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SUBSCRIPTIONS

As subscriptions fall due on 1st January each year, members are reminded that current subscriptions for 1980 are now overdue. The present subscription rates are:

Life membership	$100.00
Ordinary membership	$5.00
Institutional membership	$10.00

Subscriptions should be addressed to:

The Treasurer,
Australian Society for Historical Archaeology,
c/- Department of Archaeology,
University of Sydney,
N.S.W. 2006,
AUSTRALIA.

PUBLICATIONS AVAILABLE

Graeme Henderson, The Wreck of the Elizabeth	$3.00 (Members $2.50)
Judy Birmingham (Ed.), Lithgow Pottery. Three Early Catalogues from N.S.W.	$4.00 (Members $3.00)
Judy Birmingham and Carol Liston, Old Sydney Burial Ground 1974	$3.00 (Members $2.50)
Maureen Byrne, Ross Bridge, Tasmania	$3.00 (Members $2.50)
Eleanor Crosby, Survey and Excavation at Fort Dundas, Melville Island, Northern Territory 1978	$3.00 (Members $2.50)
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Lithgow Pottery. A Source Book (Part I)	$3.00 (Members $2.50)
Lithgow Pottery. A Source Book (Part II)	$5.00 (Members $3.75)

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I. EDITORIAL

The excavation of the former Moore's Bond Store site on Sydney's Darling Harbour now drawing to a close has a very specific lesson for all of us when the unhappy decision to move old buildings to new sites is taken.

The early 1800s sections of this structure were carefully recorded by the architects involved on behalf of the MSB, and moved stone by stone to the new site yards away where they were re-erected on a concrete slab. The history of the building however remained on the former site, in that dismantling ceased at floor level. The earlier floors, and below floor deposits, including the original ground surface and scattered aboriginal flakes, lay deeper and would have remained unknown but for the MSBs decision to have the site properly excavated and record before its re-use as a store. Moreover, because it was not to be re-erected, internal walls and details of the fourth bay were not fully recorded anyway.

The MSB, together with Dr. Lampert of the Australian Museum and Miss Truscott of the War Memorial Gallery, Canberra, together with their many volunteer helpers are to be congratulated on salvaging the history of this site in a part of Sydney hitherto known only from Cadman's Cottage. Meanwhile "to have the site properly excavated before its re-use" might well be noted as an essential part of any similar arrangement in good time.

One of the most important moves made recently by ICOMOS Australia was its endorsement at its Port Fairy meeting of the decision to review initiatives throughout Australia in professional fields related to ICOMOS fields. The development of an increasing number of training courses at several levels and in several states in aspects of conservation of the built environment is an excellent start. A comprehensive review touching upon areas still needing attention for example, or excessive overlapping of resources among other aspects can only be welcomed.

So also is the decision to seek active contact on ICOMOS matters in South East Asian region. Several of our conservation problems are more closely related to those of other arid or wet tropical areas than to the European Old World, and Australia is beginning to have experience to offer now as well as being ready to receive it.

II. NEWS ITEMS: GENERAL

N.S.W. Council of Heritage Organizations (COHO)

Growth in the number of heritage organizations in N.S.W. over the past few years has created a need for a body with a co-ordinating role. For this reason, representatives from kindred heritage organizations met in October 1978 at The Australian Museum to discuss areas of common concern and ways of improving liaison.

The following twelve organizations are now represented:

Art Museums Association of Australia
Australian Society of Consulting Archaeology
Australian Society for Historical Archaeology
Institute for the Conservation of Cultural Material
Library Association of Australia
Maritime Archaeological Association of Australia
Museums Association of Australia (N.S.W.)
National Trust of Australia (N.S.W.)
Regional Art Galleries Association of N.S.W.
Royal Australian Historical Society, and
Society of Australian Genealogists.

At a second meeting, held in February 1979 at the National Trust Centre, it was decided to call the group the N.S.W. Council of Heritage Organizations, or "COHO". It is intended that COHO will reduce duplication of effort, help in the development of policies on important issues, and assist heritage organizations in their efforts to influence Government. An attempt has been made to avoid creating another bureaucracy - the structure of COHO has been kept as simple as possible.

Several issues have been examined by COHO in its first year: short-comings in the Heritage Act relating to the preservation of portable historic relics; a proposed kit to improve the standard of collection records in small museums; the need for conservation facilities for maritime archaeological material; problems concerning preservation of historic cemeteries; a proposed Aboriginal Site Museum; the need for Regional Resource Centres to assist heritage organizations; and the need for research into the deterioration of Sydney Sandstone, an issue of great importance for the preservation of Aboriginal rock art and historic buildings and monuments. Details of these discussions and the action taken can be supplied by contacting:

Dr. Glen Hunt,
The Australian Museum,
College Street,
Sydney, 2000.

Phone: 339 8265

or

Mr. John Morris,
Director,
National Trust of Australia (NSW),
Observatory Hill,
Sydney, 2000.

Phone: 275 374

III. FORTHCOMING EVENTS

Historical Archaeology School

Each year the University of Sydney's Department of Adult Education conducts four weekend schools on Historical Archaeology and Local History. Members of ASHA are very welcome to attend.

The schools offer guided tours, often to places which are not normally open to the public, seminars, and an opportunity to engage in practical work.

The first school this year is at Lithgow, in May, and includes the excavation of part of the Vale Colliery coke ovens (see note p. 28). School fee is $20 (students and pensioners $10).

To have your name placed on the mailing list, please telephone 692 2907 or write to:

Dr. Aedeen Madden,
Adult Education K01,
University of Sydney, 2006.

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Field School in Australian Historical Archaeology, May 9-17, 1980

The Department of Prehistory and Archaeology and the Department of Continuing Education in the University of New England is conducting a field school in Australian Historical Archaeology from 9-17 May, 1980: enrolment is limited to 20 persons and closing date for enrolment is 22 April 1980. Interested persons should contact:

The Department of Continuing Education,
University of New England,
Armidale, 2351

before that date. Since the demand for these 20 places available is likely to be high applicants are advised to enrol as soon as possible.

* * * * *

Dates for your diary

You are invited to attend the following lectures:

Monday April 28 : (Arranged by A.S.H.A.)
Subject : "The Wunderlich Project - An exercise in industrial archaeology"
Place : The Stephen Roberts Theatre, Eastern Avenue, Sydney University.
Time : 6 p.m.
Speaker : Mrs Susan Bures.

Monday June 2 : (Arranged by A.S.H.A.)
Subject : "Early settlement in the Hawkesbury-Nepean"
Place : The Stephen Roberts Theatre, Eastern Avenue, Sydney University.
Time : 6 p.m.
Speaker : Assoc. Prof. Ian Jack.

Tuesday May 13 : (Arranged by the Royal Australian Historical Society)
Subject : "History and Conservation at The Queen Victoria Building"
Place : History House, 133 Macquarie Street, Sydney.
Time : 6.15 p.m.
Speaker : David Earle.

Tuesday June 24 : (Arranged by the Royal Australian Historical Society)
Subject : "Sydney's Lamp Lighting Entrepreneur: John White and the Blazing Star, 1830-1835"
Place : History House, 133 Macquarie Street, Sydney.
Time : 6.15 p.m.

* * * * *

Exhibitions
April 9 - July 25

The Museum of Applied Arts and Sciences will hold an Exhibition "In the Eastern Manner" showing the effect of trade on the arts in China, Japan and generally in the west (including Australia), from 16th - 20th centuries.

* * * * *

Saturday 17 - Friday May 23

Members of ICOMOS are advised of Meetings and Excursions at Alice Springs during May. Details may be obtained by contacting:

Secretary,
Australian ICOMOS,
P.O. Box 1567,
CANBERRA CITY. 2601.

* * * * *

I.C.O.M.O.S. (International Council of Monuments and Sites) (which has a branch in Australia) has published a Yearbook of members. Any persons interested should contact:

Ms. Jane Lennon,
ICOMOS Membership Officer,
National Parks Service,
240 Victoria Parade,
EAST MELBOURNE. 3002.

* * * * *

Jubilee ANZAAS Congress - 16-20 May

The Australian and New Zealand Association for The Advancement of Science (ANZAAS) will hold its Jubilee Congress in Adelaide, S.A. from 16 to 20 May this year. Interested persons should contact:

Ms Betty Ross,
Aboriginal and Historic Relics Unit,
43 Fullarton Road,
KENT TOWN. 5067. S.A.

IV. BOOK REVIEWS

BENDIGO POTTERY by Paul A. Scholes, Lowden Publishing Co., Victoria 1979, Ill. 281 pp. Rec. Retail $40.

Bendigo Pottery is the story of one of the oldest surviving potteries in Australia. Since 1858, when it was established by George Duncan Guthrie, the Bendigo Pottery has had a turbulent but distinguished role in the making of pottery in Australia.

Its history is typical to that of any other large pottery. The fires, floods, the World Wars, the 1930 s Depression, the boom years and the bad years have all played their part in the moulding of this business.

In recent years the Pottery has undergone a dramatic revival. It has become one of Australia's most dynamic and distinctive potteries and is currently one of the largest producers of handmade stoneware in the world.

Potters or anyone interested in pottery will gain an insight into the workings of a pottery both past and present. It includes a wealth of detail on clays, production and firing techniques and kilns. Glaze recipes used by Guthrie himself, and those of more recent times are also included.

For collectors of colonial pottery there is an accurage range of production, including illustrated price lists. This material is well supplemented with numerous colour and black and white plates illustrating the Pottery's oldest pieces and its more recent. Details of the stamping of ware and ginger beer bottle production is also included.

Bendigo Pottery will interest the historian, student or amateur potter, collector, in fact anyone interested in a vital and unique part of Australia's heritage.

LOT 48 DARLING STREET BALMAIN: AN ARCHAEOLOGICAL ENQUIRY, edited by Maureen Byrne. Sydney University Archaeology Society Publication No. 1, Sydney 1979. xii, 97 pp, 14 pls, many line drawings. ISBN 0 909203 50 4. $4.50.

CLAY PIPES FROM PORT ARTHUR 1830-1877, by Alexandra Dane and Richard Morrison. Technical Bulletin No. 2, Department of Prehistory, Research School of Pacific Studies, Australian National University, Canberra, 1979. 55 pp, 11 pls. $4.50.

The report on the rescue excavation of the site of the former Presbyterian Church at Balmain is a commendable effort by the students of the Sydney University Archaeology Society to complete the Society's work which began on the site during weekends in 1973.

The site was used as a church for only ten years, from 1858. Then it became a shop, frequently changing hands and function, until its demolition in the 1940s. After that it was used as a convenient rubbish tip until turned into a small park about four years ago.

The report is sensibly organised into three main parts: a discussion of the history of the site, based on historical, architectural and archaeological investigations; a summary of the results of the excavation, the archaeological debris in relation to the stratification, and the architectural remains; and the stratification and finds.

Because the student society did not have facilities for storing artefacts and records, and because it has a high turnover of membership, it was inevitable that some of the records were lost. Nevertheless, the report gives a good idea of the domestic artefacts used in Sydney during the second half of the 19th century.

The drawings of the finds, especially the glass, are excellent. The accompanying chapters comment on the relevant history of the material, and the general nature of the artefacts found; they are described in catalogue entries. There are some inaccuracies in the descriptions (e.g. of G50 and G51, the drawings of which seem to be transposed) as one might expect from students used to dealing with ancient material rather than modern. I would prefer that some of the incomplete inscriptions be filled in, e.g. "More..." on the plate (?) mentioned on p. 67 should be the "Morea" pattern. We read on p. 13 of "a piece of porcelain bearing the date 1852" but I cannot find it in the catalogue. J.P. Cushion's book, listed on p. 68 as Pocket Book of British Ceramic Monks might have had a wider appeal under that title!

The second report is subtitled "a descriptive account of the clay pipes from Maureen Byrne's 1977-78 excavations at Port Arthur, Southeast Tasmania". It is a catalogue of the 1055 pipe fragments found in excavations by Maureen Byrne at Port Arthur, which was occupied by convicts from 1830 to 1877. But in spite of the book's title, we read on p. 2 that "the occupation debris therefore cover (sic) some seventy years, from 1830 to around 1900, the first quarter-century (sic) relating to convicts, the next twenty years to the poor and infirm"; we read too that the 1978 excavation, mentioned in the book's subtitle, did not take place. These disparities should have been sorted out.

The catalogue, which is not a full inventory, is arranged into five main divisions: pieces attributable to particular makers, bowls, spurs, mouthpieces, and stems. However, these categories are not mutually exclusive, and the same example can occur in several places (cross-referenced), sometimes with minor differences in the description: e.g. P77461 bears the letters "...OUS..." on p. 10 and "OUSE" on p. 27. And it seems unnecessary to use the same photograph on two different plates, e.g. P77232 on pl. IV and V; P77236 on pl. IV and VI, P77344 on pl. II and IV; P77343 on pl. I and IV; P77342 on pl. IV and VII.

Seventy four of the pieces (p. 7) are attributed to 9 makers. Sixty seven pieces come from Glasgow, 1 from Edinburgh, 3 from Liverpool, and 3 from Jackson St. (Glasgow?). By the time we get to p. 50, the number of pieces attributable to Scotland has risen to 76, with 75 from Glasgow. On the same page, the high incidence of Scottish pipes is explained because of the ascendancy of the Scottish pipe industry at the end of the occupation period, but

this hardly explains why they are so preponderant in the total assemblage. It is consistent with the Scottish dominance we see in utilitarian ceramics, such as beer bottles, during the second half of the century. How this was achieved is well worth investigation.

Further results of the 1977 Port Arthur excavations are promised in later publications, which will include a stratigraphic commentary.

Both of these publications are typed and printed offset so that they are available at reasonable cost. They will join the few published works on archaeological excavation of colonial Australia, at a time when it is unfashionable to dig. Everyone interested in the field should read them: they provide useful information on artefacts in 19th century Australia, and the minor problems, some of which have been noted here, are to be expected in pioneering works. The fact that both have appeared in print is a tribute to the esteem with which Maureen Byrne was held by her colleagues, who have completed work she began.

J.W.

Recent Publications

Directory of Historic Preservation Organizations Outside the United States. Publication and distribution of this directory was made possible with a grant from the American Express Foundation.

The directory lists approximately 500 non-local organizations and public agencies in more than 100 countries that are dedicated to the protection of the built environment and the preservation of historic buildings, places and objects. It is compiled by the Education Services Division, Office of Preservation Services, The National Trust for Historic Preservation in the United States.

Available from:

The Preservation Press,
National Trust for Historic Preservation in the United States,
740-748 Jackson Place, N.W.,
WASHINGTON, D.C. 20006. U.S.A.

Price not available.

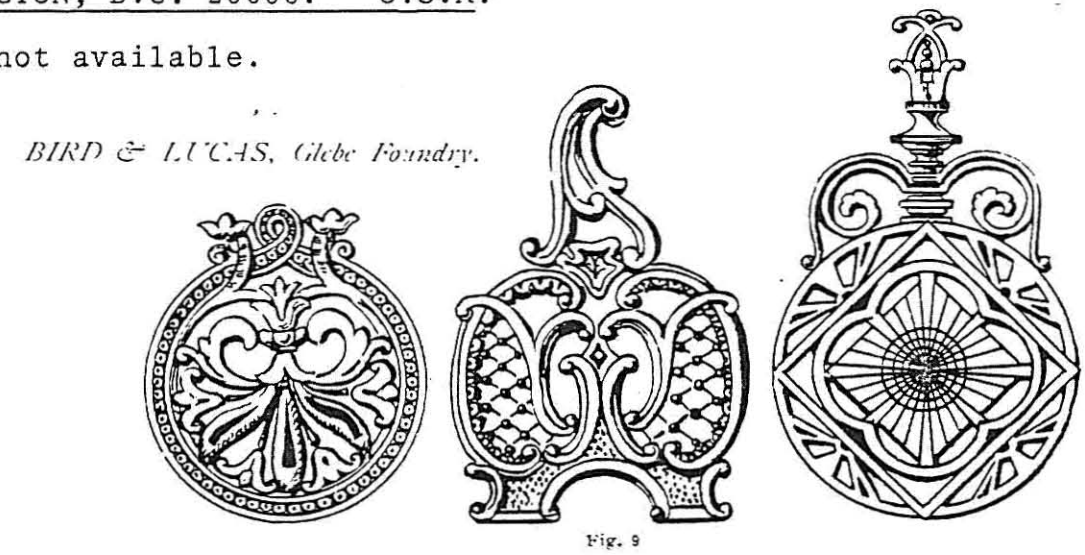


Fig. 9

TRIVETS or Kettle Stands to attach to grates.
Three samples of standard designs.

V. EXCAVATION NEWS

Excavations at McCarthy's Farm, Nepean District.
(previous note ASHA Vol. 8, No. 2, December 1978)

Excavation has already commenced for the Summer-Autumn season of 1980 by members of the Nepean District Historical Archaeology Group under the direction of Fran Bentley. The farm was first occupied around 1800 and was continuously occupied till the 1880 s when interests were finally transferred to property in the Canberra-Goulburn district originally purchased in the 1830 s. Some of the family maintained ownership of the farm near Penrith adding extensions in the 1920 s. The property was eventually purchased by one of the local gravel mining companies, bulldozed and razed in 1974.

The site is now well-cleared of the overgrowth of thorn bush, scattered brickwork and broken glass. Progress has been made in attempts to trace the earliest residential phase and subsequent additions. Efforts are also involved in investigating the dairy, tallow works, vineyard and underground wheat silo sites. Equally interesting are the family records which reflect the not uncommon sequence from convict origins to the ranks of the Victorian squattocracy.

Fran Bentley can be contacted by ringing 047.51.3554. The Nepean Historical Archaeology Group can be contacted by ringing John Gersteling 047.35.1704.

Moore's Wharf (or Towns Bond Store)

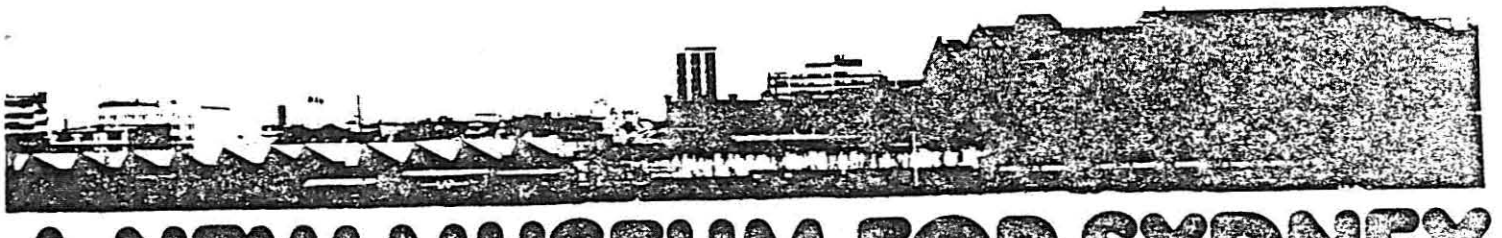
Under the direction of Dr. Ron Lampert of the Australian Museum, excavations have been carried out over the past three weeks at the site of Towns Bonds Store at Darling Harbour. The dig has been carried out at the request of the Maritime Services Board and the Heritage Council of New South Wales. Investigation has been made to floor level of the sub-surface areas and the footings of an hydraulic hoist. Digging will continue at weekends from now on and volunteers are welcome. A full detailed description of the dig will be published in the next Newsletter.

Wunderlich Project - Preserving Sydney's Industrial Past.

Working one step ahead of the demolishers, a team of industrial archaeologists appointed by the Museum of Applied Arts and Sciences, are recording the end of a factory - and an era. The Wunderlich factory, in Cleveland Street, Redfern, is a victim of progress and changing fashion. The pressed metal ceilings and wall panels produced at the factory, which for forty years were a familiar feature in Australia's interiors, are no longer wanted. The Wunderlich group has been absorbed into the conglomerate giant CSR and the site of the old metal working factory sold for a supermarket development.

Yet, this valuable part of Sydney's industrial past will not go unrecorded. Thanks to a generous grant from CSR, the Museum of Applied Arts and Sciences has been able to undertake the task of surveying and preserving as much of the factory as possible. The Heritage Commission, the Government Architect's branch of the Public Works Department and curatorial staff from the Museum, under John Wade, Senior Curator, have decided to preserve certain items for re-erection and display in the new Power House Museum. These include part of the Art Deco showroom and an old stamping machine.

Industrial archaeologists, Susan Bures and Barry Groom are meanwhile working quickly to measure and record the factory and collect samples of roof tiles and pressed metal panels before demolition is complete. They are also interviewing former employees of Wunderlich and putting together a valuable collection of photographic and printed evidence of Wunderlich's impressive past.



A NEW MUSEUM FOR SYDNEY

VI. VOYAGE OF THE EWS

Between June and September, 1978, I led a team of specialists, media representatives and volunteer helpers on an expedition whose broad aim was an archaeological investigation of history along the northern coast of Western Australia. Our area of study - Sharkes Bay to Wyndham - is geographically remote from Perth and is sparsely inhabited. The coastline is nearly 3000 nautical miles long and is flanked by a welter of offshore islands and shoals. The unique history of human endeavour and development of this region has largely been forgotten or ignored.

I familiarized myself with the region by investigating, in 1974, those shipwrecks and historical places between Kalbarri and Broome that could be reached by a team equipped with four-wheel drive vehicles and dinghies. From Broome my team was transported 230 nautical miles NNE, to tiny Browse Island off the Kimberley coast. Then in 1976, I participated in an investigation of the Admiralty Gulf and offshore Institut Islands. I learned about huge tides, hot sand, searing heat, monsoonal winds, strong currents, over-friendly flies, maddening midges, vicious green-ants, tropical ulcers, muddy water, mangrove mazes, sly crocodiles, spikey spinifex, inquisitive sea snakes, stinging sea grass and other problems that make fieldwork difficult in the North.

The biggest headache in the north is transportation. Distances are great and there are few good roads. Indeed, in many areas not even a track can be found by which to reach the coast.

The task of finding access routes between the coast and northern hinterlands dominated the efforts of 19th century explorers. In many areas, particularly the Kimberley, they were unsuccessful.

It became obvious to me that the only practical way to survey the historic sites in the North was by boat. The Museum's workboats are not suited for long-distance, live-aboard expeditions.

One of the many people who have been interested in the Museum's work on shipwrecks, is Northhampton fisherman-farmer Tony Larard, who annually visited our excavation projects in the Abrolhos Islands. When Tony heard of the plans for a wreck inspection expedition to the north coast, he offered his boat and his services as skipper. His motorized ketch EWS was well suited to the purpose, having been built in Broome for the pearling trade. She is one of the last of the traditional stout, wooden-hulled vessels called "luggers" (because of their evolution from the original lug rig used on the earliest pearling vessels).

The luggers of this century are gaff-rigged and with a characteristic beamy, round-bottomed hull. The lugger is a work boat, made for the northern waters. Fitting EWS out for the voyage required some modifications. The EWS could carry seven, but lacked modern comforts. A wheelhouse was added. The main hold, designed to store a harvest of Mother-Of-Pearl shell, was carved up and converted into a galley/salon with a one-tonne capacity refrigerator-freezer. Even with these added amenities we were to find life on the lugger cramped and uncomfortable during bad weather. The life of the pearling crews must have been pretty rough at times. A 78 km range, Koden radar was installed. This unit was to become our

best friend during night travel, saving us from becoming another shipwreck.

Although the size of EWS limited the team size to seven at any one time, when we thought we could count on good weather along the Kimberley coast we sometimes carried eight. Because of the kindness of MacRobertson Miller Airlines and BHP, through Dampier Mining Company in providing air transport, we were able to make personnel changes at Broome, Koolan Island, and Wyndham, thus ensuring that we had the right skills and interests at the right times and places.

Of 20 people involved only the skipper and museum photographer, Patrick Baker and I made the complete voyage. The rest of the team was made up of Graeme Henderson, Colin Powell, Bob Richards and Myra Stanbury from the Department of Maritime Archaeology; Peter Randolph from the Museum Department of Aboriginal Sites, Denis Hancock of the Sunday Times; John Izzard and Gavan O'Sullivan of Channel Nine TV; Aboriginal guides, Richard Hunter of Broome, "Left Hand Jack" Karadada of Kalumburu, and Martin Clark of Oombulgurrie.

Volunteers Pauline Larard, Mark Cliff, Peter Yu, Ian Fisher, George Petersons and Sandra Soffoulis, gave additional help.

An expedition of this nature must be well equipped and adequately supplied if it is to be safe and successful. This is expensive. The Museum's regular funds were augmented by a grant from the Australian Research Grants Committee, and donations from BHP, Woodside Petroleum, Channel Nine and Sunday Times. Beaufort Boats loaned a four-metre inflatable dinghy, and Honda Australia loaned two 50cc mini trail bikes.

As hundreds of vessels, large and small, have been destroyed by cyclonic storms during the northern wet season (generally December to April), this voyage was scheduled to give the "cyclone season" the widest possible berth. Unhappily, the dry season up North corresponds with Perth's winter; the expedition left Fremantle on a cold, wet day with a near gale raising big seas on the Indian Ocean. The round-bottomed lugger rolled violently and we all suffered loss of appetite. Also breakfast. The weather gradually improved as we made our way north toward the tropics.

The first stop for the expedition was Cape Inscription, the northern tip of Dirk Hartog Island. Here in 1616, the Dutch crew of the East Indiaman Eendracht made the first recorded landing by Europeans on Australian soil.

From the day we left Dirk Hartog Island until we returned, 10 weeks later, the expedition investigated more than 50 sites and inspected 28 wrecks.

A fair proportion of the wrecks were of luggers, like the one lying three to six metres beneath the waters of Hermite Lagoon, Monte Bello Island. We had arranged a rendezvous there with two other vessels; Ben Cropp's BEVA, and Cec Piesse's lugger VOLTAIRE. Ben, a noted Queensland filmmaker, and his team, which included Perth author Hugh Edwards, filmed our survey activities, as we measured and made underwater drawings of the remaining hull structure.

Although the wind was howling overhead, the sheltered waters of the lagoon remained unruffled and clear. Cec Piesse, also known as the "Count of Monte Bellos", is an old master pearler who lives in retirement aboard his lugger. He is reputed to know more about the North Coast than anyone alive. He pointed out to us the remains of Frederick Lee Parkes' lugger camp on Hermite Island. Parkes operated a small fleet of pearling luggers before World War I, rebuilding and refitting them in this remote, treeless island group.

In 1914, Parkes volunteered for war service, sending all but one of his boats to Cossack. The lugger we inspected was left anchored in the lagoon as she was being refitted at the time, and had no masts. Like so many others at that time, Parkes believed the European War would be over in six months. He never returned to finish the lugger's refit. Abandoned, she sank. Cec recalled that Parkes' toolshed stood locked, unmolested well into the 1930s.

This area contained both the oldest known shipwreck in Australia and what might be considered the most "modern". Near Trimouille Island, the Royal Naval frigate Plym was destroyed by the first British atomic tests in 1952. Along the shore and scattered half way across the island, we found her twisted, shattered remains.

A few miles north-west of the Monte Bellos lie Trial Rocks. Here the English, East Indiaman, Trial came to grief in 1622. Three-and-a-half centuries of pounding surf and strong tidal currents have reduced the ship to a scattering of eroded cannons and anchors, ballast stones and a few pieces of lead. We were lucky to get a calm day for our dive there which added further information to the Museum's survey of 1971.

Here the flow of water can reach eight knots. The powerful water movement prevents the build-up of dense marine growths on the wreckage, and only the heaviest items - anchors, cannons and bits of lead - remain on the site. Even these are badly eroded. Dr. Naom Haimson, one of the original finders, told me that several small caverns in the coral would likely have contained small artifacts in good condition, but shortly after the wreck was found, these were destroyed by some unscrupulous treasure hunter who dynamited the site.

The museum team under Curator Jeremy Green which surveyed the wreck in 1971 found much evidence of blasting, but almost no artifacts which would conclusively prove that this was indeed the Trial wreck. During the month-long survey, the heavy swell came in with monotonous regularity, and the Museum divers were not able to investigate the shallower areas of the rocks.

In this type of work you have to be lucky. We were. EWS arrived at Trial Rocks with a strong force-four north-easterly wind blowing. We studied the conditions while waiting for the slack current at the late afternoon change of the tide. An unusually low swell caused only a slight surf breaking on the highest parts of the Rocks.

The lugger could not be safely anchored near the wreck and the chop was too high and violent to use the dinghies. When the time was right, Tony motored the lugger in as close as possible, narrowly missing an outlying pinnacle of sharp rock, dropped the SCUBA divers, and then stood off. By watching the floats attached to each diver, the rest of the team on the boat could follow our movements and come to our aid if necessary.

We found the wreck straightaway. As our time was short before the current resumed, Pat filmed, Bob looked for any signs of recent disturbance, and I took photos. Then we swam in toward the shallower area. Because conditions were good, we were able to get in near the highest rocks and discovered two more large anchors, to add to those recorded by the 1971 survey.

For three quarters of a century pearling was the most important economic activity on the North Coast. The towns of Denham, Cossack and Broome grew up almost exclusively to serve the needs of the pearling industry. Boatbuilders in the pearling centres and in Fremantle, and as far away as New South Wales and New Zealand, supplied hundreds of boats designed especially for pearling. In the period between the world wars - the height of pearling activity - about 400 luggers operated out of Broome, the main centre. The town population exceeded 5000 when the boats were in, much larger than today's population.

A great number of the luggers were burnt in 1942 out of fear that a Japanese invading force might utilize them.

But by far the greatest number met their end as a result of tropical cyclones, such as the 1935 cyclone which caught a fleet off the Lacepedes Islands north of Broome. Twenty luggers were destroyed with great loss of life. Another 15 were badly damaged.

Even boats that had taken shelter in the mangrove creeks were sometimes buffeted by these storms. The 1935 blow hit Ted Norman's camp on Alligator Creek, Beagle Bay, destroying several luggers and damaging his schooner "John and Mary" so badly that it was abandoned along with the camp soon afterwards. In "Norman Creek" and in several others along the coast, the expedition found substantial remains which will be valuable sources of information for a proposed study on the evolution of the lugger, possibly the only shipbuilding form which is uniquely Australian.

Long before the mining potential of the iron ore islands Koolan and Cockatoo was realized, other islands in the vicinity were extensively mined for the guano which had been deposited over the centuries by feathered inhabitants. Competition was fierce, and the legal status of various claimants was often in dispute.

Immediately after rich guano fields were discovered on the Lacepedes Islands in 1876, a quarrel erupted between an American who claimed the uninhabited islands for Uncle Sam and a British subject who arrived to remove guano under licence from the Western Australian Colonial Government.

A point of legal contention was whether or not the islands had been formally annexed by Lt. Philip Parker King R.N., whose four

remarkable voyages of exploration between 1817 and 1822 surveyed the major part of the Western Australian coastline from Joseph Bonaparte Gulf to the Swan River.

Both sides called on their respective governments to send warships to protect their rights, and there was speculation that war would result between the US and Britain. The American President, Ulysses S. Grant, however, repudiated any US claim to the Lacepedes.

The WA Colonial Government sent an agent to supervise the mining and loading of the many ships calling there for the rich fertilizer. This did little to stop the squabbling, which was aggravated by the fact that none of the vessels' Captains was content to stay long in the exposed anchorage waiting to load. And small wonder: in less than three years, nine large vessels were wrecked there. Many were reported later to have been repaired and refloated.

At least one was not. Following the directions of Dampier skindiver Peter Board, the expedition team located the remains of a large sailing vessel. As with so many of the wrecks to be seen in the North, this one is completely covered at high tide and mostly exposed at low tide. Although this situation usually results in a very fast deterioration rate, it affords the archaeologist an opportunity for studying the material without getting too wet. This is a big advantage in the event of the water being murky, clouded by silt.

The team spent several days checking and measuring the iron deck support knees, crutches, staple knees, bollards, rider knees, anchor chain, broken-up windlass, hawse pipes, bilge pump tubes, chainplates and other sundry iron articles, all covered with moderate thickness of coraline concretion. All this became a bit tedious to John Izzard, the producer of Channel Nine's film unit, who went off filming the magnificent birdlife - boobies, terns, frigate birds and pelicans. The Brown Booby was everywhere in evidence in all stages of development from the egg to adult.

By checking the size and nature of the wreck's remaining structural details, we were able to positively identify the 585-ton ship Manfred which was wrecked in a hurricane on January 24 1879.

It is very gratifying to be able to make a positive identification of a wreck on the spot. It is usually only after analysis and study of the sample materials and careful consideration of the survey data back at the museum in Fremantle that names can be put to wrecks. And sometimes the available information is altogether insufficient. Such a wreck is the remains found under the cliffs, on the rocky shore of Cassini Island. An iron-stocked anchor, a breasthook, a few iron deck supports, what appear to be two bilge pump pipes and sundry iron bolts in a poor state of preservation cast up above high water mark is not much to go on when there is no record of any vessel having wrecked there.

Our Wanambal guide, "Left Hand Jack" Karadada used to visit this island called "Djuli" as a young man before the Second World War, which he calls the "Japanese War", as distinct from the earlier "German War".

The island and the adjoining mainland around Cape Voltaire are his part of his "country", his ancestral lands. He said that his people had neither seen nor heard of the wreck there. However, the island was not visited every year and they never came to this side of the island. They used to hunt turtles on Long Reef, and always camped on the sandy beach on the other side.

A shallow, flat-topped reef extends out 100 metres from the shore. The reef edge is very steep and there is a good possibility that a ship striking the reef in a storm would break in two. More relics in a better state of preservation may lie somewhere in deeper water outside. We snorkelled out across the reef-top and briefly along the edge, encountering no more wreckage. Though the visibility was a superb 15 metres, the bottom was soon lost to view.

With the added incentive of the best diving conditions and the most beautiful tropical reef we'd encountered, the temptation was strong to make a more thorough search for wreckage. But with many sites to visit, and many kilometres intervening, we could not afford unscheduled stopovers. The lugger's average speed of seven knots meant that a large proportion of our time was spent on the move. So the wreck at Cassini Island will be listed as an "Unidentified 19th Century Wreck", earmarked for further investigation at a later date.

During most of our work along the Kimberley coast, the emphasis on shipwrecks was intermingled with the investigation of traditional Aboriginal sites of significance. Part of the reason for this was that the opportunity to visit and record these sites was too good to miss.

But our primary motivation was to look into the possibility that certain Aboriginal legends about mythological beings might in fact relate to early visitations to the coast by outlanders.

We know that fishermen from Indonesia have a long tradition of sailing down to the northern coast of Australia in search of trocus shell and trepang, also called Beche-de-Mer. They came south with the North-West Monsoon, set up camps, fished and processed their catch. When the season changed, the south-east winds would carry them home. It is likely that the first of these preceded Captain Cook's discovery of the east coast. Did any other, more ancient maritime peoples come to the Australian coast following the monsoons, either by accident or design? If so, no record of it has been uncovered to date.

In his book, "Art of the Wandjina", Dr. Ian Crawford raises the possibility that some types of Aboriginal art in the Kimberleys may depict early contact with foreigners, perhaps shipwrecked sailors. The book contains descriptions and photos of some likely locations where cave paintings show figures which are called "Kaiara". These beings are brought to land from the sea during storms. The expedition visited two of these sites; Owatendu on Bigge Island, and Langgi in the north of Collier Bay. Both places were intriguing.

The paintings at Owatendu show Kaiara figures rowing boats with rowlocks, carrying what might be water containers, and most

seem to be smoking pipes. The rowlocks are particularly curious as they were not used by Aborigines and Indonesians who paddled their canoes.

There are many excellent depictions of vessels with two masts. Some have triangular sails. Some also have bowsprits. Some have gaff booms. The cave was beside a small beach with fresh water behind. Fronting the beach was a little bay with extensive reefs and numerous rocks running out on either side. We searched a small section of the reef in our short stay there, but did not find any trace of a shipwreck.

Langgi is an important spirit place, where sandstone pillars along the beach have been sculpted by nature into a startling array of giants. Dr. Crawford felt that this might be the site of an early shipwreck and told me of a mass of dark stones resembling a mound of stone ballast which can be seen just offshore at extreme low water. During Spring tides the difference in water levels is 11 metres. The mound of stones was checked first with an underwater magnetometer, but no reading was recorded. Then I searched the mound by diving and could find no evidence that a ship was wrecked there. On the contrary, much to my disappointment, I became convinced by the similarity of the surrounding bottom that the mound was a natural reef of stones. We spent days investigating Langgi, but were unable to find any evidence at all that shipwrecked sailors once camped there.

The work was fast-paced, interesting and exacting. The country though harsh, was ruggedly beautiful. Sometimes we could enjoy the exhilaration of a shower in a cool, clear waterfall. Sometimes the exhilaration was fright. We passed through narrow channels where the tide stream raced along at 10 knots or more, setting up whirlpools and eddies so powerful that the lugger could not manoeuvre but was swept along helplessly spinning like a toy.

Even for ardent nature lovers such as we, the long stretches of uninhabited coastline seemed lonely and inhospitable. We came to regard the small, friendly mining communities at Cockatoo and Koolan Islands, as places in the wilderness where we could enjoy the conveniences of modern civilization.

The islands are both administered by Dampier Mining Co. Peter Brown, Roy Willman, Jim McDougill, Brian Stafford and other BHP staff were very interested in our project and offered us many kindnesses. Roger Pettman, the Port Officer at Koolan, was especially helpful in arranging transportation, some repairs to the lugger, and some extra fuel to see us through. He even took us on a tour of the island, proudly pointing out "Koolan Island's only two claims to fame". One - his favourite, I think - is the marvellous view from "the world's most scenic rubbish tip". The other is the world's longest golf fairway. There is a special hazard on the par seven hole ... it is the airport runway.

The islands, situated at the tip of Yampi Peninsular, are connected with Derby by a daily air charter service operated by M.M.A. Brian Jaques, the BHP Public Relations Officer at Kwinana, arranged permission for us to bring in and take off personnel, which was rather like exchanging worn parts for new ones. This was

a great boon to the expedition as there is no other convenient airstrip between Broome and Wyndham.

On one occasion EWS arrived at Koolan to find three replacement team members already there.

As the departing people were leaving the next day, this meant an on-board of eleven. Roger kindly offered to find some extra accommodation, but as we had been allowed to tie up EWS next to an old sand-filled barge moored in Koolan Channel, we decided we could over-flow onto that. The result was an impromptu party. Singing and dancing followed a barbeque. Patrick, Myra and Peter Yu played a guitar. "Left Hand Jack" blew the didgeridoo. The rest of us made up a rhythm section and filled in the vocals. A weird mixture of tribal chants, English folk tunes and modern pop filled the calm, tropic night. The sound of a didgeridoo accompaniment to "Help Me Make It Through The Night" was a never-to-be-forgotten experience. Another was Denis Hancock's imitation of Go-Go dancing. Such was the mood of the evening that people didn't mind much where they slept. Myra awakened on deck next morning to find her legs pinned under Denis' mostly-collapsed hammock.

At Cockatoo Island we met Vic Cox. He also has an old lugger, which he is gradually restoring. He has lived on Cockatoo for 20 years, and was able to give us valuable information about the waters into which we were heading. He has an unusual pet, a large saltwater crocodile, which he keeps in his backyard. Vic said that he brought the "croc" home when it was little, but now it has grown to more than four metres in length. I was reminded of the old maxim about strong fences making good neighbours. In Vic's case, it is either strong fences or NO neighbours!

The longest stop the expedition made was at Camden Harbour, which is situated near Kuri Bay about halfway between Broome and Wyndham.

Few people today realize that the first European attempt at settlement in the Kimberleys was not at Broome, Derby or Wyndham, but at Camden Harbour.

Eager to be first in after hearing the favourable comments from the exploring expeditions of George Grey and James Martin, over a hundred South Australians and Victorians hastily formed the Camden Harbour Pastoral Association.

Early in 1864 they set sail for Camden Harbour together with families, stores, possessions and livestock.

They were not prepared for the harsh environment. Almost immediately the settlement declined. Arriving after the wet season, the grass was found to be rank and dry, and the stock perished daily.

The Aborigines could not be enticed and soon became troublesome for the settlers.

Gloom spread rapidly after their ship the Calliance was wrecked in the Harbour during a squall in December 1864.

