



**The search for
better health**

Teacher's Resource Kit

2.5 hour case study

HSC Biology

Year 12

July 2010



Mawland Quarantine Station

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1 The Program

The Search for Better Health is an education program designed to complement the HSC Biology unit of the same name. Using the Quarantine Station as a case study, students investigate the evolution in thinking about disease, its causes, transmission, and prevention as reflected in the facilities, theories and practices employed at the Station during its more than 150-year history (1828-1984).

1.1 Aims and Objectives

The aims and objectives of the program are for students:

- To understand the evolution in thinking about medical practices from the 19th Century to the present as revealed in the history of the Quarantine Station
- To have a context for understanding the conditions, attitudes, practices and theories about disease and treatments from the 19th Century to the present
- To experience some of the approaches to treating infectious diseases as practiced at the Quarantine Station
- To use primary and secondary sources to diagnose infectious disease as the medical staff might have at the Quarantine Station
- To develop appreciation for the concept of *quarantine* and its use and misuse in preventing the spread of disease
- To increase their personal knowledge of key aspects of the HSC curriculum through active learning practices.

1.2 Areas of the HSC Biology Syllabus Addressed

Contextual outline

1. Over 3000 years ago the Chinese and Hebrews were advocating cleanliness in food, water and personal hygiene.

Students learn to:

Explain why cleanliness in food, water and personal hygiene practices assist in control of disease.

2. During the second half of the nineteenth century, the work of Pasteur and Koch and other scientists stimulated the search for microbes as cause of disease.

Students learn to:

Identify the role of antibiotics in the management of infectious disease.

And

Identify data sources, gather process and analyse information from secondary sources to describe on named infectious disease in terms of its Cause, Transmission, Host response, Major symptoms, Treatment, Prevention, and Control.

3. Often we recognise an infection by the symptoms it causes. The immune response is not so obvious, until we recover.

Students learn to:

Identify defence barriers to prevent entry of pathogens in humans; skin, mucous membranes, cilia, chemical barriers, other bodily secretions.

4. Mac Farlane Burnet's work in the mid-20th C. contributed to a better understanding of the immune response and the effectiveness of immunisation programs.

Students learn to:

Identify the components of the immune response – Antibodies, T cells, and B cells

Describe and explain the immune response in the human body in terms of:

- Interaction between B and T lymphocytes
- The mechanisms that allow interaction between B and T lymphocytes
- The range of T lymphocyte types and the difference in their roles
- Outline the way in which vaccinations prevent infection

And

Process, analyse and present information from secondary sources to evaluate the effectiveness of vaccination programs in preventing the spread and occurrence of once common diseases, including smallpox, diphtheria and polio.

5. Increased understanding has led to the development of a wide range of strategies to prevent and control disease.

Students Learn to:

Discuss the role of quarantine in preventing the spread of disease and plants and animals into Australia or across regions of Australia

Explain how Public Health programs have controlled and/or prevented disease.

Students:

Process and analyse information from secondary sources to evaluate the effectiveness of quarantine in preventing the spread of plant and animal disease into Australia or across regions of Australia

Gather and process information and use available evidence to discuss the changing methods of dealing with plant and animal diseases, including the shift in emphasis from treatment and control to management or prevention of disease.

2 Preparation

Students will get more out of the visit if they are familiar with the history of the Station and the nature of the excursion they will have here. This program is designed to complement the Search for Better Health syllabus touching on some of the main points and providing a context for attitudes and practices regarding disease as demonstrated at the Quarantine Station.

2.1 Pre-visit Activities

The following information and activities are provided as suggestions for lesson activities to engage students with the concept and practice of immigration and quarantine. It is recommended that students become familiar with these concepts beforehand in order to get the most out of the experience whilst on site.

2.1.1 The Historical Phases of the Quarantine Station

Using the information provided in this kit and other historical sources, introduce students to the history of the Quarantine Station, as outlined in Section 5.1.

