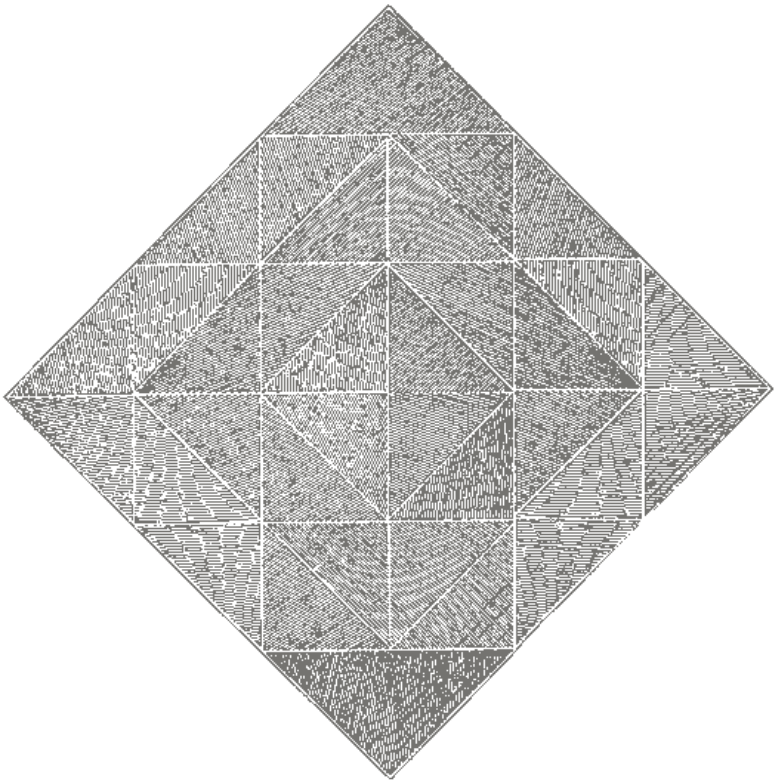
Science and Australia's Banknotes

RESERVE BANK OF AUSTRALIA



Cover: Detail from the Australian $50 banknote issued from 1973
Above: Detail from the Australian $100 banknote issued from 1984

A number of Australia's banknotes celebrate achievements in science and innovation. This booklet showcases some of these banknotes and highlights the stories of the people behind those achievements.

For further information on the individuals featured on Australia's banknotes, refer to the Bank's publication *Notable Australians*.

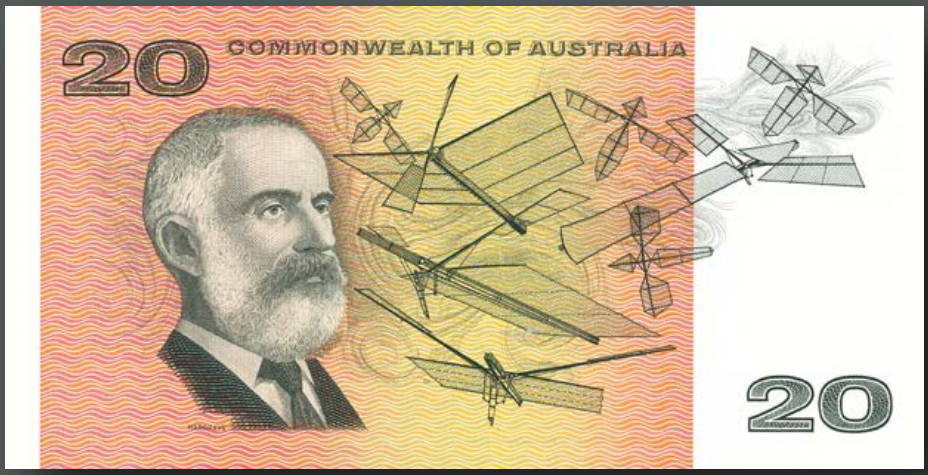
Australian $5 banknote issued from 1967 (front) showing Sir Joseph Banks. Concept design by Gordon Andrews.

