

Bottle Top Capsules in New Zealand Historic Archaeological Sites

Peter Petchey¹ & Jitlada Innanchai²

ABSTRACT

Bottle top capsules were applied over the cork or stoppers of many 19th century bottles to guarantee that the contents were authentic. They were manufactured from tin-plated lead foil, and were often embossed with the name and trademark of the bottling company. The capsules were discarded on opening, so they are directly associated with the actual consumption of the bottle contents, and used capsules are regularly found in small numbers in archaeological contexts. This paper explores the use of capsules as an additional tool for analysing historic glass bottle assemblages in New Zealand, with a particular focus on determining the actual rather than assumed contents of particular bottle forms. It also presents a typology for use as a reference tool for analysis of capsule assemblages.

Keywords: Historic archaeology; glassware analysis; bottles

INTRODUCTION

This paper explores the use of bottle-top capsules as a tool for economic and dating analysis of historic archaeological sites in New Zealand. Bottle top capsules were made from thin lead-plated tin sheet and were commonly applied to the tops of bottles after they had been sealed with a cork or glass stopper to guarantee that the contents were genuine and unadulterated. These capsules were embossed with the name and/or trademark of the company that filled the bottles, and were subject to immediate discard on the opening of the bottle, with little opportunity for reuse or curation. Therefore they have the potential to provide information regarding the actual use of the bottles they once sealed.

Nayton (1992: 75–91) identified bottle sealing capsules as an excellent chronological marker in Australian historic sites, using 76 designs found at Knight and Shenton's store site at Cossack, Western Australia. Nayton's focus was on precise chronological dating of archaeological layers within the site, to allow the application of Frontier Theory. This approach depends on being able to identify sites or features that relate to the first wave of settlement. Nayton achieved this chronological control by determining the date ranges represented in several artefact classes, including matchboxes, ceramics, tin cans and bullets, as well as bottle top capsules. Since Nayton's paper was pub-

lished a great deal more information about the companies represented in capsule assemblages has become available, both through more recently published books (such as Hughes 2006) and online resources such as scanned historic newspapers on www.paperspast.natlib.nz.

This paper describes and illustrates a number of capsules found in New Zealand sites with two aims: firstly to investigate the usefulness of capsules in the analysis of glassware assemblages; and secondly to provide reference material for future analysis of similar items.

ANALYSIS OF HISTORIC ASSEMBLAGES

Bottle glass is almost ubiquitous on historic archaeological sites, and analysis of glass assemblages is therefore included in almost every relevant excavation report. These glass analyses provide two main outcomes: dating (determining when the site was occupied) and economic interpretation (determining what was being consumed at the site). Dating is generally based on bottle manufacturing technology, which underwent several well-documented changes in the late 19th and early 20th centuries. The best and most easily accessible source for this information is the Society for Historical Archaeology (SHA) website (www.sha.org/bottle/), originally developed by the Bureau of Land Management in the U.S. Department of the Interior.

Leaving aside the relatively straightforward analysis of embossed bottles, economic interpretation has been more problematic, and arguably more subjective, as it is often based on assumptions of use or contents based on the shape and/or colour of bottles. Some such assumptions are probably reasonably safe, such as the square 'case gin' bottle (although Hamel (2003: 55) has found possible

¹ Department of Anthropology and Archaeology, University of Otago, PO Box 56, Dunedin, New Zealand

² Archaeologist, Lampang, Thailand

Corresponding author: peter.petchey@xtra.co.nz

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evidence that one was used for Australian beer), but others are less certain. A good example is the green ‘ring-seal-beer’ (RSB) or ‘champagne’ bottle that was in common use between *ca.* 1880 and *ca.* 1910. It has often been interpreted in New Zealand as a beer bottle, supported by remains of labels found at some sites (eg Bedford 1986: 35, Fig 10d; Hamel 2003: 54; Petchey 2001: 2), and is also known to have been commonly used for non-alcoholic contents such as ginger ale and lemonade (Bedford 1986: 35, Fig 10f; Petchey 2002: 90; Ritchie & Bedford 1983: 247). But at the Wanganui Hotel site surviving labels showed a complete correlation between this bottle type and champagne and cognac contents (Harris, in Campbell *et al.* 2009: 92). Tasker (1989: 39) thought that large volumes of champagne were entering New Zealand and that the change in use of this form of bottle from champagne to beer occurred here as they were refilled. However, a first-hand account of the beer bottling process at the London export bottling company of Robert Porter & Co. in 1891 states that ‘old champagne bottles are largely used’ together with an imported ‘similar’ type of bottle (*West Coast Times*, 28 March 1891: 3), and other beer bottling companies also used old champagne bottles (Hughes 2006). This makes it clear that the ‘champagne’ type bottles were indeed manufactured as champagne bottles, but many actually entered New Zealand as second-hand bottles containing beer. This may have been because they were inherently strong (having been made to contain effervescent champagne), and could therefore survive the sea voyage to colonial markets.

This recycling of glass bottles, both before export to New Zealand and within the country, makes interpretation of bottle assemblages problematic. In nineteenth century New Zealand virtually all bottles were imported, as the first bottle manufacturing plant of any note did not open until 1922 (Tasker 1989: 44). Once in New Zealand bottles could be disposed of immediately after their contents were consumed, or recycled many times by local businesses, not necessarily with the same contents each time. In the Otago goldfields Ritchie & Bedford (1983: 237) have found evidence of European-manufactured bottles with Chinese labels, an indication of the wide variety of contents for which bottles could be used.

Because of this complexity of use, Ian Smith (2003) has cautioned against a ‘folk taxonomy’, whereby analysis of a bottle assemblage is based on assumptions that certain forms are associated with certain contents. Smith has instead advocated a very descriptive glass analysis, whereby the actual form and colour of a bottle is used to describe it, rather than the ‘beer’, ‘whisky’, ‘spirits’ etc usage-based nomenclature that has often been used in the past. This descriptive approach was used by Middleton (2005) at the Te Puna Mission Station site. It has the advantage of being completely objective, allowing good comparisons between sites. But this approach leaves unanswered the important question of the actual (rather than assumed) final contents of the bottle, and thus the actual activity that the bottle

represents.

Two partial solutions to this problem can be identified. One, the analysis of surviving paper labels and their association with bottle forms is mentioned above. The other source of information is bottle top capsules. Both artefact classes (labels and capsules) were applied to bottles when they were last filled for use, and thus they are directly associated with the bottle contents, and their discard represents an actual event; the consumption of the bottle contents. In addition to the economic information, the use of company names and trademarks on labels and capsules allows the use of the bottle to be dated providing enough information on those companies can be found.

The drawback of the use of capsules and labels is that neither is particularly robust. At the Wanganui Hotel site, with its remarkably high proportion of surviving bottle labels, some 245 labels were identified, from a total of 3260 glass vessels (Campbell *et al.* 2009: 71, 82). Thus 7.5 per cent of the glass vessels could potentially be identified by their labels, while at most sites the proportion is far less. The analysis of this assemblage is of particular importance, as it is the first time such a large label assemblage from an archaeological context has been studied, and provides some important information about actual bottle use in 19th century New Zealand. Harris (in Campbell *et al.* 2009: 98) concluded that ‘the majority of labels show that commonly assumed uses such as beer bottled in ‘black beer’ bottles are generally correct.’ He also concluded that the ‘champagne’ type bottles were indeed used for either champagne or cognac.

