The Great Melbourne TELESCOPE

PHOENIX

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

Issue 10 - June 2014

The 150th Anniversary of Melbourne Observatory

By George Littlewood

Melbourne Observatory had a long wait for an "official" opening - 150 years, to be precise.

After a decade of astronomical operations, the Williamstown Observatory was closed and a transfer of equipment took place in 1863 to grand new facilities on land excised from the Government House reserve, adjacent to the Royal Botanic Gardens.

This was done without pomp or circumstance. The Government Astronomer of the day, Robert Ellery, simply reported to his Board of Visitors that the Observatory had started operations in June, 1863.

Instead, the pomp and circumstances took place on 23 November 2013. In a public event organised by the ASV and the Royal Botanic Gardens, the great contributions of the Observatory to global astronomy and the growing Colony of Victoria were finally celebrated in an "opening". And the Great Melbourne Telescope was remembered often.

Muskets and a cannon were fired by Colonial Troopers of the 40th Regiment of Foot in period uniform. The present Governor, His Excellency Alex Chernov, presided at the ceremonies - and costumed actors allowed us to enjoy the

company of Sir Henry Barkly, his Vice Regal predecessor 1856-1863, and Robert Ellery, the Government Astronomer at that time (below).

During the festivities the Great Melbourne Telescope loomed large---metaphorically at least. At the time the Observatory opened its installation was still six years away, but it had been long in the planning.

The Director and CEO of the Royal Botanic Gardens, Professor Tim Entwisle (above), and the Astronomer in Charge of the Australian Astronomical Observatory, Professor Fred Watson, and the Deputy Lord Mayor of Melbourne, Cr Susan Riley, each spoke about the Observatory's past and its bright future. A plaque was unveiled:

Sir Henry Barkly observed (in his own words from 1863) that the completion of the Observatory should be hailed with pleasure but there was unfinished business and the Colony should not rest on its laurels. He remarked: "What is wanting is a telescope of sufficient size and power for the purpose of minutely observing and mapping down the outworks of the universe". He got his wish with the arrival of the GMT six years later, but by that time he had left office and Victoria.

Robert Ellery was around to see the GMT installed, and presided over its operations for more than 25 years. Often, no doubt as a distraction from his professional work, he entertained Sir Henry's successors (and their dinner guests) who popped across from Government House to peer through the GMT.

They were not alone. Melbournians of the time, proud that their city had the largest steerable telescope in the world on their doorstep, turned up in their droves to see it. The GMT was soon firmly established as an icon of "Marvellous Melbourne", then enjoying a gold fuelled economic boom.

SORRY, this issue is as late as ever, and I already have enough copy for yet another issue even bigger than this one! It's hard to keep travelling the globe and also edit these ... but please hang in there, readers - future copies will yet appear!

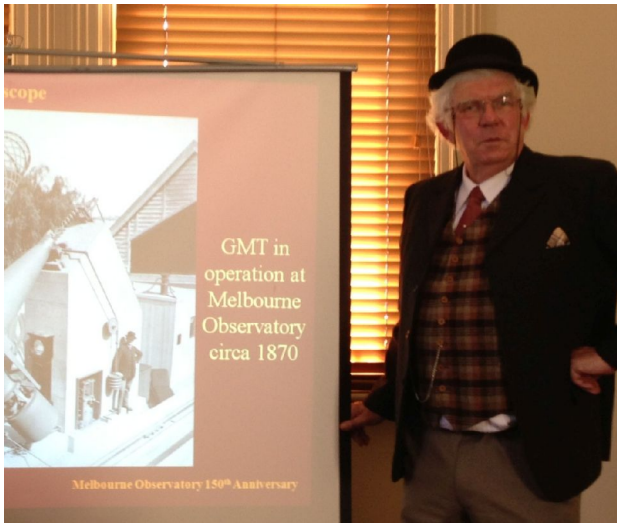
At the November "official opening", the reincarnated Ellery lamented that the GMT had…"left these buildings. It has travelled far, it has suffered much. But, looking into the visionary eyes and faces before me, I see that this will not last long. I see that the GMT will return here with your support and your encouragement".

He did not have long to wait for confirmation. Alex Chernov, Governor of Victoria said in his speech that restoration and reinstatement work on the GMT was proceeding, with the hope that it would be back at the Observatory within a very few years.