Sir Joseph Banks

Sir Joseph Banks' (1743–1820) interest in the study of botany began in his childhood, and developed during his years at the University of Oxford. Instead of making the Grand Tour of Italy favoured by young English gentlemen, Banks joined James Cook's expedition to the South Pacific on HMS Endeavour when he was 25. His fascination with natural history was enriched by the discovery of species unknown to Europeans, especially during the ship's survey of Australia's eastern coast. On the Endeavour's landing at Botany Bay, Banks collected so many botanical specimens that they covered one of the ship's sails, spread on the shore. A selection of Australian flora, including his namesake species, the Banksia, appeared in the banknote's background. In his journal of the expedition, Banks recorded his encounters with Australia's unique species of animals, including his first sighting of a kangaroo:

> *'In gathering plants today I myself had the good fortune to see the beast so much talkd of tho but imperfectly – he was not only like a grey hound in size and running but had a long tail – as long as any grey hounds – what to liken him to I could not tell – nothing certainly that I have seen at all resembles him.'*

Banks' interest and involvement in New South Wales continued for the rest of his life. He supported the idea of founding a British colony, and from his house in London's Soho Square, he advised many of those engaged in its European settlement and exploration, including Arthur Phillip and Matthew Flinders.

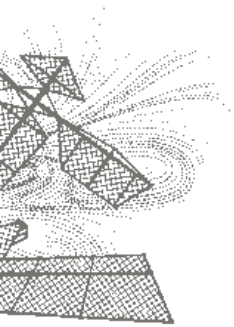


Australian $20 banknote issued from 1966 (back) showing Lawrence Hargrave. Concept design by Gordon Andrews.

Lawrence Hargrave

Lawrence Hargrave's (1850–1915) inventions represent some of the world's earliest advances in aviation. His experiments with the rotary engine and the box kite took place mainly at Stanwell Park, south of Sydney, known for its favourable wind conditions. In November 1894 he succeeded in lifting himself 16 feet above the ground with his four-kite construction.

Although his experiments were met frequently with scepticism in Australia, Hargrave remained certain of the inevitability of aviation and suggested that younger generations be exposed to its study. In his lecture, 'Notes on Flying Machines', he advised that 'the everyday employment of flying machines as means of transit would be brought much nearer in point of time if our boys would make and use these models as toys … young brains are so much readier to perceive and grasp improvement than those who have already been moulded'.



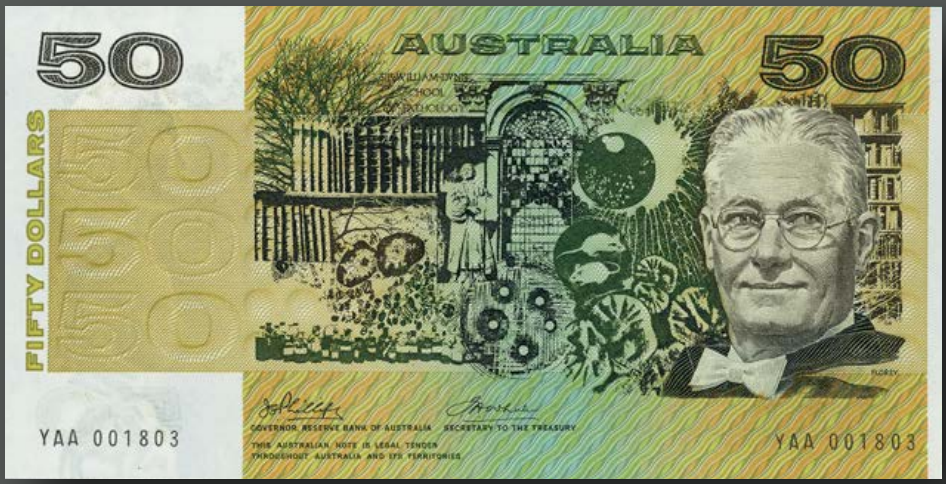
While Australian institutions demonstrated little interest in Hargrave's aeronautical models, the Deutsches Museum in Munich acquired them in 1909. These models were destroyed by bombing during the Second World War; Hargrave's surviving models are held by the Powerhouse Museum, Sydney.

Australian $50 banknote issued from 1973 (back) showing Sir Ian Clunies Ross. Concept design by Gordon Andrews.

