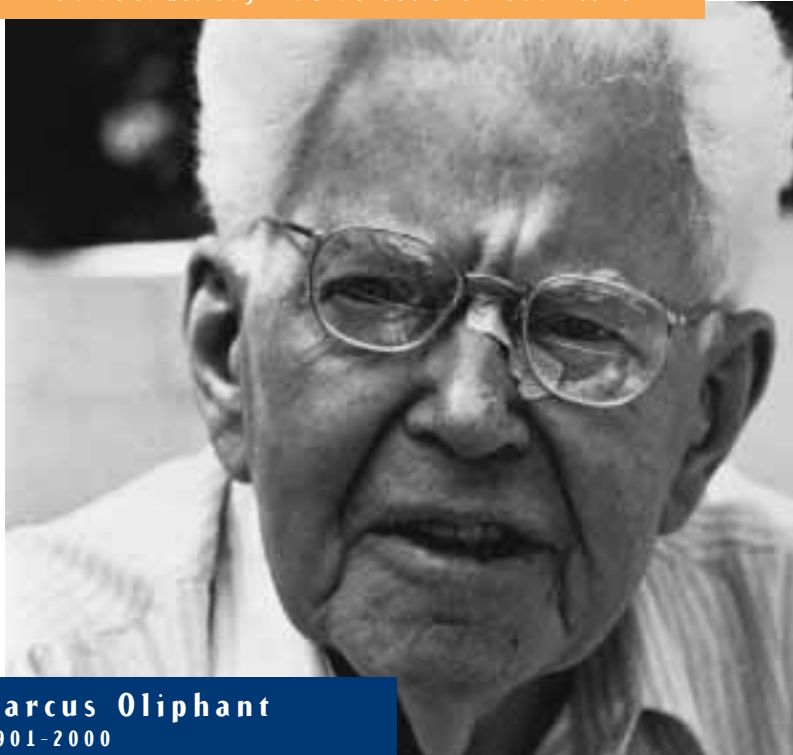


AUSTRALIAN BIOGRAPHY

A series that profiles some of the most extraordinary Australians of our time



Marcus Oliphant
1901-2000
Nuclear Physicist

This program is an episode of **Australian Biography** Series 1 produced under the National Interest Program of Film Australia. This well-established series profiles some of the most extraordinary Australians of our time. Many have had a major impact on the nation's cultural, political and social life. All are remarkable and inspiring people who have reached a stage in their lives where they can look back and reflect. Through revealing in-depth interviews, they share their stories—of beginnings and challenges, landmarks and turning points. In so doing, they provide us with an invaluable archival record and a unique perspective on the roads we, as a country, have travelled.

Australian Biography: Marcus Oliphant

Director/Producer Frank Heimans **Executive Producer** Ron Saunders

Duration 26 minutes **Year** 1992

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Also in Series 1: Neville Bonner, H.C. "Nugget" Coombs,
Dame Joan Hammond, Jack Hazlitt, Donald Horne, Nancy Bird Walton

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SYNOPSIS

Sir Marcus Oliphant is a founding father of the Australian National University in Canberra and a former Governor of South Australia. He won the Exhibition Prize at Adelaide University in 1927 and was accepted by Cambridge University. While there, he was part of a team whose task was to split the atom.

Oliphant was born in the hills outside Adelaide in 1901 into a middle class family. His formative years were shaped by a devotion to Christianity and belief in the importance of education, largely attributable to the influence of his mother, a schoolteacher.

Although there was no direct scientific influence on his childhood, the young Mark always displayed an interest in scientific experimentation. 'I was always fooling about in the shed at the back of the garden,' he recalls, 'with bits of wire and bits of wood, making what my brothers called my "raggedy, baggedy engines".'

During World War Two, Oliphant developed the centimetre wave radar. His 'secret weapon of radar' became a decisive factor in winning the Battle of Britain. Working in England, he also became deeply involved in the development of the atomic bomb. In 1942 he flew to America and helped scientists build the terrifying new weapon. After the bomb was used against civilians in Hiroshima, Oliphant vowed never to have anything further to do with nuclear power for military means. A remarkable man, he went on to devote his considerable scientific talent and energies to finding peaceful uses for atomic power.

CURRICULUM LINKS

This program will be a useful resource for teachers and students from middle to upper secondary and at tertiary levels. It is particularly relevant for Science but also has applications for English, SOSE/HSIE, Religious Studies, Politics, Philosophy and Ethics. It also provides some interesting issues in terms of production for media studies students.