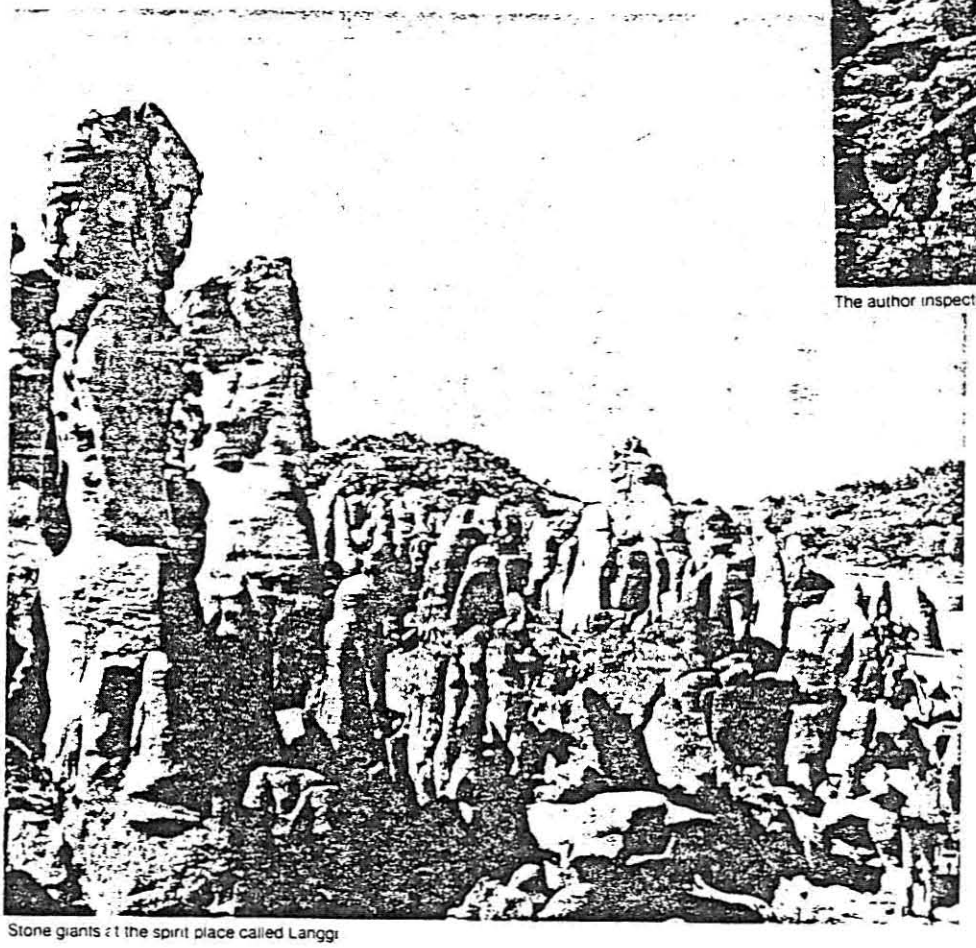
Before the end of 1865 the settlers were gone, leaving behind their shattered hopes, the graves of their dead, their abandoned implements and stores, carvings in a boab tree, and the remains of the Calliance, "a fine ship of about 850 tons".

We spent a week slogging through mangrove mud and clambering over rocky hills, locating and recording the vestiges of this historic debacle, and examining the Calliance wreck.

By the time EWS arrived back in Fremantle, she had travelled 5000 nautical miles, and was carrying about 1500 relics and sample artifacts. The voyage was over, the fieldwork completed. The wealth of information gathered is now being analysed and studied in preparation for a book intended to illustrate and illuminate the unique history of Western Australia's North Coast. I hope the book will be available in 1979 - West Australian Year.

S.S.S.

The author inspecting an anchor at Cassini Island



Stone giants at the spirit place called Langgi

VII. SOME THOUGHTS ON A COUNTRY CEMETERY IN RELATION TO FUNERARY PRACTICES

Archaeologists draw their inferences about past human behaviour from different classes of physical evidence. Pottery and glass containers, metal implements, weapons, and containers, house foundations, and the lay-out of farming cottages or an early estate each give different kinds of information whether about prehistoric and classical times or nineteenth century Australia - and each contain their own problem areas in which the archaeologist must be wary of simplistic explanation.

One of the most interesting types of evidence, is that of funerary practices which are notoriously difficult to interpret in an unknown culture. Recently I considered the archaeological remains of a small cemetery in a small Australian country town I know quite well, and realized how many false assumptions an archaeologist could make, if the above-ground remains of the community were confined to the cemetery, which was well preserved.

The cemetery is divided into religious sections: Roman Catholic, C. of E., Presbyterian, other Protestant and a small Jewish section. There is a small garden for cremation memorials planted mainly with rose trees, a War Memorial, and some graves on the periphery marked with wooden crosses. The area is surrounded with a post and wire fence, and on the other side of this is the local car grave-yard. The large memorial gates associated with the War Memorial have rusted up, and one enters through a gap in the wire, or through a cattle-proof gate wide enough for hearses. The points I decided to note are Burial Goods: Richness or Poverty of the Society: Physical Remains: Different Types of Burial in One Site: and the Orientation of the Graves.

As there are no burial goods traditionally placed in the Christian grave, it may seem strange that I include this point, but one of the most noticeable things about this cemetery was the presence of plastic flowers, as an offering, on many of the graves. Some had vases incorporated into the headstone design, others had domestic vases (crystal was popular) holding the flowers, and others had them stuck artistically into the earth or gravel of the grave covering. As well as the flowers, a few of the graves in the R.C. section had photographs of the deceased, in party situations usually, in small frames on the stone. These graves were part of the Italian community area, which although not separate from the rest of the cemetery, differentiated itself in a manner which will be mentioned later.

One wonders if the presence of plastic flowers could be interpreted as evidence of some floral cult. These flowers are sure to survive, as so much plastic is indestructible. They do not indicate a sex-differentiation, or a class cult, or could they. We might consider that those who prefer plastic flowers to offerings of real ones show a mark of vulgarity, but this type of class snobbery is too ephemeral to remain as a characteristic of our society. Soil analysis would no doubt prove the presence of flower pollen on the grave itself almost universally over the area, so the question could be asked, why only some plastic flower offerings? And why did some other people have their graves marked by a planted shrub?

The photographs are a tradition which apparently began in the Southern Mediterranean. A local source from this area said his home town graveyard had such things, and he copied it on his mother's grave, but he did not know why except that he liked it. Would this indicate to an ethnologist that there was a cultural or political relationship between the Italian communities or Calabria and this Western town? The Italian families had much larger, more decorated headstones than the average, so were they the social, economic and political dominators?

This introduces our second point: Richness or Poverty. In this cemetery it was obvious that some time in the mid-20th century there was a shift away from large, opulent headstones for most of the population, Italian community excepted. There are fewer urns, angels, broken columns etc., and more simple squared stones or slabs. The emphasis seems to be on quality as shown by a good piece of marble or granite, rather than carved extravagances. There were also a few examples of a large tree, a cyprus or other deciduous, with a brass plaque at its foot, as well as more use of the crematory garden after c. 1950. I do not know the relative economics of the two styles, but the earlier headstones look much more expensive, and would take much longer to produce. We know the change was one of taste, combined with inflation and the difficulty of getting stone-masons to do the job. (The local stone-mason does not have an apprentice, and cannot get one, as there is now more work on preparing stone for buildings than for monumental statuary. An inhabitant of this town would have to send away for a carved stone, unless it was a quite simple one.) This could be interpreted as a move towards austerity brought about by poverty in the community, except for the 'Italian' corner where no such trend was noticeable. In fact, one of the relatives of one member of this community was a stone-mason, who came from the city when requested.

The Morina has been cited as a society which spends a lot of time and money on their tombs. These were no indication of the wealth of the people, as the Italian burials were not in this town. There are three or four Italian families, one of whom had constructed the only modern mausoleum on the site. 'Papa' had designed it and begun it after the death of his father in 1951, and it had been variously added to since. The itinerant Italian stone-mason had added columns and a Pieta. A small shell mosaic of the Virgin had been made by the family after the death of their mother etc. Most of it was done by family labour and it was one of the few graves actively tended. It had been freshly painted, and the path and surround swept, at the time I last saw it.

How would this exceptional care and the amount of money spent on this one grave mean to an excavator? Especially this would create a problem, as the only other comparable grave was a vault used by the old pioneering family of the area, which is now in ruins, but which was in the form of a 'folly' built in local sandstone. It fell into disuse in 1920, some of the family are buried in the cremation garden, and after 1950, there are no more graves of that name. (The property was sold 1954.) Does this indicate a ruling family which declined, and was usurped by a new aristocracy with Southern European, rather than Northern European ties?

There were at least four different types of burial in this cemetery.

a) In the mausoleum or vault.
b) Conventional inhumation, the grave marked by some type of headstone.
c) Conventional cremation, the ashes marked by a rose bush or other small shrub.
d) The scattered grave, unmarked.
e) The War Memorial.

The only graves which really indicate more than personal preference, to us, are the unmarked scattered ones. The C. of E. minister said a few were suicides, not accepted by the R.C. or C. of E. sections, a few paupers, a few 'Town Drunks' and the 'Abos'. He didn't know which was which.

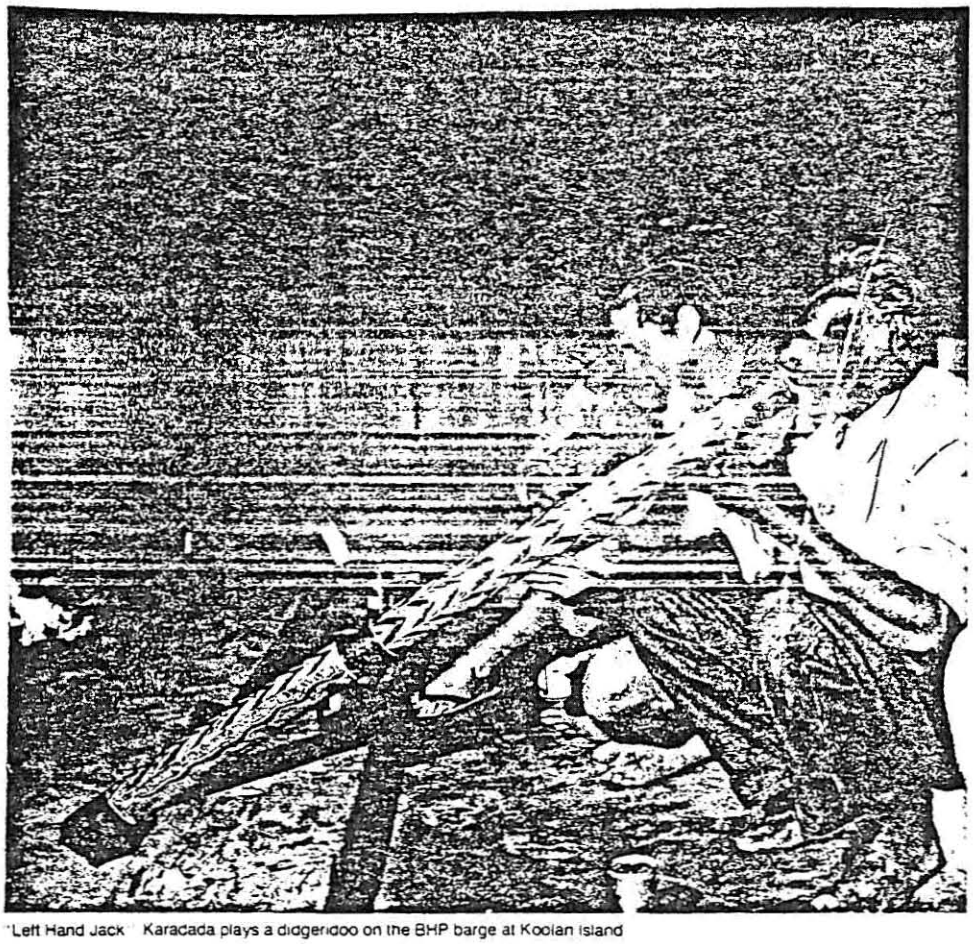
Presumably the suicides would not show any appreciable difference in their remains, when examined by the excavator. The paupers may show malnutrition, and I do not know if alcoholic poisoning would be indicated at that distance (except perhaps by better preservation.) The Aborigines would presumably be identified as a different race, if enough of their bones were preserved. Could they be interpreted as an indication of a slave-employing society?

The graves generally were placed in orderly rows, the head-stones facing one way. The slabs had their inscriptions written in the same way. The mausoleum and the vault were a little removed within their religious sections (Roman Catholic and Presbyterian). The War Memorial "To Our Glorious Dead" was similar to those in very many country towns - a life-size soldier, head bowed over a reversed gun, extreme detail in the uniform, and plaques on the sides, engraved with the names of those killed and some of the battles. It was fenced round, and associated with it was the gate, with '1939-1945' in the wrought iron design. Rosemary bushes were planted around, and some of the ubiquitous plastic flowers were laid over the soldier's feet. If none of the history of the 20th century was known to the excavator, how could this and all the hundreds of others which would be found, be interpreted. All the names were male, and they showed relationships with others buried within the cemetery. And why this 'Glorious Dead'? Does it indicate a kind of death ritual connected with the plastic flowers? Very few, if any, of the names had the same phonetic structure as those in the mausoleum area. Was it a cult sacrifice extracted by the new rulers? It was noted that two of the names coincided with those on the abandoned vault. The old usurped family connected with this sacrifice?

There are many other questions which the poor excavator may find difficult to solve, but those noted can be summarised. The cemetery area is removed from the town area, and associated with a vehicle graveyard. Its surrounds are not well looked after. The only tended area is where the largest graves are found and at the time these were first constructed the graves of the rest of the cemetery become poorer in outward show. Associated with very many of the graves, from mid-century, are offerings of floral representations. There is some indication of one rich family replaced by another one, who seems to have an influence on the economy. There

are distinct sections in the cemetery, some more crowded than others (the C. of E. section had the greatest number of graves). Some sections had smaller plainer headstones (the Presbyterians seemed to favour smaller, less flamboyant stones, and much shorter memorial messages). In the middle of the period the headstones changed style, coinciding with the construction of the mausoleum. Outside the area there were a number of graves, the people buried sometimes showing different physical characteristics from the rest of the community. There is some connection between the floral worship and a statue glorifying death etc.

C.G.



"Left Hand Jack" Karadada plays a didgeridoo on the BHP barge at Koolan Island

VIII. LITHGOW: (a) The Esk Bank Iron Works Lease, 1887

Most visitors to Lithgow are familiar with the "Blast Furnace" site, with its spectacular engine house. Fewer visitors see the original blast furnace site, about a mile away on Farmer's Creek, and yet this was once a place of prime importance for Australian industry. Here the Esk Bank Iron Works produced the first sizeable amounts of iron from NSW ores; for four years they were in fact the sole producers of iron in NSW and by far the largest producers in Australia, with a make of 8,373 tons in the period 1879-1882 (as opposed to 957 tons in Victoria for the same period).[1]

The works were started in 1874 by Enoch Hughes, formerly of the Fitz Roy Iron Works near Mittagong, in association with Dan Williams, a railway engineer, and James Rutherford, of Cobb and Co. In 1875 they erected a large blast furnace for smelting iron,[2] and operated it till 1882, when Rutherford had it pulled down, so "as to remove forever any temptation to re-light it",[3] for, while the smelting plant was quite productive, as we have seen, it could not compete with lower-priced imports. Such profits as there were came, and continued to come, from the rolling of iron rails from scrap.

By the time the furnace was pulled down, there had settled at Lithgow a fairly sizeable population of skilled ironworkers, and these formed themselves into a cooperative which ran the Works, on a lease from Rutherford, for another four years. Production of rail and bar iron was not spectacular but kept about 160 men and boys more or less employed.[4] In 1886, the co-operative got a new manager, William Sandford, formerly manager of John Lysaght's Parramatta plant. In 1887, Sandford took over the Esk Bank Works entirely, using capital borrowed from Rutherford, with whom he signed a seven-year lease.

The 1877 lease between Sandford and Rutherford is in the box of Sandford papers, now in the Mitchell Library,[5] and is a very interesting document in terms both of what Sandford was getting and of what he was expected to produce. The schedule gives details of machinery then standing, much of which must in fact have dated back to 1880 or earlier, for we have no record of machinery being installed after that described in the Annual Report of the Department of Mines, for 1877 and 1879:

> "..The blast furnace is 55 feet in height and 12 feet across the boshes, and is driven by a 70 horse power horizontal engine , with hot air-oven, and all of the appliances necessary for a first class furnace.
> ...The Company have also erected during the year a foundry for making their own castings..The rolling-mill consists of a 100 horse power engine, 18-inch mill, six puddling furnaces, one ball furnace, and two mill furnaces, a Nasmyth steam hammer and all the necessary appliances for converting pig into bar iron on the premises". (1877, pp. 178-9).

> "The works consist of furnace, foundry, and forge and rolling-mill; the two branches are connected by a horse-tramway; most of the plant, including a 24-ton flywheel, was made upon the ground. The blast furnace is capable of producing 100 tons

of gray or 115 tons of white iron per week. Both pig and malleable iron are made, and a large quantity of rails for the Sydney tramway have been rolled. The Company have a plant for making boiler-plates..." (1879, p. 45)

An 1881 description by a French engineer confirms the reports:

"The establishment...comprises seven puddling furnaces, a blast furnace, a foundry with steam hammer, a planer, and rolling mills capable of producing round, bar or flat iron in all sizes, up to 200 tons a week".[6]

Incidentally, some of the machinery remained in use till 1901, particularly the large fly-wheel referred to above.[7]

The lease schedule lists works and plant under the following headings:

Works: Fitting Shops; Mill and Forge; Mill No. 2; Blast Furnace; Adjoining Shed; Patterns Shop; Foundry Blast Furnace.

Plant tools and sundries: Roll lathes; Mill and forge; Mill and forge rolls; Smithy; Fitting shops; Foundry; In Stores; Sundries; Office furniture; Weighbridge office.

I hope in a later article to give a full transcription of the lease, but include here the items listed for Mill no. 2 to give some indication of the amount of information available:

Mill No. 2:
- one guide mill engine with mill bedplate rolls and housing as it stands in course of erection and 15 lubricators in stores
- two mill furnaces for 10" mill with 2 boilers and 2 chimney stacks
- one locomotive boiler
- 4 portions of puddling furnaces with chimney stack
- one mill furnace with egg end (?) boiler and chimney stack
- one mill furnace with iron stack
- 2 puddling furnaces with large chimney stacks and 1 horizontal boiler
- one cinder bottom scrap furnace with vertical boiler
- one mill furnace with iron chimney stack
- 405'6" steam piping with bends etc.
- 100'3" " "
- one carpenter's shop covered with iron
- 250'2" feed piping with valves bends etc.
- 150 1/4' 1" and 3/4" water piping with bends taps and fittings
- 3 elevated water tanks
- one running locomotive.
- one mill furnace with vertical tubular boiler

As to the conditions of the lease, Sandford, an optimist if ever there was one, was to pay not rent but monthly royalites of 12s 6d per ton of finished iron and 2s 6d per ton of pig iron. He was also to repay the £850 he had borrowed from Rutherford and to purchase from him coal at 5s a ton, delivered (this was actually quite a good deal, as, when Rutherford first started, coal had

cost 6s a ton, plus 6d cartage).[8]

Above all, Sandford guaranteed to: "at all times...unless prevented by unavoidable accident or by strikes or combinations of workmen effectively and vigorously work develop and carry on the said iron works and..keep a sufficient number of able workmen employed for such purpose and..during every three months manufacture not less than seven hundred and fifty tons of finished iron.." In return, Rutherford agreed to deliver good quality coal.

It would seem that Rutherford got the better part of the bargain and indeed, although the Works produced well (about £14,000 worth in 1887, about £23,000 in 1888, and almost £40,000 in 1890),[9] Sandford did not really make a profit for many years,[10] not until he had bought out Rutherford, in 1892, and virtually refitted the entire works.[11] His principal achievement then was, of course, to build in 1900 the first steel-making furnace in Australia, using imported pig iron and scrap. Although he was still constantly in financial difficulties he was convinced iron could be smelted economically for the manufacture of steel and to this end resolved to transfer the entire works of William Sandford Ltd (as his company was now called) from the old Esk Bank site to a new site, about a mile away. On this site he opened in 1907 what was to be his last work, the blast-furnace and smelting complex, of which substantial remains still survive;[12] however, he had hopelessly underestimated costs and was forced later that year to sell out to the Hoskins brothers.[13] The Hoskins built up the plant on the present site and worked it till the 1920's, when the whole operation was removed to Port Kembla.

A.M.

Footnotes

1. H. Hughes, The Australian Iron and Steel Industry 1848-1962 (1964), p. 17.
2. J. Jaquet, Iron Ore Deposits of NSW (1901), p. 3 and plates II and III.
3. C. Hoskins, The Hoskins Saga (1969), p. 35; also Essington Lewis 'Iron and Steel Industry in Australia', J. Inst. Engineers 1 (1929), p. 78.
4. Annual Reports of Department of Mines NSW (1883), p. 34, (1885) p.38.
5. The box contains personal memorabilia, a letter relating to the Fitz Roy Works purchase, the lease of 16.8.1887, and an inventory of the Lithgow Works in 1903. Acknowledgements are due to the Mitchell Library for permission to inspect this material.
6. F. Journet, L'Australie (1885), p. 198 (trans A.M.). It is clear from references in the text that it was in 1881 that Journet visited Lithgow. There is a sketch of the men at work in The Australasian Sketcher for 7th May 1881 (reproduced at half scale in The Australian Encyclopedia, 3rd ed. 1977, under 'Iron').
7. Jaquet, op. cit., p. 3.
8. Hughes, op. cit., pp. 20, 23.
9. Annual Reports 1887-1890.
10. N.R. Wills, Economic Development of the Australian Iron and Steel Industry (1948), p. 31 sqq.

11. Hughes, op. cit., pp. 28, 36; Hoskins, op. cit., pp. 35, 36.
12. Recently illustrated in J. Birmingham, I. Jack, D. Jeans, Australian Pioneer Technology (1979), pp. 94-96.
13. Hughes, op. cit., pp. 28-48; Hoskins, op. cit., pp. 35-40.

* * * * *

LITHGOW: (b) Newvale Rubble Coke Ovens Site - Vale Colliery

During the course of my final 2 years at the NSW Institute of Technology, I completed a thesis for my architecture degree entitled "A Conservation Policy for the City of Lithgow". The finished report was given to the Lithgow Council as a set of guidelines of how to preserve and conserve their 19th century industrial heritage, certain items of which are unique in this country.

During 1977 I spent a great many weekends compiling a register of those items which I intended to study later in detail. Through time spent in the local library and from talking to local historians, I became aware of certain items which for some reason have remained almost totally forgotten and untouched down through the course of 100 years or so. One such item was the Newvale Coke Ovens.

On preliminary investigation of the site it became obvious why the relic has remained unscathed. The site itself is on the Western side of the Ida Falls Gully at the extreme eastern end of the Lithgow Valley ... an area as yet totally untouched by development of any kind. The site is accessible by crossing on foot only over the main western railway line or through a stone culvert below the railway. No matter what direction is taken, the arrival at the site is by no means dramatic, and the casual bushwalker could be forgiven for thinking he had stumbled onto a long pile of rubble stones.

This apparent ad hoc arrangement however is all that remains of what may be the first rubble coke ovens in Australia. The ovens which are double chambered and number about 16 were once an integral part of the giant Vale Colliery which operated in this Gully at the latter part of the 19th Century. All that remains of the coalmining operation are a few brick footings and the filled-in shaft; and with the ovens, time and weathering have removed all but the loosely cemented rubble walls formed into rough circular patterns.

When in operation, a tramway delivered coal from the mine to an elevator which passed over the siding to the coke ovens where it was burnt and then taken to the ironworks or the Power Station at Oakey Park.

Following my rediscovery of this remnant from the past, in July 1979 and again in November, I joined a group of archaeologists and local historians in carrying out a measured field survey of the coke ovens site. The trips were supervised by Aadeen Madden from Sydney University and we hope to complete an exploratory excavation of the site in June 1980.

Just a word of caution to anyone wishing to visit the site; the rubble formations themselves are extremely fragile and every effort should be made to stay off the stones. This unique monument to a

little known and understood part of our early industrial history could well be damaged irreparably in the name of conservation simply by overenthusiastic investigation.

Because of the fragility and importance of this site I have officially requested the NSW Heritage Council to place a Permanent Conservation Order on the remains.

W.S.

BIRD & LUCAS,

Glebe Foundry.

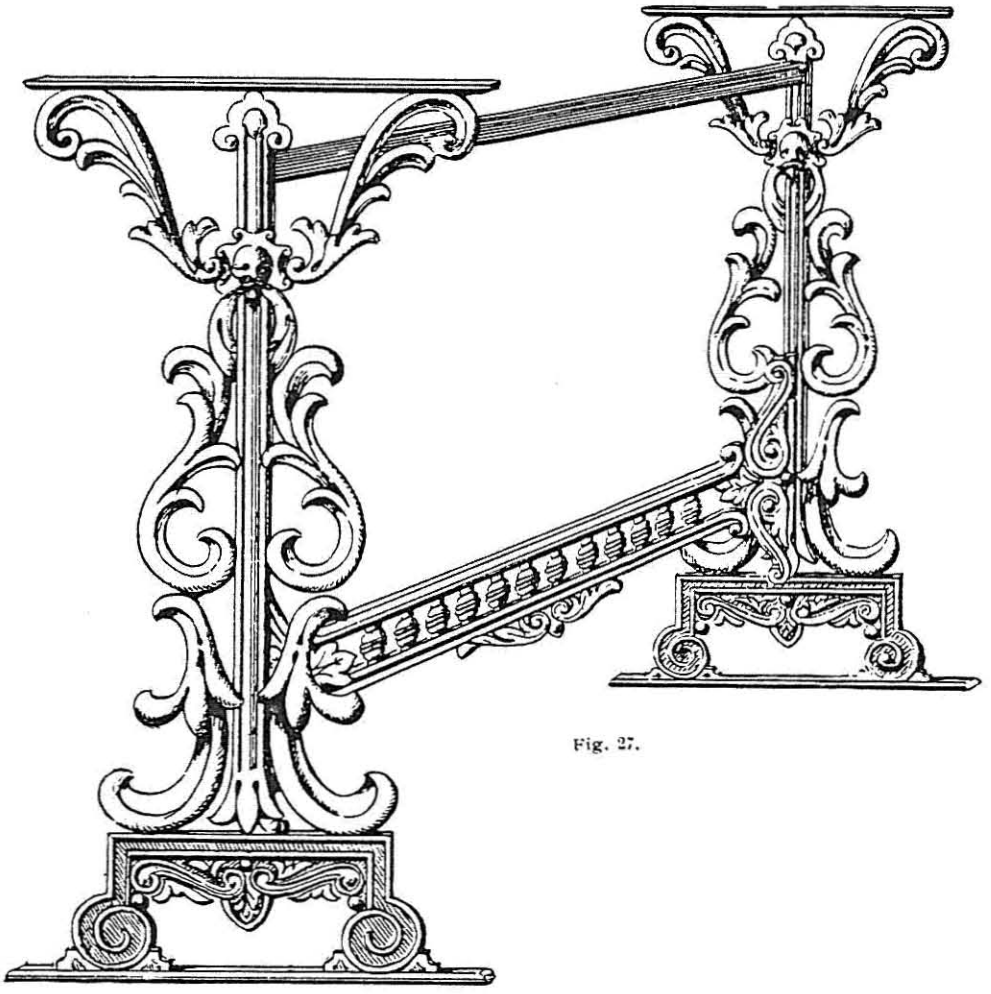
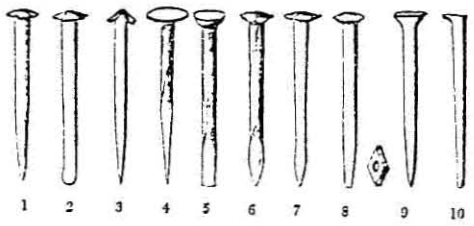


Fig. 27.

OBLONG TABLE STAND.

In two designs. These are handsome, strong, and well finished.
Height, 2ft. 6in.



A. (Tomlinson's Cyclopaedia)

1. Rose nail, sharp pointed. Used traditionally for hard woods.
2. Rose nail, chisel pointed. Used in timbers which split easily.
3. Clasp headed nail. The head is driven below the surface of the wood to give an even plane.
4. Clout headed nail. Used to nail iron sheeting, leather, etc. to wood.
5. Counter clout nail (has a countersink under the head). Used by wheelwrights and smiths.
6. Dog nail. Used for nailing stout iron work.
7. Kent hurdle nail. Used for nailing and clenching the oaken bars of hurdles together, also used as gate nails.
8. Rose clench nail with "washer". Used in ship and boat building.
9. Horse shoe nail.
10. Brad.

B.

		Inches long	No. to the pound
2d	fine	1	880
3d	fine	1 1/2	665
3d	common	1 1/4	400
4d		1 1/2	280
5d		1 3/4	195
6d	common	2	155
6d	fencing	2	80
7d	common	2 1/4	120
7d	fencing	2 1/4	65
8d	common	2 1/2	90
8d	fencing	2 1/2	50
9d	common	2 3/4	70
9d	fencing	2 3/4	40
10d	common	3	55
10d	fencing	3	30
12d		3 1/4	45
16d		3 1/2	28
20d		4	20
30d		4 1/2	16

IX. THE NAIL AS A CRITERION FOR THE DATING OF BUILDINGS AND BUILDING SITES (LATE C18th TO 1900)

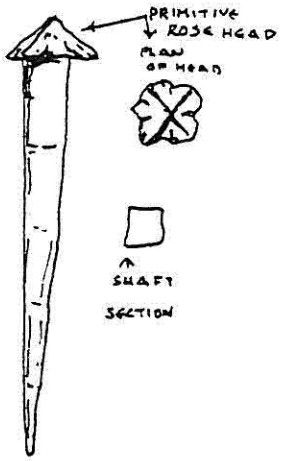
What is emerging in the examination of many building materials as dating criteria is that machine made or mass produced objects provide us with much better subjects for dating than those produced by hand. This is because machine made objects require a specific invention which is then patented and production begins subsequently. The object has a specific production life span and shelf life (i.e., how long it takes to sell existing stock). For all of this documentation may be found; the name of the inventor, the date of invention, the date of the patent, the commencement of production, clues to distribution including export, the rise and fall of popularity and finally the cessation of production.

Unfortunately there have been so many nail patents taken out since the 18th century and nearly all of them ambiguously worded that only broad statements can be made at present.

Over the last two hundred years there have existed four basic methods of manufacturing nails; these have resulted in the following types; wrought or forged nails, cut nails, cast or moulded nails and the wire nail. Within these types based on manufacturing technique there are sorts with specific names based on their particular function. Tomlinson's Cyclopaedia of Useful Arts, popular during the mid 19th century, exaggerates perhaps a little when it states that there are "probably over 300 (sorts), with at least ten different sizes for each sort, so that there are upwards of 3,000 nails with different names, all of which are perfectly understood by the persons who manufacture them or use them." (p. 308, under Nails). There are, for practical purposes, about ten sorts (see ill. A). These sorts could be bought according to their length and number to the pound using a system of penny names (see ill.B). These were further divided according to their thickness, viz, fine, bastard and strong. Nails over 5 or 6 inches in length were called "spikes". The system of penny names varied much from place to place and also over time. I have found that in Australia nail sorts were rarely used according to their text book function; this I think relates to their scarcity especially up to about 1870.

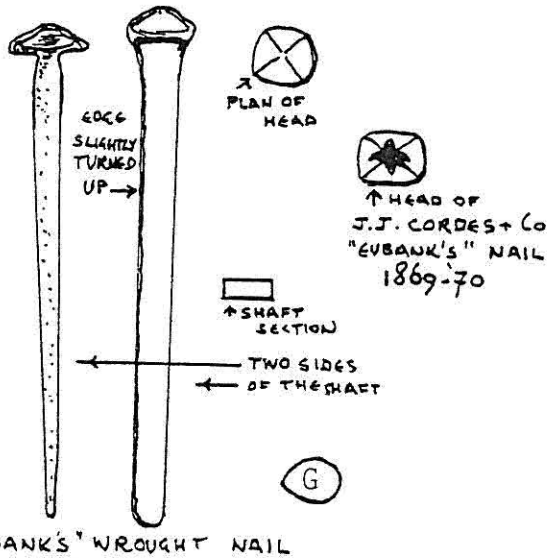
WROUGHT OR FORGED NAILS

Until 1792 nails manufactured in England were forged. Even up to that time progress had been made in the mechanization of some aspects of nail production. Forged or wrought nails were cut from rods of iron which originally had to be laboriously hammered out from a lump of iron. These sections of rod were then heated, headed and pointed with the hammer. In later times a bore was used to shape the head. This was a strong piece of iron about 10 to 12 inches long and was bored to fit the shaft of the forged nail, the forged nail was placed within using a pair of pliers, and the head was brought to shape by the hammer. The next step was to introduce a bore with another piece which when hammered on the head of the nail would produce a neat form. By using different bores various forms of heads could be produced. The ease of producing wrought nails was much facilitated by the production of ready-made nail rods. English patents were taken out in 1606 and 1618 for cutting iron into nail rods but they were never put to



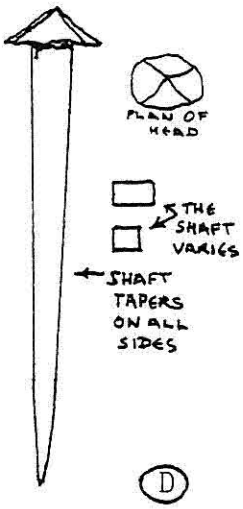
HAND FORGED NAIL

C



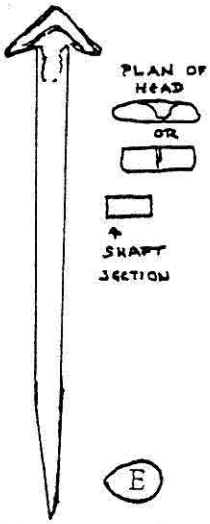
"EUBANK'S" WROUGHT NAIL
(ALWAYS WEDGE POINTED)

G



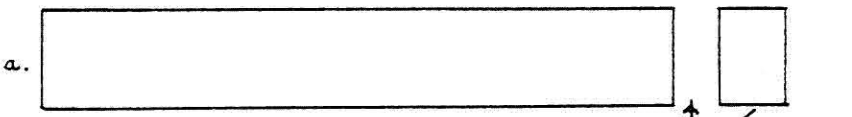
D

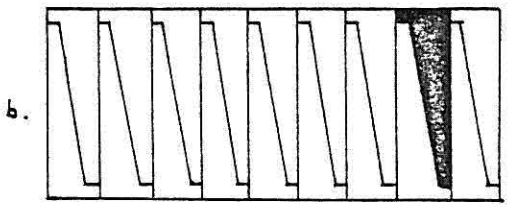
A TYPICAL ROSE-HEADED NAIL.



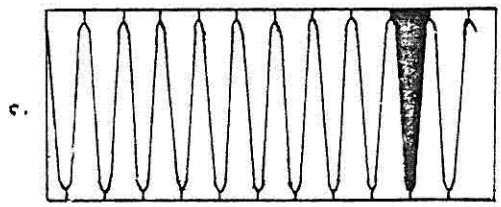
E

CLASP HEADED NAIL

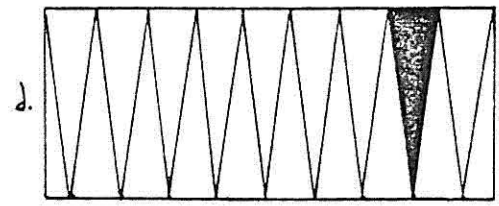




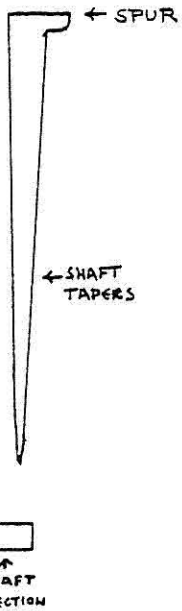
THE NAILS ARE CUT FROM THE STRIP AS ILLUSTRATED ABOVE + BELOW.



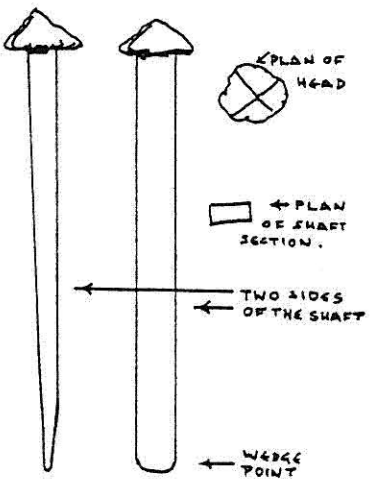
THIS TYPE IS AN EARLY FORM OF THE "COUNTERSUNK" NAIL USED FOR LEVEL SURFACES



THES TYPE ILLUSTRATES THE EARLIEST FORM OF CUT NAIL AND WAS MAINLY USED AS BRADS OR TACKS



H



WEDGE POINTED NAIL

F

practical use. Sweden was the first nation to develop machinery which successfully split rods for nail making. This invention was "borrowed" by a man called Faley of Stourbridge and the practice spread rapidly.

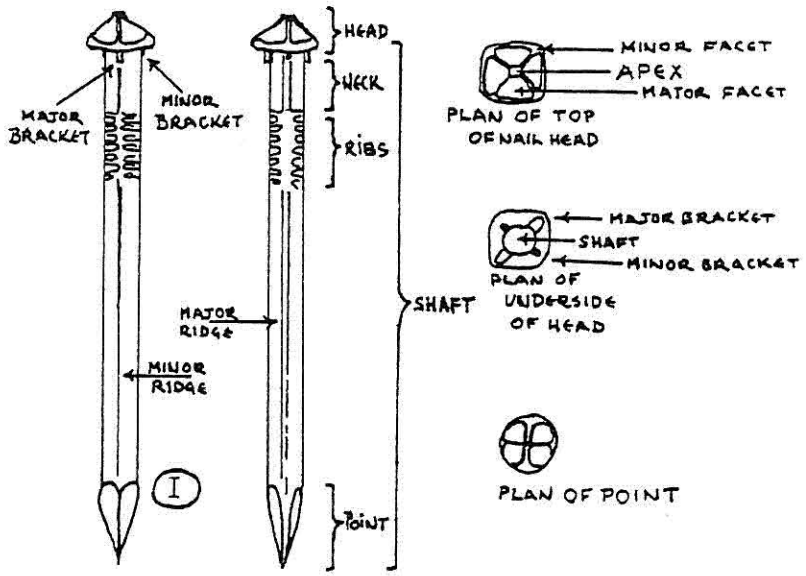
The first nails used in the colony in 1788 were brought out with the First Fleeters from England. These nails would have been manufactured out of ready made rod iron and hammered at the forge for pointing. At this time in England the nail was probably placed in the bore and the nail headed fairly crudely with a hammer into the "rose" shape (see ill. C). In most cases the head would tend to be quite flat and the four facets or sections of the head of unequal area. This type of primitive head may still be found in buildings of the 1820s.

Blacksmiths were too valuable to the early colony to spend time in the making of nails. Nails were not made locally to any large degree until about 1818 though a few instances are recorded between 1800 and that time. These nails were made from nail rod iron imported from England.

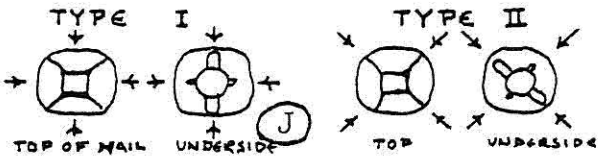
Many patents improved methods of manufacture over the first half of the 19th century. Wedge pointed nails become more common in the late Macquarie period (see ill. F), these early ones have rose heads and unlike the later ones have very sharp edges along the shaft. The wedge pointed nails have only two sides of the shaft which taper (see ills F and G). As a result of machines invented in the U.S.A. and developed in England, (there was much exchanging of nail making inventions between England and the U.S.A. during the first half of the 19th century), systems were developed where wrought nails were cut from the rod, headed and pointed in the same operation. A sophisticated nail was developed with a wedge point which became known as the Eubank's patent (see ill. G). This nail almost appears moulded, which is due to the pressers or hammers of the machine which form the shafts and the operation of the dies which form the heads by compression. This nail is most commonly found in Australian buildings of the late 1840s to about 1870 when it was replaced by the wire nail.

