

DRY STONE WORK

Fellowship Report



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Master Builders Association of Victoria/
ISS Institute Fellowship

Fellowship funded by the
Master Builders Association of Victoria



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INTERNATIONAL SPECIALISED SKILLS
INSTITUTE INC
FELLOWSHIP REPORT
DRY STONE WORK
DAVID LONG

1 ACKNOWLEDGEMENTS

In November 2001 I was the recipient of an International Specialised Skills Institute Inc / Master Builders Association of Victoria Fellowship to undertake a program in dry stone walling.

Skill gaps were identified through my close association with the landscape industry over a period of 30 years. Over this period the opportunity to develop skills and knowledge in dry stone work was not encountered with the possibility of using this capability into a useful skill which could be revived and translated into contemporary landscape works.

A short segment on a news program in 1992 about, Nathan Perkins, a young man who in 1991 returned to Australia after spending 12 months undertaking dry stone walling courses throughout UK and Scotland, sparked my interest in broadening my skills base as a landscaper with this craft. Nathan achieved the distinction of being the only person outside of the UK who had achieved the highest level available – Master Craftsman in Dry Stone Walling. Nathan commenced running weekend short courses in various locations around Victoria in an attempt to revive and lift the profile of dry stone walling which had been in general decline through the second half of the 20th century. I attended a number of the Weekend Workshops to gain essential basic levels of proficiency.

Through attending one of the workshops with a colleague employed at the time for a local government council, Nathan and I were invited to jointly design and construct an entranceway to a local golf course.

The undertaking of this commission provided me with hands-on experience of the skills gap within the landscaping industry and strengthened my resolve to see the scope of dry stone walling adapted into both historical and contemporary contexts.

2. INTRODUCTION

2.1.1 International Specialised Skills Institute

The International Specialised Skills Institute Inc (ISS Institute) fills gaps in industries and enterprises where the means of doing so are not available through government programs or Australian TAFE institutes and universities.

ISS Institute

- Explores opportunities in design and skills (traditional and leading-edge) and identifies knowledge gaps towards establishing a range of collaborative projects with industry, professional associations, firms, education and training institutions and government.
- Identifies experts in diverse areas of design, master level trades and professional occupations in established and emerging industry sectors with the intent to effect their services to visit Victoria to conduct a range of education and training activities such as workshops, lectures and exhibitions.

The way in which this is achieved is by building global partnerships through the Fellowship program, then the fellow sharing what he/she has learnt overseas through education and training activities – one fellowship; many benefits.

ISS Institute's operations are directed towards bringing knowledge and leading-edge technologies to Australian industry, business and education/training institutes, rebuilding specialised skills and knowledge, which are disappearing, or have been lost in order to build the capabilities of industry and business and to maximise opportunities in the global and local marketplace.

The result of their work has been highly effective in the creation of new business enterprises, the development of existing business and the return of lost skills and knowledge to the workforce, thus creating jobs.

Enormous benefits can be gained from working with ISS Institute through their overseas Fellowship program, education and training activities.

Since 1999, the Victorian government, through OTTE, has financially supported ISS Institute, as its major sponsor.

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2.1.2 What is Dry Stone Work?

Dry stone work has its roots in dry stone walling. As discussed under 2.2 – *An Historical & Australian Perspective – Nature & Current Situation*, dry stone construction began thousands of years ago in many parts of the world. To understand dry stone work, it is necessary to understand the technique of placing one stone on another without any bonding material between them, to construct a permanent wall.

In general, a dry stone wall is a wall constructed of, most usually, two building faces of various shapes and sizes of rock that diminished in scale as the wall is constructed. The centre of the wall forms an irregular void, which is carefully packed with small rocks and chips. The wall is laid in an A frame shape using string lines as guides. “Copestones” are laid on the top of the wall to add stability and to tie both sides of the wall together. Other equipment required: a 1.5-2 kg mash walling hammer, spirit level, tape measure or rule, pick, shovel, crowbar, sledge hammer, walling frames or walling pins, safety spectacles and leather gloves (optional). There are variations of a dry stone wall which can be used in different applications according to the requirements of the site and availability of local stone.

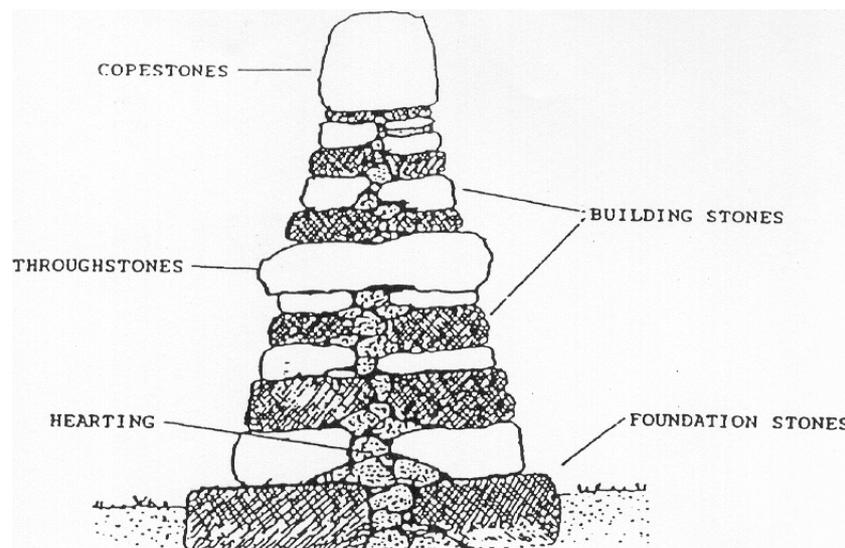


Diagram of standard freestanding wall

Dry stone walling is a skilful craft which in the past has often been handed down within families from generation to generation. Wallers can have their own particular style of wall building, but the basic method of construction is always the same.

Other variations are due to the characteristics and availability of the local stone and the prevailing geographical and geological conditions.

Dry stone walling not only requires expertise in placing stone it also requires considerable expertise in the discipline of construction of the wall.

2.1.3 Dry Stone Work – clarification and classification

When talking about dry stone work; I am offering clarification between standard dry stone walling structure and that of dry stone work, that can be with forethought be commissioned in the urban or rural landscaped setting.

In Section 2.2, I discuss the historical and Australian perspective of dry stone walling. It is important to understand that the stone used in dry stone work whilst it may have been quarried, has not undergone any dressing with saws or abrasive materials.

Stone is collected directly from the land and/or from a quarry and in its raw state is used for the construction of a structure.

The stone requirements, in the landscaped setting when undertaking feature dry stone work are somewhat different to that of the stone requirement of a standard dry stone wall. This is due to the structural requirements along with the very nature of the stone.

In order to build features that would integrate into a landscaped setting (such as the use of archways leading from one area to another or seat construction to serve as a focal point within the garden setting or stairways and steps that could be constructed in a dry stone fashion – that is without the aid of bonding agents) it is necessary to use coursed flat bedded stone.

When attending the Dry Stone Walling Congress in Visp, there were many speakers over the three days presenting papers from all over the world. Probably the most single standout point during almost all of the presentations was the fact that coursed flat bedded stone was the common denominator.

With stone so readily available on a local basis and so easily adaptable to any construction situation it made for all manner of construction from houses to farm sheds to cold storage rooms to conduits into which rainfall could be channelled and terracing on hillsides for agricultural pursuits. It was used in the construction of landscape garden features where structural integrity is so important in free standing structures.

This particular stone and its coursed flat bedded nature will be discussed further into the report; giving an insight as to how the geological differences between stone types and their location and their commercial viability has played a significant role in its inability to raise the profile of dry stone walling/work into the urban psyche.

Here is in Victoria moreover than any other state we have only small deposits of such workable stone. Deposits are found in Central Victoria around Castlemaine and a small limestone quarry near Peshurst (The Grampians).

These quarries are either run by small family concerns or by a single owner/operator. These operations are the complete opposite to the huge rock crushing quarries found in other areas around the State.

I think this situation – locality and commercial viability of these small deposits – has been the reason why dry stone work has not played a leading role in any adaptation into the built environment outside the rural landscape where it was first established for very practical reasons.

Dry stone walling/work has never been seen by the greater populous within the State as any more useful other than dividing and marking out the landscape.

The quarrying of stone to be used in dimensional stone building construction has always been seen as a completely different sphere to that of dry stone walling construction.

The building stonemason has been recognised and highly regarded and is an occupation where there has been an ongoing educational system; set up which has been allied with other forms of building construction ever since civilization became serious about building.

Unfortunately, for dry stone walling it has had very grass root evolution and is not seen on the same grand scale as quarried dimensional stone, specifically cut and fitted into position to construct grand buildings that have impressed the civilized world as different civilizations started to trade and outdo one another.

For the man on the land stone that hindered the working of fields either in cropping or the raising of animals was seen as a labour intensive but at the bottom end of the scale activity that had to be performed as far farm incomes go. And the fact that the stone could be used in constructing strong, long lasting boundaries a bonus.

2.2 An Historical and Australian Perspective – *Nature and Current Situation*

Dry stone walls have been constructed in many parts of the world for thousands of years. The Walls of Jericho, Inca fortresses, prehistoric Bronze and Iron Age farmsteads such as Carn Brae and the Isle of Scilly in Britain - all contain examples of the technique of placing one stone on another without any bonding material between them to construct a permanent wall.

Dry stone walls are also found throughout Europe as well as Asia, America and Africa – in Zimbabwe intricate dry stone walls can be found which are centuries old.

The most prolific period of wall building in Britain dates from the mid-16th century and later, when enclosure of the formerly open common farming land occurred. The development of a major wool textile industry from the mid 1500's saw improvements in stock breeding and management.

Fundamental to this wool boom was the provision of fenced grazing paddocks instead of the old open pastures. As farming became more intensive and extensive, and the landed gentry and farmers became more businesslike, the

peasant farms and commons were progressively replaced by pastoral estates and tenant farmers. The need for clear boundaries in the new system, and the containment of stock, led to wall building on an unprecedented scale into the 17th and 18th centuries, often backed up by Government legislation in the form of the Acts of Enclosure.

By 1850 virtually all the farm walls had been built in Britain and the construction methods developed in the 18th century have remained practically unchanged. Regional styles also developed, based on the nature of the available stone, local environment, the intended use, and local traditions. The type of stone probably had the greatest influence in the visual characteristics of the walls.

It was the Enclosure Movement back in the 17th and 18th centuries that gave Great Britain that direct link to Australia.

This period of the 17th and 18th centuries saw wall building being undertaken in Great Britain on an unprecedented scale. It was a direct result of the Enclosure Movement, which continued until the nineteenth century, and had a dramatic effect on the landscape of Britain. In lowland Britain the hedgerow became the most common method of enclosure, while in the upland areas it was the dry stone wall, built entirely without mortar of any kind.

With the discovery of new lands – America & Australia – migrants took skills of dry stone walling to the newly settled lands. With the same agricultural practices came the same crafts as refined in their land of origin. In Australia, dry stone walling appeared in all parts of the country where European settlement first took root. That is, where there was also a ready source of available local stone.

Victoria has more dry stone walls than any other state in the country and the network of walls in the Western District comprises the greatest group of walls in terms of number, length, height and overall size.

In New South Wales, dry stone walls occur in a few locations, Kyama (where the walls have obtained World Heritage Listing), Bowral and Lennox Heads. In Tasmania, dry stone walls can be found in association with several early settlements, but there are few extensive field walls. A few examples of dry stone walls have been identified in South Australia (Robe – one of Australia's first ports of call for migrating prospectors heading for the goldfields in Victoria); Western Australia (areas around Fremantle – generally constructed from limestone) and Queensland (Bundaberg). Contrary to popular belief, the walls throughout Australia were not built by convicts, but by craftsmen employed by free settlers.

The landscape was given new form and function by the migrants who began arriving about the middle of the 19th century. The early migrants who arrived before the gold rushes were English, Scottish, Irish, Welsh and Cornish who were used to using stone built the walls in Victoria's Western District.

Stone material played a part in determining style; the denser basaltic stone in

generally low, massive walls, and the lighter volcanic enabling narrower walls due to better grip between stones.

Other European migrants who settled in Victoria brought their skills to the goldfields. Whilst the stone and the landscape of their home countries were sometimes different, the waller/stonemason adapted his skills and learnt to effectively use the available stone.

Dry stone construction is found in several other parts of the State - in the goldfields area around Maldon, Castlemaine, Chewton and Walhalla where walls and some buildings were constructed from sandstone. These structures were mainly built by Swiss, Italian and German immigrants and were different in the type of stone and in the style of construction from those built in the Western District. This was because of the difference of local available stone types. The Swiss, Italians and Germans whose dry stone skills had come from the fact that their homeland stone was of a similar nature to the stone where they were settling – coursed flat bedded stone. This work has been identified more around Central Victoria than anywhere else in the State.

