

THE FRIENDS OF THE WAITE ARBORETUM INC.



WAITE
ARBORETUM

NEWSLETTER NO. 64

Winter 2010

Secretary
Mrs Norma Lee
8379 4237

Editor
Mrs Jean Bird
8276 1439

FROM THE PRESIDENT

Following the AGM on 12th April our first committee meeting on 2nd June was chaired by Vice-President Beth Johnstone, in the absence of your new President who was recovering from surgery for a total hip replacement. We are delighted to have Norma Lee as our secretary; she takes over from the ever efficient Rosemary Sawley, as mentioned in former President Bryan Milligan's annual report. The input of two retiring members from the committee, Jeanette Lord and Colin Jenner will be missed.

The afternoon talk by our Patron, Sophie Thomson, on Sunday 16th May, was attended by over 50 people. She spoke on the general topic of "Adapting to climate change in the garden". It was supported by an extensive display of plants best adapted to low moisture regimes. We weren't disappointed by yet another of Sophie's inspiring presentations involving the audience with much food for thought and many items given away to those who could answer a range of questions.

Various members hosted a "Walk'n Talk" Volunteer Recognition Event on Sunday 23rd May. This was organised by the Adelaide and Mount Lofty Ranges Natural Resources Management Board in appreciation of the work of their volunteers from around the state. Over 50 participated in various short tours of different sections of the Arboretum, followed by lunch at *Lyrics*. It was good that such an organisation should choose the significant Arboretum as its venue for this event and that there were representatives from a wide spread of NRM volunteers even as far a field as Friends of the Great Victoria Desert.

Also in May, many of our volunteers again enjoyed an event hosted by Mrs Lindsay McWha, the University's Patron of Volunteers acknowledging the wonderful support of volunteers across the University.

In closing may I remind you of the exciting concert we are hosting on Wednesday 18th August at 6.30 pm in Urrbrae House? This special performance follows previous highly popular appearances at this lovely venue by acclaimed classical guitarist Aleksandr Tsiboulski, Lecturer

in Guitar at Sydney Conservatorium. We are delighted to have him back again this year with the bonus of his being accompanied by Jacob Cordover from Barcelona, Spain. Their duo recital will include works by Scarlatti, Bach, Granados and Houghton. Anyone who read the article on Aleksandr in the *Weekend Australian Review* of 22-23 May would appreciate how internationally acclaimed he is. Both master musicians have won International Guitar Competitions. So book early to avoid disappointment, as seating is limited due to the room size.

Henry Krichauff

IN THE ARBORETUM

FROM THE DIRECTOR

Planting in the Arboretum has been limited to 20 special plants this winter to enable us to concentrate on formative pruning, weeding, mulching, watering, mapping and documenting the 300 or so trees planted over the last three years.

Considerable effort and funds have been put into sealing the Contemplation Pond, excavating silt, rebuilding the stone vehicle crossover to better direct water flow and depositing 3 tonnes of bentonite lining. Most of the large rocks around the edge of the pond had to be lifted then repositioned after the excavation. Sculptors Meliesa Judge & Will Kuiper took the opportunity to re-wax the bronze waterbirds while they were temporarily lifted out. It was a tense moment when the delicate sculptures on their heavy rock bases were deftly manoeuvred back into position.

The northwest corner of the Arboretum is looking very good at present. A small but dedicated group of volunteers has propagated and planted many indigenous understorey plants from seed collected in the Waite Reserve. The new plantings are thriving, but so too are the weeds – a constant challenge.

The Labyrinth continues to attract lots of new and repeat visitors, especially children, to the gardens and Arboretum, and many lovely comments have been left in the Visitors' Book.

Rejuvenation of the Garden of Discovery continued one Sunday in early June when ~ 14 members of the Mediterranean Garden Society planted 140 trees, shrubs and groundcovers, all purchased by the Society which allocated \$1,500 for the project. The garden showcases Australian natives which can thrive on minimal summer watering and will be spectacular when the new plantings are established. Also in the Garden of Discovery, volunteer Russell Cook has resown our annual display of historic wheat varieties, which always attracts interest.

Garden beds on the south side of Urrbrae House have been given a lift with additional plantings. New garden volunteers are warmly welcomed on Tuesday mornings 9 -11.30 am, especially anyone who would like to assist with rose pruning over the next week or so. We are also looking for helpers for the annual Treenet Symposium, especially on Friday 3 September in Urrbrae House and the Arboretum. Please contact me on 8303 7405 if you can assist.