2.1.2 Immigration to Australia

Discuss the different waves of immigration in Australia to the present day. This could include graphing immigration numbers chronologically within the phases of the Quarantine Stations history as outlined in section 5.1.

2.1.3 Location of the Quarantine Station

The site of the Quarantine Station was chosen for three reasons:

1. It is close to the entrance of Sydney Harbour
2. Isolated from Sydney
3. A natural spring providing fresh water runs from the swampy ground at the top of the site through the site to Spring Cove (now Quarantine Beach).

Mapping the Port Jackson area from 1837 to the present puts these ideas in context.

2.1.4 Timeline

Create a timeline showing the relevant breakthroughs in medical history covering the 19th – 21st centuries. Include the work of Fleming, Pasteur, Koch, miasma theory, germ theory, McFarland Burnett, the manufacture of the first antibiotics on a mass scale, etc. Include the World Wars and major epidemics such as Smallpox, Bubonic Plague, and Spanish Influenza.

2.1.5 Disease and Treatment

The importance of the Quarantine Station is directly related to medical developments and the changing methods of treating disease. Diseases that were quarantined at the Station include smallpox, Spanish influenza, Bubonic plague, scarlet fever, measles, bubonic plague, typhus fever, typhoid, and whooping cough. Students can research these in groups to identify how treatment has changed over time and present this information to the class.

3 On the Day

On-site experience:

The route and buildings may vary but generally the tour starts in the Wharf Precinct with an overview of the history of the site while visiting the main buildings there. Hands-on activities are designed to take place in the following precincts & buildings:

Hospital: students will visit the Hospital building built in 1918 and compare furnishings in the rooms from 1918 and 1957 as a reflection of the changes in thinking about diseases and medical treatment, and consider the evolution of the Quarantine Station in context of the historical and medical milestones in world history.

Morgue: students will be given clues to diagnose an infectious disease and compare possible treatments, past and present.

Steerage (Room P-15): in groups, students will be assigned one aspect of the immune response and create an "advertisement" to promote it.

Ratios

For every class of 25-30 students there should be a minimum of one supervising Teacher and one accompanying adult (not including the Guide). While guides will make every effort to ensure a safe and fun experience for all, ultimately it is the teachers and accompanying adults who are responsible for the behaviour and safety of their students whilst onsite.

Times

Tour times can be negotiated to suit your school's requirements. Please enquire when booking.

Duration

The activity has been designed as a 2.5 hour experience, which does not include break for morning tea or lunch. However, times can be tailored to your group's needs and is also available as a half day or full day excursion, speak to our education coordinator for details about this option.

Coach Drop-off & Parking

About 800 meters before the Q Station there is a stone arch with a height of 3.1 meters. At the Quarantine Station, there is no provision for coaches to enter, back-up, turn-around or park on the grounds – this is a fairly recent restriction and may be different from what drivers have done in the past. Coaches must stop in the round-about just before the entrance and off load passengers there. Guides will meet you there to facilitate a safe offloading of passengers. There is coach parking further along North Head Scenic Dr. and in Manly.

On Arrival

Guides will meet your coach and accompany them to the waiting shelter where they will provide a short introduction about the site, focusing on the rules associated with their visit to the Quarantine Station as a protected heritage site and National Park.

Toilets

Guides will advise students when toilets will be available however this may not be until 1hr into the experience so it is recommended that students take a toilet break before arriving at the Quarantine Station or immediately on arrival.

Water, Sunscreen and Clothing

As the experience consists of outdoor activities it is strongly advised that all students have sunscreen, hats and clothing suitable for being outdoors, including closed-toe shoes, and appropriate to the weather forecast. Students will need to carry their own belongings, including water and food whilst onsite. Please alert the education Coordinators to any specific medical conditions and requirements of individual students when booking your activity.