THE CUT NAIL

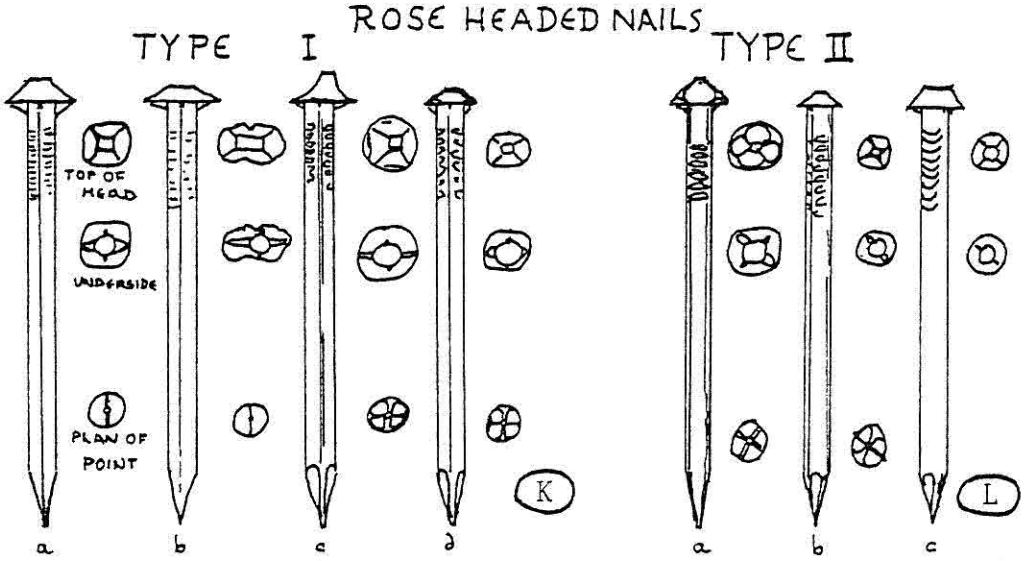
This type of nail required long thin iron plates (or ribbons of iron) instead of rods of iron as the "raw material". The nail plate or ribbon of iron was taken to the nail plate shears which sheared off pieces the length of the nail required (see ill. Ha). From these nail plate strips nails could be made from one inch to six inches plus in length. In the case of tacks or brads, (the simplest form of cut nail), the nail plate strips were fed into a machine with a shear blade set at a small angle. After each cut the nail plate was turned over and the shear blade cut a series of tapering nails resulting in a nail or tack indicated in ill. Hd. In the case of the sort of nails indicated in ills Hb and C, the nails were formed by a cutting punch which punched the nail out of the nail plate strip. (The nail plate strip was turned over after each punch as in the case of the tack or simple nail.)



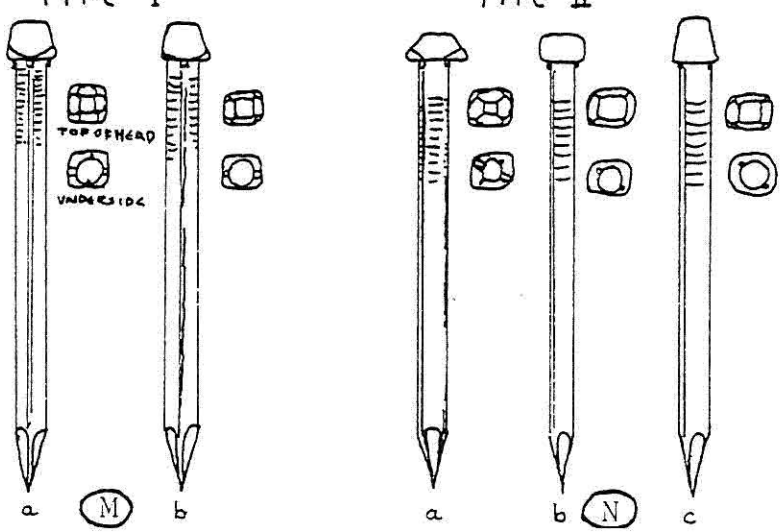
TWO VIEWS OF A WIRE NAIL



ROSE HEADED NAILS



RHOMBOID NAILS



The history of the cut nail takes us back no further than about 1775 when Jeremiah Wilkinson of Cumberland R.I. (U.S.A.) cut tacks from plates of sheet metal. He later extended his invention to nails and spikes and formed the heads of these nails in a vice. Another American, Ezekial Reed of Bridgewater, Mass., invented a machine for cutting nails from plate iron in 1786. Inventions at this time took little time to travel across the Atlantic. Thomas Clifford, in England, patented a machine in December of 1790 which cut nails from nail plates using a punch. Cut nails on the Clifford principle were being produced at French's factory at Wineburn, Staffordshire, England, in 1792. Machines producing nails as illustrated in ills Hb and c were probably not produced in England until about 1800 and we can expect them to have turned up in Australia a few years later.

They appear to have been used as housebuilding nails up to the mid 1820s and are used on a minor scale as tacks for about another fifteen years after which they are used almost exclusively as horse shoe nails (see ill A, Nos 9 and 10).

It should be noted that some nails are difficult to categorize as strictly cut or wrought as some cut nails (especially ones produced as illustrated in ill. Hd) were put through a secondary process. In the case where a cut nail undergoes a repointing and heading under heat and pressure I prefer to classify them as "wrought" because in their gross characteristics they are virtually indistinguishable from the wholly wrought product.

CAST OR MOULDED NAILS

This nail is rarely found in excavations or old buildings. I have not come across any in Australia except in the form of horse shoe nails (faily recent in date). They have turned up in excavations in the U.S.A., the earliest example being found at Fort Montgomery, New York, dating 1776, 1777. They are thought to have had a very specialized function, probably decorational. They are primarily characterized by their smooth surface and lack of sharp cut edges and on the top of the head appears a small knob as a result of the casting process.

The earliest patent for them is an English one granted to Joseph Ashton of Birmingham dated 1769. The reason of manufacture was to make "Coffin nails and tacks": these nails were also tinned. Technical manuals of the 19th century mention their use as garden nails; "a cast nail with a pyramidal head, used for nailing up climbing plants, vines, and wall fruit trees to brick walls".

WIRE NAILS

This type of nail, as its name suggests, is manufactured from drawn wire and is intimately connected with the mature development of machine wire drawing. Many machines had already been developed to cut nail rods, head and point the nail in one operation. It now required an inventor to use wire as the "raw material" instead of nail rods to produce a new type of nail. The first recorded wire nail making machine was developed by Adolph Felix Brown of New York in 1851 and production of the wire nail commenced both in the U.S.A. and Great Britain in that decade.

Although coils of wire of various diameters were readily available weighing from 15 to 20 lbs in the 1830s there was no great demand for wire until the advent of the telegraph. Its sudden demand made improvements to its manufacture in bulk imperative. In 1862 George Benson invented and patented a continuous rolling-train for the production of wire in quantity. Machinery of this patent was installed in the works of Johnson Bros. at Manchester. This invention resulted in the first quantity production of steel wire. Further improvements occurred in England and the U.S.A. in the 1880s.

The first wire nails were imported into Australia late in 1853 but as in most building circles in the U.S.A. and Britain they were viewed with suspicion. The first wire nails were not especially cheap and they were not fully accepted amongst builders in Australia until about the mid 1860s. By about 1870 as a result of the improved methods of wire manufacture they became both cheap and plentiful and replaced the wrought nail. Well dated buildings of the 1850s in Australia, for example those at Beechworth, Victoria, employ wrought nails of the sort illustrated in ill. G. Buildings of the mid 1860s sometimes use both wrought and wire nails.

Common house wire nails up to the 1870s tend to be thicker than those of later times. A nail of two inches in length in 1870 may by 9/64th of an inch in diameter whereas a nail of the same length in the 1890s may be 7/64th of an inch in diameter. Thinner nails were available in 1870, however, these were used for very fine wood work only.

The square shafted wrought nail continued to be popular in England long after they ceased to be popularly used in the Australian colonies; the British referred to the wire nail as "French" nails because of their popularity in France. Although the wire nail was produced in England the main producers of them were the U.S.A. and Continental manufacturers. I have not found any successful manufacturers of the wire nail in 19th century Australia.

To establish a dating system within the order of wire nails is fraught with problems. Patent records, as mentioned before, are generally vague; advertisements in trade journals and newspapers rarely if ever illustrate nail products. The type of nail available is usually offered under ambiguous trade names such as "Eubank's" (which from 1840 to 1900 may represent a score of different varieties) or they may be simply called "best imported".

By examining nails from the original fabric of firmly dated structures a system of dating may be established. A rough picture has emerged which with the co-operation of public institutions and individuals involved in restoring buildings may in time be reasonably perfected.

The parts of a typical wire nail are as shown in ill. I. There were two basic sorts used for common building purposes in the second half of the nineteenth century; the rose headed nail (see ills K and A); and the rhomboid headed nail (see ills M and N). The following is a rough chronological outline of the two sorts:

ROSE HEAD

The rose head is the earliest type of wire nail to be used on a large scale. The shape of its head is an adaption of the earlier rose headed wrought nail but it is more compact and well defined in shape. I have divided the rose headed nail into two types on the basis of brackets which appear under the head (see ill. J).

The earliest form of the rose nail is type Ia and b (ill. K); the head is large and in some cases primitive looking, the body is thick and the point of the nail has only two facets or divisions. This type is common until about 1870. After this date these nails have four facets at the point. Type Ic appears often in the 1870s.

The rose nail type II (with the brackets occurring at the corners of the nail head), appear in much the same form as type I a to c in the 1870s but are comparatively rare. Type II is more common during the 1880s in the form of b and c (see ill. L), these seem to disappear at about the time of the 1893 depression.

RHOMBOID HEAD

These are quite distinct from the rose headed nail as the profile of the head is much more block-like, except in the case of a transitional variety Type IIa (ill. N). The rhomboid nail has eight facets or divisions on the head excluding the apex (see ills M and N). The facets are divided into major and minor facets (see the breakdown of parts in ill. I). The rhomboid nail is divided into two types based on the same system as in the rose nail.

Type IIa appears to be one of the earliest types and first appears in the 1880s. Type Ia (ill. M) appears in the 1890s. Types Ib and IIb and c have only two sets of ribs instead of four (type IIc has only two brackets instead of four). These latter sorts appear in the late 1890s and some survive on the market well into the 20th century.

I have presented the above material not as a definitive guide to dating nails but more in the hope of creating an awareness of the possibility of their potential in dating. I wish to encourage people in the position of restoring our public and private buildings to take samples of nails from the original fabric and place these samples in envelopes noting the location of the building and the exact part of the building from which they were taken. Perhaps a public repository could be created to receive dated and properly located building materials for the benefit of future research.

R.V.J.V.

X. RESEARCH AND RESCUE - THE BIRD AND LUCAS FOUNDRY

The firm of Bird and Lucas Ironfounders, of Sheehy Street, Glebe, is to close down its operations later this year, due in the main to complaints from local residents about the pollution emanating from its furnace. Its unfortunate demise will mark the passing of a small but very significant element of the N.S.W. Industrial Heritage; for, this little foundry, which has been casting now in the area for nearly 100 years, is alone almost entirely responsible for the early domestic iron-work architecture of Glebe, and other surrounding inner city suburbs.

Fortunately, however, due chiefly to the efforts of the Museum of Applied Arts and Sciences, Ultimo, a significant number of important industrial artefacts from the firm's very early years are to be preserved.

The 'Bird and Lucas' Ironfoundry commenced operations in August 1900, on a site cornered by Phillip Street and Cowper Lane, Glebe, immediately next door to the firm of B. Stone and Sons, Stovemakers, which produced the famous "Waratah" stove.[1] Actually, however, the story of the factory itself can be traced back to as early as 1886, when it was operating under the name of Coulson Bros., Ironfounders, also of Phillip Street, Glebe; with the name-change being effected 14 years later when William Bird and Daniel Lucas acquired the ownership and management of the firm.[2] William Bird had migrated to Australia from Birmingham, England, shortly before the year 1887, whilst Lucas, a moulder by trade, had come originally from Edinburgh in Scotland. It is not known for certain whether they had both worked at the foundry prior to 1900 (we must assume that they did, at least in the case of Daniel Lucas), nor are the reasons for the takeover apparent; but in any case it was Bird, a very upright and religious man, who concentrated more on the administrative and managerial aspects of the foundry's operations whilst Daniel Lucas seemed to prefer the role of foreman inside the workshop itself.[3] These men would however, probably not have been 'buying into' an economically troubled business, for by 1901 the population of Glebe alone had reached 19,220[4], and the foundry had very few competitors. The firm's workforce, in fact, which numbered around 15 men at this time was kept almost totally occupied fulfilling orders which came solely from the local market.[5] A Sales Catalogue published by the firm in 1904, shows the firm during these years producing quite a diverse range of wares, for both public and private interests: it lists such items as bakers' ovens, truck and barrow wheels, plumbers cast fittings, hobbins, and gully grates, as well as fireplaces and register grates, sham hinges and elaborate chairs and table stands, etc. In addition to these, the foundry was also producing quantities of cast lace-ironwork for the balconies and fences of houses then being erected in the area.

The land upon which the foundry stood, was, during the first decade of this century, leased to Bird and Lucas for the sum of £1 per week by the Church of England, via the agency of Bernard Stone (the stovemaker), who was then a very active member of St. Barnabas Church, Broadway, and it also paid a business tax to the government of £17 per year;[6] but apart from these statistics little else is known about the firm's economic management at this time since all

of the relevant early records have been either lost or destroyed. However, it is known that at sometime around the year 1910 the foundry won a government contract to supply the schools throughout N.S.W. with desk-stands, and the profits of the firm then rose accordingly, along with the size of its workforce.[7] The number of men employed at the foundry rose still further with the outbreak of World War I, when the firm was classified as an industry essential to the country's war effort, and was set to work by the government producing mainly 'half-cases' for hand grenades.[8]

The immediate post-war years, and the early 1920s were boom periods for the Australian Iron and Steel industries in general, and Bird and Lucas' foundry was no exception, in fact the firm even acquired its own motorised lorry. This period however, also saw major changes occurring in the management and ownership of the company; in 1921 Daniel Lucas died, and his passing was followed 2 years later with the death of William Bird. Their shares and directorships were subsequently acquired by 2 much younger men: one Samuel Wilkes, engineer (who had, fortunately for himself, married the boss's daughter, Myra Bird), and one Thomas Hickman, who had at one time been the head foreman of the Anthony Hordern and Sons Foundry at Brickfield Hill.[9]

Despite these major upheavals, however, the firm continued to prosper, and so on 12th September, 1928, Bird and Lucas first officially registered as a company with the then Registrar of Joint Stock Companies. The company listed itself as having a capital of £5,000, divided into 5,000 shares of £1 each.[10] Trouble soon struck though, for a little later in that same year the Church, probably in pursuance of its policy to maintain Glebe primarily as a residential area, refused to renew the lease for the land upon which the foundry stood.[11] Catering to a very localised market, the firm was therefore forced to look nearby for a new site, and the cheapest land available lay along the reclaimed foreshores of Black-Wattle Bay, which was then totally unsuitable for residential use. So, a block of land which is today located at the end of Sheehy Street, Glebe, was purchased by the company for £2,200, with the sale being completed by 4th October, 1928.[12] (This land had at one time been the site of the horse stables of 'Strathmore' house, and Albert Hickman, who was then employed by the firm (see Note 3), well remembers helping to knock down their remains in order to erect the new foundry.)

Not long after the move had been made however, the Great Depression struck, and all but 2 of the company's workmen had to be 'laid-off';[13] yet the foundry managed to survive these years, and has been able to maintain its operations throughout the 5 decades since the depression, up to the present day.

After some 90 years of continuous production however, the company has now begun trailing down its operations, in preparation for its complete closure later this year (1980). Its story has already been researched and recorded in full as part of the National Estate Programme, undertaken in order to collect as much information as is possible on Sydney's early industries (especially those that are 'dying out', such as saddleries, cooperages, etc.), and it was whilst research on this foundry was underway that a most fortunate discovery was made: the directors of the firm (more or less a family

concern for the last 40 years) had, for no reason in particular, decided to keep a large number of their early casting patterns, along with a selection of original pieces. These patterns, most notably ones concerned with the early domestic iron-work architecture of Glebe (a few of them are shown in the illustrations, taken from the firm's 1904 catalogue), had been thrown into a silent, soot-blackened storeroom in a little used corner of the factory many decades ago, when their period of usefulness had ended, and have so been left lying there until the present day.

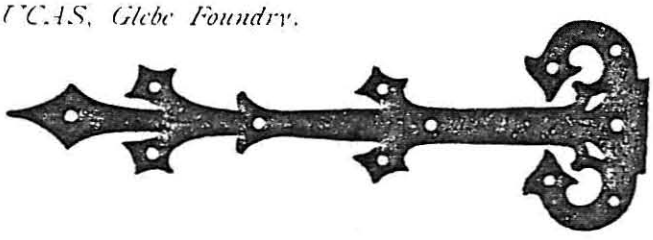
Their discovery led to a special recommendation being included in the final report on the foundry, and steps were taken immediately to ensure their preservation. Negotiations with the company's directors, undertaken by the Museum of Applied Arts and Sciences, Ultimo, have now been concluded, and all of these historically valuable pieces are now earmarked for display in the new 'Powerhouse' Museum which is to be built in the near future.

B.J.G.

Footnotes

1. A catalogue was published by the firm in August 1904, to mark the 4th anniversary of the company.
2. Phillip Street was laid down in 1883; and Coulson Bros. Iron-foundry commenced operations from No. 3 in 1886. In 1887 they shifted their works across the road to No. 2. In 1889 Coulson Bros. became W.R. Wise, Engineer; which was listed in subsequent years as W.R. Wise, Casting Foundry. In 1900 it was taken over by Bird and Lucas.
   See John Sands Directory for the relevant years.
3. Oral Testimony of Albert Hickman, now aged around 90, who began working at the foundry in 1904 when still in his early teens. His father was a close friend of Bird's, and his recollections of the firm in this early era, which are generally crystal clear, have proven to be consistently accurate whenever it has been possible to have them checked.
4. Commonwealth Bureau of Census and Statistics Bulletin, 1901.
5. O.T. of Albert Hickman.
6. Ibid.
7. Ibid.
8. Ibid.
9. Ibid.
10. Documents held by the Corporate Affairs Commission. Refer to Bird and Lucas Pty. Ltd. File No. A-012030-24.
11. O.T. of Albert Hickman.
12. C.A.C. documents.
13. O.T. of Albert Hickman.
    (It is at this point that this condensed mini-history of the foundry has to be broken off. A full and detailed story of the company's activities to the present day (with photographs, diagrams, etc.) has, however, been recorded.

BIRD & LUCAS, Glebe Foundry.



SHAM HINGES.

AUSTRALIAN SOCIETY FOR HISTORICAL ARCHAEOLOGY

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AUSTRALIAN SOCIETY FOR HISTORICAL ARCHAEOLOGY

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SUBSCRIPTIONS

Subscriptions for 1980 are now overdue. There is a gentle reminder to unfinancial members in the square below:

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We regret that owing to the considerable cost in production and postage from now on Newsletters will be sent to financial members only.

I. EDITORIAL

The widening scope of the Heritage Council's activities in N.S.W. can be seen in the diversification of its activities. Recently the Council has had two of its eleven meetings a year outside Sydney to encourage awareness of its work, using the opportunity to visit local sites and especially to talk to local government, community bodies and interested individuals. Such visits have included Albury, Bathurst, Grafton, Lismore, Ballina and the lower Hunter.

In line with the functions of the Heritage Council as set out in Sections 21B and E of the Act (1977), it is also developing a programme of Seminars on a wide range of conservation topics, one of which took place in July to discuss issues raised by the State Conservation Plan. Foreshadowed at this Seminar was an early meeting of the Heritage Council's Archaeological Advisory Committee, a welcome move.

Forthcoming also is a Seminar organised by Dr. G.S. Gibbons of the Department of Geology, N.S.W. Institute of Technology on behalf of the Council of Heritage Organizations (COHO) (25 August, 1980) on the conservation of Aboriginal rock art, tombstones and other stone monuments especially in the Sydney area, as well as the important ICOMOS Annual General Meeting to be held at the National Trust Centre in Sydney (29-31 August) which will discuss progress in protective legislation for the National Estate, Australian revision of the Venice Charter presented at Burra in 1979, the conservation of some of Sydney's major public buildings and the current survey of conservation courses in Australia.

Recent events include the National Trust's Urban Conservation weekend at Wagga (18-20 July), the previous ICOMOS meeting at Alice Springs with its emphasis on the problems of conserving fragile remains in remote areas (17-23 May including field trips), and the ANZAAS meeting in Adelaide (12-16 May) including papers on interesting archaeological field work now going on in South Australia in H.A. (Chairman Section 25A Archaeology J.V.S. Megaw, Flinders University, Adelaide.)

Both at ANZAAS and at Alice Springs concern was expressed at problems arising from heritage legislation in the care and storage of both artifacts and documentation, underlining the resolutions of the earlier Goulburn Seminar in H.A. (cf. ASHA Newsletter Editorial, April 1979). The ANZAAS resolutions endorsed at Alice Springs by Australia-ICOMOS, were as follows:

- That Section 25A recognise the urgent need to make work on all aspects of historical archaeology in Australia more accessible to potential users;

- that more comprehensive deposits of published and, if possible, unpublished reports be encouraged in the major libraries, museums and other control locations;

- that the means for disseminating information about work completed and work in progress, the question of the deposit of unpublished reports, raw data and artifacts in suitable repositories and other matters of policy arising from projects on historical archaeology be recommended for discussion at adequate length at the Brisbane ANZAAS in 1981;

- that the present Chairman of Section 25A be asked to instigate discussions on these motions with the Heritage Commission, ICOMOS, the National Library, the Museums Association of Australia and other relevant bodies preparatory to ANZAAS in 1981.

ANZAAS Section 25A also foreshadowed its intention to suggest this subject as a possible theme of the 1980/1 conference at Brisbane.

II. NEWS ITEMS: GENERAL

Saving our Past!

Research assistants of Historical Archaeology at the University of Sydney have launched a project to collect old photographs and documents in an attempt to establish a resource centre for researchers. The team (Barry Groom, Warren Wickman, Martin Davies and Graham Wilson) are involved with the collecting, sorting, cataloguing and reproduction of the photographs. The project is primarily designed to make accessible pictorial material held in private hands. Areas of chief interest include street scenes, individual buildings, industry and machinery, and items of interest like horse-drawn vehicles. The collection will be housed at the Macleay Museum and will be available for historical researchers to use.

The project was initiated as the result of a need for photographs for research purposes and the previous experiences of Barry Groom. While living in Adelaide when still a teenager, Barry was employed as a general duties man in a nursing home for the aged. His responsibilities included the disposal of the personal effects of deceased persons. Old documents, photographs, diaries, letters, medals and souvenirs were all consigned to the flames. Doubtless this activity is still taking place in nursing homes and public hospitals.

The public's response to the present time has been both enormous and encouraging. In the near future the project team will be approaching old peoples' homes in an attempt to tap this valuable source of photographs. It is hoped that the project will continue on a permanent basis and bring to light more interesting and important material which will make a vital contribution to the recording of the history of Australia.

Any members of A.S.H.A. who could assist with old photographs or give information concerning those who do have, could you please ring Sydney 692 2763. It would be very much appreciated.

* * * * * *

Master's Degree in Conservation, University of Sydney
Master of Science (Architecture) (Conservation)

The growth of public awareness and support have brought about a new understanding of the importance of Australia's heritage of existing buildings. This has been accelerated by the high cost of new construction and recent government legislation providing legal protection for important historic buildings and sites.

Since 1974 the Faculty of Architecture at the University of Sydney has offered senior undergraduate courses of study in the field of architectural and landscape conservation. In a series of student workshops and conservation seminars the Faculty has sought to enlarge public awareness of conservation and to encourage study of the key elements, their history, preservation, enhancement and reuse.

From March 1980 the degree Master of Science (Architecture) (Conservation) will be offered by the University of Sydney through the Faculty of Architecture to graduates of appropriate first degrees. This will be primarily a research degree, allied with definitive lecture programmes, and the option of undertaking part of the course at the Institute of Advanced Architectural Studies, Kings Manor, University of York, (UK) under the direction of Dr. Derek Linstrum. Each candidate will be allocated a tutor for guidance during the preparation of the thesis. It is expected that candidates will require a minimum of one (1) year full-time or two (2) years part-time to complete the degree.

Generally candidates will be encouraged to study in depth a building, or built group/environment, or man-made landscape that is deemed significant by the various government heritage bodies or by the National Trust of Australia, as a case study to which to apply the lecture material covering:

- Principles of architectural and landscape conservation
- Preservation of townscapes and landscapes
- 19th century Australian architecture
- 19th century Australian man-made landscapes and townscapes
- Conservation techniques (especially of building fabric)
- Politics, communities and preservation
- Preservation bodies and legislation in Australia.

Enquiries : Ilsa Hansen (telephone Sydney 692.3248)

* * * * * *

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Once more we acknowledge our grateful thanks to Professor Robert L. Schuyler, editor of 'Historical Archaeology: A Guide to Substantive and Theoretical Contributions', published by Baywood Press who have been directed by Professor Schuyler to remit a proportion of the royalties from the sales of his book to the Australian Society for Historical Archaeology, and who have just remitted a second cheque to us.

* * * * * *

* * * * * *

The Australian Association of Consulting Archaeologists

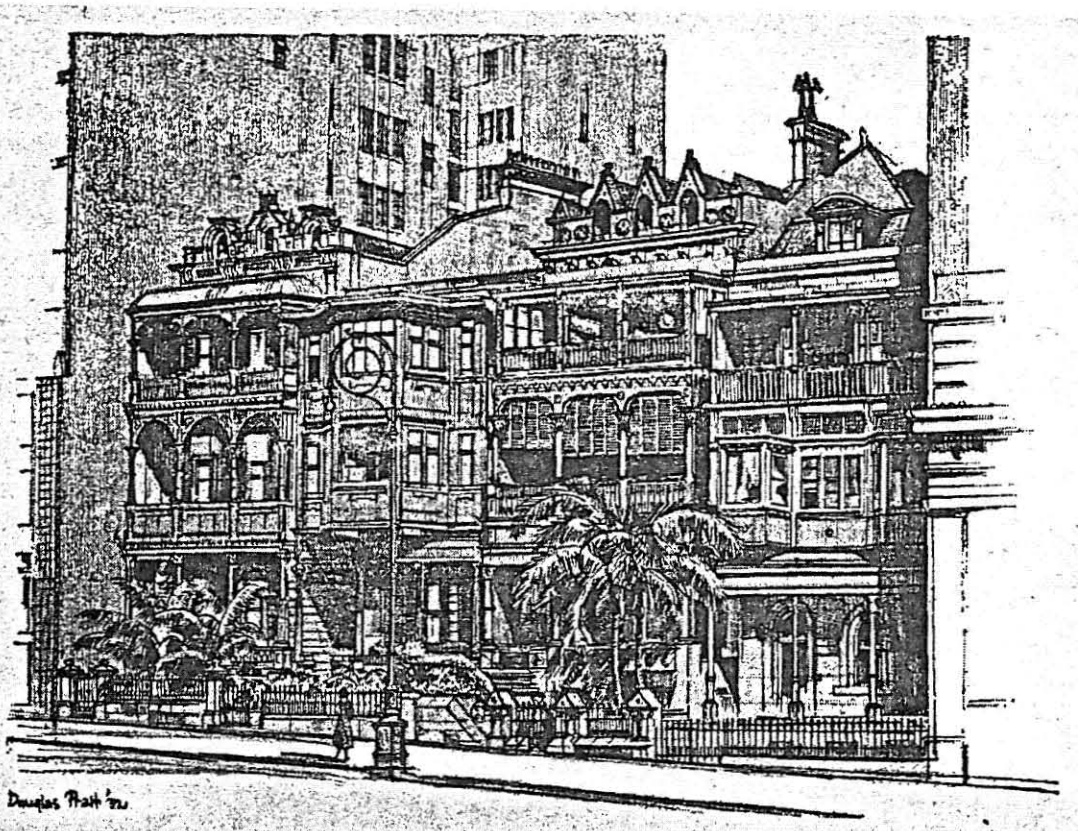
The Australian Association of Consulting Archaeologists is a new professional association, formed in late 1979. Its purpose is to provide encouragement, communication and co-operative support for workers in the field of Australian archaeology (both pre-historical and historical), and to ensure the maintenance of professional standards.

The Association had its first Annual General Meeting in March 1980, and has formulated a code of ethics, a recommended fees scale and a list of guidelines for consultants. The Association is intending to produce booklets containing information of use to consulting archaeologists, and is currently preparing information on insurance schemes, the format of contracts and on legislation in respect of both Aboriginal and historic sites.

Membership is open to all archaeological consultants: i.e. those persons who have the expertise to advise on matters within their professional field. Membership will consist of Members and Associate Members, the category of membership of each person to be decided by the membership sub-committee, and the fee scale to vary accordingly.

A National Register of archaeological consultants will be maintained, and will be available to potential clients.

If you would like more information, or wish to apply for membership, write to the Membership Secretary, P.O. Box 1, Kambah, A.C.T. A newsletter is produced regularly. Those people who are not interested in becoming members, but are interested in becoming subscribers to the newsletters, should send $10.00 to the Treasurer, P.O. Box 214, Holme Building, University of Sydney, N.S.W., 2006.



A group of town houses in Macquarie Street, 1932.

The house on the extreme left of the picture, Number 133 Macquarie Street, the main part restored to its original form, is now the headquarters of the Royal Australian Historical Society. It is the last remaining house of the group and may soon be the only mid-Victorian town house left in the city area.

The building has long historic associations. It is built on land granted by Governor FitzRoy on 1 May, 1849, to one Joseph Nottingham Palmer.

In 1852 or 1853 Thomas Woolley, who had acquired the land, erected the building which he sold on 16 November, 1853, to Dr. William Bland.

William Bland had been transported to New South Wales in 1814 for seven years after killing his adversary in a duel while serving as a naval surgeon. He was pardoned in October, 1815, and began private practice in Sydney. In September, 1818, he was convicted and sentenced to twelve months' imprisonment for lampooning Governor Macquarie. He resumed private practice after his release and in 1821 began a long association, which lasted until 1863, with the Benevolent Society; in 1859 he became the first president of the Australian Medical Association. Bland was very active politically and, with William Charles Wentworth, was prominent in the movement for self-government.

George Oakes (a son of Francis Oakes who had been appointed chief constable for the Parramatta district in 1805) bought the property from Bland on 10 December, 1857. Oakes became a member of the New South Wales Parliament. On his death in 1881 the house passed to his son, who held it until 1901.

The house then passed through several hands until in 1927 it was bought by the distinguished Australian surgeon, Dr. George Bell, who lived and practised in it for thirty years.

Membership of the Society helps to maintain this period house and to ensure its preservation for posterity in a historic street that is rapidly being redeveloped.

A.G.M. and Lecture, July 14.

It was very pleasing to see so many of our members and non-members at the Annual General Meeting and Lecture on Monday July 14. After the lecture by Dr. Jim Kerr a pleasant get-together with wine, biscuits and cheese seemed to be enjoyed by all. We are happy to welcome back to our Committee Professor Ken Cable, who was our first President, and also to welcome two new members in the persons of Dr. Jim Kerr (of the Australian Heritage Commission) and Mr. Peter James (of the National Trust of Australia - N.S.W. Division). The following Committee members were elected for 1980-1981:

President:	Mr. K. Fahy	Secretary:	Miss Judy Birmingham
Vice-President:	Miss Norah Peek	Treasurer:	Mrs Ilma Powell
Vice-President:	Dr. Jim Kerr	Other Members:	Mrs Rosemary Williams, Professor Ken Cable, Mr John Wade, Mr Peter James.

III. FORTHCOMING EVENTS

Exhibitions

July 6 - August 22

The Macleay Museum, University of Sydney, will hold an Exhibition on Acoustics 'Hear! Here!' in July and August. All members of the public are welcome. Admission free.

Monday to Friday: 8.30 a.m. - 4.30 p.m.

August - September (Dates to be determined)

The Museum of Applied Arts and Sciences will hold two Exhibitions:

'The Awesome Universe' ... a series of astronomical photographs and 'A Generation of Industrial Design' during the months of August and September. Please ring 211 3911 for the dates (which have not yet been decided).

September

Pompeii 79 AD

A.S.H.A. is endeavouring to arrange a special viewing of this Exhibition for members. At present there is no fixed date or the charge involved. However, to give us some idea of numbers, if you are interested would you fill in the enclosed slip and post it back to us. You will then be notified of date, time and cost when this information is available to us.

Dates for your Diary

Tuesday 12th August

Architecture and Historic Sites Group. (Arranged by the Royal Australian Historical Society.)

Subject : 'The Growth of Sydney's Major Airport'
Speaker : Mr Peter Oppenheim
Time : 6.15 p.m.
Place : History House, 133 Macquarie Street, Sydney.

Beverages and biscuits after talk. Contribution 40¢.

Saturday 16th August

(Arranged by the Museums Association.)

Subject : 'The Role of Science Centres in Developing Countries'
Time : 7.00 p.m.
Place : The Australian Museum, College Street, Sydney.

For further information and final details on the above talk please ring Dr Glenn Hunt, 339 8111.

IV. EXCAVATION AND SITE NEWS

A preliminary report on the site of the "stockade" near Wisemans Ferry

A Windsor man, Mr Ted Books, rediscovered the stone ruins at Wisemans Ferry. His ancestors lived in the district practically since it was first settled, and he knew of the ruins by word of mouth.

The site consists of two groups of stone constructions, steps cut into the rocks, evidence of quarrying, and waterholes in the rocks, over an area about two km. long, following the line of the road.

The early ownership of the land is doubtful. Part of it was sold in 1835 to William Webb. According to a map (A.O. Map No. 212) the rest of the land belonged at the time to Solomon Wiseman. Up to date there was no earlier map found.

Most of the site is on a 40 acre block, which was advertized in the Government Gazette on the 28th September 1869. The land which was "on the right bank of the Hawkesbury River opposite the confluence of Webbs Creek on the Road from Maitland to Windsor" was selected by George Douglas "exclusively of a road 50 links wide". An auction sale of this land was held by G.A. Gordon, the Crown Land Agent on the 29th October 1896 in Windsor at the Police Office. The 40 acres were offered at £1.0.0 per acre. George Purvis Black, innkeeper of Wisemans Ferry, bought it at £1.12.0 an acre. He paid £64.0.0 for it, and the deed fee of £1.0.0. He left a deposit of £16.0.0. Black's heirs sold the land, which was subdivided into four parts. The area on which the stone ruins are belongs to a N.E. Venturelli of Kirribilli.

Documentary history

There is virtually nothing known about the site. Even though reports mention convict huts in the area, they do not define their location. In different publications there is some mention made about a "convict stockade" at Wisemans Ferry. It is illustrated in one,[1] but it appears the stockade in this picture is confused with the hotel, which had a substantial stone wall around it. A photograph of 1919 in the Mitchell Library (Nicholls Col. 44) shows a similar light coloured line around the hotel.

Frank Walker gives this description in ca. 1907:[2]

"There are numerous stockade sites to be found in this locality, where the chain gangs were quartered at night time, after their day's work upon the road. The ruined buildings in some cases are little more than a tumbled heap of stones. I spent some time wandering about the ranges looking for these old relics, and was successful in locating a number but there are others, I am told in various degrees of ruin and decay."

These stone ruins are still there, presumably in the same state as at the beginning of the century when Frank Walker saw them, with the exception of some stones which some people have used in the meantime to build their own houses.

The importance of finding out more about the road which was built there became obvious, if one postulates that the stone ruins are the remains of the convict huts.

The Great North Road leading to Newcastle was built from about 1827 into the 1830s. In July 1825 the Governor, Sir Thomas Brisbane, appointed three commissioners, J. Oxley, J. Cordeaux and J. Campbell to make a complete survey of the colony. In March 1826 they presented their first report to Brisbane's successor, Governor Ralph Darling. The road has been traced by Major J.T. Morisset but at the direction of the Governor, Surveyor Heneage Finch made a survey for a

new route. The mountainous section of the road leading to Wisemans Ferry was started in 1828 and was finished in the first half of 1830. The engineer in charge was Percy Simpson. He is mentioned[3] as being "a practical Engineer and is very beneficially employed in making the Road on each side of the Hawkesbury, which River passes between two Mountains and the Construction of the Road is difficult".

The Sydney Gazette reports:[4] "The object of his excellency the Governor's tour to the interior on Thursday last, was not merely to visit Windsor but to inspect the line of road toward Newcastle to its crossing the Hawkesbury at Wisemans with the beauty of which His excellency was much struck and expressed his gratification at the state and progress of this noble looking and servicable road...."

At least three but sometimes five groups of convicts worked on this stretch of the road "stationed at the Lower Branch of the Hawkesbury" (Macdonald River) from 1827 well into 1830 when they were stationed at "Wisemans Station".[5]

The overseers had to write weekly and monthly reports of the progress of the work. From some of these reports (some are too faint to read on microfilm) one can form a picture of the conditions of convicts and the techniques of roadbuilding.

There were only few references in these reports relating to the "huts" of the convicts:

..."the Contractor Mr Wiseman refuses to deliver the Rations at the huts of the Gangs in the Hawkesbury...thereby occasioning the loss of many Mens labour for several hours on the days of issue..."

Another report also mentions huts and specifies that the convicts were issued with provisions twice a week.

There is one overseer who appears to have worked on the roads from 1827 into the 1830s, Thomas James. The convicts changed from time to time as they were requisitioned from one gang to another in the vicinity apparently according to how the work proceeded. It is interesting to note that convicts were sent to work at harvesting from these roadgangs. When harvesting was over they were returned to work on the road. Some of the convicts were in irons, and worked side by side with those without.

The road had to be at least 10 feet wide and on this stretch it had to be cut into rock at some places and at others retaining walls had to be built as well as culverts and bridges. Gunpowder was used at times, to blast overhanging rocks, and extra energy was sometimes supplied by a few oxen. Mostly tools were scarce and a blacksmith was set up to mend them.

The surface finds indicate that the site was used ca. 1830. (There are some 1826 English pennies, a pottery and a bottle fragment and a great quantity of animal bones.) However there is no certainty[6] that the ruins in question were actually used as convict huts but it is more than likely that they were used in connection with the building of the Great North Road.

Notes.

1. M. de Salis: Two Early Colonials, p. 81.
2. Frank Walker: The Great North Road, in the Journal of the Aust. Hist. Soc., Vol. 3, 1907-1917, pp. 68-75.
3. H.R.A. Ser. 1, Vol. 15, p. 740.
4. Sydney Gazette, 17th September 1828.
5. Archives: Microfilm reel 590.
6. One of the reports (March 3-9, 1828) says that the asst. Surveyor Warner "sent all the gang to the River to build new huts".

Eve Stenning

Provisional comments on excavations at Moore's Wharf Bond Store Site

Exploratory excavations on the former site of the Moore's Wharf Bond Store have been carried out by Dr Ron Lampert of the Australian Museum. In all, eight individual trenches were made in the floor deposits, at points chosen to reveal the archaeological potential of the site.

The most productive trench was in the southwest corner of Bay IV which penetrated floor deposits nearly 2 metres deep. At least six different floor levels were recognised, some of the deepest containing useful samples of early to mid 19th century chinaware, glass bottle fragments and building materials. Throughout the history of the building, floor materials changed from packed rubble to timber to asphalt and finally to concrete. These changes were accompanied by structural alterations to the doorway in the southern wall at the southwest corner.

Other parts of the building were less productive, most trenches penetrating only a few centimentres of packed rubble before reaching sandstone bedrock. Although the floor deposits were nearly a metre deep in the northeast corner of Bay I, early floor levels seem to have been deliberately removed and replaced with clean sandstone rubble to carry the overlying modern concrete floor.

