2. Developing a Taxonomic Structure

However, even when the stamp represents an aspect of a country, such as a monument or site, it equally represents the country itself, for the image reproduced on the stamp is accompanied by the signs which establish that nation’s identity (Scott, 1995, p. 8).

Bernard Smith, doyen of Australian art historians, is quoted as having said “an image is information” and that in assessing an image it should be “tested for validity and intention” (Palmer, 2012). The messages being studied in this book are those contained within postage stamps representing science, which I define later in this chapter.

As issued by the postal authority, stamps fall into two main categories. The first is the definitive issue, general purpose stamps which are on sale, usually for a period of a few years, over the post office counter. These are sold to pre-pay a postal service over a wide range of prices to enable the user to buy a product to meet his or her specific need. The second class of stamp, the commemorative stamp, generally has a specific themed image and will have a limited shelf-life in the post office. Commemorative stamps, also known as special stamps, are issued as a single stamp celebrating a theme or significant achievement, or are combined in a set of stamps at the prevailing prices for letter post to popular designated destinations.

The themes that are addressed on commemorative stamps can be very general, or quite specific, if, for example, medical scientists are the chosen subject. Commemorative stamps are issued to communicate a specific message for a limited time. This study is concerned with understanding scientific content messages, how and why themes are chosen, and the timing of the issue. The vehicle conveying the message might be a definitive or a commemorative stamp.

The over 200 postal authorities of the world have, to date, printed some 600,000 different stamps. Perhaps as many as 60,000 (10%) of these will have a representation of a scientist or science as a part of the image. The first portrayals of science on stamps, according to my below definition of science, did not occur until the 1920s and 1930s, after which time issuing authorities have celebrated scientific and technical achievements to promote government policy within their own country boundaries and, in turn, to the world.

Essential in determining the database for my study, I have used the listings of all legitimately printed postage stamps recognised by four reputable, international stamp dealers who provide whole-world stamp listings in their catalogues. Additionally, most countries are serviced by three or four local stamp dealers.
who list that country’s postage stamps as their sales catalogue. Two or more catalogues have been used for each country considered to ensure completeness and verification of data. Catalogues have been used as data sources and to provide a reference to specific stamps discussed within the text.

Some countries are accused of printing stamps solely for the collector and their issues may not even be sold in the post offices of that country. From 2002, the Universal Postal Union (UPU) has published online the images and catalogue numbers of the stamps of the participating countries that are registered with them. These stamps must meet the legitimacy criteria of having been readily available in the country of issue and sold at face-value at the time of issue for inclusion on the website. My study is limited to science on stamps of countries that have fulfilled these criteria. However, I also look beyond these strictly legitimate boundaries to include the stamp issues of four of the Antarctic Territories, stamps that Altman (1991) suggests are only issued to justify the controlling country’s possession and occupation of disputed land.

By and large, commercial catalogues number the stamps issued by a country’s postal authority from the first issue, in date order, and increment the subsequent issue chronologically, as does the UPU World Numbering System (WNS). This simplifies the count of the number of stamps produced by a country and specifies the time-frame. In some cases here, when identifying a particular stamp, the UPU WNS is used if the stamp issue is too recent to have been catalogued in a vendor’s hard-copy publication.

It should be a simple matter, therefore, to look at the most recent stamp catalogue for a country to determine how many stamps that country has issued. It is noted here that the number of stamps being issued annually has been higher in recent years than the average number of issues over time. No distinction is made here as to how a stamp has been sold, because in most instances this cannot be determined by examination. The postal authority might have sold the stamp as a single from a sheet, within a miniature sheet or sold via a booklet over the post office counter or through a vending machine. Sweden, for example has sold the majority of its stamp issues in booklet or coil via vending machines since the 1920s. (‘Nimrod’, 2001).

**Defining science on stamps**

I could, initially, find no convenient definition of science so I have developed my own. I have included most of the disciplines that are included in a university science and applied science curriculum. Biology, botany and zoology are included, but stamps that depict flora and fauna and dinosaurs are excluded, even if they are described with their scientific names. I adjudge these subjects as
travel and tourism advertisements for the country and collectors of these themes, rather than to send a scientific message. However, if a stamp or a set of stamps is dedicated to the celebration of a named scientist with flora and fauna shown to add a contextual description of his or her achievements, they are judged to be scientific. This is further discussed in Chapter Three. Archaeology and architecture are not included; geology, computing technology and astronomy are. Engineering is included following a similar argument to that for flora and fauna: if engineer designer is the main focus of the issue, it will be included. This latter category has been important for the Russian series of airplane designers and other technologies that have been featured, over the years, with images showing the development of their designs.