Physical Rigor

The site is rigorous with steep hills. Transportation may be provided at the beginning or end of the tour for some or all of the students but this is not guaranteed. Please inform your students and any accompanying adults that they will be walking most of the time at the Quarantine Station. If there are any students with disabilities or other health issues (including asthma, etc.) which would make walking difficult, please discuss this with the Education Coordinator at the time of your booking so that she can help you make the necessary arrangements to ensure every child gets maximum value from the experience.

Accessibility

Much of the Quarantine Station site, including the educational programs, is accessible to wheelchairs. We do have wheelchair accessible toilets but not all toilets onsite are. However, the site is rigorous with steep hills; this can pose a problem for the person in the wheelchair or their aide. Also, the Q Station shuttle buses are not accessible to people in their wheelchair – they must be able to get out of their wheelchair to get on to the shuttle bus or be carried (which is awkward and not safe). If you have a student with mobility challenges, please speak to our education coordinator before hand so that she can work with you to make arrangements so all the students will get the most from their visit.

Water access

The **Reef Goddess** is available to transport students to the station from selected wharves in Sydney Harbour. The shuttle can accommodate up to 64 people on any given trip. Please phone 1 300 760 846 for more information about this option!

Important!

The Quarantine Station is an historic site and students will be instructed to walk carefully and be mindful of where they are walking to reduce risks of slipping and / or tripping. Our risk management documentation is available for download at www.qstation.com.au .

4 Post-visit activities

The following activities are suggestions to deepen the student's knowledge and understanding of the Quarantine Station site. While the HSC Biology curriculum likely does not lend itself to extra projects, they are provided here as suggestions to extend the learning and may be used by other science or history classes.

4.1 Public Information Campaign

Develop a public information campaign appropriate for the following scenarios. Consider how you would convey the message quickly and succinctly? What media would you employ?

- **Wash your Hands/Wear a mask!** For primary school children as a means of preventing the spread of illness.
- **Don't Bring It In!** For air travellers, who may not speak English, coming into Australia from overseas.
- **Flu shots work!** for the elderly

4.2 Survey of Historical Cartoons

Throughout the 19th – 20th Centuries, cartoons were widely used to reflect the issues of the day. Develop a survey of historical cartoons commenting on diseases or conditions which contributed to them. Punch magazine in England regularly ran cartoons commenting on the social attitudes and political situations of the time.

4.3 Creating a Character

The Quarantine Station has a layered history. Ask students to research and develop background for one of the following characters and write an account of what the site was like from their perspective:

- Aboriginal man and woman prior to 1788 up to and including white occupation of North Head for its use for Quarantine. Note the introduction of smallpox into the colony and its impact on the Aboriginal population.
- Convict quarantined on the beach in 1828, sick with smallpox, after his voyage aboard the *Bussorah Merchant*.
- Elderly Sydney resident quarantined during the 1880s smallpox epidemic.
- 11 yr old Vietnamese orphan housed at the station as part of 'operation babylift' in 1974.

4.4 Avian Influenza/Swine Influenza Threat

A new threat of disease that emerged in 2009 is Swine Flu. In Asia, Avian Flu has been a concern for a number of years. Swine Flu (H1N1), Avian Flu (H5N1) and Spanish Influenza (H1N1) are related strains of virus. The Quarantine Station was an important means of controlling the spread of Spanish Influenza throughout Australia. Now that we no longer have that system in place, research the strategies that the Australian Government has in place in case of an outbreak of Avian Flu. Do you think that the government would be able to deal with an outbreak here today? Why /why not? Evaluate whether we have learnt from the past in this regard.

4.5 Quarantine Your School!

Design a response to an Influenza Pandemic for your school. Using the WHO website and other resources, design a plan that would be activated for a Stage 3 pandemic with increasingly severe restrictions as the threat increased. Consider an initial information campaign; what measures would be put in place to allow the daily schedule to continue as normal; what “non-essential” activities or classes would be curtailed and who would decide; how could students continue on with their lessons even if they aren’t going to class. How would the quarantine affect teachers, staff, and the administration?

