

Archaeology of St Bathans Cottage Hospital, Central Otago, New Zealand

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This paper describes the excavation and analysis of an assemblage from a cesspit at St Bathans Cottage Hospital. Artefacts include various items for diagnosis, preparation and delivery of medical treatments, along with patent and proprietary pharmaceuticals and a range of standard domestic items. Consideration is given to the relationship of medical and pharmaceutical products in the hospital setting and also the dual function of the cottage hospital as a residence and medical institution. Comparisons are made with selected artefacts from hospital and non-hospital contexts in Thames and Wellington, in an attempt to identify characteristics that might be distinctive of medical institutions, and to provide a platform for the future development of 'hospital archaeology'.

INTRODUCTION

Cottage hospitals emerged in England during the early and middle decades of the nineteenth century to provide health care for the poor in rural communities distant from existing hospital facilities (McConaghey 1967). Constructed in the form of a farm labourer's cottage they offered a familiar environment where the sick could be treated by the family doctor and remain close to family and friends (Emrys-Roberts 1991). The concept of the cottage hospital spread rapidly through Britain in the 1860s and was adopted in many other parts of the world (Emrys-Roberts 1991). They were established in New Zealand at least as early as 1870 (*Grey River Argus* 6 August 1870:2). In this country they often took the form of a modest home, providing accommodation for a general practitioner and family, along with facilities for the treatment and nursing of patients.

Archaeological investigations of hospitals are relatively scarce, internationally and locally. In Europe most of the studies of hospitals are from medieval and early modern times, and most focus on skeletal remains from hospital burial grounds (Atkins and Popescu 2010; Lee and Magilton 1989; Price and Barber 1998; Roberts *et al.* 2012). Nineteenth or twentieth century examples, comparable to the time period of our study, are scarce – Morris *et al.* 2011 is one exception. North American literature ranges from early colonial to late nineteenth century in age and includes hospitals in urban, rural and military settings (Bush 2000; Carley 1981; Maniery 2002; Mann, Owsley and Shackel 1991; Schablitsky 2006; Triggs 2005). In Australia the only studies that we have been able to access are assessments of former hospital buildings rather than analyses of excavated finds, with the exception of the mid nineteenth-century material from the cesspit at the Civil Hospital on Norfolk Island (Starr 1997, 2001) and analysis of surgical equipment from the wreck of *HMS Pandora* (Pigott 1995). In New Zealand there have been excavations of late nineteenth-century deposits at hospitals in Wellington (O'Keeffe 2007) and Thames (Phillips and Druskovich 2009).

In this paper we set out to describe an assemblage from a small cottage hospital at St Bathans, New Zealand, and consider ways in which it may reflect its local context and its function as a cottage hospital. St Bathans, established two years after the beginning of the Otago gold rush in 1861, persisted longer than many other goldfields towns. Its gradual transition from frontier settlement to established town, coupled with relative isolation from major centres of population throughout this process, is likely to have been an important contextual factor in health care provision. The

cottage hospital served both medical and domestic functions, and the manner in which these are reflected in the archaeological assemblage forms the major focus of this paper. In exploring these we make comparison with two contemporary hospital sites in New Zealand, and look forward to the development of a 'hospital archaeology'. We also situate our study within broader transitions in medical care during the nineteenth century, which a focus on hospital archaeology is uniquely placed to explore.

ST BATHANS

St Bathans is located at the northern end of the Manuherikia Valley in Central Otago, New Zealand (Figure 1). It occupies a small valley on the western slopes of the southernmost spur of the St Bathans Range which separates the upper reaches of the Manuherikia River from one of its major tributaries, Dunstan Creek. Gold was discovered in this valley in late 1863 (McCraw 2009) leading to a rush of miners there in February 1864 (*Otago Witness* 6 February 1864:9, 13 February 1864:9, 20 February 1864:14, 27 February 1864:4). By April a race 13 miles (20.9 km) in length was bringing water to the diggings and there was a population of 700-800 (*Otago Witness* 16 April 1864:20). Initially known as Dunstan Creek or New Dunstan Creek, to distinguish it from an earlier settlement at Welshmans Gully (later Cambrians) which also had that name, the town quickly became one of 'the most prosperous and permanent of any in the province ... [comprising] about forty business places, ten of which are hotels ... a Court House, a place of worship belonging to the Roman Catholics, and a Police Camp on a small scale' (*Otago Witness* 29 October 1864:11). Its name was formally changed to St Bathans in December 1865 (*Otago Witness* 9 December 1865:11).

The prosperity of St Bathans derived from numerous gold-bearing seams within the tilted beds of quartz gravels and sands that comprised Kildare Hill, which formed the northeast side of the St Bathans gully. These were mined initially by digging deep shafts and tunnelling into the gold-bearing seams (*Otago Witness* 29 October 1864:11), but once sufficient water was available, first ground sluicing, then from about 1874, hydraulic sluicing was used (McCraw 2009:22-24). Small claims were gradually amalgamated and from about 1878 John Ewing began using a hydraulic elevator to lift sluiced material from progressively deeper levels. By 1895 two elevators on his Kildare claim were lifting a combined total of 142 feet (43.2 m) (McCraw 2009:29). Ewing's operations ceased in 1900, but from 1907 until 1934 first the