However, there are caveats. As already discussed above, we know from both historical and archaeological sources that champagne bottles were also used for beer and non-alcoholic drinks, illustrating considerable variation in bottle use between sites. Also, within the Wanganui Hotel site label assemblage 21 different companies were identified, all of which were imported. The lack of any New Zealand companies amongst the labelled bottles indicates that these were imports that were being thrown away without being refilled locally (although reused bottles were identified amongst the embossed bottle assemblage). A similar situation applies to the Omata Stockade assemblage (Prickett 1994). But other sites contain a mixture of imported and local labels, for example Alexandra town (Hamel 2003: 54, Petchey 2002: 90) and the Halfway House Hotel (Bedford 1986: 35, 45). This means that the Wanganui Hotel label assemblage, while extremely useful, is not necessarily representative of all sites, and must be considered within a wider context.

Obvious factors affecting the inclusion of locally manufactured contents in an archaeological site are the actual existence of local manufacturers at the relevant period of time, the distance from ports where imported goods would be freely available, and the development of road and rail networks allowing manufactured goods to be easily moved. In Otago the first locally brewed beer was

offered for sale in 1857, and by 1861 three breweries were in operation in Dunedin (Leckie 1997:10). The Otago goldrushes saw many small breweries open and close; Queenstown had four breweries open and then close before 1870 (Leckie 1997:12). Locally brewed beer was thus available in the Otago goldfields from an early date, but much of this was sold to hotels in barrels (Bedford 1986:35), and is therefore hard to identify in the archaeological record. Indirect evidence is present in the numerous barrel hoops found on sites (although wooden casks and barrels had many uses), items such as barrel taps (eg Bedford 1986:35), and beer cellars. The excavation of the Royal Oak Hotel site in Arrowtown (Petchey 2004a) yielded numerous beer bottles, and also found the original 1860s beer cellar with a barrel ramp leading up to Buckingham Street.

It is therefore clear that although simple quantification of a bottle assemblage is relatively simple, interpretation of such an assemblage is more problematic. While the generic bottle-type (or ‘folk taxonomy’) approach probably produces results that are broadly true, there is room for considerable refinement of the process using the detailed information on bottle contents and the manufacturers of those contents that remnant capsules and labels can provide.

BOTTLE TOP CAPSULES

The majority of capsules found in archaeological contexts in New Zealand were made by Betts & Co. of London. Betts & Company was originally established in 1804 by John Betts as brandy distillers in Bordeaux, France, and shortly afterwards the business was extended to London where ‘Betts British Brandy’ was produced. In 1846 John Betts’ son, William, set up a factory in London to produce tin capsules which he had seen in use in France, and a patent was purchased from a Monsieur Dupre. In 1849 William Betts patented a method of coating lead with a thin layer of tin, called the Betts or B method, which considerably cut the cost of capsule making. The first customer outside the family firms to use Betts’ patent capsules was Charles Tanquery, who owned a distillery adjacent to Betts’ London factory (Carpenter in Garratt 1994:24). Betts continued to make capsules until after 1930 (Nayton 1992:85).

The capsules were embossed with the details (and often trademark) of the filler of the bottle, who was by no means always the manufacturer of the contents. In the 19th century it was generally the merchant bottlers that developed an international trade in beer rather than the brewers themselves (Hughes 2006:109), an exception to this being the Scots, who often bottled and shipped their own beer (Hughes 2006:85). This is reflected in the archaeological evidence discussed below, where English bottlers and Scottish brewers are represented. The use of the capsules was not confined to alcoholic beverages, and this is again reflected in the archaeological evidence, with numerous condiment bottles also represented.

ARCHAEOLOGICAL EVIDENCE

Although small and rather fragile, lead/tin bottle top capsules are regularly found in small numbers in historic archaeological sites. Bedford (1986:56) found six at the Halfway House Hotel, Prickett (1994:41) found 13 at the Omata Stockade site, and Middleton (2007) found 6 at the Chinese Gardens site in Dunedin. The majority of the examples illustrated here were found by Petchey at a variety of sites in Otago and Central Otago (Petchey 1999a, 1999b, 2004a, 2004b, 2005, 2007, 2010). In Australia Nayton (1992:78) has described 76 designs from the Knight and Shenton Store in Western Australia, and Garratt (1994:24) illustrated eight designs from the Long Jetty site in the same state. Many of the same designs are found both in New Zealand and Australia, illustrating the international nature of much 19th century trade.

The main sites discussed in this paper are:

A small part of the Cardrona town site was investigated during road widening in 1999 (Petchey 1999b). Gold was found at Cardrona in late 1862, and by 1863 nearly 300 miners were working there, but floods in 1878 wiped out most of the mining ventures (AJHR 1863 D6:19; Roxburgh 1957:127). A few residents stayed on, and the Cardrona Hotel has survived to the present day.

German Hills was a small gold rush settlement in the Ida Valley, investigated by Campbell and Bristow (1993) prior to modern mining of the area. The township was established in late 1864, but the rush population rapidly declined the following year, with a small population (between 10 and 30) present until the early 1900s.

The Golden Bar Mine is a small hard-rock mine, battery and settlement site in the East Otago hill country, which was also investigated prior to modern mining (Petchey 2005). The Golden Bar Mine had several periods of operation: 1897–1906/07, 1912–1913, and 1921–1928, with some desultory work continuing until 1942. Also near Macraes Flat, a small miner’s hut site in Upper Murphy’s Creek was occupied prior to 1911 and yielded some early 20th century material (Petchey 1999a).

The Halfway House Hotel site was located in the Cromwell Gorge, and was investigated before the gorge was inundated by Lake Dunstan (Bedford 1986:40). The hotel was established *ca.* 1864 beside the gorge road and burnt down in 1917.

The Royal Oak Hotel was established in Arrowtown in 1863 during the goldrushes, and burnt down in 1924 (Petchey 2004a). It was rebuilt after the fire, and in 2004 this replacement building was demolished and the site investigated prior to redevelopment.

The St. Peter’s Vicarage, Queenstown, was also excavated prior to the major redevelopment of the site for commercial use (Petchey 2007). The first Vicarage was built in 1869, and the modified building survives next to

the church as the parish lounge. A new Vicarage was built in 1963 in the grounds of the earlier building, and this was removed in 2005. The excavation found numerous rubbish pits from the Vicarage household from the late 19th century. Hamel (2001:36) has found that dumping in small domestic rubbish pits in Queenstown continued until about 1910, meaning that the Vicarage assemblage dates to between 1869 and *ca.* 1910.

Three historic sites in Dunedin also yielded capsules. As the provincial capital of Otago, Dunedin grew rapidly during the goldrushes, and was for a period the most important commercial and industrial town in New Zealand. The Farmers department store site in George Street, Dunedin, was investigated prior to a major redevelopment (Petchey 2004). Evidence relating to the occupation of the North Dunedin Flat from the 1860s through to the present day was recovered. The nearby Wall St. Mall development contained archaeological features from the 1850s through to the early 20th century (Petchey 2010). One particular area (Section 41) consisted of refuse from a small group of working class cottages that was discarded in the 1870s or 1880s, and was very well preserved in wet anaerobic conditions. When the construction of the Dunedin Chinese Gardens started in 2007 an area of ground that had been reclaimed from the Otago Harbour between 1873 and 1884 was excavated, yielding a large artefactual assemblage (Middleton 2007; Williams 2008).

