The Great Melbourne TELESCOPE

PHOENIX

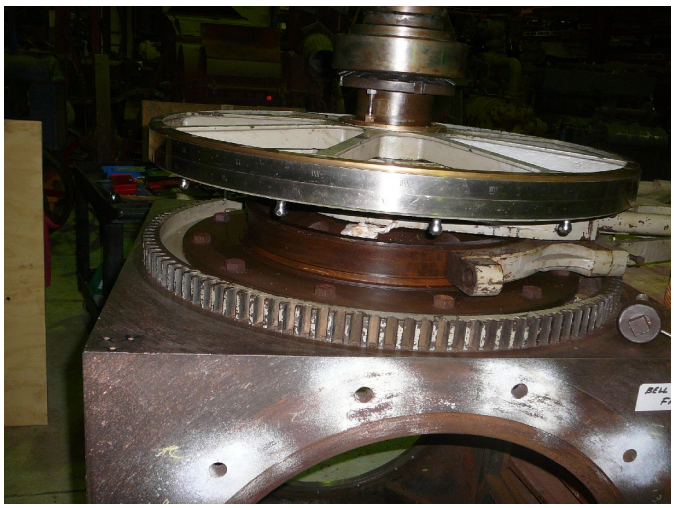
Astronomical Society of Victoria (A.I.N. A0002118S)

Issue 6 - March 2012

Slow but Steady Progress

This issue #6 of *Phoenix* appears after a 15-month gap! Work on the telescope (if not on *Phoenix*) has been plodding on reliably, but there has not been much that is spectacular to write about. But lately, some more noteworthy developments have occurred, such as a long-shot chance of getting a free primary mirror.

With slow but steady progress; we are now at workshop #125. We have catalogued all the GMT parts, cleaned them, understood them, and are halfway through photographing, describing and documenting them; so far about 500 pages of optical, mechanical and electrical engineering plans have been drafted. Some broken castings have also been repaired.



To aid with our understanding of how the GMT really worked, and to help us plan exactly how to restore it, we have refitted some parts into assemblies, the largest of which is shown in these two pictures. This includes the lower part of the Polar Axis mounted on the Cube, and fitted with the Hour Circles, the main driver sector, and its slow-motion arrangement.

Some of these parts have thereby been reunited after thirty years of separation by hundreds of miles (and even more kilometres).

On the right is another assembly - this is the roller mechanism that relieves most of the equatorial-plane loads on the declination axis bearings. These heavy loads, of course, arise from the sheer weight of the parts involved, to which this assembly also contributes. Oh, the irony.

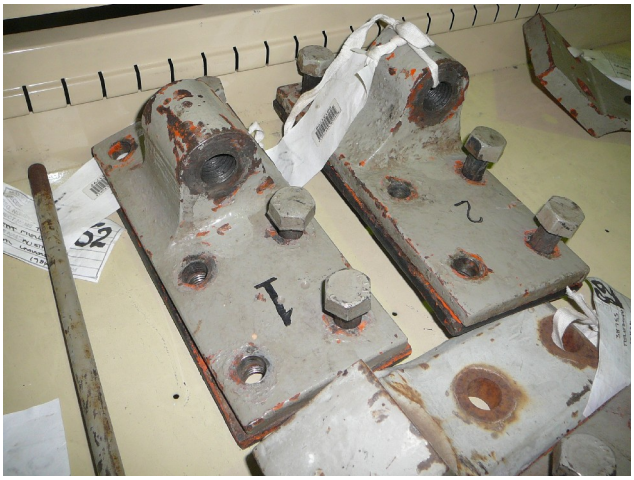
And speaking of irony, as most individual parts of the GMT are 100% Fe … for parts weighing less than about 25 kg, we

can handle them manually. Heavier parts have to be handled by crane driven by MV staff. But when we work with these assemblies of many parts, the immense weight of the whole GMT strikes home. Believe me, this thing will be HEAVY! We would not want it to move around freely, and land on your feet, let alone ours, so (obviously) the final assemblies will be properly balanced, and there will be all sorts of safety mechanisms.

But still, the sheer mass of it is impressive. The moving mass of the original GMT (comprising: Optical tube assembly, Cube, Polar axis and Drive mechanisms, Declination axis and Counterweights) was about eight tons! Although, in modern units, that would be about eight tonnes, which fortunately is not quite as much.

Despite the seemingly slow pace of progress at this stage of the project, we are all still very fired up and we earnestly look forward to this mighty iron behemoth - for decades the biggest steerable telescope in the world - once more punctuating the skyline of Marvellous Melbourne, and rising again to image our glorious Southern Skies!