Time management of technological advances brought with it increased production requirements and labour costs. This moved the emphasis away from traditional farming practices to more innovative and cheaper avenues for farming practices. Dry stone walling was seen as an expensive form of fencing in the short term and the farm gate returns were tied to this thinking.

Why were dry stone walls constructed in Victoria?

There are a number of possibilities that have been considered – clearing the fields of the over-abundant supply of loose volcanic stone, availability of relatively cheap labour and skilled immigrants, protection from rabbit plagues, and continuation of the traditional use of stones as a fencing material during the 19th century in Britain. It appears that the easier availability of wire and higher wages resulted in a decline in full construction of stone walls after the 1880's.

The Depression effectively brought an end to the wallers craft in the 1930's and by the 1960's (more than 100 years after the first stone walls were built in Western Victoria) dry stone walling was considered a dying art. By the 1960's the generation of wallers who had been constructing walls in the first half of the 20th century had reached retirement age and the relevant skills and expertise had not been taught to the next generation, as technology was changing the landscape forever.

Until the last ten years, dry stone walling in Australia was basically confined to rural Australia where the craft was practiced mainly to construct fences and property boundaries. In more recent times, landscape designers have incorporated dry stone walling techniques into domestic garden designs.

Edna Walling, for instance, possibly Australia's greatest landscape designer, dominated gardening in Australia for nearly half a century. She incorporated

dry stone walling in some of her garden designs. Her designs became increasingly popular with the broader general public in the 1930's-1950.

Edna Walling was born in Yorkshire in 1895 and at the age of 19 her family had settled in Australia and embraced the Australian way of life so wholeheartedly that she never returned to her native homeland. Childhood memories of walks across the moors remained with her throughout the years. She spent two years at Burnley Horticultural College and was in the first tide of women undertaking a line of study not previously open to females – her mother had convinced the Principal of the College that Edna was “artistic”, yet Edna and her mother had not discussed the possibility of Edna undertaking landscape design.

On leaving Burnley, Edna found herself earning a living “doing people’s gardens”. This uninspiring work continued and Walling’s antipathy for gardens grew deeper and deeper until the pivotal day she came upon a stone wall supporting a semi-circular terrace at “Kildrummie”, Holbrook, NSW. The stone wall was Edna’s first major country design in New South Wales commissioned by the Carnegie family. She said that “from then on, gardens for me became a chance to carry out the architectural designs in my head”.

This was the single most influential point in a career that would make her a household name. By 1927 she was being hailed in the popular press of the day as “Melbourne’s famous landscape gardener” and “a genius at her job”.

Edna had been greatly influenced earlier in her formative years of the English garden design movement, in particular, Gertrude Jekyll, and Inigo Triggs.

Edna Walling died in 1973, but her ideas live on through her writings and her gardens. Her magic was an ability to create gardens not as status symbols, but as enticing places of rest for body and mind.

Edna was the first person from urban beginnings to realise the value of stone structures when constructed into architectural garden designs and could do what the man on the land had been using them for since Australia had its first dry stone wallers but in a much more sophisticated manner – the creation of space within an even bigger space.

Victoria’s Western District is one of the world’s great basalt plains. The plains are dotted with dormant and extinct volcanoes, which have poured out the stones, which then covered the plains. These are igneous rocks – regarded as the source of all other rocks – being the products of molten magma from deep in the earth’s crust. Some have cooled slowly at depth and have then been uplifted and exposed by erosion either very locally or over larger areas. Others cooled quickly when erupted from volcanoes. The slower the cooling, the larger the individual crystals. These are very visible in granite or gabbro but very small in basalt.

There are no bedding planes in igneous rocks and many of them are either too hard to be easily dressed with a hammer, or brittle and splintery.

Therefore, they tend to provide irregular lumps that are not suitable for regularly coursed walls.



The rabbit wall started at Lake Corangamite and ran through to Lake Purrumbete, Western District, Victoria

Sometimes natural planes of weakness, joints, occur in igneous rocks having developed originally with contraction on cooling: basalt and dolerite develop jointing into roughly hexagonal columns. Granite has more massive vertical and horizontal joints. Exposed rock is vulnerable to physical and chemical weathering so these joints open up and are then exploited in quarries.

The stones of Central Victoria are metamorphic rocks which were formed when sedimentary rocks (sandstones, shales, limestones {around certain parts of The Grampians and back towards Peshurst}) and occasionally igneous rocks) have been subjected to high temperature and pressure. They have recrystallised to change their texture. Roughly, sandstone has become quartzite or schist; mudstone has become slate and limestone becomes true marble. Australia imports marble from Italy for the construction industry.



A coursed wall using Castlemaine sandstone, Chewton, Victoria

The pressure has caused most metamorphic rocks to develop new planes of parting, sometimes at an angle to the original bedding surfaces, which are usually fused solid and not recognisable. These “cleavage planes” can be highly useful to wallers because the rock can be split as along bedding planes. This is particularly prevalent in works being carried out in parts of Britain and Kentucky, USA.



Quarried stone with cleavage planes, Kentucky, USA

The very nature of the stone available in the Western District of Victoria compared with the stone available in Central Victoria are completely different in their geological formation and therefore the ways in which the stone could be used in constructing garden feature work.

There are many other stone quarries that are in production such as Hillview Quarry on the Mornington Peninsula which quarries a granite rock. These quarries break out rock by blasting the stone in an open cut mining operation. This rock is put through a massive rock crushing machine so that it can be graded and used in the general construction industry – mainly by way of road-making and concrete industry which is the quarries major source of revenue/income. By agreement, the quarries will allow selective appropriation. I classify this stone in the same category as basalt field boulders, as the way the stone has been mined and by its very nature leaves no planes in its geological structure that can be utilised as with flat bedded stone from around the Castlemaine region.

The stone used in large regions around Western Victoria is of a volcanic formation, which was expediently and economically gathered and built into fence and property surrounds so that paddocks/fields could be grazed without any hindrance to stock. The volcanic rocks are suitable for wall construction only and they are not open to application outside of dry stone walls and an occasional variation such as tank stands.

In other areas such as Central Victoria, local stone is a sedimentary stone, which has been quarried and because of the nature of the stone can be laid in courses not too dissimilar to standard bricklaying. This makes the stone more adaptable to use in a variety of features, which can be relevant to landscape garden design.

With the use of alternative fencing methods in recent times, the coming of technology and rapid suburbanization of rural regions and the changing landscapes; the demand for stone construction decreased until there were only a few craftsmen surviving and dry stone walling almost died out.

The craft of dry stone walling is a very labour intensive operation and requires a degree of knowledge of stone and its uses and constraints.

The scope to which dry stone walling can be implemented has not been recognised much beyond the districts where dry stone walls originated. This is because:

- The construction of dry stone walls is slow and backbreaking work in comparison to the ease with which post and wire fencing can be built.
- Whilst the walls can far outlast almost any other construction, the cost of constructing a dry stone wall far outweighs the cost of a timber and wire fence. The time factor plays a big role to property owners in the collection of stone on their properties is limited. To pay someone to collect stone is expensive. It is still cheaper to look at new alternative fencing technology.
- Even in the urban setting, possibly for landscape garden features, it is due to the extractive nature of sedimentary stone that costs are greatly distorted by the time construction has taken place in sites far removed from the stone's origin.

Even with the advent of modern technology in fencing materials (timber and wire), no other materials match the longevity of dry stone walls.

Australia's tyranny of distance still plays a role in the costs of transportation and construction of dry stone work as compared with local stone availability in the countries I visited during my Fellowship.

Quarrying of stone within Central Victoria is also becoming an increasing concern to the extent that small quarries, which supply stone for building construction, are being slowly shut down as proprietors retire from the industry. The licensing system in recent times has had a dramatic impact on the supply of materials. The guidelines set down by both the Department of Mines and the Department of Natural Resources & Environment has greatly impacted on the owners' abilities to extract stone from their existing claims.

The impetus for this has come about through a push to protect the remnants of box-ironbark forests which take in a large biodiversity of threatened flora

and fauna and which stretch from Wodonga on the New South Wales/Victoria border through as far west as Stawell. This takes in Central Victoria's small stone extractive industry.

A couple of interest groups have been formed in Central Victoria since the turning of the State Forest into a National Park. In March 2001, the Bush Users Group for the Mt Alexander Region was established in March 2001 to represent the wider community interests in the State Forests and other associated public land. One of BUG's aims has been to preserve the historic and existing rights of recreational and commercial users of the bushlands in the Mt Alexander region.

Two years ago the Construction Material Processors Association (CMPA) was formed by a group of concerned small quarry owners. The current Chairman is Mr Ron Kerr, owner of a small scoria/gravel quarry in Beveridge. The Association is deeply concerned that with the Environment Conservation Council's attitude regarding "the need for continued rationalisation of small extraction operations to reduce the level of disturbance; decisions on quarry siting and operating standards". CMPA believes that operators existing within areas that have now become National Parks will face difficulties in that they will not be able to expand their operations, or maintain their current licence status, due to the sensitive land use issue and, over time, will be slowly forced out of business. CMPA is also concerned that the opening of new extractive industry operations on freehold land abutting the National Parks are inevitable.

The two main quarries extracting sedimentary stone which can be readily used in dry stone feature work take up .07% of the total area within this newly created National Park. The quarries supply the Melbourne market and are the only two quarries in Victoria with this particular stone type.

If these quarries are forced to close over time because of the licensing system stone would need to be imported from other States and overseas to take up the market share understanding that the colour and texture of the stone are not available and would be lost for future use. Both these quarries have been managed and run by the same families since the original licences were granted – over 50 years.

The dying craft and the scattered nature of stone work in Australia means that any practitioners work in isolation and have no established networks to lobby the relevant Government Departments under which the quarrying of stone takes place in some districts.

Added to this is the cost structure of their product onto the retail market. It must be understood that stone from these quarries is more often sold on a surface square metre rate and not on a cubic metre rate – therefore adding to costs.

It is only in recent years that dry stone walls and their derivations have been constructed for functional and decorative purposes as part of public and domestic landscaping. As municipalities reach a higher standard of

infrastructure funds have been invested into public artworks and features combining local contemporary and historical themes. The rare private individual will undertake a commission of varying scale depending on the funds they have available for such feature work.

Edna Walling's early use of dry stone walling techniques in landscape design could be expanded considerably to using sedimentary stone in a variety of applications such as pathways, seating, level changes, terracing and commissions such as those described below.

Examples of public works are listed below.



The City of Broadmeadows has constructed an impressive stone entrance to the Broadmeadows Valley Park, Broadmeadows, Victoria



The Corangamite Arts Council, with funding from the Victorian Arts Council, constructed an entranceway to the township of Terang, Victoria



Construction of the entranceway to township of Terang – using volcanic stone



The Environmental Sculpture Park, located on Herring Island (Yarra River, South Yarra, Melbourne), has constructed sedimentary stone features using the principles of dry stone walling. The stone used was from Taradale, Victoria. Sculpture was designed by artist Ellen José (above)

Private Commission – Mornington Peninsula.

I have been undertaking a private commission on the Mornington Peninsula (see photo below) for the past 3 years. My commission was to undertake landscape design works, which will incorporate various walls – all of which are on a grand scale.



There are some contractors who are acknowledging the marketplace, and by building their version of dry stone walls, without sound basic training are placing pressure on an already fragile industry.

In the same field there are migrants who have come from UK bringing with them their skills and expertise. An occasional tourist with a working visa comes to Australia and undertakes small commissions in his travels.

There is a danger of dry stone walling falling into disrepute because of the lack of training programs being available. Small courses can be undertaken in basic dry stone walling but none within the mainstream education system.

Currently, stone work techniques and practices are limited to the following:

- Landscaping education through TAFE colleges touch on the topic of paving using natural stone along with manufactured products.
- Education in the Building Industry, through the TAFE system, does provide for a stonemason course in dimensional stone as found in architecturally designed buildings.
- Stonemasons, through the TAFE system, learn of all facets of stone construction. Dry stone walling is not seen as part of this curriculum.

To revive and translate the craft of dry stone work into contemporary landscape culture requires the techniques and the possibilities being explored in a variety of disciplines, in particular Landscape & Horticultural practices within the TAFE system. Courses could also be established to incorporate different layers within the building industry, - engineers, urban designers, landscape architects, and architects.

2.3 Organisations that impact on the Industry

Department of Natural Resources & Environment
Department of Mines
Local statutory bodies (local municipalities who have identified an interest in heritage and recreational value)
Parks Victoria
Quarries – for stone availability
Royal Australian Institute of Architects
Landscape Industry Association
Heritage Victoria
National Trust
International Council on Monuments & Sites
Australian Institute for the Conservation of Cultural Material Inc
Historical Societies

Education –
One day short Courses carried out on weekends are undertaken through Food and Land Resources Department, Melbourne University at Glenormiston College (there are no more than six per annum).

2.4 Aim of the Fellowship

This International Specialised Skills Institute (ISS Inc) Fellowship was sponsored by the Master Builders Association of Victoria.