5 Additional Resources

5.1 Introduction to North Head Quarantine Station

Quarantine is defined as ‘strict isolation designed to prevent the spread of disease’. Quarantine stations were created in European ports so that vessels suspected of carrying infectious diseases could be isolated for the duration of an infectious illness. The origins of the word quarantine come from the Italian *quaranta* (i.e. *quaranta giorni*) which means forty and relates to the initial period of quarantine of 40 days during the fourteenth century. At North Head the period of quarantine varied depending on the incubation time of the disease.

There were quarantine stations in ship ports-of-entry at Sydney, Newcastle, Fremantle, Broome, Bunbury, Thursday Island, Darwin, Point Nepean, Perth, Albany, Townsville, Moreton Bay, Hobart and Adelaide.

They isolated passengers with diseases such as plague, cholera, typhus fever, typhoid fever, yellow fever, smallpox and leprosy.

The experience of quarantine for many immigrants [and probably crews as well] was harrowing. After the long passage to Australia was over, they expected to be put ashore in their new home, only to find themselves encamped in isolated and, initially, poor conditions, with sick family and friends dying around them.

North Head was chosen as the site for Quarantine because it:

- was within close proximity to the entrance to Sydney Harbour
- was isolated from Sydney
- had a natural spring that ran from the swampy ground above to spring cove providing freshwater

A Brief History

In the 156 years of the Quarantine Station operation (1828 to 1984):

- At least 580 ships were quarantined
- More than 13,000 people were quarantined
- Approximately 572 people died and were buried (including people who died in Sydney of the plague)

The history of the Quarantine Station can be viewed in terms of the following phases:

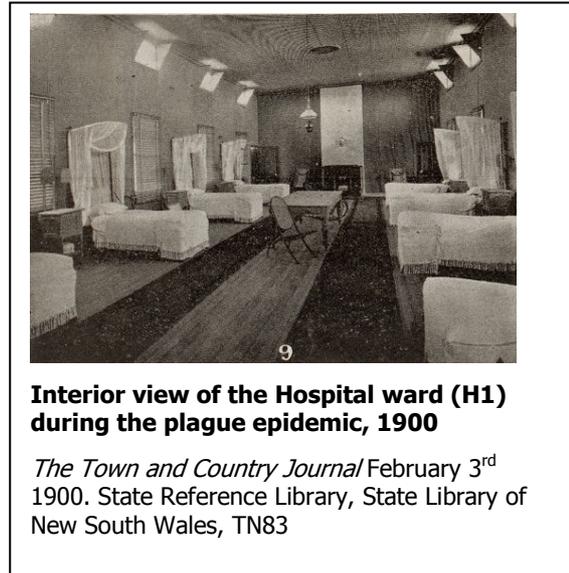
Establishment of the Station – 1838

Between 1828 and 1984 North Head was used as a site for the Quarantine of people infected or under suspicion of carrying infectious disease. The first ship to be quarantined in Spring Cove was the convict ship the *Bussorah Merchant* for an outbreak of smallpox during the long voyage from England. The convicts and their guards were housed in tents on the beach. In 1837 the site landed the ill-fated passengers and crew of the immigrant ship the *Lady McNaughten* spurned by Typhus fever and scarlet fever. Of the 44 immigrants

to the colony, 54 died on the voyage and this was followed by 17 more during their lengthy quarantine. The quarantine of *the Lady McNaughten* was the catalyst for the establishment of an official Quarantine Station on North Head and permanent buildings being erected on site.

Immigration Phase: 1839-1880

By 1853, the Quarantine Station could accommodate up to 150 people. However when the need arose for 1000 immigrants to be housed all at once, the facilities were found to be grossly inadequate and a building program was required once more. A hulk ship, called the *Harmony*, was moored in Spring Cove for use as a hospital for men and a barracks were built to accommodate single women in the former Sick Ground. This was followed by two new buildings to house 60 people each, with verandas for dining and a cottage for the Superintendent (S6) which still exists. During this time the first cemetery was also levelled (although the bodies were left in the ground) and the grave stones either moved to a new cemetery or ground up for paving, so that the burials were not in view from the healthy ground.