Part-way through my study, the Australian Government Department of Innovation, Industry, Science and Research issued its ‘Inspiring Australia’ initiative. In this strategy it defined science or the sciences to be:

- the natural and physical sciences such as biology, physics, chemistry and geology
- the applied sciences, such as engineering, medicine and technology
- newly emerging and interdisciplinary fields, such as environmental science, nanotechnology and phenomics
- mathematics, a field of study in its own right, as well as an essential tool of the sciences
- the social sciences and humanities, critical to the interface between science and society. (Department of Industry, 2010, p. ix).

This definition is consistent with the approach I had been taking. It is relevant to see the social sciences and humanities included, but in this study they are only included if they constitute part of a directly scientific message that is being told through the postage stamp requiring a science understanding: “For example, science-related areas include health promotion, science teaching, nursing, agriculture, science and environmental policy development, etc.” (Department of Industry, 2010, p. ix).

I contend that postage stamps are a part of the media, or behave as though they are. In many ways they regularly publish stories that will be of general interest to the public. The messages on the stamps are someone’s idea of a story worth telling at the time. One element of my study has been to determine the extent to which government is sponsoring the message to be told. Some attempts have been made to define science from a media perspective and I have considered several precedents. Lemhkuhl et al. (2011) suggest that classifying a media subject as science might be based on the following categorisation: “Science is the real subject matter; scientific insights are used to explain everyday phenomena or social problems, or offer orientation in a complex situation in which science
appears as a service provider; or, scientific method is the focus that problematises scientific findings or the pursuit of scientific findings.” (Based upon Lehmkuhl et al, 2011, p. 8)

These classifications are very much science-centric dependent upon a type of science. The general public, however, does not consist of a specialised science audience. I believe this categorisation is, therefore, not applicable because the messages to be sent will be almost stand-alone and not precisely structured. It also has to be remembered that the message might be contained within a single stamp, or as a story told within a set of stamps or a series over time, and who but the stamp collector is likely to see the set in its entirety?

A few previous attempts have been made to classify the images used to represent science on postage stamps. In his paper “Postage Stamps and the Popular Iconography of Science”, Gregg De Young described his classification as: (1) images of specific scientists; (2) images of scientific workers in general; (3) images of scientific research institutions; (4) images of scientific equipment; (5) images of natural phenomena; and (6) other miscellaneous symbols, such as scientific formulae (De Young, 1986, p. 3). De Young describes what he means by each category and offers examples of each. He studies the use of scientific equipment as images to represent science to the general public, concluding that these devices ignore the intellectual or the theoretical activity that is the cornerstone of science.

De Young also argues that representing science by showing the tools of science ignores the diligence, scholarship and knowledge of the process that constitutes science. But he concludes it is official government status that gives “these illustrations an authority in shaping the popular view of scientific activity that far exceeds the limits of their popular size” (1986, p. 13). This limitation is overcome in this study by confirming and making note of the postal authority’s description and reason for the issue as described in the postal authority’s publications and the relevant stamp catalogues.

Another limitation in De Young’s classification is that he has made no attempt to determine the timing of the stamp issue. This is relevant as very many issues, particularly later issues, are directly associated with an event or the anniversary of an event, the anniversary of the scientist or of their achievement for example. For my study it is important to recognise science that has been institutionalised and presented by politicians for general consumption and political ends, such as the climate change science.
The representation of science and scientists

The science stamps examined fell into the classifications of the dictionary definitions of representation shown in Figure 2.1.

representation

noun

1a. An image, likeness or reproduction of a thing; spec. a reproduction in some material or tangible form, as a drawing or painting,

1b. The action or fact of exhibiting or producing in some visible image or form,

1c. The fact of expressing or denoting by means of a figure or symbol; symbolic action,

2a. The action of presenting a fact etc. before another or others; an account, esp, one intended to convey a particular view and to influence opinion or action,

2b. A formal and serious statement of facts, reasons or arguments made with the aim of influencing action, conduct, etc.; a remonstrance, a protest, an expostulation,

5a. The action of presenting to the mind or imagination; an image or idea thus presented.

Figure 2.1: A dictionary definition of the word “representation”.