The aim of the Fellowship was to undertake a study tour on various aspects of dry stone walling, in particular: Design; Construction techniques; Different types of stone, and their selection applied in, new construction of walls in both commercial and domestic environments and restoration of historical works in Switzerland, Great Britain and USA.

2.5 The Skills Gap

In 1990, following some 20 years of working in Landscape Gardening I decided that to benefit my professional and personal development I would search for an aspect of landscape gardening in which to specialise. I decided to follow a line of stonework that I discovered had almost ceased to be practiced in Australia. In fact, in the early 1990's I found there were almost no practitioners in Australia. After a considerable search, I discovered two Victorian practitioners:

Nathan Perkins: a young man who in 1991 returned to Australia after spending 12 months undertaking dry stone walling courses throughout UK and Scotland. Nathan achieved the distinction of being the only person outside of the UK who had achieved the highest level available – Master Craftsman in Dry Stone Walling. Nathan was the recipient of a scholarship from The Queen Elizabeth II Silver Jubilee Trust for Young Australians.

Following his return to Australia, Nathan commenced running weekend short courses in various locations around Victoria. Over several weekends

throughout 1992 I travelled around Victoria learning and studying alongside Nathan Perkins and other participants of his courses. This afforded me the opportunities to not only work in different locations but also with different types of stone.

Unfortunately, Nathan no longer conducts these courses and has left the industry.

Bill Harlock: an elderly gentleman in the Western District of Victoria who had learnt the craft from his father.

Prior to his death in 1999 I spent several months with Bill Harlock who became a valuable contact and a good friend.

It was Bill who later recommended me to Ruth Pollard (Glenormiston College) where I took over his part in handing on skills in a teaching capacity following Bill's ongoing poor health.

There are no formal courses available in Australia in this craft. However, since I have gained valuable experience and understanding in the craft I have been conducting, through University of Melbourne at Glenormiston College in Noorat (Western District), a series of practical day courses in dry stone walling construction. The courses have been conducted alongside Ruth Pollard, a former College Tutor who was also (for a long period of time) in charge of the maintenance program for the College gardens. The courses have attracted people from different walks of life around Victoria and have been very well attended.

Dry stone walling not only requires expertise in placing stone it also requires considerable expertise in the construction of the wall. I have been unable to locate experts in the engineering field who are able to assist in the specifications on constructions of walls above 1-2 metres in height.

I am currently working on a dry stone walling project on the Mornington Peninsula. One aspect of the project has been the construction of a dry stone wall to a height of over 4 metres.



To enable construction of the wall I was forced to seek the assistance of a report emanating from Scotland. In fact, initially I had to seek the support of a master craftsman and his team from Scotland.

The above truly highlights the skills gap and knowledge in Australia.

3.0 THE FELLOWSHIP PROGRAM

3.1 Introduction

The nature of the Fellowship program was to attend a Dry Stone Congress in Visp, Switzerland.

Following the Congress I traveled to Great Britain to meet and discuss various aspects of dry stone work with members of the Dry Stone Walling Association of Great Britain. To undertake this I traveled to the Isle of Skye in Scotland to the Cotswold District in UK. From my past association with Nathan Perkins and my experiences with the private commission I am undertaking, it was obvious that the Dry Stone Walling Association of Great Britain were demonstrating best practice in this area.

Through my contact with the Dry Stone Walling Association of Great Britain I met Neil Rippingale, a Scot who assisted me initially in the construction of early works on the private commission on the Mornington Peninsula. Neil came to Australia for a period of 2 months to provide me with expert knowledge. Following his return to Scotland Neil and I conducted regular correspondence. I subsequently discovered that Neil had traveled to Lexington, Kentucky to work with the Dry Stone Conservancy in USA. The Conservancy mainly undertakes heritage projects throughout eastern States – an increasing task.

The work in Lexington is a large project in progress. To increase my knowledge of dry stone work I took the opportunity of visiting the Dry Stone Conservancy in Lexington, meet with Neil and members of the Conservancy to see how the dry stone walling industry in America practices.

An important aspect of my attendance at the Congress in Visp was the discovery that members of the Dry Stone Walling Association of Great Britain had provided a focus for skills gaps in Switzerland in the agricultural/horticultural/viticultural industry.



Report Author (left) with representatives from 6 countries, during an excursion, 8th International Dry Stone Congress, Visp, Switzerland

3.2 Host Organisations and Industry/Education Visits

8th International Drystone Walling Congress 2002 – Visp, Switzerland
Thursday 29 – Saturday 31 August 2002

Main Subject: Drystone Walls in Alpine Regions.

This was chosen as the main subject for the Congress because drystone walls are encountered mainly in mountainous regions. 2002 was also the International Year of the Mountains as proclaimed by the UN.

The goals of the Congress were to:

- Further awareness for drystone constructions as landscape elements and as ecologically valuable habitats.
- Spreading and exchanging knowledge about correct building and maintenance.
- Presenting research projects in the field of drystone constructions.

The participants of the Congress were:

- All persons interested in drystone construction.
- Members of nature conservancy and environmental organisations, specialists for footpath and trail construction, area planning and tourism, council representatives, civil servants and further individuals interested in the conservation of nature, heritage and countryside.
- Specialists and researchers for building, monument conservation, architecture, garden and landscape planning, agriculture and silviculture, anthropology, history, geography, biology.

More than 50 speakers from Algeria, Australia, Cyprus, France, Great Britain, Italy, Slovenia, Spain, Switzerland and the USA presented various aspects of drystone construction and heritage.

The Congress takes place every two years in a European country, with different bodies having been responsible for the organisation up to now. Previous congresses have been held in Greece, Italy, France and Spain, however also having attracted participants from Mediterranean countries, the Near East, Great Britain and the USA and now Australia.

The Congress brought home to me the depth and breadth that dry stone walling has had on civilization. Throughout Europe in every country there are examples of dry stone walling used in agricultural/horticultural practices. These have been kept in tact through the generations as it has been seen to be the best way to naturally care for the surrounding landscape and control soil erosion so that agricultural practices can be continued.

The Congress was an important opportunity for me to meet and talk with people interested in dry stone construction from other countries. Particularly valuable to the Congress were the two guided excursions to notable drystone constructions in Valais.

The Avalanche Protection on Alp Faldum

The Lotschberg-Simplon railway is protected against avalanches with over 30,000m³ drystone walls – an imposing example of the former importance of drystone construction in the mountains.

The avalanche-register of Lotschental indicates 73 known locations. The inhabitants say: “There are only two avalanches in the valley, the one on the right side and the one on the left side!”.

The most impressive avalanche protection system is above the Alp of Faldum. This was built in order to protect the railway station of Goppenstein, including the tracks of the Lotschberg-Simplon line (one of the few railway lines traversing the Alps in Europe).

The work above Alp Faldum commenced after an avalanche interrupted the railway in 1908, also killing 12 people.

From 1908 until well into the 1950's, about 47,000 m³ drystone walls were built. The work was done without mechanical assistance. As the local material (finely layered gneiss) was of middling quality the stone for building had to be transported over appreciable distances in the very steep terrain. Since the 1930's the stone was brought from appropriate quarries above. Scaffolding wasn't used. The area wasn't reachable by road until 1958, well after the completion of the work.

The work was done in 4 stages, during which weaknesses and defects of the preceding work were also repaired.

Stage 1: 1908-1918

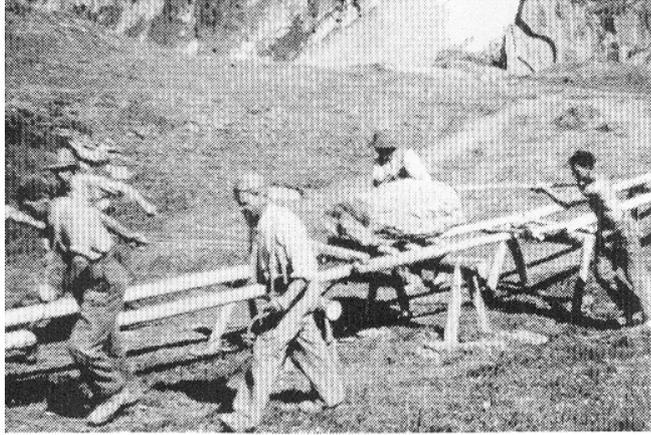
Stage 2: 1919-1924

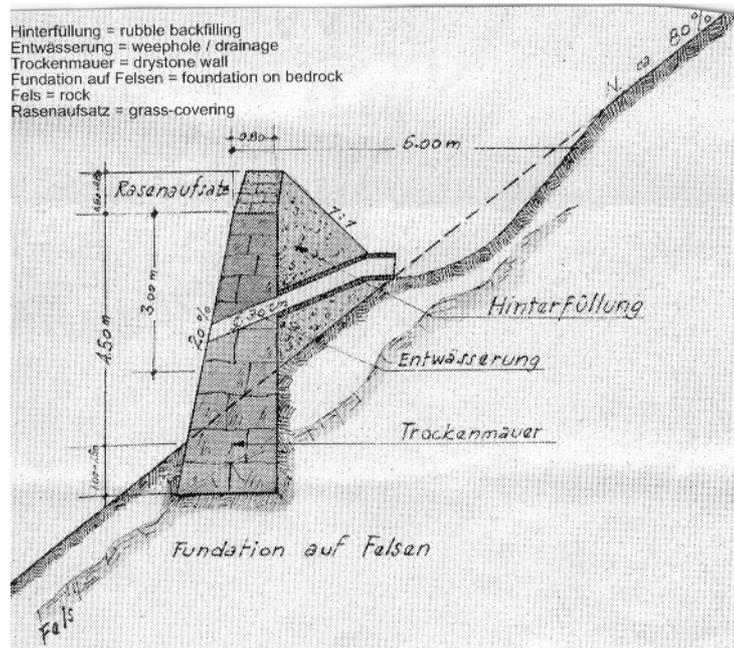
Stage 3: 1928-1934

Stage 4: 1938-1957

The drystone terraces are vital to the present day for preventing avalanches from descending onto the railway line. Because of the long period of construction, several building styles were distinguished. The over 100 terraced retaining walls built in extremely steep terrain without machinery present an impressive example of the former importance and magnitude of drystone construction in the mountains.

After this, the era of the avalanche protection walls built in drystone ended.





Zeneggen's cultivated landscape

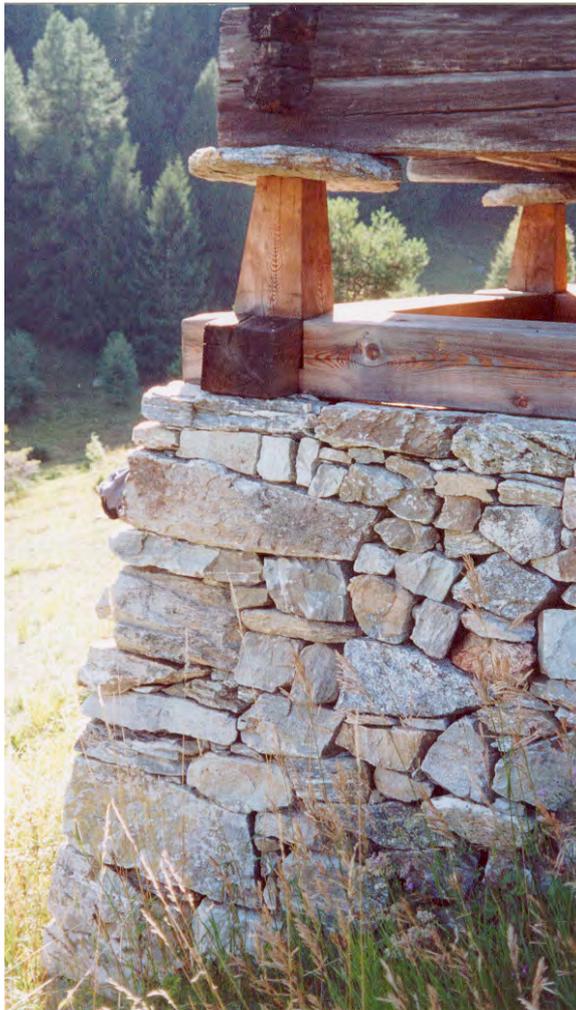
The village of Zeneggen lies above the town of Visp in the canton of Valais, at an altitude of 1400 metres. It is very sunny and with little precipitation. Agriculture in the fields and pastures, many of which are terraced with drystone walls, has always required irrigation.

The water is supplied from distant streams and wells via a 12km long system of irrigation-canals called "Suonen". Some of these canals are constructed in drystone work (walls and paving), others consist of hollowed-out tree trunks. The combination of extensive farming, drystone work and canals result in an eco-system which allows many threatened animal and plant species to survive.

The labour-intensive maintenance of the canals and walls and also the no longer economical extensive farming mean that the preservation of Zeneggen's cultivated landscape is increasingly threatened. The Fonds Landscap Schweiz, a fund which is concerned with the preservation, maintenance, and reconstruction of these cultivated landscapes well adapted

to the natural environment, has participated in a project since 1999. Some of the costs are also borne by the Swiss Confederation, the Canton of Valais and the community of Zenegeen.

