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LOVELY LINOLEUM

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INTRODUCTION

In 1988 I was employed by the Tasmanian Department of Parks, Wildlife and Heritage to conduct a series of excavations on the remains of huts and oiling works left by sealers on sub-antarctic Macquarie Island. During the course of one of the excavations, at the Nuggets on the east coast of the island, small fragments of linoleum were recovered.

The following paper is the result of attempts to identify the particular type of linoleum found, establish where it was produced, and discover the history of the product and the industry both in England and Australia. It soon became apparent that this most common of floorcoverings has an elusive and fragmentary written history for which I have only been able to provide an introduction.

MACQUARIE ISLAND HISTORIC OUTLINE

Macquarie Island (54° E, 159° E) was discovered in 1810 by Captain Hasselborough master of the sealer *Perseverance*. The potential of the island for fur-sealing operations was quickly realised and within 15 years so many pelts had been taken that the seal was virtually exterminated and the industry was no longer economically viable. Elephant seal oiling operations had also been established very soon after the discovery of the island and these operations took over from the sealing and continued, with the addition of penguin oiling from the 1890s, until 1920 when the sole licence for oiling was revoked by the Tasmanian Government (Cumpston, 1968).

Major activity at the Nuggets began in 1892 when the New Zealand entrepreneur, Joseph Hatch, established his headquarters beside Nuggets Creek. Oil production concentrated on exploiting the large numbers of royal penguins which use the creek to gain access to their breeding colonies. A production shed with digesters and boilers, and living quarters were built. During January to March, the penguins were herded into a fenced off area, killed and

then packed into the digesters for rendering down for oil. Seasonal work of this type continued in the area until 1919 (Cumpston, 1968).

The trench excavated at the Nuggets in 1988 was through part of the sealers' main accommodation hut at the north-east end of the bay. It was a small trench, three and a half metres by two metres, which extended slightly beyond the eastern wall of the hut. There proved to be four occupation layers with a mixing of contemporaneous artefacts throughout. The fifth layer appeared to have been a seal wallow, and the sixth a natural deposit which was only disturbed by the hut's foundation posts. The first four layers were interpreted as pre- and post-collapse phases of a single occupation of the hut. Linoleum fragments were found mixed in the first three layers, with structural timber, small fragments of newspaper, thin canvas, malthoid, broken bottles, twine, crushed coal, etc. The mixing of artefacts and the scattering of structural timbers were interpreted as the effects of elephant seals, penguins and big seas on the site, all of which would have dispersed and/or crushed them. The majority of the artefacts appeared to date from the late nineteenth century to the beginning of the twentieth century. Linoleum was only found at this site on the island (Townrow, 1989).

DESCRIPTION OF LINOLEUM FROM NUGGETS

The linoleum recovered from the excavation was extremely fragmentary with the largest piece being 136 mm by 45 mm.

The pattern comprised white paint (often in blobs) laid on an aqua-green background. In places this had worn through to expose the red/brown of the base material. The full pattern could not be determined from the recovered fragments but it appears to have been, at least in part, floral. The underside of the fragments were imprinted with the pattern of a cloth backing which had rotted off. It was identified by the Coogans Pty. Ltd, Floorcoverings Department in Hobart as printed linoleum, 1.4 mm gauge.

INVENTION OF LINOLEUM AND ITS MANUFACTURE

The prime purpose of oilcloths and linoleums was to offer cheap floorcovering. They were made initially in a variety of finishes, emulating more expensive and complex floor treatments. Patterns duplicated tile designs, carpets, marble and timber finishes and all of them gained a market and ready acceptance at every social level (Drummond, 1984).

During the mid 1840s to the late 1850s, following the patenting of an india-rubber based product, 'Kamptulicon' by Elijah Galloway in England, the hunt was on for alternatives to oilcloth floorcoverings. Preferably these were to be cheaper to produce and retail than Kamptulicon. Patents were registered which ranged from pulped scraps with parings and cuttings of leather to:

a mixture of india-rubber, gutta-percha, and jintawan, with cocoa-nut refuse, refuse leather, tanner's waste bark, cork, refuse from flax and cotton mills, sawdust free from resin, ground bark, pith, fibre and wood in a minute state of division (Jones, 1918).

