

**THE WINSTON CHURCHILL MEMORIAL TRUST OF AUSTRALIA**

Report by - Helen Waite 1999 Churchill Fellow

Project: To investigate the grapevine nursery industry USA, France, Italy

## TABLE OF CONTENTS

	<b>Page</b>
<b>INTRODUCTION</b>	<b>3</b>
<b>ACKNOWLEDGEMENTS</b>	<b>3</b>
<b>EXECUTIVE SUMMARY</b>	<b>4</b>
<b>PROGRAMME</b>	<b>5</b>
<b>THE GRAPEVINE INDUSTRY IN THE USA, ITALY AND FRANCE</b>	<b>7</b>
THE USA	7
ITALY	9
FRANCE	10
ENGLAND	12
<b>CONCLUSION AND RECOMMENDATIONS</b>	<b>13</b>
<b>ADDENDUM</b>	<b>15</b>
SOME COMMENTS ON TRAVELLING	15

## **INTRODUCTION**

This Churchill Fellowship was undertaken to investigate the grapevine nursery industry in the USA, France and Italy with particular reference to hot water treatment, and other forms of quality control in the vine propagation process that contribute to the production of high quality planting material for the grape and wine industry.

Information was gathered from grapevine nurseries, grapegrowers, universities, and government and private consultants.

## **ACKNOWLEDGEMENTS**

Without the support, both financial and in kind, from the following people and organisations this fellowship would not have been possible and their contributions are gratefully acknowledged.

The Winston Churchill Memorial Trust, for the majority of funds.

Mr and Mrs R. Morsby (parents), for both financial support and encouragement.

The University of Melbourne, for financial support and leave to undertake the Churchill Fellowship.

Mrs P. Forbes, for accommodation, advice and encouragement.

Mr G. Ray, for advice and encouragement.

Mr P. Ryan, for advice and encouragement.

Lucie Morton (USA), for accommodation and transport and generous hospitality.

Dr and Mrs R Wample (USA), for accommodation and information and generous hospitality.

Mr and Mrs B. F. Powell (UK), for accommodation and generous hospitality, and for acting *in loco parentis* for 4 weeks for Margaret Waite aged 10.

Professor C. Bazzi (Italy), for generous hospitality and advice.

Dr F. Mannini (Italy), for generous hospitality and advice.

Dr S. Grenan (France), for assistance and advice.

Dr L. Torregrosa (France), for assistance and advice.

Dr C. Greif (France), for assistance and advice.

## EXECUTIVE SUMMARY

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### Project Description

This Churchill Fellowship was undertaken to investigate the grapevine nursery industry in the USA, France and Italy with particular reference to hot water treatment and other forms of quality control in the propagation process including nursery and mother vine management practices that contribute to the production of high quality planting material for the grape and wine industry.

#### USA

Significant contacts were made with Lucie Morton, a consultant, the Duarte family of the important nursery of that name, and Dr Robert Wample, Washington State University, who is an internationally recognised expert in vine propagation and physiology and the author of many important papers.

#### Italy

In the north east the most significant visit was to VCR (Vitis Cooperativi Rauscedo) which is a nursery cooperative that produces 35 million vines annually for export around the world.

Important contacts were also made with Professor Carlo Bazzi (University of Bologna) and Dr Franco Mannini (Centro Miglioramento Genetico e Biologia della Vite Consiglio Nazionale delle Ricerche) both of whom facilitated nursery and vineyard visits and provided particularly useful information on disease control and propagation.

#### France

Contact was made with a number of important organisations and people including M. H. Bernabé of the Richter nursery, M. M. Couderc, Morrison-Couderc nurseries, Dr S Grenan, ENTAV, Dr L. Torregrosa, INRA and AGRO and Dr C. Greif (INRA). these contacts provided important information, particularly on micrografting, hot water treatment, and vine improvement.

### Summary of Findings

In many respects Australian nurseries are equal to those anywhere in the world, and produce a very high quality product. However there are some techniques and practices that Australian nurseries and the wine industry may consider adopting. These include the management of *Vitis vinifera* mother vines for the production of propagating wood rather than fruit, the use of rooting hormones on some rootstocks to encourage the development of an even root system, and education of growers to encourage the use of registered material produced by nurseries.