Some SPACE FILLING PICTURES of our work so far



Tube lugs, with very old paint, for attaching the mirror cell to the lower end of the optical tube

The Quadrant, which holds the lower polar axis bearing that takes much of the 8-ton moving mass

The Declination Axis Main Bearing Polar Load Relief Assembly, sitting roughly where it belongs on the Cube

ASV Project Volunteers, and some of the mess they make

GMT PROJECT ADVISERS

The GMT Restoration project has attracted the support of community leaders, educators, and astronomers who have expressed enthusiasm for the project. We are very grateful for their support and advice :-

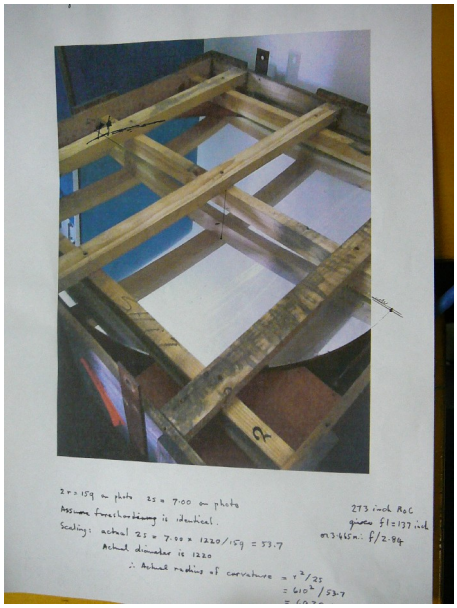
- **Professor Rob Adams** AM, Director of Design and Culture, City of Melbourne
- **Professor Weston Bate** OAM, Historian, Past President, Royal Victorian Historical Society
- **Professor Robin Batterham** AO, President, Australian Academy of Technological Sciences and Engineering; Kernot Professor of Engineering, U. of Melbourne
- **Professor Harvey Butcher**, Director, Research School of Astronomy, A.N.U.
- **The Honourable John Cain**, former Premier of Victoria
- **Dr Gloria Clifton**, Curator Emeritus, Royal Observatory, Greenwich
- **Professor Warwick Couch**, Centre for Astrophysics and Supercomputing, Swinburne University of Technology
- **Professor Glyn Davis** AC, Vice Chancellor, University of Melbourne
- **Professor David de Kretser** AC, former Governor of Victoria
- **Professor Peter Doherty** AC, Department of Microbiology and Immunology, University of Melbourne
- **Robert Doyle**, Lord Mayor of the City of Melbourne
- **Dr Alan Finkel** AM, Chancellor Monash University
- **Peter Hiscock** AM, Chair, Puffing Billy Society; former CEO, Sovereign Hill Museums Association
- **Dr Gael Jennings**, Board Member Museum Victoria
- **The Honourable Dr Barry Jones**, Professorial Fellow, University of Melbourne
- **The Honourable Jeffrey Kennett** AC, Former Premier of Victoria
- **The Honourable Joan Kirner** AM, Former Premier of Victoria
- **John Landy** AC, CVO, MBE, former Governor of Victoria
- **Professor John Lattanzio**, Centre for Stellar and Planetary Astrophysics, School of Mathematical Sciences, Monash University
- **Bill Mackey**, Deputy Chief Executive, Australian Academy of Technological Sciences and Engineering
- **Professor Sir Gustav Nossal**, Professor Emeritus, Department of Pathology, University of Melbourne
- **Lord Rosse,** Birr Castle, Ireland
- **Noel Turnbull**, Adjunct Professor, School of Media and Communications, RMIT University
- **Dr Fred Watson** AM, Astronomer-in-Charge, Australian Astronomical Observatory
- **Professor Rachel Webster**, School of Physics, University of Melbourne
- **Dr John Zillman** AO, University of Melbourne; former Director, Bureau of Meteorology.

Our Search for a Primary Mirror

The lead time to buy a new 48-inch *f*/6.5 or *f*/7 mirror, with secondary mirror and other associated optics, is about 2 years, so we are NOW at the stage where we have to place an order. And, er, pay a 50% deposit. We have been expecting this cost and delay since the beginning of the project, and accordingly we have had our ears to the ground for word of 48-inch mirrors being used as boat anchors, doorstops or wastes of space, and free to a good home. Apart from stiff necks and some gravel rash of the pinnae, we ended up with three second-hand possibilities.