Just inside the northern wall of Bay III, a sandstone rubble floor was stripped away to reveal an Aboriginal camp site predating the construction of the building. A preliminary examination of the artefacts from this site suggests that it was last occupied by Aborigines only a short time before the Bond Store was constructed.

Part of the early hydraulic power system was encountered in one trench. This has been removed and is being studied by Dr D. Godden, Applied Arts, University of New South Wales.

When all the artefacts recovered by excavation have been examined, the archaeological investigation will tell us a good deal about the structural history of the building that will usefully supplement the information obtained from documentary and other sources. However, it is doubted whether further excavations there would provide any additional information of significance.

R.L.

Ruins on Southern Side....Wisemans Ferry

V. THE WUNDERLICH PROJECT - An Exercise in Industrial Archaeology

"No firm is better known in Australia than that of Wunderlich Ltd."

"It is safe to say that Wunderlich Ltd. has done more than any other firm or organisation to improve and beautify Australian architecture, whether of a public or a private character. The roofs of our houses would be duller and drabber if there were no Wunderlich materials; the interior construction of the average Australian home would be a clumsier and less attractive thing."

(*The Clay Products Journal*, 1938, 39)

The story of the Wunderlich industries is one of the great success stories of Australian industrial enterprise. From small beginnings at the end of the 19th century, by the early 1960s it was a public company employing 2,000 people with a subscribed capital of nearly two million pounds and assets of over five million pounds. Through the greater part of this century, Wunderlich was a household name throughout Australia.

It all began in 1885 when Ernest Henry Charles Wunderlich arrived in Australia from England, with the agencies for several lines of European manufactured goods, and high expectations. Born in London and educated at Vevey in Switzerland, his business career to date had not been particularly successful -- indeed an earlier attempt to sell pianos in Africa was a notable failure.

Undaunted however, he settled in Sydney as a manufacturer's agent. A builder friend noticed, in Ernest's house, a discarded catalogue for stamped zinc mansard windows. He insisted they were just what he needed for some houses he was building at Rushcutters Bay, and Ernest agreed to supply them. And so, almost by accident, the saga of the Wunderlich industries began.

In 1887 Ernest was joined in Sydney by his youngest brother, Alfred, and the following year Ernest took out a patent for stamped zinc as applied to ceilings. The Wunderlichs' first major ceiling contract was for the Town Hall:

"The present Town Hall, at first named the Centennial Hall, was completed about 1889. It was never designed as a concert hall and the immense organ must have been an afterthought, because the architects had specified an elaborate plaster ceiling, with console and pedentives, that certainly would have fallen on the audience as soon as the 64 ft. lower C pipe sounded. After a long canvass of mayor and aldermen, I induced the City Council to substitute stamped zinc for the ceiling and all its decorations. This ceiling is intact after half a century. I merely mention this, as it is not my intention to dilate on my business achievements, which are well known."

(Ernest Wunderlich, *All My Yesterdays - a Mosaic of Music and Manufacturing*, 1931)

The business of the Wunderlich brothers expanded, and they won many contracts for both ceilings and various types of metal roofing. In 1890 they established a factory at Baptist Street, Redfern, for the manufacture of stamped zinc and other metal products. They were, of course, in competition with the makers of fibrous plaster ceilings, which had become very popular over the previous decade. We found in the *Building and Engineering Journal* of May 1889 this letter from Ernest Wunderlich to the Editor:

"Dear Sir,

It may interest your readers to learn that the plaster ceiling of Aaron's Exchange Dining Hall has quite recently come down in

a lump. I have been instructed by Mr Pritchard on behalf of Aaron's Exchange Co. Ltd to supply and fix a zinc ceiling, which I hope to be able to complete within five months from this date. In the meantime all the paster has had to be removed, and a canvas vellum has been drawn across the ceiling.

I remain, Dear Sir, yours faithfully,

E. Wunderlich"

Over the next few years the picture becomes murky. Ernest says in his own publications that he went to Melbourne to establish the metal working branch of W.H. Rocke and Co. and stayed there for three years as manager. Our researches indicate that, in fact, the Wunderlichs sold their patent to Rockes, probably after an unsuccessful business deal had left them in an unstable financial position. Both brothers were then employed as managers for Rockes, Ernest in Melbourne and Alfred in Sydney. However, in a curious reversal of fortune, Rockes themselves ran into financial difficulties during the great depression of 1892/93, and the Wunderlichs bought back the patent, operating under the name of the Wunderlich Patent Ceiling and Roofing Company Ltd.

After 1892 the Wunderlich brothers, by another happy accident, entered the terracotta roofing tile importing business. A large shipment of tiles from Marseilles to Sydney could not, for some reason, be handled by the original consignee -- it was possibly the same Rocke and Co. whose Sydney branch had become insolvent that year. The Wunderlichs were asked to sell the cargo, beginning a fruitful partnership with the United Tileries of Marseille, which lasted until World War I.

In 1900 the third brother, Dr Otto Wunderlich, arrived in Sydney and was responsible for re-organising the business along modern accounting principles.

In 1908 Wunderlichs finally absorbed their old rivals, Rocke and Co., and the business was formed into a public company under the name of Wunderlich Limited. In this year a new administration block was build at Redfern which housed the offices of the Sydney branch and the head offices for all the Wunderlich enterprises.

The outbreak of World War I proved the foundation for future Wunderlich growth. Metal for the ceilings (now steel rather than the more expensive zinc) could no longer be imported from England and there were no ships free to bring in the cargoes of roofing tiles. Wunderlichs established their own tilery at Rosehill, near Sydney, and by 1916 were manufacturing terracotta tiles in large quantities. They also established a plant at Cabarita to manufacture asbestos cement sheets, under the brand name of Durabestos.

Through a lack of sheet metal, the Redfern plant was forced to turn to other materials:

> "In the matter of ceilings, things were not so easy. It was the potency of the name that stood the Company in good stead in those trying times. Clients permitted contracts to be executed in almost any materials - plaster, wood, cardboard, etc. - as long as Wunderlichs gave their imprimatur to the work. In this way the Redfern factory was practically transformed into a plasterer's shop during the latter period of the war, and for some time after."

(*Forty Years of Wunderlich Industry*, 1927)

The period between the wars was a time of great expansion for Wunderlich Ltd. Factories for the manufacture of metal products, Durabestos and clay products were established in every state, and a new industry -- manufacturing architectural terracotta -- was founded, with the main factory at Rosehill.

The depression years shook Wunderlichs, but they survived. During World War II the entire Redfern plant was turned over to wartime manufacture. Production lines included aircraft parts, lockers, and metal coffins for the American armed forces.

It was during the immediate postwar years and through the early fifties that Wunderlichs reached their highest production peaks. A massive shortage of materials in the housing and construction industry meant the Durabestos and roofing tile factories could sell whatever they produced. In 1957 Wunderlichs established an aluminium window manufacturing plant at Villawood, and even diversified into plastics in the early sixties.

Yet some cracks began to appear in the fabric of their success. In a remarkable piece of misjudgement, Wunderlichs refused to go into the manufacture of cement roof tiles, fabricating instead metal roofing panels which imitated terracotta tiles. Today, cement tiles represent 80% of the roofing tile market.

A disastrous venture into the production of asbestos cement pipes and a significant over-capitalisation in factory real estate, buildings and plant, left the company in a fragile financial position.

In October 1969 Wunderlichs were taken over by CSR, a company that had substantially diversified into building materials. The tilery at Rosehill, the aluminium plant at Villawood and the plastics factory were retained and integrated into the CSR company structure, while the asbestos cement industry was sold off to another company.

The Redfern plant, however, devoted since 1890 to metal working and fabrication, was found to be hopelessly outdated, inefficient, labour intensive and uneconomic. It had been kept going out of sentiment, but CSR inevitably had to make the decision to close it down. Little by little the site was abandoned, machinery and people moved to other factories and some senior management people shifted to CSR's head office in the city. The site was finally sold for a supermarket development and the demolishers were ready to move in.

Just about this time the Museum of Applied Arts and Sciences was made aware of the factory. The director, Dr Lindsay Sharp, realised its importance in the record of Sydney's industrial development and approached CSR for a grant. They responded with a donation of $20,000 for the recording of the site and the preservation of certain items.

The Museum then appointed Senior Curator John Wade to head the project, assisted by the Curator of Transport and Engineering, Norm Harwood and his assistant, George Imashev. We were appointed as consultant industrial archaeologists directly responsible for the Project.

By the time we began, demolishers were already at work on the site razing the buildings. Thus, our work was in essence a rescue operation although on a massive scale.

We decided to treat the factory on a number of levels. First, there were items to be preserved for re-erection in the new Powerhouse Museum. These included an old stamping machine, the 1908 boardroom, and part of the magnificent Art Deco showroom. Then came those items to be preserved for archival purposes. As the pressed metal ceilings for which Wunderlichs were famous were so much a part of the Australian scene until World War II, it was decided to preserve and store at least two examples of every panel type found in the factory. Generally, we treated the factory as an archaeological site. Complete plans were drawn with the industrial features indicated, and an industrial flow chart is being prepared to show the workings of the plant through its history. Everything that could illuminate the life and times of the plant has been preserved for analysis and documentation -- including a detailed examination of the Marseille tiles, which

Wunderlichs imported in vast quantities, that were used to roof the factory buildings.

Finally, but by no means the least important, a complete social history of the factory and its people is being prepared, by contacting former employees and collecting as much written, oral and pictorial material as possible. One additional task, which proved of vital importance, was to attract as much public attention to the project as possible, with the aim of stimulating interest in the preservation and recording of valuable buildings and material. We found that, after each newspaper item, radio or television spot appeared, we received several phone calls from people offering us books, letters and other memorabilia of Wunderlichs. The final product of our work is to be a book summarising all that has been done and discovered in the course of the Project.

The impending destruction of the buildings naturally dictated the order of work. We began working carefully with old photographs and we are painstakingly reconstructing the different factory areas, their machinery and their usage. Although almost all the machinery had gone, there were some diagnostic features we could work with -- for example, an acid treatment bath which was used in an enamelling process for various ornamental metal works.

The whole area was carefully measured and drawn, and we are taking sketch plans with us when we visit former employees, asking them to point out on the plans what they remember of the processes that occurred in different areas. Our longest employed informant began work at Redfern in the late thirties and, as we have a fairly complete photographic record of the factory processes in the late twenties, we are able to build up a picture of the industrial development that took place at the Redfern site.

The factory once had eleven drop hammer stamping machines at the height of pressed metal panel production, which apparently peaked in 1914. There were only two left when we came to the factory and one was earmarked for preservation and re-erection in the new Museum. This machine was carefully photographed and will be measured and drawn with its original steam-powered workings reconstructed.

The sequence of pressed metal panel production began with designs carefully drawn by skilled draftsmen. In the modeller's studio, the designs were modelled in clay and plaster moulds taken. There were then cast in zinc at the foundry and taken to the press area where zinc matrices were prepared. The drop hammers then stamped out the design on sheet metal, guillotines trimmed the panels to shape and other machinery, like toggle presses, were employed for processes like blanking and forming. The panels were then stored in the warehouse until despatched.

Pressed metal panels were not, of course, the only thing manufactured at Redfern and, indeed, after the Second World War, they went completely out of fashion. The factory produced everything in its time from mudguards for the Australian Six motorcar, memorial tablets in metal doors and stainless steel sinks to beautifully crafted metal letters and ornamental metal work such as the metal griffins holding the globes atop the Grace Bros building on Broadway. "Indifferent work is never Wunderlichs" was an early slogan of the company, and indeed it was their superior craftsmanship that virtually put the Redfern branch out of business. In this era of mass production and assembly line manufacture, there is not much of a market for hand-crafted, or rather hand-finished products.

The administration building and showroom area were measured and carefully drawn up. In certain areas we discovered traces of the original external walls of the building behind the later additions and were able to correlate these findings with our knowledge of the site's development.

The next area on which we concentrated was the boardroom, designed when the administration building was erected in 1908. When the Museum first saw it the

furniture was all gone, and only the bare bones left. It was decided to preserve the fireplace, ceilings and wall panels, if possible completely. This proved an impossibility. The wall panels were completely removed but the ceiling was firmly fixed, with no access through the rafters to enable the panels to be knocked down. For this part of the project we employed five stalwart young men (Warren Wickman, Peter Kelley, Michael Lorimer, Martin Davies and Graham Wilson) and we all worked at prising off panels, which were then all stacked and labelled. It was necessary to invent new techniques as we went along for removing these panels. Finally, it was decided to take a range of samples of all parts of the ceiling pattern, with the rest of the ceiling to be reproduced in fibreglass.

We are trying to trace the furniture and other fittings from the boardroom. So far we have located the table and several other pieces. The boardroom housed a large library of technical and other publications, a list of which we discovered among the Wunderlich papers in the Mitchell Library, and we are endeavouring to recover as many as possible.

Our next major job was the showroom, which the Museum intends to reconstruct in the new Powerhouse Museum as a display hall for its own collection of Art Deco. Begun in 1928 and completed the following year, it was designed as both a social hall and showroom and was furnished with magnificent bronze and glass hanging lights, and a grand piano. The ceiling was of pressed metal and the structural columns were tiled in glazed terracotta, capped with foliate bronze capitals. Around the sides of the showroom were lower ceilings illustrating the history of design in pressed metal, and tiled pilasters were set against the walls. Gradually, the area lost its social function and was used just as a showroom. In the late fifties or very early sixties the whole area was renovated when extensions were added to the administration building. The columns were encased in caneite and a false ceiling of acoustic panels slung below the original ceiling, obscuring it completely. Even the pilasters had been covered. Only the floor was still visible. Thanks to the quick eyes of Peter Lesslie and Csaba Kollanyi of the Government Architects' branch of the Public Works Department, the original showroom was uncovered. Through the acoustic ceiling we could see the ornate pressed metal ceiling, the Art Deco windows, the bronze capitals and the tops of the columns. The exterior of the showroom had been obscured with a display of Wunderlich roofing tiles. When these were removed, the facade was photographed and the terracotta medallions removed, although vandals damaged two soon after.

It then became a matter of taking the showroom to pieces. The columns were removed by artisans from the Public Works Department, not before, unfortunately, three of the bronze capitals were stolen. We were left with the task of removing the windows and ceiling. First, the copper surrounds had to be removed from the windows; it was impossible to unscrew the windows from their frame so the wooden surrounds of each window had to be destroyed to get them out.

Again the ceiling could not be saved in its entirety. Two-thirds of all the panels had been damaged when the acoustic ceiling was hung, and it was decided to get down representative samples of each portion for future reproduction, after detailed drawings and plans had been made. As the panels could not easily be removed from their frame, we had to get into the loft above the ceiling and lower the panels on their frames by rope.

As a follow-up, we are also trying to locate the fittings from the showroom. We have traced the dome which was in one corner, and were given three ornate copper panels that framed an archway. We have also tracked down a bronze and stained glass War Memorial that stood in a small bay to one side.

As we stated earlier, one of our functions was to record and, wherever possible, preserve samples of the pressed metal panels that were everywhere scattered throughout the factory and the administration building. In the main

factory area, we had some difficulty in persuading the demolishers to take care in bringing them down. We were not always successful, and the demolishers ripped down with a crane one area of panels marked for preservation.

As we have been fortunate enough to locate a large number of old catalogues for the pressed metal panels, we will prepare a complete typology of designs which could then be used diagnostically to date certain buildings. At the very least, it could provide a *terminus post quem* if no firmer information was available.

Incidentally, in the early days Wunderlich had several competitors in the pressed metal ceiling field as we discovered from this delightful quote from an 1895 catalogue:

> "Everything of sterling merit is subject to imitation and the zinc ceiling is no exception to this universal rule. The success of our works in every colony of the Australasian group has naturally stimulated the parasitic, not to say piratic, habit in the incompetent mimic and the cheap copyist, who have entered the field with plagiarisms of our very designs and who seek to force an entry into the market with common travesties of our original and perfected work. Against these inferior imitators we intend in no wise to compete."

Part of our work at Redfern was to analyse the Marseille tiles which had been imported to Australia in such great numbers by Wunderlichs between 1892 and 1914. Seventy-five million tiles were brought in through this period, enough to roof 40,000 Australian homes. Large areas of the factory were still roofed with these tiles which thus provided a unique opportunity to study them in quantity. We were delighted to discover ten separate types including one that came not from Marseille but from Voghera in Italy, near the port city of Genoa. Each was identified by a characteristic mark:

Cock:	SAUMATI FRERES, Marseille, St. Henri
Horse:	LES FILS DE JULES BONNET, La Viste, Marseille
Bee:	GUICHARD CARVIN ET CIE, Marseille, St. André
Lion:	GUICHARD FRERES, Seon, St. Henri, Marseille
Star:	PIERRE SACOMAN, St. Henri, Marseille
Spade:	PIERRE AMEDEE, St. Henri, Marseille
Anchor:	ANTOINE SACOMAN, Usine La Plata, St. Henri, Marseille
Maltese Cross:	ARNAUD ETIENNE ET CIE, St. Henri, Marseille
Turtle:	TUILERIES DE LA MEDITERRANNEE, Siège Social, Marseille
Horned Head:) Entwined Anchor:)	GUSTAVO GAVOTTI, Lungavilla, Voghera.

Wunderlichs themselves used a waratah mark on their locally produced tiles.

We titled this paper "The Wunderlich Project, an Exercise in Industrial Archaeology". Industrial archaeology is a relatively new field in Australia and a relatively new concept in archaeology. The Wunderlich site is probably the largest industrial site to have been tackled as an archaeological project and, although we intended to work within the bounds of traditional archaeological theory, we found ourselves constantly formulating new approaches to problems.

There were, for example, few material remains at the site -- the machinery had gone, the records dispersed. The few pieces of machinery of plant remaining were either stripped or in isolation, with nothing of their industrial context evident.

We had to turn elsewhere for our information, and found it in the Wunderlich publications, in the memories of former employees, in old photographs and relevant printed material, acquired through the generosity of former Wunderlich employees and of CSR management.

A significant part of our work is the interviews we are conducting with former employees of the Redfern plant. Unlike many historical archaeology sites this one has only just died and isn't even buried. Consequently, there is a significant number of people alive whose knowledge of the workings of the plant and the company is vast. The method of handling the reminiscences of these people is of vital importance. We arrive armed with tape recorder, plans and photographs to guide the interviews, with the intention of co-ordinating the information received with all the other evidence gleaned from different sources.

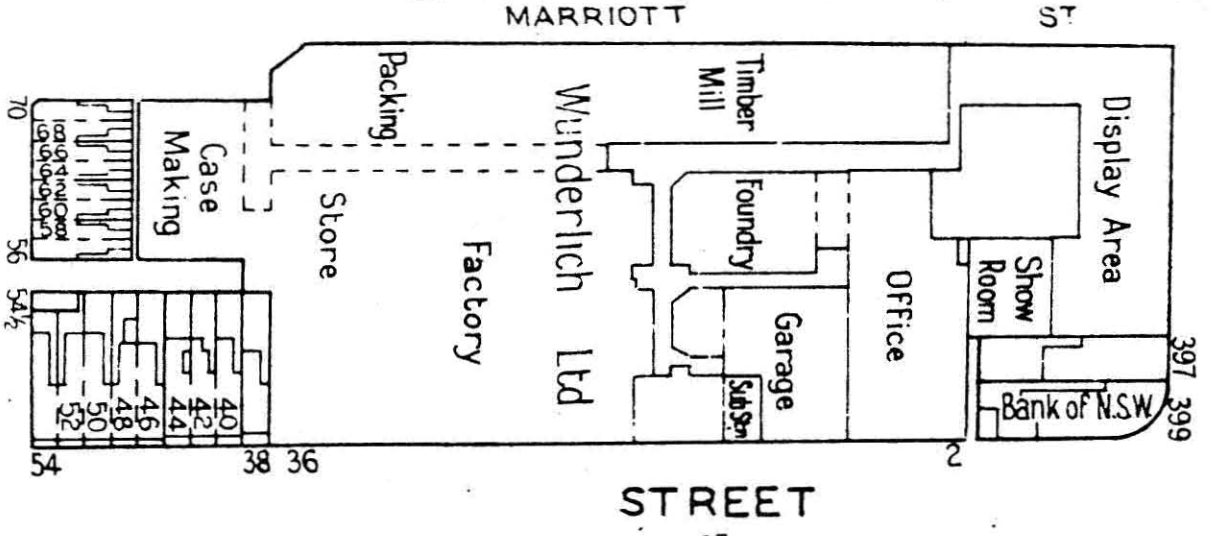
We have found it important to treat photographs as archaeological artefacts. We are taking as much analytical notice of these artefacts as a classical archaeologist would of an Attic red figure vase. Fortunately, we have acquired a vast number of pictures all of which will be inventoried, classified, analysed and cross-referenced to the plans and taped memories of ex-Wunderlich people.

Our research has taken us into the most curious places when you consider we are dealing with an industrial site. In an effort to flesh out the characters of the three original brothers, we have ferreted out some details of their extra-factory activities. For example, Ernest was an ardent Egyptologist and donated many of his acquisitions to the Australian Museum of which he was a trustee (1914-1926). With the help of Dr Ronald Lampert, we were able to find the original correspondence between the Museum and both Ernest Wunderlich and Sir Flinders Petrie concerning these artefacts. All three brothers were very cultured. Ernest was not only an amateur Egyptologist but also vitally interested in astronomy, building and equipping an observatory at Port Hacking, which he later deeded in trust to the NSW Government. Alfred was decorated by the French Government for services to French culture and Otto was a notable French scholar who translated the Chanson de Roland into English.

Although the factory at Redfern is now little more than a heap of rubble, we have still some months' work ahead of us, interviewing many more people and analysing their memories, the photographs and all other published material. We have been, and will be, aided in this by John Wade, our project leader, and many others at the Museum, by students from the historical archaeology course at Sydney University under the direction of Judy Birmingham, and by students of industrial arts at NSW University under the direction of Bill Lawson and Don Godden. Ultimately, we will produce an archaeological report and a book on the project and, of course, the material we have collected will be preserved and displayed in the new Powerhouse Museum.

We fervently hope this project will be only the beginning of applied industrial archaeology in this state. We hope other companies can be persuaded to fund such projects and that people will come to realise that, although not everything or every building can or should be kept, at the very least they should be recorded before knowledge of them is lost for ever.

Plan of the Wunderlich Factory after 1950. S.B./B.G.



VI. AN EXPERIMENT THAT FAILED? WATER-POWER IN 19TH CENTURY NEW ENGLAND

(We reprint the following article with the permission of the University of New England News in which it appeared in March 1980 (with three photos not produced here). Its author has corrected a few details and modified its structure to make it more suitable for this Journal but has not had the opportunity to provide references for it.)

In recent years there has been a growing concern about what we refer to as 'the energy crisis'. Our profligate use of energy has caused us to become more and more worried about developing alternative sources of energy. Imagine then, if you can, a world without the varied forms of energy on which we have come to rely so heavily. Imagine New England in the 1870s, just over a hundred years ago. There is no electricity at all. The internal combustion engine does not exist, the railway has not yet arrived in the area. The stationary steam engine, of course, is available and there is plentiful wood in the area to provide it with fuel. However, such steam engines are heavy and are manufactured far away, involving not only high purchasing costs but also high transportation costs over poor roads. On those roads, motive power is restricted to bullock- or horse-power or the power of one's own legs. In terms of the time and trouble taken for journeys, settlements are further apart than we of the 1980s would think them. In such a world, there is a strong incentive to provide duplicate facilities locally that we would expect to be located at wider intervals. The sawing of timber, for instance, or the grinding of corn are tasks that are well-worth carrying out in the immediate vicinity, simply because the transportation costs of such commodities are so high. Yet here is the snag: such tasks consume a very considerable quantity of energy and where is it to be found in a world of the sort that I have just described?

A very important source of such energy, that has been used for over two thousand years in different parts of the world, is water-power. I refer not to the modern use of water-power to generate electricity which can then be used as a power-source, but to the direct use of the mechanical force got from the weight or motion of water. The European settlers of nineteenth-century Australia came from countries where the importance of water-power had long been appreciated. In Britain water-wheels provided an important source of power for flour-milling, the textile industry, iron-working and various other activities. On the European continent, in countries with substantial timber resources, water-wheels also drove sawmills, a utilization of water-power that was not so common in Britain. Colonial technology rapidly made use of water-power. With the services of an experienced millwright, the predecessor of the modern engineer, it was possible to build a water-wheel with local materials and using relatively simple constructional techniques. In the eastern states of America, for instance, water-power was so intensively used over the course of some two-and-a-half centuries that it has been argued that it was the water-wheel rather than the steam engine that triggered off America's Industrial Revolution. In South Africa water-wheels seem also to have been an important source of power. But what about Australia? The idea that the so-called driest continent could have exploited water-power in the earlier phases of its settlement is enough to raise eyebrows amongst some overseas students of early water-power. The reason for this is that there has been so little written about the subject. One wonders how many Australian tourists who visit the Isle of Man in Britain, realise that the water-wheel at Laxey, often described as 'the world's greatest waterwheel', at one time had an Australian rival? With a diameter of just over 22 metres it would have been almost equalled by the Garfield Wheel that formerly existed on the Castlemaine Goldfield in Victoria, that is recorded as having been just under 22 metres in diameter. In fact water-wheels were extensively used in some parts of Australia for a variety of purposes including mining and corn-milling. Not surprisingly, they were most common in Victoria and Tasmania, where there was an adequate rainfall.

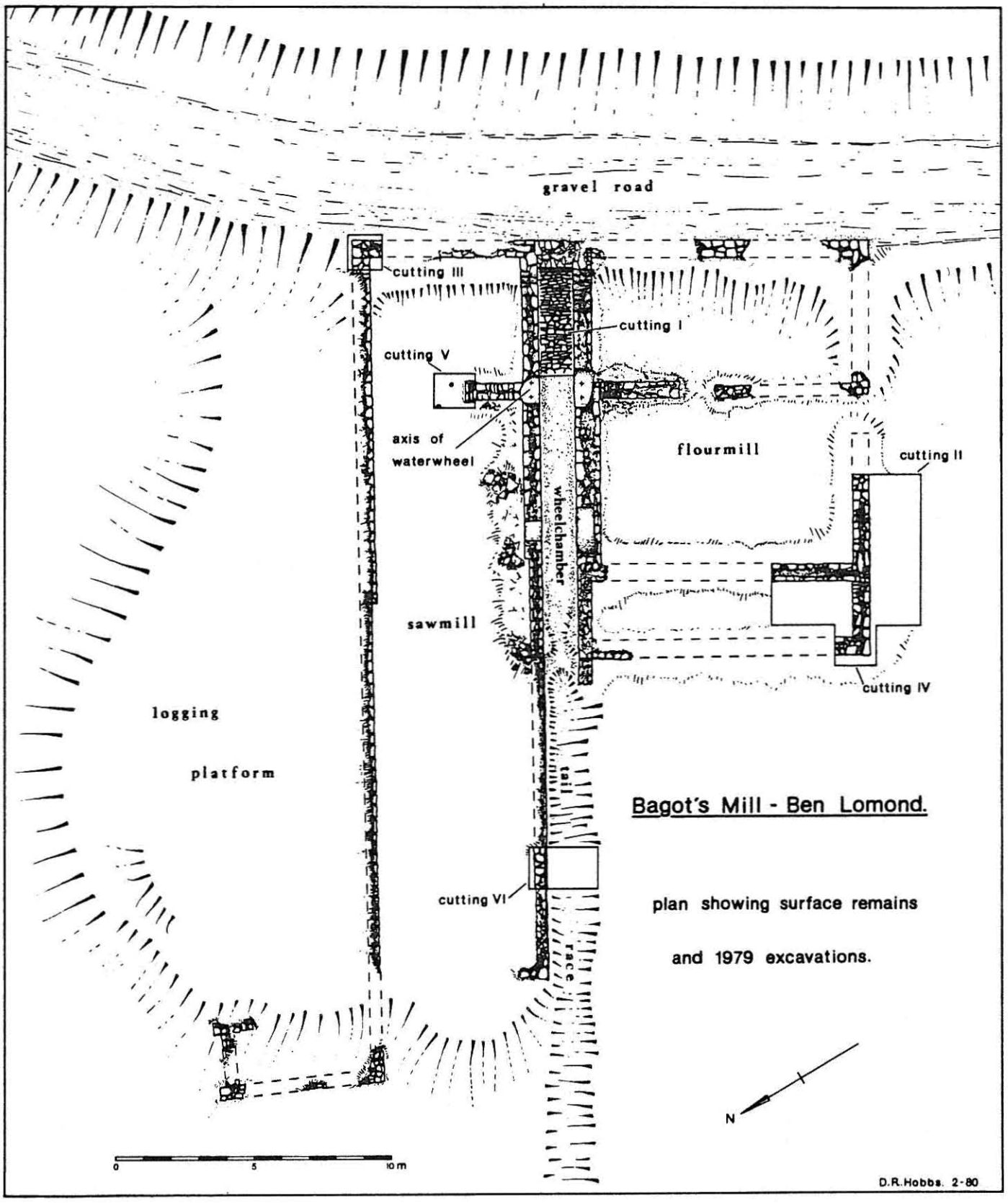
One would think that in New England surface water could hardly have been plentiful enough to make water-power a really attractive proposition, but in fact

there is evidence that it was exploited from the period of earliest settlement. William Gardner, the New England pioneer and historian who died at Oban Station in 1860, drew a picture of a water-mill at Mount Mitchell, a station at which he was employed as a tutor for a time in the 1850s. At one time or another during the nineteenth century, water-wheels seem to have existed also at Dundee, the Bluff Rock (near Tenterfield) and the Beardy Waters. Yet from the point of view of the historical archaeologist, almost nothing survives at the sites of these installations. This makes the remains of the water-wheel at Ben Lomond Station the more remarkable. Although there is now little to see at the site of this mill, there is enough for an archaeologist to be able to work out its plan and its mode of operation. Not only that but for the regional historian the mill also has an especial significance, for it was the brain-child of an extraordinary man: Christopher Thomas Gabot, who was born in Ireland in 1826 and died at Broadwater on the Richmond River in 1894.

Bagot was what might be called 'an improving land-holder'. His mind seems to have been overflowing with ideas for the betterment of the Llangothlin Station of which he had a half share from 1865 and full possession from 1873 and which subsequently became known as Ben Lomond Station. He cleared and fenced land, designed and built automatic gates, imported cattle for breeding purposes, set up a dairy on American principles and imported American agricultural machinery. He seems to have spent some time in American as a young man and frequently referred to the American way of doing things in the many letters that he wrote to local newspapers. It was possible from that country that he got the idea for his greatest and perhaps most foolhardy project. This was the erection of a water-mill of which a Sydney newspaper carried a description in 1877 when it was being built. The water-wheel was over 9 metres in diameter and carried 93 buckets. It was probably a pitch-back wheel and was driven by water from a flume about 49 metres long that drew water from a mill-race that ran for nearly 3 kilometres. The source of the water was the Llangothlin Lagoon of which Bagot dammed the outlet in order to raise the water-level. The wheel was designed to drive both a sawmill and a flour-mill. It appears that the sawmill, at least, functioned well enough but the overall experiment seems to have failed. In 1877 a man carrying out repairs on the wheel was killed when the wheel caught and crushed him. In 1879 Bagot was declared insolvent and the Bank of New South Wales took over his property. Subsequently, he and his family successfully conducted a sawmill near Ballina but that was steam-powered.

The questions remain: how was this mill designed, in detail; how did it function; should it have succeeded or was it just a bad idea in the first place? Commencing in 1979 I have been leading an archaeological investigation into the mill aided by Douglas Hobbs. Jillian Oppenheimer, one of New England's regional historians, has been searching the archives in Sydney and elsewhere for further written records. For some months during 1980 she has even been pursuing this and other investigations in the Public Record Office in London. We still know surprisingly little. Excavation at the site has revealed some of the details of plan and close inspection of the little stonework that remains above ground has given some clues to the engineering layout of this remarkable water-mill. Historical research has revealed the outline of Bagot's life. Nevertheless, we know nothing of the history of the mill after Bagot became insolvent in 1879, except that by about 1918 it is said to have been already the derelict remnant that we now see. I would appeal to readers of this article who know anything about the history of the mill to telephone me or send me a letter. It is, for instance, possible that in some forgotten heap of photographic prints or negatives lies a picture of the mill in its heyday. Perhaps there is a painting or drawing of it hung unrecognized on someone's wall. The mill must surely have been recorded by some interested photographer or artist, for, as the writer in the Sydney newspaper said in 1877, the water-wheel was 'the finest and largest of its class in the Northern districts'. Perhaps Bagot himself had it photographed, or the engineer who built it, G.H. Goddard of Uralla; but if so nothing seems to have survived. Indeed, both Bagot and Goddard are curiously elusive personages for the researcher. There appear to be no descendants of Bagot alive today and

we do not even have a picture of him let alone of his mill! Even his burial place is difficult to identify, as he lies in an unmarked grave close to the site of his Broadwater house. As for Goddard, we know virtually nothing about him, the man who designed and built New England's greatest water-wheel. The only other name that we know of in connection with the construction of the mill is that of Mr. McInness of Reedy Creek who was the contractor for the masonry. We have as yet not even established where Reedy Creek is!



Was Bagot's water-mill an experiment that failed or was it that he merely miscalculated financially? One cannot help but feel that so-bold a venture deserved to succeed. Here was an ambitious attempt to utilize water-power in the New England of a century ago. That attempt deserves to be better understood and the man behind it, Christopher Bagot, deserves to be better known. There is still, however, a good deal of mystery surrounding the whole story. Perhaps someone will read this who can throw further light on this remarkable nineteenth-century energy experiment.

NOTE : I would be pleased to hear of documentation, illustrations or even local stories about Bagot's mill, but would emphasize that all material would be copied at the University of New England and originals returned to their owners.

G.C.

THE UNIVERSITY OF NEW ENGLAND ARCHAEOLOGICAL AIR PHOTOGRAPHY PROJECT

Commencing in 1975, I have been engaged in recent years on a programme of air photography of archaeological sites. The first two years of this work was described in my paper 'Aborigine and settler: archaeological air photography' that was published in Antiquity, 52, in 1978. As will be seen from that paper, my interest is in both prehistoric and historical sites but the frequency and complexity of the latter tend to give them greater emphasis.

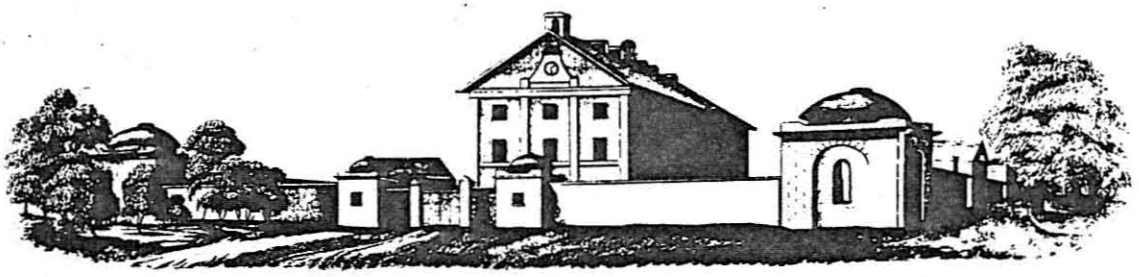
The work published in the Antiquity paper was claimed as the first formal attempt to apply the principles of low-level oblique air photography to Australian archaeological sites and certainly there is very little published evidence to the contrary. That work, however, was done with 35 mm cameras and by 1979 I had reached the conclusion that such equipment had strictly limited applications in air photography. The quality of print obtainable from such small negatives was not always as high as was needed. I therefore asked Alan Jones, photogrammetrist of the Departments of Geography and Resource Engineering in the University of New England, to join the programme and together we successfully sought funds to obtain a 70 mm Hasselblad 500 EL/M camera. The possession of this new camera, which we have only begun to get into the air since April of this year, has very much improved the quality of the resulting photography. For the moment we are continuing to concentrate on oblique photography, partly because of its inherently superior pictorial and explanatory quality but mainly because the capital investment necessary for vertical air photography is beyond our means. The University of Cambridge in Britain, for instance, runs a now-famour air photographic programme directed by DR. J.K. St. Joseph, but it also owns its own plane and automatic air-camera as well as employing its own pilot. In comparison our resources are very small but we do now have the capacity for producing work of similar quality as long as we keep to oblique work. In practice we can take photographs that are of very near vertical, simply by rolling the aircraft, but we cannot produce mechanically the controlled overlap of prints that is necessary for stereoscopic viewing. Nevertheless, we can produce high-quality black and white low-level oblique studies, and we can also do colour and colour infra-red work.

As will be seen from my 1978 work, the air photography project that I am discussing has so far been confined to Northern New South Wales. Alan Jones and myself are now interested in extending our coverage well beyond those limits, however. We have some research funds remaining for 1980 and the probability of further funds in 1981. We would like to be able to photograph any sites of interest in any part of New South Wales, Southern Queensland, or Victoria. To do this we need the cooperation of other archaeologists and particularly the cooperation of others interested in historical archaeology. Our major costs are in air charter and surface travel, for we try to fly from the airfield nearest to a site and with a pilot who knows the particular locality around that

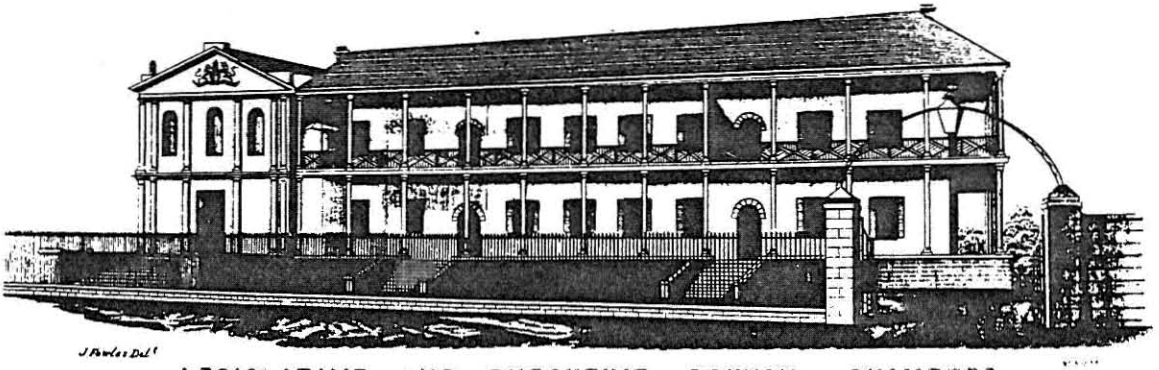
airfield. In practice it has been found advantageous to have an exact map location as a target for photography (at this stage we are concentrating on known sites rather than looking for unknown ones: a procedure of which the text-books rarely mention the cost). It is, in fact, useful to have visited the site on the ground beforehand in order to study its location, its air photographic potential and any flying problems. All this very much slows down our progress in gathering suitable photography. When you consider the fact that we also need optimum weather-conditions and, for photographing shadow-sides, need to fly in a very limited period of time during the early morning or late afternoon, it will be appreciated that we have organizational problems. In addition, sites in different environmental zones 'show' better depending on vegetational as well as lighting conditions and we might photograph a site several times before we get the quality of results that we are seeking. It is clear, therefore, that a great deal more can be achieved if we have the cooperation of other archaeologists. The purpose of this brief note is to appeal to you to contact us if you know of historical sites that might repay our attentions: especially if these are sites on which you, or someone of your acquaintance, has an on-going research programme. We need the photographs of as many and as varied sites as possible for our research programme but we would undertake to provide anyone cooperating in the way outlined with a selection of prints that could be useful in their own research and could, with suitable acknowledgement, be reproduced in their own publications;

In short, our project needs some backup from the rest of you. There is only a very limited coverage that two of us can manage alone. The sort of historical sites that we have found from experience lend themselves to air photography include the following: mining, deserted settlements, abandoned roads, abandoned railway lines, isolated buildings, sheepwashes, wool-scours, water-mill earthworks and cemeteries. There are, however, many other types of site that would repay air photography. If you would like to help us to find out, please write to me c/o Department of Prehistory and Archaeology, University of New England, Armidale, N.S.W. 2351.

G.C.



HYDE PARK BARRACKS.