## **PROGRAMME**

USA 16- 30 January 1999

### **California** Individuals contacted and organisations visited

Lucie Morton, consultant

Lisa Van de Water, consultant pathologist

Michael Porter, consultant

Jim Barbour, Barbour Vineyards

Stuart Bewley Alder Springs Vineyard

Jim and Jeff Duarte, Duarte Nurseries

Glen Stoller, Sunridge Nursery

John and Joy Caldwell, Caldwell Nursery

Susan Nelson-Kluk, UC Davis

Grace Vineyard

Robert Mondavi Vineyards

### **Washington State** Individuals contacted and organisations visited

Dr Robert Wample, Professor, viticulture, Washington State University

Dr Kenneth Eastwell, Associate Plant Pathologist, Washington state University

Dr Julie Tarara, Research Horticulturalist, US Department of Agriculture

Tom Judkins, Inland Desert Nurseries

Fairacre Vineyard and Nursery

### **Virginia** Individuals contacted and organisations visited

Lucie Morton, consultant

Gabriele Rausse, Assistant Director of Gardens and Grounds, Monticello, and nurseryman

## **Italy 2- 13 February 1999**

### **Bologna** Individuals contacted and organisations visited

Professor C. Intrieri, Istituto di Patologia Vegetale, Universita degli Studi, Bologna

Professor C. Bazzi, Istituto di Patologia Vegetale, Universita degli Studi, Bologna

Dr A. Bertaccini, Istituto di Patologia Vegetale, Universita degli Studi, Bologna

Mr > Battel and colleagues, Vivai Cooperative Rauscedo (VCR)

Dr R. Zisa, Centro Attivita Vivaistiche, Faenza

### **Turin** Individuals contacted and organisations visited

Dr F. Mannini, Centro miglioramento genetico e Biologia della Vite Consiglio Nazionale della Ricerche, Torino

Dr I. Gribaudo, Centro miglioramento genetico e Biologia della Vite Consiglio Nazionale della Ricerche, Torino

Grapevine nurseries, Piedmont

Wine education centre, Piedmont

Vineyards, Piedmont

Giardini Botanici Hanbury, La Mortola

## **France 14- 24 February 1999**

### **Montpellier** Individuals contacted and organisations visited

M. M. Couderc, Morrison-Couderc Nurseries, Vogue

M. H. bernabé, S.A. Technologies Viticoles RICHTER, St Clement de Riviere

Dr. S. Grenan, ENTAV, Le Grau du Roi

M. L. Mayoux, Onivins, Montpellier

### **Colmar** Individuals contacted and organisations visited

Dr C. Greif, INRA, Colmar

### **England** Individuals contacted and organisations visited

Denbies Wine Estate, Dorking, Surrey

## **THE GRAPEVINE NURSERY INDUSTRY IN THE USA, ITALY AND FRANCE**

### **USA**

#### California

The first part of the tour in America was spent in California, mainly the Napa Valley.

During this time I was able to get a good overview of the Californian wine industry, including vineyard establishment and management, and vine propagation. While there were many similarities to Australian practices, some of the vineyard establishment practices were notably different. In many instances training of young vines was not done with a string, but by tying the vine to a wooden or bamboo stake. The explanation for this was that although expensive, there was less likelihood of the string being tied around the wrong part of the vine and causing strangulation as sometimes happens in Australia. The price of labour was also relatively low, however in spite of this I felt that these practices were costly, and that a considerable saving could be made by using string.

The planting material available to vineyards was also quite variable, some appeared healthy and vigorous, but much appeared to lack vigour, and had small fibrous roots and small, poorly developed shoots. It was noticed that the wood used in propagation had a large pith area and a relatively small area of xylem, resulting in low starch reserves that are likely to have been the cause of poor vigour. The mild climate in California, and vineyard management practices may both be factors affecting the quality of the wood.