Countries chosen for study

Ten countries have been chosen for study. These countries represent different political ideologies and include changes of national ambition over time. The counties range from the largest in terms of population, (China, Russia, USA), to smaller countries (Ireland and New Zealand). Some of the countries are long established, (Great Britain and France), while others have been through political turmoil, (China, Germany and Poland), since the introduction of postage stamps. Russian stamps, numerically, constitute some 40% of the science stamps identified. During the 1960s and 1970s, Russia actually issued one in five of all stamps issued world-wide (Mackay, 1976). The ten countries included in my study are:
The Representation of Science and Scientists on Postage Stamps

Australasia

1. Australia: A stable democracy. Federated into a Commonwealth by public vote from six existing (British) colonies on 1 January, 1901. It was 1913 before the first federation stamp was issued. Explorer Captain James Cook had been featured in the world’s first commemorative set of stamps by the colony of New South Wales to celebrate the centenary of the First Fleet in 1898 and this stamp is included in my study. This study includes the postage stamp issues of Australian Dependencies: Norfolk Island, The Australian Antarctic Territory, Christmas Island, and the Cocos (Keeling) Islands where relevant.

2. New Zealand: Australia’s nearest neighbour and another stable democracy. The first New Zealand stamp was issued in 1855. My study also makes mention of the stamp issues of the Ross Dependency as the Antarctic location of New Zealand research interests where relevant.

Europe

3. Great Britain: A stable democracy. Stamps issued from 6 May 1840 to the present day. The stamps of the British Antarctic Territory will also be examined.

4. France:
   a) Second Republic, 1848–1852.
   b) Second Empire, 1853–1940.
   c) French State during 1940–1944.
   d) Provisional Government, 1944–1946.

The stamps of the French Antarctic Territory will also be examined.

5. Germany:
   a) Empire, 1871–1918.
   c) Third Reich, 1933–1945.

Allied Occupation


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6. Ireland: The stamps of Great Britain were used until 1922.
   a) Irish Free State, 1922–1937, Great Britain stamps with overprint and state issues.
   b) Republic of Ireland, 1937–present.

7. Poland:
   a) Russian Province, 1832–1918.
   b) Republic, 1918–1939.
   c) German Occupation, 1939–1945; Polish exiled government in London 1941–1944.
   d) Republic, 1944–1948, a Soviet-model communist state.

8. Russia:
   a) Empire, 1853–1917.

Asia

9. China:

The Americas

10. The United States of America. A democracy, its stamps issued from 1850 to the present day.

Analysis

The preliminary analysis examines every issue of a country and makes the subjective evaluation: Is this science? Does it celebrate the achievement of a
specific scientist? Does it celebrate a scientific breakthrough? Is the issue representing a scientific or institutional message. Is the image reflecting science as a public service?

Sourcing stamp images

It is important that I am able to look at the stamps as they have been supplied to the general public, who are the potential recipients of the messages being sent on postage stamps. Starting out on this project, I had the advantage of being a long-term stamp collector and owning a specialist collection of three of the countries I am examining: Australia, New Zealand and Great Britain. I do have some stamps from the other seven countries, but my collection is far from comprehensive. I needed to acquire approximately 80% of the stamps that I have classified as containing a science message after a detailed scrutiny of stamp catalogues.

Figure 2.2 shows approximately one-eighth of a page of a typical Stanley Gibbons catalogue. At random, I have chosen to show a set of Russian stamps from 1963. It is a set that is of interest in the case study looking at the stamps of Antarctica, and the continuing scientific and research interest shown in the region.

You will notice that only one stamp from the set is illustrated, and that the three other stamps in this set are described as being of type 1041. I note here that the second image, type 1042, is not science, and therefore not of interest in my study. The other three stamps from the Arctic and Antarctic research set are described textually. When compiling my list of science stamps I am required to have and scan all four stamps in the set that comprise the total message for this issue.
Having compiled the list of the stamps to be included in my study, the next step was to acquire copies of the actual stamps. For each country I have a list of three or four dealers who might source the stamps. The function and practice of the stamp dealer is to be able to source against a collector’s wants-list. Dealers typically purchase substantial collections and make their money breaking down the collection into parts to meet the requirements of purchasing customers. I have been fortunate to find dealers prepared to break down collections to be able to provide the science stamps I have requested. The two final columns from the Russia catalogue of Figure 2.2 are the Stanley Gibbons price for mint stamps (second column from the right) or used stamps (the right hand column) in British currency. Most dealers provide stamps against the Gibbons catalogue reference number but at a discount to the Gibbons price. I have managed to procure copies of almost all, (approximately 98%), of the stamps I needed to scan and include in my stamp image database. Those I have not been able to source are those that were either not, in the past, of interest to a general collector, or have become too expensive over time.
The Representation of Science and Scientists on Postage Stamps

The stamps I believed I needed were not too difficult to procure and I used one main dealer per country. The only stamps with which I had difficulty were 1960s Australia, early Chinese issues and, surprisingly, the early Russian Federation stamps of 1992–1993. Dealers I approached for the latter stated that they had decided against supplying the new Russia stamps as they had not been able to dispose of the large numbers of stamps from the USSR period of Soviet Russia.