LEGISLATIVE AND EXECUTIVE COUNCIL CHAMBERS

ILLUS. 81
HYDE PARK BARRACKS-LEGISLATIVE AND EXECUTIVE COUNCIL CHAMBERS. From *Sydney in 1848* by Joseph Fowles. Printed by D. Wall, Sydney. 1848-50.

VII. 12 RAGLAN STREET, DARLINGTON.

The material, the subject of the following catalogue, was unearthed by Bob Holmes under a terraced house shortly before its demolition by the University of Sydney. The catalogue was compiled early in 1978 but publication abandoned as better artifacts seemed to be appearing from sites of greater interest. The Raglan Street finds, however, are a homogeneous collection, possibly the result of a single dumping, are limited almost entirely to black bottles and case gins and have a definite ceiling date. As such, they are of considerable interest.

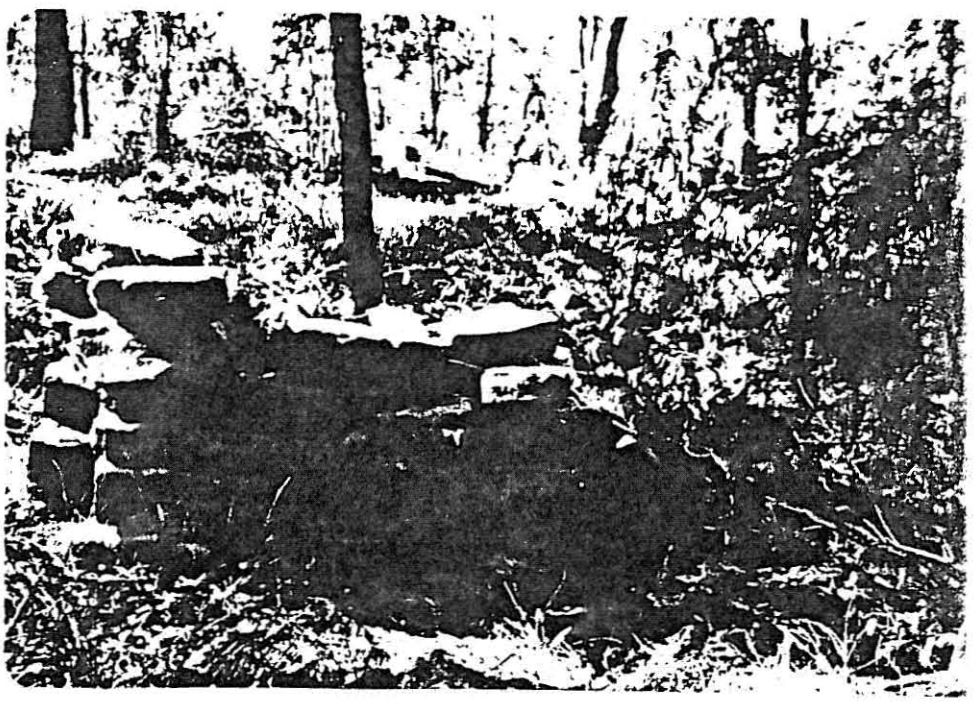
The first mention of Raglan Street in Sands' Directory was in 1867. Eight householders are mentioned, a number neatly commensurate with a terrace of eight houses on the north side of the street between Darlington Road and (former) Alma Street, considered by Mr Holmes the oldest there, of which No.12 is one. The glass fragments were found with but a shallow cover of earth and household dirt beneath the floor boards which were seemingly the original. This gives a terminus ante quem of 1867, a date borne out by the material. One of the two case gin lips is of the bulbous kind common until 1870 but not later.

The following abbreviations have been used:

H. : Height of basal kick.
L. : Height of lip.
M. : Diameter of mouth.
W. : Diameter of base.

All measurements are in centimetres.

D.B.



CATALOGUE OF FINDS.

Glass

Olive

Black Bottles:

These bottles, whilst in the main a homogeneous group, can be subdivided according to their bases, lips and necks as follows :-

Bases:

Type 1 : 9.0-9.5 cm. base diam.; domed basal kick with central nipple. G1-10; G13-19.

Type 2 : 8.6-9.3 cm. base diam.; conical basal kick. G11-12; G20-37.

Type 3 : 7.8-8.0 cm. base diam.; conical basal kick. G38-39.

Lips & Necks:

Type 1 : Convex in profile; down-tooled neck & string rim. G41-45 & G66-67.

Type 2 : Convex in profile; bulbous lip over down-tooled string rim. G46-G54.

Type 3 : Convex in profile; vertical lip over down-tooled string rim. G55-G57, G65, G68.

Type 4 : Tapered to down-tooled string rim. G58-60.

Type 5 : Pinched below trailed string rim. G61.

Type 6 : Convex in profile; vertical lip; no string rim. G63-G64, G69-G70.

Bases

G.1	W.9.0 H.2.0	Domed basal kick & moulded 'P'.
G.2		As above.
G.3	W.9.0 H.2.4	Domed basal kick with moulded 'P'.
G.4	W.9.2 H.2.2	Domed basal kick with moulded 'P'.

G.5 W.9.0 Domed basal kick with moulded 'P'.
H.2.1

G.6 Fig. 1 W.9.0 Domed basal kick with moulded 'P'.
H.2.3

G.7 W.9.0 Domed basal kick with moulded 'P'.
H.2.2

G.8 W.9.2 Domed basal kick with moulded 'P'.
H.2.3

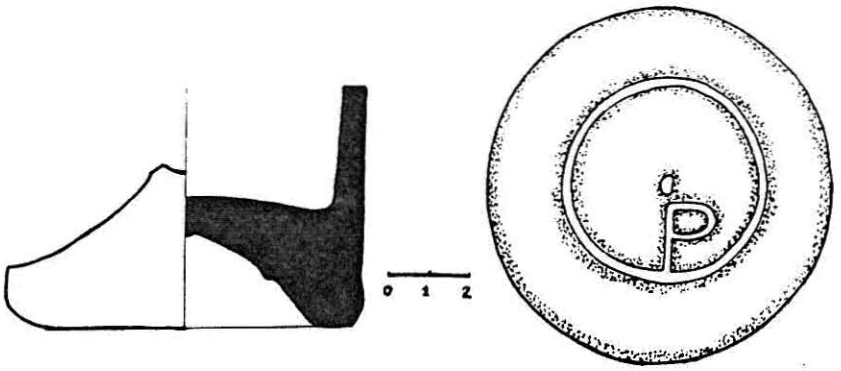


FIG. 1 G6

G.9 W.9.0 Base fragment. Domed basal kick with moulded 'P'.
H.2.3

G.10 Fig. 2 W.9.5 Shallow domed basal kick with moulded 'D'.
H.1.5

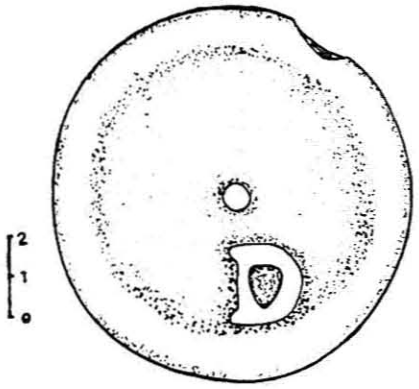


FIG. 2 G10

G.11 W.9.0 Conical basal kick. Wall transfer-marked
H.2.8 (Sto)u(t) - se labelled bottles man(ufactured)
only by J.E. Lampard & Co. Lond(on).

G.12 Fragment. Conical basal kick. Wall transfer-
marked S(tou)t - se labelled bottles manufact(ured)
only by J.E. Lamp(pa)rd & Co. Lon(don).

G.13		W.9.1 H.2.0	Domed basal kick with irregular mould marks.
G.14		W.9.0 H.2.3	Domed basal kick with irregular mould marks.
G.15		W.9.0 H.1.6	Shallow domed basal kick.
G.16		W.9.0 H.2.0	Slightly ovoid; irregular domed basal kick.
G.17	Fig. 3	W.9.0 H.2.0	Slightly ovoid; irregular domed basal kick.

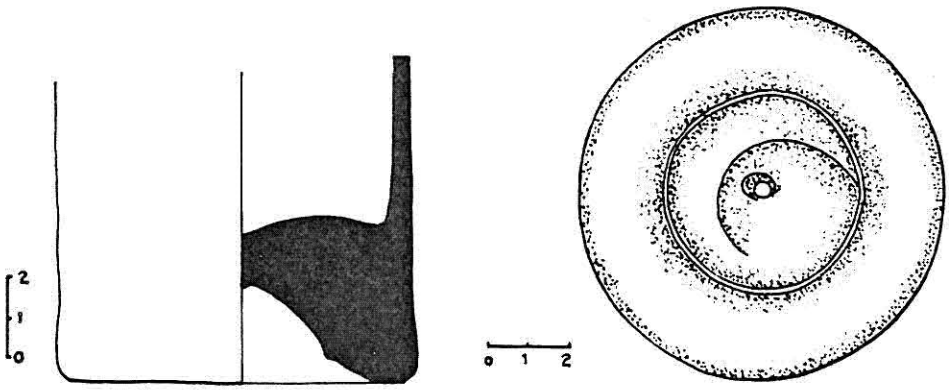


FIG. 3 G17

G.18	W.9.0 H.2.4	Irregular domed basal kick with nipple in a small moulded star.
G.19	W.9.0 H.1.9	Slightly ovoid; irregular domed basal kick with irregular mould marks.
G.20	W.8.6 H.2.5	Conical basal kick.
G.21	W.9.0 H.2.5	Conical basal kick.
G.22		As above.
G.23	W.8.9 H.2.0	Diam. 8.9 cm; conical basal kick without central indentation.
G.24	W.8.9 H.3.1	Fragment. Conical basal kick.
G.25	W.8.9 H.2.9	Fragment. Conical basal kick.
G.26	W.8.9 H.3.1	Turn moulded. Conical basal kick without central indentation.
G.27	W.8.9 H.3.1	Conical basal kick.
G.28	W.9.2 H.3.3	Conical basal kick without central indentation.
G.29	W.9.3 H.3.7	Conical basal kick slightly off-centre.
G.30	H.3.2	Fragment. Conical basal kick with mould marks. Mould mark on wall.

G.31		W.8.9 H.3.2	Fragment. Conical basal kick.
G.32			Conical basal kick.
G.33		W.8.9 H.3.3	Conical basal kick with mould marks.
G.34	Fig. 4	W.9.3 H.3.2	Irregular conical basal kick.

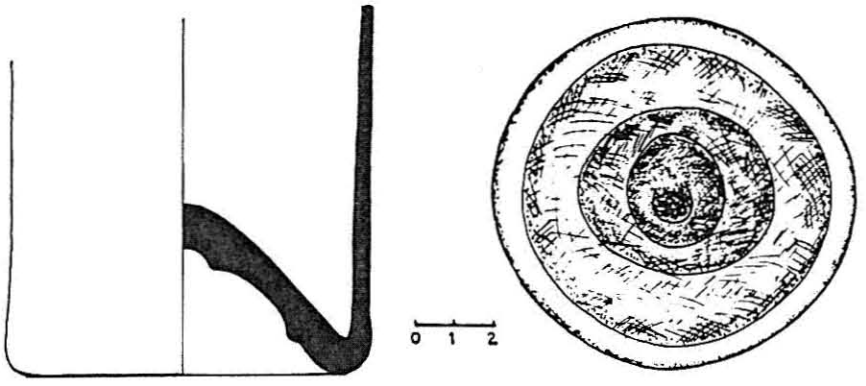


FIG. 4 G34

G.35	Fig. 5	W.9.0 H.3.0	Conical basal kick without central indentation.
G.36		W.8.8 H.2.8	Conical basal kick.
G.37		H.2.5	Fragment. Conical basal kick with mould marks.
G.38		W.7.8 H.3.0	Conical basal kick with mould marks.
G.39		W.8.0 H.2.5	Conical basal kick.
G.40			18 assorted fragments.

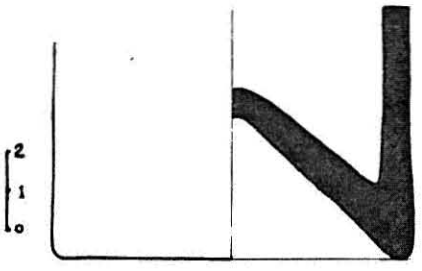


FIG. 5 G35

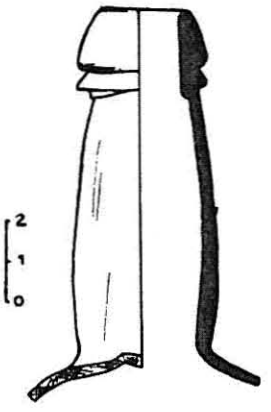


FIG. 6 G41

Necks and lips

G.41	Fig. 6	M.2.2 L.2.0	Neck. Convex in profile. Lip thickened and down-tooled string rim.
G.42			As above.
G.43			Mouth and string rim as above.
G.44		M.2.1 L.2.3	Neck. Slightly convex in profile. Lip thickened and slightly down-tooled over down-tooled string rim.
G.45		M.2.1 L.2.0	Neck. Slightly convex in profile. Lip thickened and down-tooled over down-tooled string rim.
G.46	Fig. 7	M.2.3 L.2.3	Neck. Convex in profile. Lip roughly tickened and bulbous. Down-tooled string rim.

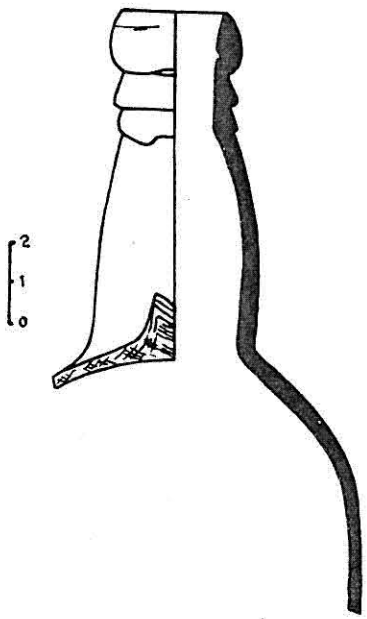


FIG. 7 G46

G.47	M.2.2 L.2.3	Neck. Pinched below string-rim. Lip roughly thickened & bulbous; Down-tooled string rim;
G.48	M.2.1 L.2.6	Neck. Pinched below string rim. Lip thickened & bulbous. Down-tooled string rim.
G.49	M.2.0 L.2.4	Neck. Pinched below string-rim. Lip roughly thickened & bulbous. Down-tooled string rim.
G.50	M.2.0 L.2.3	Neck. Convex in profile. Lip thickened & bulbous. Down-tooled string rim.
G.51	M.2.2 L.2.5	Neck. Pinched below string-rim. Lip roughly thickened & bulbous. Down-tooled string rim.
G.52	M.2.0 L.2.3	Neck. Pinched below string-rim. Lip thickened & bulbous with horizontal striations. Down-tooled string rim.
G.53		Fragment. Otherwise as above.
G.54		As above.

G.55 Fig. 8 M.2.2 Neck. Convex in profile.
L.2.3. Vertical lip thickened with horizontal striations. Down-tooled string rim.

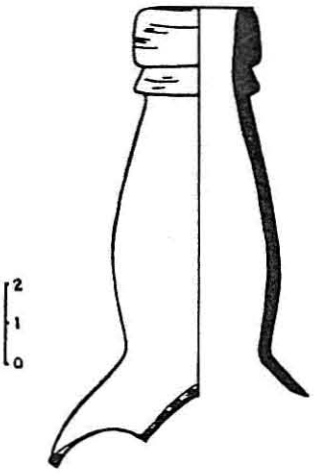


FIG. 8 G55

G.56 M.2.2 Neck. Pinched below
L.2.1 string rim; roughly applied lip vertical in profile with horizontal striations. Down-tooled string rim.

G.57 L.2.5 Fragment. Mouth as above. Down-tooled string rim.

G.58 Fig. 9 M.2.2 Neck. Vertical
L.2.2 striations. Tapered to string rim. Down-tooled string rim. Iron wire for cork in position between string rim & lip.

G.59 Fig. 10 M.2.2 Neck. Some vertical striations. Tapered to
L.2.7 string rim. Lip with some horizontal striations. Down-tooled string rim.

G.60 M.2.2 Neck. Vertical striations. Tapered to string
L.2.0 rim. Roughly applied lip with some horizontal striations. Roughly applied, down-tooled string rim.

G.61 Fig. 11 M.2.2 Neck pinched below string rim. Lip with hor-
L.2.1 izontal striations. Roughly trailed string rim extending beyond lip.

G.62 Neck fragment. Convex in profile.

G.63 Fig. 12 M.2.5 Neck. Convex in profile. Vertical sided lip
L.1.2 horizontal striations. No string rim.

G.64 Neck. Tapering to lip. Vertical sided lip with horizontal striations.

G.65 Fig. 13 M.2.0 Neck. Convex in profile. Some vertical striations
L.2.2 and long, vertical bubble. Lip thickened and vertical sided with horizontal striations. Down-tooled string rim.

G.66 M.2.2 Neck. Vertical striations & bubbles tapered to
L.2.0 string rim. Lip slightly down-tooled over down-tooled string rim.

G.67 M.2.2 Neck. Convex in profile. Lip slightly down-
L.2.0 tooled over down-tooled string rim; iron wire in position below string rim; strong shoulder.

G.68 M.2.2 Neck. Slightly convex in profile tapered to
L.2.1 down-tooled string rim. Vertical striations. Lip vertical in profile with some horizontal striations. Iron wire in position between string rim & lip; strong shoulder..

FIG. 9 G58

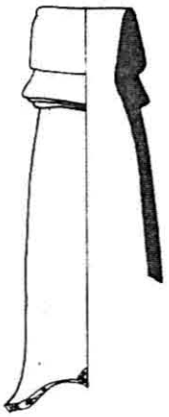


FIG. 10 G59

FIG. 11 G61

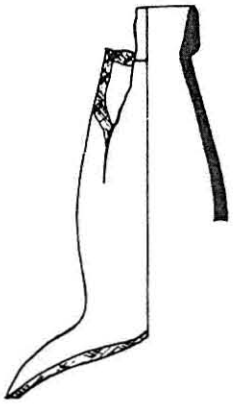


FIG.12 G63

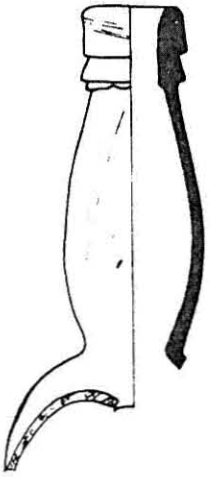


FIG. 13 G65

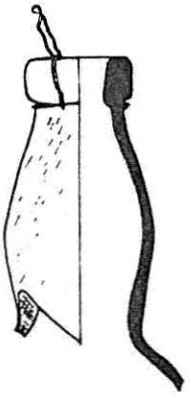


FIG. 14 G69

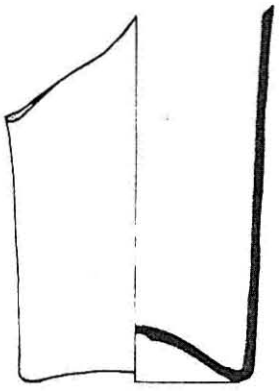


FIG. 15 G85

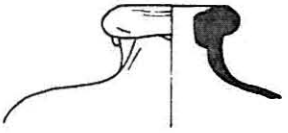


FIG. 16 G89

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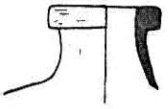
FIG. 17 G90



G.69	Fig. 14	M.1.9 L.1.2	Neck. Convex in profile with vertical striations & bubbles. Lip heavily thickened in part and vertical in section; copper wire in position below lip. No string rim.
G.70		M.2.0	Fragment. Neck tapering to applied lip with horizontal striations. Lip vertical in profile.

Assorted Fragments

G.71	24 lip and neck fragments.
G.72	60 neck fragments.
G.73	76 neck and shoulder fragments.
G.74	271 shoulder fragments.
G.75	94 shoulder fragments with single mould line.
G.76	9 shoulder fragments with horizontal & vertical mould lines.
G.77	19 base fragments.
G.78	100 body fragments (assorted).
G.79	500 body fragments (assorted) with packet miscellaneous tiny fragments.
G.80	7 shoulder fragments with "sandblasted" line.

Labelled fragments

G.81	15 fragments from 3-4 bottles Barclay's Stout with parts silk screen label.
G.82	14 fragments amber bottle with part silk screen label " - ewans India".
G.83	Fragment with illegible pink & yellow silk screen label.
G.84	Fragment with illegible pink & white silk screen label.

Case Bottles

Bases

G.85	Fig. 15	W.6.8 H.1.5	Base & part body.
G.86		W.5.2 H.0.6	Base and part body. Brown metal mottled slightly from contact with mould.
G.87		W.7.1	Base & part body. Shallow indentations in corners of base. Heavy metal.
G.88			Base Fragment.

Necks and Lips

G.89 Fig. 16 M.1.8 Neck rising to roughly applied spreading lip convex in profile.

G.90 Fig. 17 Neck rising to roughly applied spreading lip vertical in profile. Brown metal.

Body fragments

G.91 Shoulder and part body.

G.92 Shoulder and part body. Brown metal.

G.93 Shoulder and part body. Brown metal.

G.94 8 green shoulder fragments.

G.95 2 brown shoulder fragments.

G.96 14 green side corner fragments.

G.97 2 brown side corner fragments.

G.98 68 green body fragments.

G.99 23 brown body fragments.

Brown

See Case gins G.86, G.90, G.92, G.93, G.95, G.97, G.99.

Blue

G.100 Fig. 18 Base fragment. Round, vertical-sided blue castor oil bottle. Shallow basal kick with central nipple and moulded '51'.

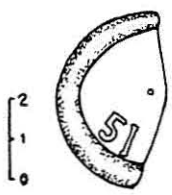


FIG. 18 G100

Pottery

P.1 (Incomplete) Neck & rim of buff glazed stoneware bottle; neck tapered to 'trailed' string rim below vertical lip.

Miscellaneous

X.1 4 small corks, one impregnated with red material, one stamped 'Lampar(dLo)ndon'.

VIII. ... IN ONE'S OWN BACK YARD

In the October number of the A.S.H.A. Newsletter John Wade referred to the all-too-common failing of not appreciating what is in one's own back yard. For those of us who came to this country for our country's good, or as immigrants, or for whatever reason, there is perhaps an above-average awareness of 'back yards', since everything is new to us. Remembering the nicer aspects of our back yards in the old country we seek similarities with as much avidity as we seek differences - but at least we do some seeking. The similarity of big cities the world over is depressing, but the thrill - even after twenty-five years - of having citrus trees fruiting in my own back yard, for example, is inexpressible.

When I first proposed to come to Australia, an Australian acquaintance who knew of my interest in sailing ship history warned me quite seriously that there was nothing here in that line whatsoever. It was, he insisted, an historical desert. The effect this had on me was to make me all the more keen to prove him wrong, not that I have ever sought the pleasure of telling him so. However, he was wrong, and dismally wrong in his assertion.

Admittedly, we have all too few historic ships, but a brief tour of Sydney alone will quickly show what a wealth of shipping relics can be found, literally lying around in our own back yard. Take ships' guns, for example. I have read somewhere or other that it was an old custom in times of peace to store big guns by burying them in the ground. Whether this relates to one period only, or whether indeed it is true or not, I honestly do not know, but a visitor to Garden Island can see the so-called 'Sirius Battery' comprising two old guns which were unearthed nearby in 1890. The plaque set up beside the battery in 1926 identifies them as a four-pounder and a six-pounder, and states that 'these guns were most probably from HMS Sirius'.

Another instance of buried treasure in the shape of an old gun came to light a year or two ago when a householder whose land ran down to the water's edge in Port Hacking decided to dig out the old pipe that had long been an eyesore to his prospect. To his delight and surprise it turned out to be a ship's gun, and the story of his find was acclaimed in the local newspaper as being that of a bronze cannon from a Portuguese visitor to these shores in the 17th century. Fiddlesticks! - though the man cannot be convinced that it is, in fact, a mid-19th century merchant ship's iron gun similar to one of those in the 'Sirius Battery' at Garden Island.

There really is far less escuse for the Navy to have identified its guns as being from the Sirius. They are not even of the calibres recorded on the plaque. If only they had read the Historical Records of New South Wales (Volume 4, page 152) they would have realised that the battery was actually fitted out with guns from the second HMS Supply and, as such, would have been three-pounders (HRNSW Vol 2, page 36).

Could the uninformed 'identification' of these guns have been avoided? Very definitely yes - if only the finders had used their eyes on what they had found, let alone if they had taken the trouble to look in any one of the many authoritative books long available on the subject of guns. In fact, in the case of one of the Garden Island pieces and of the Port Hacking 'pipe', a walk through Wentworth Avenue, Vaucluse (a rather superior back yard), would have revealed the presence of two almost identical guns flanking the war memorial there, just below the church. All have a small raised crown cast upon the barrel, but not the official royal cypher, and the weight of the ball as a raised figure 3 or 4. Incidentally, these guns are shaped like carronades, those short guns which were so murderous at short range, and which came into service about the same time as the First Fleet, but are all too long in proportion to their girth. They were designed to look more dangerous than they were, to deter pirates.

Yet another recently recovered piece of buried (or half-buried in this case) treasure in the shape of an old gun has been correctly identified. It was

one of the many guns used as bollards around the old Fitzroy Dock at Cockatoo Island. This gun has now been carefully restored and excellently remounted near the main entrance; its mates still serve as bollards. They are in two distinct patterns - probably the work of two distinct gun-founders - and date from the early days of the colony. They may well represent the bulk of what remain of some of our early defences on Middle Head and other Harbour sites. Perhaps the archives hold evidence of where these guns actually came from; I have not yet had the time to institute a search.

There may prove to be many other early guns buried in the ground around Sydney, or lying on the bed of the harbour. How can we learn to identify any that may yet come to light? I would reiterate - nothing more or less than a tour of our own 'back yard' to show us many examples of a good variety of guns of many periods of our history. Five years ago I would have found it hard to wax enthusiastic over the prospects of success of such an exercise. However, it so happened that at about that time I was involved in the design of a new carriage for the Sirius gun in Macquarie Place, the old carriage having decayed over the years to a mere skin of paint enclosing a mass of decayed and dusty wood. Since then I have found old guns almost everywhere.

The Sirius gun in Macquarie Place is almost certainly a gun from HMS Sirius, being one of four sent by Governor Macquarie to serve as signal guns at South Head. It survived there, probably half-buried in the ground, until the new lighthouse was in use. It was set up by the engineer at the lighthouse on a brick or concrete block until someone had the bright idea of removing it to join the Sirius anchor recovered from the ship's wreck site at Norfolk Island and set up on its familiar plinth in 1907. So here we have a gun of reasonably sure provenance: it certainly is a six-pounder long gun of the period such as those carried by the Sirius, its 'vital statistics' and its general outline are exactly right and, in any case, it can be 'read' with ease to reveal something of its background.

Almost any old gun can be read with ease. The Sirius gun in Macquarie Place is no exception, for it has several markings. There is the royal cypher of King George the Third still clearly to be seen just aft of the trunnions - that tells us the general period. Some chiselled figures, now no longer very distinct, tell us the weight in hundredweights, quarters and pounds (not the date as some would have us believe), and there is the usual government arrow. There is also the vague outline of a date cut into the barrle, which would have told us the date of the gun's 'proving' for acceptance into government service. Opposite St Mary's Cathedral in Hyde Park is another old gun which is an even better piece on which to practice the art of reading a gun for, in addition to the markings already mentioned, this iron twenty-four pounder has the name of the foundry, a serial number and the date of manufacture incised on the ends of the trunnions.

There are more than twenty iron or brass guns open to view in public places right in our own back yard - and nearly all of them can be 'read'. They cover many periods and so can demonstrate the slight but significant changes in style over the first eighty years of our history. They enable us to recognise and classify any gun or part of a gun of this period that we may be fortunate enough to unearth in the years to come. I must admit that I would dearly like to take a metal detector all over and around the grounds of the Observatory and other sites of Sydney's early defences, if only to turn up a few old cannon balls. If anyone in the Society takes up this idea, please let me know so that I can come along and enjoy the fun.

P.S. Of course, a cannon ball might be all that your metal detector would turn up. If so, at least you can identify the size of gun it was designed to fit. The diameters of cannon balls once used around Sydney are easy to remember - though I had to look them up because I couldn't:

	Approximately
6 pounders as used for the Sirius guns	3.500 inches
9 pounders as used for the ~~brass field~~ guns outside the Officers' Mess at the Victoria Barracks	4.000 inches

IX. BRICKMAKING AT THORNLEIGH 1901-1975.

The land around Thornleigh was first settled about 1816 by convict timbergetters who provided timber for Governor Macquarie's building schemes. By 1831 most of the timber had been cut out and the timbercutting establishment was closed. It was in this year that the first families came to the area. These pioneer families also engaged in timber getting and orcharding through at least three generations. The soil derived from Wianamatta shale was extremely fertile and the area became well-known for its fruit.

During this initial period of settlement no buildings were built of brick because timber was still in good supply. The first known brick building was the Hornsby Public School built in 1873 with bricks made in the yard of Henry Lipscombe at Enfield.[1]

It wasn't until 1884 that bricks were made hereabouts; they were typical sandstocks of the time with rectangular frogs and splotchy surfaces. These bricks were made on the site of the Hornsby Hotel and went into that building.

More brick structures were built during 1884 along the Homebush to Waratah railway line. Bricks were needed for station buildings, over bridges and culverts. At least three different types of bricks were used in the construction of the arched bridge over Devlin's Creek at Epping. Some of these sandstocks have no frogs (these occur also at Thornleigh), others have long narrow rectangular frogs and others are impressed with hearts.

New villages followed the opening of the line Epping, Beecroft, Thornleigh and Hornsby Junction. Thornleigh continued as the centre of timbergetting so fewer buildings here were built of brick. Most of the houses were for railway workers and built economically of weatherboards. However, the foundations were made of bricks similar to those used on the railway lines. It was about 1890 when the last sandstocks were used here and dry pressed bricks appeared.

A study of the 1900 electoral roll of Thornleigh reveals that 35% of the voters were labourers. The others were orchardists or men who had their own businesses in Sydney. For the labourers there was little more than seasonal work in the orchards of perhaps work in the sandstone quarries.

Consequently, when it was announced in late 1901 that a brick manufacturing works was to start operations at Thornleigh, the announcement was greeted with much enthusiasm. The site of the works was to be on "Dartford Park" - a grant given out to James Milson in 1829.[2]

Sleepers were dumped along the railway line south of Dartford Road and the Brickworks Siding was soon complete. Other materials arrived by road. The waggon carrying the boiler bogged at Thompson's Corner, West Pennant Hills and waited a week before being winched out.

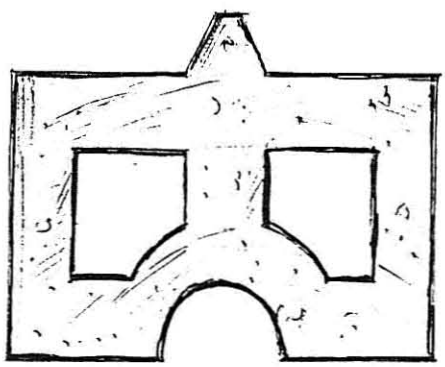
By the end of 1902 there were 12 men working on the Brickworks site, most of the machinery was in place and the foundations were being laid for the kilns.[3] These early kilns were described as being "open kilns" and were fired with timber billets. The pit was initially dug at the southern end of the brickworks site and had a wooden footbridge crossing it from Sylvania Avenue. From this vantage point one could see the men loading buckets with clay which were then hauled up to the surface with a windlass. The bricks were extruded from the bottom of a pugmill onto a board and were cut to the required length with wire.[4]

The first manager of the works was Mr Leon Joubert - a Frenchman who was later to build his residence in Dartford Road. The Secretary of the company

	Approximately
12 pounders as used at Middle Head and other batteries	4.400 inches
18 pounders ..... likewise	4.400 inches
24 pounders ..... again, likewise	5.050 inches
32 pounders as used for the two guns behind Old Government House, Parramatta, and on Pinchgut	6.100 inches

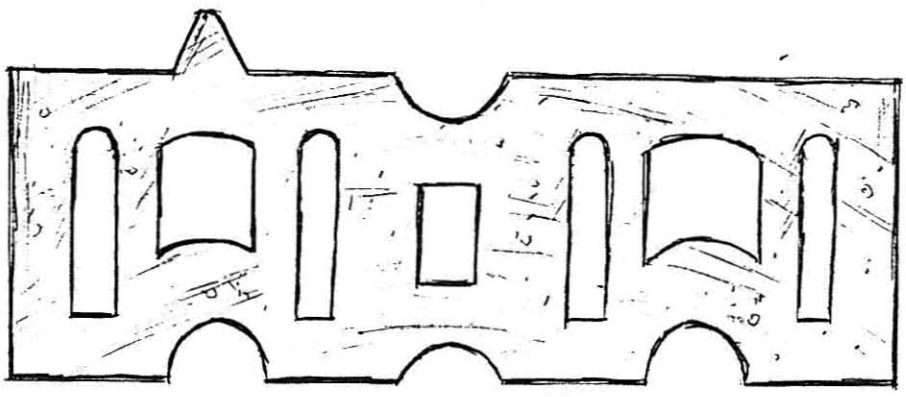
Cannon balls weigh what you'd think they should weight, more or less: guns weigh from three quarters of a ton (for the six-pounder) up.

V.E.



Patent Interlocking Bricks.

cross section drawn half size.



was Mr F.W. Parsons and the head office was at 44 Castlereagh Street, Sydney.

In the early part of 1903 the company planned to build another kiln so a sub-committee consisting of G.B. Robertson, William Noller and Cyril Blacket was set up to investigate different types of kilns and make recommendations to the management.

After inspections and interviews with experts the sub-committee recommended that a 16 chamber square ended kiln of the "Hardy" type with an independent stack and each chamber to be 16' square to hold eighteen thousand bricks be built. The weekly output of such a kiln would be 140,000 bricks. The kiln including stack would require 350,000 bricks and the labour and material exclusive of bricks (which the company must supply themselves) would cost £1700.[5]

A tender was enclosed from Mr John Hardy who promised to build the required kiln cheaply at £1550 or, including the new steaming and cooling patent, for £1650. The kiln and stack would be complete within 10 weeks. Hardy added that he had deliberately set his price low to secure the job otherwise he would at once return to South Africa.[6]

By June 1903 the new kiln and stack were complete except for one small detail. On opening day, the gallant Miss Hardy climbed the steel ladder to the top of the 150' high stack to lay the last brick. Having done so she waved a flag to shew the work was complete.[7]

The specialty of the National Brickworks Company was the patent interlocking damp proof hollow brick. The machinery for making them was specially imported from Marseille and it was hoped that these bricks would prove popular, - they were lighter and cheaper to carry making a dry substantial cottage of brick a feasibility.[8]

Several types of the patent brick were made - all are wire cut. Many were found when the first brickworks office was demolished about 1955 though no other buildings have been found so far containing them except the 1907 Hardy kiln at the works demolished in June 1980.

Unfortunately the new patent bricks were not as popular as was expected and their manufacture ceased before World War I.

By 1907 the brickpit had reached a depth of 70' and soon thereafter reached the sandstone below. Some of the sandstone was sold to the council for road surfacing. A new kiln was completed and the manufacture of dry pressed bricks began in the new large shed.[9]

Sometime before the war Mr Cecil Thomas became the new manager. He was to see service at Amiens, Ypres and Bullecourt during the war in the 13th Light Trench Mortar Battery. At this time the men at Thornleigh and Eastwood brickworks contributed £350 to the war effort.[10]

Lieutenant Thomas returned home a sick man, he had been gassed. He died at his Thornleigh home in February 1920 and was carried to his grave at Rookwood by some of his employees.[11]

After the war the works manufactured bricks without frogs for use in footpaths by the Hornsby Shire Council. When one side of the brick wore down or was damaged it could be turned over instead of being replaced.[12] Some footpaths made from such bricks are still to be seen at Beecroft.

On the corner of Dartford Road and Pennant Hills Road lived John Jeremiah Bellamy and his wife. John cared for the horses, carts and jinkers belonging to the company while his wife ran the boarding house for the single men who worked in the brickpit. Married men lived in a row of terrace houses built near the railway line in 1903.[13]

Coal for the kilns was usually piled along Dartford Road where the horses were set loose to graze. The few resident poultry farmers along Dartford Road began to object to the coal, horses and, of course, the smoke. Bricks were taken from the kilns in wooden wheelbarrows plated on the upper surface with steel strips and loaded onto drays and jinkers sometimes so hot that the timbers would begin to smoulder.[14] Brickbat were found useful by the council who filled potholes with them.

By the 1920s the brickpit had reached the depth of 100 feet. The pit man had to hang over the edge on a rope to set the charges. After blasting the men constructed 18" gauge lines to the rockfall and loaded the shale into steel push carts. The shale was hauled up in a skip from the bottom of the pit to the top of the machine shed and dropped into wooden hoppers emptying the contents into crushing bowls. From there the mixture went to the brick moulding machines.[15] In the twenties T Model Ford and International trucks replaced the jinkers as well as the railway trucks that had taken the bricks away packed in straw.[16]

A record of interview with Mr W. Shields of Pennant Hills who worked at the brickworks from 1946 till 1954 gives a good idea of the manufacturing process during the latter part of the brickwork's operations.

"Clay and shale were blasted from the pit walls and loaded into steel carts on an 18" gauge line. From here the mixture was loaded into hopper trucks. The pit man would press the bell and George Wright, the winch man, would haul the hopper truck to the top of the machine shed. From here the mixture passed down a wooden hopper into a rotating bowl containing rollers to crush the brittle shale. From here it fell into buckets on a conveyor belt. This belt took the material to the top of the machine shed again where it was screened. The pieces that did not pass through the screen were returned via a chute to the crushing bowl. Some water was added and the mixture went down a chute to the moulding machine. At this stage the clay had the consistency of moist dirt.

There were two types of brick moulding machine; a two brick machine, and a four brick machine that made 2800 bricks an hour. The four brick machines were used for making common bricks and the two brick machines made face bricks.

The unburnt bricks weighing 13 lbs were loaded onto barrows - 52 bricks per barrow and wheeled to the kilns of which there were two sorts.

Face bricks were stacked on their flat side in the "dome kilns" in benches with 2" gaps between them so the heat could get all round them. The entrances to the dome kilns were sealed with bricks that were slurried over on the outside with a mud mixture to seal the kiln. The kiln was fired from the side with pieces of coal. If the kiln was heated too quickly the stacks of bricks would collapse. There was a "burner" at work on shift perhaps attending three kilns at once. The kiln was heated slowly to get the steam out of the bricks. It was 5-6 days before the bricks were put on full heat, when one shovelfull of coal was placed in the firebox per hour. The kiln was left on full fire for 2-3 days. A test brick was taken out and the firest were closed down by putting ashes on the coal.

In the continuous kiln where common bricks were made coal was crushed and dropped through the top of the kiln onto the floor below. (These continuous kilns are the same as the Hardy kilns.) Above the kiln were feeder holes covered by metal pots that were lifted where necessary so the crushed coal could be scooped through. The chambers, i.e. spaces between the doorways of this kiln were sealed from each other with paper. Perhaps at the other end of the kiln bricks might be cooling down - the kiln was in use continuously hence the name.

All bricks were made from the same mixture of clay and shale. It was the heat that gives the colour, bricks closer to the fire were darker. After removal from the kiln face bricks were sorted and stacked according to their colour."[17]

During the 1960s the machine shed was extensively rebuilt in steel. The old wooden catwalks, ladders and hoppers were replaced. Gas was used to fire the dome kilns and the chimneys put out less smoke. The brickpit had grown to 16 acres and shale was running short. The last bricks were fired in 1975 and the works were closed down leaving only a caretaker in attendance. By 1978 plans were announced to turn the pit into a rubbish tip. It eventuated in June this year when the kilns and office and machinery shed of the brickworks were in the process of demolition.