In California, the recently recognized fungal disease *Phaeoacremonium*, which has been implicated as one of the causal agents of the vine decline disease complex known as ESCA, is thought to be transmitted in infected rootstocks. *Phaeoacremonium* is relatively slow growing, and consequently is difficult to diagnose in the laboratory, as other fungi present in the sample compete for space and nutrients when the sample is cultured. I was able to see the fungus in established vines and rootlings, and as a laboratory culture. Although *Phaeoacremonium* is present in Australia, ESCA is not present, and the extent, importance, and source of infection of *phaeoacremonium* is not yet known in this country, but it is likely to be transmitted in infected rootstocks .

There is a growing body of anecdotal evidence in Australia that suggests *Phaeoacremonium* is controlled by hot water treatment (50°C/30 min) of rootstocks (I Pascoe, pers. comm.1999), and in the light of the Californian experience, the use of hot water treatment is becoming increasingly important in the production of healthy vines.

Hot water treatment of vine propagating material is not universal in California, and is viewed with suspicion by many nurseries who, like their Australian counterparts, are afraid of losing large quantities of material in the treatment. These feeling may be justified given the poor quality wood available to nurseries, however attention to the production of superior wood is likely to result in material that is less susceptible to mortality in hot water treatment.

## Washington State

The second part of the tour was spent at Washington State University at Prosser. Prosser is in the heart of the Yakima Valley, about four hours drive east of Seattle. The Yakima Valley is and important fruit and wine production area in Washington State.

Several discussions were held with Dr Robert Wample and his colleagues at the University, particularly in the areas of vine physiology and response to climate and the consequences for propagation.

The effects of variations in the depth of dormancy on the capacity of vines to withstand both high and low temperatures were discussed in some detail, as were the effects of vine management and nutrition on the quality of propagating material.

It was felt that material collected from areas with warm winter climates such as California and Australia, was less likely to be fully dormant for as long as material collected from cold climates, and therefore more susceptible to heat or cold injury.

The quality of wood available to nurseries in the Yakima valley was generally superior to that available in California, and nurseries were more comfortable with hot water treatment. Nursery practices were generally not as modern than those used in Australia, cold storage and callusing rooms did not appear to be common. Callusing pits were usual, and the majority of material was field grown with very little use of the pots and greenhouses that are becoming increasingly popular in Australia. Growers commented that the demand for vines was not as high as that in Australia and there was therefore little pressure to use greenhouse techniques to produce plants more quickly.

## Virginia

The time in Virginia was mainly spent with Lucie Morton, a consultant, putting the finishing touches to a conference paper, and to summarising the outcomes of a workshop held in California, where I discussed the results of my hot water treatment research with members of the nursery industry.

A very interesting visit was also made to Monticello, the home of Thomas Jefferson, where there were vines with symptoms of crown gall, a disease that is transmitted in infected propagating material.

Gabriele Rausse, the Assistant Director of Gardens and Grounds, is also an experienced nurseryman, and he made several comments about plastic mulches in field nurseries during the discussion I had with him. He particularly noted the dangers of using red plastic, which can result in soil temperatures high enough to kill the vines.

## **ITALY**

### **Bologna and Rauscedo**

I was met by Dr Carlo Bazzi of the Università degli Studi in Bologna and taken to the town of Rauscedo in the north west of Italy. The VCR Rauscedo co-operative that produces 35 million grapevines each year for export all over the world.

At the co-operative I was able to see vines being waxed and packed for dispatch and the hot water treatment plant. Vines were only hot water treated if the customer requested it, and a disclaimer was signed.

The vines I saw were of a very high and uniform quality, even though they had been grown by different members of the co-operative. The vines were also cut back to two buds, and had their roots trimmed ready for planting, before waxing and packing, a practice that is not carried out in Australia where vines are only lightly trimmed before dispatch.

While at Rauscedo I was also able to see rootstocks grown on horizontal trellising. I was informed that only some varieties were grown in this way and that the usual method of allowing the vines to run along the ground was the most common practice.

I was also able to see an experimental vineyard and a collection of disease free vines that were part of the co-operative. I was invited to taste wines made from several different clones of Pinot Grigio that were part of a clonal trial. The tasting was held in the experimental winery that had been set up specially to handle many small batches of grapes and wine.

A visit was also made to an experimental vineyard high up in the hills to the north of Rauscedo. The vineyard was very small and consisted of tiny terraces cut into the hillside each holding only a few vines. The main trial was designed to determine how long it took for clean vines to become infected with Flavescence Dorée, a disease similar to Australian Grapevine Yellows.