The first of these three mirrors is of poorly durable glass that requires re-polishing every few years. But if we have to do that, we might as well stick with the original speculum primary - a thought too awful to contemplate in terms of risk of breakage and the impossibility of getting an optical performance that would satisfy the more discerning of the telescope's future users.

The second mirror is in storage at an Australian university, and is depicted in this photo that its owners sent to us. Noting that the packing battens pass across the middle of the mirror, by dropping a perpendicular through the mirror surface (very carefully, of course, so as not to scratch it) down to the battens' reflection, Barry Clark was able to establish the mirror's focal ratio to be *f*/2.7 - a focal ratio so short that we could almost build a complete Cassegrain optical system within the boiler plate lower section of the GMT tube! The almost empty lattice part of the tube would puzzle visitors for ever. Then, we noted that all the best Cassegrains have a *hole* in the primary mirror, so the light reflected from the secondary mirror can reach the eyepiece behind it. If we were desperate, we could treat this precision optical mirror as a blank piece of glass ready for perforating, followed by grinding and polishing to a longer focal length. But that would be like scrapping a Rodin bronze to get metal for casting a new sculpture.



A better use for this mirror would be to use it for a full-aperture collimator to help set up GMT optics that incorporate some *other* primary mirror. Such a collimator would be very useful because there is little prospect of seeing stars or anything else at optical infinity from our indoor workspace at Moreland. After the collimator has done its duty, it could readily be converted into a compact Nasmyth telescope with a very convenient fixed eyepiece.

Then, an American journalist who visited the GMT project in 2011 tracked down a third mirror for us, overseas. This mirror would be ideal for the GMT, except that it does not have the necessary central perforation (so we should adopt a holistic approach) but we would need to overcome a lot of bureaucratic complexity and red tape, and meet the significant transportation costs.

So, as essential backup to our op-shop crawl, we have been collecting **quotes for new mirror sets**. The dearest price is over three times the cheapest. One of the less expensive prospects is a cellular primary mirror made by fusing separated heat-softened blocks of borosilicate glass between thin disks of the same. The glass hardens as it cools, but so far there has been no sign of a hard sell :-(

Drawings and C.A.D. files

The scarcity of recent *Phoenices* might lead some readers to believe that work on the restoration of the Great Melbourne Telescope is in decline. Nothing could be further from the truth! I have excuses for failing to make new issues, of course, and I'll be overseas now until September so Phoenix 7 will be later in the year. (But which year?)

Workshops have occurred EVERY WEEK except for a 2-week break around Xmas; we are now on workshop 125. Every Wednesday, between 7 and 14 volunteers show up at Moreland and toil more or less ardently until late afternoon. Of course we break for lunch at the Awful Cafe; we do a coffee break as well but that is also a pretty ghastly experience - see the "Adventures in Moreland" at the bottom of the last page.

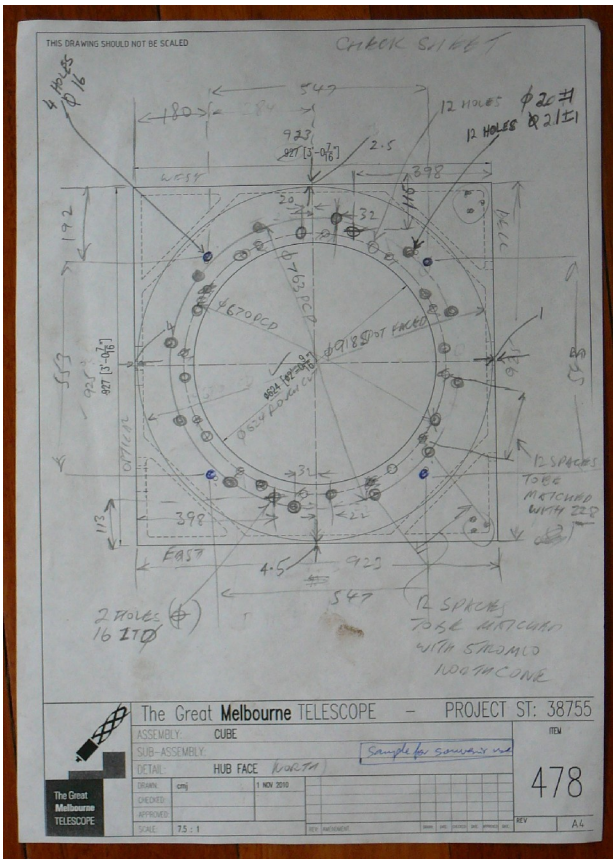
We have arrived at the stage where we have identified all the GMT parts on hand, and cleaned most of them, and for the last 12 months we have been drawing them and writing them up. Generally each part has to be written up in three types of Museum document - photographs, drawings, and a written description. Developing all this documentation is tiring and tedious work, but it must be done and we are persevering at a steady pace. To date, of the 600 numbered parts and assemblies, about 90% have photographs, 50% have CAD drawings and 20% have written descriptions. We should have inherited all the original and 1950s engineering drawings kept at Mt Stromlo, but these were tragically lost in a bushfire - not the 2003 fire that ruined the GMT, but another fire in 1952.