Jennifer Gardner



Mediterranean Garden Society Working Bee in the Garden of Discovery

POT POURRI

FROM THE GROUND UP The Basics of Climate Compatible Gardening

On Sunday, 16 May, our patron, Sophie Thomson, with the animation and enthusiasm we have come to expect from her, addressed the above topic. She pointed out that there has been a change in gardening practices due to water restrictions and gave some of the reasons why plants die. One of these is planting at the wrong time e.g. October which, although still spring, can be quite hot and plants can face months of little or no rain. Spring is the worst time to plant; autumn is the best.

Sophie also said that, when buying Australian plants, it is important not to choose plants from high rainfall areas, e.g. the Dandenong Ranges, for planting in Adelaide but to make sure that the plants were originally from SA. Plants from areas as naturally dry as Adelaide. e.g. the Mediterranean region, S. & N. Africa, Mexico, Chile and some coastal regions of New Zealand, are suitable for the Adelaide region. Sophie showed some plant adaptations to aridity e.g. fleshy leaves, tough leaves, small leaves and hairy leaves.

Soil preparation is of the essence before planting and adding organic material to improve its water-holding capacity is so important that it has been suggested that a \$1 plant should be planted in a \$10 hole! If time is spent on the soil before planting and then the plants are mulched, the garden will flourish; a 1% improvement in the organic matter in the soil equates to 1½ buckets of water.

Sophie stressed the importance of the microclimate in a garden. Factors that need to be considered are shade, shelter the aspect (N and W in particular) of the area to be planted and whether or not there are any hard reflective surfaces. Plants on the north side of a garden, especially if the wind is strong, will lose a lot of water.

Although it is now deemed politically incorrect to grow a lawn, the benefits of a small, well placed lawn, planted with drought resistant varieties of grass, which requires little water once it is established outweigh synthetic grass. Apart from its aesthetic value, a lawn has a considerable cooling effect whereas synthetic grass gets hot in summer and children and pets can't play on it, needs watering if animals urinate or defaecate on it and still might need to be weeded.

Gardens should be divided into watering zones with 50% needing no water and 25% needing low water and 25% needing a lot of water. Rainwater tanks (as big as possible) to provide water for the garden are essential and all garden waste and kitchen scraps should be composted to minimise methane production in landfill.

All in all, this was a most interesting and informative talk which gave us much food for thought.

Jean Bird

TREES AND THE URBAN ENVIRONMENT

One of the major objectives in establishing the Waite Arboretum was to evaluate a range of species and assess their suitability to the local environment. This objective has been further enhanced with the establishment of Treenet.

With the current discussion about climate change, the relationship of trees to the urban environment has become of even greater importance. There are two reasons for this. Firstly, if the climate is indeed warming, then we need to take urgent action to ameliorate the effects on our ability to cope with the extra stress on everything that lives within the world's cities. Already there are plans to place roof gardens on new city buildings for example. (High energy costs in cooling buildings place more strain on existing infrastructure).

Secondly, our cities have developed what is labelled the Urban Heat Island (UHI) effect. Because of the large thermal mass of city buildings and roads, during hot weather it takes very much longer for cities to cool than the surrounding rural areas. Obviously, the larger the city the bigger the problem. This can also create intense vertical movement of air masses over a city, increasing the intensity of local storms. There is also another interesting side effect of UHI's. A very large number of our meteorological recording stations are inside the boundaries of the world's cities. Has this created a bias when looking at temperatures over the Earth as a whole?

Adelaide is more fortunate than many cities, with Colonel William Light's plan of surrounding Parklands. The City Council seems to be making an honest attempt to plant more trees in the parklands but that whole area is always under constant threat of alienation by buildings, temporary and permanent. This is very bad policy when we know that the wonderful shading and cooling effects of trees and open parkland will be the very thing that will save a growing city

from falling victim to increasing heat and pollution. The Council could also use the opportunity to capture the water runoff in the Parklands with David Lawry's 'Treenet Inlet' and 'Black Hole' detention system and do more for the trees than the recycled Glenelg water will.

Peter Waite's wonderful legacy here at Urrbrae, at least creates a green island in the southeastern suburbs.