Part of this project is the reconstruction of drystone walls and since 1999 specialists and people undertaken civil-service duty have repaved footpaths, rebuilt path-retaining walls and renovated the foundation wall of an historic grain-store.



**GREAT BRITAIN:
2 September – 8 September, 2002**

I undertook a number of site visits as outlined below to see how dry stone walling could be used in various applications and to gain further understanding of the history of dry stone walling.

Cradle to grave generational growth of civilizations has shown that stone work in both dimensional and dry stone construction has been a large part of human existence. European settlement has only come in the last couple of hundred years to countries such as Australia and USA – Britain has such a vast array of stone work in many different variations of stone and usage because of its human history.

Isle of Skye

Through my association with Neil Rippingale of Edinburgh, I contacted Seamus Campbell, a Master Craftsman of the Dry Stone Walling Association of Great Britain. Seamus lives on the Isle of Skye and undertakes commissions throughout his district.

The souterrain was constructed of dry stone walls and stone lintels tie the two outer walls together to create the underground passage. Although its original use is not documented, it was thought to have been a possible storage area for grain, etc. and/or as a shelter in times of danger.



A souterrain – an underground chamber/passageway that is approximately 2,000 years old

Historical “black house” – which is an early Scottish residence constructed entirely by dry stone walling techniques to withstand gale force winds that have had an impact both on the way people lived and the natural landscape. Some parts of the Isle are quite barren and windswept.



Black house, Isle of Syke

Boat ramp – A different type of application of dry stone walling in that techniques were used to construct foundations for the boat ramp. This was particularly interesting due to the fact that the technique was applied in an area where there was wave and water action.

Lindley Park – is a private residence where Seamus has undertaken some construction work over a period of time in areas identified as requiring much needed attention. In particular, a dry stone retaining wall with steps by a brook because over time water erosion had impacted on this area a dry stone retaining wall was undertaken to reclaim the area so that an entranceway could be constructed. Seamus has also constructed a small retaining wall from local stone to contain a vegetable garden.



Maintenance Steps built into wall face

We also visited an entranceway to a private residence where Seamus had constructed a Front boundary fence and entranceway – of particular interest was the circular pillar construction each side of the entranceway. It is unusual to find circular rock constructions and showed yet another application for the craft.



Random stone wall, Isle of Skye

Lucarty (outside Edinburgh)

Again, through my association with Neil Rippingale, I contacted Ian Dewar, Foundation member (but now retired) of Dry Stone Walling Association of Great Britain. I was particularly keen to discuss historical aspects of walling and of the founding of the Association with Ian.

The re-birth of dry stone walling in English speaking countries has been led by the Dry Stone Walling Association of Great Britain. Its influence has spawned regeneration in interest and education of the craft in all of the countries I visited.

In discussions with Ian Dewar (Foundation member, now retired, of Dry Stone Walling Association of Great Britain) a Committee known as the Stewart Brae of Coobree had been operating for many years. Its sole function was basically to train interested people in dyking. The Committee held a national competition of dry stone walling every 2 years for dykers from Scotland and northern England however the number of profession dykers began to become fewer and fewer.

In 1968 an organisation known as the Training Agricultural Board was formed. Its purpose was to preserve and enhance the skills required in agricultural and horticultural industries, particularly the use of apprentices and industry management techniques.

Members of the Stewart Brae of Coobree Committee and the Training Industry Board met and discussed the commencement of training of existing confident dykers to instruct apprentices in the craft.

This subsequently led to the establishment of the Dry Stone Association of Great Britain – a unique Association in that it contained both professional and amateur dykers. Over the years the Association has evolved into the branch system. The Association also began to develop competitions which then led to a national competition and moved into the Master Craftsman Scheme which incorporates graded walling qualifications. The Association currently has approximately 1,200 members.

The establishment of the Association and the Scheme has led to a revival of the craft throughout Great Britain. With increasing numbers of competent wallers/dykers their expertise has been sought by countries like Switzerland and Kentucky, USA.

Part of my discussions with Ian embraced the visions and/or directions of dry stone walling in the UK. He pointed out a project that had been undertaken at an entranceway to the Broxton Business Park – close to his home – where a landscape dry stone waller has created an entranceway using dry stone walling techniques. A visit to the site revealed an artistic, but practical way of using dry stone walling techniques in an urban landscape.

Ian's overview is that like Australia, Britons are becoming increasingly interested in gardening and the structures that can be created with the use of stone.

Of particular interest in the photo below is the way in which the stone has been laid to create an artistic value.



Broxton Business Park entrance, Lucarty, Scotland

Buchlyvie (between Edinburgh and Glasgow)

I met Irwin Campbell, Master Craftsman, Dry Stone Walling Association of Great Britain at the Congress in Visp and he extended an invitation to me to visit him and view some of his completed projects and historical sites.

"Ithane", Private residence, Balfron. Irwin constructed a front boundary fence and gateway pillars using local stone. The construction material was to match slate roof tiles of the residence.



Private residence, Balfron, Scotland

Torwood is the historical site of a "broch" or dry stone fort which is approximately 2,000 years old. Torwood was built by the Picts and paid for by the Romans. The brochs were used as observation posts by the Romans to keep a look out from attacks by marauding barbarians from the north. The brochs were constructed five miles apart and stretched from Grangemouth on the west coast to Clyde on the east coast – one of the narrowest points in Great Britain.



Ancient Broch, Torwood, Scotland

When Irwin was President of the local branch of the DSWA of GB the branch undertook the construction of a public seat at the Falkirk Wheel Project using dry stone walling techniques. This also highlights another avenue for the technique.

This seat is constructed from sedimentary sandstones. The seat construction highlights that if this type of project was constructed in Australia it would need to encompass using stone from either Central Victoria or Sydney sandstone or stone from South Australia sedimentary deposits. In the Australian context, cartage becomes a major consideration in the costing of the commission.



Public seat, Falkirk Wheel Project, Falkirk, Scotland

At a private residence in a small local town, Fintry, Irwin has constructed an unusual landscape garden feature of a pyramid again using sedimentary sandstone. Of particular interest is the water from an underground spring which passes through the feature and disappears back into the ground. The flow rates of the water vary according to the amount of rainfall. Again it was particularly interesting to consider another application of the use of dry stone walling technique. This type of feature, if constructed in Australia would require a softer type of sedimentary stone such as found in Sydney sandstone.



Water Feature, private residence, Fintry, Scotland

Thornhill & The Dumfries

Neil Ripplingale and Paul Weberly suggested I visit Hugh Drysdale, Master Craftsman, Dry Stone Walling Association of Great Britain. Hugh is also one of the best dry stone wallers in Scotland.

Hugh was commissioned to construct the dry stone wall entrance and various feature focal points through “Marchfields” a partly completed modern residential development. Again, the stone used in this development was sedimentary sandstone type. This project has again enabled the use of dry stone walling to be constructed in an urban environment and used to great effect as a marketing/selling tool for the developers.

Poortrac House is a private residence in the lowlands of southern Scotland. The estate is approximately 25 acres and features contemporary gardens. The work of Charles Jencks, one of the leading advocates of post-modern architecture and his late wife, garden designer and historian, Maggie Keswick. It is a place of lakes, steep folding and spiralling hills, precipitous changes in elevation, serpentine dry stone walls, and wave-patterned gates and fences. – free standing dry stone walls and retaining walls; used as landscape garden features. Hugh, under direction from Jencks undertook constructions of various concepts which he envisaged in the layout of Jencks “garden of cosmic speculation”.



Feature wall, Poortrac House, The Dumfries, Scotland

Slaithwate, Derbyshire

Before leaving Australia I contacted Paul Weberly, Chairman, Dry Stone Walling Association of Great Britain. Paul invited me to visit him for discussions and site visits.

We visited a local private residence where Paul had been involved in the construction of various landscape features using dry stone walling techniques using sedimentary sandstone which as shown in the photograph has an

enduring ability to merge with the landscape as mosses can readily grow on the slowly decomposing stone.



Vegetable garden retaining wall, private residence, Slaithwaite, Derbyshire, UK

Skilton – we visited a project undertaken by the local branch of the Dry Stone Walling Association encompassing the various features that have been used in wall construction for agricultural reasons – letting water flow through a wall, letting sheep pass through a wall, letting people climb over a wall. The walls are all constructed from local stone collected from within the district.



DSWA local branch project, Skilton, UK

Paul and I took the opportunity of viewing “The Millennium Wall”. Paul, in his capacity as Chairman of the Association had been very involved in the administration and construction of the Wall. It was constructed in the year 2000 built in small sections of standard height dry stone walls using local stone from all the different branches of the Dry Stone Walling Association across Great Britain. The wall was constructed over a weekend by members of every branch of the Association throughout Britain.



Memorial plaque in The Millennium Wall



A section of wall using local stone from one of the districts that is covered by the DSWA of Great Britain



A section of wall using local stone in a different format from one of the districts that is covered by the DSWA of Great Britain

The Cotswolds

The Cotswolds are a well known area of dry stone walling construction in Britain.

I travelled to The Cotswolds following my meeting with Jacqui Simkins, Secretary, Dry Stone Walling Association of Great Britain at The Millennium Wall.

Jacqui and I viewed various sites through The Cotswolds. The walls in this part of the country are largely constructed using local limestone. In the time available I tried to visit limestone quarries which unfortunately were closed.



Private residence, The Cotswolds, UK



Private Estate, The Cotswolds, UK



Wall end, free standing wall, The Cotswolds, UK

USA:

9 September – 14 September, 2002

Paris Turnpike, Lexington, Kentucky

Grey rock fences built of ancient limestone are hallmarks of Kentucky's Bluegrass landscape. The earliest settlers in Kentucky built dry stone fences around farms, cemeteries and mills. Fence building increased dramatically during the 19th century so that by the 1880's dry stone walls lined most roads and fields and farmyards throughout the Bluegrass. Farmers also built or commissioned dry stone walls in New England, the Nashville Basin, and the Texas hill country, but the Bluegrass may have had the most extensive collection of quarried dry stone walls in North America.

Hence my interest in visiting to establish the extent to which dry stone walling which followed Irish and Scottish models has been re-established in Kentucky. I visited works in progress at two key sites located on the outskirts of Lexington, Kentucky.

The restoration of original styles of dry stone walling which has been undertaken when the area had originally been established under European settlement.

Great care and research was undertaken by the Dry Stone Conservancy lead by Carolyn Murray-Wooley and Karl Raitz. Both are members of the Board of Directors for the Conservancy. To enact the construction the Dry Stone Walling Association of Great Britain was contacted and numerous master craftsmen were screened for their adaptability to work with local masons and train workers in the craft of dry stone walling. The person who best fitted the bill was in fact my previous acquaintance/friend, Neil Rippingale from Edinburgh. Apart from being a Master Craftsman of the Dry Stone Walling Association of Great Britain, Neil is the recipient of the Association's highest award bestowed – "The Pinnacle Award" presented to him by HRH Princess Anne.

It was through this contact that I had the ability to travel to Kentucky to view the works in progress.

Both Leatherwood and Elmendorf Farms which are located on the outskirts of Lexington are within approximately a 5 minute drive between each project. The stone being used at both projects is a limestone of metamorphic origin. It has the ability to be cleaved apart using hammers more adapted for these local conditions.

The photographs below give a comparison between the two sites under construction which were visited in Lexington.



Elmendorf site – Bourbon Quarry Stone



Leatherwood site – Mercer Quarry Stone

In the photos you can see that the Elmendorf site stone came from the Bourbon Quarry which was of a much chunkier dimension as compared the stone for Leatherwood where the stone was of a finer coursed material.



Mercer Quarry, note thinner coursed stone



Bourbon Quarry, note thicker coursed stone

Neil Ripplingale and I visited the private residence and property of Dr Berle Clay, Director, Dry Stone Conservancy, just outside Paris, Kentucky (an hour's drive from Lexington) where we inspected an historical quarry site and dimension dry stone walling used in the construction of a well.



Dry stone constructed well at Dr Berle's property just outside Paris, Kentucky



Stone quarry where stone was sourced for construction of fences on Dr Berle's property such as the well above

Whilst in Lexington I had discussions with Carolyn and Jane Murray-Wooley, Directors, of Dry Stone Conservancy based in Lexington, Kentucky. Discussions were based around the establishment and history of, and work carried out by, the Conservancy.

During my discussions with Jane, I was provided with a copy of Paper No. 356 – Retaining Wall for Hill Roads by Dr A S Arya and V P Gupta from the Journal of the Indian Roads Congress, Volume 44-1 November 1983. On my return to Victoria, my employer and I have enlisted a civil engineering company to assist us to conduct an experiment based on the information gained from Fellowship travels. The experiment will test the application contained in the paper in an effort to possibly establish the standard for future development of dry stone retaining walls in Australia.

