New *ASHET News*

The main reason for changing the format of *ASHET News* is to allow us to publish more news and articles on the history of engineering and technology that may be of interest to our members and freinds. We particularly aim to cater for the needs of members who are unable to participate in ASHET events that are mostly held in Sydney.

We plan to publish *ASHET News* four times a year, commencing with this issue. It will contain news of ASHET activities, including notices of future ASHET events, It will also contain other news and articles, some like two in this issue based on recent ASHET events.

In its new format, *ASHET NEWS* will be published in electronic form as a pdf document, designed for reading on a computer screen or printing on a home computer desktop printer in either black and white or colour. *ASHET News* will be sent as an email attachment to all ASHET members and to non-members on our email list. If you are not already on this list and wish to receive *ASHET News*, send an email request to ASHET. ASHET does not share its mailing list with any other organization and does not provide information from its mailing list to third parties. *ASHET News* will also be available on the ASHET website www.ashet.org.au.

Contributions, including letters and articles for publication, as well as comments and suggestions, are invited. Send them to Ian Arthur, secretary ASHET sec@ashet.org.au, who is for the time being acting as editor of *ASHET News*. Expect more changes in both format and content as we further develop *ASHET News* as a medium of communication with our members and friends.

ASHET's Journal Contents Project

Thanks to a donation of $900 from ASHET member Don Fraser, a NSW History Grant of $600, a grant of $6,000 from the Sydney Mechanics School of Arts and a contribution in kind of around $3,000 from the University of Sydney Library, we can now proceed with our project to make the complete contents of two historic NSW engineering journals readily available in digital form for readers and researchers. The journals are the Journal of the Sydney University Engineering Society, published from 1894 to 1921, and the Minutes of Proceedings of the Engineering Association of New South Wales, published from 1885 to 1921.

The Sydney University Library will digitise the complete texts of the two journals, around 9,500 pages and many large reproductions of drawings, and host them on its website where they will be freely available for viewing, searching and downloading. In addition the tables of contents will be available on ASHET's website. The project should be completed by February 2008.

Oral history award to Michael Clarke

Michael Clarke has recently received the 2007 Hazel de Berg Award for excellence in oral history from the Oral History Association of Australia. Michael is a founding member of ASHET and served as a member of the interim committee elected at a public meeting in 2003 to work towards the formation of ASHET. He has a long and distinguished record in promoting engineering history and heritage through the Institution of Engineers Australia. He has written several papers on the history of engineering in New South Wales, presented numerous talks, written two books of engineering heritage walks in the city of Sydney, and himself conducted many guided tours and walks. He has served as chairman of engineering heritage Australia and the engineering heritage committee of Engineers Sydney. He is currently a member of a NSW Heritage council committee as a specialist in engineering history and heritage. Following is the citation for his recent oral history award.

Michael Clarke

Michael Clarke commenced the Public Works Department's oral history program in 1991; he chaired the committee until retiring as Chief Engineer in 1992, and remained a member until 2000.

In 1994 he became manager of the Sydney Engineering Heritage Committee's Oral History Program. Amongst other things he employed an experienced administrative assistant, personally conducted some interviews, recruited and trained volunteer interviewers, and prepared objectives, policies, procedures and standard documentation for the Program. Summary biographies were later initiated to aid preparation of obituaries and entries in the Australian Dictionary of Biography.

He obtained a heritage assistance grant of $9500 in 1996 to expedite progress, and he arranged for the master tapes, logs, biographies and related documents to be progressively donated to the State Library of NSW - they presently amount to 194 interviews. Since the Engineering Heritage Committee became a member of the Oral History Association of Australia in 1996, Michael has been its representative.

Michael freely provided all his procedures and guidelines to assist the Roads & Traffic Authority in establishing its successful oral history program, and also to Engineering Heritage Australia, when as Chair, he established the National Engineering Oral History Program in 2001.

To stimulate oral history within the engineering profession Michael presented papers to engineering heritage conferences in 1996 and 2003.