The next few days were spent in and around Bologna. I was introduced to Dr Assunta Bertaccini, a plant pathologist with specialist knowledge of phytoplasma diseases. We discussed the similarities and differences between various phytoplasmas including those that occur in Australian crops and plants, and the complex issues involved in making a correct diagnosis.

A field trip to visit a nursery and experimental vineyard south of Bologna was also organised. The nursery was somewhat smaller than VCR, but the quality

of the plants was very high. As was the case in other parts of Europe, omega grafts were used without ties to hold the scion and rootstock together.

The wood used for propagation in Italy was quite hard and dense, and the buds were very tightly closed. It was considered normal practice to source some wood from other areas where the growing conditions enabled the production of better quality cuttings for particular varieties.

The Phytosanitary facility CAV was also visited. This institution assessed crop plants including vines and fruit trees for registration as source material for disease free propagation. It has a tissue culture facility as well as insect proof screen houses and a field nursery for virus indexing.

### Turin Region

The time at Turin was spent with Dr Franco Mannini from the Centro Miglioramento Genetico e Biologia della Vite Consiglio Nazionale della Ricerche and his colleagues. Dr Mannini is involved in research in disease control and extension in general viticulture.

I was able to visit several vineyards and nurseries and was also able to see a collection of old and rare varieties from the Piedmont region.

Discussion centred around the identification of virus diseases and the maintenance of virus free mother vines and the gains in productivity that could be obtained by using disease free vines. Dr Mannini also said that vineyards that were the source of *Vitis vinifera* propagating material were managed for wood production rather than fruit which was secondary.

Time was also spent with Dr Ivana Gribaudo who has a great deal of expertise in tissue culture. I found her comments about the behaviour of different grape varieties in tissue culture interesting and informative. We also discussed hardening off techniques for tissue cultured plants.

The train route from Turin to Marseille went via the Mediterranean coast, and I was able to spend a weekend in Venitmgliia and visit the Hanbury garden at La Mortola. This garden is world famous for its collection of plants and outstanding design, and although it was damaged during the last war and, like many important gardens, has suffered from a shortage of funds until recently, it is very beautiful and quite well kept.

## FRANCE

### Montpellier Region

A visit was made to the well known nursery Morrison-Couderc at Vogue, north of Montpellier. This nursery produces very high quality vines that are exported all over the world. As was the case in Italian nurseries, omega grafts were used exclusively, and, unlike Australian practices, no tapes or ties

were used to secure the graft union, which was simply dipped in wax to prevent dehydration. Waxing is also standard practice in Australia. Vines that had been lifted and prepared for dispatch were waxed to prevent cold injury and moisture loss in the field. In Australia vines are not waxed again before dispatch because the field conditions in spring are less severe than those in Europe, and fatal cold damage is uncommon.

It was also noticed that the root systems on the vines produced by Morrison-Couderc were very evenly distributed around the base of the vine and that they were also of very even diameter. M. Couderc commented that the use of the root stimulating hormone, IBA, resulted in a more prolific and even root system.

I was also able to visit the head office of the Richter company at St Clément where I was very kindly received by M Henri Bernabé, one of the directors of the company. The Richter organization has expanded its vineyard and nursery interests into many countries in Europe, North Africa, Asia, and the Americas.

I had a very interesting discussion with M Bernabé which ranged over a number of topics including pest and disease control, vine improvement, the world wine market, and propagation techniques. I was also able to meet his mother, Mme Bernabé, an important and influential person in the world wine industry.

During my visit I was able to see some rootstock plantings at the St Clément facility. It was interesting to note that cutting material is transported in open trucks and trailers, a practice that I thought might result in dehydration of the material, particularly as the weather was relatively mild.

The French national vine improvement organization, ENTAV also has a facility near Montpellier that I was able to visit. I met Dr Serge Grenan the engineer, who has expertise in the design and use of hot water treatment plants and grapevine virus testing. It was interesting to note that hot water treated material was not plunged into a cooling tank after treatment. Dr Grenan indicated that he felt that there was no need to cool the material quickly after treatment, but was adamant that it should not be put into cold storage for at least 24 hours after treatment.