Prof Tim Entwisle said that the GMT was being very carefully and expertly brought back to life. "I do look forward to it coming back to the Observatory. The telescope will be part of a rejuvenation of this site, a site that I'd like to promote and celebrate natural science---from plants to planets. "I want to not only celebrate our history and our achievements, but also to inspire the sense of wonder that comes with discovering the world, and worlds, around us. And then to ask the very big questions and to help solve those. The Great Melbourne Telescope will be part of that vision."

Representatives of organisations such as Museum Victoria, the Royal Society of Victoria, the Royal Historical Society of Victoria and Sydney Observatory endorsed the ambition for the Observatory site to become a vibrant place of science and learning, with the GMT at its centre.

Other public events to mark the Observatory anniversary included telescope displays by ASV members, a history of the Observatory and the ASV's involvement in it given by Rod Brown, and an illustrated lecture on the GMT by a nattily attired Jim Pollock. Looking at him, maybe we have at last identified the "man in the hat" who features in our favourite photograph of the GMT?



The Observatory Anniversary was also marked the following day with a seminar on Colonial Astronomy, organised by the ASV. Leading experts on astronomy, meteorology, geophysics, history and heritage recounted the work and history of the Observatory and supported its rejuvenation, particularly the return of the Great Melbourne Telescope.

The ASV volunteers working on the GMT's restoration have an avid audience of supporters watching on, with plenty of encouragement to offer!

GMT TWITTER FEED

MV are maintaining a **Twitter feed** for the GMT project. Update 'tweets' are regularly posted, so the coverage is far better than waiting for the next issue of PHOENIX!
Well worth following - go to

https://twitter.com/GMT21stC

You do not have to be a subscriber of Twitter to read the updates!

BECA frame painted in time for NACAA visit!

The steel frame, made by BECA to hold the assembled GMT with its polar axis at the angle of latitude of Melbourne, was delivered in 2013 and rudimentary photos were in *Phoenix* issue 9. The bare metal obviously required painting, in time for the exhibition of GMT parts for the NACAA delegates, so in January these Putative Picassos geared up for the task:

Isn't it marvellous how painting improves appearances ... and the painted item also looks much better.

The frame was soon put into use; here's the Quadrant in place, that holds the northern (lower) bearing of the polar axle. Someone's chalked the latitude on it, very useful in case it gets lost, so it can be returned to either Melbourne, or Hamilton (NZ) or Los Angeles ... Los Angeles, *Chile*.

N.A.C.A.A. visit to GMT workshop

The biennial National Australian Convention of Amateur Astronomers was held over Easter 2014 in Melbourne, with many interstate guests. Since ASV was the host organisation for this "NACAA XXIV" it was appropriate for delegates to be invited to see the progress of the GMT project. A workshop was therefore convened for Easter Sunday afternoon, 20 April 2014, and guests were brought by car and public transport to Moreland, where GMT parts had been partially assembled and laid out nicely for inspection.

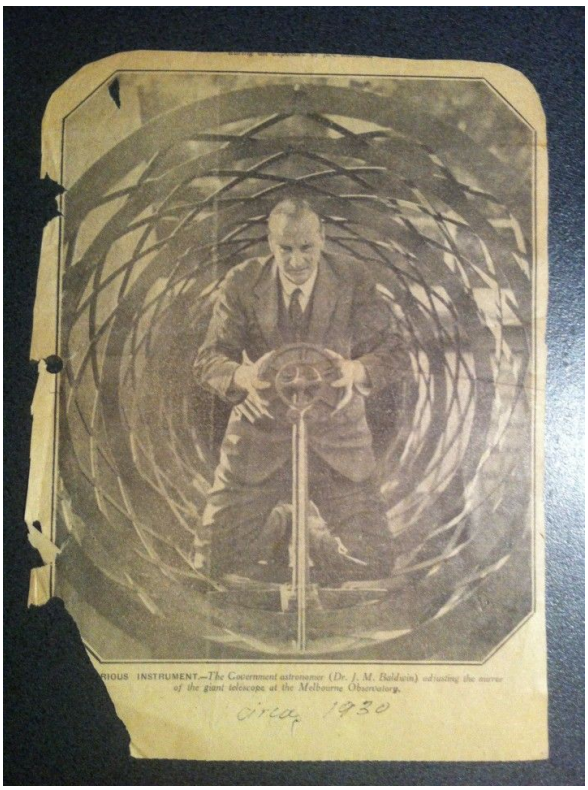
The crowd at Moreland on the day

(NACAA visit, continued)