Finally, a North Island redoubt site has also yielded several capsules. The Omata Stockade site is located in Taranaki, and was investigated in 1977 as part of an investigation into the fortifications of the New Zealand Wars (Prickett 1994). The stockade was established in 1860 during the First Taranaki War, and continued in use through the Second War of 1863–66, and was dismantled in 1867.

CAPSULE TYPOLOGY

Below are listed the companies represented by the capsules that have been found, together with details of the companies, the products that they sold, and the sites from which their capsules have recovered. A simple alpha/numerical typology is used here, based on an alphabetical listing of company names. This is cross-referenced to Nayton's (1992) listing of capsules where appropriate. This system, while not perfect, is simple and allows future addition of other makers. Figures 1 to 3 illustrate the capsules, while Table 1 summarises the capsule types and their date ranges.

Type A1

A. Arrol, Glasgow

Archibald Arrol bought the Alloa Brewery in Alloa, Scotland, in 1866, and after his death in 1888 the business passed to his sons Walter and Archibald who continued to run the company. In 1895 Archibald Arrol & Sons was registered as a limited liability company (Scottish Brewing

Archive).

One capsule was found at the Farmers site in Dunedin, in Area A beneath Feature 1 (a brick stable floor) (Petchey 2004b:50). This capsule is likely to date to between 1866 when Arrol became involved in brewing, and 1874, the latest date that the brick floor was laid.

Type B1

O. & T. Bacot

O. & T. Bacot was possibly one of the many cognac producers in southwest France that began to export their product in bottles in the mid-nineteenth century. The city of Cognac got its first glass factory in about 1860, but the bottles there were all hand-blown. In 1878 Claude Boucher set up a new factory, and there developed a semi-automatic bottle making machine that considerably increased output. By the 1890s the use of bottles for shipping cognac was practically universal (Jarrard 2005:90). O. & T. Bacot Cognac was advertised for sale in Melbourne (Australia) in 1876 (*Argus*, 11 October 1876:4). Two Bacot labels are illustrated on an online collection of cognac labels (www.cognac-paul.com), and this site dates the registration of one label at the Tribunal de Commerce (Commercial Court) to 1890.

One Bacot capsule was found at the St. Peter's Vicarage site in Queenstown, in the Feature 61 rubbish pit (Petchey 2007:42). The first Vicarage was built in 1869, and the F61 pit was encapsulated beneath the 1963 Vicarage. Hamel (2001:36) has found that dumping in small domestic rubbish pits in Queenstown continued until about 1910. This would suggest that the Bacot capsule was deposited between *ca.* 1869 and *ca.* 1910.

Type B2

Bisquit Dubouche & Co.

Bisquit Dubouche & Co. was a cognac producer of the Charente Region. The company was founded in 1819. In 1963 Bisquit Dubouche merged with Renault Castillon to become Renault Bisquit (www.cognacrenault.com/history.html). Bisquit Dubouche brandy was advertised for sale in New Zealand from 1870 (*Evening Post*, 4 August 1870:3), advertisements continuing well into the twentieth century (*NZ Truth*, 24 December 1920:6).

A Bisquit Dubouche Cognac capsule was found at the Halfway House Hotel site. (*ca.* 1864 to 1917) in the Cromwell Gorge (Bedford 1986:40).

Type B3

Blood, Wolfe & Co., Liverpool

(see also Nayton type 44)

Blood, Wolfe & Co was established by Frederick Blood and Thomas Wolfe, both Irishmen living in England. They were export bottlers of beer, mineral water, aerated water



Figure 1. Capsule Typology (A1–F1)

and ginger beer, and their 'Z' trademark was registered in 1876, but had been in use since 1864 (Hughes 2006: 112–114). They appear to have only bottled export Guinness and Bass, and were dominant in many markets, including New Zealand, Australia and British controlled areas of Southeast Asia in the late 1860s to 1880s. During the 1930s their trade declined markedly, and in 1936 Guinness took over Blood Wolfe (Hughes 2006: 114–115).

This documented dominance in the New Zealand market is supported by archaeological evidence, as their products are well represented in New Zealand sites, with both bottle top capsules and bottle labels being found. At the Wanganui Hotel site 68 Blood Wolfe & Co. labels were found, together with several lead capsules, and at the Alexandra Floodbank excavation six labelled bottles were found in one pit feature (Petchey 2002: 90).

Blood, Wolfe & Co. capsules have been found at German Hills (1864–1864 with small continued occupation) and Cardrona Township (1862–1878, with small continued occupation). These all bear the company's 'Z' trademark. At German Hills, Ida Valley, one intact capsule on a broken bottle neck was recovered (Otago University, Anth. comparative collection HA42). At the Cardrona Township site (Petchey 1999b) one capsule was found, with the 'Z' and circle coloured red.

Type B4

James Buchanan & Co.

James Buchanan & Co. was one of the largest producers of Scotch Whisky at the turn of the twentieth century. James Buchanan was born in 1849 in Ontario, Canada, of Scottish parents who returned to Scotland soon after his birth. In 1879 he became the London representative of the whisky merchant Charles Mackinlay. In 1884 he set up on his own account to sell whisky, obtaining his supplies from the Glasgow whisky broker and blender W.P. Lowrie (MacLean 2003: 136–137). He was very successful, and in 1885 obtained the contract to supply the House of Commons. In 1897 he bought the Old Black Swan Distillery in Holborn, demolished it, and built a new plant (MacLean 2003: 138), and in 1898 in partnership with W.P. Lowrie he built a new distillery at Glentauchers (MacLean 2003: 158).

In 1902 Buchanan became a private limited company, with James Buchanan still in control (MacLean 2003: 178). In the same year the company opened an office in New York, and promoted the whisky in the U.S. and Canada. Distillery purchases continued, Bankier being bought in 1903, and Convalmore in 1908 (MacLean 2003: 174). Buchanan also bought 50 per cent of the North British Bottle Manufacturing Company, making Buchanan the only whisky company to make its own bottles (MacLean 2003: 178).

In 1915 James Buchanan & Co. and John Dewar & Sons Ltd formed a new private limited company, Scotch Whisky Brands Ltd, but for the time being the two companies kept

their respective identities (MacLean 2003: 182–184). In 1925 Buchanan, Dewar, John Walker & Sons and the Distillers Company Limited amalgamated (MacLean 2003: 195).

One Buchanan Whisky capsule was found at the Halfway House Hotel site (ca. 1864 to 1917) in the Cromwell Gorge (Bedford 1986: 40). This was from a bottle of 'Red Seal' whisky, a mid-price whisky in the Buchanan's range (MacLean 2003: 181).

Type B5

E. & J. Burke, Dublin

Edward & John Burke Ltd were the most important export bottler of Guinness to America, and developed healthy markets in the far-east and Australia. They had been set up in business by their uncle, the second Arthur Guinness, with the prime objective of securing a market for Guinness Stout in America. Their Cat trade marks were registered in London in 1876, but had already been in use since 1870. As merchants they handled a wide range of products, including stout, porter, ales, whisky, finest Jamaica rum, gin, brandy and liqueurs. The company initially bottled in Dublin, then in Liverpool, and later also in America where they purchased a brewery in 1932 and started to produce their own beer. By the early 1900s their trade was in decline, and their export bottling business was sold to Export Bottlers Ltd in 1936 (Hughes 2006: 111–113).