At the end of my project I shall have the opportunity to approach the same dealers to see if they want to buy back the science stamps I have acquired. It has to be said that none of the dealers to whom I suggested a loan, lease, or rental of the stamps involved were interested.

Construction of the taxonomy

A number of attempts have been made to classify science on some postage stamps. Jones (2001) makes observations about the images used to show particular sciences, and Webber (1980), Furukawa (1994) and Wilson (2001) have concentrated upon specific sciences. Kevane defines his categorisation based upon the kinds of stamps that are issued:

Decisions have to be made when coding the imagery on stamps, even before arriving at a smallish number of categories to be used for grouping the wide variety of images and messages. These decisions arise from four sources of complexity in the kinds of stamps produced by countries: (1) some stamps are intended for the collectors market; (2) some stamps have different physical properties from the ordinary perforated, gummed stamps, properties that make them more or less suitable for use on letters; (3) the quantities produced and usage of stamps vary with the images on the stamps, in perhaps predictable ways; (4) and many stamps are issued in series rather than as stand-alone images. These four characteristics of stamps — collectability, properties, quantities, and series — have to be addressed in coding (Kevane, 2006, p. 5).

The Kevane coding regime has not been followed, because it will not help to answer the questions that are the focus of this study. For this study, a new scheme has been devised, as discussed below. Kevane also makes mention of the property of a stamp that might not make it suitable for use on letters. Very occasionally a post office has a pseudo-stamp issue that is not really suitable for everyday use. Such a device is not included within my study.

The taxonomy developed for my study overcomes the deficiencies noted above concerning previous definitions of science on stamps. For this project,
a subjective visual evaluation is made at the time of analysis. The conceptual representation of science and scientists on postage stamps is defined in the listing below.

The method involves a simple evaluation and count. The five primary categories are:

1. Is the stamp a single issue, with the one stamp relaying the message?
2. Is the stamp part of a set? Has a set been issued to tell a more complete story? If only one stamp in a set includes a representation of a science or a scientist, it is counted and noted as coming from a set.
3. Is the issue printed in a single colour or full colour?
4. Does the stamp name or recognise a particular celebrant as the main image of the design, the signifier and therefore the signified? As a symbolic process, what does the participant mean or represent? (Kress and Van Leeuwen, 2006).
5. Is the subject image non-personalised, showing the science, a scientific device, or the description of science in the service of the public to tell its message?

A schematic of the taxonomy used is shown as Figure 2.3 and is expanded with examples in Figures 2.4 and 2.5.

Another category that was considered is that of production of the actual image. Prevailing technology meant that the earliest stamps were printed in a single colour on white paper, although in times of shortage of white paper, papers of different colours were used as for expediency (and are a specialist delight for the avid collector). The first stamps printed with two or more colours were issued in 1887. Today’s stamp designer occasionally uses a single colour as a device to represent a historical connotation to the image even when the complete palette of colours is available through the photogravure process. The early stamps were recess-printed from etched intaglio plates in much the same way as bank notes were produced. The initial prints were single colour, and it was only after WWII that two-colour intaglio became the norm. Lithography was used sparingly and eventually photogravure became the standard method. How the stamp is printed does not reflect the message except in rare cases that are best considered in isolation.

One example of where production is important, however, and which is a part of the story being told, is the Great Britain 2001 set of six stamps to celebrate Nobel Prizes and laureates. The stamp representing chemistry, for example, is a heat sensitive image of the carbon 60 molecule, celebrating the work of Sir Harold Kroto (born 1939), who was the Nobel Prize winner in 1996. Three stamps from this set are discussed in my study and are shown as Figure 3.11.
The taxonomic classification

My rationale for the taxonomy developed for the study has been explained. A schematic to illustrate the taxonomy is shown in Figure 2.3 and examples of the image classification are shown in Figures 2.4 and 2.5.

Figure 2.3: A basic taxonomy of the stamps studied, derived from Kress and Van Leeuwen (2006).
Source: Author's research.

In Figure 2.4, I show examples of the four classifications of the stamp images used in my study that have a named recognised celebrant. A narrative description of each classification follows:
Figure 2.4: Examples of four taxonomy classifications of stamps that celebrate an identified scientist.

Source: Author’s research.