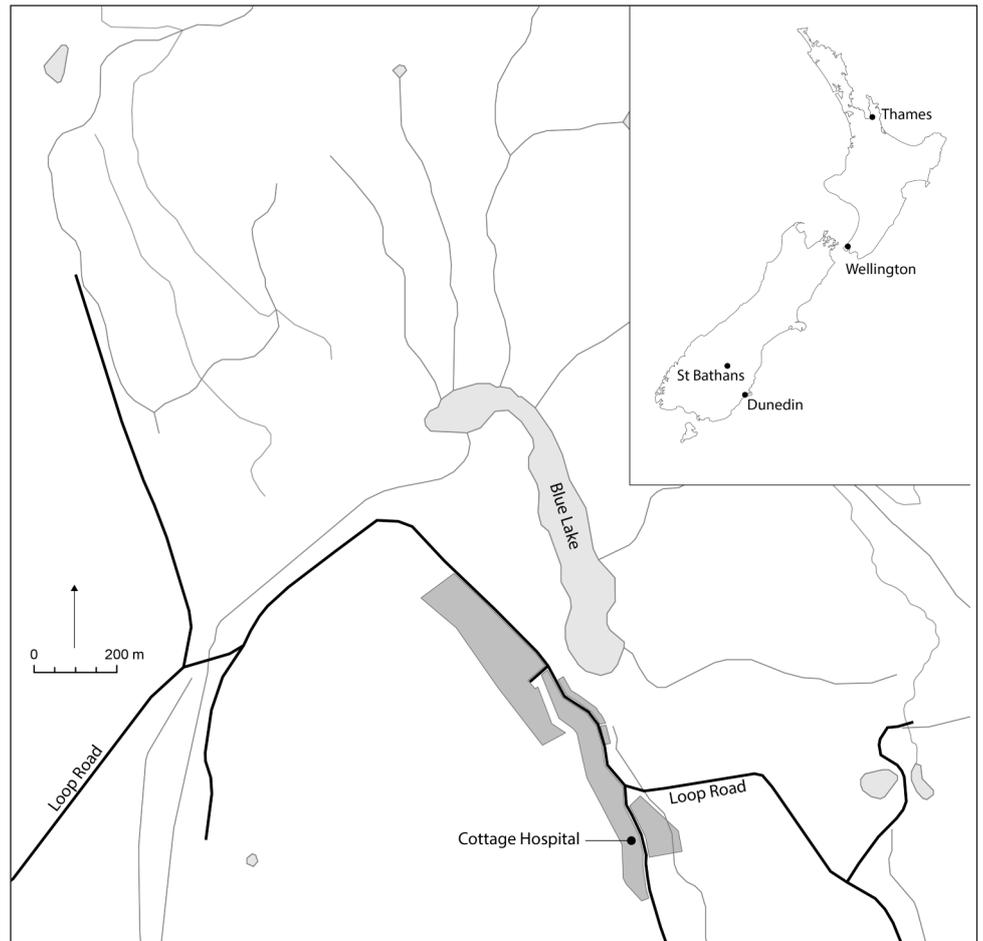


Figure 1: St Bathans, showing location of cottage hospital and inset of New Zealand showing location of St Bathans and other places mentioned in text.

Scandinavian Water Race Company and then the Kildare Consolidated Gold-mining Company extended the mine to a depth of 225 feet (68.6 m), when work was abandoned because it was threatening the stability of buildings in the town (McCraw 2009:30).

With the demise of mining operations the population of St Bathans dwindled, businesses closed and many of its buildings were abandoned, demolished or moved elsewhere. Today the township comprises some 21 buildings, including a hotel, public hall, two churches, the former post office, a bank and a blacksmith's building and 15 premises used as residences, although only two of these are permanently occupied with the remainder serving as holiday homes. There are also sections containing unused or ruined buildings and/or archaeological remains of former activities there. These are arrayed along a c. 750 m length of street that overlooks the Blue Lake, which formed in the abandoned gold workings after the cessation of mining there in 1934 (Figure 1). The lake and heritage character of the township are major attractions for tourism, which plays a significant part in its present day economy. Parts of the town, including several of its public buildings, are now administered by the Department of Conservation as part of the Otago Goldfields Park.

ST BATHANS COTTAGE HOSPITAL

During its early decades St Bathans had no hospital, being served initially by the Dunstan District Hospital in Clyde which opened in 1863. St Bathans residents established a Medical Aid Club in 1868, its members paying subscriptions which entitled them to 'medical assistance and medicine gratis, in case of sickness or illness' (*Otago Witness* 9 May

1868:15). In return the club took responsibility for procuring medical services for the area, attempting to find and retain a resident doctor. Success was limited, with only three doctors residing there over a period of 22 years, and none of these staying very long (Garland 2012). The people of St Bathans were forced to rely on visiting medical professionals. From 1871 the nearest permanent doctors were at the Mt Ida District Hospital in Naseby (Middleton 2009). In St Bathans services were also provided by William Pyle, local grocer, pharmacist and Justice of the Peace (*Otago Witness* 29 June 1893:22).

In 1890, the Medical Aid Club presented a petition to the Central Otago Health Board requesting funds to establish a cottage, or branch, hospital in St Bathans. The petitioners cited their isolation from medical services, which had already contributed to the loss of lives, and their financial contribution to the Board in the form of the county levy, which they felt justified their petition (*Mt Ida Chronicle* 29 May 1890). Despite some territorial objections from Naseby, the Board eventually resolved to acquire funding from the government for a cottage hospital provided that the subscribers of the St Bathans Medical Aid Club contributed the same amount each year, and saw to the erection of the building themselves (*Mt Ida Chronicle* 10 July 1890).

The St Bathans Cottage Hospital opened in 1891, and comprised a six-roomed building, which also served as a residence for the town's doctor. An additional ward room was added in 1898, with the capacity to house six patients. The hospital also contained a surgery. At least five doctors are known to have resided there between 1890 and 1920 (Table 1), but due to persistent difficulty retaining and attracting doctors to the position there were frequent closures. The first was only two years after the institution first opened, and the longest may have been the seven years after 1909. Exactly when the

Table 1: Doctors known to have resided at St Bathans Cottage Hospital.

| Years | Doctor | Additional information |
|------------|----------------------|---|
| 1890-1892 | Dr. H.K. MacLachlan | Trained at Glasgow University and Anderson's School of Medicine |
| 1898-1902 | Dr. Andrew Stenhouse | Surgeon to Dunedin Hospital and graduate of Otago University |
| 1902-1906 | Dr. James Brugh | Trained surgeon and graduate of Otago University |
| 1908, 1909 | Dr. Bagley | |
| 1917-1919 | Dr. Griffen | May have been called up for military service in that time and replaced with Dr. Byres |
| 1918 | Dr. Byres | Replacement for Dr Griffen? Unclear when he ceased work at St Bathans |

Sources listed in Garland (2012).

hospital finally closed is not clearly indicated in any historical documents that we have been able to locate. It is known from an advertisement in the *Dominion* newspaper that the position of doctor there was empty in 1920 (Pyle Family Papers n.d.), and a former resident of the town notes that the hospital was no longer functioning during her childhood in the 1920s (Middleton 2009).

The hospital building occupies a terrace cut into a sloping hillside at the southern end of the township (Figure 2). It is constructed of mud brick with a corrugated iron roof, and an L-shaped concrete foundation at its southwest corner is all that remains of the 1898 ward room. The building now serves as a private holiday home, and a proposal by its owners to construct a retaining wall along the scarp at the rear of the terrace prompted an archaeological assessment which noted what appeared to be a rubbish pit exposed at the top of this scarp (Middleton 2009).

ARCHAEOLOGICAL INVESTIGATIONS

In September 2009 excavations were undertaken at the cottage hospital (New Zealand Archaeological Association site number H41/170), focusing on the rubbish pit. A rectangular area on sloping ground above the scarp was turfed by spade then excavated by hand trowel following standard stratigraphic procedures. Most artefacts and other finds were hand-picked from the matrix, but a sample of buckets from each context was sieved to confirm that complete recovery was being achieved. The feature exposed by excavation was initially part-sectioned so that a profile could be drawn and then fully emptied so that a plan could be compiled (Figure 3).

The excavation disclosed a circular stone-lined pit, c. 1 m in diameter with the stacked stone reaching a height of c. 1.4 m except where the upper courses had been breached by cutting of the scarp along its eastern edge. The stacked stones were predominantly water-rolled greywacke cobbles varying in length from c. 150–400 mm.

