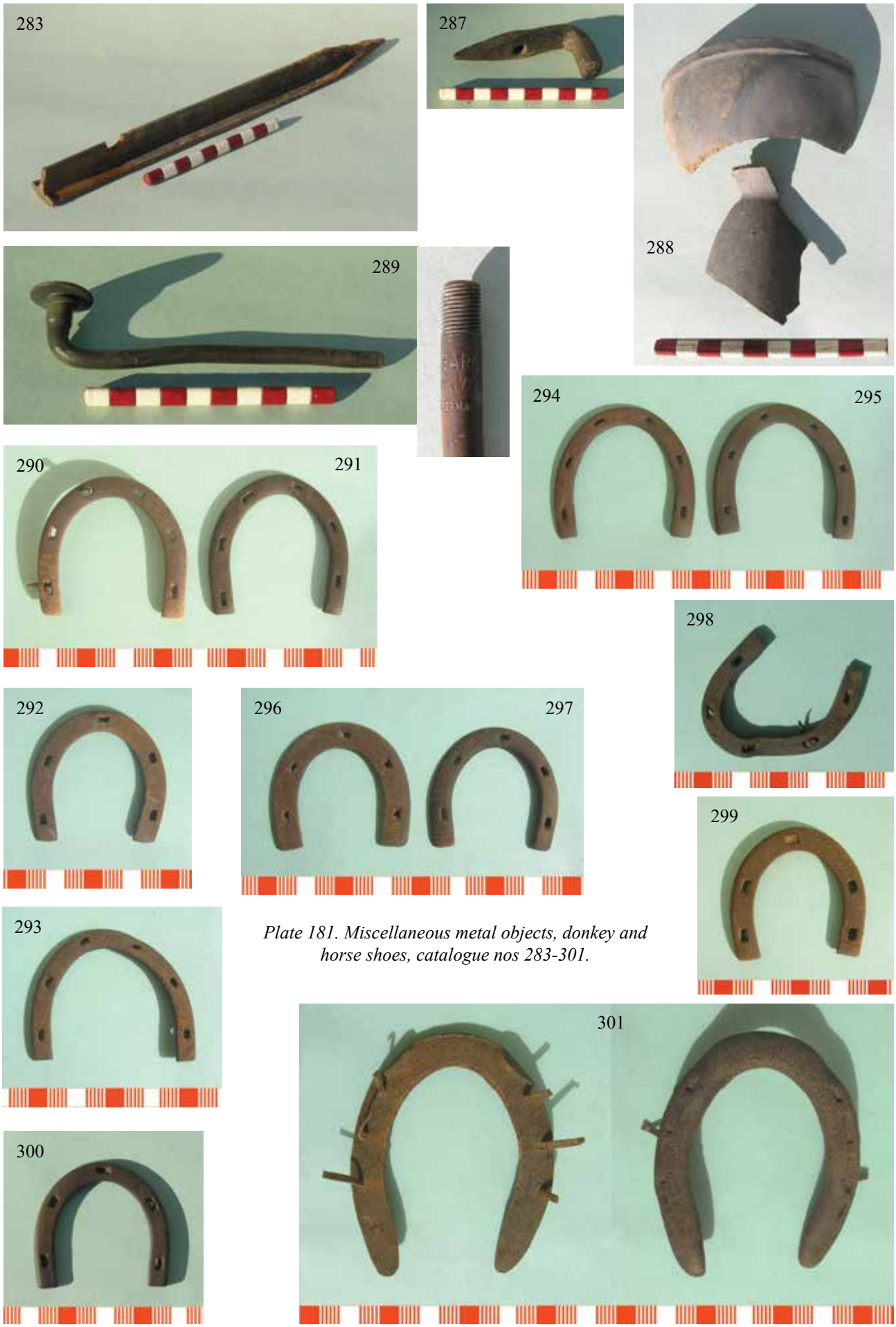


Plate 181. Miscellaneous metal objects, donkey and horse shoes, catalogue nos 283-301.

Holes – L:5.5mm, W:3mm.
SF:10.2, Site WHKRS 139, CC7

292.+ Donkey shoe as Cat. no. 290 but well made.
L:69mm, W:69mm, W of band: 11.5mm, Th:5mm,
Holes – L:5mm, W:2.5mm.
SF:16, Site WHKRS 35, CC2

293.+ Donkey shoe pierced by six rectangular holes, same as Cat. no. 290.
L:70mm, W:85mm, W of band:11.5mm, Th:4.75mm,
Holes – L:4mm, W:3mm.
SF:39, Site WHKRS 6, CC1

294.+ Donkey shoe as Cat. no. 290.
L:72mm, W:76mm, W of band:11mm, Th:5mm
Holes – L:4.5mm, W:2.75mm.
SF:49.1, Site WHKRS 145, CC9

295.+ Donkey shoe as Cat. no. 290.
L:73mm, W:78mm, W of band:12mm, Th:5mm
Holes – L:4mm, W:3.25mm.
SF:49.2, Site WHKRS 145, CC9

296.+ Donkey shoe as Cat. no. 290 but with only five holes.
L:67mm, W:71mm, W of band:14mm, Th:4.5mm
Holes – L:3mm, W:3mm.
SF:54.1, Site WHKRS 90, CC4

297.+ Donkey shoe as Cat. no. 296.
L:67mm, W:70mm, W of band:11.5mm, Th:4.5mm
Holes – L:4mm, W:3mm.
SF:54.2, Site WHKRS 90, CC4

298.+ Donkey shoe badly bent by explosion. Five rectangular holes, one nail and one nail head *in situ*.
L:63mm, W:68mm, W of band:11mm, Th:5mm
Holes – L:4.25mm, W:2.5mm.
SF:75, Site WHKRS 162

299.+ Donkey shoe with five rectangular holes.
L:69mm, W:71mm, W of band:13mm, Th:5mm
Holes – L:5.25mm, W:3.5mm.
SF:83, Site WHKRS 268, Dal camp

300.+ Donkey shoe with five rectangular nail holes.
L:69mm, W:71mm, Th:6mm, Holes *c*. 5 x 3.5mm.
SF:282, WHKRS 162

301.+ Horseshoe with two caulks towards the front. Pierced by six rectangular holes in a shallow 'V'-shaped groove. Rectangular-sectioned nails *in situ*.
L:127mm, W:104mm, W of band:18mm, Th:7.5mm
Nails – L:29mm, W:4mm, Th:1.5mm.
SF:38, Site WHKRS 6, CC1

Nuts, bolts and washers

302.+ Thirteen identical iron bolts with nuts attached. Bolts square headed, threaded to half the length of the shaft. Head bears an inscription in relief P N B Cº along with a star and crescent. Nuts square and shallow domed on one side.
Bolt – L:95mm, shaft D:20mm
Bolt head – L:29mm, W:29mm, H:14.5mm
Nut – L:34mm, W:33.5mm, H:19.25mm.
SF:18, Site WHKRS 136, CC6