Michael encouraged and advised the Monaro engineering group in its recording of the experiences of a group of 15 of the Snowy Mountains Authority's engineers as part of its 50th anniversary celebrations. He was also consultant to the BMC-Leyland Australia Heritage Group on an oral history program about former employees of the company and the Zetland works. The tapes of both projects have been included in the engineers collection lodged with the State Library of NSW.

Michael conceived the OHAA publication *A Guide to Commissioning Oral History Projects,* which with his 'Voiceprint' article *Tendering for Oral History,* is a valuable and useful reference. He also prepared the proposal and procedures for the establishment of the Hazel de Berg Award.

Michael's volunteer efforts have contributed significantly to the conduct of oral history within the engineering profession and have provided guidance for both oral historians and those wishing to engage their services.

ASHET events

Thursday 21 February 2008
Talk by Tony Griffiths
Arming for war – surviving in peace: Lithgow Small Arms Factory, 1914–1960

During two world wars and the lesser conflicts in Korea and Malaysia, the Small Arms Factory was very busy arming Australia's infantry units, requirements that stretched the Factory's resources and distorted the social structure of its host town.

Almost as trying, especially for the townspeople, were the subsequent lulls after wars, times when the Factory's products and its workforce were not needed but when the government was reluctant to allow commercial manufacture.

Tony Griffiths will outline the 'ups and downs' of the iconic Factory and its host town. This is part of the Factory's history, the first volume of which, covering the period from 1907 to 1950, Tony published in 2006; the second volume, 1950 to 1990, should be ready for publication by the end of 2008, with possibly a third volume to follow.

Tony Griffiths is an electronic engineer whose retirement has been taken over by researching and writing the history of the Lithgow Factory – partly because of family connections to the Factory and the district and partly because it's a fascinating subject well worth exploring. Tony is a foundation member of ASHET.

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

> **Venue**: History House, 133 Macquarie Street, Sydney
> **Time**: 5.30 for 6 pm
> **Cost**: $7.00 Includes light refreshments on arrival
> **Bookings**: phone RAHS on (02) 9247 8001 or email history@rahs.org.au.

More ASHET events

Wednesday 12 March 2008
Talk by Tony Dawson
Line of sight: the trigonometrical survey of Sydney's north

To the earliest European explorers, the rugged country to the north of Port Jackson appeared virtually uninhabitable. Yet settlers made their way there and surveyors such as James Meehan followed, marking out portions of land. By the mid-19th century, widespread uncertainty over land boundaries prompted Governor Denison to instigate a trigonometrical survey of New south Wales. The survey commenced at Lake George in 1867 and by 1880 had reached Sydney. Over the next four years over a hundred trigonometrical stations were erected in Sydney's north and by observing the angles and computing the distances between them, a precise framework for the construction of accurate cadastral and topographic maps.

Tony Dawson, former Associate Dean of Science at the University of Technology Sydney, looks at the history of these events and shows how they brought certainty to land tenure and underpinned

the development of essential infrastructure in the region.

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> **Cost**: $7.00 Includes light refreshments on arrival
> **Bookings**: phone RAHS on (02) 9247 8001 or email history@rahs.org.au.

Tuesday 22 April, 2008
ASHET Annual General Meeting
Talk by Gregory Blaxell
Halvorsen Boatbuilders

In 1903 Lars Halvorsen built his first boat in Norway and during WWI employed 35 staff building boats up to 409 metres. In 1925 Lars and his family moved to Sydney, attracted by its beautiful natural harbour, and before long Lars had established himself as the number one boat builder in Sydney, with his five sons working at his side.

From 1925 to 1980 the family designed and built nearly 1,300 craft, including 237 vessels for the Australian, US and Dutch forces during WWII, which earned Lars' eldest son Harold the Order of Australia Medal. After the war, the Halvorsens ran a fleet of their own boats as a charter business in the waters around Sydney.

In 1975 a joint venture company was formed in Hong Kong to design, build and market a new range of pleasure boats. It currently manufactures in China for a worldwide market.

Gregory Blaxell has researched the history of the family and its boatbuilding business. His talk, to a joint meeting of ASHET and Royal Australian Historical Society (RAHS), will immediately follow the brief ASHET Annual General Meeting.