A database of parts is updated weekly to monitor this progress. There's a separate article about this fascinating enterprise elsewhere in this issue of *Phoenix*, but for now we'll say the database records the name and weight of each part, notes about the progress of writing documentation for it, and the origin of the part, as one of five categories:

- it's an original Grubb part from 1868, or
- it's a part that was added later by Mt Stromlo, or
- the part is missing (lost, destroyed, or cannot be found), or
- this is a proposal for a wholly new part, or
- this is really an assembly of other parts.

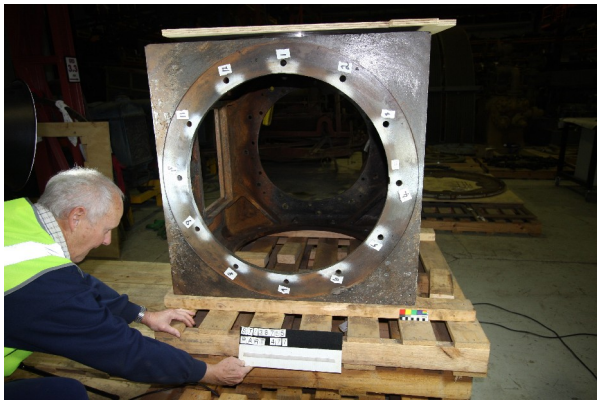
For each part, a clickable link takes you to a directory for that part, where everything known about it is kept - photographs (each photo showing a colour swatch, and a board with the part number and GMT project reference - ST/38755), description, and the CAD drawing, both as an AutoCAD file and as a PDF. The CAD drawings are printed out, checked by a different engineer, and the finalised version is formally signed off.

Poor Jack! We told him not to go inside the Southern Cone ... terrified folk were muttering about the Legend of the Cone Monster ...



The picture on the left shows the checking of just one face of the Cube, after the checker has scrawled all over it. The Cube is so complicated that although it was cast in one 620-kg piece (an amazing feat of engineering, for 1868) we have had to divide it notionally into twelve sub-parts - 6 outer and 6 inner faces. This sheet of paper would go back to Campbell, our hapless CAD expert, who has to decipher the scrawls and get all the new details into the CAD drawing. Then we check it again, and may add further changes in which case it goes around the cycle again :-(

And speaking of the Cube, below is a photo of Graham trying to label one face of it. Note his overly cautious approach and respectful demeanour! One does not simply *label* the Cube; one must first approach it with trepidation and due reverence.



The written description is really the most important document, because it not only describes the part but also states where it belongs on the GMT and what it is used for, its current condition and the proposal for what we are going to do with it. When ALL the parts of an assembly, for example the slow-motion declination drive, are described and written up, we can have a meeting with MV personnel and discuss proposals for action; the agreed actions will then be written into the descriptions, and the work carried out, paid for (if we have to), accepted and signed off.

These may be tedious and exasperating procedures, but it's how MV functions, what with the Great Melbourne Telescope being an irreplaceable relic of a bygone age. Being owned by MV it is also public property, so any alteration of it requires properly informed consideration beforehand, as we should not make any mistakes with heritage materials! So, progress has been steady but not newsworthy; we are still on track for completion in about 2014-15.

SHERLOCK HOLMES AND THE HAT

Sometimes, on assessing the purpose and fitting for GMT parts, we have to make deductions worthy of Sherlock Holmes - who, in *The Blue Carbuncle*, was given a battered felt hat and observed: "On the contrary, Watson, you can see everything. That the owner was highly intellectual is of course obvious upon the face of it, and also that he was fairly well-to-do within the last three years, although he has now fallen upon evil days. He had foresight, but has less now than formerly, pointing to a moral retrogression, which, when taken with the decline of his fortunes, seems to indicate some evil influence, probably drink, at work upon him. This may account also for the obvious fact that his wife has ceased to love him. He has, however, retained some degree of self-respect. He is a man who leads a sedentary life, goes out little, is out of training entirely, is middle-aged, has grizzled hair which he has had cut within the last few days, and which he anoints with lime-cream. These are the more patent facts which are to be deduced from his hat. Also, that he has recently had mains gas laid on in his house."