I also met with Dr Karl Raitz, Professor of Geography, University of Kentucky, Lexington and a member of the Board of Directors of Dry Stone Conservancy. Dr Raitz is an authority on rock fences, their history and construction in the Kentucky Bluegrass district.

4. RECOMMENDATIONS

4.1 The opportunity

It is only in recent times that dry stone construction in Australia has moved from its rural confines where the craft was practiced to construct fences and property boundaries. The few landscape designers who have incorporated dry stone walling techniques into domestic designs have been restricted to walling and changes of level – both retaining and freestanding wall construction.

Edna Walling foresaw the value of stone construction in her garden design criteria. If we are to build on dry stone work originating from her designs, the craft will have to be lifted from its recent declining history and into a variety of usages for the built environment that encompasses the aesthetic value of stone in our lives today and be open to be incorporated into an already established educational curriculum.

Gardens were once the domain of the wealthy, but with the increasing popularity of gardening and lifestyle television shows (free to air and paid); magazines, newspapers, articles, etc. peoples' interest/imagination has been heightened.

As such, it is the ideal opportunity for a revival and expansion of the craft. By doing so, techniques could be applied not only to residential gardening/landscaping works, but also in the construction of functional and decorative projects as part of public and domestic landscaping and in general to the built environment.



Malvern Valley Golf Course, East Malvern

There are many opportunities for a range of dry stone work constructions i.e. features in atriums in buildings; art pieces in public spaces ; corporate team building exercises; public exhibitions showcasing both heritage and contemporary work; entranceways to business parks.

From an environmental viewpoint, dry stone walls can be used to create focal points, to provide shade and shelter to an exposed area or as a retaining wall.

Walls provide a splendid habitat to many species of small birds and animals, insects and plants; and because the materials used are natural, the walls blend harmoniously into the landscape.

Dry stone walls are sustainable in that they are fireproof, and with a little regular attention will outlast any form of fencing.

4.2 The Problem

The dry stone walling industry today is virtually non-existent, other than for a very limited number of practitioners who have a comprehensive understanding of the craft.

There is a danger of dry stone walling falling into disrepute because of the lack of training programs available other than small courses undertaken in basic dry stone walling outside the mainstream education system.

However, by lifting the profile of dry stone work, I have two concerns:

- a. The demand may well outstrip supply of available qualified labour, which could have a detrimental flow on effect, in the sense that work could be undertaken with little understanding of what is entailed in the proper construction of any dry stone work.

Unless there is an increase in the number of qualified practitioners in the marketplace to carry out works, the situation will continue to cast a shadow over the industry.

- b. The rapid suburbanization of rural regions and policies generated by government departments could mean the closure of small quarries thus decreasing the amount of available stone for work of a general nature which is incorporated into garden feature work where sedimentary stone would be used in construction.

As we move into the 21st century the world becomes a smaller place, policies made in metropolitan cities could have lasting effect on rural/regional areas which may not be generally understood, such as the situation with the extractive industries in Central Victoria and the declaration of new National Parks. This could have a lasting effect on the future of dry stone work and the landscape industry in general as Victoria would in the long term be forced to seek substitute and/or import stone.

A recent past example has been the plan to renovate and undertake additional construction works in the Victorian State Parliament House. The stone required was located in a quarry, which has not been in production for some years in The Grampians National Park and was therefore deemed out of bounds for the extractive industry to return to production. Although the stone from this quarry was not to be used in dry stone construction, it nevertheless highlights the effect of stone quarry closures that have little or no forethought to the future of the built environment.

4.3 Other pertinent comments:

In Victoria's situation, the four main construction stone materials are basalt field boulders and quarried rock spalds, Castlemaine slate and Castlemaine sandstone. These are all currently locally obtainable.

As indicated in the main body of my report, basalt field boulders and quarried stone other than sedimentary deposited stone are limited in their construction to free standing and dry stone wall work – this is due to the fact that there are no bedding planes in the boulders and quarried rock spalds which are either too hard to be easily dressed with a hammer, or too brittle and splintery. These rocks are easily obtainable to the landscape industry and have become entrenched in landscaped gardens since the 1970's when there was a move towards native garden design which was brought about through Edna Walling's earlier involvement in stonework in the Australian context.

In the case of Castlemaine slate and, to a lesser extent, sandstone – the relative cost for dry stone feature work, as compared with basalt boulders and/or quarried rock spalds for walling, becomes more relevant at the point of sale. The cost of purchasing Castlemaine slate which is based on a square metre rate rather than a cubic metre rate as is the case with basalt field boulders. Castlemaine sandstone is only supplied through a one-person owned and operated quarry. It is for this reason that supply of the sandstone is sporadic and can lead to demand outstripping supply.

My reason for highlighting the above is that the majority of stone used for dry stone work (outside the standard dry stone wall) within Victoria is restricted to Castlemaine slate and Castlemaine sandstone.

Whilst it is possible to obtain stone from other States of Australia, it would increase the cost of any project undertaken.

4.4 The Solution

To ensure that the solutions to this identified skills gap are of lasting value, the craft needs to be widened at the base and built upwards.

Industry establishes a vertical integration strategy. The following chain would need to be incorporated into the strategy with education on a human scale through all levels of the strategy:

- **Professions** (building & landscape architects, engineers, urban designers, landscape designers, landscape contractors, stonemasons).
 - Incorporation into relevant courses of basic training and understanding of how walls are constructed, including occupational health and safety process.

- **Extractive industries.**
 - Listing of Australian Quarries with available suitable stone for use in construction of dry stone work and their present day requirements for procurement. Initially in Victoria and then into

quarries interstate where coursed flat bedded stone could be obtained.

→ **Media.**

- Undertake a selective three tier marketing campaign:

1st Tier – release of general targeted media articles alerting interested parties that craft is commencing initial stages of recovery.

2nd Tier – to establish interest in the craft and identify those who are willing and able to participate in a creditable course program (both professionals, eg architects/engineers, local government and other interested parties).

3rd Tier – release of general media articles outlining results of 1st and 2nd Tiers and showing the possibilities being explored in a variety of disciplines.

- Due care needs to be taken that the process is established in a logical manner to ensure the market does not become overheated and that parts of the setting up processes are not overlooked.

Action Plan

I think it is necessary to undertake a four pronged approach as outlined below:

Education:

- The initial immediate approach would be the development and implementation of Short Courses in the Western District where dry stone walling has been established as the main fencing technique. This would give participants a sound base understanding of the craft. Building on the already existing surrounds will add a heightened awareness and bring a greater pragmatic appreciation in a condensed period of time. These courses would be open to all professional disciplines as noted in **The Solution** above.
- Establish a program to “Train the Trainers”
The program would require guidance from appropriate members of Dry Stone Walling Association of Great Britain.¹

Discussions would need to be held with appropriate government/education/industry bodies to gauge interest in obtaining sponsorship of appropriate trainers from the UK training future Australian trainers.
- Ensure that basic training in the principles of dry stone walling/work is incorporated into relevant TAFE Landscape/Horticultural courses.

- Establishment of Scholarships – Overseas Training Programs and Research Fellowships to enable levels of competency in dry stone walling to be undertaken and to allow for cross-fertilisation of ideas, understanding of local conditions, features, techniques and varieties of application.

Development of appropriate tools for the industry:

- Development of literature relating to walling in general – build on the variety of pamphlets sold by the Dry Stone Walling Association of Great Britain from technical specifications through to the Craftsman Certification Scheme. Such literature to include a relevant pamphlet based on Australian geology in areas where the construction of walls has been undertaken over time.
- Establishment of network of practising and/or part time dry stone wallers. This is of particular interest and has a direct link to the education points raised above.
- Full understanding of occupational health and safety issues relevant to and included in basic training courses.

Value added aspects – Conferences, Seminars, Workshops, etc:

- The Trainers could then make themselves available to attend and present papers at relevant conferences and forums in all professional disciplines as outlined above - building & landscape architects, engineers, urban designers, landscape designers, landscape contractors, stonemasons.
- The Trainers would be involved in the development of workshops and seminars both in a rural and metropolitan environment showing stone variety and its applications.

Skills Bank:

Compile a list of practitioners and their capabilities/qualifications on the Skills Bank database being developed by ISS Institute.

Networking:

- Establish an Annual Exhibition – which encapsulates all aspects of dry stone construction. Such Exhibition could be organised through the newly established Dry Stone Walling Association of Australia and could provide a forum for the photographic exhibition including historical information and current work undertaken through the TAFE system, public and private commissions and on site practical examples of construction. A very early discussion with a person on the St Heliers Art Precinct Board has brought a positive response. This area could also be seen as a springboard to public awareness.

Obviously, any such exhibitions would have humble beginnings and progress as the training programs become reality.

4.6 My perspective

From my perspective, dry stone walling/work has an aesthetic appeal which has not generally been appreciated outside of the field that I have practiced for the last thirty years – Landscape Gardening.

The fact is that dry stone walling/work has a basic down to earth movement. Regretfully, it has not been seen as useful other than an agrarian philosophy/practice.

As we have entered an age of environmental awareness it can be seen that this dry stone work can be brought into our environmentally developing consciousness.

We have reached this point in time and to develop beyond will mean that challenges will need to be met in almost all levels of the craft.

These challenges have been outlined throughout this report. Whilst Solutions and Action Plans are listed, I have never seen this as a quick fix. To educate the marketplace (including practitioners, educationalists, clients/consumers) strategies, which are both short and long-term, are required with the focus on niche areas.

A dry stone structure constructed in the built environment in private or public spaces, is worth a thousand words.

This is the way dry stone walling/work will survive. The craft, like dry stone work, needs to stand on its own – connecting nature, space and the earth – without a word. The reality of dry stone work will then be recognised as a structure held together with nothing but man's ingenuity.

1

It is clear from discussions with members of the Dry Stone Conservancy in Kentucky regarding the establishment of such a program during the mid 1990's that Australia has much to gain by building on the results of the introduction of such programs in the USA. The recommendation from the Conservancy is to ensure that Trainers are trained by accredited members of the Dry Stone Walling Association of Great Britain before long term or ongoing education of professionals and interested parties commences. This would follow on from 3.2 Education (see above).

Appendix 1 - Glossary

The terms below are based on terminology used in dry stone walling in Great Britain.

Commonly used terms	Meanings
"A" frame	Is a wooden or metal frame used as a guide when building a wall.
Base Stone	See "Foundation".
Batter	This is the inward taper of the wall from base to top.
Bee Bole	A niche constructed in the wall to provide a shelf and shelter for bee skeps or occasionally for hives.
Buck & Due	Copstones arranged alternatively with large and small stones to give a castellated effect. Called "cock and hen" in The Cotswolds, UK.
Building Stone	See "Doubling or Double Dyking".
Capping Stone	See "Cope Stones".
Cheekends	See "Wall Head".
Consumption Dyke	Wall built with stone to clear the land and which is especially wide. Also called "clearance wall" and accretion wall".
Copstones	The top stones – the stones along the top of the wall to give weight and protection. Also called "cams", "tops", "toppers".
Corner Stone	Used in the construction of wall in turning a sharp bend. Much the same as a cheekend.
Course	Horizontal layer of stones placed in a wall.
Coverband	Large stones placed across width of wall to form base for the copstones in some areas.
Doubling or Double Dyking	Term used for a dry stone wall built with two faces of stones, packed with hearting between.
Foundation	The first layer of large stones in the base of the wall, also called "footing" or "found".
Gap or Gapping	A breach in a dry stone wall. Gapping is the repair of it and the "gapper" is a dyker who carries out the repair.

Commonly used terms	Meanings
Hearthing	The small stones used as filling or packing in a double wall.
Level	Spirit level.
Lunkie Hole	Passageway through wall to allow sheep access to other side but preventing cattle from crossing. Also called cripple hole, hogg hole or thirl hole.
Mash hammer	Small hammer between 1.5 and 3 kgs in weight – usually with a rectangular head.
Mawling hammer	A large axe-like sledge hammer used in shaping of wallends and/or copestones.
Pinnings / Pins	Small, usually tapering stones used to wedge building stones firmly in place.
Retaining Wall	Dry stone wall built into the cut face of a bank to prevent the soil from moving down the slope.
Seeming	Running joint on a vertical axis on either side of the wall.
Single Dyke	Wall built with single stones going the width of the wall.
Sledge Hammer	See “Mawling Hammer”.
Smoot	Small passageway through wall to allow rabbits, etc. to cross the wall. Also called “pen hole” and “pop hole”. (Strictly Great Britain usage.)
Stile	Special construction to allow pedestrians through or over the wall, but retaining livestock.
String Lines	String lines used in the building industry – to ensure a straight line.
Throughstones	Heavy, large stones placed at regular intervals along the wall to tie the two sides together.
Trace Walling	Placing of stones along face of wall rather than placing length of stone into the wall for strength.
Wall Ends	See “Wall Head”.
Wall Head	Vertical end to a length of wall. Also called “cheekend”.
Walling Frames	See “A Frames”.
Walling Pins	Used as a substitute for “A” Frame.

