

# Herbarium WELT in New Zealand's national museum, 1865–1997

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**ABSTRACT:** The herbarium known internationally as WELT is the oldest public herbarium in New Zealand, having been established in 1865. For its first 90 years, staffing varied between minimal and non-existent. For the first 120 years, storage and working conditions were inadequate and at times harmful to the collections. Despite this, the herbarium has amassed an extensive collection of historical and reference material and is an important centre for taxonomic research on the New Zealand flora. The 1997 move into the fourth building it has occupied provides the herbarium with good quality storage facilities for the first time in its existence. For at least the last 70 years, most basic work on the collections has been done by non-permanent staff or volunteers. Although there are now more permanent staff, who are more academically qualified, than ever before, the herbarium remains understaffed relative to its responsibilities and the work still to be done.

**KEYWORDS:** botany; herbarium; history; museum; Te Papa; WELT

## Introduction

The word "herbarium" originally referred to a garden in which plants were grown for medicinal purposes (Leach 1984). With the development of printing, the word also came to mean a book about medicinal plants, but it has been used to describe collections of dried plants since about 1700. Specimens were, and still are, dried under pressure and mounted on heavy paper or card as a lasting record. The practices among botanists of depositing specimens in established collections or herbaria, and of exchanging or selling specimens, were common by the mid-1700s (Wright 1998). Over time, the word herbarium has come to mean the place where a collection is stored and studied, as well as an actual collection of specimens.

The primary purpose of a herbarium is to service and support plant taxonomic research. Thus, a herbarium is a store of reference material (Wright 1993). The word "store", however, should not be read

as implying a finite entity that is shut off or locked away. A working herbarium is in a constant state of growth as new specimens are collected by staff or donated by other researchers and are incorporated into the collections. A working herbarium is also a busy place as staff fumigate, press, mount, label, register, and file newly acquired specimens in special storage boxes; send groups of specimens to other herbaria on loan for research or as donations; maintain the collections in good condition; and identify specimens for other agencies and the public. In addition, staff and visiting botanists carry out research on particular taxonomic groups and write both popular and scientific papers about their results. As a result of such research, plant names are sometimes changed or corrected. Herbarium staff read a wide range of taxonomic literature and keep the names of specimens in the collections up to date. In the 1990s,

developing and maintaining an electronic database of all specimens in a herbarium has been added to the work of a herbarium.

The herbarium in New Zealand's national museum in Wellington is the oldest public herbarium in New Zealand (Wright 1993). The museum, under a succession of names, is the only Government-funded museum in the country (Brownsey 1987). The museum was founded in 1865 as the Colonial Museum, was the Dominion Museum from 1907 to 1973, the National Museum of New Zealand from 1973 to 1992, and since 1992 has been the Museum of New Zealand Te Papa Tongarewa. Each name change has been accompanied by legislation. In 1997, the brand name Te Papa was launched for commercial and popular purposes as museum staff and departments moved into newly constructed premises on the Wellington waterfront.

The identifier WELT has been used for the herbarium since 1952, when an international system for standard abbreviations of herbarium names was formally established by the International Association of Plant Taxonomy (Lanjouw 1952; P.K. Holmgren pers. comm. 1998). Specimens held in this herbarium are of all the plant groups, except fungi, that occur within the New Zealand Botanical Region, plus material from related areas such as Australia, the Pacific, Europe, and North and South America (Brownsey 1987). The New Zealand Botanical Region is defined as including mainland New Zealand and offshore islands, plus all outlying islands from the Kermadec Islands in the north to Campbell Island in the south and the Chatham Islands in the east (Cockayne 1967). The principal collections and herbaria held in WELT are listed in Wright (1993).

This paper outlines the history of WELT from its foundation in 1865 through to the 1997 move into the new waterfront building of the Museum of New Zealand Te Papa Tongarewa in Cable Street, Wellington.

## Establishment: 1865–1885

The Colonial Museum and Geological Survey Department was established as a single entity in Wellington in 1865, the year after the transfer of central government from Auckland to Wellington (Dell 1965). Purpose-built museum buildings, including a Government

Laboratory and Director's house, were completed in September 1865, in what is still called Museum Street, immediately behind the present Parliament Buildings (Dell 1965). The museum was opened to the public in December 1865 (Dell 1965). This site is currently used partly for parliamentary car-parking and, on the site of the former Broadcasting House, partly as a park.

The Colonial Museum was given geological and natural history specimens initially collected by members of Wellington's learned society, The New Zealand Society. In the nature of these first collections, and in the integration of the museum and science, the Colonial Museum was similar to many others established in British colonies in the mid-19th century. The collection of specimens and objects in the new colonies was undertaken primarily to document and record the new land, the physical and biological environment, organisms new to science, and natural resources (Fleming 1987; Sheets-Pyenson 1988).

The first Director of the museum was Dr J.D. (later Sir James) Hector. Trained in medicine, botany, zoology, and geology, Hector gained experience as a field naturalist and explorer in Canada in the late 1850s (Dell 1990). From 1861 to 1865, Hector was Director of the Geological Survey of Otago, for which he trained a small team of experts. He took this team with him to Wellington to found the Colonial Museum: W. Skey carried out analyses of rocks and minerals, J. Buchanan was appointed as draughtsman and also did botanical work, and R.B. Gore did clerical work plus meteorological observations and recording (Dell 1965, 1990).