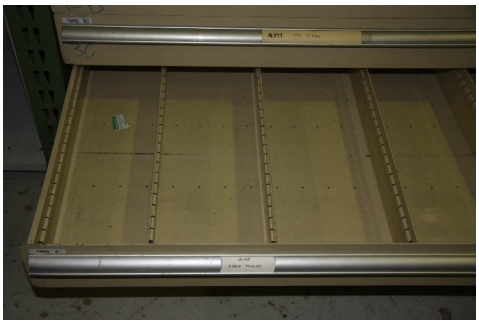
Estimates of Necessary Expenditure

Barry Clark wrote a detailed paper - many weeks of work - on the commercial work that we expect to require for restoring the GMT, an idea of the cost of each task and the approximate financial year in which the cost would occur. By far the major cost was $300,000 for a new Cassegrain mirror set, but many smaller costs mount up to exceed this figure.

The restoration tasks were grouped into Optics, Lattice tube, Opto-mechanical replacement parts, Polar axis, Declination axis, Support/mounting frame, Electronic motion control, and the Mirror grinding/polishing machine (MGPM). Knowing that ASV volunteer labour will continue - we have put in over 6,000 man-hours to date, with about double that figure yet to be done - and without using the Museum's own workshops, the estimated costs *without the mirror* were:

Stage 1	Repair parts, replacement parts, start work on polar/decl axes	$238,600
Stage 2	Finish polar/decl axes, optical mechanics, motion control	$190,000
Stage 3	Install into GMT House, test and finalise; build MGPM	$175,500

At present we are halfway through Stage 1 but with very little money spent (or available; the picture shows the drawer where we keep our Surplus Funding). Without discussing fundraising for now,



we estimate that the transition to Stage 2 should occur in late 2013, with completion of Stage 3 in 2014-5. So far so good … but some of the tasks may alter in cost. Most negatively, the above estimates do not include buying the primary mirror and other optical components, or making changes to accommodate a donated mirror. But conversely, some other tasks might come in well below the estimates. For example, replacing the missing half of the Lattice Tube could be done in the Museum's own workshops, or done at a university as a project for engineering students.

Barry's report also identified our Highest Priorities at the time of writing (mid 2011, but they have not changed since then). Regardless of the size or sequence of expenditures, the tasks on the "critical path" were, and still are:

1. Acquire a new mirror - if we cannot find a second-hand mirror soon we will have to order a new mirror set, and pay the required deposit (probably 50%)
2. Systematically proof test the critical structural elements of the GMT and show that the GMT will be structurally sound enough for an operational lifetime measured in centuries.
3. Supply local universities with engineering drawings for NC machining major repairs or replacement of broken parts, at materials cost.
4. Bead blast and apply protective coatings to the Cube and some other large castings.
5. Make a scale model of the GMT and its surrounding operational workspace, to guide an MV decision on exactly where and how to reassemble the GMT within the MV warehouse.
6. Buy self-aligning bearing for the outer end of the declination axle, replacement bearing for the north end of the polar axle, and needle bearing for the south end of the polar axle
7. Complete the paperwork descriptions of all the GMT parts, so as to provide full enough documentation to begin discussions about restoring assemblies of parts.

The Database of GMT Parts

We maintain an Excel file that documents the GMT parts and assemblies and the progress of work on them. We rename the file for every workshop, and we save all the old copies, storing all of them on the Museum's server which is backed-up nightly, and in addition we keep two copies of everything offsite*.

471	Mirror Polisher Arm Rotator, bearing half, drive shaft left	Link	M	L		378	0.5	Generic copy of 366		greened	TBD - missing part
472	Mirror Polisher Arm Rotator, bearing half, drive shaft right	Link	M	L		378	0.5	Generic copy of 366		greened	TBD - missing part
473	Finder Scope Drawtube Assembly	Link	T	A	488 489 490 491 492	204	1		done	TBD	TBD soon
474	Finder Scope Eyepiece Assembly	Link	T	G		204	6			TBD	2-Nov-11
475	Cube Optical Tube Face	Link	T	G		157	50		with SJR	MV	2-Nov-11
476	Cube Bell Housing Face	Link	T	G		157	50		with SJR	MV	26-Oct-11

A few typical lines from this database are shown above; the columns are, from left to right:

- Part Number - 3 digits 001 to 999 - no particular groupings - and Part Name
- A clickable hyperlink, leading to the pictures, description and CAD of this part
- Context - (T)elescope, (M)irror-grinding machine, (U)nwanted
- Origin - (G)rubb 1868, (S)tromlo, (L)ost or missing part), (P)roposal, (A)ssembly
- For an assembly (e.g. 473) - a list of all the parts that the assembly contains
- The single assembly that this part or assembly belongs in
- Mass of the part, kg, and optional free-form notes
- Description of the part (the progress of completing the description)
- Photographs: to be done, need improvement, done to MV standard, or "greened"
- CAD - the progress of making and verifying a CAD drawing, or the date of signoff

Any part, such as the Finderscope Drawtube (part 473, in the sample lines above), can at any time be discovered or construed as being an assembly of smaller parts. When a part is physically or conceptually broken up into smaller parts in this way, then all the new parts are added to the list, the original part becoming an *assembly* but keeping its original part number. Every part belongs in exactly one assembly, and every assembly belongs in exactly one higher assembly, except for 998 "Pile of Unused Items" and 999 "Great Melbourne Telescope, installed in GMT building".

The other messy area concerns the management of missing parts. As these no longer exist, it is difficult to draw them and make a CAD file, and impossible to verify the drawing or CAD, except for areas that join onto an existing part. The only sources of information we have for the missing parts are the 19th-century photographs and academic papers that happen to show them; we edit the best of these renditions to highlight the part in "green" (an example is on page 3 of Phoenix #5).

The missing parts were part of the original GMT, so we will need to manufacture them, for which proper engineering drawings are now essential. (Gone are the days of master craftsmen sighting at structures and measuring with their thumbs; the 1826 Menai Bridge+ was the last major engineering project to be built without any engineering drawings). For each missing part there will be at least *two* verification processes - one to sign off the drawings that will define the manufacturing process, and another to verify the newly-made part against its physical neighbours.

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*This paranoiac redundancy reminds me about the murder of Rasputin: poisoned with enough cyanide to kill 5 men, then shot, his head clubbed in with iron bars, shot again 3 more times, and thrown into the icy river Neva, then his body was fished out and buried, and then it was exhumed, and burned, the ashes were fired from a cannon, and ploughed into the ground. A footnote in my history book pointed out that "A strong element of skepticism runs in the Russian soul."

+ Celebrated, of course, in this badly-scanning Welsh *englyn* by Dewi Wyn o Eifion (David Owen, 1784–1841):

Uchelgaer uwch y weilgi - gyr y byd / Ei gerbydau drosti, /
Chwithau, holl longau y lli, / Ewch o dan ei chadwyni.

GRAND 100th WORKSHOP LUNCH!

When we had our 100th workshop I thought that for once, just for once, we could eschew the Awful Cafe and sample one of the many gastronomic delights of Sydney Road. So here we are at the Cedar Tree Restaurant, scoffing a giant Lebanese Feast. Congratulations, guys!

ANOTHER DISTINGUISHED VISITOR

Heidi Victoria MP, the member for Bayswater, Parliamentary Secretary to the Premier and Assisting the Premier with the Arts, *visited the 94th GMT Project workshop at Moreland in 2011. The picture shows, from left to right: Declination Axle, GMT; Neville Quick, Manager Storage MV; Dr Robin Hirst, Director MV; Dr Richard Gillespie, Head Science & Technology, MV; Heidi Victoria, MP; Jim Pollock, ASV. Meanwhile, in the background, some people are working.*

Richard's New Book!

"The Great Melbourne Telescope"

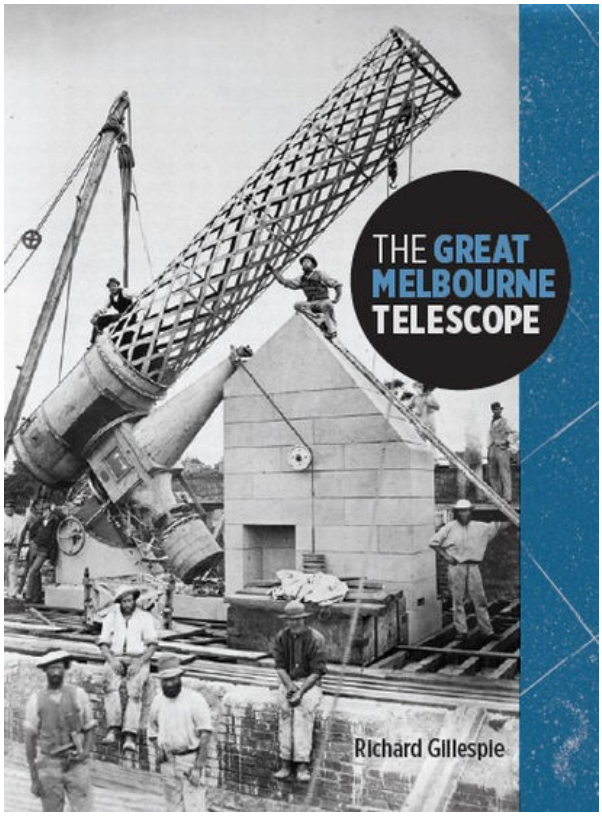
Dr Richard Gillespie, Head of History & Technology at Museum Victoria, has written this book about the instrument in his professional care. Copies are available **post free** from Borders: http://www.borders.com.au/book/the-great-melbourne-telescope/25878729/ - or ask us to get you a copy and we can get it signed for you. Here is a review by Dr Nick Lomb of Sydney Observatory, taken from their website.