Appendix 2 – List of Reference Materials

The Vision of Edna Walling – Trisha Dixon & Jennie Churchill.

If these walls could talk - Report of the Corangamite Dry Stone Walls Conservation Project.

Built to Last: The History and Archaeology of Dry Stone Walls in Melbourne's Western Region – Gary Vines

Rock Fences of the Bluegrass – Murray-Wooley & Raitz.

Rock Fences and Preadaptation, Karl Raitz, Vol 85 No. 1 January 1995; Geographical Review.

Discussions undertaken with:

Brian Maltby, Castlemaine Slate (Taradale)

Mark Halliday, Associate, Beveridge Quarry

Stan Shepherd (Campbell's Creek Quarry, Castlemaine) – NB: as of 19th December, 2002, Stan Shepherd's quarry has been closed until at least the end of January, 2003.

Appendix 3 – Supporting Documents

8th International Drystone Walling Congress 2002:

Congress Program

Daily Program

Fellowship Itinerary

8th International
Drystone Walling
Congress 2002



We thank the following sponsors for their contributions:

City of Visp/Viège. Coop Switzerland. Département des transports, de l'équipement et de l'environnement du Canton du Valais. Die Mobiliar, Generalagentur Oberwallis. Loterie Romande Valais. Pro Natura. Swiss Agency for the Environment, Forests and Landscape. Swiss Federal Office for Agriculture. Swiss Foundation for Landscape Conservation. Swiss Landscape Fund.

8th International Drystone-Walling Congress 2002.

Congress Program

Congress Dates Thursday 29 – Saturday 31 August 2002.
Congress Location Congress Center «La Poste» in Visp-Valais, Switzerland.

Stiftung Umwelt-Einsatz Schweiz (SUS) is pleased, in collaboration with the Société scientifique internationale pour l'étude de la Pierre Sèche (S.P.S.), France, to invite all interested persons to the 8th International Drystone-Walling Congress.

Main Subject «Drystone Walls in Alpine Regions».

This was chosen as the main subject for the 8th International Drystone-Walling Congress because drystone walls are encountered mainly in mountainous regions. 2002 is also the International Year of the Mountains as proclaimed by the UN.

Goals

- Furthering awareness for drystone constructions as landscape elements and as ecologically valuable habitats.
- Spreading and exchanging knowledge about correct building and maintenance.
- Presenting research projects in the field of drystone construction.

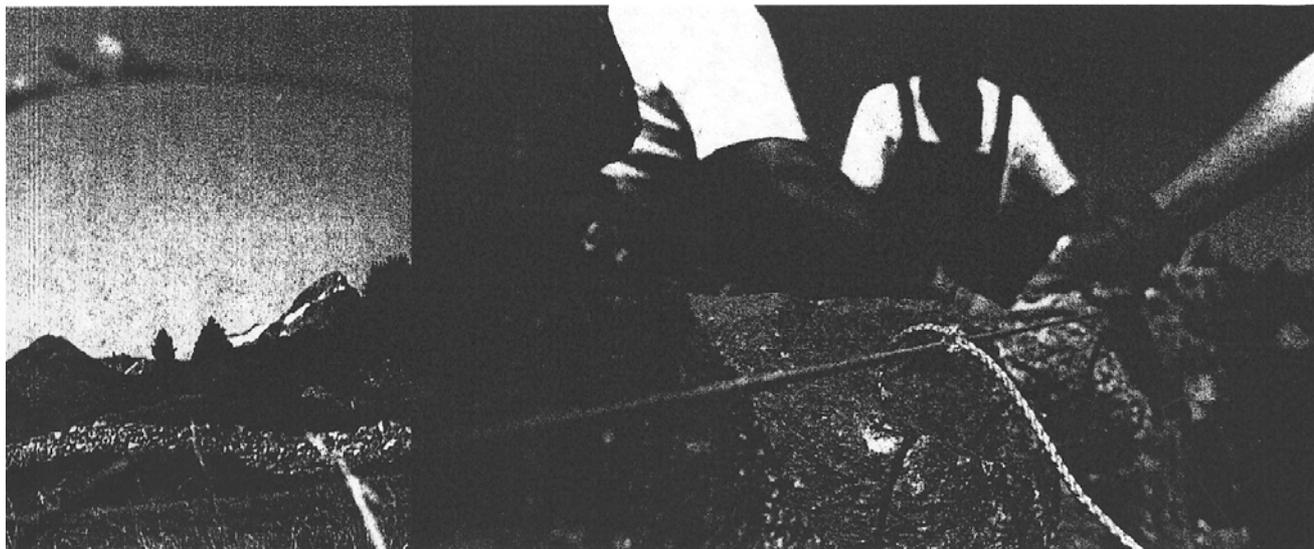
Participants – All persons interested in drystone construction.

- Members of nature conservancy and environmental organisations, specialists for footpath and trail construction, area planning and tourism, council representatives, civil servants and further individuals interested in the conservation of nature, heritage, and countryside.
- Specialists and researchers for building, monument conservation, architecture, garden and landscape planning, agriculture and silviculture, anthropology, history, geography, biology.

Congress Languages The presentations will be simultaneously translated into German, French, and English.

Congress Programme During three days, drystone construction will be featured in the Congress-Center «La Poste» in Visp-Valais. More than 50 speakers from Algeria, Australia, Cyprus, France, Great Britain, Italy, Slovenia, Spain, Switzerland and the USA will present various aspects of drystone construction and heritage. A poster session will supplement the papers. (See the list of papers and posters on the back cover.)

On two afternoons there will also be guided excursions to notable drystone constructions in Valais. The Lötschberg-Simplon railway is protected against avalanches with over 30 000 m³ drystone walls – an imposing example of the former importance of drystone construction in the mountains. The second excursion leads us to the community of Zeneggen above Visp, where we will see an impressive example of a project for the preservation and the recultivation of the former agricultural landscape.



Excursions Thursday:

We will visit the community of Zeneggen above Visp, which a few years ago initiated a project for the preservation and recultivation of the former agricultural landscape, together with Fonds Landschaft Schweiz (FLS). Included are the reconstruction of the original irrigation system (aqueducts along cliffs) and of agricultural storage sheds, also the repair of drystone walls and stone paving. Within this programme, Stiftung Umwelt-Einsatz Schweiz (SUS) has constructed several drystone walls from 1999 until today. These, as well as SUS worksites with people actually walling, can be viewed during the excursion.

Saturday:

The drystone avalanche protection terraces on Alp Faldum above Goppenstein were constructed in the years 1908 to 1960. They are vital to the present day for preventing avalanches from descending onto the Lötschberg-Simplon railway line. Because of the long period of construction, we can distinguish several building styles. The over 100 terraced retaining walls (totalling a volume of over 30 000 m³ drystone construction!), built in extremely steep terrain without machinery, present an impressive example of the former importance and magnitude of drystone construction in the mountains. (Excursion subject to change in the case of poor weather.)

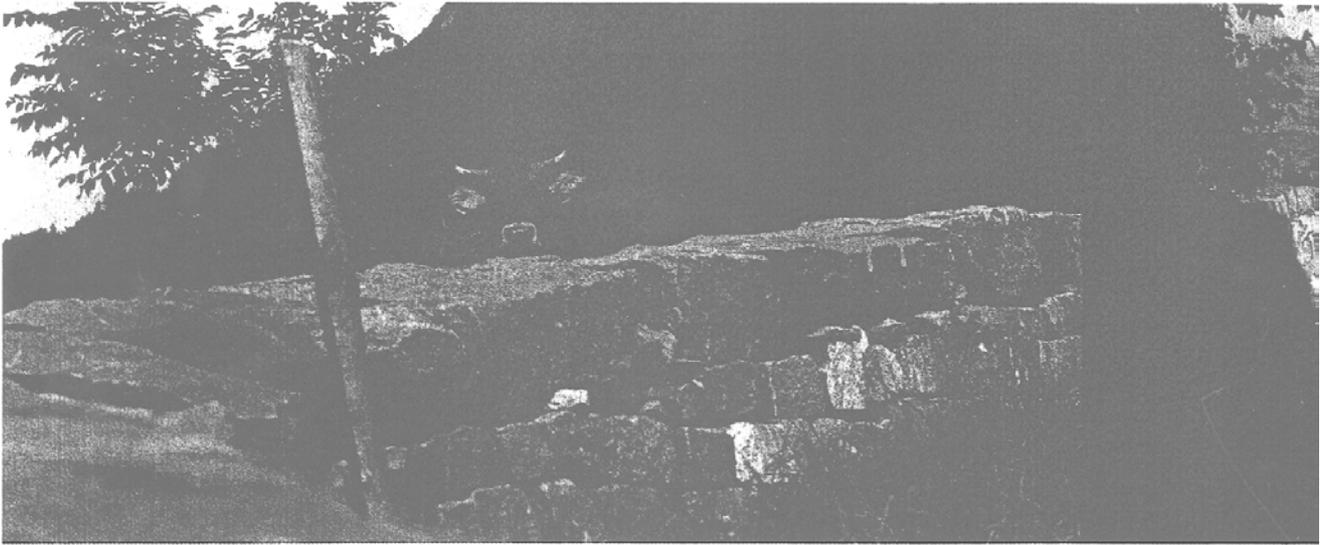
Outfit recommended for the excursions: solid shoes or boots, a warm pullover, and rain gear. Images and descriptions of the excursions: www.umwelteinsatz.ch/temp/ex.htm

Participation It is also possible to attend single congress days.

Exhibition «La nostra terra – unser Boden» is an exhibition about the terraced landscapes in Piemonte/Italy and in Switzerland. It is presented by Stiftung Landschaftsschutz Schweiz (SL) and rounds off the copious congress programme.

General Assembly of the S.P.S. The members of the Société scientifique internationale pour l'étude pluridisciplinaire de la Pierre Sèche (S.P.S.) will hold their general assembly on Friday.

Proceedings The proceedings with all papers and posters will be published shortly after the congress. The cost for this is not included in the registration fee. The proceedings may be ordered during the congress or by mail if not attending the congress, using the registration form. Orders received by 31 August 2002 will profit from the reduced subscription price of CHF 38.– (EURO 26.–). After this date the proceedings will cost CHF 48.– (EURO 32.–).



Registration The congress begins on Thursday, 29 August, 8:30 and ends on Saturday, 31 August, 19:30. Registration is possible on Thursday, 29 August from 7:30 to 9:00. Participants already arriving on 28 August may register from 16:00 to 20:00, also at the Congress Center «La Poste» in Visp.

Congress Costs Booking and payment received by 30 April 2002:

Standard fee	CHF 400.-	about EURO 267.-
Reduced fee*	CHF 250.-	about EURO 167.-
Single-day fee	CHF 140.-	about EURO 94.-

Booking and payment received after 1 May 2002:

Standard fee	CHF 500.-	about EURO 334.-
Reduced fee*	CHF 350.-	about EURO 234.-
Single-day fee	CHF 180.-	about EURO 120.-

* S.P.S.-members and young people in training or education.

The congress fees for all three days include: presentations, poster session, simultaneous translations, refreshments, simple lunches, excursions (including transportation), and a common evening meal (regional specialty).

SUS would like to make the participation possible for as many people as possible. Therefore we will consider a price reduction on application, in case the full fees exceed your budget.

Accommodation in Visp is available in all price categories—see the separate application form.

Congress-Telephone During the congress: +41 (0)79 204 48 62.



Booking, Method of Payment Please book with Stiftung Umwelt-Einsatz Schweiz (SUS), using the form enclosed. The booking becomes valid on receiving your payment (in CHF).

Foreign participants, bank address:
Schweizer Verband der Raiffeisenbanken, CH-9001 St. Gallen
SWIFT-Code: RAIFCH22 (this code is very important!)
Attention: for RB Fahrni-Teuffenthal, BC 80817/AA80817000
For account 936778, SUS, congress

Swiss participants, bank address:
Raiffeisenbank Fahrni-Teuffenthal, CH-3612 Steffisburg
Postal account of the bank: 30-22804-5, BC 80817
For account 936778, SUS, attention: congress

Visa Any required visa must be obtained by the participants themselves.

Insurance Any required or desired insurance must be procured by the participants themselves.

Accommodation Enclosed please find the list of overnight accommodation available in Visp. Please send your reservation by the end of May directly to the tourist office in Visp:
Verkehrsbüro Visp, Postfach 589, CH-3930 Visp
Telephone +41 (0)27 948 33 33, fax +41 (0)27 948 33 35, info@visp.ch

Your reservation will be confirmed by the tourist office. You pay for your accommodation directly at your hotel, guest house, etc.

Cancellation In case you must cancel your participation, we will reimburse your booking fee as follows:
- Written cancellation until 31 July 2002:
100% reimbursement minus a cancellation fee of CHF 70.- (about EURO 47.-)
- Written cancellation until 20 August 2002:
50% reimbursement minus a cancellation fee of CHF 70.- (about EURO 47.-)
- From 21 August 2002 onwards there will be no reimbursement, however you can have another person participate in your place.