The pit fill comprised three main stratigraphic components, two of which were further subdivided.

- *Layer 1* was a grey-brown topsoil that varied from 50–100 mm in depth.
- *Layer 2* was a brown soil. In its upper 250–300 mm (*Layer 2a*) it was loose, silty and contained glass, ceramic and metal artefacts. At the base of this component, covering about half of the pit opening, were decayed remnants of one or more pieces of corrugated iron. The lower 200–350 mm (*Layer 2b*) was mottled with patches of rusty orange staining and in places had distinct lenses of yellow-brown ash. It also contained glass, ceramic and metal artefacts.

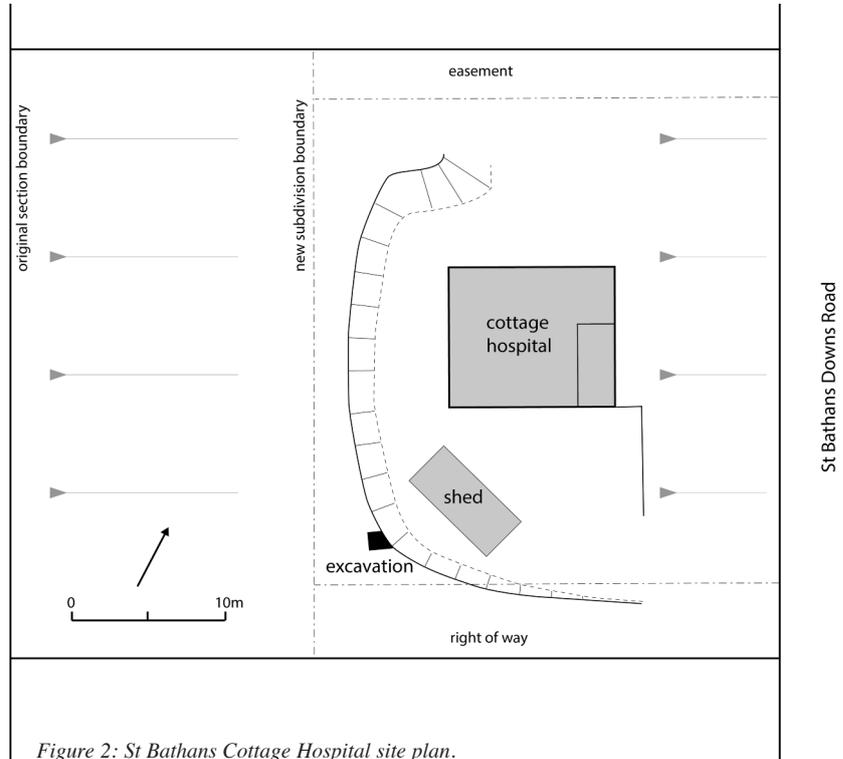


Figure 2: St Bathans Cottage Hospital site plan.

- *Layer 3* was a grey-black soil. The upper 200–400 mm (*Layer 3a*) was predominantly grey, ashy and contained fewer artefacts than Layer 2. The lower 150 mm (*Layer 3b*) was darker, contained numerous pieces of charcoal and yielded no artefacts. It was very damp. The water table was encountered c. 25 mm above the base of the deposit.

The pit had been dug into compact yellow-brown clay. Around its perimeter this was hard and dry, but at the base of the pit, below water level, it was very sticky. Two yellow-stained quartz boulders, one very large and the other smaller, were embedded in the surface of the sticky yellow clay.

The excavated feature is most likely to have been constructed to serve as a cesspit. Potential alternative functions can be ruled out – it is too shallow to have been a well, and it lacks any evidence of the water-proof lining that would be needed to be effective as a water reservoir. Cesspits were a common feature of nineteenth and early twentieth-century settlements in New Zealand and were typically located beneath an ‘out-house’ building (Butcher and Smith 2010; Hamel 2004). It seems likely that this was the case here, even though no foundations of such a structure were located during the excavation.

The relatively shallow depth and frequent presence of stone, brick, metal or wooden lining were features that assisted the periodic removal of the contents from cesspits (LeeDecker 1994). Where regular cleaning occurred it is probable that any rubbish that accumulated during use of the cesspit would have been removed, or at least depleted