303.+ Rail screw of ferrous metal with a square head bearing a crescent motif. The slightly domed wide flange gives way to the shaft with its coarse thread extending to within 13mm of the flange.
Flange D:30mm, shaft D:16mm L:129mm, Max D:30mm.
SF:251, WHKRS 167a, CC14a2

304.+ Hexagonal headed iron bolt and nut. Shaft threaded for a length of 48mm. Nut slightly domed on one side with a stepped thickening.
Bolt – L:123mm, shaft D:17mm
Bolt head – L:23.5mm, W:23.5mm, H:13.5mm
Nut – L:29mm, W:28.5mm, H:17mm.
SF:19, Site WHKRS 26

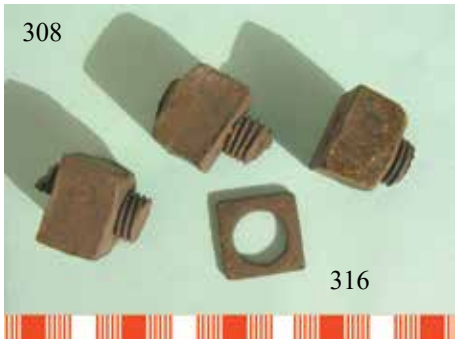
305.+ Nut and bolt as Cat. no. 302 but the arrangement of the inscription P N B Cº and star and crescent on top of bolt head are different and set in a circular impression.
Bolt – L:93mm, shaft D:19.75mm
Bolt head – L:29.25mm, W:29mm, H:13mm
Nut – L:33.5mm, W:33.5mm, H:20mm.
SF:20, Site WHKRS 197, arched bridge

306. Rail screw with square head and circular flange. It tapers down its length towards a square-sectioned blunt point. The very coarse thread begins 20mm below the flange. Identical in form to Cat. no. 303.
Screw – L:121.5mm, L of end:9mm, unthreaded section D:16mm, W of end:8mm
Screw head – L:16mm, W:15.5mm, flange D:38mm.
SF:21, Site WHKRS 136, CC6

307.+ Large iron wood screw with a square head and a coarse thread which starts 21mm down the shaft.
Head L:28mm, W:28mm, Th:14mm L:93mm, Max D:17mm.
SF:291, WHKRS 190a, CC14f

308.+ Three broken bolts with nuts attached, snapped during removal of rails. Nuts square, slightly domed with step as Cat. no. 304.
Bolt – D:18mm
Nuts – L:33mm, W:32mm, H:23mm.
SF:25, Site WHKRS locus uncertain

309.+ Round-headed bolt with upper part of shaft oval to engage with the oval holes in the fish plates. Threaded half of its length. Nut hexagonal with slight step on one side as Cat. no. 304.
Bolt – L:105mm, upper part of shaft D:25-20mm, lower part of shaft D:19.5mm
Bolt head – H:18mm
Nut – L:37mm, W:33.5mm, H:23.5mm.
SF:36, Site WHKRS 6, CC1



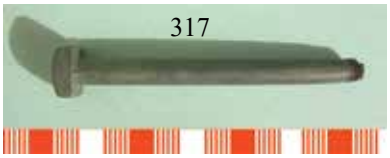


Plate 182. Nuts, bolts and screws, catalogue nos 302-317.

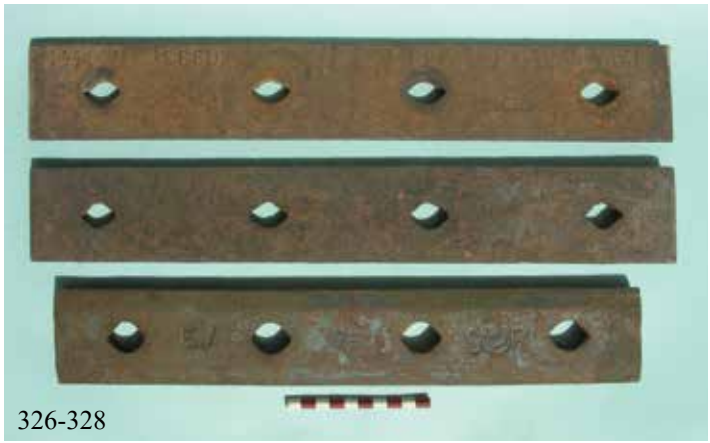


Plate 183. Rail spikes, fishplates and metal fittings, catalogue nos 318-332.

310.+ Long thin bolt with a shallow domed head. It has a fine thread over a length of 55mm.
Shaft D:9mm, L:180mm, Max D:26mm.
SF:275, WHKRS 153a, CC11a

311.+ Square-headed bolt, sides chamfered with upturned crescent over a B in raised relief on the top. Only last third of shaft threaded. Square nut, slightly domed on one face. Identical in form to Cat. 305.
Bolt – L:81mm, D:16mm
Bolt head – L top:26mm, L bottom:28mm, H:12mm
Nut – L:30mm, H:16.5mm.
SF:56, Site WHKRS 206, CC17

312.+ Square-headed iron bolt bearing in relief ISR on two opposite facets of the very shallow pyramidal top. (not collected)
SF:104, Site WHKRS 35, CC2

313.+ Coach bolt, threaded towards the end. Domed head. Hexagonal nut.
Bolt – L:135mm, L of threaded section:28mm, D:16mm
Bolt head – H:10mm, D:34mm
Nut – L:32mm, W:28.5mm, H:16mm.
SF:70.1, Site WHKRS 162

314.+ Coach bolt, as Cat. no. 313 with circular washer.
Bolt – L:119mm, L threaded section:27mm, D:11mm
Bolt head – H:11mm, D:32.5mm
Nut – L:34mm, W:31mm, H:16mm
Washer – Th:3.5mm, D (ext.):42mm, D (int.):20mm.
SF:70.2, Site WHKRS 162

315.+ Iron screw with square 'bolt' head, slightly bent. Tapers to a point.
Screw – L:115mm, L of unthreaded section:38mm, L of threaded section:64.5mm, D:13mm
Head – L:22mm, H:11.5mm.
SF:71, Site WHKRS 162

316.+ Square iron washer.
L:32mm, Th:4mm,
SF:26, Site WHKRS locus uncertain

317.+ Adonised pale grey bolt. Long unthreaded shaft broken part way down the thread. Square head with corners chamfered to give round top. More modern than other material? Found by square post – telegraph pole?
L:118mm, L of unthreaded section:100mm, D:10mm,
Head – L:18mm, Th:8mm.
SF:55, Site WHKRS 234, CC19

Rail spikes

318.+ Rail spike with square-sectioned shaft tapering to a point from two opposite sides only. 'T'-shaped head stamped with PNBC and a star and crescent.
L:115.5mm, W of shaft:16mm, Th of shaft:16mm
Head – L:34mm, W:32mm.
SF:28.1, Site WHKRS 257, CC25

319.+ Rail spike as Cat. no. 318 but no inscription or decoration on head. Badly bent.
SF:28.2, Site WHKRS 257, CC25

320.+ Rail spike similar to Cat. no. 318 but head chamfered at the front.
L:131mm, Shaft – W:16.75mm, Th:16.75mm; Head – L:35mm, W:31mm.
SF:35, Site WHKRS 6, CC1

321. Two rail spikes. (not collected)
SF:100, Site WHKRS 6, CC1

322. Iron rail spike with a bent shaft. The point has been removed and the end of the shaft rounded. (not collected)
SF:102, Site WHKRS 16

323. Rail spike. (not collected)
SF:115, Site WHKRS 145, CC9

324.+ Rail spike stamped on the head with a five-pointed star and PNBC$^{\underline{O}}$.
Head 32 x 26.5mm, shaft 15mm square in section. L:117mm.
SF:255, WHKRS 169a, CC14b1

325.+ Rail spike stamped with a star and crescent on the head.
L:115mm, W:11mm, Th:16mm.
SF:293, WHKRS 190a, CC14f

Iron rail spikes of this form are referred to as dog spikes in the report on railway stores at Wadi Halfa and Sarras compiled probably in December 1883 (National Archives, WO 78/185). For examples from the excavations at Kulubnarti see Adams and Adams 1998, 50 both now in the British Museum (EA 77673 and 77674).