John Buchanan was an artist and lithographer as well as a draughtsman, for whom botany and geology became lifelong interests (Sampson 1985; Adams 1990a). In extant lists of Government employees held at National Archives, Wellington, Buchanan is listed as "Draughtsman" in 1872 and 1874, and as "Botanist" in 1880. His duties, however, ranged much more widely than those titles suggest, using all of his interests, knowledge, and abilities.

From the very beginning of the Colonial Museum, Buchanan was responsible for building up the herbarium of indigenous plants. Botanical specimens for the herbarium were collected by Buchanan himself, especially during summer field trips (Sampson 1985; Adams 1990b), by staff members of the Museum and

Geological Survey (Lush 1951), and by collectors who were paid for their specimens (Adams 1990b). Material was also received from a wide variety of donors, both in New Zealand and overseas. New Zealand material was sent overseas by the Colonial Museum from 1868, frequently in exchange for collections of overseas plants (Lush 1951). Adams (1990b) noted that by 1870 the botanist Thomas Kirk (a frequent visitor and collector for the herbarium) referred to the museum's herbarium as "copious". The museum's annual report for 1871–72 described the collection as "very extensive", but also recorded that it was not properly accommodated and so was constantly liable to injury by insects and mice (Lush 1951).

Labelling of specimens was minimal. The Colonial Museum had its own printed labels, on to which the names of the plant and (sometimes) its location were handwritten (see Appendix). No other information was recorded with the specimen. Labels were also printed for specific large collections, such as those from the trip to the Chatham Islands by H.H. Travers, who was not a permanent employee of the museum but collected a large number of specimens for the herbarium on that trip (see Appendix).

By the 1870s, Hector realised that a considerable number of plants were being introduced to New Zealand and becoming naturalised, and that this trend would continue. He wanted to obtain reference material both for the identification of naturalised plants and for the comparison of indigenous taxa. During a trip to Britain in 1875–76, Hector negotiated the acquisition of 28 000 specimens from the British Museum (Wright 1993; Fox 1998). This collection was subsequently found to comprise the combined herbaria of Silvanus Thompson and J.G. Baker (Whitwell 1893; Fox 1998).

The Thompson–Baker Herbarium arrived at the Colonial Museum in 1877 but, because of poor environmental conditions and lack of botanical staff at the museum, remained in its original zinc-lined packing cases until the 1950s to 1970s (Lush 1951; Hamlin 1971a; Fox 1998). The collection includes 11 boxes of bryophytes (mosses and liverworts) collected between 1797 and 1820 from Germany, Austria, England, Iceland, Greenland, South America, and Nepal (Hamlin 1971a, 1976); early collections of Australian plants; collections from 1790 to 1830 of Australian

plants cultivated in continental European gardens; marine algae; and British plants (Fox 1998). To date, only the 1700 marine algae are adequately curated; the rest are kept separately boxed and have not yet been properly examined (Fox 1998; F.M. Kell pers. obs.).

Buchanan wrote a number of papers on various aspects of New Zealand botany, and his publication *The Indigenous Grasses of New Zealand* has been described as the first major botanical work by a resident botanist (Sampson 1985). It was published in three fascicles, one in each of 1878, 1879, and 1880, for which Buchanan prepared the illustrations and lithography himself. It was followed in 1880 by a smaller, reset book edition, *Manual of Indigenous Grasses of New Zealand* (Yaldwyn 1982; Sampson 1985). This book remained important for New Zealand botanists for over a hundred years; the next comprehensive grass flora for New Zealand was not published until early 2000.

## Neglect: 1885–1920

Buchanan retired from his position as draughtsman and botanist in June 1885 (Adams 1990b), and no one was appointed in his place. The condition of the museum building had been deteriorating and continued to do so (Dell 1965; Adams 1990b; Fox 1998). The annual report for 1889–90 recorded that for some years the herbarium had suffered from the "ravages of insects and dust", that good cabinets had been provided for the New Zealand specimens, and that steps would be taken to get the collection into thorough order. The following year, the specimens in the herbarium were said to have been looked through and cleaned, and new insect-proof cases provided (Lush 1951). Few accessions of botanical material are recorded after Buchanan's retirement.

Hector retired as Director of the museum in 1903. His position was taken by Augustus Hamilton. Although Hector had originally intended the museum to cover natural history and the Māori as well as geology, it had developed largely into a geological museum. When Hamilton was appointed, his attention was directed towards the collection of representative specimens of Māori art and workmanship (Dell 1965). This change in emphasis followed the pattern of other

colonial museums, where interest in indigenous culture and history began to develop from the 1890s (Lewis 1986), but was also influenced by the Maori Antiquities Act 1901 and government interest in establishing a Māori museum (Dell 1965).

Hamilton brought to the museum a background of collecting and caring for collections, and a bibliography in natural history and ethnology. He also inherited a building that was in a bad state of repair and infested with insects and mice, a large geological collection that was the property of the Geological Survey (by now part of the Mines Department), and very few staff (Dell 1965; Fox 1998). By 1906, Hamilton had organised some cleaning of the herbarium storage area and provided boxes and cabinets for loose specimens. Material still in its original packing was left that way to prevent further damage (Dell 1965; Adams 1990b; Fox 1998).

