



The mystery objects

Mystery solved

ASHET's Yahoo group is an email forum for members to share information, ask questions and share responses. Group member Ian Rae recently sent an email attaching two photographs of objects that a friend from the Maribyrnong Council had been unable to identify, and asking for help. The photos are of objects that came from the University of Melbourne Archives. Another group member, Peter Benkendorf, replied:

'I can tell you what the top two items are. These are Le Chatelier moulds for the testing the soundness of cement. There is a description of the moulds in AS/NZS 2350.5 Soundness of Portland and Blended Cement.

'Le Chatelier actually started as an engineer (his father was an engineer) but later turned his efforts to science and chemistry. His testing for soundness dates to the 19th century in the early part of his career. The moulds could have been used by Prof. Kernot but I suspect that they are much more recent and were in use in the 1960's

'The other items in this photo appear to be some kind of tamping rods. In the slump test AS1012.3.1 the concrete has to be rodded. Here is a description:

"4.2 Rod The rod used for compacting concrete in the mould shall be a metal rod of 16 ±1 mm in diameter, approximately 600 mm long and having at least one end tapered or a distance of approximately 25 mm to a spherical shape having a radius of approximately 5 mm."

"This seems to fit the description of the second rod from the top."

If you are not yet a member of ASHET's Yahoo group, and would like to consider joining, send an email to Ian Arthur, secretary of ASHET at sec@ashet.org.au and you will receive an invitation to visit the group's website and join if you wish. There is no cost involved.

Oil shale: a part of New South Wales mining history

There is a common theme to three of the ASHET events in early 2011. On Tuesday 22 February, Ian Jack, President of both ASHET and RAHS, will talk on *Oil Shale and the Age of Kerosene*; on Tuesday 23 March Leonie Knapman will talk on *Glen Davis and Shale Oil*; and in a weekend tour on 2-3 April, we will visit, with Leonie as guide, the remains of the oil shale industry at Glen Davis, 200 km north west of Sydney.

Oil shale was once seen as a highly promising source of liquid fuels. It is a sedimentary rock rich in hydrocarbons, which can be extracted by heat, and then refined to produce kerosene. Deposits in various parts

of the world have been exploited commercially, including in Scotland, France and several parts of New South Wales, at Joadja, Hartley Vale and Glen Davis. The costs of mining and processing make it an expensive source of liquid fuels, compared with crude oil, and these days oil shale deposits are worked in only a few places, notably Brazil, China and Estonia, mainly for local production of electric power and for cement making.

There is now no commercial oil shale mining in Australia, although huge deposits exist, particularly in Queensland, where in the years after the Second World War a vigorous effort was made to establish an industry.



Ruins of the oil shale works at Glen Davis

Ian Jack speaks with authority having done extensive field work on the remains of the industry in Scotland, France and New South Wales. Leonie Knapman grew up in Glen Davis and has researched and written books on the industry in New South Wales. Her most recent book, *Glen Davis in the Blue Mountains: the shale oil ghost town and its people 1937-1954*, was published in 2010 by Halstead Press.

For details of the ASHET/RAHS events, go to the listing of events on page two of ASHET News.

In this issue

Mystery solved	1
Oil shale: a part of New South Wales mining history	1
ASHET events	1
Early New South Wales patents: index now on line at ASHET website	3
Engineering Heritage award for ASHET member Michael Clarke	4
Book review	
Not just a wide brown land: urban planning in Australia	4
Twenty years ago; Nyngan's biggest flood	5

Next ASHET event

Saturday 12 February 2011

Tour: Kurrajong Radio Museum

Ian and Pat O'Toole have together 60 years of teaching experience which is reflected in the meticulously curated and documented display of radio technology in the Kurrajong Radio Museum. Multiple display boards and item descriptions trace the history of radio with particular relevance to Australia and guide the visitor through the collection. Ian will illuminate the history with an entertaining talk including anecdotes and practical demonstration of radio transmission and recording systems.

