

A dramatic, sepia-toned photograph of a young man with short, wavy hair. He is wearing a light-colored, long-sleeved shirt. His head is tilted back, and he is holding a human skull gently in his hands, examining it closely. The lighting is low, creating strong shadows and highlights on his face and the skull.

ROBERT LEWIS

STUDYGUIDE

SILENT STORM

Synopsis

In 2001, SCIENTISTS IN A MELBOURNE LABORATORY made a startling discovery. They found thousands of jars of ashed human bone which had been stored for up to forty years. All contained evidence of one of the most dangerous poisons on earth—Strontium 90, a by-product of nuclear testing that can cause bone cancer and leukemia. All had been collected during autopsies without consent.

Silent Storm reveals the story behind this astonishing case of officially sanctioned 'body-snatching'.

Set against a backdrop of the Cold War, the saga follows celebrated scientist Hedley Marston's attempt to blow the whistle on radioactive fallout from the British atomic tests in Australia. Cities and grazing land had been contaminated, he claimed. Deadly Strontium 90 was in the milk supply.

Marston's findings were not only disputed, he was targeted as 'a scientist of counter-espionage interest'. Yet



the government's own bone surveys proved his assertion right. Despite attempts to bury the information, the debate continues to rage. Is there a safe level of radioactive fallout? And what could be the health consequences for the generations of people exposed to Strontium 90?

Curriculum Links

Silent Storm has relevance for students of :

- Science
- Australian Studies
- Discovering Democracy
- Politics
- Australian History
- Studies of Society and Environment

at middle and senior secondary levels.

Before watching

Hypothetical scenario

It is 2010. There is great tension between two groups of countries: A and B. Australia is part of the A alliance.

The leading country in the A alliance, X, has developed a weapon that will, in theory, destroy the enemy's computers, without interfering with those of friendly nations. However, it needs to be tested to see that it will work in practice, and to make sure that there are no unexpected side effects. Australia wants to be involved in the testing because it will help us to develop our own version of the weapon and because we are good allies

However, some scientists think that it might cause cancer, but most do not. If people suspect that it does, public pressure might lead to the scrapping of the weapon altogether and take away the A alliance's potential best weapon.

There is a meeting of a group of decision makers. In groups of four, each member chooses one of the following

PREVIOUS PAGE: Hedley Marston with skull. © John Spooner
FROM TOP: Hedley Marston and microscope. © CSIRO • Atomic bomb. Courtesy Australian Academy of Science



roles and discusses this question:

- If we discover any harmful side effects of this new weapon, do we tell and risk the loss of the weapon, or keep it quiet from the public so that testing and developing can continue, and hopefully fix the problem while continuing to maintain the weapon?

Roles

- Country X official, whose job is to develop the weapon as soon as possible ready for any war against B.
- Australian Government official, whose job is to support the tests and hopefully help Australia develop its own version of the weapon.
- Civilian scientist, whose job is to make sure that the weapon is safe for use.
- Defence scientist, whose job is to make the weapon as effective and safe as possible.

Task 1

Meet and discuss the issue and come to your decision.

Task 2

Forget the roles above. Now you are a journalist who has found out about the meeting and the decision. You know that if you reveal anything negative about the new weapon it may result in the cancellation of the development program and therefore less security for Australia against the B group of countries.

What do you report?

Background to the film for students

The hypothetical situation you have just discussed is very similar to an event that happened in Australia—and which is still having an impact.

In the 1950s the Australian government supported a series of British atomic bomb tests in Australia. Those tests released radioactive fallout that contaminated pasture, which was then eaten by cows and made its way into

MAIN PIC: Bille Brown as Hedley Marston on a hill at Robe, South Australia. Photo by Rob McAuley. BELOW: Hedley Marston with lab technician. © John Spooner



FROM TOP: Map 01 • Laboratory staff with fallout test equipment - Ruth Nicholls, Bille Brown, Shannon Burke and Jane Radford. Photo by Peter Butt.



human bones in the cows' milk.

The film *Silent Storm* tells the story of these events and raises issues that are relevant to your life.

Watch the film and work through the questions in the **Exploring the narrative** section to make sure that you follow the story. Then consider the issues in the **Discovering Democracy** section to explore how the issues apply to your society today.