*Portrait:* The portrait here is of Charles Darwin, from a 2006 issue commemorating the 150th anniversary of the National Portrait Gallery. He is the only scientist from a set of ten portraits of various well-known people painted by different artists. The portrait is the icon. The artist is John Collier (1850–1934). Seven men are depicted (through six paintings and one sculptured bust) and three women.
All stamps are of the same (first class) value for mail service within the UK, and all carry the monarch’s profile in the top right hand corner to identity the country of origin. All images identify the celebrant and the artist.

*Portrait with life-dates:* Here I show a stamp that includes a descriptive image in addition to the portrait name and life-dates. Charles Sturt (1795–1869) was an explorer of Australia. The background map of Australia provides the context for inclusion in the set of five portraits entitled *British explorers.* Issued in 1973, the Sturt stamp is the highest value in the set and could be expected to be used on mail to Australia.

*Portrait and descriptive image:* From a set of ten *Eminent Britons* published in 2009, astronomer Sir Martin Ryle is shown against a background of communication equipment. His achievement is described as the ‘Radio survey of the Universe, 1959’. Eight male and two female scientists are celebrated in the set. The set is tied together with a muted background, a profile of the monarch in the top left corner, and a further design consistency naming the person and their achievement in two lines at the bottom of the stamp. All ten stamps are of the same value, (first class post, internal delivery in the UK) so the expectation is that these stamps will be used within the UK, except for overseas collectors.

*A named scientist and a particular event:* The event is the 300th birth anniversary of John Harrison (1693–1776), the inventor of the maritime chronometer. The image is the decorated enamel dial of his H4 clock, not a portrait of the celebrant. The text includes Harrison’s name, life dates and the fact that the clock-face is of his marine timekeeper number four. No portrait is shown but the scientist John Harrison is named through his signature, which is shown. The example reproduced is the lowest value in the set of four, for second class mail delivery in the UK.

In Figure 2.5, I show examples of the three classifications of the stamp images used in my study that do not have a named recognised celebrant. They show a science in abstract. A narrative description of each classification follows. Semiotically, the three stamps are similar to the first classification in that the monarch’s profile identifies the issuing authority as Great Britain and shows the pre-payment service price.
Celebration of an event: As will be shown below, Great Britain commemorates institutional events and anniversaries of science more frequently than any other country. This set of four celebrates the 150th anniversary of the Royal Microscopical Society (1839–1989). The image examined on the stamp is a snowflake at a magnification of ten times. The other examples in the set show magnifications of different subjects at 6, 300, and 600 times.

A scientific image: A scientific image is used, as will be shown, for one in five of all science stamps. The x-ray image of a hand manipulating a computer mouse comes from the 2001 Millennium series, the ninth of 12 projects. This set of four images, titled Mind and matter, featured four different designers showing what they had determined as the significant images from four scientific/
research projects. The Millennium Project, containing 48 stamps in all, can be categorised as Royal Mail stamps designed to excite further interest in the observer. The stamp shown is numbered 35 in the Millennium Project series and features the location of Millennium Point, a “science centre in the Digbeth area of Birmingham which aims to encourage youngsters to develop an interest in science and highlights industrial and scientific innovation” (Davies, 2000, p. 60). Scientific images have also been used to look forward into the future, particularly in respect to space fantasies.

An institutional message, a public campaign or a scientific service to the public: This classification, although general, is not a catch-all. It is significant that one in eight science stamps fits here. The example shown, one of a set of four, is from the 1992 Protection of the environment issue. This is a noteworthy issue, the first stamp indication from Great Britain highlighting growing concern for the environment. Children’s paintings have been selected for the images. Shown is the child’s perception of the effect of acid rain. The three other images are the ozone layer, the greenhouse effect and the bird of hope. The objective in issuing the set is obvious as Royal Mail have also described the stamps as The Green issue, albeit seven years after Australia Post signalled a growing public concern over the changing climate with its first issue messages on this subject.

A children’s art competition was the source of images for this set of British stamps looking at the changing climate. The USA and China have also used children’s paintings to look into the future, emphasising the fact that a child’s perspective is critical if future action is to be taken. Children, or the judges of these competitions, understand the role science will play in solving the problems and effects of global warming. The USA issued a 2001 set of four predictions, entitled Stampin’ the future. Three of the stamps featured space travel. A Chinese fine arts competition elicited one of four pictures entitled Enthusiasm for science.

Context

In conveying its message, the stamp designer has the option of including extra information about the science and the scientist they are featuring in their design. I describe this additional information as it provides context to the image. Context will be studied as a tool towards the telling of the message while, at the same time, providing an entry point for new ideas and concepts. Early stamps showed only an icon of the country of issue, so stamp design has developed in the telling of science messages.