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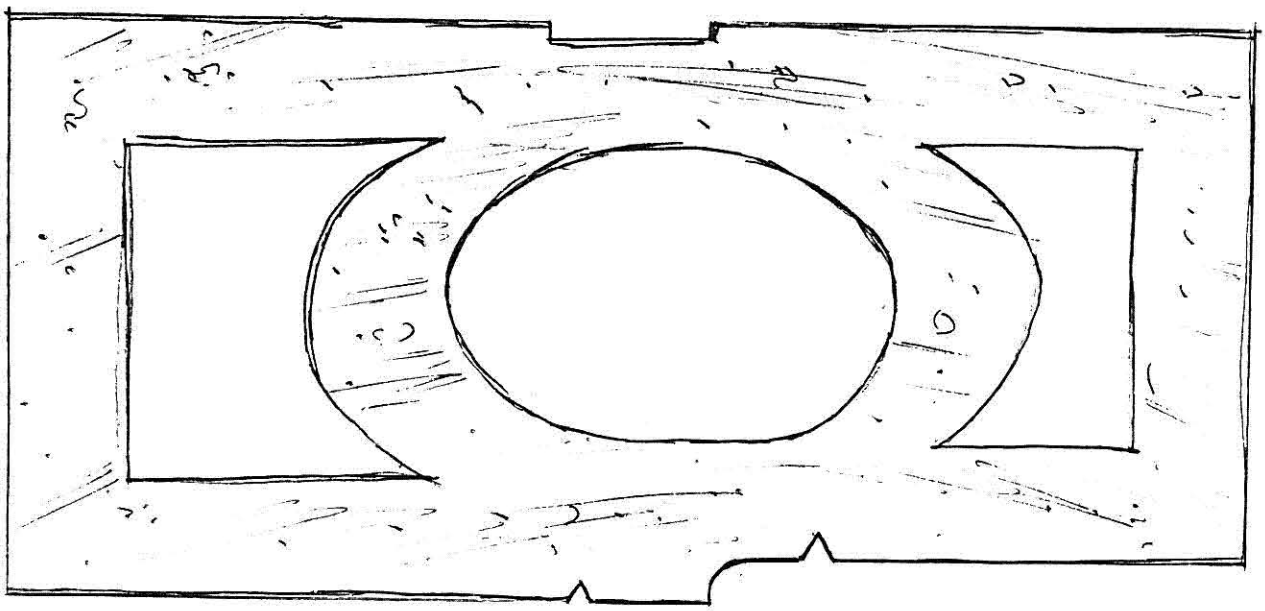
R.H.

Drainage Brick. cross section drawn half size.



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I. EDITORIAL

An industrial archaeological visit to Queensland on heritage business is a stimulating experience at any time. The completeness and range of sites surviving, such as the superb Venus Battery (Charters Towers), Chillagoe smelters, outback mines, Ravenswood, coke ovens of the 1860s at Ipswich, a full range of sugar milling and refining equipment as yet scarcely explored, and some mind-blowing meat works are a sharp contrast by and large, to the County of Cumberland, N.S.W. Moreover, the vitality of local conservation groups in Townsville and Rockhampton, as well as the solid academic productivity of James Cook University's Department of History (especially apparent in its latest Readings in North Queensland Mining History I,($6.00 + postage) has lessons for all of us. So has the careful thinking now going into a management plan for Queensland Parks and Wildlife Services' first historic national park on the island of St. Helena in Moreton Bay, with its magnificent rural remains spanning more than a century.

Perhaps we should add part of the occasion for such a visit was the University of Queensland's Faculty of Architecture seminar on the Burra Charter- yet another step forward for this critically important document. Resolutions were passed by all Queensland's major heritage bodies in its acceptance. One body represented there was the increasingly important Engineering Heritage Committee of the Australia-wide Institution of Engineers, which announced its first heritage conference for May 1982 and recently called for papers(those interested should contact Professor Whitmore, Department of Mining Engineering, University of Queensland.) The N.S.W. section of this body recently inaugurated its programme by means of John Muirhead's presidential address on September 9.

Liaison between such professional and government bodies is already paying dividends in N.S.W. as it has in South Australia and will increasingly in Queensland. The association between the Department of Main Roads and the National Trust has recently produced the highly successful 'Bridging the Past ' Exhibition at the Erwin Gallery. The M.W.S.&.D.B. are showing their usual heritage awareness in their maintenance work at the historic Cataract Dam; and the Government Architect's Office has shown renewed involvement over the archaeological importance of the Old Mint and Hyde Park Barracks in their large-scale restoration programme. An interesting development in this context was the initial meeting of the Department of Environment and Planning's Archaeological Advisory Panel in October, unquestionably a first in Australia. Mention must also be made in this context of the new State Conservation Plan, now in its last stages of preparation which should provide welcome guidance for new initiatives in the State's heritage programme.

Recently (October 13-15)Sydney has been host to Museums Association representatives from all over Australia. A varied programme including, of course, workshop sessions at our Power House Museum, together with the latest developments in materials conservation and display entertained 180 people together with an N.S.W. State Government reception which proved a notably productive forum for interstate informal discussion and planning. The succeeding cellar dinner at Elizabeth Bay House must have continued the good work.

From State to Commonwealth, an interesting initiative from the Department of Mining and Construction in Canberra was a meeting of State Historic Buildings Liaison Officers for a two day meeting on heritage matters. Not so dull or public-service when you realise that the Commonwealth, for a start, looks after all historic lighthouses, post offices and defence establishments, all of which are maintained and serviced by the D.H.C. (in accordance with the Australian Heritage Act.) An excellent initiative by the Department.

II. NEWS ITEMS: GENERAL

Jubilee ANZAAS Conference: Adelaide May 1980

Section 25A of ANZAAS, the Archaeology section featured two half-day sessions devoted to studies in historical archaeology - or colonial archaeology as Professor Ian Jack prefers to call it.

The first session emphasised site management problems and conservation philosophies.

Howard Pearce presented an illustrated lecture on Killalpaninna Mission - The Final Phase and Dispersal, which discussed the evolution of this South Australian Lutheran mission station, its abandonment and decay and now the need for stabilization and interpretation of the building ruins, access track relocation and visitor management.

Betty Ross, an archaeologist, and Christine Wilton, an aboriginal ranger with the Aboriginal and Historic Relics Unit of the South Australian Department for the Environment, discussed the Adnjamathanha Management of Historic Sites in the Flinders Range concentrating on the conservation aims for Ram Paddock Gate, a traditional camp site which attracts visitors because of its attractive setting and permanent well. They discussed compiling plant lists in the local dialect and site recording with local aboriginal people. Site management would aim to fence vehicles out, comprehensive recording and interpreting the site at two levels - for local inhabitants and for the heritage conservation network.

Helen Temple, an archaeologist with the New South Wales Planning and Environment Commission, described the provisions of the New South Wales Heritage Act (1978) with regard to historical archaeology and presented a series of case studies: salvage excavation on the Lower George Street site of the colony's first gaol (1797), site recording at Town's Bond Store (1835-7) prior to its relocation, fieldwork at Kurnell and archaeological survey at Boydtown aimed at preventing unsympathetic development. This lecture generated some lively discussion on the problems of an excavation permit system.

Dr Josephine Flood of the Australian Heritage Commission presented a paper reviewing Alpine Archaeology and Conservation rather than the advertised Tourism and Remote Sites - Problems and Solutions. She described a number of sites in the high country (e.g. Clogg's Cave and New Guinea Cave in East Gippsland), their significance and conservation problems.

Rosemary Buchan of the New South Wales National Parks and Wildlife Service gave a lecture on Mungo National Park - Further Notes on a Sacred Site in Two Cultures which highlighted the scientific importance and aboriginal significance of Lake Mungo and the consequent management problems. She did not discuss the historic importance of the major visible relic in the park - the beautiful native pine woolshed, which represents a third layer of cultural occupation, the pastoralists.

Professor Ian Jack presented a paper reviewing the status of Colonial Archaeology in Australia and the dramatic change between 1970 when it was seen primarily as one means of introducing students to dirt archaeology (excavations) and 1980 when it has become a diverse discipline primarily recording, assessing and mapping sites with an immediate report on the end-product aimed at urgent salvage or conservation. He described how the growth of the discipline in Europe and the United Kingdom has been different from that in the U.S.A. and Canada where it has been associated with restoration and reconstruction. He discussed the biggest current problem facing colonial archaeology in Australia - publication of results, which is vital to comparison and assessing site significance and without which archaeology will not thrive. He predicted that excavation will play a decreasing role in colonial archaeology while site recording will increase.

Judy Birmingham gave a comprehensive lecture on The Tasmanian Aboriginal Settlement at Wybalena, Flinders Island (1832-1847) - A Study in Cultural and Environmental Adaptation which presented the long-delayed (10 years!) analysis of excavated material, which was essentially undertaken as salvage archaeology. She emphasised that the site requires total survey at a future date and that there is no point in excavating the Commandant's house except as part of a total survey. Careful but unskilled initial excavation at the site had focused on European materials, such as bricks, and had lost much stratified evidence.

Peter Christopher of the South Australian Society for Underwater Historical Research presented a paper on Shipwrecks and their Contribution to Archaeology in South Australia which described the Society's program involving historical research, wreck inspection and survey and to a limited degree, excavation and recovery.

It is hoped that the full text of the papers delivered at the conference will be published in either Artefact or Australian Archaeological Association Newsletter.

The following resolution was passed at the end of the meeting:

"That Section 25A recognise the urgent need to make work on all aspects of historical archaeology in Australia more accessible to potential users.

That more comprehensive deposits of published and, if possible, unpublished reports be encouraged in the major libraries, museums and other control locations.

That the means for disseminating information about work completed and work in progress, the question of the deposit of unpublished reports, raw data and artefacts in suitable repositories and other matters of policy arising from projects on historical archaeology be recommended for discussion at adequate length at the Brisbane ANZAAS in 1981.

That the present Chairman of Section 25A (Professor Vincent Megaw) be asked to instigate discussions on these motions with the Heritage Commission, ICOMOS, the National Library, the Museums Association of Australia and other relevant bodies preparatory to ANZAAS in 1981."

J. L.

* * * * *

The following has been received from the General Secretary of the Royal Australian Historical Society setting out the latest rules of the Principal Registrar N.S.W. in regard to access to records for historical research purposes.

Circular No. 1 of 1980

1. Access to Records.

Birth, death and marriage records are deemed to be confidential to the persons concerned or their closest living relatives and are not available for inspection. Sections 43 and 44 of the Registration of Births, Deaths and Marriages Act, 1973, provide that no certificate shall be issued unless written application is made, the prescribed fee is paid and a sufficient reason is given. The same restrictions apply to requests to inspect records and extract information.

From time to time requests are made by or with the support of historical societies to access local records. It is the policy to assist where possible the

genuine aims of such societies to record local history having regard to the availability of resources, the preservation of confidentiality and the avoidance of disruption of the normal functions of offices. Approval to inspect local records will only be given by the Principal Registrar.

In New South Wales there are currently 204 historical societies affiliated with the Royal Australian Historical Society. Some of these societies have a higher standing in the local community and greater competence than others.

At the present time the following broad principles are applied to requests by historical societies to access local records -

1. Specific information should be provided concerning the research project being undertaken.

2. Except in very special circumstances access will be restricted to records preceding the year 1900.

3. Applications will require the endorsement of the Royal Australian Historical Society.

4. Access will be restricted to a limited number of accredited representatives.

5. Such representatives will be required to give an undertaking that no information of a confidential or potentially embarrassing nature will be divulged by them nor will they use any information for personal purposes.

6. Minimum disruption will be caused to the normal working of an office.

Similar tests are applied to requests by persons engaged in sociological research but it is also necessary to establish that there will be no financial benefit to the person and that the project is supported by some reputable authority.

Whenever special facilities are accorded to any organisation or person to inspect local records there is a danger that the public may suspect that confidentiality of the records has been disturbed. Other members of the public who become aware of the inspection could seek the same privilege for entirely different or personal reasons.

If approval is given for the inspection of local records the local registrar will be notified in writing and the purpose of the research will be stated.

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AUSTRALIAN STOCKMAN'S HALL OF FAME AND OUTBACK HERITAGE CENTRE

A group of Australian bushmen have issued what they consider to be the greatest challenge ever to Australian architects. They want a design for a multi-million dollar building for the outback; one indelibly stamped with the spirit of pioneer Australia. To be known as the "Australian Stockman's Hall of Fame and Outback Heritage Centre" the building at Longreach, in central western Queensland, will be a national gallery, museum and library, housing fine art, bronzes, memorabilia and records that depict and document the country's pioneer heritage.

A national design competition for the building will be sponsored by the Australian Womens' Weekly and the Queensland State Government and run under national lines laid down by the Royal Australian Institute of Architects.

Inquiries regarding the Hall of Fame may be directed to:
R.M. Williams, Honorary Secretary, The Australian Stockman's Hall of Fame and Outback Heritage Centre, G.P.O. Box 1, BRISBANE. 4001.

Historical Weekend Schools 1980

The Department of Adult Education at Sydney University conducts each year several weekend schools on historical themes and aims, among other things, to show students some of the less well-known sites of historical or archaeological interest. Most of these sites we visited have never been systematically recorded but they certainly merit some attention. It had been hoped to do some recording during the schools, but this has proved impracticable as there are usually too many students on site. Photographic surveys have been made, where-ever possible, and could be made available to researchers. The sites listed below seem of particular interest in terms of the amount and quality of the remains still visible. Please note that where sites are on private property it is essential to obtain permission to visit from the owner and it is always a good idea to give at least a week's notice. Further details of these sites and information about the Historical Weekend Schools can be obtained from Dr. Aedeen Madden, Adult Education KO1, University of Sydney 2006, tel: 692 2662, or 692 2907.

LITHGOW AREA

Zig Zag Brewery : An outstanding example of a country brewery, which operated from the 1880s until 1958. Main buildings include a tower, cellars, the brewery itself, a chimney stack, a boiler house with boiler and many outbuildings, as well as the manager's house. Much machinery is still intact.
Private property. Access from road, through a private road. Permission to visit must be obtained from the owners, Dale's Soft Drinks, Lithgow.

Vale Colliery Coke Ovens : foundations of a bank of brick-lined stone ovens which operated from c. 1892 to 1899, when the colliery closed. The remains can be seen very clearly from the railway (onto which there was originally a siding, now visible as level ground), just before Oakey Park, on the left of the line coming from Sydney. Remains include the ovens themselves, the traces of the siding, foundations for a poppet head (?), a mine-shaft, and parts of other structures on the bush in the hillside above the siding. One of the ovens was excavated by the schools' students under the direction of Carol Powell and the excavation report is shortly to be published.
Crown land. Access is by a lane leading up to the railway line from behind the last group of houses in Oakey Park.

Hartley Vale Cottages : a group of houses in one property consisting of a slab hut, a stone house with separate kitchen block, a storage shed, and a number of other smaller structures. The main house is particularly interesting as it appears to have been built in two stages, with two different roofing systems. Still in use but as the owner was absent at the time of our visit we do not know if permission can be obtained to view the interior.
Private property. Access from the road directly into property, which is beside the "old schoolhouse".
Hartley Vale Shale Oil Works : remains of tanks, tramways and inclines quite fully described in G.H. Eardley and E.M. Stephens' 1974 work on The Shale Railways of New South Wales. Access from the road.

Torbane Shale Oil Processing Plant : remains of well-built circular bases for storage tanks, numerous foundations of plant buildings; on the hillside remains of inclines and of tunnel from Airly. Described by Eardley and Stephens. Traces of a schoolhouse and of some further structures scattered around plant. Private property. Permission to visit must be obtained from the owners at "Carinya", Ben Bullen. Carinya homestead, which was originally the plant manager's house, is not open to the public.

Sunny Corner mines : extensive and spectacular remains of mining (1875-1930s) including remains of hillside flue and fine chimney stack (one of three originally); very fine power house built of cast (?) slag blocks with remains of loading platform and portions of machinery. On the small slope which faces the main works are traces of the assay office - no structural remains visible but the spot is marked by an accumulation of crucible and other debris. Further up that slope and viable from the road on the way down to the site are the pise (?) walls of the manager's house (J.K. Charleston 1903-1910 ?). Access from Sunny Corner village. Other mines in the Sunny Corner Forestry area include the Nevada mine, with shafts and some remains of working platform and machinery, and the Paddy Lackey mine with remains of cyanidation tanks and extensive spoil heaps.
Crown land. Access from forestry tracks.

BRAIDWOOD AREA:

Convict Barracks, at Ardstrath: remains of a very fine stone building, before 1840. Roof gone but walls and two gable ends intact; remains of smaller adjoining structure in less good condition, and scattered material from yet another building (?). Large mausoleum of young woman in the next paddock, 1840s. Private property. Permission to enter must be obtained from owners, Mr. and Mrs. Roger Jackson, of Braidwood. Access from road, through private property.

Mongarlowe goldfield : many shafts and some corrugated-iron and stone shacks on the hillside above Little River creek, facing present-day village. Occasional remains of working platforms for the dredging machinery which was used here extensively from 1908 on, mining having started in 1853. Access from road.

A.M.

* * * * * *

Since we are approaching Heritage Week I98I (March 23-29 I98I) all heritage bodies are invited to participate and to notify their intentions forwith to Celia Wade, Exucative Officer, c/- National Trust Centre, Observatory Hill, Sydney. Another interesting development for N.S.W. will be the first Historic Photographs Conference to be held at the National Trust Centre, Observatory Hill, next April. This is a most welcome follow-up to the recent Australian Photographic Conference in Melbourne, and has grown naturally from the considerable interest generated by the historic photographs project mentioned in our last issue.

III. BOOK REVIEWS AND RECENT PUBLICATIONS

The Lithgow Pottery, by Ian Evans. A comprehensive history of the Pottery established in the late 1870s by the Lithgow Valley Colliery Company. The text of 50,000 words is derived from the Company's minute books and ledgers and from diaries and contemporary accounts of the development and ultimate closure of the Pottery. The 264 illustrations include 120 colour plates, each depicting a piece from the Pottery's extensive production range. Black and white illustrations include views of the Pottery buildings from 1878 to 1946, photographs of potters including James Silcock and Arthur Brownfield, pottery tools and artifacts, examples of Lithgow architectural pottery, and closeups of the various marks used at Lithgow. Appendices contain details of glaze and body formulas, lists of Pottery employees and uncatalogued wares from the Pottery's stockbook, plus a copy of the 1889 catalogue with prices written in. 285mm by 210mm, 176 pages of 120 gsm art paper, hard cover with gold blocking on spine and front. The book is published as a limited edition of 2,000 copies, each signed and numbered. Available late October from The Flannel Flower Press, 18 Mansfield Street, Glebe, 2037, for $49.95.

Historic Clay Tobacco Pipemakers in the United States of America, by Byron Sudbury. This article* is a compilation of much of what is currently known about the historic clay tobacco pipe industry in the USA. This 189 page article presents extensive information gleaned from historical records, published information, and manuscript sources, as well as the author's personal research. The information in this review-survey type article is organised by state with varying amounts of information arranged chronologically for 22 states. In addition to extensive textual information and references, pipes attributed to known pipemakers are illustrated whenever possible — over 300 pipes manufactured by known pipe producers are illustrated actual size. There are also photographs of pipe moulds, pipe machinery, and pipe producing sites. In all, there are 72 full page plates and 16 figures. This study will be a valuable basic reference in any historic archaeological library.

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* This article is reprinted from British Archaeological Reports International Series, Volume 60. Available from Byron Sudbury, P.O. Box 2282, Ponca City, Oklahoma, 74601, U.S.A.

ANDREW BROWN'S WOOLLEN MILL AT LITHGOW by R. Ian Jack. Published by the Lithgow District Historical Society, Eskbank House, Lithgow 2790. ISBN 0 85866 031 8. Soft cover, 16 pages, cost $2.00.

The extraordinary energy that a new environment releases is perhaps nowhere better seen than in the lives of Australia's pioneer settlers. Had Andrew Brown remained in his native Perthshire, instead of emigrating at the age of 25, he would undoubtedly have been a prosperous man, but would he ever have extended himself as he did at Lithgow? Here was a man who might have been content to have been a great landowner and pastoralist, but who chose instead to pursue the more hazardous path of industrial development, for profit, of course, but not without a due sense of concern for the welfare and education of his dependents, to the point that he can justly be described as a philanthropist. Professor Jack promises to write more at length about this complex man who, in many ways, can be seen as representing the creative face of nineteenth-century capitalism. In the meantime, we are enticed by an admirably clear account of Brown's construction of a flour mill in 1837 and its subsequent conversion to a textile factory in 1857 (a factory which was to last till 1973). There is a nice parallel between the meticulous research which Brown put into constructing his industry, visiting factories in Scotland and England, checking out machinery, altering and extending buildings as required, and the equally meticulous work which Professor Jack has put into reconstructing the history of the mill from accounts, diaries and site visits.

As a documentary history of the mill the information-packed text is exhaustive, but by no means exhausting - indeed it should stimulate the historical archaeologist into supplying the details of building, machinery and product which lie outside the scope of the paper. Above all, from an archaeologist's point of view, it will supply the essential source for an interpretation of the shambles which resulted from the developers' savage onslaught of 1979. Suitably illustrated, it could make an interesting book with which to introduce the general public to the forgotten industrial history of New South Wales and one hopes that the Lithgow District Historical Society may one day have the resources to consider such a venture. In any event the Society is to be congratulated on a fine contribution to local history.

SURVEYING FOR ARCHAEOLOGISTS AND OTHER FIELDWORKERS by A.H.A. Hogg. Published by Croom Helm Ltd, 2-10 St. John's Road, London SW11. ISBN 0-7099-0185-2. Soft cover, 315 pages, 77 figures. RRP £10.95 (UK).

Archaeologists are of less than average intelligence! So said an eminent Czech prehistorian, but let us hasten to qualify that he was referring specifically to mathematics and indeed few archaeologists would deny that their grasp of mathematics is generally poor. It will be appreciated that this is a considerable disadvantage for those who have to carry out measurements which involve some calculation, such as estimating a volume, or plotting from an aerial photograph. In this invaluable work Arthur Hogg explains these complexities with the same clarity and commonsense with which he deals with every problem, however small, that the fieldworker may encounter.

In twenty-five years of archaeological work, Dr. Hogg, who originally trained as an engineer, has seen it all : he has had survey chains crushed by lorries, ranging-poles used as javelins by small children, survey pegs uprooted by abusive farmers, finished drawings 'improved' beyond recognition by over-enthusiastic editors, and above all has had the perennial problem of the inadequately trained and equipped assistant. With the aid of his book most of these difficulties can now be foreseen, prevented or overcome. The work will be an invaluable source of reference to anybody who engages in fieldwork, although it may occasionally require supplementing by some specific work, such as J.M. Pannell's Techniques of Industrial Archaeology (in the 1974 revised edition).

Dr. Hogg is of course writing for a British public but by substituting the words 'harsh sunlight' for 'rain', and 'dust' for 'mud' throughout, it will be found that the work translates well into Australian. Perhaps the only source of difficulty in adapting it for local use is that Dr. Hogg has, very sensibly, chosen to illustrate technique by reference to one main type of site. Unfortunately for us he has chosen the British hill-fort which is hardly likely to be encountered here. However, if one understands that a 'hill-fort' is simply an earthen bank, or a series of banks, enclosing, usually, the top of a hill there should be no difficulty in following his illustrations which are self-explanatory, as any good surveys should be.

The publishers do not list an Australian agent but it seems well worth while sending to England for this one, as it should be of considerable use to local groups or individuals interested in fieldwork.

A.M.

IV.(a) SURVEY AND DOCUMENTATION OF THE QUEEN VICTORIA BUILDING - SYDNEY

In July, 1978, Sydney City Council's Engineering Department employed two architectural assistants in a temporary capacity to undertake the documentation of the Queen Victoria Building in preparation for the calling of tenders for the restoration of the building. It had been announced in 1971 by the Lord Mayor, Alderman McDermott that "the Queen Victoria Building will be preserved and restored to its original state". The announcement was received with much applause from Sydney-siders, as it marked the end of a heated twelve year debate on the fate of the building. This was sparked by the announcement of the Lord Mayor, Alderman Jensen in 1967 that the building would be demolished for "an exciting project with the ground level as parkland, and a car park underneath". The Civic Square to be formed "would increase the values of all properties facing the square". Following the 1971 announcement, Council in December, 1976 publicly called for restoration proposals, from which five had been selected for public appraisal in August, 1978. This decision-making process begun in 1976 is still under way in 1980.

It was decided in 1978 that a full measured and photographic survey of the building would not be undertaken by Council, and that this task would be undertaken by the successful tenderer. A process of retrieval of known and unknown documentation was then begun. Some 400 odd sheets of drawings were gradually found in different departments, including drawing registers for about half. These ranged from a few early design drawings on linen, from about 1890, to pencil on butter-paper diagrams and details for innumerable additions and alterations. Layout plans had been prepared in 1972, for the main 5 levels, but not including the upper 2 levels or roof. These drawings do not differentiate between concrete, masonry or light partitions, and are drawn at 1/16" to 1'0" scale, without sections. About 15 maps and plans were found of the site and its former buildings in Council and other sources.

The Council possesses two albums of 179 photographs of alterations made to the building in 1917-1918. Much of this information is irrelevant to the present form of the building however, since extensive alterations were again made in 1920, 1928, and especially between 1936 and 1938. Their value however is in recreation of the original detailing and structure, especially if read in conjunction with the original documentation. This original documentation is design and working drawings, which although not "as built", indicate very close following by the building tradesmen. Further photographs were found in Mitchell Library and the Government Printing Office.

In response to public demand, illustrated lectures were given to schools of building, architecture and history, and also to Historical Societies in 1979, which have continued in 1980. In this way further photographs were obtained from private collections, and intimate details of the Building's social history were revealed. Late in 1979 some 250 glass plate negatives were found in Mitchell Library, from which the 179 photographs in Council's possession had been made.

Detailed information was gradually revealed from Council's archives in the form of Minutes, letters and reports, some dating back to the former markets on the site. Two academic papers had been prepared in 1977 by B. Hemphill and E. Stenning, and a report by P. Reynolds for the National Trust of Australia in 1971. There are some 6 or so literary references to the Building including a children's adventure for which it is the main setting. Gradually a very detailed history of the Building and its site are emerging in categories which are interdependant, but are pursued as follows:-

1. Site history; including use, ownership, boundaries, improvements and adjacent works.
2. Tenancy history; from about 1798 to date.
3. Building history; from 1810 to date.
4. Structural and architectural history; of the present building from

its design beginning in 1888 to 1980.

5. Economic history; of the present building from its opening in 1898 to 1980.
6. Historic relevance; as a market from 1810 to 1910, also containing a Police Courthouse, watchhouse, fire station and public library (since 1899) it has been a prime focus of retail activity for 170 years. It was the settlement's main market for 100 intermediate years between the first markets at the Kings Wharf, until moved along George Street to Haymarket (then latterly out along Parramatta Road to Flemington, again to the demographic centre of Greater Sydney.)

The Queen Victoria Building known until 1918 as the Queen Victoria Markets Building, has been the subject of continued controversy since it was opened in 1798. The first known use of its site was as a dairy owned by John and Gregory Blaxland. In 1810 however, Macquarie commissioned Greenway to design a Market and Market House on the site. His elegant domed building at the south end was converted in 1828 into a police office and Magistrate's Court, but the remaining two-thirds continued in low market buildings, named after its acquisition by the Corporation of Sydney in 1846, as the Queen Victoria Markets. The police court site was acquired by the Council for the demolition of these buildings, as well as the old markets between 1889 and 1891, for the complete re-development of the total block.

Sydney had lost its grandest building, the Garden Palace Exhibition, to fire some eight years previously, which no doubt influenced George McRae, the City Architect, and the city fathers, in his design for a new covered market building. He submitted a grand design of a building formed along a galleried avenue over a lofty basement market, but left the applied "style" of the building to aldermanic decision. Four choices were submitted, Renaissance, Gothic, Queen Anne or Byzantine, and the last was selected. The choice would have been influenced by the wide use of the style, also called Romanesque, in the U.S.A. for early Modern Movement buildings. It is probably Australia's first Modern Building, certainly of such proportions.

The functional design incorporated a great number of technical innovations. Site work began in 1893, being mostly the excavation of the basement space into the sandstone ridge. Tanked in brickwork, the perimeter carries metre square Bowral Syenite piers at 5.5 metre centres at ground level. All the richly carved and modulated Waverley sandstone external walls are carried up from rivetted steel girders for three and four storeys. The internal structure, except for three brickwork cores, is framed with steel girders, beams and joists to cast iron columns. Columns and beams are encased in terra-cotta lumber, and the ceilings are similarly formed by a suspension system which is not yet fully understood, but shows no sign of deflection or movement. The ground floor is level with all four surrounding pavements, and was finished with patterned encaustic tiles on a concrete bed, as are the core floors. All other floors were timber finished. All six staircases, of which two remain, were formed by cantilevered syenite slabs, butter lengthwise to form a continuous shell structure for the full height, with fine Art-Nouveau wrought iron railings. Several cast iron spiral staircases served ancillary spaces, and four hydraulic passenger lifts were housed in the end cores. Four more hydraulic cart and lorry lifts served the basement market from York Street.

A glass vaulted "Avenue" ran full length of the building, with single arched entries from Druitt and Market Streets, intersected by a transverse Main Hall through the central core three bays wide. These magnificent entries from George and York Streets carried ornate cast iron gates on polished syenite columns with bronze capitals. Half-wheel stained glass windows rose for the next 1 1/2 storeys lighting the complex central staircases of the central core. These fine wheels still exist, but are completely obscured internally. The centre of this crossing carried up through circular penetrations in floors to a glass dome, side lit by tall windows in the drum which carries the great dome.

The building was thus naturally lighted internally as well as from surrounding streets. The perimeter of the basement was lit by prismatic pavement lights, and by vertical stalls beneath the shop windows. Further natural lighting was obtained from a pattern of circular pavement lights along the Avenue, top lit by the glazed vault. Night lighting was all gas, but electricity was available in the building. Plumbing and other services were carried up through several ducts in each core, fourteen in all, with access doors on stair landings.

The great and lesser domes are carried on open web rivetted steel trusses. A variety of other roof forms, mainly hips, saw-tooth and skillions are carried on timber trusses, connected by flat concrete sections containing gutters. The great dome is clad with copper on timber decking and vertical rolls, but the twenty lesser domes are clad with a standardised interlocking tray system of muntz metal, also on timber backing. All joinery throughout was of Australian cedar, with considerable use of stained glass, much of which is still extant. The soffits of galleries, the ceilings of some shops and a frieze on the long vaults were of pressed metal, again much of which is still intact. All other internal finishing was of in-situ and fibrous plaster work, of which many examples remain, including the fine ceiling of the Concert Hall.

The building is 186 metres long, 30 metres wide and 27 metres high (on average), having the horizontal bulk of an average 60 storeyed tower block. The great doem, 19 metres in diameter, carried a lantern and cupola 60 metres above street level. The whole building, not including siteworks, was constructed in a little over four years, made possible no doubt by the severe economic depression which followed the boom of the decade earlier. The groups of statuary above the two main entrances were designed by W.P. Macintosh who supervised sculpting by S.A. McFarlane in his studios in Carrara in Italy. The figures are twice life-sized, and are allegories of Australia distributing Her "Honours to Commerce" in George Street, and His "Honours to the Arts" in York Street. They were sculpted in two years, and probably positioned in 1899. A columned awning was completed in about 1902, of cast iron columns, doubly acting as down pipes, with a Romanesque cast iron valance echoing the cedar framed shopfronts, with steel skillion trusses carrying a muntz metal roof of flat trays. The bays of the awning appear to have carried decorative pediments and glazed panels alternately. The whole awning was lined with cedar boarding.

Strong criticism of the immensity, ornateness, the cost of the building broke out in 1898, when it was proposed that it become part of the City railway station, currently being planned. The finished building housed a Coffee Palace ("temperance" hotel) of several public rooms and 57 bedrooms with "gallery promenades", as well as a glass roofed Photographic Studio, two Exhibition Galleries, a Concert Hall seating 500, "warerooms", offices and showrooms. It also contained a Caretaker's Apartment, 58 shops on the Avenue at ground level, and the basement Market, together with wine bodegas and plant rooms. It was designed at the end of the 1880s boom, the last of six large shopping arcades (just preceded by the Strand Arcade), at a time when Sydney's total population was less than 500,000. Apart from a wide range of stall holders in the Markets, and the shops and offices above, notable tenants included the Singer Co., several piano showrooms, Penfolds and Lindemans wine saloons, the eminent merchant Quong Tart and a branch of the Government Free Lending Library which in 1909 came under Council control. In 1910 the markets were removed. From then on the building became an economic liability.

The stated total cost of the Queen Victoria Building was 261,102 Pounds on completion. The Council refused an offer of 681,000 Pounds made in 1916 by one of the aldermen, and in 1917 accepted a design tender for extensive alterations at a cost of 47,000 Pounds. The shops were halved in number to thirty, by glazing over the Avenue at first floor level, and making them run the full width from street to street. The awning was removed and replaced by a cantilevered structure to comply with Council's policy for removal of posts throughout the City.

The shopfronts were completely remodelled and the Library was housed in larger accommodation on three floors of the Market Street end. This entailed adding an intermediate floor in the former Concert Hall. The building was valued at 1 million Pounds in 1922, and an offer of 325,000 Pounds was refused in 1923.

In 1934 the Council considered competitive designs for its complete remodelling, in particular to accommodate the Sydney County Council which was to take over Council's former Electricity Undertaking. In the selected scheme all galleries were floored across, shopfronts were again completely remodelled, and the awning refurbished, to be consistent with the expensively designed "Art Deco" interiors for the County Council on three floors at the southern end. The main entrances were formed into shops, the crossing floored across at all levels, and the glass dome replaced with a large air conditioning plant room. This, and other works were completed in 1938, including a two level car park in the basement, which was subsequently halved in a few years to form a honeycomb of air-raid shelters.

Apart from a heterogeneous assortment of partitioning, no significant alterations have been carried out in the last 40 years. The only fault in the original fabric is in the precast "breeze concrete" balustrade and cornice of the great dome. Copper turrets which flanked the minor domes at four points were removed in 1964 to avoid repairing them, five years after the Civic Square proposal. A few of these turrets still exist in private ownership as garden ornaments in Sydney suburbs. At the time of Jensen's proposal in 1959, the Queen Victoria Building was quoted as being worth "about 1 million Pounds" with its site.

This prominent Sydney building has generated voluminous public and corporate discussion, ranging from ecstatic praise to damning criticism since it was built. National Trust membership was canvassed for its favourite building in 1975 and selected the Queen Victoria Building even above masterpieces like old Government House and St. Matthew's Windsor. It had been listed by the Trust in its highest category in the prime Civic group which includes the Town Hall, St. Andrews and two commercial buildings, and also has been submitted for inclusion on U.N.E.S.C.O.'s World Heritage List. It ranks in significance with the G.U.M. building in Moscow and the Galleria in Milano. The City Council has not as yet published its 1974 Preservation List, but is aware of the building's significance. Late in 1974 the building was valued at "about $30 million" and was "to get a $4 million facelift". The late Lord Mayor, Alderman Leo Port, had earlier appealed for the recovery of original detailing such as gaslight fittings and the copper turrets, which prompted a niece of the original architect, George McRae to present a superb album of photographs of the interior and exterior to the Lord Mayor of the day, Alderman N. Shehadie.

When Council called for tenders again in December, 1979, a detailed brief was provided outlining lease requirements, and specifying architectural details to be retained or restored. These include the whole exterior, the shopfronts, the four main entrances and the awning, which is essential visually and for pedestrian protection, especially for the York Street bus station. The copper turrets pose a large problem as there were originally 78 of them, all now missing, each about 2 metres high. The unsound and unsightly 1918 cantilevered awning has been removed, and a steel posted protective hoaring erected for the building programme.

The process of arriving at conservation decisions for the future of the Queen Victoria Building could be a model for those adopted for other publicly owned buildings, and is reminiscent of the original design process, as well as those for the major changes of 1916 and 1934. Council commissioned five feasibility studies which were examined by a special Q.V.B. Panel of four Council officers, and the specifically formed Project Team. Back in December, 1976, Council publicly called for conservation proposals, using the word "restoration" quite prominently, inviting firms and individuals to nominate a Project Manager. Fifty five applications were received, from which ten were

selected to submit further detail. From eight subsequent responses, the Panel selected five schemes proposed by development consortia in June, 1978, to whom a fee was paid to submit further detail and information for public inspection. Graphic proposals were displayed in August, when about 7,000 people viewed the display, and submitted some 1,600 written comments with preferences. Although none of these five proposals was accepted in 1979, they stand as feasibility studies along with the 3 tenders received again in 1980. Council is now in a position to make some sort of decision about the building. It could accept one of the proposals wholly or partly, or parts of several, or decide to shelve the whole issue. But regardless of what the outcome is, the last few years has seen the amassing of documentation relevant to this building which is probably greater than that of the previous 80 years. The graphic and verbal documentation of the building grows at mathematical rate. The task of a historian tackling the story of this building from a fresh start at any time in the future, will be immense. What emerges from having looked at the history of this building and its site, is that because of its function, and the succession of structures and activities, it is a microcosm of the history of Sydney itself.

D.E.
July 1980

(b) George McRae - Architect of the Queen Victoria Building*

Had three young friends coming home from church one Sunday in Edinburgh not decided to emigrate, Sydney would not have had the present Queen Victoria Building. One of the young men was quickly followed to Australia by his family including his older brother, George McRae.

George McRae was born on 10th September, 1858 in Edinburgh, Scotland. When he arrived in Sydney he had already worked for 10 years in architectural offices in his home town. In Sydney he was appointed as temporary draftsman at

* Extract from unpublished University of Sydney, B.A. Honours Thesis, 1977

the City Council. He did his job very well because when he was put on the staff permanently a few months later in December, 1884, he was offered an annual income of £250, which was £50 more than he had asked for. Mr T.H. Sapsford was city Architect, who - from all accounts - had a number of differences with the City Council, which erupted at a meeting in 1885 and ended with Sapsford's death a year later. During this time George McRae was Acting City Architect. In 1887 he was appointed as City Architect and City Building Surveyor with a salary of £600 per annum. McRae also had his share of troubles with the Council while designing and overseeing many of the landmarks which still stand today.

One of the first buildings McRae designed was the Fruit Market in 1887 on the corner of Market, Sussex and Day Streets, which was mercifully saved recently when it was going to be pulled down, together with Pyrmont Bridge. The alteration of the building in Prince Alfred Park into Public Baths and a Concert Hall, was also done according to his plans.

After the "trouble" with Sapsford, the responsibility of finishing the Centennial Hall of the Town Hall was McRae's. The interior was designed by Sapsford but the roof needed McRae's attention. It was opened on 27th November, 1889. A few years later he also designed the "port-cochere", which is still there, and the ornamental iron gates and railings which have disappeared since.

The Fishmarkets, the Belmore Market and the Corporation Building all bear his special attention to detail - aesthetic as well as technological. The new Fishmarket was opened in 1893, on the site bounded by Bourke, Forbes, Wilson and Plunkett Streets. It had a fashionable exterior which concealed the advanced ideas inside. The Belmore Market was built where the Capital Theatre now stands. It appears that when the Market was later altered, the original building was rebuilt on a new plinth one floor high, and it is still there.

The Corporation Building which was opened in 1895 still stands and is one of the finest small buildings in the City behind the Capitol Theatre in Hay Street, even though the Council has done some unsympathetic repairs to it recently.

As City Architect he also designed small works which mostly disappeared, such as bandstands in Hyde Park and Wentworth Park, a fountain near Pyrmont, and even the trolleys for Belmore Market.

From the time he was appointed Principal Assistant Architect to the Government Architect, Walter Liberty Vernon, in December, 1897, he worked as part of a large team. McRae had particular interest in technological and architectural advances and was put in charge of special projects. He was also involved with Acts of Parliament relating to public safety when he was appointed to the committee in 1905 to investigate the welfare and safety of persons in public places.

When Vernon retired in 1911 George McRae became his successor as Government Architect until his death in 1923. In this office he was in charge of all Government building projects. His signature appears on all the plans which his office prepared. These include Police Stations, Post Offices, Court Houses, Hospitals in country towns; the plans for rebuilding the Rocks area which had to be pulled down at the outbreak of the Plague. His office was characterised by its versatility; it designed the plans for the Federation ceremonies, the surf pavilions at North and South Steyne and buildings for Taronga Park Zoo. In a more conventional line of work were the offices for the Department of Public Institution in the city. After the first World War, there were additions to the Fisher Library, the Treasury Offices and Central Railway, among a long list of other works.