EXPLORING THE NARRATIVE

THE FILM RAISES A NUMBER OF ISSUES relevant to Australian society today, but it does this through the historical context of the testing of nuclear weapons in Australia in the 1950s and the efforts of one man, Hedley Marston, to reveal the truth of those tests.

Students should look at the narrative of the film and then think about the 'big ideas' raised and their relevance to our society today.

Discovering the ashed bones

The film opens with the discovery in 2001 of a large number of ashed bones kept in storage; bones that had been taken from autopsied bodies and tested without the knowledge and ap-

roval of the relatives of the dead.

- Why is this a significant discovery?
- Why is it presented by the narrator as a shocking discovery?

(You will be asked later to discuss the ethical implications of this situation.)

the Hiroshima explosion of 1945 was about 15 kt)

Emu Field (Operation Totem)

- 15 October 1953 (10 kt)
- 27 October 1953 (8 kt)

Monte Bello Islands (Operation Mosaic)

- 16 May 1956 (15 kt)
- 19 June 1956 (60 kt)

Maralinga (Operation Buffalo)

- 27 September 1956 (15 kt)
- 4 October 1956 (1.5 kt)
- 11 October 1956 (3 kt)
- 22 October 1956 (10 kt)

Maralinga (Operation Antler)

- 14 September 1957 (0.9 kt)
- 25 September 1957 (5.67 kt)
- 9 October 1957 (26.6 kt)

(see map 01)

- Why did the British 'need' to test atomic weapons?
- Why would they not test them in Britain?
- Why do you think the Australian



Bille Brown as Hedley
Marston at the CSIRO
field station, Robe South
Australia Photo by Peter Butt





ABOVE: Bille Brown as Hedley Marston at desk BELOW L-R: Diagram 01 Based on Roger Cross *Fallout*, Wakefield Press, Adelaide, 2001, p. 100 • Bille Brown as Hedley Marston in lab Both photos by Rob McAuley

government chose to be part of these tests?

The involvement of the CSIRO

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's foremost scientific testing and development entity.

It became involved in the tests when it was asked to monitor the tests to protect civilians' safety.

- What is meant by 'atomic fallout'?
- Why would monitoring of the tests

be needed?

The role of Hedley Marston

Hedley Marston, the chief scientist at CSIRO, was asked to create a way of testing the fallout from explosions on pasture, and therefore the impact on grazing animals as a source of food.

- Why would the impact on grazing animals be relevant?

Marston decided that the proposed British monitoring process was inadequate. It would test the fallout in a narrow area around the explosion.

Fallout would land in small plots of grass, which would then be fed to sheep. The sheep would then be tested to see if any fallout material had entered their system. The size of the plots meant that only a small part of the sheep's feed would actually be contaminated grass. Marston was very critical of the methodology employed for this experiment.

- Why would this experiment produce limited or no useful results?

Look at diagram 01 showing the pathways for the accumulation

Diagram 01

PATHWAY FOR THE ACCUMULATION OF RADIOACTIVE IODINE IN ANIMALS		
Entry via the lungs	OR	Entry via eating pasture
Animals breathe radioactive gas or aerosol, thus it finds its way to the thyroid via the lungs.		Animals consume pasture that is contaminated with radioactive material, which is absorbed via the alimentary canal and finds its way to the thyroid.
If this is so then the consequences for humans are grave, especially for human foetuses.		Cows could graze and concentrate deadly isotopes in their milk, which would then be consumed by people via the milk.
In either case the amount of radioactivity accumulated in the thyroid gland would reveal the capacity of grazing animals to assimilate and concentrate deadly radiation.		





ABOVE L-R: Scientific staff Jane Radford, Ruth Nicholls and Director Peter Butt on set • BELOW: Bille Brown as Hedley Marston in office with radio Both photos by Rob McAuley

of radioactive iodine in animals. Complete the diagram by drawing arrows to show the flow or sequence of the events shown

- What was Marston's alternative experiment to the British one?
- How would this experiment gather more and different information?

Marston and Titterton

Hedley Marston and Ernest Titterton had different attitudes towards atomic testing. Titterton was a believer; Marston a sceptic.