Fishplates

326.+ Fishplate pierced by four lozenge-shaped holes spaced 120mm, 110mm and 120mm apart centre to centre. Chamfered along top and bottom on one face and bearing raised dots and inscriptions EFBU and SUC.
L:451mm, W of chamfer:3.5mm, H:61mm, Th:15mm
Holes – L:27mm, W:18mm.
SF:23.1, Site WHKRS 136, CC6

327.+ Fishplate very similar to Cat. no. 326. One face rusted but does not appear to have born inscriptions and the raised dots. All dimensions as Cat. no. 326 but 2mm shorter.
L:449mm.
SF:23.2, Site WHKRS 136, CC6

328.+ Fishplate pierced by four lozenge-shaped holes spaced 105, 110mm and 110mm apart centre to centre. Chamfered along top and bottom on one face and with shallow chamfer on the other. Bears three impressed inscriptions E.V, 75 and SR. The central inscription is much shallower than the others and set at an angle. The letters S and R are separated by a star and crescent.

L:408mm, H:65mm, Th:20mm, W of chamfer (front):5mm, W of chamfer (back):13mm
Holes – L:27mm, W:21mm.
SF:24, Site WHKRS 23, Murrat Wells

329. Bar roughly cut from the edge of a ferrous metal fishplate. The upper part of the embossed letters S and R with a crescent between survive.
L:224mm, W:13mm, Th:19mm.
SF:156, WHKRS 6, CC1

Rails

330.+ Rails reused to support the verandas of many buildings in the *souk* at Delgo, some with fish plates held in place with original bolts. At least one bears an inscription in raised relief along the side of the rail

BV & C^{o} III 1885 I B STEEL 411141 B S

(note the central B and final BS are uncertain). Not collected.
SF:122, WHKRS Delgo

Rolling stock

331.+ Square slightly dished (along its length) iron plate with a raised boss in the centre through which is a threaded hole. L:75mm, W:71mm, Th:8.25-10.5mm 20.5mm at boss, D:17mm hole.
SF:37, Site WHKRS 6, CC1

332.+ Rectangular iron bracket pierced by a countersunk hole at each corner. Flanges 44mm high along the two long sides. Plate slightly bowed. Handmade, clear hammer marks.
L:221mm 144mm flange, 82mm 107mm at flanges, H:44mm flange, Th:10mm 8.5mm flange, D:10mm holes.
SF:69, Site WHKRS 162

333.+ Small fragment from an iron casting perhaps similar to Cat. nos 334 and 335. It bears in raised letters part of the word BIRMINGHAM.
L:79+mm, H:31+mm, Th:8mm max 4mm min.
SF:80, Site WHKRS 162

334.+ Two-piece casting held together by two bolts. Both pieces fragmentary. Upper piece – arch-shaped with flanges to each side pierced by bolt holes. Cast into it on front face in high relief is

CAPE
BM & C^{O} L^{D}
BRITANNIA WORKS
BIRMINGHAM
1882

On top of arch traces of a threaded hole.

Plate 184. Detail of the axle box cover on a wagon in the repair workshop of Sudan Railways, Khartoum, October 2008.

L front to back 108+mm, L of arch:131mm, L with flanges:208mm, L of tray (ext.):110mm, L of tray with flanges for bolts:210mm, L of tray with grooved flanges:139mm, L of bolt heads:27.5mm. L of nuts: 28.5mm, H:189mm upper piece H:75mm tray, 8mm upper piece, D:19mm bolt holes, D:9mm tray, central holes.

Lower piece – rectangular tray extended at one end with two flanges pierced by bolt holes to attach the upper piece. Flange outside tray with locating groove. On centre line of tray two conical projections with central holes, not threaded. Bottom slightly dished.
L front to back 192+mm, L of arch:131mm, L with flanges:208mm, L of tray (ext.):110mm, L of tray with flanges for bolts (ext.):210mm, L of tray with grooved flanges:139mm, H:189mm upper piece, H of tray:75mm, H of upper piece:8mm, D:19mm bolt holes, D of tray central holes:9mm.

Nuts and bolts, one with washer. Hexagonal head, little under half of shaft threaded, drilled near end for locking wire.

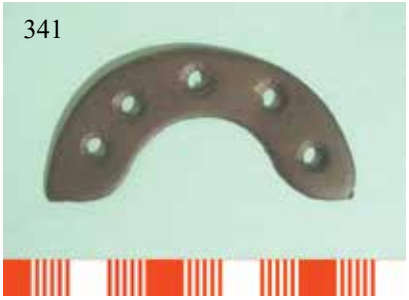


Plate 185. Axle covers, shoe sole protectors and other metal objects, catalogue nos 333-342.

L:108mm bolts 43mm bolts, threaded length 30mm bolt heads 32.5mm nut, W:27.5mm bolt heads 28.5mm nut, Th:3.5mm bolt heads 16mm nut 4mm washer, D:15.5mm bolts 41.5mm washer ext.
SF:81, Site WHKRS 162

335.+ Two piece casting very similar to Cat. no. 334. Upper piece – Arch top missing but does not appear to contain the word CAPE. Otherwise inscription identical but date is 1885. Minor differences in the flanges for the bolts. Casting broke through on left side of arch.
L:141+mm, 134mm of arch 203mm with flanges, H:138+mm, Th:7mm.

Lower piece – towards the back there appears to be the start of another flange for a bolt.
L:190+, 114mm 202mm with flanges for bolts 141mm with grooved flanges, H:75mm.