One E. & J. Burke capsule was found beneath the floor of the 1879 Farmers building in Dunedin prior to excavation (Petchey 2004b). It had been dropped down a vent, and post-dated the building. The capsule had a yellow background to the top and red lettering and sides, with a partial signature also on the side. It was intact on a broken green ring-seal bottle neck, with iron tie-down wire.

Type B6

Robert B. Byass, London

This was an early London bottler, established by Robert Blake Byass. Byass supplied home trade as well as export to the colonies, bottling Bass Pale Ale and Foreign Guinness (Hughes 2006: 144). Advertisements for imported Byass's bottled ale appear in New Zealand newspapers as early as 1842 (*Nelson Examiner*, 1 October 1842, p117). The company was listed in 1871 as an export bottled beer, wines and sprits merchant trading from 2 Brabant Court, Thomas Place, Limehouse Hole, London E. (Hughes 2006: 144). Byass was bought out by Hibbert in about 1900 (Hughes 2006: 144).

Two varieties of Robert B. Byass capsules have been recorded, one for 'Imperial D Stout' (Type B6a) and one for porter (Type B6b), both from the harbour reclamation at the Dunedin Chinese Gardens site (Middleton 2007; Otago University, Anth. Comparative collection H.A. 827, 828). Both incorporate a trade mark shield in red bearing the initials 'RBB'.

Type D1

John De Kuyper & Son (Johannes de Kuyper & Zoon, or JDKZ)

De Kuyper was established in 1695 by Petrus De Kuyper, a manufacturer of barrels and casks. By 1752 the family owned a distillery in Schiedam, and in the nineteenth century the company expanded its business internationally (Coates 2000:126). JDKZ Genever (Dutch gin) was advertised in New Zealand as early as 1854 (*Daily Southern Cross*, 3 October 1854:2), and the company is still in existence today. As well as the traditional Genever (or jenever) they also produce a London Dry style gin and an extensive range of liqueurs (Coates 2000:127).

A John De Kuyper & Son capsule was found at the Halfway House Hotel site (ca. 1864–1917) in the Cromwell Gorge (Bedford 1986:40). A number of embossed ('JDKZ') gin bottles from the same company were also found at the site (Bedford 1986:38).

Type D2

John Dewar & Sons Ltd, Perth

John Dewar joined a relative in a wine merchant business in Perth (Scotland) in 1828, and in 1846 set up on his own as a wholesale wine and spirit merchant. Shortly before he died in 1880, John Dewar brought his son John Alexander into the business, and in 1885 John's brother Thomas Robert also joined, and the firm's name was changed to John Dewar & Sons (MacLean 2003:115–117, 141–144). The brothers started selling Scotch whisky in England, and quickly became a major supplier to that market. In 1890 John Dewar & Sons leased a distillery near Ballinluig, and in 1896 built its own at Aberfeldy (Lockhart 1951:81–82).

The company received the Royal Warrant to supply Queen Victoria in the early 1890s (MacLean 2003:149). This was renewed by Edward VII in 1902, and again by George V in 1910 (MacLean 2003:181–182). In 1892 Thomas Dewar set out on a two year tour of the world to promote the company's product, resulting in the export of large amounts of bottled whisky (Lockhart 1951:83). In 1915 James Buchanan & Co. and John Dewar & Sons Ltd formed a new private limited company, Scotch Whisky Brands Ltd, but for the time being the two companies kept their respective identities (MacLean 2003:182–184). In 1925 Buchanan, Dewar, John Walker & Sons and the Distillers Company Limited amalgamated (MacLean 2003:195).

Two Dewar capsules have been recorded from the Macraes Flat area. One example was found in a small miner's hut site on the banks of Upper Murphy's Creek (occupied prior to 1911) (Petchey 1999a:74). The other Dewar capsule was from Hut 9 at the Golden Bar Mine (1897–1906, 1912–1913, 1921–1928, some work until 1942) (Petchey 2005:35).

Type E1

William Edmonds Jr. & Co., Liverpool

William Edmonds Jr. & Co. was established in Liverpool in 1861, and were listed in a 1874 trade directory as ships-stores agents. The company was well-known for their red 'Pig' brand labels, and called their beer 'Pig Stout' and 'Pig Ale' (Bass). By 1888 they were the second largest Guinness bottler, exporting to Australia and South America, but by 1908 they were in sharp decline. The company continued trading into the early 1930s in a much reduced way, and were bought out by Guinness in 1935 (Hughes 2006:115–116).

One Edmonds capsule (Type E1) was found in the Otago Harbour reclamation at the Chinese Gardens site (Middleton 2007; Otago University, Anth. Comparative collection, H.A. 830). The capsule has an embossed pig against a red background.

Type F1

J. Friend & Co.

This company has not yet been identified, although their capsules have been found in both the North and South Islands. The Cardrona Township site (1862–1878, with continued small occupation) (Petchey 1999b:35) contained three J. Friend capsules, and the Omata Stockade site (1860–1867) (Prickett 1994:41) also contained three capsules. The capsule design consists of a lion or cat head and signature.

Type G1

W. Gregg & Co. Ltd, Dunedin

William Gregg was born in Ballymena, Northern Ireland, in 1836, and went to Australia when he was young. He set himself up as a coffee and spice manufacturer in Ballarat, Victoria, but when news of the Otago goldrushes reached him, he moved to Dunedin. He established William Gregg & Co. in 1861, and in 1862 purchased the Otago Steam Coffee Mills. His premises were on Princes Street, and in 1866 an agency office was also opened in Auckland (Matheson 1961:4–6). An 1871 trade circular issued by William Gregg lists the goods that he was selling: roasted and ground coffee and chicory, pure coffee, raw coffee, chicory, white pepper, cayenne pepper, black pepper, mixed spice, pimento, ginger, cinnamon, cassia, nutmegs, cloves, mace, caraway seeds, mustard, cocoa and chocolate, curry powder, ground rice and sundries (Matheson 1961:7–8).

Despite a strong start, the company was in financial difficulties by 1894, and was restructured. It was incorporated as a limited liability company in May 1897 (Matheson 1961:13–14). In the early twentieth century the company began to focus more on manufacturing rather than simply operating as a merchant (Matheson 1961:19).