> **Venue**: History House, 133 Macquarie Street, Sydney
> **Time**: 5.30 for 6 pm
> **Cost**: $7.00 Includes light refreshments on arrival
> **Bookings**: phone RAHS on (02) 9247 8001 or email history@rahs.org.au.

Other events, not ASHET

Saturday 8 March 2008
Talk by Julian Holland
'*A Share of Public Patronage: James McNaughton, chemist and druggist, as exemplar of commercial enterprise in the convict period*

The members of the City of Sydney Historical Association invite the members of ASHET to join them at their meeting on Saturday 8th March. at 2pm. The speaker, Julian Holland, is senior vice-president of ASHET.

> **Venue**: Sydney Mechanics School of Arts 280 Pitt St, Sydney
> **Time**: 2pm
> **Cost**: gold coin
> **Bookings**: not required.

Tebbutt's observatory

Linden observatory

On Sunday 26 August, 2007, ASHET members visited two private observatories close to Sydney, Tebbuttt's Observatory at Windsor and the Linden Observatory in the Blue Mountains. The article on this page is about the men who built them.

John Tebbutt, Ken Beames and their observatories

John Tebbutt (1834–1916) and Ken Beames (1899–1989) both built private observatories near Sydney; both were Fellows of the Royal Astronomical Society. But in other ways they were not alike. Tebbutt's *Astronomical Memoirs* of 1908 listed his 371 publications in various learned journals; Beames never wrote a single learned paper; he delivered a few lectures to the New South Wales Branch of the British Astronomical Association and built 450 telescopes, including his masterpiece, the 610 mm reflector at Linden; Tebbutt never built a telescope himself.

John Tebbutt was born at Windsor, the son of a farmer and grandson of John Tebbutt who arrived as a free man in Australia in 1801 and settled in the Windsor area. He was educated locally and developed an interest in astronomy. He bought his first instrument, a marine sextant, in 1853. In 1861 he announced his discovery of the great comet of 1861, one of the finest comets on record. The following year he refused the position of government astronomer for New South Wales.

He continued to make patient, reliable astronomical observations and published regularly, building an international reputation. In 1872 he bought an 11.4 cm. refracting telescope with which he observed the transit of Venus in 1874, and in 1886 imported a 200 mm Grubb refracting telescope and housed it in a substantial brick observatory building on his property at Windsor, The telescope later went to new Zealand, but was returned to Australia at the time of the Bicentenary and rehoused in its original location. The

Tebbutt's telescope at Windsor

Hawkesbury Shire Council now owns the telescope.

Tebbutt spent his whole life at Windsor, devoting most of his time to astronomy. He never left Australia, but corresponded with colleagues around the world, and published widely. His image was on the Australian $100 note from 1984 to 1996.

He had six daughters and a son. His direct descendants still own and occupy the property at Windsor. He is buried in the Anglican cemetery there in a vault that he designed himself. The funeral was one of the larges ever held at Windsor.

Ken Beames was born near Gilgandra in western New South Wales, the seventh of eight children. He left school at 14 and joined the Post Office as a telegraph boy. He joined the Australian Light Horse and served as a signaller in Palestine during the First World War. On returning to Australia he completed a two year course in electrical fitting at Sydney Technical College.

In 1924 he established his own manufacturing company, which provided facilities and funds for him to pursue his interest in telescope making. He first became interested in astronomy in the early 1930s and began studying optics and mathematics. He built his first telescope in 1934. Others followed this, and by the start of World War II he had completed the mirror for his 610 mm telescope and also many of the parts for it. He ground the mirror himself from a crown glass blank purchased from Chance Brothers in England.

During the war his company was kept busy making optical equipment and signalling lamps for the Royal Australian Navy, and his great telescope project was set aside for the time being. After the war he located a suitable site with dark, clear skies for his observatory at Linden, 80 kilometres west of Sydney. He completed the brick building and dome to house the telescope in 1947. According to a

Ken Beames' telescope at Linden

plaque on the telescope, the Linden Observatory became operational in 1959. As well as the 610 mm telescope, it includes a 432 mm reflector telescope and a 152 mm refractor, sharing the same equatorial mounting. Apart from the machining of the large shafts for the mounting, carried out at Mort's Dock, Beames did all the work himself.