Bryan Milligan

THE FRIENDS OF URRBRAE HOUSE

2011 will not only be a significant year for South Australia in celebrating its 175th Jubilee but the Friends of Urrbrae House will celebrate 20 years since the inaugural meeting on 17th April 1991.

The main aim of the FOUH is to use Urrbrae House for events that fit in with the history and atmosphere of this splendid 1892 family home of Peter Waite and his family and raise money for specific projects to assist with its restoration and conservation.

As well as arranging functions for the enjoyment of all associated with the Waite Campus and Historic Precinct, the FOUH enjoy such opportunities to have people visit Urrbrae House for the first time. Their usual response is "I did not realize that we had such a splendid mansion in Adelaide"!

The most successful and long running activity in the FOUH program is the Twilight Concert in the Drawing Room. Since 1998 these have been run in association with Vivente Music and promote local talent, including members of the Adelaide Symphony Orchestra. Because of the unique acoustics of the Drawing Room and discerning audience attracted, this venue is regarded by the musicians as one of the best in Adelaide for such chamber music recitals. Those attending also appreciate the refreshments provided prior to the concerts by the Committee.

In the past two years we have introduced some Sunday afternoon concerts in association with a tour of the House. On these occasions we are seeking to provide an opportunity for students from the Elder Conservatorium of the University of Adelaide to gain experience in public presentations. The next Sunday afternoon tour and concert will be on 5th September.

In contrast to the above but also taking advantage of another unique feature of Urrbrae House, the ballroom with its special sprung floor proved a great venue for a 'Peter Waite Heritage Ball' in 1991 and a '1920's Ball' in 2000. A Ceilidh was held in 2008 and a Bush Dance in 2009 was so successful it will be repeated this year (28th August).

In October last year the FOUH arranged a special presentation by The Lumina Vocal Ensemble. This was one of two performances to celebrate the 10th anniversary of this ensemble which comprises 16 a capella singers.

A follow up performance by Lumina will be held at Urrbrae House on Sunday afternoon 27th February 2011 as a Festival Fringe Event. On this occasion small groups of singers will present

a range of mediaeval, early renaissance and contemporary music at different venues throughout the House.

For the third year, FOUH will be presenting a 'Games Day' on 6th October 2010 for children and parents / grandparents. Featuring 'games our grandparents used to play' and a traditional 'Punch and Judy Show' this has proved a fun day for all.

From the profits of the above functions the FOUH have been pleased to assist with the following major projects in Urrbrae House: restoration of the dining room chairs, conservation and rehangng of the original drawing room curtains, refurbishment of the timber floors upstairs and the purchase of rugs and restoration of the billiard table.

The bell call system is currently being restored and a major project in the planning is the restoration of a children's bedroom to represent that of Eva Waite who was 12 in the year the current Urrbrae House was completed.

Bill Wallace (President 2007 - 2010) and Yvonne Routledge (President 2010-11)

THE STRANGE CASE OF THE DISAPPEARING MONTEREY PINES

Part 1: How Monterey pine arrived in South Australia.

The Monterey pine comes from the central part of coastal California. It is better known here as Radiata pine (*Pinus radiata* D. Don). Its natural vigour is greater than many of the several hundred species in the genus *Pinus*. Its native home has a similar climate to central parts of South Australia. That match has been called an example of a *homoclimate* that is, a common link with other parts of the world which share that type of climate. In the late 1940s and 1950s, Professor Prescott of the Waite Institute together with Professor Lindsay Pryor of the Botany Department of the Australian National University, compared the performance of tree species, when they were introduced and grown at one place although they were often floristically unique. The Mediterranean warm temperate climatic type was chosen and the place was the Waite Arboretum. They chose species that came from several global locations with this same climate in both the northern and southern hemispheres. They also studied some of the same species growing in a contrasting type of climate and used the ACT for this. This 20th century creation developed with many introduced tree species plantings, with most of them planted in special arboreta, in Canberra. Whilst they introduced species from South Africa and Chile in the 1950s, many species from the Mediterranean Basin as well as California, had been introduced into SA earlier, some much earlier. The earliest record is from 1837, one year after the colony was declared, when European oak seeds (acorns) were sown as a grove at Gumeracha. Conifers soon followed. Among the true pines (Genus *Pinus*) several from the Mediterranean Basin and the shores and islands in the eastern Atlantic had been established by the mid-1840s, namely, Maritime pine, (*P. pinaster*), Aleppo pine (*P. halepensis*) and Stone pine (*P. pinea*). According to J.C. Loudon, (*Encyclopædia of Trees and Shrubs* 1838; 1869 edition), these species had been cultivated in Europe and introduced to Britain in the seventeenth and eighteenth centuries, and would have been familiar to tree fanciers, several of whom arrived among the colonists.