Ian's addiction to the air-waves began as a youth with crystal sets and has led to this collection of hundreds of hobby, domestic, professional and commercial radio items and systems including a broadcast studio and ship's radio station. The armed services display (from Australia, USA and elsewhere) is among the most comprehensive publicly available. Google "Kurrajong Radio Museum" for more illustrated information.

This is a joint activity of ASHET and the Royal Australian Historical Society.

Venue: : 842 Bells Line of Road, Kurrajong Hills. Right hand side, 8.5km beyond Nepean River crossing. Parking on and adjacent to site.

Time: 10.30am to approx 12.30pm. Individuals may stay on if they wish. There are numerous possibilities for lunch or picnics in the area.

Cost: \$12.00

Bookings: phone RAHS on (02) 9247 8001 or email history@rahs.org.au

More ASHET events

Tuesday 22 February, 2011

Talk by Ian Jack

Oil-shale and the Age of Kerosene

Mineral oils transformed the second half of the nineteenth century, producing such basic commodities as lubrication for steam engines and kerosene for lighting and other purposes. There were two sources for mineral oils: the oil-well and oil-shale. Whereas wells produced crude oil ready for refining, oil-shale had to be dug out of the earth like coal and then retorted to extract crude oil. The refining process was common to both, but only oil-shale required retorts.

Ian Jack, who has done extensive field-work on oil-shale

sites in Scotland and France as well as Australia, will talk about the oil-shale industry and in particular the variety of designs for the retorts, both horizontal and vertical. He will demonstrate the international importance of the physical remains on sites in New South Wales, especially Joadja and Hartley Vale, with a glance at the later technologies surviving at Murrurundi and Glen Davis.

This is a joint activity of ASHET and the Royal Australian Historical Society.

Venue: History House, 133 Macquarie Street, Sydney

Time: 5.30 for 6 pm

Cost: \$8.00 Includes light refreshments on arrival

Bookings: phone RAHS on (02) 9247 8001 or email history@rahs.org.au

Wednesday 23 March, 2011

Talk by Leonie Knapman

Glen Davis and Shale Oil

In 1937, the National Oil Pty Ltd, a mining company, was established as a response to both the unemployment of the 1930s and to the jeopardy of Australia's oil supplies in the event of war. The multitude of problems that the refinery faced finally led to the closure of the mine in 1952, threatening the livelihood of many of the mining families in Glen Davis. This former oil shale mining town lies in the Capertee Valley north east of Lithgow in the Blue Mountains. The manufacturing of oil from shale has a long history in Australia.

Mining historian and former Glen Davis resident Leonie Knapman will be presenting this talk on the history of the mining village of Glen Davis between the 1930s to 1950's. Leonie has spent much of the last 25 years researching the history of oil shale mining and retorting in New South Wales and has become recognized as an international expert in this area. Her fifth book, *Glen Davis in the Blue Mountains: the shale oil ghost town and its people 1937-1954* is a culmination of almost 30 years of research.

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Venue: History House, 133 Macquarie Street, Sydney

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Bookings: phone RAHS on (02) 9247 8001 or email history@rahs.org.au

Saturday 2 April–Sunday 3 April, 2011

Country tour: Glen Davis and Rylstone locality

Glen Davis is the site of a government sponsored oil shale mine and processing plant that operated from 1940 to 1952. A model town was built to house the workers. There are interesting relics remaining and Leonie Knapman, an RAHS member who is an expert on the history of the oil shale industry in New South Wales, will be our guide.

We plan to stay overnight at a motel in Kandos and on Sunday visit nearby Rylstone, which has interesting buildings and a museum, and the historic Dabee homestead near Rylstone.

200 km from Sydney, Glen Davis is renowned for its scenery as well as its historic associations. Those with time to stay an extra night might wish to visit other attractions in the area including Lue pottery, Mudgee, Gulgong and wineries.