Two nuts and bolts, one with locking wire in place. No washers provided. Nuts slightly stepped as Cat. no. 304.
L:106mm 31mm head 33mm nut, W:27.5mm head 29.5mm nut, Th:15mm head 16mm nut, D:16mm.
SF:82, Site WHKRS 66

336.+ Large ferrous metal 'L'-shaped bracket with a square-headed nut and bolt with washer through it. Perhaps from the rolling stock destroyed by the explosion.
Bracket – L:137mm, W:100mm, Th max:58mm; bolt – L:150mm, head 28mm square, shaft D:16mm.
SF:281, WHKRS 162

337.+ Rectangular ferrous metal bracket with rounded corners each long side pierced by two countersunk holes. Strengthening for the end of a timber of 115 x 39mm scantling?
L:127mm, W:50mm, Th:6.5mm, H:25mm.
SF:269, WHKRS CC13a3

Objects Cat. nos 334 and 335 are railway wagon or carriage axle box covers[1] made by Brown, Marshall & Company Limited, Saltley, Birmingham. This company, which was established in 1840, had by 1918 become part of the Metropolitan Railway Carriage & Wagon Company Limited and eventually Metro-Cammell. A four-wheel flatbed wagon with axle covers of this type, one with an identical inscription to that of Cat. no. 334 (the date is masked by a thick encrustation), another with the inscription

CAPE
W^H RC & C^O
SALTLEY WORKS
BIRMINGHAM
....

[1] Kindly identified by Mr John Clarke of the National Railway Museum, York.

survives in the repair workshop of Sudan Railways in Khartoum. Another surviving piece of rolling stock may be the carriage often thought to have been used by Kitchener as his headquarters during the Dongola campaign (Plate 12). This may have been shipped back to England in 1898 and was used by George V during the First World War. It is now in 3 Slip - The Big Store at ERIH Anchor Point in the Historic Dockyard, Chatham. It was made in 1885 by the Birmingham Metropolitan Railway Carriage and Wagon Company perhaps initially for use on the Suakin to Berber railway (see pg. 11, fn. 14; *The Times*, 6-11-2008, 75).

Nails

338. Iron nail, machine made. Identical to modern nails except head a little oval.
L:65mm, D:8.5-7.5mm head 4mm shaft.
SF:91, Site WHKRS 35, CC2

339. Five handmade nails with facetted conical heads.
L:48mm, H:3mm of head, D:8mm head, D:4mm shaft.
SF:92, Site WHKRS 35, CC2

340.+ Rectangular-sectioned iron nail broadening along its length from the sharp point to the rectangular head. This type of nail was used to affix donkey shoes.
L:50mm, Width and thickness of the head – W:6mm, Th:5.5mm.
SF:292, WHKRS 190a, CC14f

Personal items

341.+ Shoe heel protector, semi-circular pierced by five countersunk holes.
L:40mm, W:80.5mm 17.5-20.5mm band, Th:2mm, D:5mm holes.
SF:27, Site WHKRS 250, CC23

342.+ Iron 'D'-shaped heel protector with a heart-shaped cut-out. Retains the five nails which held it in place. Presumably from a high-heeled boot considering the length of the nails. (not collected)
SF:99, WHKRS

343.+ Belt end with three prongs and hinged loop to affix it to the belt. Coiled snake and 'D'-shaped loop for attachment to the other end of the belt.

This is a military design but is unusual in being made of ferrous metal rather than a material which could be polished to a high lustre.
L:47mm, W:50.5mm, Th:2.5mm.
SF:9, Site WHKRS 139, CC7

344.+ Sub-rectangular buckle of iron with two prongs rotating on a central bar.
L:60mm, W:28mm, D:3-3.5mm wire.
SF:31, Site WHKRS 96, CC5

345.+ Sub-rectangular iron buckle with a single prong.
L:58mm 64.5mm prong, W:54mm, D:7.5mm wire

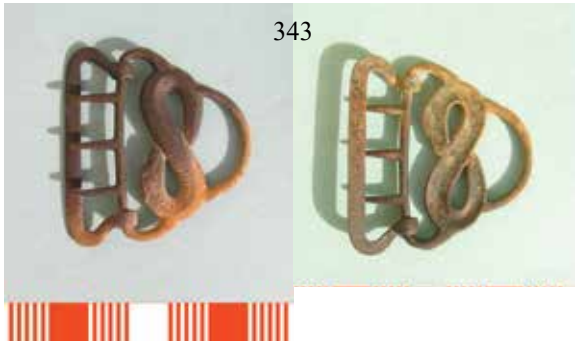


Plate 186. Belt buckles, metal objects, lead sealings and wooden objects, catalogue nos 343-357.

Plate 187. Wooden tent pegs and textile fragments, catalogue nos 359-366.

6.6mm prong.
SF:76, Site WHKRS 162

346.+ Large sub-rectangular iron buckle with two prongs.
L:70mm, W:27mm, Th:4mm.
SF:244, WHKRS 136, CC6

347.+ Small rectangular iron buckle made from circular-sectioned rod (D:2.75mm) with a single prong on a short side and a sleeve on an adjacent side.
L:23mm, W:18.5mm, Th:4.5mm.
SF:345, WHKRS 15a/b, CC1z1/2

348.+ Razor blade with part of the hole for a pin to attach it to the handle surviving.
L:103+mm, H:36-12mm, Th:1.2mm.
SF:57, Site WHKRS 208, CC18

349.+ Clasp and hinged trim from a purse with rivets and backing plate to attach it to the leather or fabric. Notched decoration along the edge, copper bulbous clasps.
L:*c*. 85mm, W:5.5mm, Th:0.5mm.
SF:30, Site WHKRS 96, CC5

Lead seals

350.+ Roughly oval lead seal impressed with a stamp on both sides, each within an oval roundel. One stamp is at 180º to the other. Both sides read تعينات *taeenat*, military supplies, Found within the southern part of the fort.
L:21mm, W:19.5mm, Th:5.5mm.
SF:166, WHKRS 54, Ambigol Wells

351.+ Lead seal roughly oval in shape with an inscription on both sides within an oval roundel. It reads تعينات *taeenat*, military supplies.
L:23mm, W:21mm, Th:5mm.
SF:183, WHKRS 139, CC7

Wood

352.+ Toggle with a central groove and a small hole drilled through it near to one end.
L:78mm, Max D:23mm, Hole D:4mm.
SF:271, WHKRS 172a, CC14c

353. Toggle with central groove. Biconical? (not collected)
SF:107, Site WHKRS 96, CC5

354.+ Cylindrical object with a flange at both ends and a hole through its length, a bobbin
L:45mm, Max D:29mm, Hole D:11mm.
SF:167, WHKRS 123a, CC5d

355.+ A cylindrical object as Cat. no. 354.
L:35mm, Max D:20mm, Hole D:7mm.
F:235, WHKRS 32a, CC1b B

356.+ Cylindrical mallet head with a rectangular socket 27 x 14mm running right through it to accept the handle. A circular hole 5.5mm in diameter on one side and 7mm on the other at 90º to this will have been used for a peg to affix the handle to the head.
L:115mm, W:32mm.
SF:173, WHKRS CC13a1

357.+ Small wedge probably used in attaching a tool head to its wooden handle.
L:29mm, W:26mm, Th:12-3mm.
SF:372, WHKRS 162

358. Wooden tent peg pointed towards one end. (not collected)
SF:113, Site WHKRS 208, CC18

359.+ Tent peg with a shallow notch 73mm from the upper end. The lower part is missing.
L:191+mm, Max D:27mm.
SF:299, WHKRS 190a, CC14f

360.+ Upper part of a rectangular-sectioned tent peg with a notch in one side.
L:111mm, W:34mm, Th:13mm.
SF:381, WHKRS 145, CC9 Deposit VII

Textile

361.+ Textile fragments. Many cotton cloth fragments, some substantial. All have been scrunched up before being cut from larger items. About half of the items are of lightweight plain cloth (close weave like poplin, *c*. 28 threads / cm) and are hand stitched.