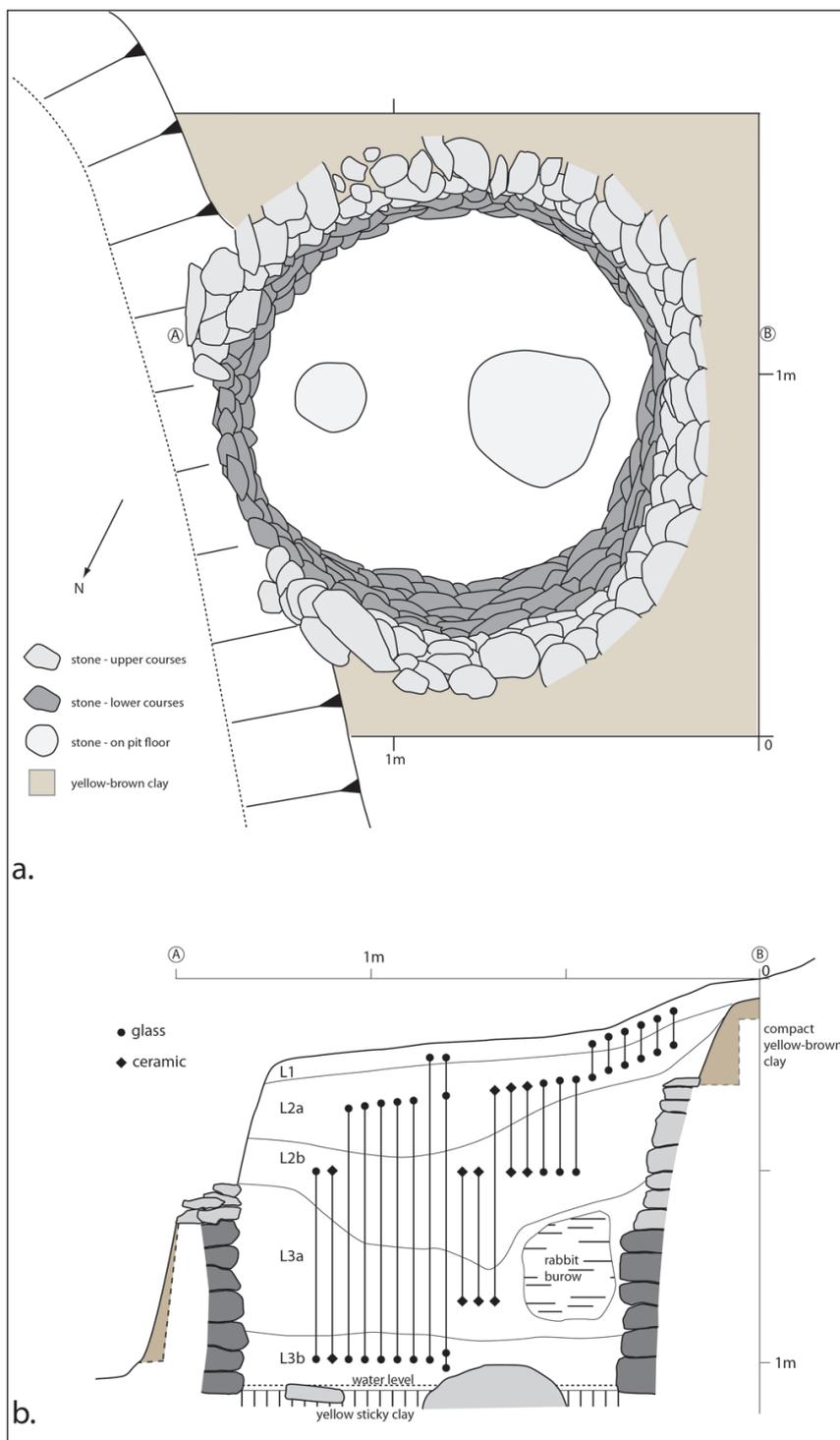


Figure 3: a. Plan of cesspit. b. Stratigraphic profile, showing glass and ceramic conjoints that cross stratigraphic boundaries. Note that indicated positions of the latter within layers are schematic, rather than indicating precise spatial locations.

(Butcher and Smith 2010). However, this process did not necessarily take place when use of the pit ceased (Wheeler 2000). This seems likely to have been the case at the St Bathans Cottage Hospital where the concentration of charcoal at the base of the fill (Layer 3b) suggests a primary deposit, as this is one of the materials commonly used to counter odour and 'sanitise' night soil (Crook and Murray 2004:45). The dark colour of the upper part of Layer 3 is also suggestive of this. Layer 2 was of a distinctly different character, being predominantly ash and containing numerous artefacts, many of which were complete or near-complete items. These are most likely to have been rubbish thrown into the pit after it

ceased to be used for its original purpose, as has been observed frequently elsewhere (Crook and Murray 2004; McCarthy and Ward 2000).

ARTEFACT AND FAUNAL ASSEMBLAGES

The St Bathans Cottage Hospital cesspit contained 1752 artefacts and 230 faunal items distributed through the three stratigraphic units (Table 2). Almost half (49.5 per cent) of the artefacts were glass, followed by metal (30.8 per cent) and ceramics (9.9 per cent). Miscellaneous items included leather, fabric, paper, lead and bakelite objects. During preliminary sorting it became clear that portions from similar glass and ceramic artefacts occurred throughout the stratigraphic profile, and more detailed conjoin analysis established that many of these could be refitted to form individual vessels (Figure 3b). The implications of this for understanding formation of the cesspit assemblage are considered below; for the present it is clear that the material should be treated as a single analytical unit.

Items were initially identified and catalogued by material class and artefact type, before being assigned to functional categories following protocols that are discussed elsewhere (Garland 2012). Some items were difficult to classify functionally, being potentially assignable to more than one category. Where there were strong grounds for us to choose which category to place these in they are discussed in the text below. Otherwise these items were categorised as of 'uncertain category'. For almost a quarter (24.1 per cent) of the items identification was so insecure as to preclude functional categorisation.

A minimum number (MN) of 323 artefacts were represented in the cesspit assemblage (Table 3). Leaving aside the unclassifiable items, structural artefacts were most numerous, followed by those related to foodways. Medical and pharmaceutical artefacts, categories of greatest interest to this study, have a combined total greater than either of those. It is notable that these categories are represented almost entirely by glass artefacts, making up 65 per cent of the classifiable items in that material.

Table 2: Stratigraphic distribution of items (NISP) from the cesspit.

| Stratum | Artefacts | | | | Fauna | | Total |
|--------------|------------|------------|------------|------------|------------|-----------|-------------|
| | Glass | Ceramic | Metal | Other | Bone | Shell | |
| Layer 1 | 66 | 21 | 7 | 1 | 63 | 2 | 160 |
| Layer 2a | 258 | 86 | 219 | 40 | 152 | 8 | 763 |
| Layer 2b | 61 | 42 | 15 | 1 | - | 5 | 124 |
| Layer 3a | 11 | 1 | 158 | 42 | - | - | 212 |
| Layer 3b | 472 | 25 | 141 | 85 | - | - | 723 |
| Total | 868 | 175 | 540 | 169 | 215 | 15 | 1982 |

Table 3: Functional classification of artefacts (MN) from the cesspit.

| Category | Glass | Ceramic | Metal | Other | Total |
|--------------------|------------|-----------|------------|-----------|------------|
| Foodways | 20 | 27 | 4 | - | 51 |
| Furnishing | 4 | - | 1 | 1 | 6 |
| Medical | 21 | - | 1 | - | 22 |
| Other | - | 2 | 1 | - | 3 |
| Personal | 3 | 4 | 1 | 13 | 21 |
| Pharmaceutical | 47 | - | - | - | 47 |
| Structural | 2 | - | 61 | - | 63 |
| Transport | - | - | 4 | - | 4 |
| Uncertain category | 8 | - | 15 | 2 | 25 |
| Unclassifiable | 25 | 7 | 35 | 10 | 77 |
| Total | 130 | 40 | 123 | 26 | 319 |

MEDICAL

Artefacts assigned to the medical category were those that could be associated with the provision of health care in a medical setting. These items, mostly of glass along with one of metal, were further divided into three subcategories relating to steps in the medical health care process: diagnosis, or investigating the causes of an illness or injury; preparation, involving the making or mixing of medicines; and treatment, relating to the delivery of such preparations to the patient (Table 4).

Table 4: Minimum numbers of medical artefacts.

| Subcategory | Description | Glass | Metal |
|--------------|------------------|-----------|----------|
| Diagnosis | microscope slide | 1 | |
| | thermometer | 1 | |
| Preparation | pipette | 1 | |
| | stirring rod | 1 | |
| | test tube | 1 | |
| | tube | 4 | |
| Treatment | ampule | 9 | |
| | enema tube | 1 | |
| | syringe | 2 | |
| | aneurysm needle | | 1 |
| Total | | 21 | 1 |

Two diagnostic artefacts were identified, a thermometer and the glass slide with coverslip from an optical microscope



Figure 4: Thermometer and microscope slide.