The concept of context, in terms of it providing additional background and enhancing the depth of the message being told on the stamp, is considered
throughout this study. There is a strong case to be put forward that context has evolved to the point where it is a major factor of stamp design. The ability to provide meaningful context has improved through technology and the adoption of photogravure printing. Some countries have used context from earlier issues but, to generalise, I believe that the use of context has become more common from the mid-1990s, a date at which internet use became routine and a date that may mark a change in the underlying impetus of science communication philosophy moving from wanting to develop a public understanding of science (PUS), to that of stimulating a public awareness of science (PAS). Context will be discussed from this point forward in my study.

Two examples from East Germany are shown to demonstrate how the addition of context enhances the message. The scientists celebrated are physician and physicist Hermann Ludwig Ferdinand von Helmholtz (1821–1894), and physicist Heinrich Hertz (1857–1894). The simple portrait representations to the left of the figure are from the 1950s. The larger 1994 stamps define the celebrants’ life-studies with images of their achievement issued at the time of their death centenaries.

Another example of context is shown in Figure 2.7. This Royal Mail example, entitled Medical discoveries, is an extreme example of context in relation to a known scientist. Four acknowledged medical techniques and their proponent scientists are recognised with this issue, but the scientist is not named on the face of the stamp. The celebrants are: Ultrasonic imaging: physician Dr Ian Donald (1910–1987); Scanning electron microscopy, physicist and electronic engineer Sir Charles Oatley (1904–1996), Magnetic resonance imaging, 2003 Nobel Medicine
Prize winner Sir Peter Mansfield (born 1933); and Computed tomography, 1979 Nobel Medicine Prize winner Sir Godfrey Hounsfield (1919–2004). The detailed background to each image is provided in the Royal Mail Yearbook (Shackleton, 1994, pp. 36–39). The detail was also provided in the presentation pack for this issue. The image of the achievement has become the main element. This almost changes the classification of the stamp from named scientist and event (achievement) to non-personalised image/scientific image. These stamps use a specialist context to tell their message, more so by Royal Mail than any other postal authority, to date, in telling a medical story.

Figure 2.7: Great Britain, 1994. Europa, medical discoveries. Gibbons catalogue # 1839–1842.
Source: Author’s collection.

From Australia, I am able to reproduce an example of increasing context in association with the scientist’s portrait. This is shown in Figure 2.8. From the 1960s, the first single stamp does contain some context. The 1962 Centenary of John McDouall Stuart’s overland crossing, shows the explorer full face, he is named within the portrait frame, (in very small letters) and the background is very sparse, suggesting an unexplored land. You will note the event is not explained. In contrast, the 2012 two-stamp celebration published 50 years later details the name of the explorer and the event being celebrated, The overland crossing of 1861–1862. From the later stamp we also learn that it was a team effort with at least five participants on horseback who raised the Union Jack flag on the shores of the Indian Ocean having travelled from Adelaide. Stuart returned to Adelaide with his team, who actually numbered nine.
Figure 2.8: An example of the development of context on Australian stamps, 1962–2012. Renniks catalogue # 270. The two stamps on the right are too recent to have been catalogued.

Source: Author’s collection.

The designer of the 2012 issue has also been able to incorporate the Stuart expedition into a miniature sheet with the discovery of the Blue Mountains and is able to show the maps of the explorations and date them, thus increasing the context of the issue. The event to prompt the issue is the 150th anniversary of the completion of Stuart’s exploration, and, a year later, the 200th anniversary of the Blue Mountains crossing, although this is not stated. The issue is entitled Inland explorers and is quite explicit in describing the events being celebrated. The four stamps separately show textually more information than the 1960s images, including the event name and date and the names of the participants. None of the available space is wasted, with the image continuing to the very edge of the stamp. The mode of travel is illustrated as is the topography and foliage. The miniature sheet is shown as Figure 2.9.

Figure 2.9: The Australian miniature sheet, Inland explorers, which is too recent to have been catalogued.

Source: Author’s collection.
Method of analysis within this study

The first step was to list, in chronological order, the country’s science stamps, attaching a short narrative of subject matter, and details of whether it was a single stamp or part of a set enveloped within a single theme. Within the description is included a designator, usually an established catalogue number, so that the issue is placed within its context. Within this step was an editing of pseudo-scientific subject matter. For example, is a stamp with just the words “fight against cancer” showing science? Probably not. But if the image includes a microscope and/or a doctor/nurse and/or medical equipment, the representation is beyond a public health announcement and falls within a science framework.