A – Largest piece is sewn on two sides with one side attached to a gathered second piece; possibly part of a collar or cuff.

B – a strip with a hand-sewn seam allowance with a join to a second gathered piece.

C – hand-sewn cuff corner with attached thread for a button and part of the sleeve attached.

D – piece hand sewn to heavier coarse fabric that has green threads in one direction, plain in the other. There is a succession of felting (like moleskin). It is a complex shape, possibly an upstand collar. There is evidence for the button attachment through several thicknesses of cloth and one handmade button hole. The rest of the pieces are of similar cotton but of coarser appearance. They have roughly the same thread count so possibly they are worn pieces of the same textile.

E – one large piece and lots of fragments, all shredded.

F – several fragments of the heavier 'green' fabric.

A few pieces of palm leaves and a very small fragment of bone also in the deposit.
SF:151, WHKRS 90, CC4 Deposit VIII

362.+ Textile fragments.

A – 450mm length of removed seam allowance from a larger item in a lightweight cotton canvas, hand sewn.

B – several pieces of the same canvas cut from something larger after being scrunched up.

Plate 188. Textile fragments and paper documents, catalogue nos 367-371.

C – several pieces of plain weave cotton (approximating to the weight of a light sheet) scrunched up and then cut from a larger item.
D – two short lengths of 2.5mm diameter S-twisted rope/cord (jute?).
E – knot of the same cord associated with some of the cotton canvas.
F – two pieces of cotton webbed cord (like pyjama cord) not tubular but round. One piece is knotted at the end.
G – large shredded piece of muslin or gauze scrunched up with some of the cotton and cut together. Found at locus F.
SF:152, WHKRS 145, CC9 Deposit VII

363.+ Fragments of textile.
A – used pieces of cotton drill loosely squashed up into a palm-sized bundle and then sliced off, leaving indicative cut marks.
B – lightweight plain cotton offcuts including a length of hand-sewn hem.
C – cotton canvas offcuts.
D – short lengths of rope (jute? flax?) with two strands, *c*. 2.5mm in diameter, S-twist. Two bits knotted together, one piece with a knot.
E – small fragment of closely woven plain cotton, possibly with treatment on one side.
There was also a small fragment of paper.
SF:210, WHKRS 146, CC10 Deposit I

364.+ Textile fragments.
A – approximately 260mm length of coarse canvas (cotton warp, jute? weft) with a selvedge. One long side is sewn by hand to muslin/gauze. There is a crude hole cut on one corner with a lightweight plain cotton length passed through it and tied.
B – another piece of the same canvas, triangular in shape with the edge hand sewn to muslin/gauze. It appears to be the 'upper' corner of a large triangular piece, cut through at the top.
C – rectangular piece of lightweight plain cotton knotted in one corner with jute? fibres caught in the knot.
D – long 'streamered' strip of fine plain cotton (poplin weight) cut at one end.
E – piece of medium weight plain cotton, hand stitched (running stitch) to a second fragment of the same cloth, both scrunched up and cut through after use.
F – two lengths of medium weight plain cotton tied in loops and knotted, loop diameter 40mm. Neither are cut.
G – very tight multiply-folded lightweight plain cotton fragment once wrapped around something rectangular (*c*. 10 x 5mm). It was cut through diagonally in one go.
SF:143, WHKRS 139, CC7 Deposit IV

365.+ Rope fragments.
A – length (one or two) of cable-laid rope (jute? flax?) with two closely spaced knots (a stopper knot?), D:*c*. 8mm.
B – two short lengths of rope made from double strands of lightweight plain cotton twisted together. The strands are tightly twisted,(D:*c*. 8mm). Both lengths have been sliced along their length and at the ends in a single action for each.
SF:131, WHKRS 93a, CC4b Deposit II

366.+ Textile fragments.
A – Five fragments of coarse sacking (jute?) cut from larger pieces. One piece is partially wrapped around a length of matting or twisted palm rope.
B – two lengths and a fragment of cotton webbed cord (like pyjama cord).
C – two small fragments of plain cotton fabric cut from larger used pieces.
SF:213, WHKRS 139, CC7 Deposit V

367.+ Textile fragments and hair.
A – 320mm length of hand-sewn seam allowance in lightweight plain cotton cut from a larger piece with rectangular segments removed leaving three rectangular flaps (a castellated effect).
B – short length of twisted rope (jute? flax?) S-twist, (D:*c*, 4mm).
C – multiple clumps of long wavy hair varying in colour from black to brown. None of the clumps have been cut before the locks were made. The origin of the hair, whether human or from another source is unknown.
Found in the second tent, west row.
SF:147, WHKRS 110a, CC5a Deposit III

368.+ Textile and hair fragments.
A – *c*. 200mm length of coarse cotton canvas, one edge rough, one cut. There is a 6mm wide band of blue weft running its full length.
B – a piece of medium weight plain cotton cut from some large piece which had been scrunched up before cutting.
C – two small clumps (L:16mm and 20mm) of short coarse dark hair (beard?).
In the deposit is a small piece of palm frond stem 115mm long neatly sawn off at one end.
SF:150, WHKRS 136, CC6 Deposit VI

Paper

A small number of fragmentary documents was recovered. These have been studied and are published here by Mahmoud Suleiman Bashiir. Amongst them are only two paper documents containing substantial amounts of text (Cat. nos 369 & 372). The general state of preservation of both documents is poor and only parts of the texts are readable. However, they do shed some interesting light on the personnel involved in the latter stages of the railway's construction.

Both documents contain hand-written text in Arabic. Unfortunately it is impossible to ascertain the full meaning of even a single sentence, because of the lacunae and the poor state of preservation of what remains. Both texts make use of military language and employ Turkish terms some of which are still in use in the Sudanese military language. The clearest example of this is to be found on the lead seals (Cat. nos 350 & 351), which read تعينات 'food supplies'. In addition, the old Turkish numbering for the battalions is used, Bringi for 1, Kingi for 2, and Talatagi for 3 and so on. Here Arabic numbers are employed with the addition of the letters G ج and I ي after the number. Two numbers of this type were observed on the collected papers.

369.+ Document fragment with hand-written text in Arabic on both sides at right angles to each other. The paper has been neatly folded and has mainly broken along the folds.