- Explain what this meant for the way tests were likely to be monitored and reported.

Government lies

The Australian government reported that there had been no fallout from atomic tests in populated areas, yet Marston's sheep thyroid tests and the sticky paper tests both showed that there had been fallout on Australia's major cities from

several of the atomic tests.

- Why did the government lie?
- Why did Marston want to expose the lie?

Strontium 90 fallout

Marston's tests measured Iodine 121 fallout, not the more dangerous Strontium 90.

- Why was Marston certain that if there was Iodine in sheep thyroids, there would also be Strontium in their bones?
- What was the scientific

disagreement over the significance of Strontium 90 levels and their impact?

- Why did Marston's report create suspicion of him by the Australian spy organization, Australian Security Intelligence Organisation (ASIO)?

Testing bones

The Australian government, despite its denial that there had been fallout, started to test bones for Strontium 90.

- Why did it do this?
- What was the significance of bones for this test?
- Whose bones was it most important to test?
- Why was Marston certain that there would be Strontium 90 found in bones?



The end of atmospheric testing

In the early 1960s atmospheric testing was resumed and there was a notice-

able increase in fallout. This led to an international agreement to stop conducting nuclear atmospheric testing.

- How does this vindicate Marston?

DISCOVERING DEMOCRACY

SILENT STORM DEALS WITH events that occurred about fifty years ago. But it raises issues that are still relevant in our society today and challenges us to think about how we deal with political and ethical issues.

Australian sovereignty

The film shows that Australia allowed another country to carry out dangerous and potentially harmful activities on Australian territory.

- Do you think the international circumstances (the Cold War and Australia's interest in developing atomic weapons and nuclear power capacity) justified this?
- Can you imagine any circumstances today where a similar action would be justified?
- If there was a similar proposal today (e.g. the establishment of a United States base near Darwin to help the fight against terrorism) what might influence you to accept it, or to oppose it?

Prepare a set of arguments for or against such a proposal.

The independence of government bodies

Government bodies such as CSIRO are created to carry out specific tasks in the national interest. Sometimes there can be uncertainty about what is in the national interest, and what is in the government of the day's political interest.

Imagine that you are head of a body that exists for the benefit of Australia. The government of the day asks you to carry out a task that you do not believe is appropriate or proper.

- Discuss the difficulties that this situation would create for you.

- How might you resolve this dilemma?

The right to know

People in Australia often assert their 'right to know' what the government is doing. Good decisions can only be made if they are well-informed. But there is also a government responsibility to keep certain information from people.

- Discuss under what circumstances, if any, you would support a government keeping information from people.
- Are there any safeguards or limits on that right to restrict information?

Health outcomes

Many people who were involved in the atomic tests of the 1950s in Australia believe that they are suffering particular health problems directly caused by that testing.

- Whose responsibility is it to deal with those problems—should be the Australian government? The British government? Both? Neither?
- Some of the participants are claiming that their health problems include genetic damage, so their children and possible future generations will be affected by what happened to them between 1952 and 1957. If there is a responsibility, for how long does that responsibility exist?

Whistleblowing

Hedley Marston behaved in a way that today would be classified as 'whistleblowing'—that is, as an insider in an organization he went public with criticisms of that organization and its activities.

Typically, a whistleblower is criticized for his or her exposure of the activities.

Many people will not 'blow the whistle' even if they know things are wrong, for fear of the personal consequences.

Imagine that you know that a group of your classmates are planning to cheat in their exams. If they do, their results will mean that students who abide by the rules miss out on a valuable scholarship, and this will affect their ability to continue studying. You also know that if you report the cheats they will know that you have informed on them, and may bash you up. There is also a possibility that you will be implicated in their cheating scheme.

- Discuss the implications and consequences of not telling and of telling.
- What do you do?

Ethics of bone testing

A major focus of *Silent Storm* is the ethical issue of the collecting and testing of bones without people's knowledge or permission.