Monterey pine was only discovered by European botanist plant explorers at about the time the SA Company was fostering colonisation. Its eventual arrival in South Australia was several decades later, since when it has become the predominant softwood species in the State's commercial forest plantations for the last 125 years. This is not surprising because, returning to the homoclimate concept, it is striking how similar are the settled areas of SA and central California. If you flip the map of SA and match it latitude for latitude with the northern hemisphere at the same scale over California, and when you overlay the same degrees of latitudes particularly, 132° to 138° N and 132° to 138° S, with the closest match to the respective coastlines, the comparison geographically is remarkably similar. The pines native to California, (specifically addressed by this note), were classified by taxonomists contemporaneously with the early settlement of SA. According to Loudon, the first five Californian species arrived as herbarium specimens with Dr Coulter in 1829. Monterey pine was amongst them, but was not named taxonomically until 1837, by David Don (*Linnean Society of London*, Vol 17: 439-444, 1837). He called it *Pinus radiata*, after the radial markings on the scales of its cones. But this was not the first discovery.

The first seeds of Monterey pine reached London also in 1829, introduced by into the Royal Horticultural Society's Garden, by M. Godefroy, a Parisian botanist and taxonomist. They came from trees growing in Paris that had come from seed of a single cone that had been collected "from the shores of Monterey Bay" by M. Colligon, a gardener who was part of the 1787 expedition of French explorer La Perouse, or La Peyrouse. The young trees from this cone also included one potted seedling that went to Dublin, Ireland. All died a year later from frost in the severe spring of 1830. The same fate met the young trees grown in and around London, from Godefroy's gift of seed, in severe frosts of winter 1837-38, but "not everywhere" – which appears to mean that a few specimens were spared at the Pineta, at Woburn, the Royal Horticultural Society's pinetum at Hackney, at Syon House, White Knights and especially Dropmore. At this stage these young Monterey pines were too young to produce cones and bear seeds. So far as people like the English colonists to SA knew, it was not within their vision.

Meanwhile, a Scottish gardener, David Douglas was employed by the Horticultural Society of London, sponsored by Joseph Sabine, to collect tree species on the Pacific Coast of North America. He explored there in 1831-32 and he rediscovered the pine that grew on the shores of Monterey Bay of California. He sent cones back to Britain and seeds were extracted in 1833. He sent part of the seed lot to the Royal Horticultural Society's Garden in London, and the rest to the Edinburgh Botanic Garden. Douglas, whose name is honoured by the famous Douglas Fir (*Pseudotsuga menziesii*), the source of 'Oregon fir' timber, named his species *Pinus insignis*, or Remarkable pine recognizing its high intrinsic vigour, beautiful green foliage and impressive timber-tree form. He also named the Digger pine, *Pinus sabiniana* as a compliment to his patron. The description was published in 1833 (*Trans. Linn. Soc., London* 16:749). However, he didn't publish his description of *P. insignis* until 1838, thereby missing out on the priority taxonomic name *radiata* for Monterey pine. Synonymy of the two names as taxonomically the same species was not resolved until the early part of the 20th century. This meant that the two specific names persisted independently for nearly a century.†

Subsequent exploration discovered the three discrete mainland populations of *P. radiata* and two more on offshore islands. Recalling the juxtaposition of the SA and Californian maps, the population at the lowest latitude in California, at Cambria, closely matches the state forest at Wirrabara in the southern Flinders Ra.; the one at the highest latitude, Ano Nuevo, matches the lower SE of SA (where over 100,000 ha of plantations grow successfully).