One of these patents, which was to overshadow its competitors, was registered in 1860 by Frederick Walton as the result of a period of experimentation at his works at Chiswick, England. He called it linoleum from *linum* (flax) and *oleum* (oil) (Board of Trade, 1947). It was made from oxidised linseed oil, kauri gum, resin, cork dust, woodflour, and whiting and colouring pigments on a cloth backing (Jones, 1918). By 1864, Walton had moved his firm, Walton, Taylor and Co., and plant to Staines where he formed a new company known as the Linoleum Manufacturing Co. Ltd.

Production, requiring large premises and expensive equipment, involved the following stages (taken from Jones, 1918):

1. Production of linoleum cement.

Originally oil was flooded at intervals down long sheets of cotton scrim in a heated building. The oil would skin over (ie. oxidise) after which another layer of oil would be added. After two to three weeks the oxidised oil was stripped off the scrims (the scrims were then reused). In 1894, Walton patented an improved process called the 'Shower-bath and Smacker'. Using this process the oil was initially thickened by feeding heated oil through a tank fitted with a perforated bottom. The oil was then vaporised and beaten which further oxidised it. This process only required five to six days. The oxidised oil was then ground into a powder prior to it being reheated and agitated with resin and kauri gum (proportion of about 30% to weight of linseed oil) until liquid and boiling. Once thick enough, it was poured into pans, allowed to cool and cut into small blocks for storage until required.

2. Production of plain or coloured linoleum.

Dried cork was pulverised, using saw-toothed rollers running at different speeds, until powdered. This, with the linoleum cement and colouring pigments was then 'kneaded' before being calendered (a calender is a machine fitted with four heavy steam rollers) into a canvas backing, and polished. The fabric was then hung vertically in a heated room for a number of weeks (depending on its thickness) to mature.

Variations on the plain or coloured linoleum were the printed or inlaid linoleums. To make printed linoleum, the partially matured plain linoleum was run through a rotary or block printing machine where granulated material was sifted onto the backing through stencils and pressed into the base fabric. The disadvantage of this product was that the pattern could and did wear through. Consequently inlaid linoleum, where the pattern went right through the cement to the backing, was developed with patents being registered in 1880 and 1882. The 1880 patent involved different coloured granulated linoleum material being fed onto a moving canvas backing and then through heated rolls or a hydraulic press. The results were mosaic or granite patterns. Walton's 1882 patent involved cutting out up to six sheets of differently coloured linoleum, placing them on a backing and heat-pressing them together. Apparently the machine required was massive and complex.

Several other similar products were also being produced at this time including corticine which was more porous than linoleum and therefore absorbed sound, and retained heat better.

Various grades and widths of linoleum were produced, these becoming standardised through time. Widths of two yards (1.83 metres), for the home or colonial market, and two metres for the European market in lengths of between 25 to 30 yards (22.75 to 27.30 metres) became common. Gauges of linoleum varied between 1.4 mm to 8 mm thick. Types of linoleum produced were plain, cork carpet, printed, inlaid (including jaspe, moire, granite and sheet marble), and patterned inlaid. It could be used in almost any setting in the home and was commonly laid in kitchens, bathrooms, libraries, halls, pantries, billiard rooms and nurseries. It was also commonly used in public buildings such as government offices, churches and libraries (Drummond, 1984).

DEVELOPMENT OF THE INDUSTRY

The development of the industry in the United Kingdom appears to have been rapid, although other companies had to wait for Walton's patents to expire before switching to the production of linoleum. Thus Michael Nairn and Co. of Kirkcaldy, Scotland switched from oilcloth to linoleum production in 1877 and Jas Williamson and Son Ltd. switched about 1880, specialising in printed linoleum (Dept. of Trade and Customs, 1927). In 1895 the Greenwich Inlaid Linoleum Co. Ltd. purchased Walton's patents for inlaid mosaic linoleum and had 240 000 shares on offer (Greenwich Inlaid Linoleum Co. Ltd. Prospectus, 1895). Other companies followed, such as Barry, Ostlere and Shepherd Ltd. in 1899, the Tayside Floorcloth Co. Ltd in 1891 and the Dundee Linoleum Co. Ltd. in 1901 (Dept. of Trade and Customs, 1927).