If a scientist is portrayed and named on the stamp, it is determined to have a scientific context, although the scientific achievement might not be described. Can it be assumed that the celebrant is so well known that no additional information need be given? This is examined in the case study titled ‘Heroes of Science’ in Chapter Six. Listing the scientists honoured on stamps allows for an analysis, by simple count, of which scientists are celebrated by which countries. This may give an indication of how and why scientists were chosen by the postal authority.

Analysis of the messages contained within a postage stamp

The semiotic approach recommended by both Scott (1995) and Child (2008) is based upon the work of Charles Peirce (1839–1914), the founder of American pragmatism, and has been followed in my study. The three elements of the Peirce typology are defined as:

1. Index: a pointer taking the viewer somewhere. An example would be smoke, which is an index to the fire that released it.
2. Icon: a graphic pictorial representation such as a picture, a design, or a photograph. It can be observed for its own aesthetic sake or, more important for our semiotic analysis, analysed to see what the message of the picture is.
3. Symbol: a conventional sign in which elements stand for something else. Thus the symbol “$” stands for dollar, and the post horn is a common symbol for postal service. (Peirce, 1867).

I recognise that in looking at the design of postage stamps these definitions may become blurred and intertwined.
I expected to endorse semiotics as a significant tool to better determine the messages contained within postage stamps issued with a scientific content or context. I have undertaken semiotic analyses of stamps and included a number of these within my study.

Due to the limitations in size, the stamp designer has, perhaps, limited opportunity to show other than the stipulated message.

**Understanding the process of stamp development**

To help understand the big-picture of policy for a postal authority, I have reviewed the process of stamp development through documents taken directly from the UK Royal Mail and the United States Postal Service websites. I have also taken advantage of the opportunity to look through the archival corporate files of Australia Post and Royal Mail, which included the documentation of issues deemed to be scientific. I also interviewed the curators of these archives.

While undertaking my study, I was fortunate enough to be asked by (the UK’s), *Royal Mail Philatelic Bulletin* to write an introductory article for a 2010 stamp issue of medical breakthroughs. To facilitate this process, I was sent the initial designs and concepts for the issue and was sworn to secrecy about the particular scientists and breakthroughs that were to be celebrated. The set is reproduced in the discussion in Chapter Eight, Figure 8.1.

**Interviews with significant contributors to my study**

I had approval from the ANU Ethics Committee to interview the heads of the stamp units of Australia Post, New Zealand Post and Royal Mail for my research. The encouragement and advice from these managers was open and frank, within the commercial constraints that were explained to me. All three of the postal administration managers were interested in my study and endorsed my research interest as appropriate and have requested sight of my eventual findings. I was given copies of the latest stamps that each authority determined as related to science, when I met them. These were a valuable aid in our discussions. I raised the flora and fauna issue, described in the next chapter, with each manager and their response was an enthusiastic, ‘Yes, that’s science’, if the stamp contained the image’s botanical name as text. My pursuit of them to tell me the actual science message confirmed to me, with their eventual agreement,
that many flora and fauna stamps are issued to attract the casual buyer and the thematic philatelist within a tourist attraction and advertisement classification. The managers confirmed that each authority has, as an objective, the sustainability and a continuing profit for the stamps unit.

I have also been privileged to meet and discuss my study with two of the three authors of the seminal books that were essential reading, Professors Altman and Scott. I exchanged notes with the third, Professor Child of the American University in Washington, but he was obliged to cancel our scheduled meeting due to health problems.

Semiotics has provided the prompt in opening discussions with all interested parties as I pursued my study. I used a reproduction of the 1980 Second National Conference of the Chinese Science and Technology Association stamp issue—already shown in the opening chapter and replicated and shown in Figure 2.10—on all my ANU Ethics and third party communications. It has remained of importance through my project. On the surface it is a design that shows apsaras and symbols of modernisation.

![Figure 2.10: China, 1980. Second National Conference of the Chinese Science and Technology Association. Gibbons catalogue # 2974.](image)

Source: Author’s collection.

The question is, what are apsaras—traditional Chinese mythical wood-nymphs—doing on a Chinese stamp just four years after the Cultural Revolution, when the Red Guards reviled and rejected everything intellectual? The stamp image is full of symbols of modern technology and the main figure is pointing towards the year 2000 which is spelled out and underlined by the space rocket. Stars are included in the background, as are the symbols of atomic structures, a gear-wheel and a symbol of the Association being celebrated. The text designating the indices of the stamp, country and service value and the purpose for the issue are unobtrusive, but are available if someone is seeking the information. My showing and reading of this stamp has been a conduit into discussion with all the people I have interviewed for this study.
Not many stamps convey a message other than the obvious, but a semiotic analysis is appropriate for some. I also carried, as back up to further prompt to discussion if necessary, reproductions of the three Polish stamps shown in Figures 2.11, 2.12 and 2.13.