There is not much known of McRae's private life. He married Katie Prescott, the daughter of a wealthy produce merchant in 1895. They had three children, two girls and a boy and lived in a three-storey house "Ringswold" in Glenmore Road, Edgecliff. He was a handsome man, with thick hair turning grey,

distinguished looking, always well dressed, well mannered and mixing in the right social circles, with a good reputation as an architect of taste. In his spare time he liked to fish, to read, he enjoyed music and painted watercolours, some of which are now in the National and Mitchell Libraries.

Morton Herman observed that "scientific and industrial progress was, at last, beginning to break down the conservatism of building techniques, and one of the leading protagonists of new methods was George McRae".*

McRae's great achievement was that he could design something structurally inventive, even if the style was not always imaginative but dependable and reassuring, with an occasional relieving dash of romanticism. This would probably also characterise the man himself.

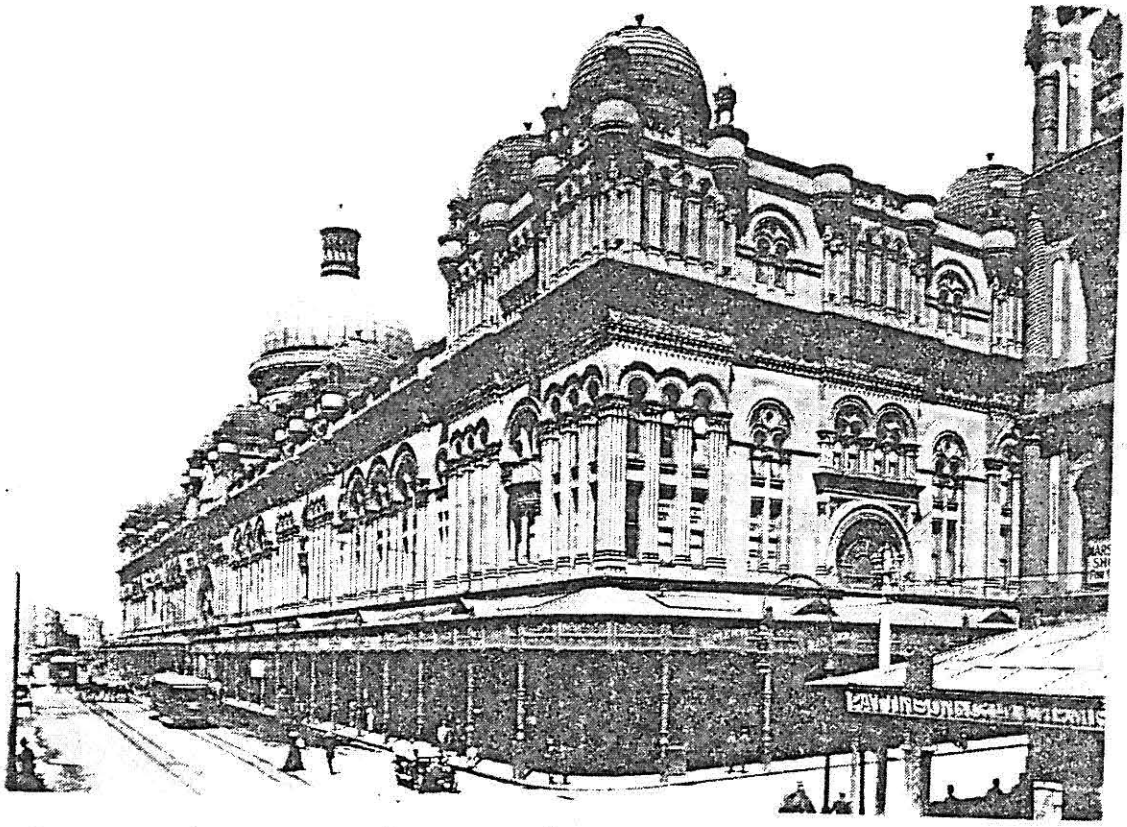
His work always mirrored the changing patterns of architectural thought. Viewed in relation to contemporary events, it was an integrated and characteristic expression of the period, and was always flexible and versatile.

Prof. Freeland says, "Architecture and building of 1879 were still basically medieval; the mechanics of architecture and building of 1890 were to all intents and purposes twentieth century. In that lies the unique and tremendous significance of the period."**

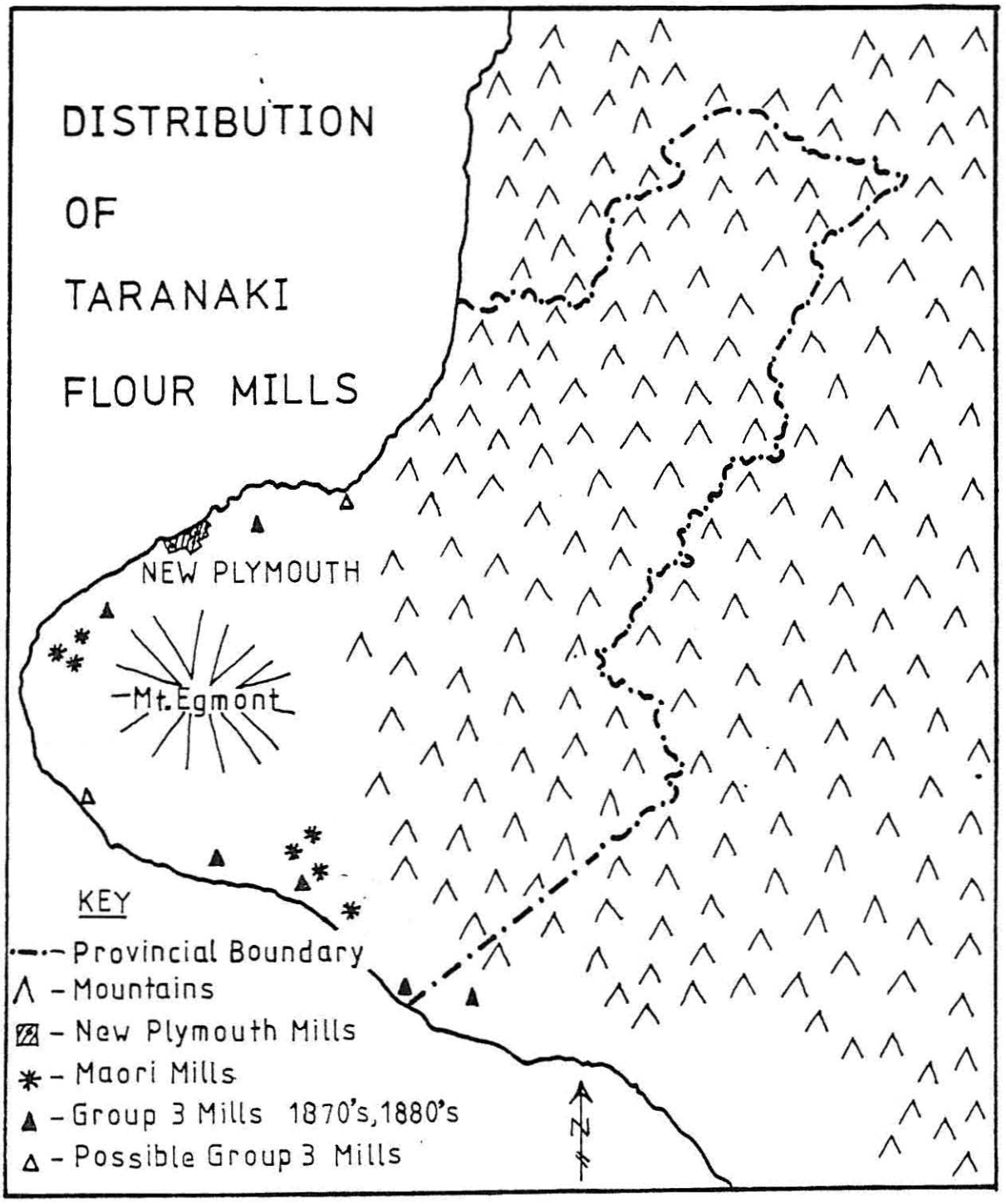
A comment which could sum up the significance of George McRae himself, the propagator of those modern building practices.

E.S.

* Morton Herman: The Architecture of Victorian Sydney, p. 138.
** J.M. Freeland: Architecture in Australia, p. 197.



Q.V.B. North-east aspect. C.1912 (N.S.W. Gov't Printer).


DISTRIBUTION
OF
TARANAKI
FLOUR MILLS
NEW PLYMOUTH
Mt. Egmont
KEY
Provincial Boundary
Mountains
New Plymouth Mills
Maori Mills
Group 3 Mills 1870's,1880's
Possible Group 3 Mills
N

V. THE FLOUR MILLS OF TARANAKI - A Background

Preface: I am presuming in this article, that Taranaki is virtually unknown to most of the people reading it. I therefore make no apology for the fact that it contains more history than archaeology, as the forerunner to future articles on specific mills.

Taranaki is one of the North Island provinces of New Zealand, largely self-governing until 1876. New Plymouth, where I now live, was the first settlement, and the provincial capital. Although since 1876, a little administrative relevance, some of the provinces, including Taranaki have kept a fairly distinct provincial identity.

One of the main reasons for this is Taranaki's geographical isolation. As you can see from the map, it takes up most of the large peninsula on the West Coast of New Zealand facing Australia. The dominant feature is Mt. Egmont (in Maori, Taranaki) - a picturesque dormant volcano, similar in appearance to Mt. Fujiama. Mt. Egmont is surrounded by a ring plain. Behind this, curving almost to the coast at the north and south boundaries of Taranaki, is the mountain range which covers most of the central North Island. Early settlement in Taranaki was therefore scattered around the coast (the inland plain being covered in dense forest) - separated from the rest of the island by mountains and forest to the rear, and sea in front. Overland travel is easier to the south, although there was no regular transport until 1871. The road to the north was not opened up until the late 1920s, and still does not make easy travelling. Much transport, even well into this century was by sea. But here again, there were difficulties. The coastline is for the most part rocky and inhospitable - no sandy beaches or deep protected inlets. The site of the first settlement of New Plymouth was selected for its land, in spite of its treacherous coastline. Until 1881, when the first breakwater was completed, passengers and goods had to be brought ashore by small boats. Wrecks and accidents to both ships and lighters were common. Ships destined for Taranaki, often had to pass by without stopping because of the weather.

The land around the coast of Taranaki has especially rich and well drained volcanic soil. Rainfall, between the mountain and the sea is good - if almost too good, and rather erratic. There are few other areas consistently as green. The typical Taranaki postcard is of fat Jersey cows on unbelievably lush green fields, with snow capped Mt. Egmont in the rear. Today, Taranaki and the dairy industry are almost synonymous. The countryside is dotted with small dairy factories of the late 19th and early 20th centuries (now being replaced by larger co-operative ventures), and freezing works on the coast slaughtering meat for overseas export are among the largest employers of labour. Crops are grown mainly for cattle feed - hay and some maize. Taranaki people now find it difficult to conceive of a time when flour milling was a major industry of the province, and optimistically expected to become vital export industry.

Prior to 1840, whalers had visited Taranaki and one, the enterprising Dicky Barrett, had married the daughter of a local Maori chief, settled down and based his operations here. Real European settlement, however, did not begin until the 31st March, 1841, when the first of the Plymouth Company ships arrived with its cargo of optimistic colonists. (It had been barely preceded by the first missionary to the area). The Plymouth company was set up in 1840, and its aim was to transplant a vertical slice of English society from Devon and Cornwall - socially and economically - to the New Zealand shores, along the lines set out by Edward Gibbon Wakefield. (His two brothers, Colonel William and Captain Arthur, in New Zealand played a part in the setting up of the settlement). Immigrants were to be carefully selected, with industrious lower classes to provide labour, and wealthier classes to provide capital for development - roughly equal numbers of men and women. Land sales were to be

artificially restricted, and prices fixed, so that people did not buy more than they had capital to develop, the settlement remain fairly compact, and the labouring classes remain labouring classes until they had worked hard to earn land. One of the serious flaws in the system, was that fewer men of capital were attracted to the scheme than were needed, and finance eventually ran very short.

I am enrolled at Sydney University as an M.A. student in Historical Archaeology, and for my thesis I am conducting a survey of the remaining evidence of the Taranaki flour mills. This has involved surveying and photographing sites where physical evidence of the mills existence remains; photographing the few pieces of mill machinery that remain in museums and private ownership; collecting documentary evidence from Lands and Deeds, Lands and Surveys, diaries and records of early settlers, local histories and newspapers; hunting for old photographs of the mills, and interviewing people who might remember the mills in operation, or be familiar with the sites.

Altogether, approximately 20 mills were built between 1843 and 1882. I have divided them into three main groups.

1. The New Plymouth mills - built between 1843, and the wars of the 1860s.
2. The Maori mills, built during the same period.
3. Mills outside New Plymouth built after the 1860 Land Wars, when land outside New Plymouth was opened up for settlement by Europeans and the new wave of immigrants arrived.

Shortly after the first ship-load of settlers arrived in New Plymouth, the first wheat was planted. In the geographical conditions I have described, it was important that the community become self-sufficient in foodstuffs as soon as possible. In terms of 19th century milling as they knew it, the Devon and Cornish settlers saw Taranaki as an ideal flour milling area - the soil was rich, there were innumerable fast running streams to provide water power, and beach stone thought suitable for millstones. One writer predicted in 1849 that Taranaki would become the granary of the South Pacific. Early crop returns justified this optimism. Prior to 1849, most wheat crops were yielding 30-35 bushels to the acre, whereas, according to the same writer, the average New South Wales crop between 1835 and 1844 was 14 bushels to the acre. Europeans, followed by Maoris launched enthusiastically into grain growing, as the major industry of the settlement - wheat, barley, oats and some maize. Plots were small by modern standards - the largest farm was 70 acres, most were 5 acre plots.

In 1843, two water powered mills were built in New Plymouth, on the same stream. The Alpha used entirely local materials and labour, the Victoria imported machinery, but as far as can be deduced, bothwere fairly primitive, and settlers quickly became dissatisfied. In 1846, there was a threatened riot outside the Victoria, when the millers attempted to raise their prices for grinding. In the same year, the Union Mill was begun as a co-operative venture, but changed later to a public company, and finally opened in 1849 under private ownership. Also a water mill, it was undoubtedly more sophisticated, but litte by way of description of its machinery remains. In 1853, another small mill opened up on a farm, then outside the township, known as the Blagdon Mill. About this time, it appears that the two early mills ceased to operate as flour mills, and the owner of the Alpha took over the Union. During the 1850s, the first doubts about the prospects of the train-flour industries were cast after a few bad seasons. The soil was losing its early promise, pest and disease problems were beginning to appear, and too much rain was falling at harvest time. Settlers were also hampered in their grain growing ambitions by lack of land. In August 1844, Governor Fitzroy had decided to revoke an earlier decision awarding the settlers 60,000 acres, and confined them to 3,5000 acres. Although later, additional land was purchased from the Maoris, the problem was a complex one, and caused considerable annoyance to the settlers. Maori owners of land around New Plymouth were beginning to understand the nature of European colonisation

more clearly, and consolidate in opposition to the sale of land to Europeans. War broke out in February 1860 over a disputed piece of land near New Plymouth in 1865. (Localised outbreaks continued until the 1880s). During the war, for the first time since flour milling began in New Plymouth, flour was imported in large quantities, instead of exported. Most grain growers were either involved in the battle, or their fields were not safe to work. The last of the New Plymouth flour mills was opened at the end of this phase of the war, with the prospect in sight of more land outside New Plymouth being opened up for cultivation. The Egmont Mill was by far, the most sophisticated and expensive of the New Plymouth mills costing £7,000 to build in 1866. There was much fanfare and optimism at the time of its opening. Unlike the other smaller mills, it was powered by steam instead of a waterwheel, and its owners were local businessmen, not working millers.

The site of the Alpha Mill is well preserved on a little public reserve near the centre of town, and could be well worth excavation, to solve problems, such as the purpose of the two visible stone walls, position of the buildings and date of demolition. I hope to write more about it at a later date. The millstones, cut from local beach stone, are held on another reserve. A private home stands on the Victoria site, and although the wheel pit depression is identifiable, there has been a lot of alteration to the site. The stone basement of one part of the Union Mill still exists under a motor cycle shop, but most of the mill site is covered by the central industrial area of New Plymouth. Although the approximate position of the Blagdon Mill is marked on an early map, the area has been developed for state housing and I have been unable to locate the specific site. The mill was destroyed by the Maoris in 1861, but was later rebuilt and operated again for a brief period. The Egmont is the only flour mill building left standing in Taranaki, and although it has been extended and modified for subsequent use as a department store, its original function can still be clearly seen in the basement and above ground floors.

During the same period, Maoris in Taranaki quickly jumped onto the grain growing/flour milling bandwagon. At first, they were encouraged by the missionaries, who saw the development of such commercial interests as a civilising force. Shortly, however, flour milling had developed into such a mania that missionaries regretted its introduction. Tribes played off missionaries of different denominations against each other in the race for mills, and church building was neglected. The Rev. Richard Taylor was forced to preach to one such tribe on the text "Man shall not live by bread alone" . At least seven of these mills are known to have been built around Warea and in South Taranaki, the first in 1846. They were built by European millers engaged with missionary help and the labouring was done by the Maoris themselves. Some of the tribes retained the miller to operate the mill. Although generally small, some of them used imported machinery and millstones. Most of them were water mills, although one of the Warea mills may have been powered by oxen. Information about them is scarce, and mostly comes from passing references in missionary diaries. Modern Maoris have no memory of them. Five sites have been identified, at Warea, Waitoto, Orokowhai, Mokoia and Taiporohenui. The Warea and Mokoia sites are in excellent condition. Two other mills in the Warea area have not yet been located. Four sets of millstones are known, but no other machinery. No contemporary photographs or drawings of the mills have yet come to light. As far as I can ascertain, these mills were either dismantled as military targets, or fell into disuse during the 1860s Land War. All reference to them ceases at that time. With the loss of much of their land, Maori morale and enterprise suffered a severe blow, and the war had taken up most of their time and energy.

As a results of the Land War, vast tracts of land were confiscated from the Maoris, and opened up for European settlement. At the same time, there was a new drive to attract immigrants. They arrived in large numbers and the province entered a period of renewed prosperity, barely dampened by the depression of the 1880s, when many other provinces suffered badly. The last group of flour mills were built during the late 1870s and early 1880s following the failure of the great flax boom of the late 1860s and early 1870s. (At least one, and possibly two flour mills were built in disused flax mills). Farmers and millers who were

beginning to have doubts about the viability of grain growing around New Plymouth, apart from maintaining local supply, now fixed their hopes on South Taranaki - the builders of the Egmont in New Plymouth, at a time when they were beginning to have financial difficulties with the New Plymouth mill, plunged further into debt to build a mill in South Taranaki, in the belief that the future of grain growing in Taranaki lay there. There are five mills definitely placed in this group, at Sentry Hill (1876), Kakaramea (1876), Tataraimaka (1878), Hawera (the Tawhiti, 1881), and Manaia (1882). Another flour mill was erected in 1877 at Waverley, just over the Taranaki provincial border, and more closely related historically to South Taranaki, than to the Wellington province in which it is officially placed. Two flax mills, at Opunake and Urenui (to the north of New Plymouth) are said to have been converted to flour milling, but evidence is slight. I have often heard people mistakenly refer to flax mills as flour mills, because the flax industry is less familiar.

The sites of all these mills are known. At Sentry Hill, the miller's residence, dam, race and turbine shaft are all in good order, but the site of the mill itself has been bulldozed. Some of the machinery is held by the local museum of transport and technology, who are hoping to restore it. The Tataraimaka Mill site is in good order on a dairy farm. There is a curious series of small stone terraces near the probable position of the mill house, which I have been unable to interpret. This was the smallest of this group of mills and appears to have operated mainly to provide a service for grain growers on surrounding farms. The miller's residence at Kakaramea was standing until a fire last year, but the whole of the mill area has been bulldozed and the stream rechannelled. The race of the Tawhiti Mill can be followed for some distance, but the dairy factory and bacon works which succeeded the mill on the site have completely obliterated any evidence of the mill itself. The Waverley Mill was demolished and the dam reconstructed for the town water works in 1907. Nothing visible remains of the mill. The Manaia Mill site is in a good state of preservation, and remains of the concrete building for grinding grain for animal fodder, which replaced the earlier wooden flour mill, (in 1900), are clearly visible from the main road. The dam can be located in the middle of a swamp, and the race followed. This mill was originally operated by a water wheel, as were the Tataraimaka, Waverley (Pelton wheel), and Kakaramea mills, but when the wooden building was demolished, a Turbine was introduced. Tawhiti, and Sentry Hill (for most of its working life) were also powered by turbine. Sentry Hill and Waverley were the only mills in Taranaki to replace millstones with steel rollers.

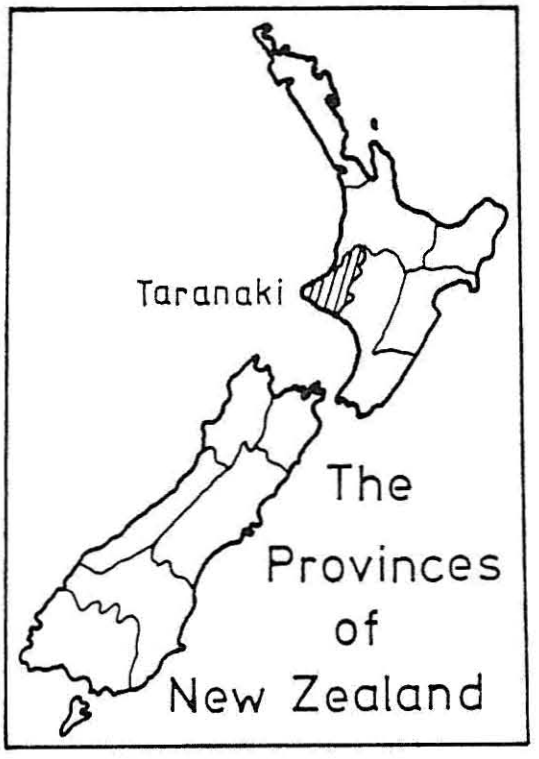
By the 1880s, the more perceptive were already beginning to cast doubts about the future of the grain growing/flour milling industry anywhere in Taranaki. They suggested that the land was better suited for grazing, and further, that grain growers were betraying the province by wasting the potential of the land. Even these critics, however, were agreed that at the very least, the province should ideally be self-sufficient in grain and flour - although this had been far from being the case since war broke out in 1860. Better quality and more cheaply produced flour was arriving in quantity from the South Island and Australia, in spite of transport problems, however the problem, as always was capital. It was felt that the province could not afford to send money out for any product that could be possibly produced in Taranaki. The great bonanza that Taranaki settlers had always hoped for - oil from obviously oily soil, iron from the black iron sands or mythical gold from the surrounding mountains - had not occurred.

When the Hawera and Manaia mills were built in 1881, 1882, the writing was already on the wall. Although seasons varied, they often had difficulty purchasing sufficient good quality grain from local farmers to keep then running. People were beginning to show a preference for imported flour, even though dearer because of transport costs. Newspaper articles were written exhorting the public to save the province's capital and buy local flour. At the beginning of the 1890s, there were two mills operating in New Plymouth (the Egmont and a renovated Union) and six of the mills built outside New Plymouth. By the turn of the century, the Sentry Hill Mill was the only one left. It continued to operate until 1935, for

the last ten years owned by a large South Island milling firm and grinding mostly South Island grain. It owed its continued existence to a law designed to protect small mills, rather than to real commercial viability.

There were a number of factors involved in the failure of the flour milling industry in Taranaki. There were the immediate local problems much discussed in contemporary newspapers - caterpillars, later the small birds introduced to get rid of them, fungus diseases, soil exhaustion and the unpredictable weather at harvest time. Behind these however, and less well recognised at the time, were the massive changes taking place world wide in the grain growing and flour milling industries. The factors which had made Taranaki seem so ideal a place for the industry in the 1840s, did not apply by the turn of the century, as the new technology, which had come to the fore much earlier in other places, reached New Zealand. Harvesting machines made their appearance in Taranaki in the late 1870s. They proved much cheaper to use than manual labour - but unfortunately, it was difficult to operate the huge machines in Taranaki because of the multitudinous small hills of volcanic formation and mountain streams, often in flood at harvest time. The introduction of steam power, then gas and electricity, made the fast running steams needed for water power redundant - mills could now be replaced by metal rollers. Meal from the softer varieties of wheat grown in moist areas tended to clog up the more sophisticated machinery, and harder wheat from dry areas was sought. It was for this reason that the Sentry Hill Mill refused to buy local wheat in any quantity in the 1920s even when it was offered. On all these counts, Taranaki lost out. The 1880s saw the introduction of refrigerated shipping, giving an enormous boost to the fledgling meat and dairy industries, and once the breakwater was completed in 1881, these ships could anchor here on a regular basis. The completion of a freezing works at the harbour shortly after, had the new grazing industry well on the way in, and the end of the old grain growing and flour milling industries in sight.

R.O.



VI. RECORDING OF ENGINEERING AND INDUSTRIAL HERITAGE SITES ADAPTED FROM FIELD INSTRUCTIONS OF THE HISTORIC AMERICAN ENGINEERING RECORD (HAER)

1.0 Introduction

The essential aim of the work is to document important engineering and industrial sites and structures effectively. It is done by a team which normally consists of an engineer, a historian, and an architect who possess different backgrounds, interests and expertise. The work will only be successful when their skills are applied to the task so that each complements the others; cooperation and sharing information is essential if success is to be achieved. On arrival at the site, the team will often encounter a number of mysteries or puzzles: the function of a particular structure or artifact may not be easily recognized. It may not be known why it is there, when it was made, or what it did. Alternatively a missing object may be the mystery, what fitted into the empty room, or on to the remains of a foundation. What was there? What did it do? Unknowns must not be ignored; they are often very important.

The process of recording a site has much in common with good practice in acquisitioning and preserving objects for a museum. Artifacts are three dimensional objects which after proper examination can tell us much about the people who made or used them; they can tell us how people spent their time, performed tasks, earned their living, used materials, and shaped and worked the finished articles.

Occasionally sites can be preserved by a current compatible and sympathetic use, sometimes as a museum, occasionally as ruins. Most will probably be completely destroyed and their information lost unless they have been adequately recorded; this is in many ways, the functional equivalent of physical protection. Reports, photographs and drawings, like artifacts in a museum, store information on past human behaviour.

Provided the right questions are asked and answered; documentation has some advantages over physical preservation: the site and its function can be explained; documents are the results and summary of research. They have definite limitations; texture, heat light, colour and sounds are hard to record on paper.

1.1 Documenting technological sites and structures

There is no set formula for each site differs and requires its own specific treatment. The basic questions are usually:-

What was there?
Why was it there?
How did it work?
Why did it take the shape it did?
Who did the work?
How did the site change through time?

Finding answers requires good detective work: the following advice is usually helpful when time is short:-

(i) Decide on the questions which seem most applicable; establish an historical point of view; develop a strategy or plan of attack.

(ii) There are often a number of sources of data: but start with the site itself. What questions does it raise? Then examine manuscripts, published materials, historic graphics and knowledgeable local people who worked on or at the site.

(iii) Adapt to the available data: if information in one area is scarce, turn to another.

(iv) Record information by the best means available; recognizing that written reports, drawings and photographs have both strengths and weaknesses. A written report explains best why a site was chosen, a drawing describes more precisely its situation: photographs show clearly durability, texture and workmanship. In general historians (and engineers) should use graphics extensively; architects should use script as well as lines on their drawings.

(v) The report concerns a particular site; it must at all times feature in the foreground: regional or national developments may be relevant, but are essentially background supporting material.

1.2 Analysis and description of location

A site, situated on property with real boundaries, may be analysed in terms of:-

(i) Topography
(ii) Geology including foundation problems
(iii) Climate
(iv) Resources including minerals, building materials and supplies of water, power, fuel etc.
(v) Natural or man-made barriers
(vi) Transportation systems
(vii) Utilities such as water, electricity, drainage
(viii) Land values
(ix) Markets and capital
(x) Labor
(xi) Zoning ordinances, regulations, taxes
(xii) Community and business services

1.3 Analyses of contents

A site may contain one or many structures; some may already have been demolished; some may be important because of what they are, or what they did, because of rarity or alternatively because they are typical examples of a once common structure. Their importance may be in who built it, used it, or what it looks like. Significant questions include:

What is it?
What was its function?
When was it built, manufactured, destroyed?
Who designed it, engineered it, built it?
How much did it cost?
Of what materials was it made and why?
How was it made?
How did its form relate to its function?
What machinery or process did it house?
How many people worked on it or in it?
What products were made?
What processes were carried out?
How long did it remain in service?
Is it rare or unusual?
Is it typical of an important but now scarce type?
Is it associated with significant individuals, inventions or events?
How much did the individual item contribute to the economics or technology of the site, structure or process.

1.4 Analysis of a work place

Some of the questions to be asked are:

What machines or tools are or were present in the structure?

Who manufactured the equipment and when?
How much skill was required to operate the machinery?
What was the source of power for the machinery?
How was this power transmitted through the site or buildings?
What tasks were performed?
What were the products?
What materials and resources were used?
How were they processed or shaped?
What were the working conditions, e.g. heat, light, ventilation, fire prevention, air pollution, noise?
What was the size of the labour force?
What different occupations and trades were involved?
Where did the labour force come from?
What was their composition ethnically or by sex and age?
Were children employed?
Was the labour force exploited?
Was the venture profitable?
How were the profits and rewards distributed or shared?
Whenever a site is complex and an assemblage of work-places, investigate their inter-relations and inter-dependencies.

1.5 Temporal and Technological Changes

The site, especially when used for a long time, will have survived many changes, and much wear and tear. An enterprise may be successful for a time, it grows, changes its machinery and processes. Competition forces it to change.

Not all changes are equally important; select the most important which are generally;

the initial development
the zenith of its development
the final period of collapse.

Look for changes in ownership or internal organisation, the arrival of innovative people, changes in the local and national economy, changes in markets, the growth or decay of competitors, fires, explosions, strikes. Try to find out -- who instigated or resisted changes and why? Did the changes come from inside or outside? What new machinery or processes were required?

1.6 Impacts

A site was often part of a larger community; What effects did the site have on this community? Did the goods or services provided have regional or national significance? Were new products or technologies developed at the site and subsequently adopted by others? What effect did the site have on the environment and "quality of life", locally and regionally?

1.7 Intangibles

Human actions are not always logical and rational: cultural values and personal quirks can be significant: these should be considered and evaluated where possible.

1.8 Conclusion

These areas of enquiry do not constitute a formula for evaluating sites. Use this list to generate an appropriate strategy for the particular site and set of resource materials under consideration.

D.A.C.

VII. RECENT MARITIME ARCHAEOLOGICAL INVESTIGATIONS IN NEW SOUTH WALES

In the last year, a number of wreck sites have been investigated by the authors under the auspices of the Maritime Archaeological Association of New South Wales. These are part of an ongoing programme of wreck inspection. Two sites have been completed (Alexander Berry and Rose of Australia) and two more are still in progress (Royal Shepherd and Catherine Adamson).

ROYAL SHEPHERD: (wrecked 13th July, 1890)

History

In 1853 Messrs. Blackwood and Gordon of Paisley on the Clyde in Scotland built two ships for the Launceston and Melbourne Steam Navigation Company for operations in Bass Strait. One of these was the Royal Shepherd (O/No. 31714) and the other, the Black Swan (O/No. 32181).

The Royal Shepherd ran on the Launceston-Melbourne run averaging up to 48 hours. In 1865, the Tasmanian Steam Navigation Company took over the Launceston-Melbourne Steam Navigation Company together with its ships including the Royal Shepherd. Sometime between 1865 and 1876 she was sold to a nine man syndicate trading in the Spencer's Gulf. In 1876 this syndicate became known as the Spencer's Gulf Steamship Company Limited. This Company traded until 15th December, 1882 when it amalgamated with the Adelaide Steamship Company. However, the new Company could not keep all their ships in full employment and at various times in 1884 and 1885 instructed Eldred, a Sydney shipbroker, to sell the Royal Shepherd for £2,800. He was only able to get £800 for her. She was sold to Joseph Mitchell who, on the 29th October, 1885, raised a £901.16.1 mortgage from the Adelaide Steamship Company. This mortgage was discharged on the 11th October, 1886. Prior to this in June, 1886, J. J. Cattanach trading as the Cattanach Chemical Co. bought her and used her for carrying refuse and sewage from Sydney to outside the Heads for dumping. Then, in August, Cattanach took out a £3,000 mortgage from William Alexander Manning who immediately transferred the mortgage to the Mercantile Bank of Sydney. The mortgage lapsed in October, 1889 'due to unfortunate circumstances' as reported in the press[1], forcing the Mercantile Bank to sell the Royal Shepherd of 31st October to Charles George Warburton. He used her in the coal trade until January, 1890 when she was sold to W. A. Firth. Under this ownership, she was used to bring coal from South Bulli and Bellambi to Sydney[2].

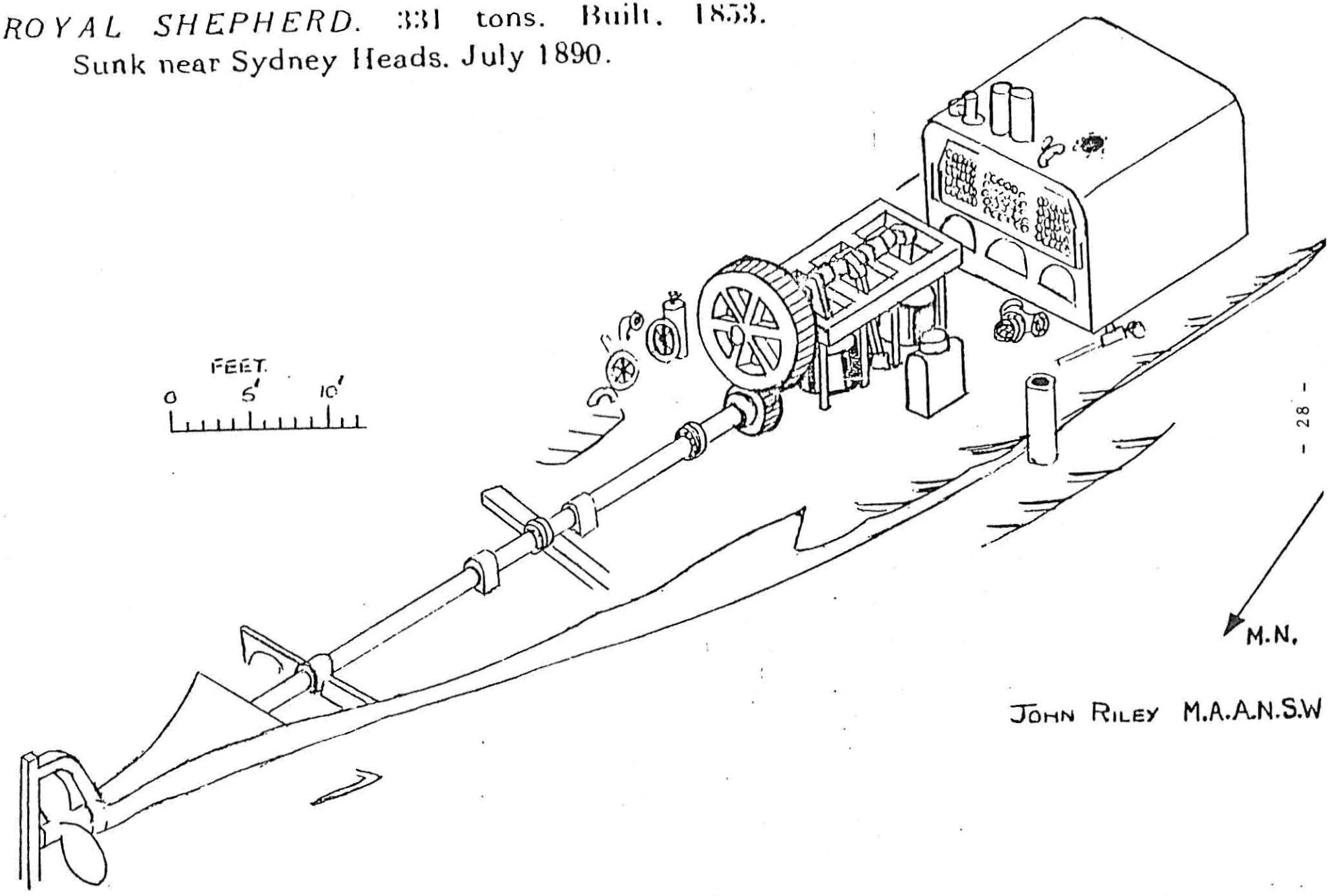
The Wrecking

The Royal Shepherd was outbound from Sydney for South Bulli and Bellambi on the on the 13th July, 1886, with the schooner Countess of Errol in tow. Between 11pm and 12 midnight, the crew sighted the steamer Hesketh approaching. Shortly after the Hesketh struck the Royal Shepherd on the port side amidships. The Royal Shepherd began to sink immediately so her crew went aboard the Hesketh while the ships were locked together. Ten minutes later the Royal Shepherd sank[3].

Technical Details

s.s. Royal Shepherd	76/1885 Sydney Register previously 1/1865 Port Adelaide
139.9' x 19.8' x 10.5' engine room 31. 6'	
Tonnage:-	
Underdeck tonnage deck	233.63
Poop	35.64
elongation of poop	61.38
	358.61
Deductions (propeller space, and crew)	104.03
	226.58

S.S. *ROYAL SHEPHERD.* 331 tons. Built. 1853.
Sunk near Sydney Heads. July 1890.



JOHN RILEY M.A.A.N.S.W

Steam Screw built at Paisely, County of Renfrew in 1853 by Blackwood and Gordon.
1 deck and poop
2 masts, schooner rigged
square stern
iron clench built on iron framework
female bust head
two engines oscillating by Blackwood and Gordon
diameter of cylinders 38' h.p. 60 nominal
Speed 10 knots on 22 tons (coal) per day
Could carry up to 50 passengers

Significance of Vessel

The Royal Shepherd was a fairly typical small iron coaster of the middle of the 19th century. She reliably served many owners in diverse places and trades for nearly 40 years, descending from passenger and general cargo to tramping, cattle boat and garbage scow. Her last employment was as a collier - a familiar story to aging ships overtaken by technology. She will provide much information on mid-19th century marine engineering which is, as yet, poorly understood as little in the way of plans, diagrams and records have survived, especially of the smaller ships. Little archaeological work has been done on this type of vessel, yet these vessels are almost as poorly documented as the 17th century Dutch sailing vessels.

The Site

The site lies in 27 metres of water off South Head Port Jackson, and as such poses a number of technical problems. For reasons of safety, considering that none of our divers are professional divers, we decided not to allow dives which require decompression, so bottom time has been limited to 20 minutes per diver per day. So far only 8 days have been spent diving.

The Royal Shepherd is lying on sand at an almost even keel. The length of the site is 42 metres, however little is visible above the sand. At the south end of the site is a winch which was originally near the bow. Further north and working aft on the wreck is the boiler (box type), then there is a twin oscillating engine with gearing to increase the number of revolutions. The propeller shaft plus propeller are, at times, visible. Around the propeller there are the stern and rudder posts. Remains of the hull can be seen from the stern to the boiler. A small pump and other machinery lie to the port of the engine. A hot well and large steam valve are to starboard.

Our work until now has been concentrated on recording the details of the machinery as these are at risk from divers acquiring souvenirs. It is well known and a popular dive spot. The isometric drawing has been produced from the measurements so far made. Photographic recording is also under way but, due to the wreck's location near the Heads, visibility is usually very poor - often less than one metre[4]. So far, only the oilers and some details of the boiler have been photographed; we are waiting for a good day to produce a photomosaic.

In the near future, a more accurate ground plan will be produced in preparation for the laying of a grid for recording artifacts which are appearing from the sand.