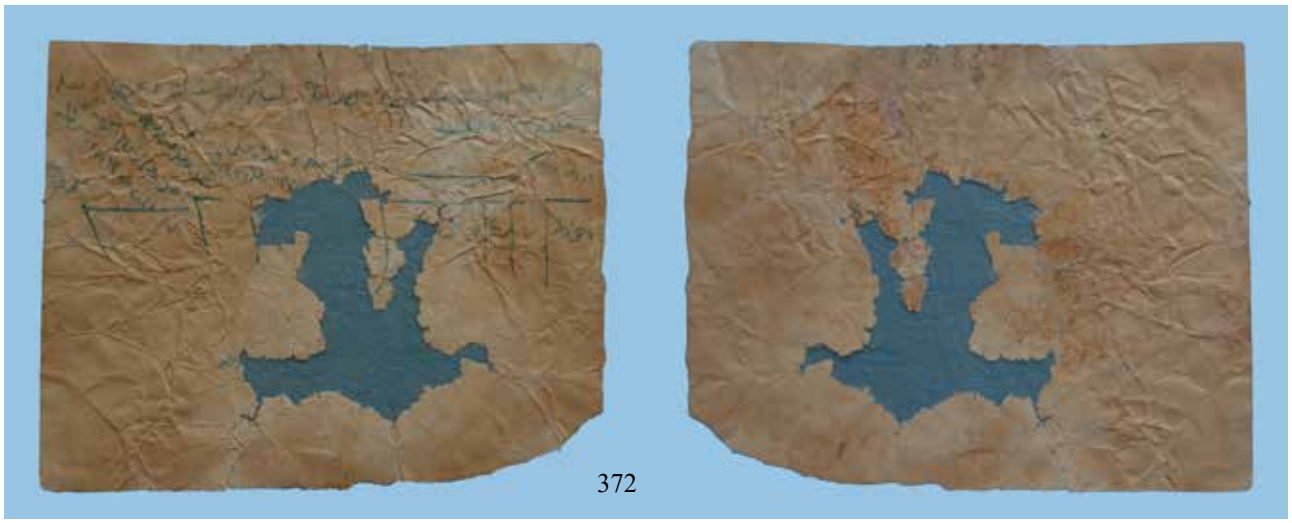
The surviving text on this document is the last two lines of an official letter from a lower to an upper ranking soldier, the latter most probably the leader or the commander of battalion.
The first line of the text reads:

ثم حضرتم و هو يأتى رئيس

then you attended and he is becoming as a leader

The 'you' is a plural. On the other side of the sheet the final line is an unreadable signature above which is:

[.....] ٨ جى اورطه افندم حالى



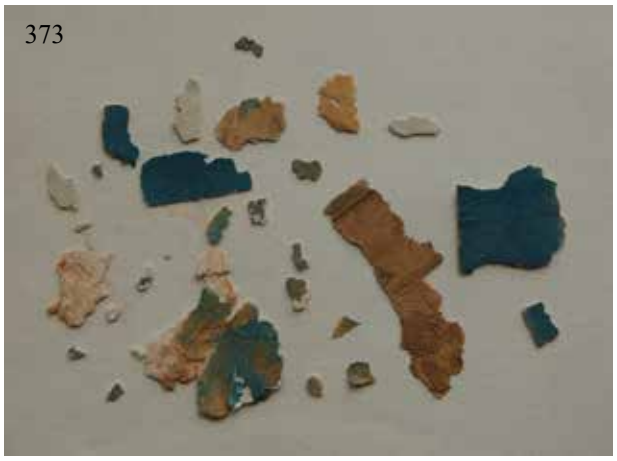


Plate 189. Paper documents, leather sole, shell button, faience bead and guffa*, catalogue nos 372-382.*

[....] Battalion 8 {*Tamanyagi Orta*}, present Sir.

W:113+mm, H:84+mm.
SF:319, WHKRS 146, CC10

370.+ Small fragment of a document. No traces of text can be seen.
W:80+mm, H:39+mm.
SF:321, WHKRS 145, CC9 Deposit VII

371.+ Document fragment with the typescript word 'from' …]الا من ر[… in Arabic.
W:18+mm, H:13+mm.
SF:323, WHKRS 139, CC7 Deposit IV

372.+ Manuscript document in pale blue ink. The central part of the sheet is missing. This text is a soldier's report, which has been written in Arabic in the form of a questioner and includes a number of questions concerning his service. This text is the most important of the documents found containing dates and place names together with a clear mentioning of the military campaign to Dongola (Figure 46).
L:168mm, W:210mm.

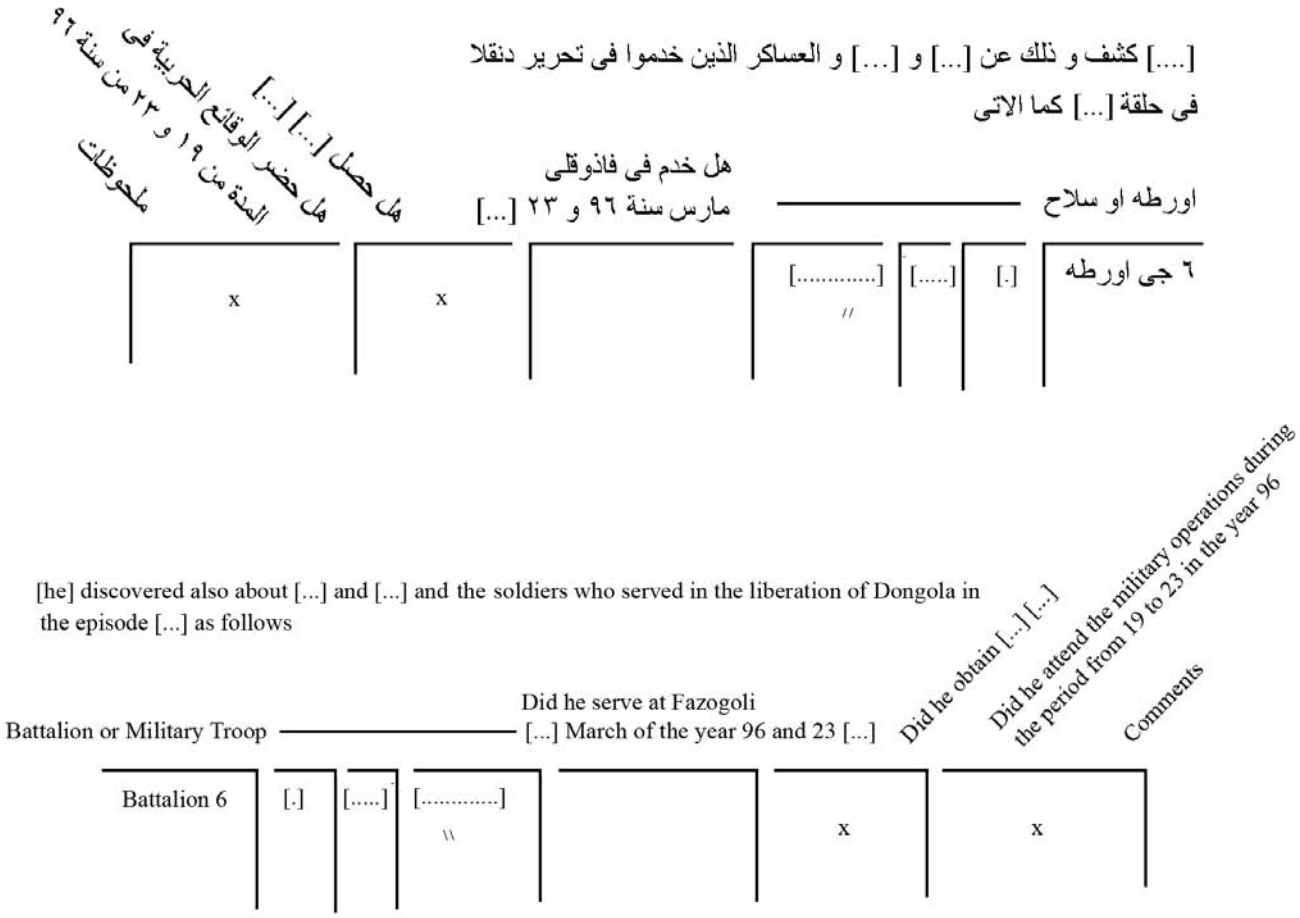


Figure 46. Schematic representation of the document Catalogue no. 372 with Arabic transcription and English translation.