That appears to have been the limit of Hamilton's activity concerning the herbarium. There are no accession records for the herbarium from 1903 to 1927 and no annual reports from 1904 to 1913. In view of the dilapidated and overcrowded state of the museum building and the lack of any botanical staff, it is unlikely that Hamilton would have encouraged or welcomed additional plant material.

Within months of becoming Director, Hamilton was putting forward plans for an enlarged museum, particularly for a fireproof building for Māori artifacts. In 1907, he was informed that plans were being prepared for the Mount Cook site (later known as the Buckle Street site), but Cabinet and Parliament prevaricated. They continued to do so for the rest of Hamilton's directorship (Dell 1965).

The change in status of New Zealand from Colony to Dominion in 1907 brought a name change for the museum; it became the Dominion Museum.

In 1913, Hamilton died and was succeeded as Director by Dr J. Allan Thompson, a geologist. In the museum's annual reports, there is no mention of the herbarium until that of 1919–20, which notes: "The Herbarium still remains in the Museum annexe, and from want of space many of the specimens are still not unpacked from their original cases. When examined and classified the importance and magnitude of this collection will be realised." This comment may have been a response to comments at the New Zea-

land Institute Science Congress by the botanist Donald Petrie about the state of neglect of the museum's plant collections and his call for a comprehensive Dominion Herbarium with expert staff (Petrie 1919).

## Revival: 1920–1948

W.R.B. Oliver was appointed to the staff in October 1920 as a Museum Assistant. He was already an experienced and knowledgeable naturalist and had published scientific papers. From 1924, he studied at Victoria University College while working at the museum. He completed his BSc in 1926, MSc (Hons) in 1928, and DSc in 1934 (Salmon 1958; Pitt 1982).

Oliver set to work very quickly in the herbarium, investigating its contents and beginning the long task of mounting, naming, and systematically storing the accumulated specimens in insect- and dust-proof boxes. He was also quick to begin increasing the holdings of the herbarium. The 1920–21 annual report records the purchase of approximately 3000 specimens from H.H. Travers, and also the presentation of 90 boxes that were the private collection of B.C. Aston (Lush 1951; Adams 1980). In 1922, Donald Petrie gave the museum his herbarium of approximately 50 000 specimens, consisting of some 1800 species from nearly 15 000 localities (Lush 1951; Pitt 1993). Although he was in his late 70s, Petrie worked in the herbarium relabelling his entire collection on to specially printed labels (see Appendix). As he did so, he destroyed his original labels, and Hamlin (1958) noted that inconsistencies in the labels could not subsequently be checked for copying errors. However, some duplicate specimens at AK (Auckland Museum herbarium) contain their original labels, which reduces the size of the problem (E.K. Cameron pers. comm. 2000). Petrie died in 1925, but work on remounting and incorporating his specimens continued until at least 1930 (Lush 1951).

Dr A.W. Hill, Director of the Royal Botanic Gardens at Kew, visited New Zealand in 1928. In his subsequent report to the Minister of Scientific and Industrial Research, he praised the collection held by the herbarium but made a strong case for more staff, specifically a Keeper of the botanical department and at least one scientifically trained botanical assistant and one or two preparers of specimens (Hill 1928).

Thompson died in 1928, and Oliver was appointed Director of the Museum. Although his duties allowed him little time for day-to-day herbarium work, he continued to collect specimens and to write scientific papers, including the work for his DSc. Although the lists of permanent staff published annually in the *New Zealand Gazette* do not list any botanist or botanical assistant from 1929 to 1934, the annual reports for that period make it clear that work was being done in the herbarium by “different members of staff” (Lush 1951). Presumably some were short-term or part-time assistants, but much of the work was done by Miss E.M. (Ellen) Heine.

Miss Heine worked in the herbarium from January 1929 to January 1935. Her MSc was conferred in 1930. She carried out all the duties of the position of Botanist, but she was officially categorised as a temporary staff member and called Botanical Assistant. She collected, mounted, and documented specimens; carried out research and wrote scientific papers; answered queries from the public; and generally ran the herbarium. Correspondence held on file (DM 6/1/24) in the museum's Archives Section records her annual attempts to be officially recognised as Botanist and made a permanent member of the museum staff. Oliver, as Director, supported her applications, praising the quality and quantity of her work and pointing out that her salary was well below that of other equivalent positions in the public service and that of the Botanist at Auckland Museum, Miss Lucy Cranwell. No reason was ever given for keeping Miss Heine on the temporary staff. She left the herbarium in January 1935 to take up a lecturing position at Canterbury College (now University of Canterbury).

Herbarium labels used in the Dominion Museum varied. Many had just a blank area for recording all information. From 1928 and during the 1930s, however, labels had headings that called for more information to be provided than just a name and a place. Some labels were printed with the names of prolific collectors, such as Oliver and Miss Heine. In the 1940s and subsequently, headings were no longer printed on the labels, but collectors continued to record information according to those headings (see Appendix).