ASHET is organising this tour; members of RAHS and others are welcome to join in the tour. Tour participants will arrange their own transport, meals and accommodation.

Register your interest: To register your interest and receive further details, phone RAHS on (02) 9247 8001 or email history@rahs.org.au. More details will be available early in 2011, and will be sent to all those who register an interest.

Thursday 28 April, 2011

ASHET Annual General Meeting

The Annual General Meeting will be brief. Prior to the meeting, all ASHET members will receive an agenda for the meeting and proxy information by mail or email.

Venue: History House, 133 Macquarie Street, Sydney

Time: 5.30 for 6 pm

The meeting will be immediately followed by a joint meeting of ASHET and RAHS: see details below.

Thursday 28 April, 2011

Talks by Matthew Connell and Rob Renew

The Tote – the invention and global success of the automatic totalisator

An 1913 an enormous mechanical calculator linked to 30 ticket terminals was installed at the Ellerslie Park racetrack in Auckland, New Zealand. This was the world's first automatic totalisator, a system capable of adding records of bets made simultaneously on many horses in a race, keeping running totals of the bets on every horse and of the total 'pool' of bets, and calculating the dividends payable to successful punters.

Our talk will trace how George Julius, a railway engineer, invented and improved the automatic totalisator and established Automatic Totalisators Limited, the company known as ATL. Over a period of 60 years ATL installed precision-made totalisator systems in racetracks first in Australia and then in numerous other countries. Tote betting transformed and popularised the gambling experience for punters, and provided a financial lifeline to struggling state, provincial and city governments around the world, creating a dependency on income from legalised gambling which continues today. The automatic totalisator is now recognised as a major advance in the history of computing technologies, and is arguably Australia's most distinctive and enduring contribution to this field.

Matthew Connell was Curator (mathematics & computing) and Rob Renew was Senior Curator (engineering & design) at the Powerhouse Museum in 1994 when they first inspected the 'lost' ATL archive and arranged for it to be brought into the Museum's permanent collection.

This is a joint activity of ASHET and the Royal Australian Historical Society.

Venue: History House, 133 Macquarie Street, Sydney

Time: 5.30 for 6 pm

Cost: \$8.00 Includes light refreshments on arrival

Bookings: phone RAHS on (02) 9247 8001 or email history@rahs.org.au

Early New South Wales patents: index now on line at ASHET website

In August this year ASHET received a NSW Cultural Grant of \$1,000 to assist with a project to provide a searchable on-line index to early New South Wales patents. The work has now been completed and the index is on line at <http://ashet.org.au/downloads-3/>.

This index provides the names and brief descriptions of the subject for all the Registrations of Inventions in New South Wales, from the first, in 1855, up to 1884, a total of over 1,200 items. For most of these, the complete specification of the inventions are available in printed form, with reproductions of the original drawings, are available in the State Library of New South Wales. The introduction to the on line index has information on how to access these records.

The work of compiling the index was undertaken wholly by ASHET, employing a competent contract typist for the data entry. The source of the information for the index is the records held by the New South Wales and Victorian State Libraries.

This set of patents includes many of major historical significance. It includes the patent for the world's first successful refrigerating machinery granted to James Harrison of Geelong, Victoria, and the patents covering the design by Eugene Nicolle of Sydney for the plant in the world's first refrigerated cold stores, established by Thomas Mort in Sydney and Bowenfels to serve the frozen meat trade which he pioneered.

Many of the patents relate to the mining, mineral processing and agricultural industries and record the development of important industrial processes and machines. These include wool presses by Humble and Nicholson, harvesters by Furphy and sheep-shearing machines by

Wolseley. There are also a group of patents that cover the key inventions relating to railway brakes, to which Sydney engineer Norman Selfe contributed.