The Ecole Nationale Supérieure Agronomique is located in the city of Montpellier and is linked to INRA the national vine research institute that has campuses in several locations around France. I met with Dr Laurent Torregrosa, who is involved in genetic engineering of vines to improve grape quality and disease resistance.

Topics we discussed included dehydration and its effects on the viability of propagating and planting material and the effects of hot water treatment on grapevine cells. Dr Torregrosa gave me a copy of a French paper that concluded that once a vine cutting loses 20% of its weight by dehydration,

permanent damage occurs, and death occurs when moisture loss reaches 26% by weight.

## Colmar and Epernay Regions

The climate in the north west of France is much cooler than in the south, the area around Colmar is famous for its excellent sweet white wines and Epernay is in Champagne.

Viticultural practices were more modern in these areas than in the south. Trellising was more strongly built than was the norm. I saw very few vineyards without trellising in the north, although untrellised vines were quite common in Provence. Pruning and vine training methods were also more modern in the north, a consequence of better trellising and the cooler climate.

At Colmar I visited the INRA facility, the centre where the green grafting technique was developed. I spent some time with Dr Charles Greif who showed me the glass houses and the tissue culture laboratory. We discussed tissue culture and grafting techniques. Dr Greif told me that it is important to rest the mother plants used in green grafting for 3 months during winter. If this is not done the success rate declines, making the process unprofitable.

Dr Greif also told me that green grafting was losing popularity in France because it was expensive to maintain the glasshouses, and the technique required a relatively high degree of skill.

## ENGLAND

Two vineyards were visited in England, both in the south. The first was relatively small, with wine accounting for a relatively small part of the business that was mainly devoted to cider production. The wine produced at this vineyard was quite acidic and lacked fruit flavours. The vines were trained on a high trellis similar to GDC. I felt that this system did not take advantage of all the available sunlight which would have improved the quality of the grapes and the wine. This vineyard also had difficulty managing fungal diseases, particularly the mildews.

The second vineyard, Denbies Wine Estate was very large by English standards, over 100 acres. The vines were extremely well managed to ensure maximum ripening and minimum disease and the vineyard was immaculate. Unfortunately the English climate prevents to production of quality wines with good fruit flavours, and consequently Denbies relies heavily on tourism, which contributes 50% of the income of the estate.

The winery building is very attractive and designed to cater to tourists as well as manufacture wine. It was possible to take a tour of the winery in specially designed electric carts. The tour began with two excellent videos about the estate, and the grape growing and wine making processes. The carts then took visitors through the cellars where the wine making process was

explained, and on into the tasting room. In the tasting room there were a number of barrels made from oaks blown down in the great storm in 1987. The barrels had been made by an Austrian craftsman, and there were beautiful scenes of wine making and grape growing carved into the front of each one.

Other visitor facilities included an excellent shop, restaurant, and conference facilities. Australian wineries wishing to attract tourists could learn a great deal from the Denbies experience.

## **CONCLUSION AND RECOMMENDATIONS**

The Australian vine nursery industry produces a product that is frequently as good as, and sometimes better than, that produced elsewhere in the world. However the pressure on the nursery industry brought about by the rapid growth of the wine industry has resulted in inconsistencies in the quality of vines offered to growers. This has been compounded by the shortage of propagating material, particularly from registered sources.

A further problem is the lack of understanding of the benefits of high quality planting material in some sectors of the grape growing industry. Some grape growers elect to propagate their own vines and obtain propagating material from unreliable sources outside the vine improvement schemes, perpetuating the transmission of endogenous diseases, and the misidentification of varieties.

The incidence of virus diseases, and their effects on productivity, is of concern in Australia and overseas, with the common understanding that most virus symptoms are caused by a complex of different viruses and control of potential vectors such as mealy bug is particularly important.

Although phytoplasma diseases (AGY, Bois Noir etc.) have been the cause of considerable concern in the wine industry everywhere, the difficulty of diagnosis has meant that it has also been difficult to design protocols to prevent infection of mother vines. In this respect Australia leads the world in the commercial use of hot water treatment as a means of controlling phytoplasmas and other endogenous diseases in planting material.