Important additions to the herbarium were the private collections of Thomas Kirk in 1931 and Leonard Cockayne in 1932. These acquisitions were recorded

in the annual reports for 1930–31 and 1932–33, respectively.

When Thompson became director in 1913, he continued Hamilton's efforts to obtain a new building for the museum, and Oliver, in turn, kept the momentum going. By 1929, funds had been raised locally, the Government had agreed to provide a subsidy, and designs were sought for the National Art Gallery and Dominion Museum to be built on the Buckle Street site. Construction began in 1934. The contents of the old building in Museum Street were transferred to the new building in April 1936. The official opening took place on 1 August 1936 (Dell 1965).

The list of permanent staff at 31 March 1935 includes Miss Mary Sutherland BSc (For) as a Clerk, but by then she had taken over Miss Heine's duties in the herbarium. From 1938 to 1946, she is listed as Botanist, but she did not work in the herbarium all of that time. A letter stored in the herbarium with Norfolk Island specimens collected by J.D. McComish, written by Oliver to McComish and dated 10 February 1938, notes that Miss Sutherland had been on sick leave for six months. The lists of permanent staff record Miss Sutherland as being on leave without pay from 1943 to 1946, and the annual report for 1943 lists her among staff who were in the armed or auxiliary forces. In 1946, she took up the position of Farm Forestry Officer with the Department of Agriculture (Lynch 1991).

Temporary staff continued to help in the herbarium. The annual report for 1938–39 records the resignation of Miss Norman from the Botany Department and the appointments of Misses K. Pickmere (later Mrs Katie Reynolds) and Primrose Self as temporary Botanical Assistants. They went on collecting trips and also continued the day-to-day work of caring for the collections. Annual reports record that in 1940 a large herbarium of lichens collected in the 1860s by Charles Knight was transferred from Victoria University College to the museum, and that the collection of specimens collected by Banks and Solander on Cook's first (1769) voyage to New Zealand had all been mounted and classified by 1941.

Charles Knight was a top level public servant in New Zealand from 1845 to 1878 and also a botanist. He promoted botany in New Zealand and collected,

researched, and published mainly about lichens (Galloway 1990). As Auditor-General, he supported and closely monitored the preparation and production of J.D. Hooker's *Handbook of the New Zealand Flora*, first suggesting the project to Hooker in 1860, helping to secure funding, and ensuring final payment after completion in 1867 (Galloway 1998).

The Banks and Solander specimens were duplicates that were sent to New Zealand in 1895 by the British Museum of Natural History, along with proofs of engravings of Sydney Parkinson's drawings from that voyage, to assist Thomas Kirk in his preparation of a new Flora (Adams 1988). The Flora was published posthumously in 1899, from the best available manuscript, as *Students' Flora of New Zealand and the Outlying Islands*.

On 8 June 1942, most of the Museum and Art Gallery building was taken over at very short notice for defence purposes. The Art Gallery vacated the building, and the main contents of the museum and its remaining staff were repositioned on the display floor. The building was closed to the public for the next seven years (Dell 1965). Although annual reports from the war years record a few accessions, collections, and publications, mainly by Oliver, the 1944–45 report notes that the Botany Department had been without staff for several years. The military occupation ended in August 1946. From July 1947 to March 1949, the building was restored and redecorated. It opened to the public again on 29 September 1949.

During 1937–38, Oliver spent approximately nine months on a Carnegie Travel Grant, visiting and studying museums overseas. Many of his resulting ideas for improvements to the Dominion Museum were sidelined by the military occupation of the building, but during the war he crystallised his ideas on museums in New Zealand in a pamphlet (Salmon 1958). His comments are still relevant over 50 years later. He argued for the public education and scientific roles of museums and stressed the lack of public support and funding for institutions that do not return a monetary profit, the inadequate staffing of New Zealand museums compared with those overseas, the need for well-designed and easily accessible buildings, and the need for knowledgeable and efficient administration (Oliver 1944).

Oliver retired in July 1947 but continued working in the herbarium for several months as there was no botanist on the staff. He continued collecting and contributing to the herbarium until his death almost 10 years later. Dr R.A. (later Sir Robert) Falla became Director from 1 November 1947.

## Consolidation: 1948–1981

Miss P. Alison Lush MSc was appointed to the permanent staff as Assistant Botanist on 29 November 1948. She began to keep a register, in a bound volume, of all accessions of plant material. This register, which she labelled General Accessions Record Book, was maintained from 14 December 1948 to 10 December 1953, just before she left. One of her first large tasks was the relocation of the herbarium from its wartime corner of the display floor to a better and roomier working and storage space. This move gave her an opportunity to assess the nature and condition of the collections and also of some of the records relating to them.

In 1951, Miss Lush gathered together all the information she could find about accessions to the herbarium and its activities. From the museum's general accessions registers that still existed (1865–1903 and 1927–1950) and other looseleaf folios, she extracted all records of plant material deposited in the museum. She also examined all the annual reports for which copies were available (1865–1904 and 1913–1949) and extracted all comments and information about the herbarium and Botany Department. All of this information she typed and attached in the front of the General Accessions Record Book, following an explanatory note of what records were available.