The inventor with the largest number of patents in this set is Thomas Edison, with 31 patents covering electric lamps, phonographs, telephones and electricity generation. There are six patents granted to George Westinghouse covering the development of the Westinghouse railway brake. But most of the patents in this set were granted to Australians, with the largest individual number being 15 to Eugene Nicolle, mostly for inventions related to ice-making, refrigeration and food preservation.

This index is a part of ASHET's Patent Project, which aims to facilitate access to historic Australian patents, particularly those for the colonial period, for which the records are rare, fragmented and relatively difficult to search. In this project we are co-operating with others who share the interest, and in particular David Yandell at the State Library of Victoria and Gavan McCarthy, an ASHET member, at the University of Melbourne. A progress report on this project is on the ASHET website at <http://ashet.org.au/downloads-3/>

Engineering Heritage award for ASHET member Michael Clarke

Engineers Australia has recently awarded one of its highest honours, the John Monash Medal, to Michael Clarke for his contributions to engineering history and heritage.

Michael's contributions included the production of a set of oral history records of Australian engineers. There is a collection of these interviews in the State Library of New South Wales. He has regularly conducted walks around Sydney, and produced several brochures of self-guided engineering heritage walks. He has also been active in the program of placing commemorative plaques on items of heritage significance. He has served for many years on committees of the Heritage Council of New South Wales and Engineers Australia.

Michael is a foundation member of ASHET and for two years served on its committee.

Book review

Not just a wide brown land: urban planning in Australia

Urban Nation: Australia's Planning Heritage. By Robert Freestone. CSIRO Publishing; 322 pages; \$79.95

Gough Whitlam remarked that Australia is one of the world's most urban nations. And certainly, urban planning has been a feature of Australia almost since the British colonies were established. The early governors arrived with instructions on the orderly planning of settlements and were provided with surveyors to ensure they were implemented.

Governor Phillip had his surveyor Augustus Alt produce a plan for Sydney based on a large public space at Sydney Cove and an avenue 60 m wide terminating at the site for a Government House on a ridge near Wynyard Park. However the plan was soon forgotten and development of Sydney town proceeded in a haphazard fashion. The governor established his house by the Tank Stream. Governor Hunter arrived in 1795 to succeed Phillip, to find the settlement in a sorry state, with streets impassable in the wet, uncontrolled land clearing and siltation beginning to affect Sydney Cove. He managed at least to secure large tracts of land as public reserves, on the sites of the present Government House and the Botanic Gardens.

Governor Macquarie, (1810–1821) began a number of projects that between them established the form of central Sydney. He also made

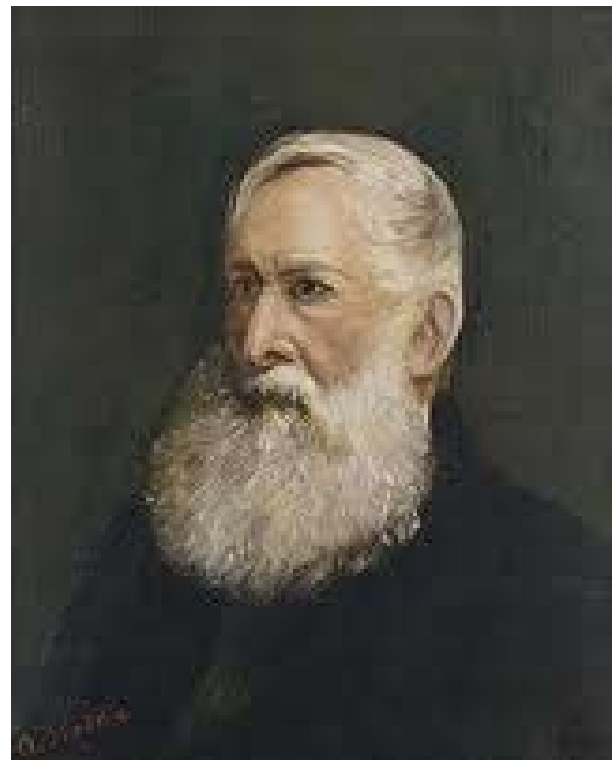
his mark on Parramatta and on the six towns he established on high ground at the edge of the Cumberland Plain bordered by the Nepean River. Windsor was the most ambitious of these, with two squares and a handsome church designed by convict architect Francis Greenway. All the towns were planned on similar lines, with 20 m wide streets on a rectangular grid, town blocks predominantly four hectares in area, and strictly enforced building regulations.