Crown gall, and endogenous fungal diseases that are now implicated in vine decline, are also coming under closer scrutiny in wine producing countries around the world including Australia, and awareness of the effects of these diseases on vine health and productivity is increasing. Measures to control these diseases in propagating material are as advanced in Australia as they are overseas, although inspection of mother vine plantings appears to be more rigorous in Europe.

The Europeans also placed greater emphasis on the production of high quality scion wood and rootstocks. To this end *Vitis vinifera* mother vines are managed specifically for the production of scion wood rather than grapes, and

both scions and rootstocks are sometimes grown in areas distant from the nurseries in order to obtain the best quality material.

In general the depth of dormancy of both scion and rootstock wood in Europe and the colder parts of the US appeared to be greater than in Australia, and this may contribute to resistance to dehydration during handling and a lower mortality in hot water treatment.

It was interesting to note that the bigger nurseries in Europe and the US had seen opportunities in the wine producing countries in Eastern Europe, Africa and South America, and had either established nurseries in these countries or exported vines.

There have been a number of inquiries to Australian nurseries from South America and South Africa in recent seasons, and if a sufficient quantity of high quality vines could be assured, there would be a ready market for Australian vines in these countries where the seasons coincide with Australia. However the increasing activity of the Europeans and some North American nurseries requires prompt action if Australia is to have a share of this market. A co-operative approach to the export market would enable Australia to establish one identifiable brand name and ensure a supply of sufficient quantities of vines.

In order to remain viable in an increasingly global market it is important for the Australian vine nursery to produce a consistent, high quality product at a competitive price.

To achieve this, careful attention must be paid to quality control, and a reduction in wastage caused by poor quality propagating material and handling practices. A well trained, skilled labour force is also essential.

It is planned to disseminate the information contained in this report to the nursery and wine industries via a series four workshops for the nursery industry in Victoria, Queensland, Western Australia and South Australia, articles in trade journals and individual contact.

A national vine nursery industry conference, to be held early next year, is also being planned in partnership with the Vine Industry Nursery Association.

## **ADDENDUM**

### **SOME COMMENTS ON TRAVELLING**

#### Constructing an Itinerary

Making contact with people in non-English speaking countries can be extremely difficult, even with Email facilities. It can take months to get a reply and it can be quite difficult to get information about accommodation and transport.

It is also difficult to deal with a travel agent that is 200 km away. Some things, such as route planning, are difficult to do by telephone, and it would be more economical to do the initial planning at a personal meeting.

The telephone number provided by the Churchill Trust for the travel agent was incorrect, and it took more than a week and many telephone calls to both the Trust and Quantas to obtain the correct number.

#### Modes of Transport

While a Eurail pass was quite useful in Italy where people met me and drove me to nurseries and vineyards outside cities, it was less useful in France as many destinations were in the countryside, and very little could be achieved without a car.

I had a car for 5 days in the south of France, and in retrospect it would have been better to keep the car for the entire time I was in France as I would have been able to see more nurseries and vineyards.

Although extra time should be allowed for navigating when in a car, the time wasted is much less than the time that is wasted waiting for trains and making connections, and although people were often most helpful, it is difficult to obtain detailed information about train routes.

A car was essential in America, particularly to get to Prosser where much valuable work was done.

I found driving in the US and France far less difficult than I had been led to believe, and quickly adjusted to driving on the right hand side of the road. Although the French drive very fast, they are quite polite, and the roads are good and well sign posted.

In the United States the Quantas partner is American Airlines. This caused some very long and inconvenient journeys via indirect routes. The standard of service on American Airlines is also low, the planes were often late, frequently in need of cleaning, and the food was inedible.

## On Being a Lone Female Traveler

It would be naïve to suggest that it is not sometimes more difficult for lone female travellers. However there are some simple rules that help to make travelling a pleasant and enjoyable experience and reduce the risk of assault or other unpleasant experiences.

Firstly, don't leave home without your self-respect and your sense of humour. Being able to see the funny side of an incident will often defuse a difficult situation and prevent it from escalating.