Imagine that there is a very sensitive issue—the issue of paternity (whom a person's father is). You, as a government scientist, realize that you can develop a way of checking paternity instantly, on the spot, and for virtually no cost, simply by seeing if saliva has a certain effect on a specially treated cotton bud. There will certainly be great controversy about this, because while your test will have great medical benefits in terms of matching people for transplants, it will create much social controversy as well. You can develop the test only if you have access to medical waste from people who have been treated in hospital for wounds. Without that access, or if the access is limited, you will not be able to develop your test.

- What do you do—tell and get permission? Tell but not get permission? Neither tell nor get permission?

The role of the individual

Silent Storm emphasizes the personal qualities and role of Hedley Marston.

- What strengths did he show?
- What weaknesses did he have?
- Did his personal qualities and



Crew filming Bille Brown as Hedley Marston L-R Nicholas Mathews (Camera Assistant), Peter Butt (Director),
Calvin Gardiner (DOP), Bille Brown as Hedley Marston Photo by Rob McAuley

behaviour influence the course of events?

- Would you call him a hero?
- How do significant individuals have an impact on your life, and on the lives of others?
- How important is personality in political and social leadership in our society?

The after effects

The film does not raise two issues that are significant elements of the British-Australian testing program of the 1950s: the environmental after effects of the tests; and the impact on Aboriginal people of the area.

The tests left much of the area contaminated. People just walked away after the tests. More recently, there has been an attempt to clear the sites—but the cost is huge.

- Who should be responsible for that clean-up—the Australian govern-

ment? The British government? Both?

The tests also had a devastating impact on the health and lives of Aboriginal people of the area. Because there was insufficient warning and notice given, and because the predictions about the extent and location of fallout were often wrong, many Aboriginal people were caught in the fallout. The radiation exposure to local communities and country was extensive as dense radioactive clouds travelled far across the land. Furthermore, the testing range boundaries were not secure and warning signs were written in English only.

For the Aboriginal people who still walked the Western Desert, many living traditionally, radiation exposure caused sickness and death. Here is the testimony of one person, Eileen Kampakuta Brown:

Westward we noticed the smoke when

the sun was going down. We were all watching the sun going down funny. We thought the farmers were burning stumps—cleaning them up ... We could see the light clear.

Smelling a different smell. We were all talking about it—'oh it must be the farmers, the workers'. We were watching it, watching it then we went to sleep. We were close that was why the smoke [nuclear fallout] caught us.

We got up in the morning from the tent ... everyone had red eyes. Everyone had red eyes. Right here the smoke caught us—it came over us. Us lot ... We tried to open our eyes in the morning but we couldn't open them. [We had] red eyes and tongues and our coughing was getting worse.

We were wondering what sort of sickness we had. We put a dish in every corner, a dish of hot water and Vicks. We covered ourselves with blankets to [breathe in the Vicks] ... There were no



ABOVE: Filming a mockup thyroid removal on a sedated sheep at Robe. L-R Lew Schinkel (vet), Bille Brown, Peter Butt (Director), Calvin Gardiner (DOP), Nicholas Mathews (Camera Assistant) Photo by Rob McAuley. BELOW: Peter Butt (Director) on set

Doctors—only the two station bosses ... All day we sat in the tent with our eyes closed. Our eyes were sore, red and shut. We couldn't open them. We were coughing ... All people got sick right up to Oodnadatta and all the way over that way ... We saw the poison [from Maralinga] and we all got sick.

http://www.iratiwanti.org/iratiwanti.php?3?page=atomic_tests

Imagine that the Australian government wanted to conduct similar tests in a similar place today.

- Identify the difficulties or issues that would have to be addressed (e.g. language, locating people, interfering with people's possession and use of land, etc.)
- Prepare a set of steps that you think would be fair and reasonable for the circumstances.

Final activity

The issues raised in *Silent Storm* are still current.

A newspaper article on 5 October

2003 reported the finding that British atomic bomb tests in Australia in the 1950s may be responsible for large increases in thyroid cancer cases around Australia.

- Prepare a short talk that explains this report and puts it into its historical context.

Creating a documentary film

Read this quotation from the film-maker, Peter Butt:

While many photographs of Marston were available from CSIRO archives and relatives, precious little was found of Marston on motion picture film. A seven-second shot of the scientist, side-on to camera with a sheep, was not enough on which to base a fifty-two minute film.