St. Matthew's, Windsor designed by Francis Greenway

The authoritarian Governor Darling (1825-1831) set out a series of regulations for the establishment of towns, and between 1829 and 1842 a total of 53 more towns and villages were planned.

Settlement of Melbourne began in 1835 without the blessing of the NSW Governor, but Governor Russell turned up in 1837 with his most senior surveyor, Robert Hoddle in tow. Surveyor Robert Russell had already surveyed the site of the town, and reports that Hoddle produced the plan for the central square mile of Melbourne in around two hours before going to lunch with the Governor. The Governor took an interest in Hoddle's plan and disputed his proposal for main streets at least 30 m wide. They settled on 20 m wide main streets with 10 m access lanes at the rear of the properties.



Robert Hoddle

Hoddle, who had arrived in Australia in 1823, and who had played an important part in the planning of several NSW towns, then settled in Melbourne and in 1842 built a large, comfortable house on the corner of Spencer and Bourke Streets. He joined the Melbourne City Council as an alderman in 1842. He was responsible for laying out the grid plan for the Melbourne suburbs and for planning the 60 m wide boulevards radiating from the central city.

In this book Robert Freestone describes the planning of the major cities, and covers in detail other aspects of urban planning, such as the garden suburbs, the planned new towns including various special purpose towns such as those for mining developments and the Snowy Scheme, urban renewal schemes and planned commercial developments. He is eminently qualified for this project, having already researched and written extensively on various aspects of urban planning. He is currently Professor of Planning and Urban development at the University of New South Wales.



Yallourn, Victoria, a planned town, now demolished

Freestone also discusses urban planning strategies in Australia. Notable among these is the increasing importance of integrating land use planning and transport planning. Transport began to strongly influence town planning from the 1850s with the building of the first suburban railways and became increasingly important with the advent of bus and tram services and motor vehicles. Eventually, by the mid twentieth century, urban transport planning became a discipline in its own right.

This book is a comprehensive record of urban planning in Australia. The material is arranged in a series of chapters each dealing with one broad aspect of planning, rather than in a strictly chronological order. The book is designed to be easily read, understood and enjoyed by anyone with a general interest in the topic of urban development, and in its history in particular, and it succeeds admirably.

But there's more. Freestone writes that the book was predicated on the assertion that landscapes and urban planning are under-represented in Australia's heritage system. He notes that in all the Australian and state heritage registers there are only just over 70 places explicitly exemplifying planning values, a tiny 12 per cent of the total number of heritage places listed. He rightly claims that the material in the book provides evidence that this grossly under-represents the significance of urban planning in the built (as distinct from the natural) environment of Australia. To illustrate, he lists just over twenty major sites of planning heritage in Australia. Most readers would have no doubt that the places that Freestone lists have major heritage significance, and that in each case it is an aspect of urban planning that underlies the heritage significance.

Ian Arthur

Twenty years ago; Nyngan's biggest flood



Helicopter at Nyngan commemorating the 1990 flood

Outside the Nyngan railway station a helicopter is permanently parked, a reminder that on 24 April 1990 this was the first town in the world to have almost its entire population evacuated by helicopter. On that day over 2300 people were airlifted from the station yard and from the lawn outside the hospital. The helicopters took them, seven at a time, to a point 9 km east of the town where they were met by ambulances and coaches to take them to Dubbo.