SF:322, WHKRS 139, CC7 Deposit IV

373.+ Fragments perhaps from a card book cover? These are blue on one side, cream on the other. There is also one cream paper fragment with a border of seven thin parallel lines, one thick line and another thin one all in black. Largest blue fragment W:31+mm, H:29+mm.
SF:320, WHKRS 90, CC4 Deposit VIII

374.+ Small fragment from a buff-coloured paper label, perhaps originally of oval shape. It has an oval border of a wide and narrow black band. Only a part of the lower portion of the label survives with the words

SAUL. […..
MEDAILLES

the latter in a much smaller font. The word following Saul begins with an upright stroke.
W:18mm, H:25+mm.
SF:382, WHKRS 90, CC4 Deposit VIII

Leather

375.+ Two conjoining pieces from the insole of a shoe with another insole fragment attached by circular-sectioned nails (L:15mm) with flat rounded heads. Around the edge are many nail holes and some square-sectioned headless nails (L:8mm).
L:*c*. 160mm, W:56mm, Th:3mm.
SF:127, WHKRS 153b, CC11b

Bone

376. Fragment from a rib probably from a cow but possibly from a camel.[2] There is no evidence that this has been worked to form an object.
L:125+mm, W:40mm, Th:11mm.
SF:380, WHKRS 139, CC7 Deposit IV

Shell

377.+ A white disc button made from shell with two small holes.
Th:1.8mm, Max D:12mm, Hole D:1mm.
SF:135, WHKRS CC14f

378. Thin and flat button of mother-of-pearl possibly originally with two holes now broken through.
Th:1.5mm, Max D:14mm.
SF:177, WHKRS 145, CC9

379. Flat roughly circular disc button of mother-of-pearl with two small overlapping holes in the centre. The disc is much thicker on one side.
Th:1.2-0.6mm, Max D:12mm, Hole D:1mm.

[2] Identified by Pernille Bangsgaard Jensen

SF:338, WHKRS 121a, CC5c

380. Disc button made from mother-of-pearl pierced by two holes in the slightly dished centre.
Th:1.5mm, D:12mm,
SF:52, Site WHKRS 145, CC9

Matting

381.+ Wall of a *guffa* with string handle. (Not collected)
SF:384, Site WHKRS 93a, CC4b

Faience

382.+ Blue slightly oval square-sectioned ring bead.
Th:6.5mm, Max D:13mm, Hole D:5mm.
SF:126, WHKRS 153b, CC11b B

Chalk

383. Fragment of a stick of chalk.
L:25mm, Max D:12mm.
SF:246, WHKRS 136, CC6

Graffito on stone

384.* On the face of the rock at locus 230b, quarried away during the re-alignment of the railway over the new bridge at Kajbar, was an incised graffito (Figure 47). Its meaning is unclear.

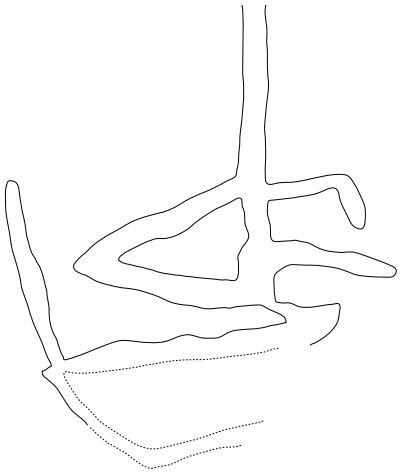


Figure 47. Graffito incised on the quarried face of the cutting immediately south of the bridge at Kajbar.

'Ritual' deposits

Within a number of camps small collections, often of diverse objects and materials, were found buried in very shallow pits either within the tent circles or in the ridges delimiting one tent plot from another. The individual items are listed with their detailed description in the catalogue above. The following deposits were found:

Deposit I from CC10
- Textiles — Cat. no. 363
- Tubular metal handle — Cat. no. 267

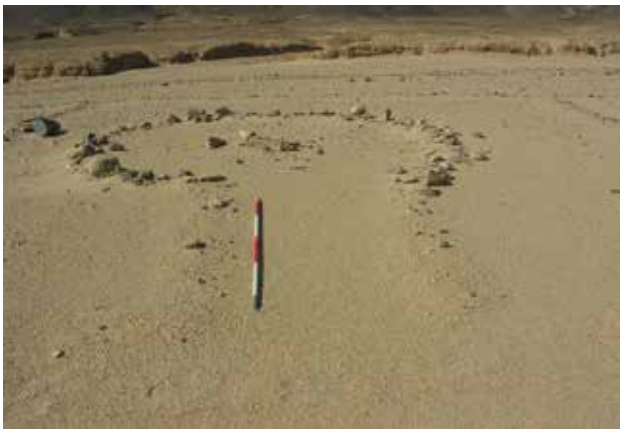


Plate 190. Deposit III in the centre of a tent base at camp 5a.

Plate 191. Deposit IV at camp 7.

Plate 192. Deposit VI at camp 6.

Deposit II from CC4b
- White glass button — Cat. no. 141
- Rope — Cat. no. 365

Deposit III from CC5a
- Textile and hair — Cat. no. 367

Deposit IV from CC7
- Cattle rib — Cat. no. 376

White glass button Cat. no. 142
Broken glass stopper Cat. no. 137
Textiles Cat. no. 364
Document Cat. no. 372
Document Cat. no. 371

Deposit V from CC7
Textiles Cat. no. 366

Deposit VI from CC6
Textiles and hair (beard?) Cat. no. 368
Palm frond stem

Deposit VII from CC9 F
Wooden tent peg Cat. no. 360
Textiles Cat. no. 362
Document Cat. no. 370

Deposit VIII from CC4
Paper label Cat. no. 374
Book cover? Cat. no. 373
Textiles Cat. no. 361
Ferrous metal button Cat. no. 204
Ferrous metal gilded button Cat. no. 203