Beames' last major project started in 1967 and incomplete at the time of his death, was the construction of a planetarium that he proposed to install under an 18 m dome on the property at Linden. The mechanical parts of the planetarium, largely complete and assembled, are in his workshop that remains intact on the site. He estimated that about two years work was needed to complete the project.

The telescopes at Linden had little use, as Beames' main interests were not in astronomy. He had a vision of his observatory being an education centre, particularly for young people. After his death a trust was established with the idea of bringing the vision to reality. But there has been little progress, and it is now realised that before the telescopes could be put to regular use for this purpose, some major work would be needed, particularly on the electrical systems; photographic equipment would also be required. Amateur astronomers now use the Linden site, but not Beames' telescopes, which seem destined to become a museum piece.

Further reading:

Tebbutt, John (1834–1916), *Australian Dictionary of Biography – online edition*: www.adb.online.anu.edu.au/biogs/A060268b.htm

Wayne Orchison, *Ken Beames: Australian telescope-maker extraordinaire:* adsabs.harvard.edu/abs/1997JBAA..107...83O

Changes in library technology

This article by Ian Arthur is based on a talk presented by Dr. Lesley Muir to a joint meeting of ASHET and the Royal Australian Historical Society in Sydney on Wednesday 28 November 2007.

In 1962, when Lesley Muir joined the staff of the Public Library of New South Wales (renamed the State Library of New South Wales in 1975) index cards were hand-written, there were no photocopiers or microfilm, and letters were produced on a manual typewriter, with carbon copies. The technology available to libraries had changed little since the beginning of the twentieth century.

In 1969 Lesley was promoted to a librarian's position at the Teachers College library. By then major changes were afoot. Microfilm and microfiche had appeared during the 1960s and soon there were several incompatible technologies in use, creating problems for libraries. Photocopiers and fax machines were being installed in libraries. For

Lesley Muir

Lesley studied historical geography at the University of Sydney, and trained as a librarian. While researching her Masters' degree, which dealt partly with the geography of the Illawarra and Bankstown Lines, she came across a series of interesting links between the politicians who made the decisions and their developer friends who happened to be in the right place at the right time. She decided to pursue these people through the Land Titles Office and the Bankruptcy records, and this resulted in "Shady Acres", her Ph.D. on the design of Sydney's public transport system in the late Victorian era.

Lesley's career as a librarian began in 1962 at the Public Library of New South Wales, (now the Sate Library of New South Wales) and continued at the Sydney Teachers College Library and the School of Nursing library at the University of Sydney, from which she retired as manager in 2007.

Lesley has researched and written on the history of the suburb of Canterbury in Sydney. Her contributions were recognised by the award of a Centenary Medal in 2001 for her services to the community through the Canterbury Historical Society and the Medal of the Order of Australia in 2007 for service to recording and preserving local history, particularly in the Canterbury District.

Lesley is currently a councillor of the Royal Australian Historical Society. She is a foundation member of ASHET, has served on its management committee. In 2004 presented to ASHET a paper titled *Designed by Politicians–Sydney's Public Transport System.*

librarians there were new chores in operating these machines and new skills to be acquired for looking after them. At the Teachers College, these innovations allowed many inter-library loans to be superseded by photocopies sent by fax. Readers soon found that microfilm and microfiche were mixed blessings.

In the early 1970s libraries at universities and colleges became the custodians of audio-visual materials and equipment. Reel to reel tape recorders had been around for several years, but it was not until 1970 that they started to appear in Australian libraries. Collections of taped radio programs, talks and oral history soon followed, adding another dimension to the work of librarians.

Next came videotape. Initially the new medium was expensive, over $200 for a videotape copy. But prices soon came down and several years of competition between the Betamax and VHS formats ensued until the VHS format became almost universal, a relief for libraries that had previously needed to cater for both formats.

Librarians had not been trained to handle all this new technology. There were a few cases of technologists, rather than librarians, becoming the managers of libraries. But technologists never achieved mastery of all the skills involved in running a library and the careers of professional librarians were not seriously threatened, as it turned out. Librarians just needed to acquire the knowledge and skills required for them to manage it themselves.