Eleven days later the first residents were able to return on day trips to inspect their property and start cleaning up. Re-occupation of the town did not commence until 15 May, when some of the essential services had been restored. Residents were permitted to occupy their homes only after they had been inspected and passed as fit for habitation, and this took many weeks.

Nyngan was established in 1883 on the banks of the Bogan River, as the temporary terminus of the railway heading west from Sydney, 500 km away. At that time there were a few sheep and cattle stations in the area. Once the bridge over the Bogan was completed the railway was extended by two branches diverging just west of Nyngan, to Bourke in 1885 and Cobar in 1892. When the Municipality was proclaimed in 1891 the population was 1355. The railway directly and indirectly provided most of the employment in the town.

Nyngan has a history of droughts and floods. Its average rainfall is around 400 mm per year, but in its wettest year, 1950, the rainfall was 1123 mm and in the two months of February and March there was more rain than the average for a whole year. There were also drought years when the rainfall was less than half the yearly average.

In the 1950s Nyngan experienced two serious floods. The 1950 flood was the largest recorded up to that time. Two thirds of the houses in the town were left in bad condition and many families had to take refuge with friends or in the town's public buildings. Most of the town was under water and the school was closed.

The town was better prepared for the 1955 flood, which was larger than the 1950 one. This time the town was saved from inundation by temporary levees pushed up with earth moving machinery by council staff and contractors, and with sandbags. After a long period of drought following the 1955 flood, the next test of Nyngan's flood defences was in 1976. By this time, the Municipality of Nyngan had been amalgamated with the surrounding Bogan Shire. At the time of the flood, the Shire Engineer, Clegg Forgie, was on holiday away from the town, and his deputy, Jim Johnson, had responsibility for organising the construction of emergency levees. This time the temporary earthen levee extended right around the aerodrome. The flood turned out to be approximately as large as the 1955 one and once again Nyngan escaped major damage.

Immediately following the 1976 flood the council decided that Nyngan should have permanent flood protection. With the help of grants from the State and Commonwealth governments, a permanent earth levee

was completed in 1983, to provide protection from a flood as large as any that the town had so far experienced.

During the whole of the 1980s Nyngan experienced no serious floods.

From early April 1990 there was heavy rain throughout the Bogan River catchment. For the whole month the rainfalls and river heights recorded at every station in the catchment were the highest on record. The main flood peak was associated with rainfalls over the period 18 to 22 April.

Sandbagging at Nyngan commenced on Easter Saturday, 14 April, initially to plug gaps in the permanent levee at road crossings and other low points, and to protect some low-lying houses. The pace of work was soon stepped up as more rain fell and it was realised that the flooding might be much greater than any previously recorded. That was certain by Wednesday 18 April, and the Meteorological Bureau was predicting a peak of 4.3 m. The 1983 levee was designed to withstand a flood of 4.2 m, so to save the town it became essential to raise the levee by placing sandbags on top of it over its whole length. By the weekend all available resources in the town, mostly volunteers, were directed to sandbagging, with the objective of building the levee to 5.0 m.

A flood emergency committee was formed and met for the first time on Thursday 19 April. It was chaired by the Mayor, John Hoare, and included the Town Clerk, Garry Delaney, Shire Engineer (and State Emergency Service (SES) representative) Bob Whatham, Police Superintendent Jim Hampstead, and others. The committee then met twice each day, directed all the emergency work in the town and issued press releases and advice to residents. By 21 April an evacuation plan had been prepared, with old people to be given priority and taken to the hospital.

Even as late as the afternoon of Monday 23 April it was expected that the levee would hold and the town would not become inundated or need to be evacuated. However plans were ready for helicopter evacuation to Dubbo if necessary. The railway and highway outside the town were under water and closed to traffic. 22 people were being evacuated from the Riverside Caravan Park. Premier Nick Greiner visited the town during the afternoon.