A single William Gregg & Co. Ltd capsule was recovered from the beer cellar fill at the Royal Oak Hotel

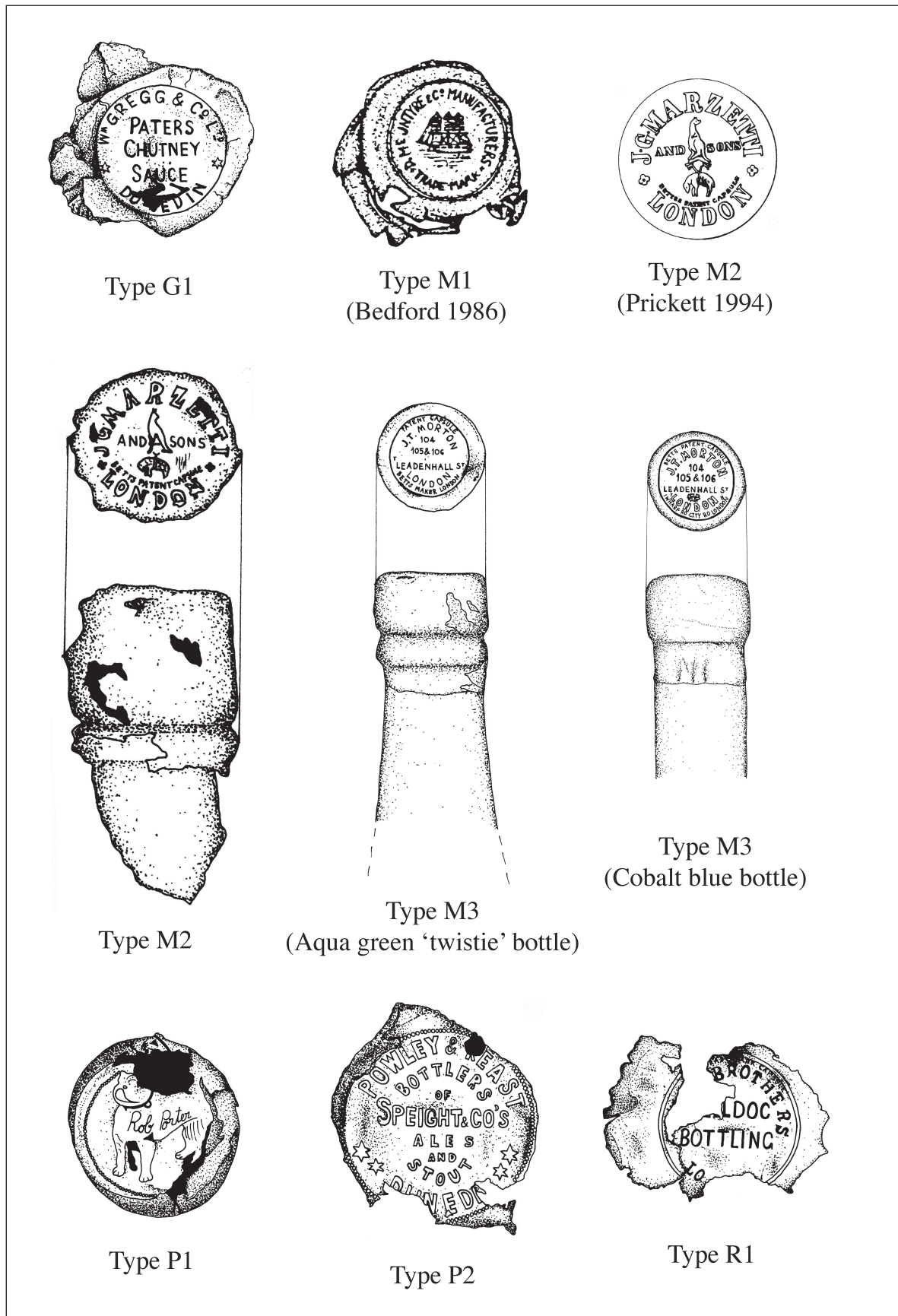


Figure 2. Capsule Typology (G1-R1)

site, Arrowtown (Petchey 2004a). This capsule must post-date 1897, the date that Greggs became a limited liability company, and is likely to date to the early twentieth century when the company was increasing its manufacturing activities. It must pre-date 1924, when the hotel was destroyed by fire.

Type M1

D. McIntyre & Co.

One D. McIntyre & Co. capsule was found at the site of the Halfway House Hotel (*ca.* 1864–1917) (Bedford 1986: 40). This company has not yet been identified.

Type M2

J.G. Marzetti, London

John George Marzetti was born in London in 1790, and died in 1871. He established himself as a ship chandler, trading under the name of J.G. Marzetti. He supplied ships with wine, spirits and beer, and he also built up a business exporting bottled Bass and Guinness to Australia. Marzetti employed his three sons, and took two of them, Augustus and Charles, into partnership in the business in 1849 (theforsterfamily.com/The%20Marzetti%20Family.pdf). The genealogical source referenced here states that the business of J.G. Marzetti was finally wound up in 1862, but advertisements appear for Marzetti's goods in New Zealand newspapers as late as 1869 (*Evening Post*, 17 November 1869: 3), so this date is not correct.

In 1859 advertisements in the *Otago Daily Times* (1 October 1859: 1) stated that J.G. Marzetti & Sons had adopted the use of Betts' Patent Metallic Capsules to prevent 'numerous piracies upon this old and favourite brand.' Other New Zealand advertisements refer to J.G. Marzetti & Sons porter in both quarts and pints (*Evening Post*, 17 November 1869: 3), Dublin stout, London brown stout and pale ale (*Daily Southern Cross*, 20 June 1865: 7). The Marzetti capsules that have been found have a kangaroo and sheep, suggesting that Australia was the company's main market.

Two Marzetti capsules were found at Cardrona township site (1862–1878, with some continued occupation) (Petchey 1999b). A single Marzetti capsule was found at German Hills in the Ida Valley (1864–1865, with a small continued occupation) (Campbell & Bristow 1993; Grogan 1997: 67). Six Marzetti capsules were found in association with 'black' bottles at the Omata Stockade (1860–1867) (Prickett 1994: 41). A Marzetti whisky label was also found at the site.

Type M3

J.T. Morton, London

See also Nayton (1992) Type 8

J.T. Morton was originally a Scottish firm, founded in Aberdeen in 1849 as a ships chandler ([www.millwall-history](http://www.millwall-history.co.uk/origins.htm)

[.co.uk/origins.htm](http://www.millwall-history.co.uk/origins.htm)). By the 1860s Morton was a general provider, and stocked a wide range of goods from premises in Leadenhall St., London. An 1868 trade directory (Anon 1868) shows that the company supplied not only foodstuffs such as cheese, confectionary, corn, preserved provisions, sauces, vinegar and salt, but also apparel, books, soap and candles. Morton's bottled fruits, pickles, jams, salad oil, sauces and castor oil were advertised in Perth (Australia) from 1870 to 1920 (Nayton 1992: 85). In New Zealand Morton's pickles, salad oil, marmalade and castor oil were advertised (*Evening Post*, 2 December 1882: 4). The Wanganui Hotel site contained a number of J.T. Morton bottles with intact labels, including raspberry syrup, cauliflower pickle and picalilli pickle (Campbell *et al.* 2009: Fig 5.8). In 1868 the food shipments were listed from 107, 108 and 109, while arms and apparel were supplied from 106 Leadenhall St. (Anon 1968). In 1900 C.E. Morton took over the company. The company address was shown on bottle top capsules, and one major change can be seen. Nayton's Type 8 shows the address as 107, 108, 109 Leadenhall St., London (1992: 88), while the capsules from the Wall St. Mall site in Dunedin show 104, 105, 106 Leadenhall St. (Petchey 2010: 68).

J.T. Morton containers (bottles and jars) are very commonly found in New Zealand sites, for example the Halfway House Hotel (Bedford 1986) and the Sky City Site in Auckland (Bioresarches 1995).