Companies had also been established in France, Belgium, Italy, Sweden, Russia, Germany and Austria. In the USA, the American Linoleum Manufacturing Co. of New York City began production in 1875 (Von Rosenstiel et al, 1988).

By 1905, the number of companies involved in linoleum manufacture had increased dramatically with 27 factories operating in the USA and 50 in Europe. Linoleum had become firmly established on the market (Drummond, 1984).

There appears to have been a rationalisation of the industry in the United Kingdom over the next 40 years, particularly during the World Wars when smaller factories were requisitioned by the government, or stopped manufacture for the duration. Raw materials were also more difficult to purchase and the competition from European and American companies had increased (Dept. of Trade and Customs, 1927). Consequently, by 1927 there were 13 manufacturers (Monopolies and Restrictive Practices Commission, 1956) and by 1956 only nine with an annual turnover of between £8-9 million (Dept. of Trade and Customs, 1927).

The Greenwich Inlaid Linoleum Co. Ltd.'s English prospectus of 1895 states that the patents for Australia, New Zealand and Tasmania had been obtained. However, the first patent for an unknown type of linoleum registered in Tasmania was in 1897 by F. Walton (further patent information has been mislaid and it is unclear if F. Walton is the same person as the inventor of linoleum, Patent Nos. 1843 and 2385). In addition linoleum was never produced in New Zealand (G. Low pers. comm.), suggesting that the patents were not taken up by the company at this time.

It is not clear when production began in Australia but the pioneer company, Australia Linoleum Co. Ltd., established a plant in Auburn, NSW which was taken over by the Linoleum Manufacturing Company of Australia and then the Michael Nairn group in 1927. It produced plain linoleum having only one machine capable of producing printed linoleum which did not allow for successful competition with imported printed linoleums (Monopolies and Restrictive Practices Commission, 1956).

It has not been established when exports to Australia began, or by whom, but linoleum was being imported into Tasmania by 1892 (when a tariff of 12.5% was imposed on it) (Tasmanian Official Record, 1892) and by 1899 was advertised regularly in home journals and catalogues where it appears to have commonly been sold in two yard widths (1.83 metres), in special widths for staircases, or in squares, for between two shillings and six shillings six pence per running yard (0.91 metres) (Brownells' Mail Order Magazine and Sunbeams Journal).

By 1913 the United Kingdom was exporting 32 566 000 square yards (29 635 060 square metres) of linoleum, worth £1 870 118 (Jones, 1918). Of this, 18 771 000 square yards (17 081 610 square metres), worth £1 028 787 was imported by British colonies and possessions. In 1927 United Kingdom manufacturers such as Staines Linoleum Co. Ltd. and M. Nairn and Co. Ltd., were sending 40% of their exports to Australia, 6.92% of which were plain linoleums, 78.30% were printed and other inlaid linoleums, and 14.78% were inlaid linoleums worth a total of £1 300 000. This represented almost 90% of the linoleum available for purchase in Australia. Some imports also came from the USA and Germany. At this time Myer of Australia held between 350 to 400 different linoleum designs in stock (Monopolies and Restrictive Practices Commission, 1956).

Production peaked in the 1940s but then demand began to decline due to the availability of cheaper products which were similar to linoleum, such as Congolium, sheet vinyl, felt base and rubber (Drummond, 1984). A further blow to the demand for linoleum was the production of modestly priced carpet, particularly carpet squares or rugs and later wall-to-wall fitted carpets (pers. comm. G. Low).

Currently no linoleum is produced in Australia but it is still distributed through the subsidiary of the Forbo-Krommonie Co. which manufactures its linoleum in Kirkcaldy, Scotland (pers. comm. Nairns Pty. Ltd.).