Secondly, most people are nice most of the time, and it is important not to assume people are out to take advantage unless your intuition tells you that the person you are dealing with is untrustworthy. Your gut feeling about somebody is usually right, and if a person makes you feel uneasy it is important to extricate yourself as gracefully as possible and as quickly as possible without appearing to panic. It is important not to see yourself as a victim or you are likely to become one. This is where self-respect is important, other people recognize it and treat you accordingly.

It is also helpful to be the owner of a well-worn wedding ring, if you are not married, consider buying or borrowing a ring that does not look too new or flashy. Other jewelry should also be discreet, not flashy, and kept to a minimum.

The way you dress also sends unspoken messages to others. If your clothes are shabby and dirty it shows a lack of self-respect, and people will treat you accordingly. Tight skirts and trousers, plunging necklines, and tight, sleeveless tops that emphasize your female attributes are a form of advertising, and may result in unwanted advances. If you are travelling on business it is important to look businesslike and be tidily dressed. Europeans are frequently very well dressed, and if you are to be seen as an equal you need to be well dressed in good, but not overtly expensive clothes. Do not wear jeans.

Laundering clothes when you are constantly on the move is very difficult, and is the most persistent, and annoying problem faced by travellers. Laundromats are hard to find and do not have irons, and hotels charge exorbitant fees for washing and ironing. Dry cleaners are more common and reasonable, and underwear can be washed in hand basins, but shirts are hard to wash properly and travel irons do not do a very good job of getting the creases out. Some synthetic fabrics do not require ironing, but the garments made from them are often unsuitable business attire, and it can be difficult to look presentable, particularly in warm weather.

Finding inexpensive accommodation that is not unsavoury, or in unsafe areas, is also a problem. Some of the guide books such as the Lonely Planet books can be helpful, and your contacts will often arrange accommodation. However I found that the people I visited, particularly in Europe, were inclined

to book me into hotels that were a bit more expensive than I could afford. They were most adamant that I should be accommodated in hotels that were safe, and of a standard befitting my status as a Churchill Fellow and a university lecturer. I found the Europeans attached much more importance to status than either Americans or Australians, and the level of attention I received was directly related to my perceived status.

In Europe, men do not entertain lone female colleagues in the evening or invite them to their homes.

Food is also very expensive in Europe, and it is difficult to find restaurants where one can get an evening meal for a reasonable price. Meat is particularly expensive, and it is better to choose pasta and rice dishes.

It is sometimes suggested that economies should be made on food, however travelling is tiring and can be stressful, and it is important to eat properly. If you do not eat properly you get tired quickly and do not think clearly, and small difficulties become insurmountable. Money spent on food and clean and warm accommodation is money very well spent.

Some women find it intimidating to eat alone in restaurants in the evening. Remember you have as much right to be served as anybody else. Waiters often expect single women to order the cheapest items and not to tip. Ordering a drink, even if it is only a glass of the house wine, sends the message that you are a serious customer and the service is often more friendly. If you are staying in a place for more than one night, and are satisfied with the food and service you receive on the first night, it pays to return to the same restaurant. If you left an appropriate tip the first evening, you will be assured of friendly attentive service.

When you are travelling alone and have heavy luggage taxis are a godsend. I found taxi drivers uniformly polite, pleasant and helpful. It is much better to take a taxi than to try and find your hotel on foot while dragging heavy luggage. It is difficult to avoid heavy luggage, particularly in winter when warm clothes are essential.

I also found it useful to have a quantity of appropriate gifts. Small gifts were appreciated by people who offered assistance, or provided service above expectations. For colleagues, I chose more substantial gifts that were distinctively Australian. Half bottles of good quality red and fortified wines were very popular, as were tee shirts with tasteful designs, and good calendars. I also took some small items of Australian jewelry for female colleagues. A substantial gift is an important sign of appreciation for people who have provided hospitality and information, and it will enhance your reputation and smooth the way for others coming after you.

As a result of my Fellowship I now have many colleagues in Europe and America who I regard as friends.

In a personal sense I have learnt to value my own resourcefulness, persistence, strength and intellect, and I am now less inclined to doubt my own ideas and opinions.

The current economic and social climate makes it difficult to survive and provide for a family, and the successful completion of the Churchill Fellowship has enabled me to reflect on my life in a positive manner.