CATHERINE ADAMSON: (wrecked 24th October, 1857)

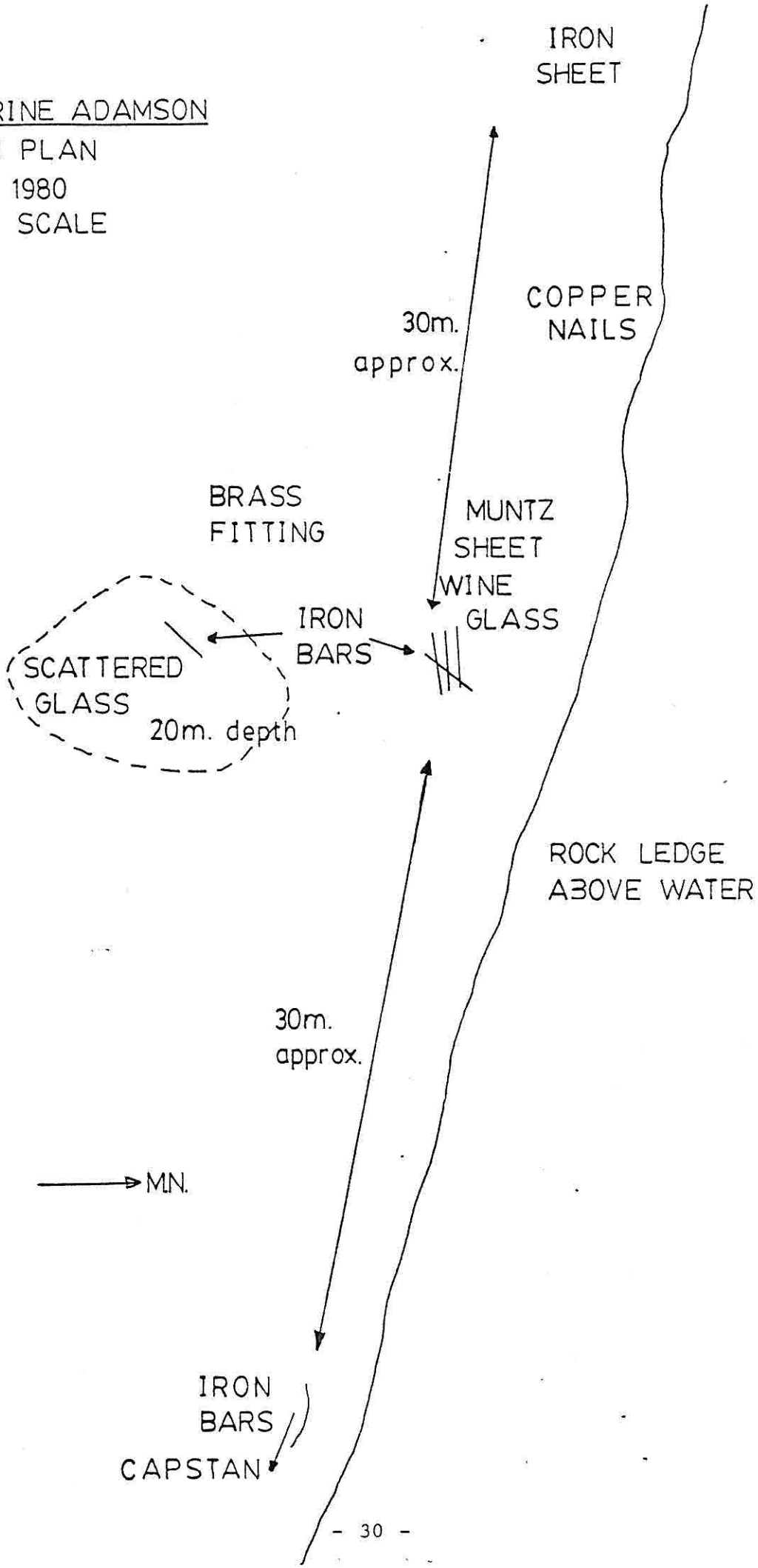
History

She was a ship rigged clipper built in 1855 at Aberdeen for H. Adamson, for use on the Britain-Australia run[5].

Wrecking

At 9pm on 23rd October, 1857, she entered the Heads of Port Jackson with Pilot Hawkes in control. Due to the strong S.W. breeze she had double reefed topsails, courses jib and spinnaker. She made several tacks across the Heads. But after going about on the port tack was struck by a heavy squall forcing the crew to reef the mainsail and foresail. This tack had her heading for North Harbour. The wind began to moderate forcing the crew to reset the foresail to keep way on,

CATHERINE ADAMSON
SKETCH PLAN
MARCH 1980
NOT TO SCALE



however, in the process the foresheet carried away. It was not possible to set the mainsail so the ship had insufficient steerage and started to drift rapidly to leeward. Both anchors were then dropped, all sails were clewed up and furled. The crew, at this stage, thought the ship was safe. When the steamer Williams under Captain Creagh entered the Heads, the Catherine Adamson burnt blue lights and sent up rockets as signs of distress.

The Williams managed to get a hawser aboard the Catherine Adamson twice but the first broke and the second had to be shipped. About 3am on the 24th heavy rollers began to come from the Heads and the ship's stern swung very close to the rocks. At approximately 3.30am the ship's keel hit the rocks several times. The crew began to transfer passengers to the Williams. The Captain of the Catherine Adamson then went aboard the Williams in the life boat. Immediately after this, the boats were swamped and destroyed, leaving a number of people aboard the Catherine Adamson. She soon went to pieces and 21 lives were lost including passengers and the pilot[6].

Salvage

Almost immediately salvaging began on the wreck. The cargo included bales of cottons, woollens, worsteds, flannel, muslins, umbrellas, parasols, hats, counterpanes, clothing, agricultural implements, machinery, 9,876 gallons of rum, 4,376 gallons of brandy, 1,873 gallons of white wine, 74 barrels of bulk beer[7]. Parts of the cargo and the ship were scattered throughout the bays of Port Jackson. A number of people were prosecuted for failing to hand in articles they had found. Divers were quick onto the scene and brawls developed between competing divers, but eventually most of the cargo was salvaged.

She was then forgotten until the mid 1960s when she appeared in the headlines again. Sometime in 1964, two local divers found the wreck and tried to keep its location a secret. Then in May, 1965, Ben Cropp found the wreck and he began to salvage the remains[8]. Since then, the Catherine Adamson has become a popular dive spot among Sydney divers.

Significance

The Catherine Adamson is an example of the type of ship which maintained the lines of communication of the Colony with the centre of the Empire during the gold rush period. In the 1850s sail still predominated on all international Australian routes. The clippers were the prestige craft of the '50s carrying both passengers and cargo. In the 1850s, the exports of England to Australia quadrupled[9] and the cargo of the Catherine Adamson is typical of the range of goods being imported into New South Wales at the time. This typicality along with its position near to Sydney which meant that it was at risk, decided us to make an inspection to record what had been left after many years of gradual destruction by both sea and man.

The Site

The site lies in water ranging from 2 metres to 20 metres off the locality known as Old Man's Hat on North Head, Port Jackson. So far only two dives have been made involving approximately 10 divers. The visibility is usually no more than 4 metres with a continual strong surge buffetting the divers. The bottom consists of large boulders with twisting gullies and holes. There is no sign of the hull structure remaining and on the scale Muckelroy developed for wreck sites in British waters, based on topography (% of bottom sedimentary deposits), deposit (range of sediments), slope (average over the whole site), sea horizon (sector of open water for 10+ km.) and fetch (maximun offshore distance),[10] the Catherine Adamson would be a Class 4 site in a scale of 1 to 5. Class 4 is described as more than 10% of bottom being sedimentary deposits; range of sediments being boulders to sand. Slope average being less than 8% (this is not strictly correct in the Catherine Adamson as the slope becomes quite steep at approximately 10 metres), the sea horizon ie. the sector of open water for 10+ km. being more than 30° and the fetch or offshore maximum distance more than 250km.

A sketch plan has been made and is continually being added to as the bottom sediments move. In the conditions prevailing it is practically impossible to make an accurate survey of the area nor is it at present warranted.[11] Artifacts are found in holes, sand catchment areas and in any place where the surge is minimised by the shape of boulders.

The major problem with the site is that, not only the Catherine Adamson was wrecked in the area but that a number of other ships have been wrecked in the general region, for example the Annie, a 470 ton barge on 29th June, 1858; the Emily Horst, a sailing vessel on 12th October, 1861; the William Hill, a 109 ton brig on 28th November, 1865, and the Julia, a 60 ton schooner on 11th August, 1873. None of these wrecks has been located and the possibility exists that part, at least, of their remains are mixed in with those of the Catherine Adamson.

Future work will consist of more mapping, limited artifact recovery and more attempts at photography. Unfortunately, conditions so far have not been conducive to successful photography. The only significant artifact recovered so far is a sheet of Muntz metal. Muntz metal was a patent alloy developed for sheathing wooden hulls to protect them from the various marine organisms, such as toredo, which attack wood. This piece has regular nail/tack holes showing how it was attached to the hull. Lloyd's register for 1856 indicates that the Catherine Adamson was sheathed in yellow metal, i.e. Muntz metal on top of felt. Other artifacts recovered have been wine glass bases, nails and tacks. Significantly, glass is not very common on the site. It is worth quoting a newspaper report of 25th May, 1965, describing what Ben Cropp found when he started diving on this site. 'They swam around the wreck for hours and recovered pewter mugs, coins, a sextant, a cannon, brass bells, cutlery and broken pottery'.[12] After 15 years of diving on the site it is a very different story.

ROSE OF AUSTRALIA: (wrecked 22nd January, 1874)

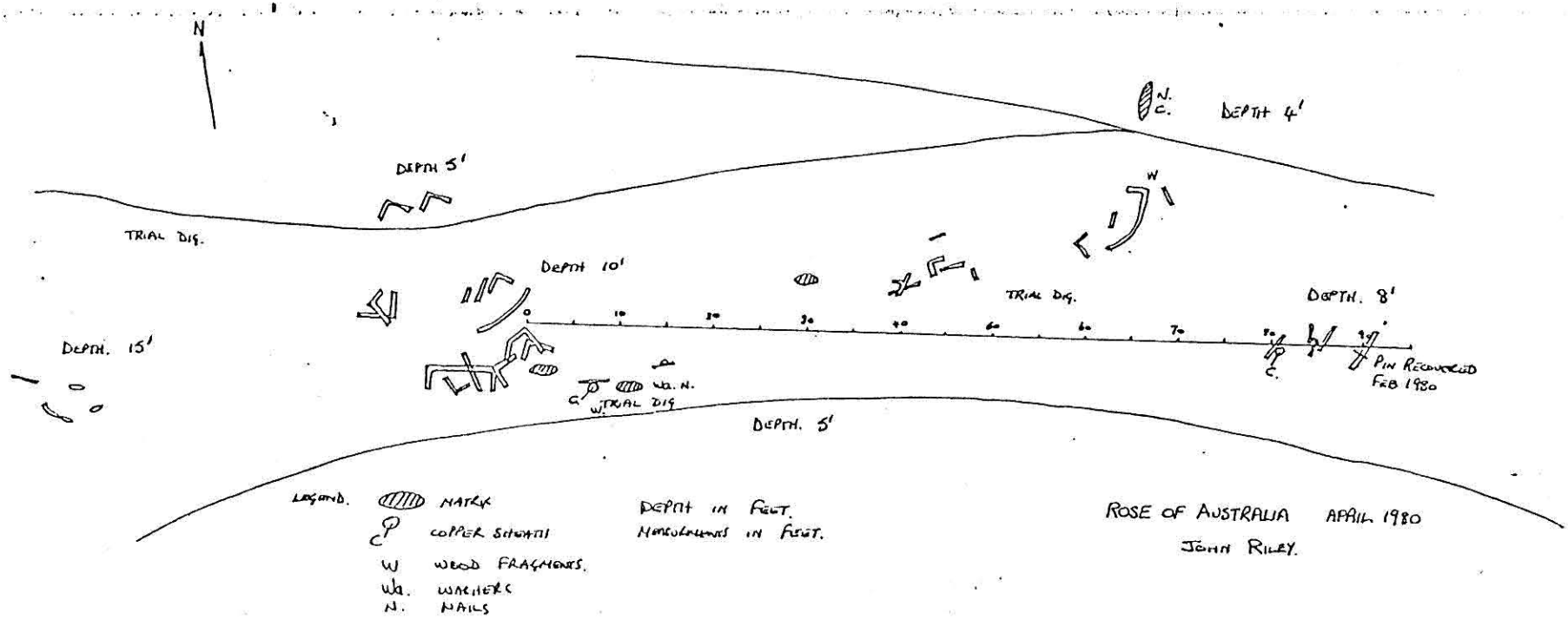
History

The Rose of Australia was a wooden brig of 261.72 tons 98.9' x 26.2' x 16.2' built at Gateshead, County Durham, England in 1862. She was first registered in Australia in 1864 at Newcastle, N.S.W. when her owner was William O'Hagen, master mariner; in July, 1864 he took as a partner R.R.S. Bowker of Newcastle. Then in June, 1867 William O'Hagen sold 16 of his 32 shares to James Munro. Bowker bought Munro's 16 shares in February, 1868. The final share arrangement was reached in March, 1869 when Charles B. Desborough has 21 shares and R.R.S. Bowker 43.[13] Charles Desborough was the master of the vessel when she was wrecked and a George Desborough (relationship not traced - brother?) was Second Mate. The Rose of Australia made a number of trips between Melbourne, Sydney and Newcastle and prior to the wreck had been to Foo Chow.[14]

The Wrecking

She was sailing from Melbourne to Sydney in ballast, leaving Melbourne on 15th January, 1874. The last land they saw was, according to the Master, Point Perpendicular. This was on 21st January, 1874. On being asked why they had been wrecked in Wreck Bay some 9 miles south of Point Perpendicular the Second Mate, George Desborough, blamed a particularly strong current which took them south whilst the ship was sailing north at 7 knots.[15]

On the 22nd there was a strong gale from the SSW with short squalls - 'thick dark, rainy weather'.[16] The Second Mate was on watch when the crew reported land ahead but he thought it was cloud. Later he changed his mind and called the Captain who came on deck. Captain Desborough was also not certain whether it was land or cloud and gave the order to wear ship. Unfortunately he picked the wrong tack and almost immediately she went ashore. Erik Olsen was at the helm at the time of wrecking and states that the officers did not know where they were when she went ashore.[17] No one was killed as everyone got ashore by a plank. The vessel was insured for £2,600 with the Sydney Marine Office.[18]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W WOOD FRAGMENTS.
Wa. WASHERS
N. NAILS
DEPTH IN FEET.
HORIZONTALS IN FEET.
ROSE OF AUSTRALIA APRIL 1980
JOHN RILEY.

A letter written by the local Sub-Collector of Customs reports that the crew was beginning to salvage gear.[19]

Significance

The Rose of Australia is typical of the craft which made up the bulk of the coastal fleets which ran between the capital cities of the Australian Colonies. As the history of this vessel shows these craft would also make the occasional run to ports throughout the Pacific. They were the general workhorses of the internal maritime trade of Eastern Australia.

The Site

In February, 1980 the site was located by the authors using directions from a letter concerned with the Marine Board of Inquiry and information from a local abalone fisherman.

The wreckage lies in a shallow gully beside a small island and is strewn in general East-West direction. Nothing indicating bow or stern has been found but working from the wreck reports it is assumed that the bow is in the east. The gully is rock with a covering of natural stones mixed with small, smooth pebbles used as ballast and shellgrit. Iron knees and other pieces of iron lie over the area. pieces of copper sheath, nails, washers and small fragments of wood and pottery were also found in the sediment overlay.

The absence of fittings, anchors, rudder pintles and gudgeons suggests that the wreck was dismantled after going ashore as it would have been easily accessible in calm weather.

At Easter 1980 a site plan was produced and photographs of all the iron fittings were taken (see diagram). Although the site would classify as Class 2 on Muckelroy's scale from environmental attributes, it is very disappointing from an archaeological point of view. It has clearly been very thoroughly salvaged.

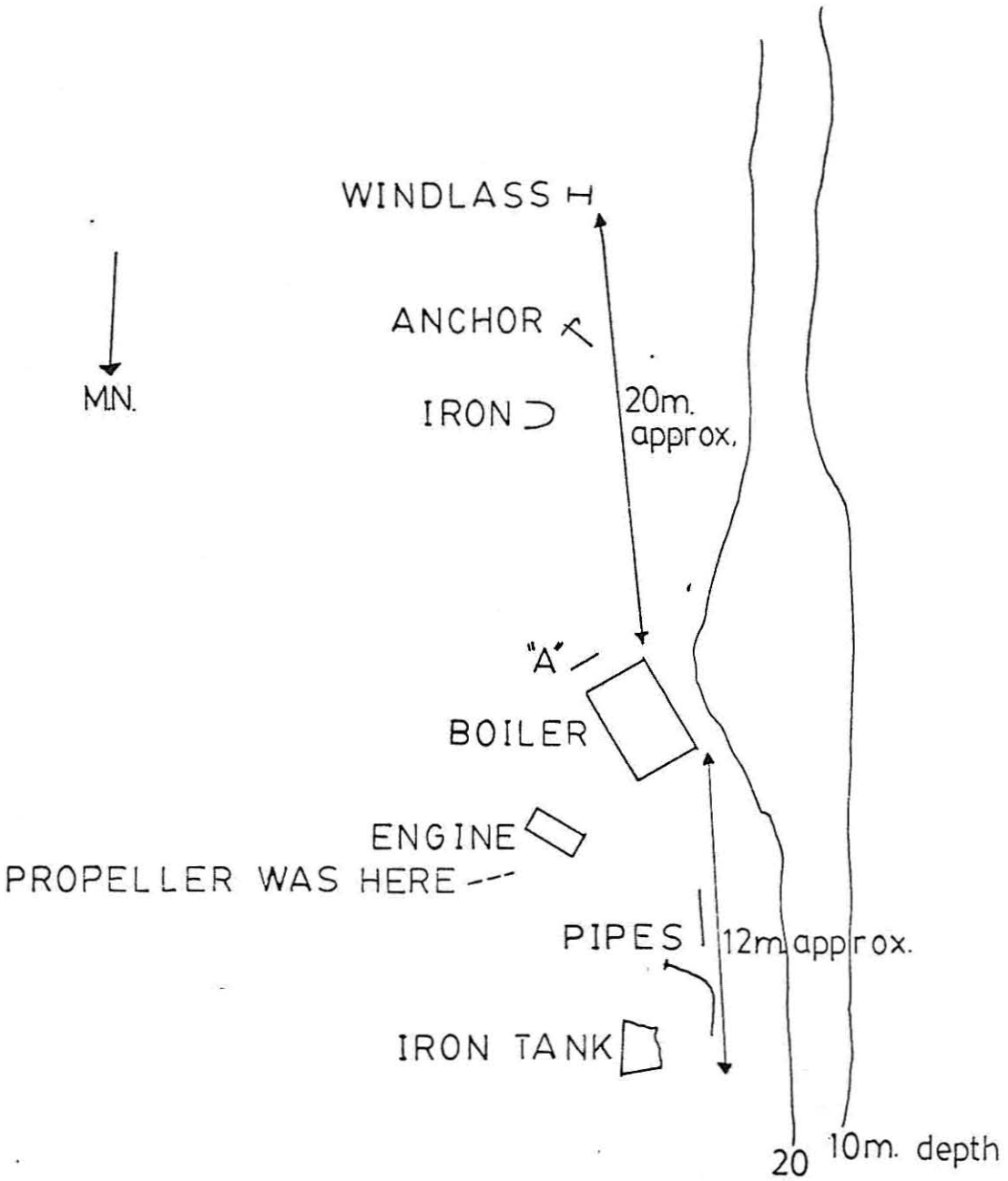
ALEXANDER BERRY: (wrecked 1st June, 1901)

History

The Alexander Berry (O/No. 69740) was a steam drogher built in 1873 at Pyrmont by James Bower & Co. for the Illawarra Steam Navigation Company. She was named for a director of the company who had died in 1870. She was 42.36 net tons, 80.6' x 15.4' x 5.2' wood with an elliptic stern, billet head, two masts, schooner rigged. The engines were two direct acting high pressure cylinders with diameters of 9 inches and a stroke of 10 inches with a rating of 20 h.p. James Bower not only fitted the engines but built them.[20] She was used on the Shoalhaven River running from Nowra to Greenwell Point.[21] A late photograph (date unknown) taken at Nowra Wharf shows that she was at some stage cut down from a schooner.[22] It also shows her function very well. The main vessels of the I.S.N. Co. would unload at Nowra either onto the wharf or directly onto the droghers which would then distribute the cargo up the river. They were not intended for coastal work although they would often be forced to make coastal passages from one river to another. She remained in this company's hands right up to her wrecking in 1901. In 1898 she had had some £700 spent on making her seaworthy.[23]

The Wrecking

She left Shoalhaven on the 30th June, 1901 for Merimbula. Heavy weather forced her to take shelter at Abraham's Bosom about eight miles south of Gerringong. There she anchored but at half past nine the anchor cable parted and the gale drove her out to sea. At midnight the rudder head broke leaving the vessel without steerage. The crew used the booms from the mast in an attempt to steer her by dragging them astern, however this failed. The seas were continually sweeping the vessel, carrying away anything loose. She eventually drifted onto the rocks at the extreme end of Long (or



ALEXANDER BERRY
SKETCH PLAN
APRIL 12, 1980
NOT TO SCALE

Bass) Point. She seas lifted her clean over the rocks and deposited her in a small bay on the other side of the Point where she went to pieces and sank. There were only five men on board, namely Captain Marshall, the engineer Mr A.J. Bartlett, the fireman Mr Walter Pearce and two able seamen Mr John Pratt and Mr John Jansen. Only Mr Pratt survived.[24]

The Site

The wreck was discovered by two local divers Mr Ludvic Lieske and Mr Ray Pike. After seeing a poster advertising the Maritime Archaeological Association of N.S.W. they contacted John Riley requesting information as to what they should do with the wreck. So on 12th April 1980 a group of divers from the Association went to Wollongong to investigate the wreck and advise the finders as to correct procedures. The finders had already raised the propeller, stern tube and the bronze shoe of the stern of the keel. The site is lying in 23 metres of water off the North side of Bass Point. The bottom is rock over which there is a continually moving shell grit, sand and pebble sediment. During the four dives made at the site, on only the first was there sufficient exposed to record any details of the engine boiler and winch.

From the sketch plan it is clear that the hull had broken apart before settling on the bottom. It would appear that the vessel struck the rock cliff to the west of the site before being carried over the first rocks she had struck and then broke up scattering the machinery and fittings in a disjointed pattern.

The Artifacts

There are a number of significant artifacts, some of which have been raised, others are still in situ. These show the type and standard of machinery fitted to the river droghers. The boiler is oval with a single stoke hole. The engine has twin high pressure cylinders of 9" diameter (note the specifications of the register list 9" cylinders - a good identification feature.) The propeller and stern gland plus shaft is 9.1' long and shows a very rough and ready design typical of the small local engineering workshops. Note in particular the unsophisticated design of the propeller. Also raised was a bronze shoe 3.8' long which fitted around the stern end of the keel. The purpose of this was to protect the propeller blades when the vessel grounded - a frequent occurrence with the river droghers. On a later dive fitting 'A' was raised. This was found on the first inspection dive and was at risk. Its function is provisionally suggested as a pivot shoe for a derrick or crane.

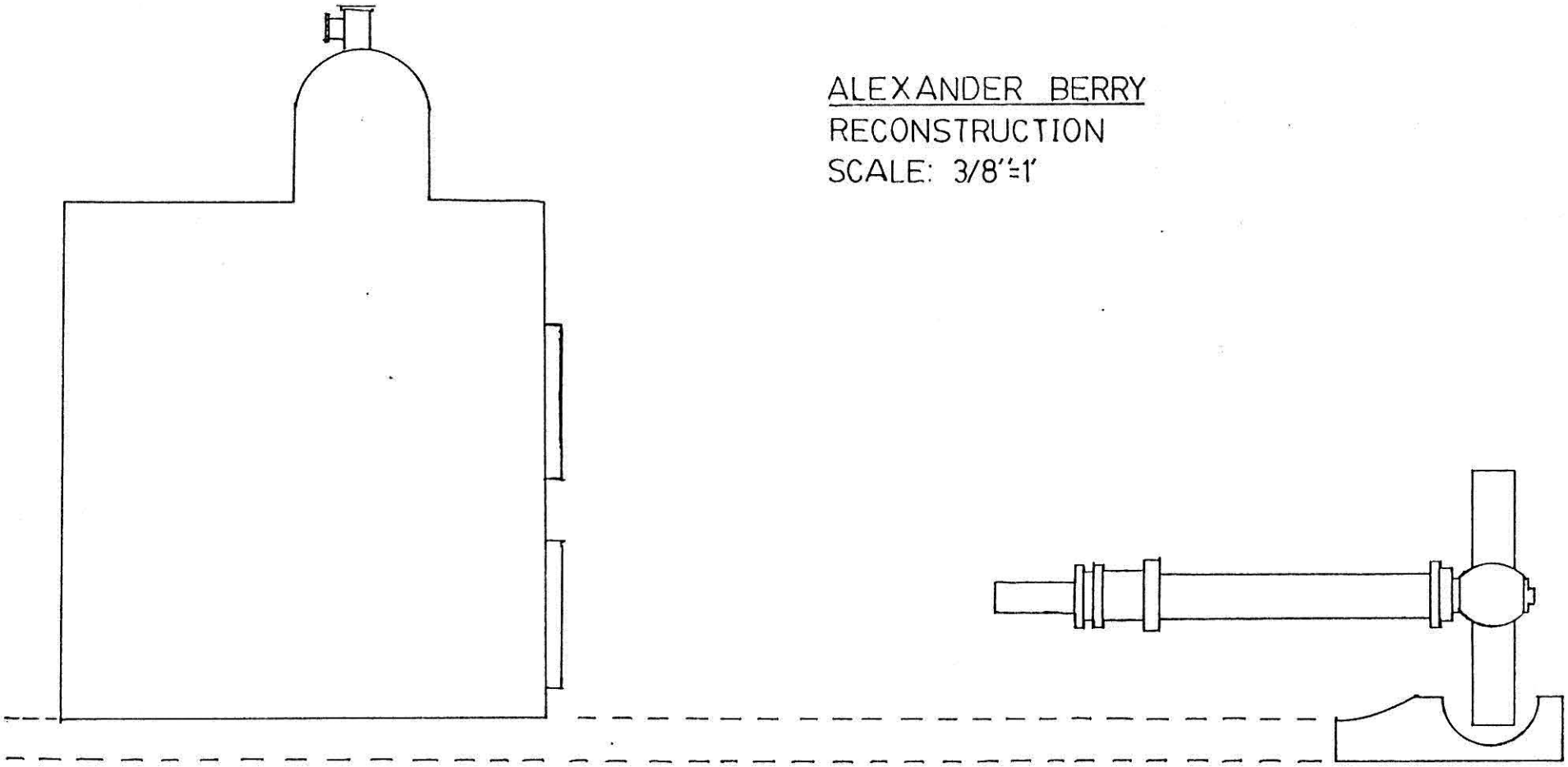
No further work is intended for this site at present. It is quite important as one of the best examples of river droghers machinery known and as such should be protected. Fortunately the finders took a very responsible attitude to this wreck and so prevented an archaeological disaster so common in diving history e.g. the Dunbar.

Conclusions

The preceding reports show a large part of the range of material available along the New South Wales coast. The Maritime Archaeological Association intends continuing this programme. Expeditions are planned to the Maitland wrecked at Maitland Bay, the Wauhope II at Port Stephens. It will also respond to any reports of wrecks and requests for advice.

As yet no intact wooden hulls have been inspected but it is anticipated that in the near future two sites will be recorded. These sites show the value of wreck inspection which is the most fruitful area of research for bodies with little or no funding. It also has great value in extending diver's recording skills.

M.S.
J.R.


ALEXANDER BERRY
RECONSTRUCTION
SCALE: 3/8"=1'

Notes

1. Sydney Morning Herald, 14th July, 1890.
2. History based on M. Page, Fitted for the Voyage, D. Gregory, Steamships Past and Present, Register of British Shipping at Sydney, Folio 76/1885. Sydney Morning Herald, 14th July, 1890.
3. Sydney Morning Herald, 14th July, 1890.
4. Being a non-funded body we are not able to afford the expensive underwater photographic equipment which would allow us to work in these conditions, e.g. a Nikonos with a 15mm uw-Nikkor lens, the cost of which is approximately $2,000 a unit.
5. Lloyd's Register of British and Foreign Shipping, 1856.
6. Sydney Morning Herald, 26th October, 1857, 28th October, 1857, 30th October, 1857 and 4th November, 1857.
7. Daily Mirror, 24th May, 1965, Australian, 25th May, 1965.
8. Ibid.
9. J.S. Bach, A Maritime History of Australia, p. 94. A.G.L. Shaw, The Economic Development of Australia, p. 78.
10. K. Muckelroy, Maritime Archaeology, p. 164.
11. P. Baker & G. Henderson, 'James Matthew Excavation', International Journal of Nautical Archaeology, 1979, Vol. 8:3, p. 229, for discussion on the degree of accuracy required.
12. The Australian, 25th May, 1965.
13. Register of British Shipping at Newcastle, Folio 7/1864.
14. Sydney Morning Herald, 24th January, 1874.
15. Court of Marine Inquiry, Evidence of George Desborough, 1874.
16. Court of Marine Inquiry, Evidence of Captain G.B. Desborough, 1874.
17. Court of Marine Inquiry, Evidence of Erik Olsen, 1874.
18. Desborough, op. cit.
19. Letter of Sub-Collector of Customs, Shoalhaven to the Collector of Customs, Sydney, dated 26th January, 1874.
20. Register of British Shipping at Sydney, Folio 6/1874.
21. Illawarra Mercury, 11th July, 1901.
22. Held by Nowra Historical Museum.
23. Illawarra Mercury, 11th July, 1901.
24. Ibid. 4th July, 1901.
    Kiama Independent, 2nd July, 1901.

VIII. W.F. MORRISON'S ALDINE CENTENNIAL HISTORY OF N.S.W., 1888: THE VOLUME II BIOGRAPHICAL SECTION; AN UNTAPPED HISTORICAL SOURCE.

The potential of the biographical section of the Aldine Centennial History in, social, industrial, commercial and family history research is enormous. The biographical section when taken in toto covers in detail the lives and enterprises of individuals over about a forty-year span, though in some instances events are taken back into the late eighteenth century.

The biographical sketches concentrate largely on the working life of the subject, this is especially so if the subject is listed under one of the major cities such as Sydney or Newcastle. Many of the Sydney sketches read much like advertisements, for example, Askew and Co., 'wholesale and retail providers and general agents, 80 Oxford Street', lists by name more than two hundred products offered for sale.

If the sketch is of a company one can expect the following sort of information; name of company, line of business, year of founding, changes in name and ownership, brief history of the founder (when and where born, educated, apprenticed and employed), information on products, processes and machinery used, prizes awarded, future plans, etc.

In personal sketches the following information may be expected; name, date and place of birth, (occasionally parentage and family connections are indicated), education and training, detailed history of work experience, travel (overseas, interstate, goldfields, etc.), societies and churches patronized, details of marriage and offspring.

For those researching builders and architects of N.S.W. there are in excess of 150 biographical sketches (75 of them are in Sydney alone). Many of these sketches are quite detailed, giving information on where the subject was born, educated, to whom apprenticed or articled, business partners, major works and major achievements.

Many useful details emerge from some of the biographies; Mr E. Vickery, according to his sketch, 'is reputed to be the first colonist to introduce the more massive and ornamental style of architecture, having in 1864 erected the large stone buildings in which his business is conducted, and in 1870 the adjoining pile now occupied by Messrs C. Newton Bros and Co'. (In 1888 Newton Bros were listed as being at 80, 82, 84 Pitt Street.)

Though the 1880s was a decade of invention and great enterprise, many of the booming industries were obliterated during the disastrous depression which started in 1893. Little is remembered of these industries which could have made the colony independent of so much of its imports had they been allowed to develop. The Centennial History at least preserves a shadow of that era.

Morris Brothers, engineers, are an example of an advanced industry at its height in 1888. The firm specialized in making machinery, they outshone any similar subsequent efforts for about thirty years after the 1893 depression. They constructed hydraulic machinery and hoists for the 'new General Post Office', travelling cranes, 14 h.p. horizontal engines, flour and saw mill machinery. In 1888 they had just completed a double press brick machine for their brick plant at Merrylands, (probably the first constructed in the colony), and they had patented a 'dry, cold and freezing machine'.

When researching a nineteenth century Australian industry it is often the custom to consult the various post office and trade directories. The directories should reveal from year to year the name and the address of an industry and hence one may take an educated guess as to the life span of the industry.

An interesting test case can be made by comparing the data on an industry covered in the Centennial History with the data taken from Sands' directories. As an example I took Rupert Cook, brickmaker, as a test case. He is first listed in the Sands' directory for 1863 as a brickmaker at 'St Peter's Newtown'. In 1865 he is listed at Marrickville (where he seems to remain for the rest of his working life). Cook disappears from the directories until 1837 and is next listed in 1884 and from then on till the turn of the century. This is fairly skeletal information; we don't know whether he worked alone or if he was the manager/owner of a brickyard or whether the gaps in the directories have any significance etc. A summary of his entry in the Centennial History fills in many of the gaps. The sketch begins with his brick business at Marrickville about 1865 which continues until 1873 when he left for England to work as a brickmaker 'under the corporation of the city of Manchester'. Cook returned to the colony ca. 1880 and in 1881 established his 'present business' at Marrickville. He employed about thirty hands. All of Mr Cook's work was done with machinery 'of the latest improved description'. He produced common bricks, white double pressed bricks (of high repute) and ornamental and terra cotta works 'of all kinds'.

Nearly all trades and professions are well covered. There are over sixty sketches of timber merchants and forty of brickmakers. Other trades and industries covered include iron-founders, tin and galvanized iron works, decorative iron works, potteries, lime works, stone quarries, marble and monumental works, mining, food industries etc. Professions include bankers, lawyers, journalists, doctors, ministers and politicians. Land owners, stock agents and farmers were also well represented.

For the researcher of family histories the Centennial History is of special value for, apart from supplying names and dates, it etches out the high points and career of an individual's life. The biographical sketches vary quite considerably as to the details of family relationships. Entries listed under large cities such as Sydney and Newcastle have very little family content except in incidental cases where a son succeeds to the business or in the case where a father or grandfather originally established the business. Country sketches tend to have more family content, giving dates and places of birth, death and marriage, names of wife and in-laws, and the number of issue. In rare instances three to four generations are represented, and in even rarer instances descent from illustrious individuals or families in Great Britain and Europe are included. The ancestors of the Liardet family of Sydney are well represented from the seventeenth century onwards. Mrs Caroline Liardet, it is stated, 'could trace her pedigree from the foundation of Rome'. Most of the lives presented in the Centennial History are a little more modest but there is a strong emphasis on the word 'pioneer' which seems to have been used more loosely than it is today. The term as it is used in the Centennial History may amount to an antiquity of twenty to thirty years.

There are a number of problems encountered when using the biographical section of the Centennial History. Firstly, the sketches are arranged under the heading of towns and cities, neither of which are in any perceivable order; secondly, there is no index attached to the publication; thirdly, the biographical section is unpaginated; and fourthly, there are few versions with identical contents in terms of the areas covered.

The biographical section may contain anywhere between 150 to 250 pages. Even the number of biographical sketches under town or city headings vary. In one version Sydney has 132 pages of entries, another has 62 and another has but a total of 16 pages.

It appears that when the Aldine Publishing Company collected the biographical sketches they found themselves with more entries than they could cope with. The decision made was to stagger the entries into volumes intended for different areas, this accounts for the many versions and the decision not to

paginate. Most versions seem to begin with 'Albury and Vicinity' or with 'Wellington', probably in an effort to make the publication appear uniform. The next six or seven towns listed seems to indicate the area for which the particular version was intended, after that the grouping of towns or areas appear to be chosen at random from anywhere in N.S.W.

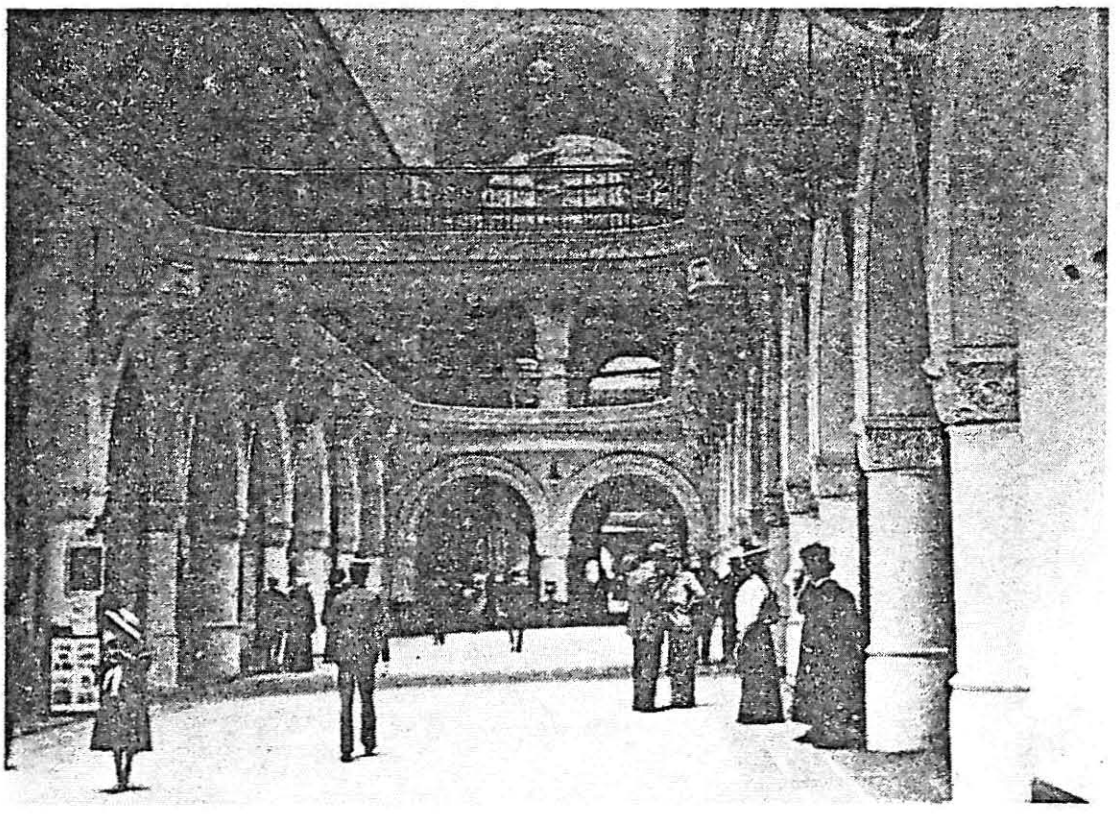
Using a 'control' such as the inclusion or omission of certain details I was able to conclude that each area must have had an agent representing the Aldine Publishing Company. It appears that the agent collected the information for each sketch on the basis of a number of prepared questions. Some areas consistently leave out all birth dates and places and mention few family details, while other areas are meticulous in these details. Some areas are specific as to the exact place of birth while other areas are consistently vague. The same was noted in cases of marriage or statements about children.

The primary attraction of the biographical section rests on the fact that the only prerequisite one needed for inclusion was the payment of a modest fee. This means that one may expect a coverage of all sections of the community, 90% of whom would have been excluded from any edition of Australia's Who's Who. The veracity of any one sketch is based only on the honesty of the subject and the possibility of community censure in the case of untruth.

There have been similar publications since the Aldine Centennial History of N.S.W., some of which are wholly biographical, for example; W.F. Morrison's Aldine History of South Australia, 1890, vol. II, (partly alphabetical); James Smith's Cyclopedia of Victoria in three volumes, (1903, 1904 and 1905, indexed); and T.H. Burgess' Cyclopedia of South Australia in two volumes, (1907 and 1909, also indexed).

The problem now is in tracking down as many versions of the Centennial History in order to compile a complete biographical set. It is anticipated that an index of names may be ready for reference work by the end of this year.

R.V.J.V.



QVB Interior of Avenue, looking south from north end. C 1910. (Tyrwell Collection.)

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A T H O M E

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