This book, which must have taken many hours among all the day-to-day herbarium work plus her involvement in preparing new displays for the post-war museum, is an invaluable contribution to the herbarium's records. Without it and other lists made in the 1950s, historical work by present staff would be almost impossible (J. Fox pers. comm.).

An important acquisition in about 1949 was the New Zealand collection of William Colenso, consisting of vascular plants, bryophytes, lichens, algae, and fungi (Oliver 1951; Hamlin 1971b; Brownsey 1979). This was a very large collection, including over 1400

hepatics (liverworts), 11 mosses, and 900 fungi (Hamlin 1971b; Wright 1993).

After Alison Lush's departure (as Mrs Williamson), annual reports show that work in the herbarium was carried on by temporary staff until the permanent transfer in 1954 of Bruce G. Hamlin from the Botany Division of DSIR as Botanical Assistant. Although not academically qualified in botany, Hamlin developed expertise in taxonomy, particularly of Cyperaceae (sedges) and Hepaticae (liverworts). He also realised the need for detailed examination of the large private collections that had been deposited by earlier botanists. From specimen labels plus field notebooks that were available, he worked his way through the collections of Petrie, Kirk, and Cockayne and produced records of dates and locations of their collections as collecting itineraries (Hamlin 1958, 1965, 1967).

As he worked with specimens, Hamlin began registering them in numerical order in bound volumes. This was the beginning of the numbering system still in use, which uses the international abbreviation for the herbarium, WELT, as a prefix to each number. Thus, every specimen has its own unique number, by which it can be referenced in academic papers. All of these registers are maintained in the herbarium. As each specimen is registered and its details are recorded, its number is also written on the label attached to the herbarium sheet or on the herbarium sheet itself.

When Oliver died in 1957, he left his private natural history collections to the museum. This included 6000 sheets of herbarium specimens. In the same year, the herbarium completed the purchase of some 10 000 moss specimens from G.O.K. Sainsbury, a process begun in 1948. Through the 1950s and 1960s, Hamlin had assistance in the herbarium from university students on vacation (including J.E. Braggins) and from volunteers, and they did much of the mounting, labelling, and registering of specimens, working through historical collections such as those of W. Colenso and Oliver. The herbarium also contains the main collections of B.C. Aston, William Martin (flowering plants only), and J.H. McMahon (Wright 1993).

In 1966, Falla retired and Dr R.K. (Dick) Dell became director. The 1968 annual report of the museum records recommendations made by a subcommittee of the Royal Society of New Zealand on future

staffing of the Dominion Museum. A need was seen for the museum to play an increasingly important role in research on biology and ethnology. Strong recommendations were made for more scientific staff in several areas, including botany and marine systematics. However, the annual report notes: "In the current economic situation, this was an unfortunate year to ask for more staff."

In 1969, Miss Nancy M. Adams was transferred within the museum from her position as Artist to a newly established position as Technician in Botany. For the first time, the herbarium had two permanent staff members. She began work on the marine algae, which had scarcely been looked at previously, and began sorting, mounting, and registering the specimens, including those in the Thompson–Baker Herbarium. She collected new specimens, especially from the Wellington coast, and also did a lot of identification, sorting, and registration of terrestrial plants. About the same time, Hamlin turned his attention to the liverwort collections. Assistance with routine herbarium work continued to come from students on vacation, other temporary or part-time staff, and volunteers.

The 1971 annual report carries a description of defects in the museum building, particularly its increasing leakiness. In 1972, there is discussion of the lack of space for adequate storage of Māori and European artefacts and historical objects, as well as for natural history specimens.

From April 1973, the museum's name became the National Museum. A new style of label was printed for the herbarium, with the museum's new name and the international abbreviation WELT. On these labels, the registration number was written immediately following these letters. The practice of providing headings was revived, to ensure that as much collection information as possible about the specimen was recorded (see Appendix).

During the 1970s, Hamlin began investigating the bryophytes in the Thompson–Baker Herbarium. A copy (held in the herbarium) of a letter he wrote to a bryologist in the Netherlands shows his excitement at what he found. Among about 800 packets (specimens) of liverworts and 1500 packets of mosses, mainly from central Europe, he was sure there were many isotypes, including some for which holotypes had been lost in war and natural disasters. He had

begun to seek advice as to an appropriate taxonomist with knowledge of the historical aspects of European bryology who could be invited to work on these specimens (Hamlin 1976) when he died in March 1976.

Two days after Hamlin's death, Miss Fiona D.H. Pitt was transferred from being Receptionist-Typist to the position of Botany Technician, to assist Miss Adams. Miss Pitt's calligraphy will endure in registers and on thousands of labels. Both she and Miss Adams researched and published collecting itineraries of early collectors, carrying on from the similar work done by Hamlin (Adams 1980; Pitt 1982). In January 1977, Dr Patrick J. Brownsey was appointed Curator of Botany, the first academically qualified plant taxonomist to be in charge of the herbarium. The number of permanent staff in the herbarium had now risen to three, supported from time to time by students on vacation and volunteers. As a specialist in ferns, Brownsey's attention went first to those collections, to the work of sorting, mounting, packeting, labelling, and registering thousands of New Zealand specimens.