(Figure 4). These would have been relatively common items of medical equipment by the late nineteenth century, and reflect modest levels of general diagnostic capacity through measurement of temperature and blood count. The thermometer has a partial mark, probably from Burgoyne, Burbidges & Co., a London supplier of pharmaceutical and photographic products who operated from 1863 onwards (Garland 2012). Optical microscopes had a range of scientific and recreational uses in the nineteenth century, but in the present context there is no reason to doubt that its primary use was in medical diagnosis, even if the capacity for this in a general practice setting was limited. A letter written by Dr Brugh in 1906 acknowledges the limitations of his laboratory facilities in St Bathans, necessitating sending samples to Dunedin for more thorough analysis (Colquhoun n.d.). Such a situation appears to have been common internationally as well, with cottage hospitals in Britain also possessing basic elements of laboratory analysis yet still requiring outside services for more advanced diagnostic needs (Emrys-Roberts 1991).

The pipette, stirring rod and various glass tubes found show that medicines were prepared in St Bathans, despite the lack of documentary information regarding this facet of the hospital's operation. While evidence discussed below shows that this was not the only source of health care products for residents of the town, it does indicate that even in a small isolated location there was a scientific element to medical technology and practice.

Equipment such as this, however, says little about the *kind* of treatments being prepared or the illnesses being treated. Some light is cast on this by the 13 treatment-related artefacts. The two glass hypodermic syringes indicate injection of liquid remedies, as do the nine glass ampoules (Figure 5). The latter were a common method of transporting and storing liquid drugs. The thin sealed necks of these torpedo-shaped glass tubes had all been broken, indicating that their contents had been dispensed. It is possible that they had contained morphine, which is known to have been used at the hospital (Colquhoun n.d.).

More specific medical procedures are indicated by the remaining two items. We are reasonably confident that a twisted glass funnel recovered from the site was an enema tube (Figure 6). These were not uncommon in the nineteenth

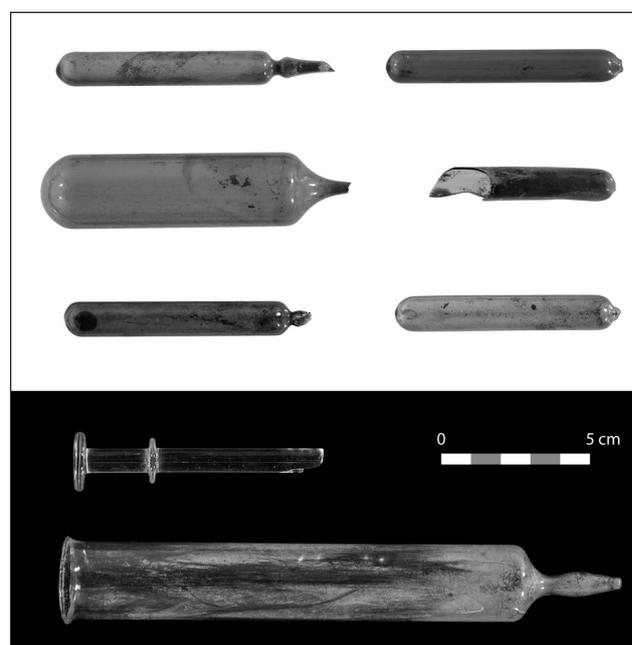


Figure 5: Syringes and ampoules.



Figure 6: Enema tube.



Figure 7: Tenaculum.

and early twentieth centuries for the delivery of purgative treatments (Doyle 2005). We also identified a possible tenaculum or aneurysm needle (Figure 7), a small hook-shaped surgical tool, used for passing ligature around an artery or holding arteries and other small body parts during surgery. If correct, this identification would support documentary evidence of the cottage hospital's capacity for surgical procedures (*Otago Witness* 12 May 1898:7). The absence of any other surgical tools in the cesspit assemblage may reflect the relative expense of such items and the likelihood that they

would have been personal property of a resident doctor, reducing the probability that they would be abandoned at the hospital.

Pharmaceutical

The pharmaceutical category is made up of health care related items that were not necessarily delivered under medical supervision. It includes both patent/proprietary products that could be purchased over the counter from licensed or unlicensed practitioners, and ethical products, for which the purchaser required a prescription (Knehans 2005). We also include two further subcategories: items which, although the contents were unknown, have labelling that indicates they derived from a chemist or pharmaceutical company; and unidentified items, for which artefact form suggests that they are most likely to have been containers of pharmaceutical products (following Lindsey 2011). Items from the cottage hospital assigned to these subcategories were all glass bottles (Table 5).

Table 5: Minimum numbers of pharmaceutical artefacts.

| Subcategory | Description | MNV | |
|---|--|-------------------|---|
| Patent/ proprietary | Barry's Tricopherous | 1 | |
| | St Jacob's Oil | 1 | |
| | Kerol disinfectant ** | 1 | |
| | Kruse's Prize Medal Magnesia | 1 | |
| Ethical | Martin H. Smith, glyco-heroin | 1 | |
| | Contents unknown | B. Bagley and son | 2 |
| | | R. Conn, druggist | 1 |
| | James Reid, Chemist | 3 | |
| | Burroughs Wellcome & Co * | 2 | |
| Unidentified (pharmaceutical shape) | lozenge shaped pill *** | 1 | |
| | rectangular bevelled *** | 5 | |
| | rectangular panelled *** | 4 | |
| | rectangular (pharmaceutical)*** | 24 | |
| | square bevelled vial *** | 1 | |
| | round c/s *** | 1 | |
| | oval c/s (one embossed poisonous not to be taken) *** | 2 | |
| Total | | 51 | |

Note: * = identification probable but not definite
 ** = could be placed in household category (see text)
 *** = could be placed in medical category (see text)

All the bottles assigned to the patent/proprietary and ethical groups were identifiable to original contents. Barry's Tricopherous, St Jacobs Oil and Kruses Prize Medal Magnesia are remedies ubiquitous in nineteenth-century archaeological sites, often found in household contexts unrelated to the formal provision of health care. Barry's Tricopherous, first produced in the 1850s, was advertised as a hair restorative and claimed to prevent 'baldness and grey hair, cure diseases of the skin, glands and muscles, pimples, chilblains, and give instant relief in cuts, bruises, burns and scalds' (*Otago Daily Times* 4 March 1871). However, a pharmaceutical handbook published in 1893 (Haynes & Co. 1893) gives a recipe for the concoction which contains 81.4 per cent alcohol and 18.3 per cent castor oil, in addition to oil of bergamot, oil of lavender and fluid extract of alkanet (a colouring agent), suggesting it was unlikely to have been effective, medicinally or cosmetically.

St Jacobs Oil and Kruses Magnesia, on the other hand, were both advertised primarily as health care products. They were directed, respectively, at pain relief (from rheumatism and swelling to toothache) and stomach complaints (including the results of heavy drinking). In particular, St Jacobs Oil, although predominantly turpentine (82.4 per cent), contained

capsicum (0.04 per cent), aconite (0.01 per cent) and carbolic acid (2 per cent), which have anti-inflammatory and anaesthetic properties (Murrell 1894). No recipe was found for Kruses Magnesia, indicating that it was a proprietary, rather than patent medicine, as a list of ingredients was required to patent a remedy. It is known to have originated in Australia after 1863 through a German pharmacist named Johann August Kruse (McMullen 2000).