Information Stiftung Umwelt-Einsatz Schweiz (SUS)
Ortbühlweg 44, CH-3612 Steffisburg
Telephone +41 (0)33 438 10 24, fax +41 (0)33 438 10 25
info@umwelteinsatz.ch, www.umwelteinsatz.ch



Congress Location Visp lies in the Canton of Valais, one of the most beautiful holiday destinations in Switzerland. The town is a station for those changing trains in order to visit Zermatt with the famous Matterhorn. Further information may be found on www.visp.ch.

Reaching Visp by Public Transport Foreign participants arriving by public transport may benefit from two special offers of the Swiss Federal Railways (SBB): the Swiss Transfer Ticket and the Swiss Pass. These two tickets are available in travel offices in many European countries, at train stations or at Zurich and Geneva Airport. They may also be ordered within Europe using the free telephone number 00800 100 200 30.
E-Mail: reservation@sdm.ch, www.MySwitzerland.com.

By the Way The Swiss National Exhibition Expo 02 will take place during the same summer. Combine the congress with a visit to the Expo! Further information see www.expo.02.ch.

International Drystone-Walling Congress This takes place every two years in a European country, with different bodies having been responsible for the organisation up to now. Previous congresses have been held in Greece, Italy, France, and Spain, however also having attracted participants from Mediterranean countries, the Near East, Great Britain and the USA.

Stiftung Umwelt-Einsatz Schweiz (SUS) Stiftung Umwelt-Einsatz Schweiz (SUS) started the project Drystone Walls in 1994. Since then, 10 000 m² drystone walls were built or properly reconstructed in Switzerland under the supervision of the foundation. Drystone walls are a part of our landscape heritage – and also silent witnesses of past craftsmanship. Also, these walls are ecologically valuable habitats for rare animals and plants. Unfortunately many drystone walls are lost each year, and with them also the valuable biotopes. SUS has been spreading the knowledge required since eight years, allowing an almost forgotten craft to be revived.

Société scientifique internationale pour l'étude pluridisciplinaire de la Pierre Sèche (S.P.S.) The Société scientifique internationale pour l'étude de la Pierre Sèche (S.P.S.) combines individuals and institutions interested in researching, preserving and documenting drystone walls. The first international congress took place 1988 in Bari, Italy. The originally informal meetings eventually led to the formation of a formal society in 1998, with the goal of following and intensifying research activities in the field of drystone construction.

International Year of the Mountains See www.berge2002.ch for more information.



- Algeria** *Boubaya Ali Faiz*, Faculté des Sciences de l'Ingénieur, Université Ferhat Abbès, Sétif:
Effets des séismes sur les sites traditionnels de construction en pierre sèche.
- Australia** *Raelene Marshall*, Culture in Action, Keilor (East Victoria):
The shaping of Australia's cultural landscape. How our European immigrants adapted the drystone skills of their home-lands to survive in a new and harsh terrain.
- Cyprus** *Theodosiou Antonia*, Nicosia:
Habitats in drystone constructions in Cyprus (plants and animals).
- France** *Acovitsioti-Hameau Ada, Morin Jérôme*, Institut d'Ethnologie Méditerranéenne et Comparative, Université de Provence et Société scientifique internationale pour l'étude pluridisciplinaire de la Pierre Sèche:
Des «cabanons» en pierre sèche en Provence: réflexions sur les usages de la technique.
Cornu Claire, Association pour la Participation et l'Action Régionale, Avignon, Lanaspèze Jean-Baptiste, Centre Méditerranéen de l'Environnement, Avignon:
- Présentation du programme REPPIS «Réseau européen des pays de la pierre sèche».
- Présentation du programme PRO TERRA concernant les terrasses de culture en Italie, Espagne, Grèce et France.
Harfouche Romana et Poupet Pierre, Université d'Aix-en-Provence, Caissargues:
Les murs de champs en terrasses antiques dans les paysages de la montagne méditerranéenne actuelle (France du sud, Grèce cycladique, Liban et Jordanie).
Larcena Danielle, L'Isle sur la Sorgue:
Les Ayguiers (cuves à vin en bordure de falaise); Les capteurs de rosée (clapiers récupérateurs de rosées et distributeurs d'eau); Les Bergeries de la montagne de Lure (constructions pastorales en pierres sèches).
Lécuyer Didier, Parc national des Cévennes, Florac:
Remise en valeur des terrasses de culture et valorisation des savoir-faire liés à la pierre sèche dans les Cévennes.
Roustan Maurice, Association ASERPUR, Nîmes:
La pierre sèche dans la récupération de l'eau de pluie en garrigue méridionale.
Villemus Boris, Ecole Nationale des Travaux Publics de l'Etat, Vaulx-en-Velin:
Behavior of dry stone retaining walls.
- Great Britain** *Clark Philip*, Dry Stone Walling Association of Great Britain, Builth Wells, Wales:
A new scheme for rebuilding boundary walls in the uplands of Wales «Walls of Llangynidr».
Haddow Norman, Perthshire, Scotland:
Traditional methods of moving large stones in the Scottish mountains.
Rippingale Neil, Edinburgh, Scotland:
International Opportunities in Dry Stone Walling.
Tufnell Richard, Drystone, Dalry, Scotland:
The construction of dry stone retaining walls and road retaining walls.
- Italy** *Bretto Gianni, Giordano Gisella Elisabetta*, Società scientifica internazionale di studi sulla Pietra a Secco, Torino: La filologia della pietra a secco: Toponomastica e lessico tecnico; la pietra a secco nelle Alpi centro-occidentali. Luoghi e costruzioni a confronto.
Delpiano Vittorio, Ecomuseo dei Terrazzamenti, San Benedetto Belbo:
Dalla pietra: una proposta di vita alternativa.
Gollo Paolo, Moretto Barbara, Comune di Pontedassio, Pontedassio:
L'architettura delle caselle imperiesi.
Gramigna Emilia, Istituto civiltà del mare S. Teodoro, Sardegna:
Nuraghi e muri a secco come materiale di riutilizzo.
Laiolo Giampiero, Società scientifica internazionale di studi sulla Pietra a Secco, Imperia:
Strutture agropastorali ipogee in pietra a secco nell'estremo Ponente Ligure, Italia.
Lamberti Andrea, Laboratorio di antropologia storica e sociale delle Alpi Marittime, Zuccarello:
Le Costruzioni e i muri a secco delle Alpi Liguri.
Murtas Donatella, Ecomuseo dei Terrazzamenti e della Vite, Cortemilia:
Il paesaggio terrazzato come elemento strategico per la rinascita integrata del territorio.
Un caso pratico: l'Ecomuseo dei Terrazzamenti e della Vite, Cortemilia, Cuneo.
Leone Pierluigi e Laiolo Giampiero, Comunità Montana dell'Olivo, Imperia:
La funzione delle strutture storiche in pietra a secco nella regimentazione delle acque nel territorio della Comunità Montana dell'Olivo.
Scarpini Schmidt Cinzia, Perinaldo:
Progetto Artemide (Liguria).
Volorio Paolo, Associazione Canova, Canova di Oira:
Strutture megalitiche in Ossola (I-II millennio a.C.); aspetti paesaggistici, morfologici, costruttivi.
Volpone Elio, Impresa Edile Artigiana, Bannio Anzino:
Costruire a secco oggi in Ossola.

- Slovenia** *Borut Juvanec*, Ljubljana University, Ljubljana:
Dry Stone Walling: what had been done.
- Spain** *Alomar Antoni*, Muro (Mallorca):
Recherche et systématisation pour les lexiques de la pierre sèche.
Garcia Queijeiro Jose Manuel, Departamento de Biología Vegetal y Ciencia del Suelo,
Universidad de Vigo, Ourense:
Terrazas de cultivo y defensa contra la erosión en los viñedos de la Ribeira Sacra (Galicia, España).
Rebés D'Areny-Plandolit Xavier, Font Ruana Joseph Maria, Fundació El Solà, La Fatarella:
Els pous de la Fatarella; Proyecto agricultura e de montana: tierra i piedra; La pedra en sec en l'arquitectura d'Avui.
Seguí Joan, Cruz Jorge, Garcia Asuncion, Museu de la Prehistoria i de las Cultures de Valencia:
Sheperding dry-stone structures in the valencian territory (Mediterranean Spain).
- Switzerland** *Benedetti Sandro*, Bureau Benedetti, Finhaut:
Agenda 21 local de Finhaut, Valais.
Betschart Andres, Inventar historischer Verkehrswege der Schweiz IVS, Bern:
Erhaltung und Sanierung von Trockenmauern an Strassen und Wegen im alpinen Raum: Die Erfahrungen des IVS.
Escher Jean-Robert, Forum Umwelt AG, Visp:
Trocken gemauerte Lawinen- und Steinschlagverbauungen in Grächen, Wallis.
Hartman Michael, Bürogemeinschaft für Angewandte Ökologie, Zürich:
Neubau einer Trockenmauer als Ersatzmassnahme (Alptransit Gotthard).
Hochkofler Giovanni, Département de Géographie de l'Université de Genève, Genève:
Murs de délimitations et de soutiens dans la montagne véronaise, du Monte Baldo (Lac de Garde)
au Monti Lessini occidentaux.
Krebs Ruedi, Twann:
Trockenmauern am linken Bielerseeufer: Behau- und Werkzeugspuren.
Leoni Fabio, Bellinzona:
Restauration der Brücke auf dem Kreuzweg in Bigorio.
Luginbühl Priska, Krinau:
Trockenmauerbauten aus den verschiedensten Regionen der Schweiz.
Lutz Martin, Stiftung Umwelt-Einsatz Schweiz (SUS), Steffisburg:
Das Projekt Trockenmauern der Stiftung Umwelt-Einsatz Schweiz (SUS).
Maillard Nadja, Construire & Habiter, Essert-s/Champvent:
Le nu et le fruit. Réflexions au pied du mur.
Mettler Daniel, Fribourg, und Stalder Marcel, Departement Geology, University of Stellenbosch South Africa:
Die Trockenmauern und ihr geologischer Untergrund in der Schweiz: Auswirkungen auf Baustil, Mauerbild
und Beständigkeit.
Monigatti Dario, Brusio:
Video über den Bau eines «Crots» im Puschlav.
Naef Felix, Naef & Partner, Brugg:
Trockensteinmauern auf dem Golfplatz Zuoz-Madulain.
Nussbaum Dieter, Caritas Schweiz, Luzern:
Bodenschutz in der Steinwüste Nord-Äthiopiens.
Schneider Dieter, Buckten:
Mauern in Trockenbauweise als Element der Gartengestaltung.
Schüpbach Erwin, quadra gmbh, Dussnang:
Reptilienförderung im Rebberg – neue Trockenmauern und Artenschutz.
Stoll Gerhard, Wald:
Aspekte der Geschichte des ingenieurmässigen Trockenmauerwerks (Themenbereich Geschichte).
Strebel Bruno, Entwicklungsfragen + angewandte Ökologie, Geuensee:
Mit Steinen gegen Hunger: Trockenmauerbau in Nord-Äthiopien.
- USA** *Kulusic Sven*, Brooklyn, New York:
Typology and analysis of the dry stone walls in the Eastern Adriatic coastal region of Croatia.
Pilipski Mark, Barns are Noble, New York:
The fractal lacunarity of alpine dry walls and their matrix stones:
Why some walls look good and others do not.

Subject to changes.