Three of the five pine species collected by Dr Coulter, endemic to Coastal California, between latitudes 132°N and 138°N, are growing today in the Waite Arboretum. These are Digger pine, *Pinus sabiniana*, Bigcone pine, *P. coulteri* and Torrey pine, *P. torreyana*. Three species from that area, including two found by Coulter, are not growing here any longer. Most surprising of all, Monterey or Radiata pine, *P. radiata*, D. Don (syn. *P. insignis*, Dougl.), Bishop's pine, *Pinus muricata*, and lastly, a later discovery, Knobcone pine, *P. attenuata*, pine are not growing there either. Herein lies the mystery that will be examined in the second part of this article.

The early history of domestication of Monterey pine is an interesting path that leads to its arrival in this State. The first reliable Australian records of Radiata pine are from the Sydney Botanic Garden (SBG), namely, a potted *P. insignis* received from Veitch in 1854 and another simply recorded without a date, as "one from Kew [Gardens]". *P. insignis* is recorded in the catalogue of the Hobart Botanic Garden from 1855.

The commercial distribution of the Californian pine species was taken up by an English nurseryman of Scottish descent, James Veitch, based in Exeter, Devon. He promoted the pines from SW of the USA and Mexico, not just in Europe. His son John opened a branch of the tree nursery business in Chelsea, London in 1832. Veitch senior employed a Californian local man, William Lobb, from 1850 to 1857 to send cones and seed from Monterey. In 1858 Lobb severed his connection with Veitch, produced potted seedlings at his own place, and exported them until 1863 when he died.

Substantial documentation, however, supports the arrival in Sydney on 13th December, 1857, of the *Duncan Dunbar* with seeds and potted plants from London, via Plymouth. One potted *P. insignis* tree was donated to the SBG. All the seed and the bulk of the potted plants went on to Melbourne to meet an order from Baron Ferdinand von Mueller, the Government Botanist. Seedlings were reported to be growing at the Melbourne Botanic Garden (MBG) in 1858 (Report of Government Botanist to Parliament, 1858). Von Mueller used some of the potted plants (clearly there were more than 60) to form an avenue in the MBG and others, enough to form a two-row hedgerow, i.e. a shelterbelt, were planted at Doncaster (now an inner suburb of Melbourne) and the property of a close friend. K.J. Simpfendorfer, witnessed the felling of this belt in 1962 and ring-counts on stumps indicated a planting date of 1861 or 1862. (Seed from Hobart was received at the MBG in 1864-5). Von Mueller distributed *P. insignis* seed "most extensively throughout the Colony of Victoria and some other parts of Australia" as he wrote on the flyleaf of one of the books he published which is held in the MBG. Ferdinand von Mueller had a close professional relationship with William Hooker at Kew and had sent specimens of the Australian flora in 1853. J.G. Veitch visited the MBG in 1866. People were so impressed by the growth and form of *insignis* pines that in 1869 the Inspector of State Forests in Victoria stated that an expenditure of no less than £100 was recommended for the purchase of seed *from Europe* (writer's emphasis).

Baron von Mueller is credited with the introduction of *P. insignis* into South Australia. This was definitely in the form of potted plants which the Adelaide Botanic Garden (ABG), Annual Report in 1866 states to be "a donation from Dr Mueller, 40 *Pinus insignis*". These were grown, most probably, from seed of the trees imported in 1857 and growing in the Melbourne Botanic Gardens, which would have borne seed by this time. The ABG Annual Report recorded that the *P. insignis* trees had been planted in an avenue. Dr Schomburgk, Director of the ABG, and F. von Mueller were good friends. Dr von Mueller had a property at Bugle Ranges near Mount Barker, in the Mt. Lofty Ranges of South Australia. By 1878, the avenue in the ABG was reported to be "over 50 feet high [15 m] although not over 12 years old". The 1867 ABG Annual

Report advocated the use of “Californian pines” for parks and avenues into the city, which suggests that experience longer than one year (in relation to the donation of 40 trees in 1866) supported the recommendation, possibly as a result of some plants supplied by von Mueller between 1857 and 1859.

South Australia is credited with establishment of one of the original (if not the oldest) public forestry departments in the British Empire. The initiative came from the Surveyor-General. G.W. Goyder, appointed in 1861, who had “convictions that the timber lands should be reserved and regenerated, and supplemented by planting” and in this he was supported in Parliament by F.E.H.W. Krichauff in 1870 with a motion which set the matter in train. The use of plantations was clearly indicated. Mr. Krichauff was a neighbour of Dr von Mueller at Bugle Ranges. (Lewis, N.B., 1975, *A Hundred Years of State Forestry. South Australia: 1875-1975.*) In the follow-up to this move, public participation was included in which pines were clearly identified as suitable trees for the higher rainfall and sandier soils parts of the State where they have unquestionably succeeded subsequently (*Report by the Surveyor General, G.W. Goyder, October, 1872*). The report includes a verbatim summary from all respondents to a number of specific questions.