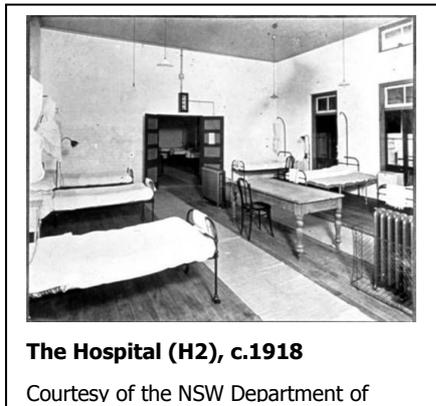
Interior view of the Hospital ward (H1) during the plague epidemic, 1900

The Town and Country Journal February 3rd 1900. State Reference Library, State Library of New South Wales, TN83

In the 1860s and 1870s the world economy slowed and as a consequence the immigration rate also slowed and the Station fell into such disrepair that in 1872 passengers were kept aboard their quarantined ships. This period also saw the introduction of class-based accommodation after a number of wealthy and well connected first class passengers put pressure on government officials to provide accommodation more apt for their needs

Board of Health Phase: 1881-1909

The outbreak of Small pox in Sydney in 1880 created hysteria amongst Sydney’s residents. If it was suspected that a person was either infected with smallpox, or had come in contact with someone infected with smallpox, they could be taken from their home and sent to the Quarantine Station with as little as five minutes notice. This, combined with the inadequacies of the Quarantine stations facilities resulted in so many complaints that a Royal Commission was ordered resulting in the dismissal of the Superintendent of the Quarantine Station and the establishment of a ‘Board of Health’ to operate the Quarantine Station. From this point onwards there was also much closer supervision of procedures and greater accountability for the actions of staff.



The Hospital (H2), c.1918

Courtesy of the NSW Department of

Federal Phase: 1910-1950

The turn of the century saw a change in the administration of the Quarantine Station from State to Commonwealth control with the federation of the colonies. This, and the recognition by the new director of Federal Quarantine, Dr. W.P. Norris, that Australia's facilities for the protection against infectious diseases were grossly inadequate, precipitated the biggest upgrade to the Station. The wharf precinct was redesigned to accommodate a luggage shed, state of the art disinfection block, laundry and powerhouse, waiting shelter and bathing blocks for each of the three classes. A modern isolation block was constructed to accommodate up to thirty cases of suspected infection and a dining, kitchen block, accommodation for up to 300 steerage passengers and quarters for 100 second

class passengers were welcome additions. A cable tramway, electric lights and new staff cottages were also constructed.

Aviation Phase: 1950-1983

The twentieth century saw many advances in medical science, immunisation, and quarantine procedures. Consequently the need for the quarantine station facilities decreased significantly. Sydney received nearly 700,000 assisted immigrants between 1946 and 1980, or nearly double the number it had received between 1831 and 1940, yet only four ships were quarantined in that period and at least one of those was a tanker. After 1919 only two deaths occurred at the Station.

As maritime quarantine decreased in frequency the Quarantine Station was allowed to deteriorate. By the time that air travel was becoming more common, the Station was in poor condition. In 1957, instead of another expansion, there was a refurbishment program and the Station was re-equipped to house fewer people (250) but in 'modern comfort'. As a result a number of buildings were removed in order to fund the refurbishment of others. Ironically the refurbishment was not used to any great degree because there were so few quarantines. The only large quarantine after the refurbishment was of 29 cholera suspects from an aircraft in 1972.



The Hospital (H2) following the Stations modernisation, 1964.

Image courtesy of the NSW Department of Environment and Climate Change

The last ship to be quarantined was the tanker *Sasaki Maru* in 1973, whose crew was landed for a short period while a suspected infection, was found not to be a quarantinable disease. After that time the only people admitted to the Station were airline passengers who arrived without adequate vaccination certificates.