At the end of July the detailed day-by-day programme can be found on:
www.umwelteinsatz.ch



**8. Internationaler Trockenmauer-Kongress
8th International Drystone-Walling Congress
8è Congrès international sur la pierre sèche**



Donnerstag / Thursday / Jeudi 29.8.2002

- 7.30 - 8.30 Einchecken / Registration
- 8.30 - 9.00 Eröffnung / Introduction: **Christoph Müller**, Präsident Stiftung Umwelt-Einsatz Schweiz
- Grussadressen / Welcome / Bienvenue: **Thomas Burgener**, Staatsratpräsident Canton Valais; **Enrico Buergi**, Bundesamt für Umwelt, Wald und Landschaft, Chef Abteilung Landschaft
- 9.00 - 10.45 Referate / Presentations
- Ada Acovitsióti-Hameau**, S.P.S., ASER du Centre Var Maison de l'Archéologie, F: Des "cabanons" en pierre sèche en Provence: réflexions sur les usages de la technique
- Giovanni Hochkofler**, CH: Murs de délimitations et de soutiens dans la montagne véronaise, du Monte Baldo (Lac de Garde) aux Monti Lessini occidentaux
- Raelene Marshall**, Culture in Action, AU: The shaping of Australia's cultural landscape.
- Aleksandra Faber**, Croatia: Architektur der Hirtenbevölkerung des Velebit-Gebirges, Kroatien: Bauart der Jahrtausende
- 10.45 - 11.15 Pause
- 11.15 - 12.45 Referate / Presentations
- Gianni Bretto**, SPS (Société scientifique internationale pour l'étude de la Pierre Sèche), I: La pietra a secco nelle Alpi centro-occidentali
- Andrea Lamberti**, LASA (Laboratorio di Antropologia Storica e Sociale dell'Alpi Marittime), I: Le costruzioni e i muri a secco delle Alpi Liguri
- Paolo Volorio**, l'Associazione Canova, I: Strutture megalitiche in Ossola (I-II millennio a.C.); aspetti paesaggistici, morfologici, costruttivi
- Neus Borrell Cedó**, Fundació El Solà, E: Proyecto Agricultura de Montaña: Tierra y Piedra
- 12.45 - 14.00 Apéro, Grussadresse / Welcome / Bienvenue: **Felicita Lengacher**, Gemeinderätin in Visp; Mittagessen / Lunch / Déjeuner
- 14.00 - 15.00 Referate / Presentations
- José Manuel Garcia Querjeiro**, Departamento de biología vegetal y ciencia del suelo, Universidad de Vigo, E: Terrazas de cultivo y defensa contra la erosión en los viñedos de la Ribeira Sacra (Galicia, España)
- Gisella Elisabetta Giordano**, SPS Société scientifique internationale pour l'étude de la Pierre Sèche, I: La filologia della pietra a secco: toponomastica e lessico tecnico
- Joan Seguí, Jorge Cruz Orozco**, Service for Ethnographic Research Museu de Prehistoria i les Cultures de València, E: Shepherding dry-stone structures in the Valencian territory
- 15.00 Abfahrt nach / Departure to / Départ pour: Zeneggen
- 16.00 - 19.00 Exkursion / Excursion: Zeneggen

- 19.00 Apéro, Grussadresse / Welcome / Bienvenue: **Fritz Kenzelmann**, Gemeindepräsident Zeneggen
Nachtessen / Evening meal / Souper: in Zeneggen
- 21.30 (circa) Erste Rückfahrt nach / First return to / Premier retour à: Visp / Viège
- 22.00 (circa) Zweite Rückfahrt nach / Second return to / Deuxième retour à: Visp / Viège

Freitag / Friday / Vendredi 30.8.2002

- 8.30 - 10.15 Referate / Presentations
- Daniel Mettler**, CH: Die Trockenmauern und ihr geologischer Untergrund in der Schweiz: Auswirkungen auf Baustil, Mauerbild und Beständigkeit
- Dario Monigatti**, CH: Das "Crot", ein architektonisches Phänomen im Puschlav: Video
- Gerhard Stoll**, CH: Aspekte der Geschichte des ingenieurmässigen Trockenmauerwerks
- Dieter Nussbaum**, Caritas Schweiz, CH: Beschäftigung und Entwicklung: Bodenschutz in der Steinwüste Nord-Äthiopiens. "Adigrat Diocesan Development Action" (ADDA)
- Erwin Schüpbach**, quadra gmbh, CH: Reptilienförderung im Rebberg - neue Trockenmauern und Artenschutz
- 10.15 - 10.45 Pause
- 10.45 - 12.15 Referate / Presentations
- Didier Lécuyer**, Parc national des Cévennes, F: Remise en valeur des terrasses de culture et valorisation des savoir-faire liés à la pierre sèche dans les Cévennes (France)
- Maurice Roustan**, ASERPUR, F:
La pierre sèche dans la récupération des eau de pluie en garrigue Nîmoise
- Antonio Turiel**, SEREC (Association suisse pour le service aux régions et aux communes), CH: Sauvegarde des murs en pierres sèches et du vignoble en terrasses valaisan
- Danièle Larcena**, Pierre sèche en Vaucluse, F: Les Ayguiers (caves à vin en bordure de falaise); Les capteurs de rosée (clapiers récupérateurs de rosées et distributeurs d'eau)
- 12.15 - 12.30 Kurzhinweise / Brief introductions / Introductions brefs: Poster
- 12.30 - 13.30 Mittagspause / Lunch / Déjeuner
- 13.30 - 14.30 Postersession
- 14.30 - 16.15 Referate / Presentations
- Antoni Alomar Esteve**, Prèsident SPS, E:
Recherche et systématisation pour les lexiques de la pierre sèche
- Jean-Baptiste Lanaspeze**, Assoc. Participation Action Rurale, F: Programme PROTERRA concernant les terrasses de culture en Italie, Espagne, Grèce et France
- Claire Cornu, Roger Bouvier**, Assoc. Participation Action Rurale, F:
Programme REPPIS - Le Centre International de la Pierre Sèche du Beauceat
- Laurent Pitteloud**, Pralong Bureau d'ingénieurs civils, CH: Les murs en pierres sèches
- 16.15 - 16.45 Pause

- 16.45 -18.30 Referate / Presentations
- Boris Villemus**, Ecole Nationale des Travaux Publics de l'Etat Département Génie Civil et bâtiment, F: Comportement des murs soutènement en pierres sèches
- Mark Pilipski**, Barns are Noble, USA: The Fractal Lacunarity of Alpine Dry Walls and Their Matrix Stones. Why Some Walls Look Good and Others Do Not
- Antonia Theodosiou**, GR: Habitats in drystone constructions in Cyprus
- Philip Clark**, Dry Stone Walling Association of GB, GB:
"Walls of Langynidr": a new scheme for rebuilding boundary walls in the uplands of Wales
- Norman Haddow**, Tirlin Pin Dykers, GB:
Traditional methods of moving large stones in the Scottish mountains
- 19.00 (circa) GV / General assembly: S.P.S.

Samstag / Saturday / Samedi 31.8.2002

- 8.30 - 10.15 Referate / Presentations, Diskussion / Discussion
- Richard Tufnell**, Drystone, GB:
The construction of dry stone retaining walls and road retaining walls
- Michiel Hartman**, Bürogemeinschaft für angewandte Ökologie, CH:
Neubau einer Trockenmauer als Ersatzmassnahme
- Jean-Robert Escher**, Forum Umwelt AG, CH:
Trockengemauerte Lawinen- und Steinschlagverbauungen in Grächen
- Giampiero Laiolo, Pierluigi Leone, Ilzo Calzia**, Comunità Montana dell' Olivo, I:
La funzione delle strutture storiche in pietra a secco nella regimentazione delle acque nel territorio della Comunità Montana dell'Olivo
- 10.15 - 10.45 Pause
- 10.45 - 12.30 Referate / Presentations
- Andres Betschart**, Inventar historischer Verkehrswege der Schweiz, IVS, CH:
Erhaltung und Sanierung von Trockenmauern an Strassen und Wegen im alpinen Raum
- Ruedi Krebs**, CH: Trockenmauern am linken Bielerseeufer: Behau- und Werkzeugspuren
- Vittorio Delpiano**, Ecomuseo dei Terrazzamenti - Cortemilia, I: Dalla pietra:
Una proposta di vita alternativa
- Martin Lutz**, Stiftung Umwelt-Einsatz Schweiz, Projektleiter Trockenmauern, CH:
Trockenmauerbau in der Schweiz
- 12.30 - 12.45 Schlussdiskussion / Final discussion
- 12.45 - 13.30 Mittagspause, Lunch, Déjeuner
- 13.30 Abfahrt nach / Departure to / Départ à: Alp Faldum
- 15.00 - 17.30 Exkursion / Excursion: Alp Faldum
- 18.00 Erste Rückfahrt / First return / Premier retour
- 19.30 (circa) Letzte Ankunft / Latest arrival / Dernière arrivée: Visp-Viège "La Poste"

ITINERARY FOR DRY STONE WALLING / INTERNATIONAL SPECIALISED SKILLS INSTITUTE INC.

Day	Date	Time	Place	TT* Contact	Reason
Monday	26-Aug	pm	Melbourne		Flight to Geneva Switzerland
Tuesday	27-Aug		Arrive Geneva		Making way to Stone Congress in Visp
Wednesday	28-Aug		Genev/Visp		
Thursday	29-Aug	830	Visp		Stone Congress begins
Friday	30-Aug		Visp		
Saturday	31-Aug	20:00	Visp		Congress closes
Sunday	01-Sep		Visp - Edinburgh		Travelling
Monday	02-Sep	14:00	Isle of Skye	7 hrs Suemas Campbell	Master Craftsman in DSW - walls abounding river streams. Site visits. Stone sourcing
Tuesday	03-Sep	14:30	Isle of Skye - Dumfries	7.5 hrs Hugh Drysdale	Master Craftsman in DSW - 2 Pinnacle awards - teacher and mentor
Wednesday	04-Sep		Dumfries & Galloway area	Hugh Drysdale	Feature work - Poortrat house. Site visits
Thursday	05-Sep		Yorkshire	5 hrs Steven Harrison?	? Possibly rather stay with Hugh. Artistic and Feature work. Site visits
Friday	06-Sep		West Yorkshire	Paul Webley	Chairman of the DSW Association and Master Craftsman - Gristone (local stone). Site Visits
Saturday	07-Sep	09:30-12:00 14:00-16:00	Yorkshire Yorkshire	Jacqui Simmons Ian Dewar	Secretary of the DSW Association. General information on the DSW Association of GB Set up the Certification of the DSW Association of GB
Sunday	08-Sep		Birmingham - Kentucky		Travelling
Monday	09-Sep		Lexington	Superintendent of D.S.C.	Paris Pike project - its design, construction technique, stone used in a commercial environment
Tuesday	10-Sep	09:00	Lexington	Carolyn Murray-Wooley	President of the DSC. Landscape Architect. Design, construction and restoration techniques of historical works in both commercial and domestic areas. Site visits
Wednesday	11-Sep	09:00	Lexington	Jane Murray-Wooley	Landscape Architect - Program Director of the DSC. Future prospects available in networking and the development of dry stone training at a local and international level. Site visits and discussion of large dry stone retaining walls.
Thursday	12-Sep	08:00	Lexington	Neil Rippingale	Field Superintendent of DSC. Site visits of works undertaken in the last year and the training achieved with local and out of state masons, builders and wallers.
Friday	13-Sep	9:00-11:00 13:30-16:00	Lexington Lexington	Carl Raiz Berie Clay	Local Historian. Co author of "Rock fences of the Blue Grass" Professor in Archaeology University of Kentucky. Historical works
Saturday	14-Sep				
Sunday	15-Sep		Melbourne		Flight back to Australia

TT* TRAVEL TIME

A Special Note of Thanks

I would like to acknowledge the following individuals and organisations for their assistance and contributions during my time spent working on Dry Stone projects and finally the formulating of this report.

The following lists are alphabetical by surname/organisation's name and I am very grateful to each and every person mentioned.

Thank you,
David Long.

INDIVIDUALS

Australia

Josie Black – Secretary, Corangamite Arts Council Inc.

Carolynne Bourne – Executive Director, International Specialised Skills Institute Inc.

Lyn Hall – Friend who worked tirelessly on report

Bill Harlock – Farmer/Dry Stone Waller, Pomberneit, Victoria (Dec'd.)

Felix Hemingway – Manager, Urban Design, Whitehorse City Council

Andrew Miller – Engineer, City of Ballarat

Kenneth Neff – Development Manager, GSA Bloodstock Pty. Ltd. (Victoria)

Maudie Palmer – Maudie Palmer & Associates Pty. Ltd.

Nathan Perkins – Master Craftsman of Dry Stone Walling Association (DSWA) of Great Britain (former)

Ruth Pollard – Lecturer in Horticulture, Chandler Institute, Werribee, Melbourne University

Overseas

Irwin Campbell – Master Craftsman, DSWA of Great Britain (Scotland)

Seamus Campbell – Master Craftsman, DSWA of Great Britain (Scotland)

Berle Clay – Member, Board of Directors, Dry Stone Conservancy, Lexington Kentucky (USA)

Ian Dewar – Foundation member (now retired), DSWA of Great Britain (Scotland)

Hugh Drysdale – Master Craftsman DSWA of Great Britain (Dumfries)

Karl Raitz – Professor of Geography University of Kentucky, Lexington (USA). Member of Board of Directors, Dry Stone Conservancy, Lexington, Kentucky (USA)

Carolyn Murray-Wooley – Director, Dry Stone Conservancy, Lexington, Kentucky (USA)

Jane Murray-Wooley – Director, Dry Stone Conservancy, Lexington, Kentucky (USA)

Neil Rippingale – Master Craftsman and examiner of the DSWA of Great Britain and recipient of The Pinnacle Award (Scotland)

Jacqui Simkins – Secretary, DSWA of Great Britain (West Midlands)

Paul Weberly – Chairman and Master Craftsman of DSWA of Great Britain (Derbyshire)

ORGANISATIONS

Dry Stone Conservancy, Lexington, Kentucky, USA

Dry Stone Walling Association of Great Britain

International Specialised Skills Institute Inc. and the Selection Committee, Camberwell, Melbourne, Australia

SPONSORSHIP

Master Builders Association, Melbourne, Australia