Credit for recommending wide scale testing of *Pinus radiata* in the newly designated Forest Reserves in SA has been attributed to Edwin Smith who was a Scottish-trained nurseryman, brother-in-law and advisor to G.W. Goyder. An ‘Act to Encourage the Planting of Forest Trees’ was passed in 1873. Goyder was responsible for locating suitable sites for the original Forest Reserves and was Chairman of the first Forestry Board, created by a further ‘Resolution of Parliament’ in 1875. The Board was given control of 78,900 ha of land. It “decided to grow only useful timber; ... and where quality of timber was equal, preference was to be given to that variety having the most rapid growth” (quoted in Lewis, *ibid*).

Monterey pine, unlike all the other conifer species put into forestry trial plantings after 1875, has no recorded acknowledgement in Forestry Board Annual Reports of the source of its seed. The other species sources were acknowledged and were mostly private individuals and local landowners. From the date of first usage and the relatively large scale of seedlings raised, this source was almost certainly the trees in the Botanic Garden avenue, courtesy of Dr Schomburgk, a Forestry Board member.

Historical observation

† SA forestry figured in the confusion about the specific names *insignis* and *radiata* and actually had evidence, without drawing the necessary conclusion, that the two were identical in a single plantation, planted in 1882 at Wirrabara Forest. The plantation was the largest in area made up to that time. As usual it was divided into discrete blocks for management purposes. Transplants in some of them came from the local seed source used by the Woods and Forests Department from the start, known as *P. insignis* and the remainder planted with seedlings grown from seed obtained from Lawson’s, seed merchants of Edinburgh, Scotland. These were labelled “*Pinus radiata* true to name.” Walter Gill, the Conservator of Forests at the time the stand was growing, was also a professional photographer and several of his prints taken through this plantation appeared in the Annual report just prior to the time the trees were clear-felled. The trees all appear to be similar and, with the benefit of hindsight, match those from Monterey Bay populations. We can surmise that Lawson’s seed came from trees grown from the seed sent to Edinburgh by David Douglas under his nomenclature. This plantation formed a milestone in SA’s forestry history; it was the first major sale of Monterey pine timber (Lewis, N.B., 1975. *One*

Hundred Years of State Forestry: Bulletin, Woods & Forests Department, Gov't Printer, Adelaide; Boardman, R., 1979. Productivity under successive rotations of radiata pine. Tech. Note. Aust. For. 41:177-179)

Robert Boardman

FORTHCOMING FRIENDS OF THE ARBORETUM EVENTS

6.30 – 8 pm Wednesday 18 August:

Guitar concert by Aleksandr Tsiboulski and Jacob Cordover. Cost \$25 (conc. \$20). Light refreshments will be served from 6 pm.

Thursday 2 September and Friday 3 September: 11th TREENET SYMPOSIUM.

Sunday 10 – Sunday 17 October: Exhibition of Beryl Martin's paintings.

10 am Wednesday 13 October: special morning tea for Dr David Symon, Curator of the Waite Arboretum 1956 - 1985 who will be celebrating his 90th birthday on the day.

Friday 19 November: Talk and twilight walk by Meliesa Judge, sculptor.

HELP NEEDED

In the last Newsletter I pointed out that the Committee is calling for Volunteers to help with the Treenet Symposium. We still need help at the following times:

Monday 30 August at 10 a.m. – packing satchels in the Coachhouse

Wednesday 1 September – afternoon set up in the National Wine Centre

Thursday 2 September 8 a.m. – 5 p.m. (in shifts) – Registration Desk in the National Wine Centre

Friday 3 September 8 a.m. – 4 p.m, (in shifts) – assisting with food and guiding at Urrbrae House.

If you can commit to any of these times we shall be extremely grateful. Please Contact Jennifer 8303 7405 if you can help.

We also need help with rose pruning and the roster for Beryl Martin's exhibition (10–18 October)