There followed a period in which libraries came to be regarded by some as the appropriate repositories for all kinds of things that could be

browsed or borrowed, and looking after and lending items from these collections as part of a librarian's work. The Sydney Teachers College

The Teachers College library lent toys as well as books

library had a collection of toys available for loan; the Stanton Library in the municipality of North Sydney briefly lent tools. In neither case was the service a greet success; items on loan often went missing or were returned much the worse for wear. The craze for such diversions wore off and libraries were generally able to concentrate on being custodians of intellectual property in one form or another, and of providing services to make it widely available. That provided plenty of new challenges.

One of those challenges was dealing with copyright. As soon as libraries and their clients were able to make copies of books, periodicals, and audiovisual records, they could, and often did, infringe the rights of copyright holders. The problems were not quickly resolved; it was not until the 1990 that Australian universities were allowed to purchase rights to make photocopies for their own and their readers' use. In the meantime there were some bizarre situations. For example the University of Sydney was required to destroy copies of items such as records of broadcasts to schools, many of which the ABC itself did not possess. The ABC had no archives of programs at all until 1970.

In 1966, Henriette Avram, a computer programmer, joined the staff of the US Library of Congress. She developed machine-readable cataloguing (MARC), which was launched in 1968 and revolutionized library cataloguing throughout the world. The protocols she developed have never been superseded; they have been extended and adapted to languages other than English, including Chinese, and have become the international standard.

MARC was introduced in Australia in 1971. By this time every medium-sized library in Australia was having problems coping with the task of cataloguing the increasing amount of material it was acquiring. Cataloguing is a skilled and time consuming job that traditionally involved compiling and transcribing information on each publication by hand to a catalogue card and assigning the publication a catalogue number. With MARC, libraries could buy ready printed catalogue cards from the Library of Congress for items that it had catalogued, and this saved librarians much of the work of cataloguing as well as introducing a degree of standardisation. For libraries outside the USA, there were problems with subject words; for example 'wharf labourers' were 'longshoremen', and 'bushfires' were 'forest fires'. But the savings in time and effort made it worthwhile to live with the American terminology or to find ways of translating the unfamiliar subject words. Huge thesauruses came into being to assist in assigning subject words and to add to the work of librarians.

MARC was based on the concept of storing catalogue information in a standard form on a computer, so once desk-top computers became user-friendly and readily available, and all the contents of the old card indexes had been entered into a computer, card index catalogues could be phased out. This did not happen quickly or easily, and there are still some large libraries, like Sydney's Mitchell, that are still struggling with the task of converting all their catalogue information to computer-readable form.

Once MARC took hold in Australia and library catalogues became computerised, it became possible to network library catalogues so that librarians could locate copies of publications held by other libraries. This quickly led to the 'battle of the networks'. Although MARC had an elaborate set of rules for cataloguing, the rules were often ignored or were interpreted in different ways. For example, an author's name might appear as 'John Smith',' J. H. Smith', Smith, John H., or other variations.

Henriette Avram

One network of libraries, headed by the National Library of Australia, and including major Victorian libraries, insisted on Authority, with one library responsible for establishing the master catalogue information for each publication, and all other libraries in the network conforming to this standard, but being allowed to have secondary references as well if thy wanted.

Other libraries, including many in New South Wales, adopted a laissez faire approach to networking, with the result that a combined catalogue for the network could have as many as 40 different entries for the same publication. It took twenty years to sort these problems out sufficiently for a national catalogue of the holdings of all major libraries to be practical.

On-line access for the public to library catalogues was introduced in Australia around 1987. Libraries Australia now provides a combined on-line catalogue for the major libraries. Anyone

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Q. How does someone find ALL an author's works?
The first is a family history, "Legendary Muirs", by Billy Muir.
The second is a saddler's how-to-do-it manual for his apprentices "Techniques with leather", by Wal Muir
The third is an official company history "Barraba Saddler", by W.W. Muir

A. With an "Authority Record"
Muir, William Wallace, 1895-1955
With **See** references from the other forms of name

Solving this type of problem on a computer – essentially devising a MARC format for authority records, oc-cupied years, and caused bitter divisions in the library profession.

using this will know that searching for libraries holding a particular book or journal is complicated because the participating libraries catalogue the one publication in different ways. Serials (newspapers, journals, magazines and other periodicals) present particular problems because their publishers adopt various conventions about naming and numbering, often changing the name or the frequency of publication of a journal or publishing at irregular intervals.