The Great Melbourne Telescope, by Richard Gillespie.

RRP $29.95. Published by Museum Victoria - ISBN 978-1-921833-05-2
Paperback, colour and black & white illustrations, 192pp

In November 1868 the ship *The Empress of the Seas* arrived in Melbourne carrying the disassembled parts of what was to be the largest steerable telescope in the world, *the Great Melbourne Telescope*. This large telescope with its 48-inch or 1.2–m wide metal mirror was installed and ready for use in its sliding-roof housing at Melbourne Observatory by the middle of the following year.

The absorbing story that led up to the arrival of this famous instrument is ably told in a new book by Richard Gillespie, the Head of the History and Technology Department at Museum Victoria. Some of the leading astronomers in Britain are involved in the story as is some complex politicking in the Colony of Victoria.



William Wilson, the young professor of mathematics at the new University of Melbourne, was the originator of the idea of a large telescope for Melbourne and its strongest champion. Though there was immediate support for the idea, at the time in the second half of the 1850s there were also competing proposals for scientific projects. One proposal put forward by the German scientist Georg Neumayer, was for the establishment of a magnetic and meteorological observatory. Richard Gillespie does not shie away from quoting Wilson's xenophobic reaction, 'it would be a scandal if a foreigner should have the honour of carrying out such an important task'.

Eventually Wilson compromised and agreed to combine Neumayer's observatory with the existing small astronomical observatory at Williamstown into a new Melbourne Observatory that would house the new telescope. With the establishment of the new observatory next to the Botanic Gardens, Wilson could start seeking support both in Britain and in Victoria in earnest. After many trials and tribulations, discussed in the book, the contract for the telescope was signed on 19 February 1866.

The arrival of the GMT in Melbourne is, of course, just the early part of the story. The book goes on to tell of the operation of the telescope at Melbourne Observatory, the variety of fascinating characters associated with it and the controversies that surrounded it. Surprisingly, we find out from the book that the telescope did not just fade into obscurity, but had a new life at Mt Stromlo Observatory near Canberra from the 1950s onwards. At Stromlo it first became the 50-inch Telescope and, more recently, once again as the Great Melbourne Telescope it became a fully automated telescope searching for a form of dark matter called MACHOs.

One concern I have about the book, and that should come as no surprise to anyone including the author, is the claim on page 34 that 'Melbourne would have the pre-eminent observatory in Australia for decades to come'. The main other observatory in Australia during the second half of the nineteenth century was Sydney Observatory and the statement indicates a value judgment between the two institutions. In the 1870s Henry Chamberlain Russell, the director of Sydney Observatory, built up the staff and resources of his observatory so successfully that their contemporaries treated Russell and his friend Robert Ellery at Melbourne Observatory as equally pre-eminent in the Australian science of the late 19th century.

My one concern aside, the book relates the story of one of the most important artefacts in the history of Australian science. The book is highly readable with Richard Gillespie carefully putting events in the context of the times. An unusual aspect is the inclusion of short almost fictional pieces at the start of each chapter such as 'Robert Ellery sat at his desk, searching for the right phrase', that helps to bring the people and events described alive.

I strongly recommend *The Great Melbourne Telescope* to anyone with any interest in the history of Australian astronomy and science, whether they are based in Melbourne or in Sydney or elsewhere in the country.

PRESS COVERAGE!