During 1977 and 1978, the herbarium area was redecorated and reorganised, and sorting and care of New Zealand seed plant specimens followed the work on ferns. By 1979, work was concentrated on adventive (naturalised in New Zealand) and foreign collections. Annual reports show that some of this work in 1977 and 1978 was helped by the employment of Miss Prudence D. Wisheart under a Government temporary employment scheme. In 1980, again, most routine work was done by a non-staff member under the Temporary Employment Programme.

In 1980, the museum had a change of Director; Dr J.C. (John) Yaldwyn became Director after Dell's retirement.

## Towards Te Papa: 1981–1997

The 1981–82 annual report commences: "The main problems facing the National Museum during 1981–82 were overcrowding, poor storage conditions, and leaks. These problems have concerned the museum for a very long time, but now they threaten its future functioning." The report goes on to itemise the nature and location of the problems and then notes: "With working drawings for the extensions to the

building in the final stages of preparation, it is hoped that Government will ensure that approval to proceed with the new museum wing is granted." The following year's report states that plans and specifications for the building addition have been completed and adds: "Approval to call tenders for this addition is urgently needed." This same (1982–83) report records the receipt by the herbarium of important historical botanical material from the Otago Museum on long-term loan, which included collections by J. Buchanan, J.S. Thomson, and J.E. Holloway, and adds: "... the department is now seriously embarrassed for space and could not satisfactorily take another collection of this size without extensive additional space".

The tone of the 1983–84 report is less strident. In September 1983, Government had deferred the proposed extensions from further consideration until the 1990s. An interim solution of using other building space was being explored by the Department of Internal Affairs and the Ministry of Works. In 1985, a five-storey building of offices and workrooms in Taranaki Street plus an adjoining three-storey warehouse building were leased and renovated to house all of the natural history departments except Entomology plus the National Art Gallery and Museum Conservation Unit. Occupation of the Taranaki Street site was expected to be for about ten years. This move left considerably more room for ethnological collections at the Buckle Street site.

Also in 1985, a Government Caucus subcommittee investigating the siting of the new National Art Gallery, which was expected to vacate the Buckle Street building in 1990, proposed a Pacific Arts Centre on the Wellington waterfront, not far from the Overseas Terminal (Brownsey 1985).

At Taranaki Street, the herbarium occupied most of the top (fifth) floor plus parts of the first and second floors of the larger building. For the first time, there was room to store most of the specimens on shelving where they were easily accessible. Staff had offices and research space, and there was also bench space for routine work and for use by visiting botanists. Serious collection management work was only possible after the move to Taranaki Street (P. Brownsey pers. comm.).

During the 1980s, attention turned towards the conservation requirements of all of the museum's

holdings. By the late 1980s, the use of acid-free paper and card was introduced in the herbarium. Use of acid-free material was not considered as crucial for Botany as in some other departments, because plants contain and leak organic acids, but acid-free materials were introduced as old stocks were exhausted. New storage boxes of acid-free card have been designed for introduction in the new building.

The 1980s saw a change in the availability of funding and thus of extra staff. Like many government departments, the museum had a long tradition of employing students who were on vacation to do routine work. Within the museum, however, there was a limited amount of money available and its allocation had to be approved by the Director. From the late 1970s, Government introduced several employment schemes designed to help the unemployed to gain work experience. During the 1980s, the main scheme was PEP (Project Employment Programme), under which several people, including Elaine Laracy, Christine MacDonald, and Mike Huaki, did valuable work in the herbarium and went on to further botanical or scientific work elsewhere.

Other important external sources of funding that became available from the later 1980s for specified projects were the Lotteries Grants Board and the Foundation for Research, Science & Technology (FRST). Projects funded by the Lotteries Grants Board included the first electronic databasing of Sainsbury's moss collection in 1987–88 (by Melanie Kohler, Natalie Walker, and Graeme Lindsay) and the re-entry of those records on to the main museum database and the repackaging of the entire collection in 1996 (by Katy Brown and Bec Stanley); the identification of Auckland Island mosses, Antarctic lichens, and mosses collected by W. Colenso (by Barbara Polly); the boxing and conservation treatment of the Knight lichen collection and Cunningham and Colenso vascular plant collections (by Mike Huaki) and Knight moss collection (by Maria Ericksen); and the purchase of special equipment such as algal growth chambers and microscopes.

Funding obtained from FRST for taxonomic research has included a large project on New Zealand genera of the daisy family (employing David Glenny), now completed and published (Glennly 1997; Glennly & Wagstaff 1997), and projects on algae, in collabora-

tion with Otago University and Industrial Research Ltd (IRL) (employing Glenys Knight, Louise Phillips, and Sushila Pillay), and the genus *Hebe*, in collaboration with Victoria University of Wellington and IRL (employing Mike Bayly), both of which are ongoing. Such project funding has also supported temporary staff (including Fran Kell and Rebecca Ansell) for related herbarium work.

Since the mid-1970s, volunteers have made an important contribution to the herbarium, doing routine work such as mounting, labelling, and filing specimens. Volunteers have included Peg (Lady) Fleming, Jo Eberhard, Tina Young, Jacqui Griffiths, Laura Ashley-Jones, Sarah Yaldwyn, and Jo Forbes.