Figure 2.11 celebrates the achievement of Ignacy Lukasiewicz. The shape of his petrol lamp is shown in white as the background to his image. This scientist has been the subject of three Polish stamp issues. His life dates are shown in text. The stamp also features a congress being held in Poznań, Poland during 1960, although no overt link is made between Lukasiewicz and the pharmaceutical industry.

Figure 2.11: Poland, 1960. Ignacy Lukasiewicz (1822–1882), inventor of the petrol lamp and the 5th Pharmaceutical Science Congress in Poznań. Gibbons catalogue # 1172.
Source: Author’s collection.

Figure 2.12 shows an arrow piercing an “E”. The text describes the celebration of the 50th anniversary of the deciphering of the German Enigma cipher codes. No explanation of who or what Enigma is has been made. It has only been later in time, during the 1980s, that the full story of Poland’s contribution to the deciphering of German Military codes during WWII at Bletchley Park in the UK has been made public. The colours of the arrow are the same as that used in the Polish flag. In 2009, a second stamp, part of a celebration set of Poles in the World names three of the Polish scientists and includes photographs. The Enigma machine mathematician/cryptographer code-breakers recognised are Jerzy Witold Różycki (1909–1942), Marian Adam Rejewski (1905–1980), and Henryk Zygalski (1908–1978).
Figure 2.12: Poland, 1983. 50th anniversary of the deciphering of “Enigma” machine codes, and Poland, 2011. Polish scientists in the world. Gibbons catalogue # 2889 and WNS catalogue # PL039.09. Source: Author’s collection.

Figure 2.13 needs no elaboration. It uses an iconic image of Marie Curie at work in her laboratory. It is an image that has also been used by France and Ireland. It is unencumbered except for the two required indices of country and value. The colours are subtle and subdued.

This stamp is actually one of a set of two and was also published as a miniature sheet titled Centenary of the Chemistry Nobel Prize for Marie Curie Skłodowska. The other, smaller stamp is equally simple, featuring three images: what Marie Curie is seeing in her test tube, overlaid by a gold Nobel Medal, and the profile of Alfred Nobel.

Figure 2.13: Poland, 2011. Centenary of the Chemistry Nobel Prize for Marie Curie Skłodowska. WNS catalogue # PL036.11. Source: Author’s collection.

During my interview with him, the Manager of Stamp Strategy of Royal Mail introduced me to his concept of the communication message on a stamp being a
mirror or a lens. My definitions of these terms are described later. I felt obliged to consider using this additional classification in my formal taxonomy. At the time, however, I did not include this classification because I believed that it was too subjective. I have subsequently undertaken surveys to ask colleagues and members of the public to consider my definitions and judge where 16 science stamp examples would be placed on a scale with mirror at one end and lens at the other. The results showed very little consistency of response. The date at which the stamp had been issued was proved to be the most significant. A stamp foretelling a future event—the image of first moon rocket, for example—is seen as a lens at the time, and as a mirror of an achievement after the event.

Access to specific (stamp issue) Post Office development files

Australia Post

Prior to my second meeting with Australia Post historian and curator Richard Breckon in Melbourne in October 2010, I requested access to the files of four stamp issues from the Australia Post archives. As it happened, the curator was able to provide only two of the requested four files, partly because of the 30-year embargo on public service files. Knowing this, Mr Breckon had prepared a précis of file contents of the two other issues for me.

Royal Mail, UK

I also had recourse to Great Britain files through the British Philatelic Museum and Archive (BPMA) during May 2011. Prior to my attendance at BPMA, curator Douglas Muir had made available specific academic studies of the issue of stamps I have designated scientific. The procedures seem to be straight-forward and in accord with the published process.

Libraries and postal museums

During the course of my study, I have been able to inspect specialist philatelic items contained within the National Library of Australia, The British Museum, the Irish National Philatelic Museum, and the Library of Congress and the Smithsonian Library and Museum in Washington to facilitate my understanding of my subject.
During the development of this methodology, I did consider whether I should study a control group against the science taxonomy. The obvious contrast would have been to compare art stamps. This decision would have been even more subjective. I decided that the count within ten different countries would provide the control.