On the symmetrically dated Tuesday 21-2-12 the Melbourne *Age* ran a very positively-written article, complete with a photo of Campbell Johns measuring a piece of the Lattice Tube. And there are 10 more very good photos you can click on, in the article:

www.theage.com.au/victoria/great-melbourne-telescope-to-see-night-again-20120220-1tjn8.html

… Phew, what a long URL! So instead, I have set up a shorter one - go to:

www.tinyurl.com/age212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Great Melbourne Telescope to see night again

Glenn Mulcaster
February 21, 2012

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Campbell Johns, one of the volunteers at the Museum Victoria storeroom in Coburg, works on the restoration of the Great Melbourne Telescope. *Photo: Eddie Jim*

THE draughty timber building used as a dressing room by Shakespearean performers at the Royal Botanic Gardens was the scene of much 19th-century drama.

It housed the Great Melbourne Telescope, a British scientific icon that Victoria wrested off colonial rivals Tasmania, New South Wales and South Africa after industrious political and scientific lobbying and £5000 from the Treasury vaults. The telescope, feared lost at sea when it arrived late in 1868 and then damaged in the 2003 Canberra bushfires, has survived its fire and tempest and will return to Melbourne Observatory after a worldwide

Steve's Adventures in Moreland

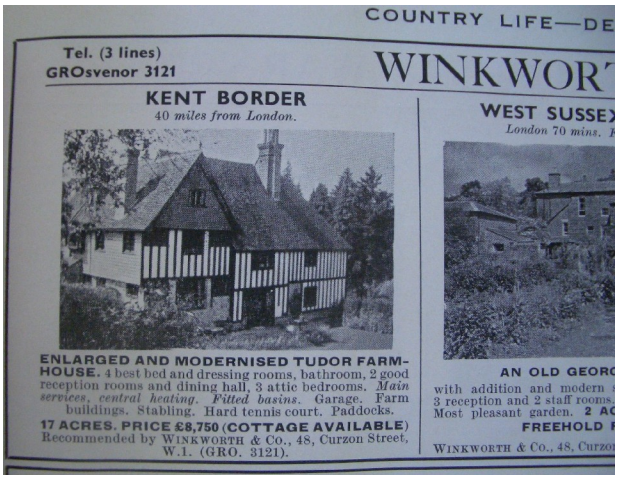
Moreland is a nice quiet suburb where not much happens, but that only applies to people who do not have morning coffee in the MV Tea Room. At every workshop, we have to endure this torture - because the tea room contains a lot of items that have been given to the Museum but are not required and so would otherwise be thrown away. A bust of Bob Hawke - melamine trays and plastic equipment for cocktails - a mirror with clock and picture of Elvis Presley - a woven depiction of Hiawatha. The walls are bright pink.

This Record Player, for example, comes with an ever-growing collection of seminally unwanted LP records from the 1960s - records that the Salvation Army's shop evidently did not want. (Dear Sir, I have a large round black thing with a hole in the middle - is this a record?)

But nothing compares with the room's masterpiece - an outline of Australia done in sea shells, with a picture to fill out the "ghastly blank" in the middle. A picture of *Adelaide*. A picture of Adelaide *at night*.

I reckon that this room is made to be like Room 101 from *1984*, in order to discourage MV employees from spending too much time in it, so that they get back to work sooner.

There are magazines to read, of course, my favourite being copies of the British *Country Life* from circa 1955. Actually, this organ is not British so much as quintessentially English - it would not have sold very well in the Welsh coalfields of my ancestors. There are advertisements to sell houses with extensive land just outside London for a few thousand pounds, and from people wanting to hire servants. One issue reported on a survey of the *Edible Dormouse*, a hapless rare species that would have been significantly under threat in a starving postwar Britain.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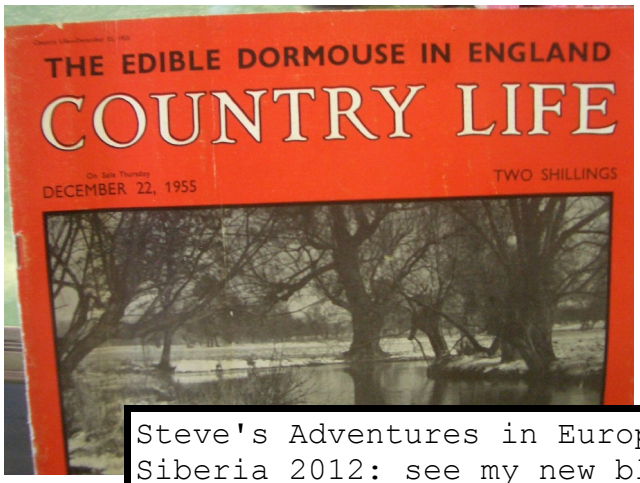

Steve's Adventures in Europe & Siberia 2012: see my new blog!
www.stevethings.wordpress.com

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"More positive than a bucketful of protons" - Barry Clark