Sir Ian Clunies Ross

Sir Ian Clunies Ross (1899–1959) began to study veterinary science at the University of Sydney in 1918. He specialised in the study of parasites, and was appointed as the first parasitologist for the Council of Scientific and Industrial Research (CSIR) in 1926, at a time when it was focusing on improving the health of animals, especially sheep. By 1949 Clunies Ross was appointed chairman of its successor, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and he became an influential advocate for the public benefits of science, research and education. Lord Casey, the Liberal minister who had been responsible for the CSIRO, observed in a memorial speech that 'in the last ten years of his life … he used his remarkable talents as scientist, administrator, and publicist in building up CSIRO and making it a household word throughout the country'.

The banknote included a representation of the radio telescope of the CSIRO's Parkes Observatory, New South Wales, which has become one of the symbols of the country's scientific advancement. Since its establishment in 1961, the observatory has made a series of discoveries; in 1969 it received signals from the Apollo 11 moon landing, which were relayed worldwide.



Australian $50 banknote issued from 1973 (front) showing Lord Howard Florey. Concept design by Gordon Andrews.

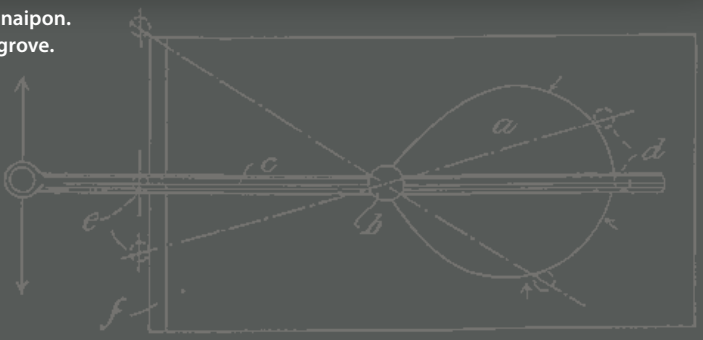
Lord Howard Florey

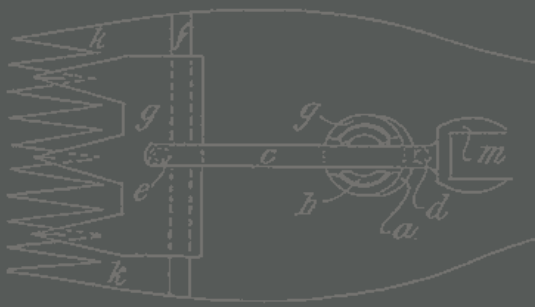
Lord Howard Florey (1898–1968) played a vital role in the development of penicillin as an antibiotic drug. Although Alexander Fleming had discovered penicillin in 1928, its medical, curative benefits had not been developed. Florey conducted experimental work at the University of Oxford with a team including the biochemist Ernst Chain. He was assisted by his wife, Ethel (née Reed), whom he had met when they were studying medicine at the University of Adelaide. In August 1942, Florey reported on their progress to his mentor, Sir Charles Sherrington: 'It is most tantalising really, as there is, for me, no doubt that we have a most potent weapon against all common sepsis. My wife is doing the clinical work and is getting astonishing results – almost miraculous some of them'. Penicillin represented one of the most influential medical advances of its era.

Florey was appointed the William Dunn Chair of Pathology, University of Oxford from the mid-1930s until the early 1960s, and a detail of the school's building was depicted on the banknote, together with an image of a culture of penicillin. Florey envisaged a medical research centre of international standing for his native Australia, and discussed its possibility with Dr HC Coombs, a member of the Australian National University Interim Council, later its Pro-Chancellor (1959–68) and Chancellor (1968–76), and the first Governor of the Reserve Bank (1960–68). The vision evolved and, as Coombs explained to Florey, the proposed medical centre developed to become one of four research schools that could 'form the nucleus of a university of higher learning, equal to any in the world'. The John Curtin School of Medical Research at the Australian National University (ANU) was founded in 1948. Florey was Chancellor of the ANU from 1965 until his death in 1968.