The broad range of ailments targeted by these products, in addition to their availability over the counter and inexpensive cost, may have contributed to their popularity in the nineteenth century, both within and beyond the medical profession. Included in this category is a bottle embossed 'Kerol', a disinfectant advertised as having medicinal properties, specifically in regard to the prevention of acute poliomyelitis (also known as infantile paralysis) (*The Ashburton Guardian* 16 May 1916). However, we are cautious about including this here as this product would have also had domestic uses and is likely to have been relatively easy to obtain.

A broken Glykeron bottle, manufactured by Martin H. Smith, chemist, New York, has been classified here as an ethical medicine. We have presumed that it was a prescribed medicine because of its inclusion of heroin, in combination with glycerin, and the absence of any advertising of the product to the general public. In North America it was 'prescribed and greatly esteemed by physicians for over twenty five years', as a relief for respiratory illnesses such as bronchitis, pneumonia, asthma and whooping cough (*Journal of the National Medical Association* 1925). Heroin was used in medicines, including those given to children, prior to World War I, although the availability of such preparations appears to have been more restricted than the availability of patent and proprietary medicines (Seddon 2007).

Embossed markings disclosed names of the chemists who had produced the original products in nine of the pharmaceutical vessels, including the Glykeron bottle. Most were from Dunedin pharmacists B. Bagley and Son, R. Conn and James Reid, both of whom operated during the later decades of the nineteenth century (Garland 2012), suggesting that this was a primary source of health care remedies. However, wider supply networks are indicated by both the Glykeron bottle, originating from a chemist in New York, and a small pill bottle believed to have been manufactured at Burroughs Wellcome and Co., a pharmaceutical company founded in London in 1880 by Henry Wellcome and Silas Burroughs (Bailey 2008). Now the Wellcome Trust, this company was popular during the nineteenth and early twentieth centuries as large-scale producers of compressed pills.

More than 80 per cent of the pharmaceutical bottles were identifiable solely by their distinctive rectangular form. These are likely to have had paper labels denoting their contents. While the association of these bottle shapes with pharmaceutical products is very strong, we are aware of the pitfalls of determining function solely from form. Given that we have evidence for the preparation of medicines at the St Bathans Cottage Hospital, we have to consider the possibility that these bottles were stockpiled for dispensing such treatments. For this

reason we have placed unmarked 'pharmaceutical' bottles into a 'medical/pharmaceutical' category for the purpose of comparison with other sites.

Foodways

Some 24 per cent of the classifiable artefacts related to the storage, preparation and consumption of food and beverages. This included all but four items from the ceramic assemblage, 20 per cent of the classifiable glass vessels and four metal items (Table 6). Glass vessels included six for storage, four jars and two bottles, one of the latter being embossed with 'Bovril'. There is some ambiguity regarding Bovril which, although generally considered a foodstuff, was also advertised for use in the sick room (*Otago Daily Times* 28 September 1904:69). We have preferred the more common categorisation here. Glass vessels for food service include a tumbler and what is probably the lid of a serving dish. Ten bottles were of types frequently used in nineteenth and early twentieth century New Zealand for alcohol, including dip-moulded and three-piece moulded specimens in dark olive glass, green ring-sealed bottles and both amber and aqua-coloured bottles with crown closures. Non-alcoholic beverages were represented by a torpedo-shaped soda bottle and a milk bottle.

Apart from a single whiteware storage jar, the ceramics assigned to this category were all tea and table wares. Most of these were identified as whiteware or bone china decorated with gilt banding, *fleur de lis* or floral transfer prints. Maker's marks on three items provide some evidence for the age of this component of the assemblage: a Burgess and Leigh mark on one dinner plate indicates manufacture between 1906 and

Table 6: Minimum numbers of artefacts from all other categories

| Category | Class | Glass | Ceramic | Metal | Other | Total |
|------------|--------------------------|-----------|-----------|-----------|-----------|-----------|
| Foodways | Food storage | 6 | 1 | 2 | - | 9 |
| | Food preparation | - | - | 1 | - | 1 |
| | Food/beverage service | 2 | 26 | 1 | - | 29 |
| | Beverage (alcoholic) | 10 | - | - | - | 10 |
| | Beverage (non-alcoholic) | 2 | - | - | - | 2 |
| | Total | 20 | 27 | 4 | - | 51 |
| Household | Stationery | 2 | 3 | - | 1 | 6 |
| | Total | 2 | 3 | - | 1 | 6 |
| Personal | Clothing | - | - | - | 7 | 7 |
| | Adornment | 1 | - | 1 | - | 2 |
| | Hygiene | - | - | - | 1 | 1 |
| | Leisure | - | - | - | 2 | 2 |
| | Smoking | - | - | - | 2 | 2 |
| | Toys | - | 1 | - | - | 1 |
| | Total | 1 | 1 | 1 | 12 | 15 |
| Structural | Fasteners | - | - | 52 | - | 52 |
| | Fittings | - | - | 2 | - | 2 |
| | Piping | - | - | 3 | - | 3 |
| | Windows | 2 | - | - | - | 2 |
| | Wire | - | - | 4 | - | 4 |
| | Total | 2 | - | 62 | - | 62 |
| Transport | Equestrian | - | - | 2 | - | 2 |
| | Automotive | - | - | 2 | - | 2 |
| | Total | - | - | 4 | - | 4 |
| Furnishing | Lighting | 4 | - | 1 | - | 5 |
| | Floor covering | - | - | - | 1 | 1 |
| | Total | 4 | - | 1 | 1 | 6 |
| Other | Leclanche cells | - | 2 | - | - | 2 |
| | Insulated wire | - | - | 1 | - | 1 |
| | Total | - | 2 | 1 | - | 3 |

1912, an F. Winkle and Co. plate was made between 1908 and 1925, and a Paragon China saucer almost certainly dates to 1916 (Garland 2012).

The four metal artefacts in this category include a milk bottle top and another foil seal, presumably from a storage vessel, a pot handle and a small jug or tankard.

In addition to the artefacts, faunal remains from the cesspit reflect foodways practices. Sheep (*Ovis aries*) bones were the most abundant items, especially if specimens of rib and vertebral fragments identified as ‘sheep or pig’ belong to the former, as seems highly likely (Table 7). These included elements from all parts of the body including some with butchery marks, indicating carcass preparation on site. At least two rabbits (*Oryctolagus cuniculus*) were represented, but with a large burrow cutting into the cesspit (see Figure 4), there has to be uncertainty as to whether these are food remains from the cottage hospital. Cow (*Bos taurus*), chicken (*Gallus gallus*) and cat (*Felis catus*) were also represented, with the first two of these likely to have been food remains.