DISCUSSION

Based on what is known of the development of the linoleum industry in Australia, it is likely that the linoleum found at Macquarie Island was originally imported to Australia or New Zealand from the United Kingdom.

The small amount of linoleum recovered suggests that only a little was taken to the island. It is impossible to establish whether it came from Joseph Hatch's offices, from the supply ship or was bought specifically for use in the sealers' huts. Specific dating is also problematic as linoleum was available for the entire period of occupation at this site and because an insufficient amount was recovered to be able to identify its pattern. However, given its type and gauge it was one of the cheaper types of linoleum available.

The linoleum itself has limited significance because of its fragmentary and worn nature. However its presence on Macquarie Island is extremely unusual and implies a degree of comfort previously unseen in the sub-antarctic. Therefore, in this context, it has considerable significance.

Pelagic sealing and whaling was a relatively low capital investment industry, particularly in the early years of the industry in the southern hemisphere. Entrepreneurs bought and equipped ships but little appears to have been spent on providing good, or even reasonable, working conditions for members of gangs involved in carrying out the industry. On isolated, far flung sub-antarctic islands conditions seem to have been similar. Gangs were dropped off on the islands, sometimes for long periods, with oiling equipment (such as tryworks) and food. They then made the best of what was available locally to build shelter for themselves. Consequently caves, stone, and timber were used on Heard Island (McGowan pers. comm.), on the South Shetland Islands (Lewis-Smith and Simpson, 1977) and at the Prince Edward Islands (Cooper and Avery, 1986). Timber probably originated from shipwrecks, flotsam and jetsam. On Macquarie Island it appears that tussock-peat walls with timber frames and elephant skin roofs were replaced by timber huts which, in turn, were replaced by corrugated iron and timber huts. Commonly the corrugated iron was saved for the construction or recladding of sheds in which the oil was produced (Cumpston, 1968, Townrow, 1989).

Floor coverings appear to have been rare. Some matting was found in association with 'Cutler's Hut' on Livingstone Island (Lewis-Smith and Simpson, 1977) but dirt floors and bare planking appear to have been more common. On Macquarie Island, both dirt floors and bare planking seem to have typified the earlier phases of production but, by the late 1880s, hessian sacking with a newspaper underlay was sometimes used as a floorcloth. The sacking in this context probably reflects re-use rather than specific importation

(evidence from trench 008 at Hurd Point, Townrow, 1989). By c.1892, at the new island headquarters, both malthoid (a bitumen product used for damp-coursing) and linoleum were in use. The linoleum, like the sacking, appears to have been laid over the top of sheets of newspaper. Linoleum, in a sub-antarctic setting and in association with sealers, is therefore rare and unusual.

It should be noted, however, that very little archaeological work to date has been carried out on sub-antarctic islands and that some of the work has been done by interested people from other disciplines who may have viewed the presence of linoleum as unremarkable and commonplace and therefore un-noteworthy.

It is known that linoleum was laid on the floor of Scott's base camp at Cape Evans, near Ross Island on the Antarctic Continent (Bickel 1989). Its type and gauge is unknown. This raises a stark contrast to the linoleum found on Macquarie Island. Scott's expedition was well funded and had the backing of the Royal Geographical Society in the United Kingdom in addition to the support of the rich and 'enlightened'. The sealers did not. The provision of linoleum in the supplies and materials for the construction of Scott's expedition hut could therefore be seen as a likely inclusion. However, it is not a likely inclusion in sealer's supplies. Its presence at one of Hatch's huts may therefore emphasize this entrepreneur's singularity. Unlike previous entrepreneurs, he saw the industry as a long term proposition worthy of more than token capital input as is indicated by his importation of boilers, digesters, coal and timbers (Townrow, 1989).

The evidence implies that linoleum had indeed gained 'ready acceptance at every social level' to the point where it was perhaps seen as a necessity when a practical solution to the problem of drafty floors had to be found. Indeed it may generally reflect the ubiquitous state that the product had obtained worldwide by the 1890s.

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