Florey was knighted by King George VI in 1944, and the following year he received the Nobel Prize for physiology and medicine with Ernst Chain and Alexander Fleming. He was made a peer in 1965, and became Baron Florey of Adelaide and Marston, the village near Oxford where he settled.

Australian $50 banknote issued from 1995 (front) showing David Unaipon. Concept design by Brian Sadgrove.

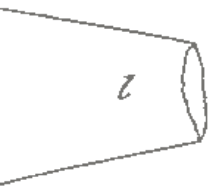




David Unaipon

The talents of David Unaipon (1872–1967) were so varied that he counted the occupations of author, activist, inventor, musician and preacher among others, during his career. An Ngarrindjeri man, he was born at the Point McLeay Mission, South Australia, now known by its original Aboriginal name of Raukkan. Unaipon's father, James Ngunaitponi, was the first convert to Christianity from the Lower Murray tribes, and he became an evangelist. David played the organ of the mission's small church, and during his time as organist taught himself increasingly more advanced music, including Handel's *Messiah*. The church, built in 1869, is depicted on the banknote.

David Unaipon was especially interested in recording the myths of Australian Aborigines, and he travelled through southern Australia collecting these stories in 1924 and 1925. He became the first Australian Aboriginal writer to be published, with his works including *Hungarrda* (1927), *Kinnie Ger – the Native Cat* (1928) and *Native Legends* (1929). In the preface to his volume titled 'Legendary Tales of the Australian Aborigines', Unaipon records, 'As a full-blooded member of my race I think I may claim to be the first – but I hope, not the last – to produce an enduring record of our customs, beliefs and imaginings.' An excerpt of his handwritten preface is reproduced on the banknote. His writing style employed simple means to communicate the story's atmosphere as it was embellished when repeated orally.



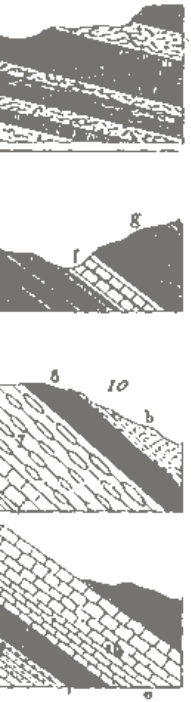
Unaipon coupled his interest in the traditions of the Aboriginal peoples with eagerness to understand science and to contribute new inventions. He read the theories of Sir Isaac Newton and attempted to achieve a perfect model to illustrate perpetual motion. He studied aerodynamics and foresaw the eventuality of the helicopter, basing his experiments on the boomerang. His attention was also directed towards inventions for immediate practical use and, in 1909, he patented an improved mechanical hand-piece for shearing sheep, which is represented on the banknote.

Australian $100 banknote issued from 1984 (front) showing Sir Douglas Mawson. Concept design by Harry Williamson.

Sir Douglas Mawson

Geologist and explorer, Sir Douglas Mawson (1882–1958) organised and led the Australasian Antarctic Expedition, 1911–14. The expedition mapped the coastal area of Antarctica closest to Australia and established a wireless station on Macquarie Island to facilitate communications with Australia. The expedition's members kept meticulous scientific records, and the 22 volumes of the *Australasian Antarctic Expedition Scientific Reports* were published by 1947.

During one of the expedition's sledging journeys, Mawson's two companions perished: Lieutenant Belgrave Ninnis fell through a crevasse with most of the supplies some 500 kilometres from the base, and Dr Xavier Mertz died on the return journey. Mawson managed to survive alone with depleted supplies; however, he reflected in his account of the expedition, 'I was confronted with this problem, whether it was better to enjoy life for a few days, sleeping and eating my fill until the provisions gave out, or to "plug on" again in hunger with the prospect of plunging at any moment into eternity.' He jettisoned unnecessary items and cut his sledge in half to lighten the load, but retained the geological specimens. Mawson was knighted for his achievements by King George V in 1914.



The huts used to shelter members of the expedition and their scientific equipment in Antarctica have survived and were placed on the National Heritage List in 2005.