Discussion

The finds recovered during the survey provide a wealth of information on the more mundane aspects of a military campaign in the late Victorian period. Apart from the small number of obviously intrusive objects which long post-date the construction and use of the railway, it has rarely been possible to differentiate between those objects used by the Gordon Relief Expedition, by the Dongola Expedition and during the use and dismantling of the railway. However, the context of many items coupled with the historical record detailing the progress of the railway's construction allows many objects to be associated with a particular phase of activity. There is nothing that can convincingly be related to the civilian phase of the railway's construction. By the time the railway was abandoned by Gordon it had only reached as far as Sarras although the rail-bed did extend a little further. Virtually the whole of the line along with the associated construction camps as completed by 1879 lies beneath the waters of Lake Nubia. No study of the railway comparable to the survey reported upon in this volume was undertaken before its complete destruction. During the Gordon Relief Expedition railway installations were constructed as far as Firka as well as along the aborted route which was to meet the river between Semna and Wadi Attiri (see pg. 5). Traces of the associated construction camps may have been noted at Camp 1 and Camp 1a4 (see pgs 32 & 34) where the tent lines of 1896 in places appear to be overlying an earlier arrangement. At Camp 1 the buttons, Cat. nos 186-191, may date to the activities in the 1880s as may the ferrous metal tin perhaps containing vegetables dating from the 'Saison 1884' (Cat. no. 205). The oval fish bolts (Cat. no. 309) were only noted at this camp and may also date to an early phase on the construction of the railway as elsewhere all the fish bolts are of circular section as Cat. no. 302. Other finds which might relate to this period cannot be identified.

The finds fall into a number of categories reflecting the nature of the activities being undertaken, railway construction and dismantling along with the army as an offensive mobile force and as a defender of the supply lines. The finds also reflect the differing components of the force, the British officers, the British, Egyptian and Sudanese troops and the railway workers. The buttons as Cat. nos 177 - 185 will have come from the uniforms of the Egyptian units in the 1880s.

Of the material relating directly to the military the ammunition confirms that the weaponry issued to the Egyptian army units participating particularly in the 1896 campaign was of a type no longer used by British soldiers. Much of it at that time was obsolete and indeed much of it had been manufactured well over a decade earlier, perhaps this in part being responsible for what must have been a dramatic accident when an ammunition wagon exploded on the section of line in use between 1897 and 1904.

Although we know that during the construction of the railway in 1896-7 there were British officers, Egyptian officers and men, Sudanese troops and prisoners of war along with a wide range of camp followers these groups are not obviously reflected in the material recovered from the construction camps. This is particularly the case with objects associated with the provision of rations and the production and consumption of food. Notable by its absence is evidence for cutlery – only one fork or spoon was recovered (Cat. no. 259). However these objects, although susceptible to accidental loss were eminently reusable and may have been collected from the sites subsequently. A wide range of crockery was noted with good quality china in some profusion from a range of European factories. These included plates, bowls, dishes and tourines as well as cups and saucers. The Egyptian and Sudanese soldiers in the ranks presumably will have eaten from communal bowls with their hands and may have used the crude metal cups as Cat. nos 260-262 for drinking. As well as the ceramics imported from Europe, presumably the property of the British and Egyptian officers, were a number of ceramic containers of Egyptian manufacture including large water storage vessels (*zir*) and fine water jugs (*qulla*) with filters. Also of Egyptian manufacture are the internally glazed double-handled cooking pots as Cat. nos 67-70. The very crude vessels, Cat. nos 65 and 66 are in a very distinctive fabric seen on a number of sites in northern Sudan and were still being made in the early 20th century (Welsby Sjöström 2001, 234 - Fabric 51).

Food and drink was obtained from a wide range of sources, purchased by the military on the open market. Tinned goods were common, the highest proportion

containing the products of Messrs Crosse and Blackwell. Tins of the type still used for sardines came from Chicago (USA), Brazil and Nantes (France) while the origin of many others is not known. Beverages included Rose's lime cordial, Tennent's pale ale, soda water and champagne, the latter often included amongst military supplies for medicinal reasons. Among the condiments was Lea and Perrins. The pale ale was transported in stoneware bottles which were only found in Camp 1a4 and in the nearby Camp 1a5 where large numbers were discarded after what must have been quite a party.

At least one cigarette tin was found (Cat. no. 216) but not a single clay smoking pipe.

The abundant donkey shoes reflect the importance of that animal as a beast of burden. Horse shoes are by contrast very rare. The undoubted presence of large numbers of camels has left no trace amongst the artefacts in the archaeological record apart perhaps from the 'iron camel tank' (Cat. no. 255).

Of the railway itself many elements were either recovered or noted. Dating from the use of the line were the axle boxes, one which presumably was from the rolling stock destroyed by the ammunition explosion, the other found by the line reflecting a structural failure when the rolling stock was in use. When the line was abandoned all reusable material between Kerma and Kosha was removed. The cache of bolts (Cat. no. 302) by Camp 6 were presumably inadvertently forgotten. Although most of the rails were recycled during the expansion of Sudan Railways in the early 20th century a significant number found their way into local buildings. Why these were not removed by the railway demolition gangs is uncertain although at least one in the *souk* at Delgo dates from 1885 and may, therefore, have been of too light a weight for use on the new railways.

The date of the 'flimsies', the square metal petroleum product tins is in most cases unclear. As already noted the Shell tin dates to the 1960s but the others are much earlier although whether contemporary with or post-dating the use of the railway is uncertain. What use the contents may have been put if they predate the use of the internal combustion engine in Sudan, is equally uncertain.

The most intriguing finds were the 'ritual deposits'. No explanation for these comes readily to mind. They are certainly not the result of rubbish disposal. Some small degree of effort has been taken to bury them but it is the nature of the material in the deposits which indicates that their deposition must have held some special meaning which may be sought amongst Egyptian popular religion. One deposit is certainly associated with an Egyptian soldier as it contains an army report on his conduct (Cat. no. 372).

The location of the types of finds within the camps was not as informative as might have been expected. Of the large numbers of glass bottles for beverages these were not confined to those tents which, from their position, may be assigned to the officers. Likewise with the fine ceramics, these were widely distributed across the camps although their find spots may not reflect where they had actually been used. Certainly rarely were all the sherds from these objects recovered together. In those camps, or parts of the camps, where there were tent bases surrounded by concentric circular enclosures there was a clear association with a high proportion of banding iron and nails indicating that it was in these areas that stores, presumably in wooden crates were unpacked. The wooden crating would then have provided a ready source of fuel for the cooking fires which are invariably to be found close by.

Not a single coin was found and only one item of jewellery, a faience bead. One might have expected a wider range at least of jewellery belonging to the camp followers but this group have left little trace in the artefact record.

The finds and archive

All the finds listed above were handed over to the Sudan National Museum in February 2008 and 2011.[3] Copies of the digital archive are housed in the archives of the Sudan Archaeological Research Society at the British Museum, London and in the National Corporation for Antiquities and Museums in Khartoum.

[3] Objects from Camps 1z1 and 1z2 are marked/labelled 1aaa, objects from Camp 14a1 are marked/labelled 14aa1.

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'Pepper box', redoubt and tent lines at Murrat Wells.

Bridge in the desert between Kosha and Delgo.

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