Miss Adams retired in March 1987. She was replaced in August that year by Dr Wendy A. Nelson, a marine algae taxonomist. A temporary employee who became permanent was Mr J. (Jeff) Fox. He had previous herbarium experience and special interests in historical aspects of collections, their collectors, and botanical nomenclature. Thus, by 1991, the permanent staff of the herbarium had reached a total of four.

The 1985 Government Caucus subcommittee's concept of a Pacific Arts Centre had developed into a new incarnation of New Zealand's national museum. The Museum of New Zealand Te Papa Tongarewa Act 1992 gave the museum its current name. It also amalgamated the National Art Gallery and the museum into a single institution, to be housed in a new purpose-built building on the Wellington waterfront, near the Overseas Terminal. Following the retirement of Dr Yaldwyn in 1989, Dr A.N. (Alan) Baker was the last Director of the National Museum, under Mr M. (Michael) Volkerling, who was Chief Executive Officer. In late 1992, Ms Cheryl Sotheran was appointed CEO, responsible for establishing the new facility as well as for the day-to-day running of the institution.

Collection management policies were developed along with other policies for the new combined institution, and technicians such as Jeff Fox and Miss Pitt were relabelled Collection Managers. Work began on establishing an electronic database of all items held by the museum. The choice of a single database system to suit the wide range of the museum's holdings was not easy. The system that was established, known as Te Kahui, was custom-designed to accommodate as best possible the wide variety of information types

that are held on it and is now envied by other organisations. Specially trained data-entry staff work in the various sections and departments of the museum inputting the records and information.

For databasing of existing plant collections, information on the labels has to be as full as possible and in the standard format, and the specimens have to be already registered. Where appropriate, some extra information is added, such as latitude and longitude. Where specimens carry only a collector's label, a museum label is provided (see Appendix). Where information on a previous museum label is augmented, a supplementary label is added (see Appendix). Any unregistered specimens are registered before databasing. For newly acquired specimens and collections, all information is recorded directly on the database, a registration number is allocated, and a standard label is printed (see Appendix). As more and more of the herbarium's holdings are added to the database, it is becoming possible to provide quick, accurate information about plants, localities, and collectors, such as data about rare and threatened species for Department of Conservation or about holdings of families and genera that outside researchers wish to revise.

The public opening date for the new building had been set at 14 February 1998. In April 1996, the Buckle Street building was closed to the public and the long task of packing items for the move down to the waterfront began. As construction of the new building progressed, allocation of the available floor area was revised. It was desirable to have as much public space as possible, yet also to have as many museum staff and departments housed there as possible. In the end, Botany and Marine Mammals were the only natural history departments destined for the new building. Entomology was to move from Buckle Street to Taranaki Street, into the area vacated by Botany, to join the other natural history departments.

In the herbarium, packing of the collections began in January 1997. The contents of each box had to be tied as a bundle between sheets of cardboard and packed with plastic and paper to prevent movement. All herbarium personnel packed the thousands of boxes, and the permanent staff also packed the contents of their offices and research areas. Some foreign material, most notably the Thompson–Baker Her-

barium, was still packed from the 1985 move from Buckle Street.

Over Easter 1997, the contents of the entire herbarium and its offices and laboratories were moved to the new waterfront building. Although the herbarium storage rooms were not quite ready for the collections, dusting and cleaning of shelves was carried out as the collections were unpacked. For the first time in the herbarium's 132-year history, the collections were stored in a controlled environment (air temperature and humidity control) with no direct sunlight and with little opportunity for infestation by insects or mice.

## Conclusion

I am sure that Oliver would approve of the location and accessibility of the new building, the informative nature of the displays in the public areas, the storage and working facilities for the herbarium, and the professional standing of the herbarium's permanent staff. However, I suspect that he would be disappointed that the whole museum as an institution is still not housed under one roof and that, at 132 years old, the herbarium still does not have enough staff for the work it is required to do. Indeed, the permanent staff of four is no more than that recommended for this herbarium by Dr Hill of Kew in 1928.

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## Appendix

Herbarium labels in use at varying times.

A Colonial Museum. Handwriting of J. Buchanan.

HERBARIUM, COLONIAL MUSEUM, WELLINGTON, N.Z.
<i>Hymenophyllum <del>multifidum</del> Swartz</i> <i>Chatham Island.</i>
J. HECTOR, M.D., F.R.S. DIRECTOR.

B Collecting trip to Chatham Islands by H.H. Travers on behalf of Colonial Museum.

<i>Ruppia maritima</i> L.
CHATHAM ISLANDS, NEW ZEALAND.
COLLECTED BY H. H. TRAVERS, FROM THE COLONIAL MUSEUM, WELLINGTON.

C Specially printed label for the Petrie Herbarium at its incorporation into the museum herbarium. Details are recorded by Petrie.

**THE PETRIE HERBARIUM.**

<i>V. salicifolia</i> : Frut. f. Valley of Ure R. S.E. Marlborough Early April 1915. B.C. Aston.
Dominion Museum, Wellington, N.Z.

D Dominion Museum Herbarium, printed in 1928.