Table 7: Faunal remains from the cesspit.

| Class | Taxon | NISP | MNE | MNI |
|-------------|----------------------|------------|-----------|----------|
| vertebrates | chicken | 2 | 2 | 1 |
| | bird or small mammal | 1 | - | - |
| | rabbit | 34 | 31 | 2 |
| | cat | 1 | 1 | 1 |
| | sheep | 79 | 43 | 3 |
| | sheep? | 2 | - | - |
| | sheep or pig | 30 | 10 | - |
| | cow or pig | 5 | 1 | - |
| | cow | 5 | 4 | 1 |
| | mammal ?sp | 55 | 4 | 1 |
| | Total | 214 | 57 | 8 |
| molluscs | oyster | 15 | 4 | 2 |

Household

There were surprisingly few artefacts relating to general household activities. We have included glass and ceramic ink bottles and a slate pencil here, although we note that the former may reflect either or both the domestic and professional spheres of cottage hospital life.

Personal

Clothing items include a button, a dome, two pieces of woollen fabric and four fragments of leather footwear. A copper locket, glass perfume bottle and porcelain doll fragment point to the presence of family along with at least some of the doctors listed in Table 2, and an early plastic or bakelite toothbrush handle, fragments of newspaper and both clay and wooden smoking pipes point to domestic life.

Structural

Nearly all the structural items were metal. Most were iron wire nails and other fasteners, but also included a door lock and hinge and water pipes. Along with two window glass fragments these items are likely to derive from maintenance and repairs of the cottage hospital building.

Figure 8: Manufacture date ranges for artefacts in the St Bathans assemblage.

Furnishings

Very little information exists in the documentary record regarding the interior of the hospital building and its furnishings, including whether or not these items were provided by the community or the resident doctors and their families. The artefacts cast some light on these matters, with fragments of four glass chimney lamps and a tin candle holder reflecting a way of life before the arrival of electricity which did not reach St Bathans until some years after the closure of the hospital (Reilly 2008).

Transport

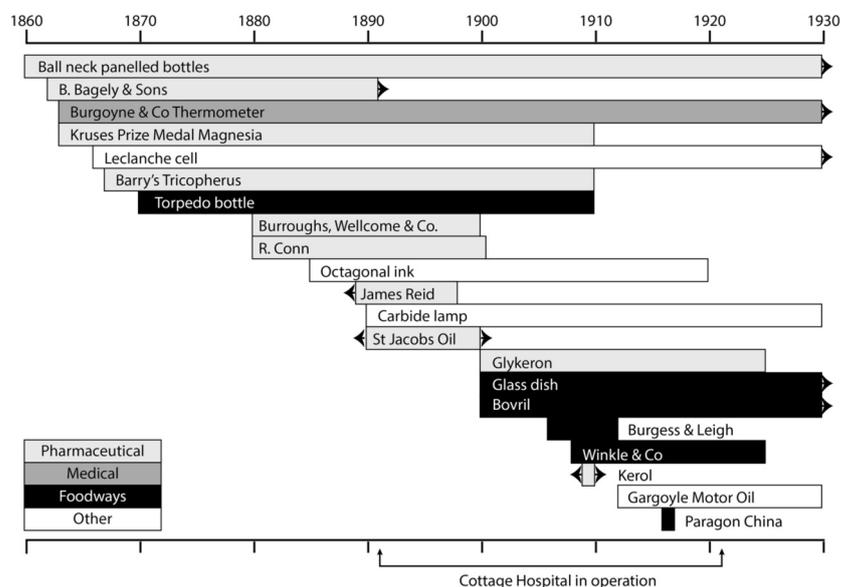
At least two forms of transport were in use in St Bathans during the three decades of occupation at the cottage hospital. There are a number of references in the historical records to the use of horses, with and without carts or carriages, so it is not unexpected that there were two large horseshoes in the cesspit. Part of a carbide (acetylene) lamp from an early motorcycle and part of a can of Gargoyl Motor Oil point to the presence of automotive transport as well.

Other

Among the items that were difficult to classify were two coarse white earthenware tubes from Leclanché battery cells. Producers of low current electricity, these were commonly used in telegraphy, signalling, electric bells (Derry and Trevor 1993; Oakes 2002) and other applications which included medical experiments (Fish, Geddes, and Babba 2003, Chapter 13; *New Zealand Tablet*, 8 August 1879:14). Their use in St Bathans may have been medical, professional or household-focused, or some combination of these.

Dating

Manufacturing dates for artefacts from the cesspit span the known period of operation for the cottage hospital (Figure 8). Most of the pharmaceutical items date to the first decade or so of occupation of the hospital, while the foodways items are mostly from the middle and later decades. However, as the dated items form only a small proportion of artefacts in each of these categories, it would be unwise to read too much into this observation. The youngest precisely dated item, the Paragon China saucer, provides a *terminus post quem* for deposition of the assemblage, although the presence of



machine-made bottles (7 per cent of all bottles) suggests that this is more likely to have been in the 1920s.

DISCUSSION

Several factors point to the assemblage under analysis being wholly or predominantly from cleaning up material in and around the cottage hospital at or soon after it ceased to operate. Archaeological observation suggested that the lowest layer in the cesspit derived from the end of its use for that purpose, with other fills thrown in later. Conjoins demonstrate that some artefacts were already broken in several pieces with some sinking to greater depths than others when dumped in the cesspit. Date ranges indicate that some items may have been in use at the hospital from the beginning of its occupation, while others cannot have been brought there until the very end. Cesspit deposits such as this have often been interpreted as a clean-out by new occupants, removing debris that had accumulated during a previous use (Butcher and Smith 2010; McCarthy and Ward 2000; Wheeler 2000). As such we can feel confident of it as a reflection of life at the cottage hospital, although only a partial one, due to the small size of the sample.

The assemblage gives strong reflections of both the medical and domestic functions of the cottage hospital. It shows that the hospital had simple, but up-to-date equipment for medical diagnosis, preparation of medicines, and a range of treatments including limited surgery. The inventory of domestic artefacts is constrained in breadth, but suggests a modest, almost unexceptional, lifestyle. Perhaps of greatest interest are the pharmaceutical items. Were these part of health care provision to the community by the doctor, or remedies used in the family setting? Whichever is the case, they indicate that patent and proprietary medicines remained an integral part of health care practice at the hospital.