Eight J.T. Morton capsules were found in the Section 41 rubbish deposit at the Wall St. Mall site in Dunedin, which dated to the period *ca.* 1867 to *ca.* 1880 (Petchey 2010). All were intact on broken bottle necks. Five capsules were on aqua-green 'twistie' salad-oil bottles, the tops all being 24 mm to 25 mm outside diameter. Three capsules were on cobalt-blue bottles, 18 mm to 21 mm outside diameter. The embossed design was the same on all capsules, although reduced in size on the smaller blue bottles. For this reason, the type designation has not been subdivided.

Type P1

Robert Porter, London

See also Nayton (1992) Type 15

Robert Porter & Co. of London was established in 1848 as an export bottling company in London. The company's premises were on Pancras Road, London, near the Midland Railway Company's terminus where Bass Ale was bottled, while Guinness Stout was bottled at another premises nearby at the St Pancras Goods Station (*West Coast Times*, 28 March 1891: 3). The company's 'Bull Dog' trademark was first used and registered in September 1879 (Hughes 2006: 119). In 1891 Robert Porter were bottling Guinness Foreign Stout, Bass Pale Ale and Light 'Oriental' Pale Ale, and Porter's 'Apple' brand cider. It is of note that the company was filling second-hand champagne bottles, and an imported 'similar' type of bottle (*West Coast Times*, 28 March 1891: 3). In 1938 Robert Porter & Co. amalga-

mated with Read Brothers to form Export Bottlers Ltd (Hughes 2006).

A Robert Porter Bulldog capsule was found underneath the floor of the 1879 Farmers building prior to excavation (Petchey 2004b). It had been dropped down a vent, and post-dated the building. Robert Porter Extra Stout bottle labels were found at the Wanganui Hotel excavation (Campbell *et al.* 2009: 85).

Examples of R. Porter & Co. capsules have been found in Western Australia at the Long Jetty site (Garratt 1994: 24) and Knight and Shenton's store (Nayton 1992: 85), although these were of a different design to the Farmers example. Nayton (1992: Type 15) illustrated two designs, both with text only, while the Long Jetty example had the 'Bass' triangle.

Type P2

Powley & Keast, Dunedin

The partnership of Richard Powley and Charles Keast was formed in Dunedin in about 1893, and lasted until 1914 when Keast left the partnership. They gained the bottling contract for Speight's beers in 1893, and operated from the former Apollo Hotel on the corner of Carroll and Maitland Streets (Leckie 1997: 93). They were well-known for their 'Moa' brand. Speights (James Speight & Co) was established in 1876, and in 1913 was one of the nine leading New Zealand breweries that amalgamated to form New Zealand Breweries Ltd (Leckie 1997: 90, 94). Speights beer is still produced today.

One Powley & Keast capsule was found at the Farmers site in Dunedin (Petchey 2004b). It had been dropped down a vent and was found beneath the floors of the 1879 building. The capsule must post-date 1893, when the company was formed.

Type R1

Read Brothers, London (Bulldog Bottling)

Read Brothers bottled Bass, Guinness, and sparkling champagne cider for export. By 1906 they were the largest buyers and bottlers of Bass Ale in the world, all sold for export (Hughes 2006). They collected used champagne bottles from all over London for refilling with beer or cider. In 1938 Read Brothers amalgamated with Robert Porter to form Export Bottlers Ltd (Hughes 2006). The Read Brothers' Bull Dog trade mark was very similar to that of Robert Porter (see above).

Two partial 'Bulldog Bottling' capsules were found in the Feature 11 rubbish pit at the St. Peter's Vicarage site in Queenstown (1869–ca. 1910) (Petchey 2007: 42). The 'BULLDOG BOTTLING' lettering was red, the rest of the text uncoloured. A very similar capsule was found at the Long Jetty site in Australia (Garratt 1994: 24).

Type S1

Thos. Symington & Co., Edinburgh, London

Thomas Symington & Co. was established in Edinburgh by Thomas Symington in the second half of the nineteenth century. He developed a very early 'instant coffee.' Symington's displayed goods at the New Zealand Exhibition in 1882, and advertisements for Thomas Symington's essences of pure coffee, coffee and chicory, dandelion coffee and taraxicum appear in the 1880s in New Zealand (*Otago Daily Times*, 11 June 1886: 17). Symingtons continued to operate from Edinburgh until 1975 when it was sold to G.R. Lane Health Products Ltd (www.laneshealth.com). The company name survives today, Symington's Dandelion Coffee being a current product.

Symington's essence of coffee and chicory bottles are commonly found in New Zealand historic sites, such as the Halfway House Hotel (Bedford 1986), the Sky City site in Auckland (Bioresarches 1995), and a miner's hut at Macraes Flat (Petchey 1997: 13). They are readily recognisable as they are square with embossed side panels that read 'SYMINGTON & CO, ESS COFFEE AND CHICORY, EDINBURGH.'

One Symington capsule was found on a glass stopper and broken neck in an exposed rubbish pit at Macraes Flat in 2000.

Type T1

R. Tennent (Wellpark Brewery), Glasgow

John and Robert Tennent established a brewery and distillery in Glasgow in the 1770s, and later took over the adjacent brewery of William McLehose, renaming it Wellpark Brewery. The brewery expanded and continued to be run by the Tennent family throughout the nineteenth century, and today remains in production (Harris in Campbell *et al.* 2009: 85). A source of confusion exists in the presence of a Well Park Brewery in Dunedin between 1862 and 1894 (Leckie 1997: 55), and this had no connection with the Scottish firm although the name may have been chosen to take advantage of the Scottish brewery's reputation.

Tennent's Wellpark Brewery capsules have been found on a number of sites, and with a number of slight design variations. Tennent's Pale Ale labels were also found at the Wanganui Hotel site on tall black beer bottles (280–286 mm high) (Campbell *et al.* 2009: 85).

Six intact capsules on broken bottle necks were found in Dunedin at Wall St. Mall site, in the Section 41 rubbish assemblage, which was probably deposited between 1867 and the early 1880s (Petchey 2010). There were a number of minor variations amongst the tops, with two main types. One type had a plain embossed circle around the capsule design (two examples, Type T1a), the other had a dotted circle (four examples, Type T1b). Some capsules had the letter 'T' coloured red, but the colouring may simply have come off the others. At the Farmers site in Dunedin one