The river level at 10.40 a.m. was 4.74 m and forecast to peak at 4.85 m by mid-day. However it continued to rise and was at 4.89 m at 5 p.m. and still rising. By that time there had been three major breaks in the sandbag levees, all of them repaired. Further breaks were occurring, and as it would not be safe to have people working on the levees in the dark, work on the levees was abandoned. Further breaks occurred and by 6 p.m. the town was beginning to fill with water. To everyone's surprise, there was a surge in the flood waters during the evening and a further rise of 0.3 m occurred over a few hours. So even if the failures in the sandbag levees had not occurred they would have overtopped during the evening and the town would still have been inundated. It was completely flooded by midnight.

During the evening the Mayor toured the town with a loudspeaker warning the residents that they would need to leave their homes. Many took shelter in the cinema, the RSL Club and Barrett's Hotel where the upper floors were above water level. Others climbed into the ceilings of their homes or on to the roof. All night boats were rescuing people from their homes.

The river level peaked at 5.23 m around 2 a.m. on Tuesday 24 April. At daylight evacuation by helicopter began and by the end of the afternoon there were only 200 people, including 15 police, left in the town. Some of the men found a diesel generator and set about making cages for the town's dogs, none of which had been evacuated. They were rounded up and taken by helicopter to Dubbo, along with a variety of other pet animals, birds and fish that had been left behind.

The Premier visited Nyngan again on 28 April. On 30 April he appointed Rear Admiral Peter Sinclair (who was shortly afterwards appointed Governor of NSW), as special co-ordinator, located in Nyngan to assist in the recovery, and granted him special powers over state government agencies as needed to carry out his work. He was well fitted to the task, having had a similar role in Darwin when it was devastated by Cyclone Tracey in 1974 and two thirds of its population was evacuated. Sinclair arrived on 1 May and stayed for two weeks. He saw his role as



Nyngan, 24 April 1990

providing leadership rather than management. He formed five working groups to manage the major aspects of the recovery operation, and gave high priority to restoring businesses. Meanwhile the various government agencies were working to restore essential services.

The people from Nyngan were well looked after in Dubbo. Individuals and community groups provided food, clothing, medical services and supplies. Once the residents returned to Nyngan there was more help provided. The people of Cobar organised a laundry service that picked up over a hundred tons of wet washing and delivered it back clean and dry. It was estimated that the people of Cobar alone spent some fifteen thousand hours on the relief effort. The people of other surrounding towns were equally generous with their time and money. Help in the form of money, goods and volunteer assistance came from everywhere. Prime Television ran an appeal that alone raised \$1,500,000.

The total cost of the flood damage was estimated to be directly and indirectly around \$50 million, around 40 per cent to property of Nyngan residents, 36 per cent to government and 24 per cent to business. Public appeals raised a total of \$8.5 million and volunteer effort was estimated to be worth at least another \$2 million. The total amount of financial assistance provided to Nyngan residents including government grants and insurance payouts was estimated at \$24 million.

After the flood it was quickly agreed that the Public Works Department should be responsible for designing and constructing a new levee around the town and the airport, to a height at least the peak level of the 1990 flood plus 1 metre. The Shire Council would contribute \$550,000 of the total estimated cost of \$3,750,000 and the State and Commonwealth governments would contribute the rest. The new levee was completed in September 1992. Even before it was completed it was called on to resist another major flood in February 1992. Water reached a level of 4.39 m, making it a flood of similar size to the ones in 1955 and 1976. With some temporary work the levee was raised to a level approximately equal to the 1990 flood and no flood waters entered the town.

The recent floods throughout New South Wales have been the only major ones since the 1990s. The Bogan River reached high but not record levels, and the town of Nyngan has been free of flooding. With the permanent levee completed in 1992 it is one of the best protected flood-prone towns in Australia.

Ian Arthur

ASHET News is the newsletter of the Australian Society for History of Engineering and Technology Incorporated ABN 47 874 656 639
ISSN 1835-5943

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