**DOMINION MUSEUM HERBARIUM,**  
Wellington, N.Z.

Name: *Asplenium nervosum* 2  
Locality: *Wallacerville, etc.*  
Habitat: *In shade, on river bank.*  
Life form: *attached by root.*  
Flowers, fruit: \_\_\_\_\_  
Species associated: \_\_\_\_\_  
Collector: *D.M. Munro* Date: *19<sup>th</sup> July 1928.*  
(1928-28)

E Dominion Museum Herbarium, printed in 1928 with Oliver's name as collector.

**DOMINION MUSEUM HERBARIUM,**  
Wellington, N.Z.

Name: *Asplenium nervosum.*  
Locality: *2nd Eymont 200-300ft.*  
Habitat: *Karamehi forest.*  
Life form: \_\_\_\_\_  
Flowers, fruit: \_\_\_\_\_  
Species associated: \_\_\_\_\_  
Collector: *W. R. B. Oliver.* Date: *22<sup>nd</sup> March 1928.*  
(1928-28)

F Dominion Museum Herbarium, printed in 1932 with Miss Heine's name as collector.

**DOMINION MUSEUM HERBARIUM,**  
Wellington, N.Z.

Name: *Asplenium nervosum.*  
Locality: *2nd Oxford 200ft.*  
Habitat: *In scrub.*  
Life form: \_\_\_\_\_  
Flowers, fruit: \_\_\_\_\_  
Species associated: \_\_\_\_\_  
Collector: *E. M. Heine.* Date: *17 April 1932.*  
(1932-32)

**G** Dominion Museum Herbarium, label of the late 1940s. Handwriting of D.R. McQueen.

**DOMINION MUSEUM HERBARIUM,**  
Wellington, N.Z.

*Hebe subciliolata* var

In *H. cliffortioides* forest  
E bank Muiapakahi R.  
Lower canopy dominant  
28/3/48  
col D R McQueen

**H** National Museum Herbarium. This specimen has not been identified, and so the label has no plant name above the double line, and no identifier's name next to Det. (determinavit).

HERB. NATIONAL MUSEUM, WELLINGTON, NEW ZEALAND  
WELT No. 78898

Loc. L. Kohangatera eastside  
Wellington S. coast  
Hab.  
Date: 2.3.1974  
Coll. G.B. CONE  
Det.

**I** Museum of New Zealand Te Papa Tongarewa label, copying and augmenting information on the collector's label, ready for databasing; handprinting of F.M. Kell. Cyclostyled collector's label was a standard form used by Stage III students at Victoria College (later Victoria University of Wellington).

WELT 17182 HERBARIUM MUSEUM OF NEW ZEALAND  
TE PAPA TONGAREWA, WELLINGTON

*Hebe odora* (Hook.f.) Cockayne

Loc. North Island, Wellington, Kaimanawa Range,  
High Cone basin  
Map Lat. 39° 08' S Long. 175° 59' E  
Hab. *Hebe* - *Olearia nummularifolia* alt. 5000 ft  
Coll. D. R. McQueen 28 Mar 1948  
Det.  
Notes

Family: ..... SCROPHULARIACEAE .....  
Genus and species: *HEBE subciliolata* .....  
Loc.: HIGH CONE BASIN, KAIMANAWAS .....  
alt.: 5,000 ft .....  
Habitat (vegetation) *Hebe* sp., *Olearia* .....  
*nummularifolia* .....  
(edaphic) .....  
Geol. Forms: .....  
Notes on specimen: .....  
Collector: .. D. R. McQueen .....  
Identifier: .....  
date: 28.3.48: .....

**J** Supplementary label, interpreting handwriting and augmenting information on older museum label, ready for databasing.

## SUPPLEMENTARY LABEL

WELT No. 17177

*Hebe odora* (Hook.f.) Cockayne  
 North Island, Wellington, Tongariro National Park,  
 Hauhungatahi  
 Lat: c. 39°14'S Long: c. 175°26'E  
 Coll: H. B. Matthews early Jan 1918

**THE PETRIE HERBARIUM.**

*Hebe odora*: Beuth.  
 Hauhungatahi  
 Mt. Ruapehu  
 Early Jan 1918.  
 H. B. Matthews.

**Dominion Museum, Wellington, N.Z.**

**K** Fully computer-generated label, printed after direct electronic registration and data entry. The letter P preceding the registration number is for Pteridophyte (fern).

**HERBARIUM, MUSEUM OF NEW ZEALAND TE PAPA TONGAREWA  
 WELT P018430 WELLINGTON, N.Z.**

*Trichomanes reniforme* Forst.f.

**Loc.** New Zealand, North Island, North Auckland, Great Barrier Island, S of Port Fitzroy  
 on Fitzroy Harataonga Road, Hirkimata Track to Mt Hobson, Kaiarara Stream

**Map** NZMS 260 S08 24-54- **Lat./Long.** 36°11.00' S 175°22.00' E

**Hab.** Mature *Kunzea ericoides* scrub with young *Agathis australis*, *Cyathea dealbata*, C.  
 medullans and *Geniostoma ligustrifolium*. On large boulder in stream.

**Alt.(m)** 40

**Coll.** Brownsey, Patrick J **Date** 07.10.1995

**Det.** Brownsey, Patrick J **Date** 15.12.1995

**Collection Notes**

**Herbarium History**

**Specimen Notes**