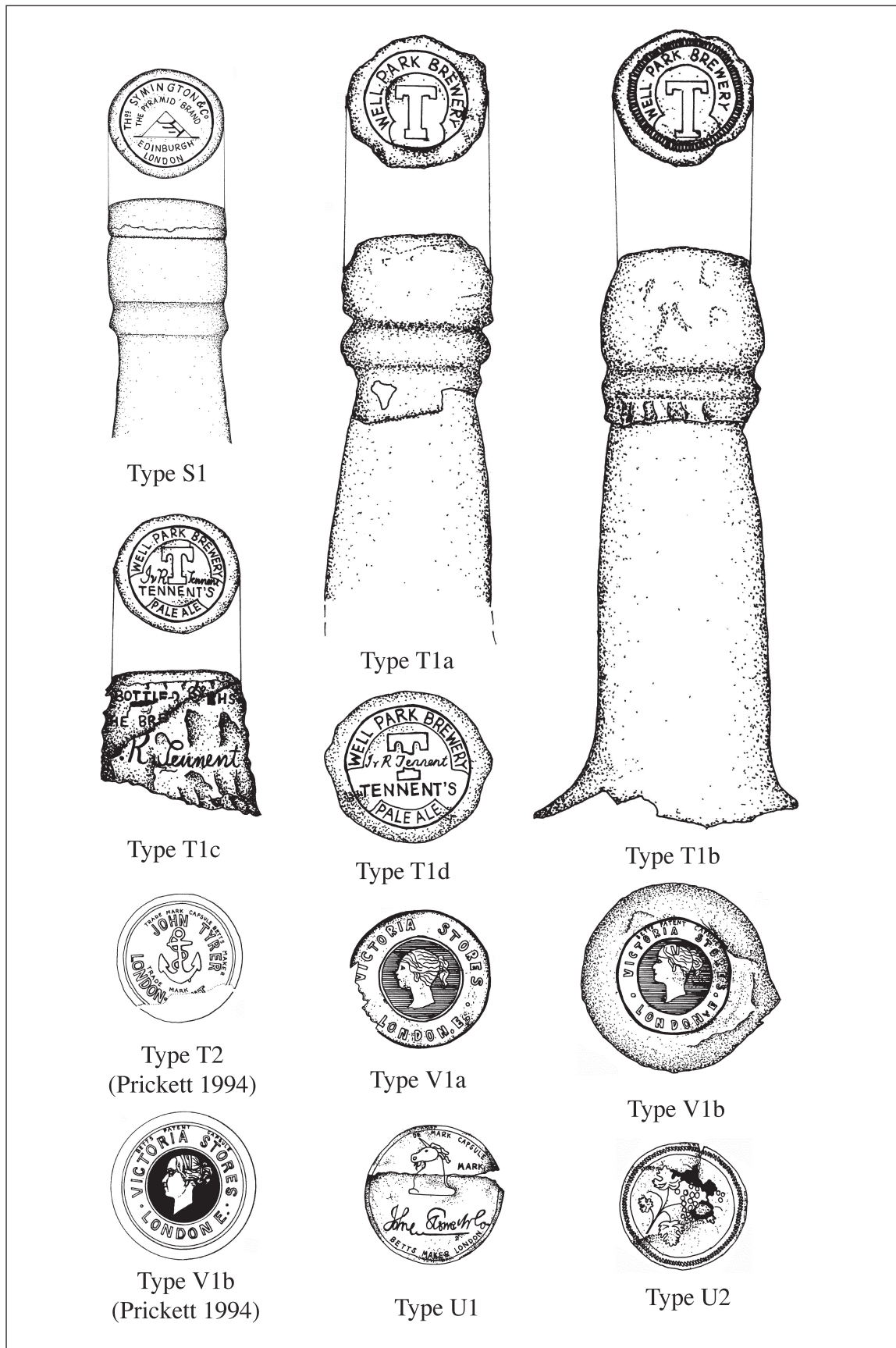


Figure 3. Capsule Typology (s1–u2)

capsule (Type T1a) was found in Area A beneath Feature 1 (a brick stable floor), dated to 1867 and 1874 (Petchey 2004b: 50).

One capsule was found under the floor of the Waikouaiti Hall. The capsule had yellow background on the top and red lettering. A large red 'T' was on side opposite that shown in the illustration. The top lettering specified 'Pale Ale' (Type T1c). Another Pale Ale capsule, but without the colouring and with the 'J & R Tennent' script running through the 'T' was found in the harbour reclamation at the Dunedin Chinese Gardens (Type T1d).

Type T2

John Tyrer, London

Little has been found out about this company. It is likely that it is the same John Tyrer & Sons Ltd that was a Liverpool bottling company. A 1914 T. Hine & Co. Cognac label bottled by John Tyrer & Sons is illustrated on the website www.cognac-paul.com.

A single John Tyrer capsule was recovered from the Omata Stockade site (1860–1867) (Prickett 1994: 41).

Type V1

Victoria Stores, London

(Note that this is given a V- letter because although the company identification is reasonably secure, the company name is never given on the capsules).

This was the capsule used by M.B. Foster & Sons, who had premises at Victoria Stores, North Woolwich E, with their main offices and warehouse at 242–244 Marylebone Road London (Harris in Campbell *et al.* 2009: 86). An 1886 advertisement in New Zealand listed the Victoria Stores as Foster's export department (*Poverty Bay Herald*, 31 May 1886: 2). M.B. Foster & Sons was established in 1829 by Myles Birkett Foster and his sons. At the request of Michael Bass as an experiment Foster undertook the bottling of a barrel of Bass' India Pale Ale, which started a long association with the Bass brewery (Hughes 2006). The company bottled Bass for export, Pilsner larger, Barclays stout, cider, sparkling Scotch ale and East India pale ale. After several restructurings, and after the drop in trade that occurred when Bass took their bottling in-house in 1928, the company joined Export Bottlers Ltd in 1936, and merged with A. Probyn & Co. Ltd in 1958 (Hughes 2006).

At the Wanganui Hotel site several partial labels were found with 'INDIA PALE ALE, VICTORIA STORES, LONDON E.' Unfortunately all of the labels were fragmentary, and the full legend could not be read (Campbell *et al.* 2009: 86).

The Victoria stores capsules that have been found all have a portrait of Queen Victoria looking towards the left. Two slight variations have been observed; one with unadorned hair (Type V1a) and one with hair ribbons (Type V1b).

One capsule was found at the Cardrona Township (1862–1878, with small continuing occupation) (Petchey 1999b). This was the type without hair ribbons (Type V1a). One Type V1b intact capsule was recovered on a broken bottle top from Germans Hills (1864–1865) (Otago University, Anth. comparative collection, HA142). Three Victoria Stores capsules (Type V1b) were found Omata Stockade (1860–1867) (Prickett 1994: 41).

Unidentified Capsules

Several capsules have either not been identified, in one case the name could not be deciphered, and in one case the capsule carried no text, just a generic 'grapes' design. These have been given the Type numbers U1, U2.

Type U1

A Betts' Patent capsule with a unicorn trade mark (coloured red) and a partially-legible signature, which appears to be John (??) & Co. Two of these capsules were found at the Cardrona Township site (1862–1878, with small continuing occupation) (Petchey 1999b).

Type U2

An embossed but unlettered capsule, the design being a sprig of grape vine with leaves and a bunch of grapes. Nayton (1992) recovered capsules with similar grape motifs (Nayton Types 45, 50), one of which was from Bertrand & Co. Bordeaux, and the other similarly unlettered. It is almost certainly from a grape-based alcoholic drink, possibly wine or cognac. It was found at the St. Peter's Vicarage site in Queenstown, in association with an O. & T. Bacot Cognac capsule (Type B1) (Petchey 2007: 42).

DISCUSSION

The majority of the capsules described above can be confidently associated with a particular manufacturer or bottler, allowing the type and origin of the contents together with the date range of use of the relevant bottles to be determined. Nayton (1992) used the overlapping date ranges of the capsules that she identified to determine dates for different stratigraphic contexts in Knight and Shenton's store site. This same approach can be used in New Zealand if enough capsules are recovered from a single site, although many of the firms were in business for long periods. But the initial intention of the present research paper was to consider the economic analysis of bottle assemblages using capsules as a tool, and it is clear that they have considerable potential.