The Thames and Wellington hospital sites provide useful comparison, being of comparable age, although there are contextual differences between the sites. Thames was a much larger mining town than St Bathans and its hospital, established in 1868 was, by the late 1880s and 1890s, much larger than a cottage hospital. Due to its expanding footprint, large-scale excavations there in 2007–2008 sampled material from residential and educational contexts as well as some relating directly to the hospital (Phillips and Druskovich 2009). While the latter are of greatest interest, we will also use the former as a non-hospital reference point for our comparisons. Wellington Hospital, established in 1881 to serve the capital city, was also a much larger institution than St Bathans Cottage Hospital. The assemblage recovered here

through selective test excavations, although small, is more securely associated with hospital operations, and is described by the excavator as ‘representing the activities of people working and living in the hospital: people are administering medicine and medical procedures, but the patients are also being fed and having their other needs attended to’ (O’Keefe 2007:27). This description provides a strong parallel to our observation of the St Bathans assemblage.

Differences in analytical procedures make full statistical comparison of assemblage makeup problematic, and neither of the sites provides datasets directly comparable to ours. Nonetheless we have drawn on these to make selected comparisons, restricting attention to glass and ceramic vessels that that we have assigned to ten functional groups (Table 8). Following our observations at St Bathans we have separated unmarked ‘pharmaceutical’ bottles into a ‘medical or pharmaceutical’ category. A high incidence of bedpans and bed warmers in the Wellington assemblage prompted us to distinguish these, along with chamber pots and wash basins as a ‘bed care’ category, separate from other general household items.

The St Bathans assemblage has more explicitly medical items, by number and proportion, than either of the other hospital sites. Wellington yielded two syringes, and the Thames Hospital a measured dispensing glass, along with a probable chloroform bottle. As at St Bathans, marked pharmaceutical containers were outnumbered by unmarked ‘medical or pharmaceutical’ vessels in the comparative assemblages. Identifiable pharmaceuticals in Wellington include Lane’s Emulsion and castor oil. The latter is also represented at both the Thames Hospital and residential sites, with Davis’s Vegetable Pain Killer also present at the hospital. When all the medical and pharmaceutical items are combined they make up more than half (58 per cent) of the St Bathans assemblage, and over one third (34 per cent) of that from Wellington. The low proportion (7 per cent) at the Thames Hospital, where it is comparable to the residential assemblage (8 per cent), seems more likely to be a product of archaeological sampling rather than an indication that hospital staff and patients in Thames took fewer health care treatments than their southern contemporaries.

Bed care items, not recorded at St Bathans, were especially strongly represented at Wellington Hospital, and more common at Thames hospital than in the residential sample, suggesting that in at least some contexts, this may be a distinguishing feature of hospital deposits. At all three hospitals the ‘other household’ category is made up almost exclusively by ink bottles, which still occur, but amongst a much broader array of items, in the residential sample.

Table 8: MN of selected groups of glass and ceramic vessels from comparative sites.

| Category | St Bathans Cottage Hospital | | Wellington Hospital | | Thames Hospital | | Thames residential | |
|-------------------|--------------------------------|------|---------------------|------|-----------------|------|--------------------|------|
| | MN | % | MN | % | MN | % | MN | % |
| medical | 21 | 16.8 | 2 | 2.7 | 2 | 1.1 | - | - |
| med/pharm | 38 | 30.4 | 17 | 23.3 | 7 | 3.9 | 20 | 6.0 |
| pharmaceutical | 13 | 10.4 | 6 | 8.2 | 3 | 1.7 | 5 | 1.5 |
| bed care | - | - | 8 | 11.0 | 8 | 4.4 | 6 | 1.8 |
| other household | 5 | 4.0 | 7 | 9.6 | 8 | 4.4 | 23 | 6.9 |
| personal | 1 | 0.8 | - | - | 1 | 0.6 | 10 | 3.0 |
| food storage | 7 | 5.6 | 3 | 4.1 | 21 | 11.6 | 36 | 10.8 |
| food preparation | - | - | - | - | 3 | 1.7 | 3 | 0.9 |
| food/bev service | 28 | 22.4 | 15 | 20.6 | 98 | 54.1 | 163 | 49.1 |
| beverage, non-alc | 2 | 1.6 | 11 | 15.1 | 6 | 3.3 | 20 | 6.0 |
| beverage, alcohol | 10 | 8.0 | 4 | 5.5 | 24 | 13.3 | 46 | 13.9 |
| Total | 66 | | 54 | | 172 | | 312 | |

Personal items are also much better represented in the residences.

Foodways vessels made up the second largest component (28 per cent) of the St Bathans assemblage, slightly more than at Wellington, but significantly less than in the Thames Hospital (67 per cent) or residential (61 per cent) assemblages. The similarity of the two Thames assemblages suggests that the rubbish pits sampled at Thames Hospital derive mainly from the provision of residential care to patients and/or staff. In all sites about 80 per cent of these items were for the serving of food and beverages, suggesting that this was as important in the hospital setting as at home.

Beverages were better represented in Wellington and Thames than at St Bathans. Non-alcoholic drinks were especially common in Wellington, while both the Thames and St Bathans hospitals showed a strong preference for alcohol. This preponderance was much less marked in the residential sample. Some explanation may be derived from the possible use of alcohol in medical treatment, as has been noted in historical documents elsewhere (Alexandra District Hospital Association 1988; Phillips and Druskovich 2009).

CONCLUSION

Several observations can be drawn from these comparisons. Firstly, we note the considerable variations in assemblage composition between the three different hospitals, and the strong similarities between one of these and the adjacent set of residences. This challenges the prospect of identifying a suite of characteristics that might distinguish hospital deposits in general or cottage hospitals in particular. Secondly, we also observe that explicitly medical artefacts were confined to the hospital assemblages, and are better represented in the cottage hospital than elsewhere. Thirdly, some health care-related characteristics of the assemblages were clearly identifiable only by modifying functional categories to account for polyfunctionality. As Casey (2004) and Brooks (2005) have noted, it is important to remain flexible in the application of analytical categories so that they are suited to the problem being addressed.

We had anticipated that the combination of the medical and domestic spheres in the cottage hospital context would have led to a stronger representation of household and foodways items at St Bathans than in larger hospitals. This proved not to be the case, with nearly half (45 per cent) of the artefacts from Wellington and 77 per cent of those from Thames falling within these categories, well ahead of the 33 per cent at St Bathans. Counterintuitively, this is likely to be a reflection of larger hospital size, where the ratio of patients to medical staff would have been much greater than that of family and occasional patients to doctor at the cottage hospital.

The nineteenth century was a period of major changes in the provision of health care, with hospitals transforming from places of refuge to institutions of research, education and healing (Bynum 1994). Our finding of scientific and investigative medical equipment at St Bathans shows that research-informed healing was practiced in a small, remote rural cottage hospital at the beginning of the twentieth century. Exactly how widely and consistently this was the case is difficult to tell, as our evidence is currently restricted to modest samples from three late nineteenth-early twentieth century New Zealand sites. Extending comparisons to sites outside New Zealand and to earlier time periods was impossible within the confines of this paper. However, it is only by expanding the scope of such analysis that a clearer picture of hospital archaeology and broader changes in medical practice will emerge.

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