In the late 1980s university libraries began to introduce automated systems for recording loans. These systems tended indiscriminately to issue notices of fines for overdue books, causing irritation to some academic staff that found themselves treated just like students. Librarians needed to learn how to work with computers. Lesley Muir remembers well when the Nursing Library at the University of Sydney acquired its first computer, an Apple IIe, in 1986. Then in the 1990s the Internet sparked another revolution.

Nursing Library, University of Sydney, in 2007

Searching for information in reports and journals had long been facilitated, for some disciplines, by bibliographies and abstracts that listed items on specific subjects, but their inadequacies became increasingly apparent as the number of publications and articles to be covered increased exponentially. In 1968, NASA contracted with Lockheed to produce a system for indexing its extensive data files and reports. The resulting system was widely copied by government agencies in America, and made access to vast quantities of technical information much easier. Dial-up access to these databases became possible in the late 1980s. With the Internet, searching for information became much easier, and specialist companies began to offer, for a fee, on-line search facilities using the digitised text of publications, and offered the ability to browse and download complete papers from journals. University libraries, needing to provide for staff and students, soon became major customers of these commercial services. The commercial providers of these services operated mostly independently of each other, so inevitably there was lack of standardisation as each provider developed its own software and systems.

University librarians who have acquired knowledge and skills in searching for information are now in demand to teach them to students, adding yet another dimension to the work of librarians. At the same time, libraries themselves are changing. A library is no longer just a collection of books available for browsing or borrowing. It is now also a service providing access to vast amounts of information that is not in books on its shelves, but is held in other libraries and repositories, and to an increasing extent, in electronic databases accessible over the Internet. Much of the information that libraries now provide will never appear in printed form.

Lesley Muir retired in 2007 as Manager of the Nursing Library at the University of Sydney. The library she left held a collection of thousands of books on shelves, just as did the library in which she started work over forty years earlier; but almost everything else is different from the library of forty years ago.

Further reading

For more about the technology currently being used in Australian libraries, read the text of the Ferguson Lecture recently presented to the Royal Australian Historical Society as printed in its journal. Warwick Cathro, Transforming access to Australia's documentary history, Journal of the Royal Australian Historical Society, vol. 93, part 2, pp.244–253.

About ASHET

ASHET, the Australian Society for History of Engineering and Technology, is a non-profit society, incorporated in New South Wales and affiliated with the Royal Australian Historical Society. ASHET currently has 92 members.

It was formed in Sydney in 2003. Its objects are to encourage and promote community interest and education in the history of engineering and technology in Australia. It has members throughout Australia, with most in Sydney and other parts of New South Wales.

ASHET has regular program of events in Sydney, and looks forward to establishing groups with programs of activities in other centres.

ASHET meetings in Sydney are mostly held at History House, 133 Macquarie Street, Sydney, on weekday evenings, as joint meetings with the Royal Australian Historical Society. In addition ASHET arranges daytime visits to places of historical interest.

ASHET has held weekend or longer tours to the Mudgee, Lithgow and Goulburn areas, and to northern Tasmania. For 2008, we are planning a tour to Broken Hill by rail and coach.

ASHET is managed by a committee of five office-bearers and three ordinary committee members. A complete new committee will be elected at ASHET's annual general meeting on Tuesday 22 April 2008. Members of the present committee will be eligible for re-election but we would like to see some new blood. All members will receive a notice of the annual general meeting and a call for nominations of office-bearers and committee members. Nominations must reach the secretary seven days before the meeting.

If you are interested in the idea of serving on the committee or otherwise contributing to running ASHET or expanding its range of activities, call or email the secretary Ian Arthur, talk to any committee member or make a nomination.