New South Wales National Parks and Wildlife Service: 1984- 2006

On 16 March 1984, ownership of the Quarantine Station was transferred from the Commonwealth to the State Government and it was reserved as part of Sydney Harbour National Park. The National Parks and Wildlife Service [NPWS] established guided tours and a conference and functions centre.

To minimise visitor impacts, access was limited to these paid experiences, so people could not spontaneously visit, and could not independently access the site.

A new Community Employment Program from 1985 to 1986 helped fund a major conservation program for buildings, structures, grounds and site works, with emphasis on stabilisation of the most threatened elements. Conservation planning also commenced for individual elements of the place, including historical research, measured drawings of buildings and structures and recording of rock engravings.

The NPWS also made the Quarantine Station its base for district operations, setting up workshops and offices, and permitting some staff to become temporary residents.

Because the site is rugged, the buildings light weight, and the landscape continually changing, maintaining the Quarantine Station is a constant and very expensive exercise. Despite considerable work by the NPWS over the first 15 years of its management as a national park, many of the buildings and some of the cultural landscape surrounding them fell into poor condition. The NPWS did not have enough money to return the Quarantine Station to a fit condition that ensured its cultural significance was maintained. For over a decade the NPWS tried to raise the funds from State government, from grants and sponsors, and from the profits of their on-site conference, functions and tours business. Despite all of these efforts, the NPWS judged that they could not raise enough funds to stop the decline, and that the situation would become much worse if at least \$4 million was not spent within the next few years.

Mawland Quarantine Station: November 2006- present

In November 2006, the site was leased to tourism operator, Mawland Quarantine Station, who are currently undertaking much needed conservation works, adapting buildings to provide for accommodation, conferences & events, a restaurant, visitor centre and health retreat. In April 2008 the site opened, allowing increased access for the public in conjunction with new interpretive experiences such as displays and tours for the public to explore the history of the site, bringing it into the present and to the future.

For more information about Mawland see http://www.qstation.com.au/mawland_group.php .

5.2 Map of the Quarantine Station showing both existing and demolished buildings



LEGEND

-  Buildings Present
-  Buildings Demolished
-  Buildings Burnt Down & Reconstructed

5.3 Bibliography and Suggested Resources

Printed publications

The Town and Country Journal February 3rd 1900. State Reference Library, State Library of New South Wales, TN83

New South Wales. *Report of the Royal Commission, appointed on the 13th September, 1881, to enquire into and report upon the management of the Quarantine Station, North Head, and the hulk "Faraway"; together with the minutes of evidence and appendices.* Sydney: Govt. Pr., 1882.

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Wills, R. ed. *Humin hopes. The Diary of Charles Moore, English Immigrant to Australia on the Constitution.* Pigface Press, Point Lookout 2005.

Foley, J.D. *In Quarantine: A history of Sydney's Quarantine Station 1828-1984.* Kangaroo Press. Kenthurst. 1995.

Dobson, Mary. *Disease: The Extraordinary Stories Behind History's Deadliest Killers.* Quercus, London 2007.

Arnold, Nick. *Horrible Science: Deadly Diseases.* Scholastic, London 2000.

Etherington, Kate ed. *Anatomica: The Complete Home Medical Reference.* Global Book Publishing, Pty Ltd, Lane Cove, 2006.

Internet resources

Quarantine Station website- www.qstation.com.au

Australian Quarantine and Inspection Service- <http://www.daffa.gov.au/aqis/quarantine>

State Library of NSW- www.sl.nsw.gov.au

Department of Immigration- <http://www.immi.gov.au/>

History of Immigration to Australia- Trinity College -
<http://www.trinity.wa.edu.au/plduffyrc/subjects/sose/austhist/immigration.htm>

National Archives of Australia- www.naa.gov.au

Picture Australia- www.pictureaustralia.org

Sydney Morning Herald- www.smh.com.au

Google- www.google.com.au

World Health Organisation- <http://www.who.int>