BEFORE WATCHING

Before watching the program, discuss some of the following questions and issues:

- What do you already know about Sir Marcus Oliphant and his life's work?
- The moral dilemma of scientific discovery and the way that it is used is central to this story. Do you believe that scientists are responsible for what others do with their discoveries/ inventions?
- Have you ever experienced 'a new world' being opened to you? What was it? How did you deal with it?
- Think of several examples of modern scientific or medical discoveries that could be used for negative purposes. Do governments or churches have a role in such issues?

AS YOU WATCH

Think about these questions and issues:

- What was Sir Marcus Oliphant's background?
- What development was he most famous for?
- How was it used?
- Was its use necessary?

- Can anything in the 20th century world be said to have changed because of his work?
- How did a science student from South Australia come to influence world affairs?
- Did his work produce any moral dilemmas then or later?
- Does he have any regrets?
- If you had been a brilliant scientist making such discoveries, would you have acted any differently from Oliphant?
- What was the defining force in his life after 1945?
- Explain how the world continues to be affected by the decisions that were made at that time, particularly in relation to the responsibilities of the United Nations.

OLIPHANT'S CHILDHOOD AND FAMILY

- Were any influences obvious in the program, that were significant in determining Mark's future direction?
- He describes his parents as being very cultured, very well read and very religious. What would be the positive and negative impact of having parents like this?
- Oliphant describes a conversation with his father as they walked in the countryside. What does this tell you about the relationship and about possible influences on the young Mark?
- Is it reasonable to suggest that a particular type of parent produces a particular type of child? What type of parents would be likely to produce a nuclear physicist? Explain your ideas.

1927 CAMBRIDGE

- Explain the circumstances that led Mark to study at Cambridge University.
- How was he received at the Cavendish Laboratory in Cambridge?
- On what experiments did he work with Rutherford?
- What was his specific skill?
- What was this 'new world [that] was opened to us'?
- Oliphant says of his work with Rutherford 'that was absolute heaven, working with him, actually with him.' Is there anyone you have encountered who has motivated you to create a dream and work hard to achieve it? Discuss.

OTHER SCIENTIFIC PROJECTS

- The beginning of World War Two was to have a significant impact on the course of Sir Marus Oliphant's career. Comment on Oliphant's work and achievements in relation to radar and magnetron
- Why did he return to nuclear physics?
- What contribution did Peirls and Frisch make to the invention of the nuclear bomb? Why was it so unexpected?
- What happened to their report and why? How may things have been different if Peirls and Frisch had been British or American?
- What is the project that became known as the Manhattan Project and what led to its birth?
- Explain the scientific principles behind the creation of the atomic bomb.
- What was the outcome of the Manhattan Project?

- Research and prepare a short report or talk on one of the following: electromagnetic waves, magnetron, the Manhattan Project, plutonium.

THE MORAL DILEMMA OF THE SCIENTIST

- Sir Marcus Oliphant suggests that he had some difficulty dealing with the outcome of the scientific discovery that he was so involved in. What are his two differing reactions to the use of the atomic bomb on Hiroshima?
- Do you believe that the use of the bomb to end the war was justified? Support your answer.
- The manifesto written by the philosopher Russell and the scientist Einstein had a clear simple message. What was it? Use the internet to search for a copy of that manifesto.
- In 1948 Gromyko, the Russian delegate, put a proposal to the new Security Council and the Atomic Energy Commission that had been newly established by the United Nations. What was that proposal and why was it rejected?
- Conduct a class debate on the topic: 'The scientist must take full responsibility for any negative consequences of his or her discoveries.'
- The issue of the responsibility of the scientist for the consequences of discoveries and inventions has implications for the medical and health industries. Give two examples of this.
- Search the Internet to determine when the United Nations gained the power to conduct universal inspection of every country and its industries to verify that no nuclear weapons were being produced. How significant was this power in the declaration of war in Iraq, March 2003?
- It has been suggested that there has been no further use of nuclear weapons since 1945 because the world is too afraid of the consequences. To what extent do you agree with this reasoning?
- What did Oliphant see as the safe and practical solution to the energy crisis? Research the use of solar power in relation to a particular energy need (eg heating, swimming pools, hot water supply, motor cars) and prepare a five-minute radio report on tape.

1950 AUSTRALIAN NATIONAL UNIVERSITY

- What brought Oliphant and his family back to Australia in 1950?
- Oliphant had mixed feelings about his time at ANU. Draw up a list of the positive and negative aspects of the 20 years that he spent in the role in Canberra.
- Canberra in the 1950s is painted as something of a backwater; Oliphant described it as 'an outback place'. Do some research about Canberra to discover whether this was a fair or unfair description.
- What is the 'brain drain'? Have things changed in the past 50 years? If so, what has led to this change?
- Find out what scientific discoveries were made during the time when Oliphant was head of the Research School of Physical Science (1950-1970), and the names of some of the outstanding students who worked with him. Trace the career of one of these scientists.