Questions

1. How did the film-maker overcome the problem of there being very little film of the main character? Discuss the use of:
 - an actor
 - reconstructions
 - music
 - archival film and stills
 - sound effects
 - mood effects
 - film styles (e.g. simulated Super 8 home movie style)
2. Do you think the film-maker has created an effective style for this documentary? Discuss your reasons.

You can also look at more from the



interview below with Peter Butt about the creation of the film and use that in making your judgement.

Peter Butt:

I knew this was a documentary just waiting to be made. Film Australia Executive Producer, Anna Grieve, enthusiastically agreed. In early 2002, with Roger Cross on board as historical consultant, I set about researching the complete story. Interviews with scientists who worked with Marston as well as hundreds of top-secret documents, personal correspondence and Marston's ASIO file helped flesh out the story.

The most exciting find was a tape, unlabelled and possibly never played for forty-seven years. It turned out to be a telephone conversation, which Marston secretly recorded with the head of the Safety Committee, following his initial discovery of fallout in sheep and cattle. The sound quality was poor, but the character of Marston came through—especially his anger about government assurances that the tests were safe.

With Hedley Marston dead for almost four decades, it was clear that the only way of telling his story was to dramatise it. An actor would have to be found to play the large and larger-than-life character. Importantly, he would have to look comfortable both in the bush and in a city laboratory.

Over the coming months we set about recreating the world of Hedley Marston. Miraculously, his corrugated iron-clad field station at Robe, South Australia, remained in original condition. The façade of his Adelaide laboratories and office also remained, but the interiors had been completely modernized. After a desperate search, suitable period laboratories and offices were found at the University of Sydney.

A search was also carried out in Australia and Britain for the specialised radiation instrumentation fundamental to Marston's discovery. The hunt was unsuccessful, so we had a replica built using a photograph as a guide.

The most sensitive scenes to portray involved the bone sampling carried out by the Safety Committee. More than 6000 from a total 20,000 samples of ashed bone survived, but were not available to the media for filming. Dramatisation again was the only option.

For the production, I wanted a 'filmic look'. I worked with cinematographer Calvin Gardiner and post-production house Engine on a lighting style and colour-grading solution to make digital video look like 35 mm film shot in the 1950s.

We also decided to use Super 8 home movie film to bring the audience closer to Marston, who by all accounts was not averse to being the centre of attention. Indeed, in real life he was painted by leading artists Dobell, Murch and Gruner, and feted by industrialists, photographers and the creme of society.

While shooting the early scenes at Marston's Robe Field Station, a local farmer, who with his father helped Marston on his groundbreaking work with sheep, took me aside and said that Bille Brown had not only captured the look and stature of Marston, but the character.

Further Resources

Lorna Arnold, *A Very Special Relationship: British atomic weapon trials in Australia*, London, HMSO, 1987.

Australian Radiation Protection and Nuclear Safety Agency, 'ARPANSA Report, Strontium-90 Testing Program 1957 – 1978. Use of Human Bone Tissue', ARPANSA, c. September 2001 www.arpansa.gov.au/strontium90.htm

Peter Butt (director), *Fortress Australia: the secret bid for the atomic bomb* [videorecording], Film Australia, Sydney, 2002.

Purchase the film at the NFSA
[http://shop.nfsa.gov.au/
product_info.php?products_id=4215](http://shop.nfsa.gov.au/product_info.php?products_id=4215)

Roger T. Cross, *Fallout! Hedley*

Marston and The Atomic Bomb Tests In Australia, Kent Town, SA, Wakefield Press, 2001.

National Health and Medical Research Council (NHMRC) - Australian Health Ethics Committee, 'Ethical and practical issues concerning ashed bones from the commonwealth of australia's strontium 90 program, 1957-1978, NHMRC, March 2002 <https://www.nhmrc.gov.au/guidelines-publications/e44>

SILENT STORM

A Film Australia National Interest Program. Produced in association with SBS Independent.

WRITER/DIRECTOR: Peter Butt
CO-PRODUCERS: Peter Butt and Rob McAuley
EXECUTIVE PRODUCER: Anna Grieve
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