With capsules that state the particular contents (such as Bacot's Cognac, Gregg's Chutney Sauce and Byass' porter) and capsules from makers of a single product (such as J&KZ gin) it is possible to be quite specific about the bottle

Table 1. Capsule types and companies, sites at which they have been recorded, and date ranges. Dates in normal typeface are the historically known years of company operation (or trademark use), and dates in italics are inferred from archaeological evidence.

Type	Company	Sites	Date Range
A1	A. Arrol, Glasgow	Farmers	1866–(1874) 1895+
B1	O. & T. Bacot	St. Peter's Vicarage	(1869)–(1910)
B2	Bisquit Dubouche & Co.	Halfway House Hotel	1819 (1864)–(1917) 1963
B3	Blood, Wolfe & Co.	German Hill Cardrona Township Wanganui Hotel Dunedin reclamation	1864 (1864)–(1878) 1936
B4	James Buchanan & Co.	Halfway House Hotel	1884–(1917) 1925
B5	E. & J. Burke	Farmers	1870 (after 1879)–1936
B6	Robert B Byass	Dunedin reclamation	1840s–1900
D1	John De Kuyper & Son	Halfway House Hotel	1854–today
D2	John Dewar & Sons	Upper Murphys Creek Golden Bar Mine	1885–(1911, 1942)
E1	William Edmonds Jr. & Co.	Dunedin reclamation	1861–1935
F1	J. Friend & Co.	Omata Stockade Cardrona Township	(1860)–(1870s)
G1	W. Gregg & Co. Ltd	Royal Oak Hotel	1861–today
M1	D. McIntyre & Co.	Halfway House Hotel	(1864)–(1917)
M2	J. G. Marzetti & Sons	Cardrona Township German Hills Omata Stockade	1849–1869
M3	J. T. Morton	Wall St. Mall	1849–ca.1900
P1	Robert Porter	Farmers	1879 (Bulldog mark)–1938
P2	Powley & Keast	Farmers	1893–1914
R1	Read Brothers	St. Peter's Vicarage	Prior to 1906–1938
S1	Thos. Symington & Co.	Macraes Flat	Prior to 1882–1975 (tradename still survives)
T1	R. Tennent (Wellpark Brewery)	Wall St. Mall Farmers Waikouaiti Hall Dunedin reclamation	1770s–today
T2	John Tyrer	Omata Stockade	(1860)–(1867)
V1	Victoria Stores (M. B. Foster & Sons)	Germans Hill Cardrona Township Omata Stockade	1829–1936

contents. With other capsules from makers or bottlers of wider ranges of products it is not possible to be so specific about the bottle contents: for example 'beer' might be the greatest degree of accuracy possible, rather than 'stout' or 'pale ale,' while a provisioner such as J.T. Morton is known to have supplied a wide range of goods, such as salad oil, castor oil, cordials etc. However, capsule analysis is still a useful tool on a case-by-case basis during analysis of bottle assemblages, as it is completely objective, and does not rely on any assumptions. In particular it can identify the presence of the large-scale beer exporters such as Blood Wolfe & Co. in archaeological assemblages. When combined with the information from surviving paper labels

(which are generally far more specific about contents), the potential for very detailed analysis of bottle use is obvious. But, as already discussed in the Introduction above, one problem is the very low survival rate of capsules and labels when compared to the survival of bottle.

At the Wall St. Mall site in Dunedin the Section 41 midden deposit contained a minimum number of vessels (MNV) of 172 bottles and 14 capsules, the capsules therefore representing only 8 per cent of the bottle assemblage (Petchey 2010: 57, 68). But these 14 capsules (which were all intact on broken bottle necks) were found on only three different types of bottles ('twisty' salad oil, cobalt blue, and 'black beer'), and were from only two companies (J.T. Mor-

ton and Tennent's Wellpark Brewery), both of which were imported, so they do not represent the full range of bottles from this feature. If embossed bottles from the same context are taken into account, six bottles from a Dunedin chemist (B. Bagley) were also present (Petchey 2010: 58). Similarly, the largest assemblage of legible paper labels described to date, from the Wanganui Hotel site (Campbell *et al.* 2009), has only 7.5 per cent of bottles identified by their labels, all of which were imported. But again, if embossed bottles are also considered, the site contained a number of examples from local aerated water manufacturers (Campbell *et al.* 2009: 75). Thus small sample size combined with this type of variation in bottle assemblages is a problem, and most sites have much lower (or non-existent) rates of recovery of capsules and/or labels.

Despite this small sample size, capsule and label analyses at the Wall St. Mall and Wanganui Hotel sites shows that imported goods were commonly consumed, even though local alternatives were available. This is a significant outcome of the present study, emphasising (from archaeological rather than historical data) the degree to which export bottlers dominated trade in the nineteenth century. Today we are used to manufacturers packaging their own goods, but the historical and archaeological evidence is clear that bottling firms had a significant (although not complete) portion of the market. In particular this applied to the international beer market, where the large brewers such as Guinness and Bass only supplied their products in barrels, and the export market was largely in the hands of bottling companies such as Blood Wolfe & Co., E. & J. Burke and Robert Porter & Co. (a notable exception being the Scottish Tennent's Wellpark Brewery). This practice of splitting manufacture and packaging was also present in New Zealand, as Powley & Keast bottled the products of the brewer James Speight & Co. The presence of bottle capsules from the British export bottling firms in New Zealand archaeological sites shows that despite the presence of numerous local breweries, imported beer still found a ready market. Eldred-Grigg (1984: 77) has stated that by the 1870s local brewers had pushed most imported beers out of the market, and that for every one bottle of beer, ale, cider or perry (pear cider) shipped from overseas, 13 bottles were made in the colony. However, the archaeological evidence is that imported beer was still common in this period, although the exact proportions of imported to local product are impossible to calculate.

Overall, this study has shown that capsule analysis is of use in the interpretation of glass bottle assemblages. Although sample sizes are small, the information that capsules can supply is useful because such information is objective, and is certainly associated with the last use of the bottle, and therefore the actual event or activity that is being investigated archaeologically. Such analysis requires reliable reference information, and this paper has attempted to supply this for the first time in the New Zealand context. There is a need for ongoing collection of such data,

together with the closely related paper label information that is also being found, such as the Wanganui Hotel assemblage. What the information available to date has quite clearly shown is that there can be a considerable variation between sites in the use of particular bottle forms, in particular the 'champagne' or 'ring-seal beer' (RSB) bottle. A key consideration when studying such bottle assemblages is whether imported or locally manufactured products were being consumed at any particular site. Capsule and label (even if only fragmentary) analysis is the best way to address this issue.

CONCLUSIONS

Glass bottle analysis in historic archaeological sites relies heavily on examination of form and manufacturing technology, and this is unlikely to change. However, there is an increasing body of knowledge regarding bottle top capsules and paper labels that can greatly assist the analysis of glass assemblages. This paper has attempted to present the available empirical information regarding capsules in a way that can be used as a reference for future work, and also discuss some of the limitations and implications of such analysis. In particular, it is an attempt to bridge the gap between Smith's 'folk-taxonomy' in glassware analysis and his suggestion of an entirely descriptive approach. Capsules cannot answer all of the questions that a bottle assemblage may pose, especially as their survival rate is low, but they are another source of objective empirical information that is available for consideration. Future work will hopefully expand and refine this preliminary typology.

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