1971 GOVERNOR OF SOUTH AUSTRALIA

- Oliphant's appointment as Governor of South Australia was his final role in public life. Summarize Oliphant's comments on his role as Governor of South Australia.
- On balance, do you think that the experience was a positive one for Oliphant? Support your view with his words.
- Why do you think he says that Premier Don Dunstan may have lived to regret the appointment?
- Give a brief outline of the history and purpose of state governors. Are their duties all ceremonial or do they have any political responsibilities?
- Do you think that Oliphant's time as Governor of South Australia would have enhanced the status of the position or not? Support your opinion with reference to the program and further research.

BELIEFS AND REFLECTIONS ON LIFE

- Does Oliphant believe in an afterlife?
- He was in his 90s when he gave this interview. What does he say about living?
- What is he prepared to believe and how does he explain it?
- What is 'the big mystery'?
- How does he wish to be remembered? Is this possible?
- Talk to someone in their 80s or 90s and ask them about living. Some of the questions that you could ask include:
 - What are their greatest challenges?
 - What gives them most joy?
 - What is their greatest strength?
 - How can they be better cared for?
 - What are they most pleased with? What makes them happy?
 - How often do they exercise?
 - What does the local council provide in terms of activities and support?

Bring your ideas back to the group and draw up a list of strategies for living with energy.

- What do most religions tell us about the afterlife? Research beliefs about the afterlife in one Eastern and one Western religion and compare the two.
- Sir Marcus Oliphant died on 18 July 2000 at the age of 99. Use the information that you have gained from the video and any further research, to write an obituary for him. (You may find it useful to read several obituaries in the daily newspapers before you attempt this task.)

MEDIA STUDIES QUESTIONS

- Does this program work as a documentary? What particular approach does the director use and how effective is this approach?
- Well-known TV interviewer Michael Parkinson outlined what he saw as criteria for a successful interview. Comment on the extent to which each of these criteria is met by Robyn Hughes in her interview with Sir Marcus Oliphant:
 - a real relationship between interviewer and interviewee
 - making the interviewee comfortable with the host
 - asking the right questions and ignoring those that are better left alone
 - timing
 - trust
 - demonstration of genuine interest
 - thorough research
- What are the advantages of making a biographical program while the subject is still alive? In what ways would this program have been different if it had been made after Oliphant's death?
- Suggest another Australian that you would like to see as the subject of a similar program. Outline the reasons why that person's life should be celebrated and comment on some of the aspects that could be covered in a biographical program.

ENGLISH QUESTIONS

- Write six further questions that you would like to have asked Sir Marcus Oliphant if you had had the opportunity to meet him.
- Discuss the quotation: 'There is no evil in the atom; only in men's souls.' – Adlai Stevenson
- Construct a dialogue between Sir Marcus and Lady Oliphant at the end of a busy day of activities during their time at Government House in South Australia. Through the dialogue, try to indicate their attitudes and feelings in relation to the position.
- Write a speech that Oliphant may have given to first year university science students. In it you should cover the joys, the problems and the moral dilemmas and responsibilities of scientific research and the management of scientific teams.
- Debate the topic: 'The role of Governor is not only anachronistic, it is at odds with our democratic principles'.

LANGUAGE

The program uses some unusual language. What is meant by the following expressions in the context of the biography?

- to 'dig up some dirt'
- 'raggedy baggedy engines'
- 'pottering about'
- to 'get your bearings'
- who 'to me were just sort of text book names'
- a very religious person
- enemy aliens
- scintillations

ENDNOTES

M. Parkinson, 'How to Talk to Anyone in the World' in **The Sunday Age Magazine**, 1 June 2003

Susan Ratcliffe (ed), **Oxford Quick Reference Quotations**, Oxford University Press, New York, 1999, p. 145

REFERENCES AND FURTHER RESOURCES

Australian Science and Technology Heritage Centre, Bright Sparcs published sources – Oliphant, Marcus Laurence Elwin
www.asap.unimelb.edu.au/bsparcs/bib/P000683p.htm

Books

Robin Hughes, **Australian Lives: Stories of Twentieth Century Australians**, HarperCollinsPublishers, 1996, Chapter 4

Videos

Fortress Australia, Film Australia, 2002

Uncovers one of the most extraordinary chapters in Australia's history - the brazen attempt by successive Australian governments to fortress the nation with atomic weapons. This groundbreaking film reveals a web of intrigue as it penetrates a murky world of diplomatic double-dealing and atomic espionage. Set against a backdrop of cold war paranoia and fear of Asian aggression, it explores the motives of the politicians, defence chiefs and scientists who set out to buy, then ultimately build, a nuclear arsenal.

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