Mawson led the British, Australian, New Zealand Antarctic Research Expedition (BANZARE) on board the *Discovery*, 1929–31. His portrait on the banknote derived from Frank Hurley's photograph of the ship's crew. As Professor of Geology and Mineralogy at the University of Adelaide from 1921 to 1952, Mawson advanced their study in Australia. This contribution was acknowledged on the banknote with an illustration of the geological formations that he studied in the Flinders Ranges, South Australia.

Australian $100 banknote issued from 1984 (back) showing John Tebbutt. Concept design by Harry Williamson.

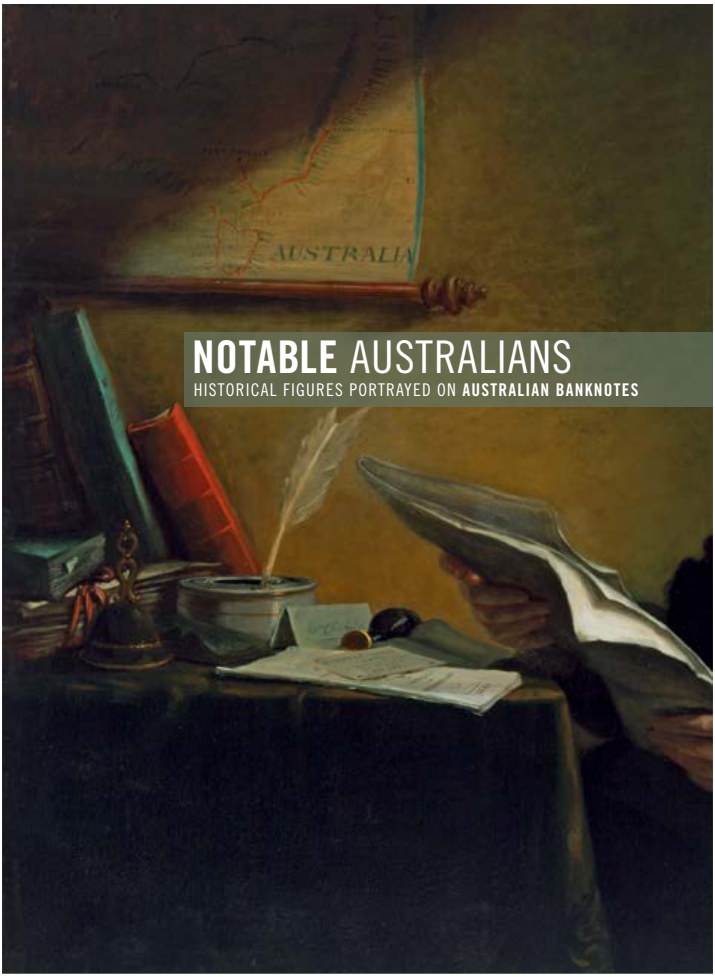
John Tebbutt

John Tebbutt (1834–1916) began to make astronomical observations from a modest, wooden observatory that he built on his family property in Windsor, New South Wales. It was followed by the construction of a more substantial observatory, which is represented on the banknote to the right of his portrait, with the earlier observatory to the left.

In his *Astronomical Memoirs*, Tebbutt recalled his first major observation. He detected 'on the evening of May 13, 1861, while searching the western sky for comets … a faint nebulous object near the star Lacaille 1316 in the constellation Eridanus'. His observations were published in *The Sydney Morning Herald* and *The Empire*, which believed that his findings 'may well excite a feeling of pride and gratification in all who claim Australia as their native or adopted country'. Tebbutt had become the first astronomer to discover the Great Comet of 1861, which was later named after him.

Although he was offered the position of government astronomer for New South Wales, Tebbutt continued to work privately, and published some 400 papers during his career. In 1973 a crater near the moon's *Mare Crisium* (Sea of Crises) was named in his honour.

The biographies presented in this booklet are from the Reserve Bank's publication, *Notable Australians*. To purchase a copy of the book, please contact the Reserve Bank of Australia Museum, 65 Martin Place, Sydney, museum@rba.gov.au. The book can also be viewed at <museum.rba.gov.au>.



NOTABLE AUSTRALIANS

HISTORICAL FIGURES PORTRAYED ON **AUSTRALIAN BANKNOTES**