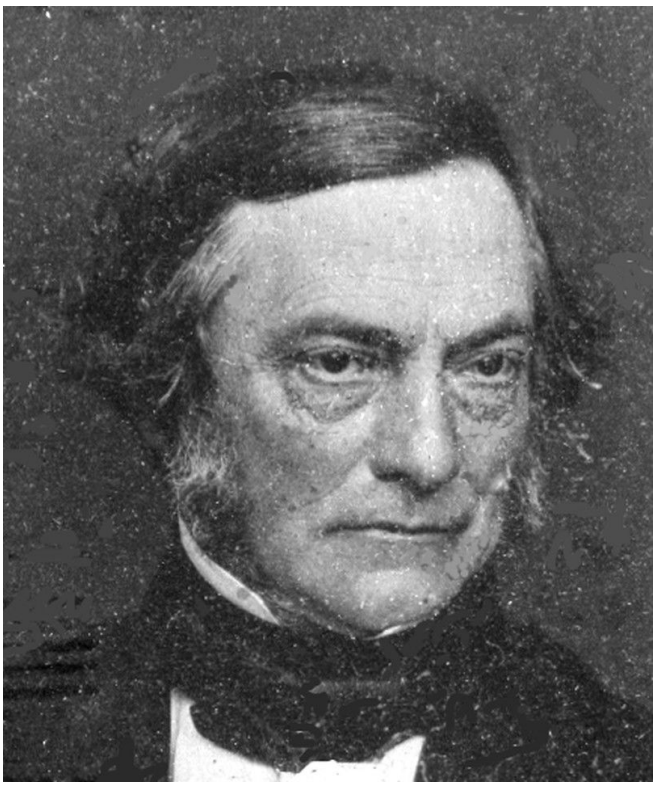
Glenn & Anne Williams and the painted frame

Several major assemblies of the GMT

Two Pioneers of the Great Melbourne Telescope



"A CURIOUS INSTRUMENT - The Goverment astronomer (Dr J.M.Baldwin) adjusting the [secondary] mirror of the giant telescope at the Melbourne Observatory".
From p.15 of the Melbourne *Argus,* 13 June 1931.



A Daguerrotype circa 1860 of Thomas Grubb, designer and maker of the Great Melbourne Telescope

Note: Dr Baldwin did not usually adjust it like this!

F L A N G E N E W S

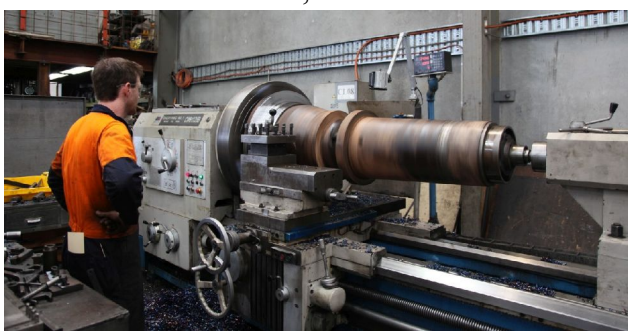
Photos by Matthew Churchward

THE FLANGE HAS GONE.

The beflanged Declination Axle was sent to Robinson Engineering at Altona, where it was mounted on one of their lathes and the steel flange was machined down to a narrow thickness, whereupon it could be removed.

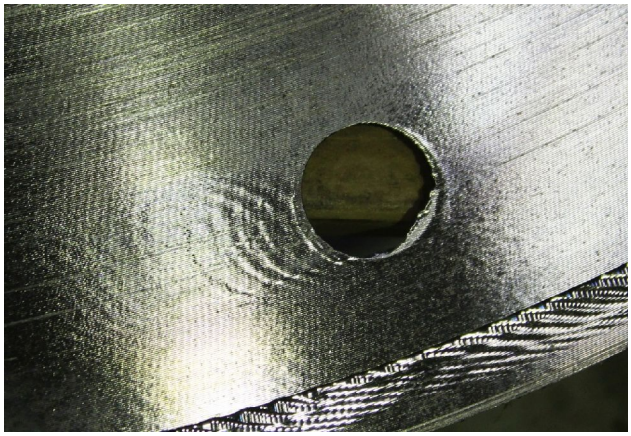
The flange was fitted by Mt Stromlo engineers and was evidently shrunk-fit to the axle. To reverse the process we thought of heating it up again to red heat, while keeping the precious Axle cool with solid CO_2 or the like, or of attacking it with angle grinders to cut a radial slot and wedge it off (with significant stresses from intense local heating), but turning it down was an altogether more controllable process.

In the event, it took only FIFTEEN MINUTES to machine the darn thing down into swarf. Here it is at Robinson's, on the lathe.

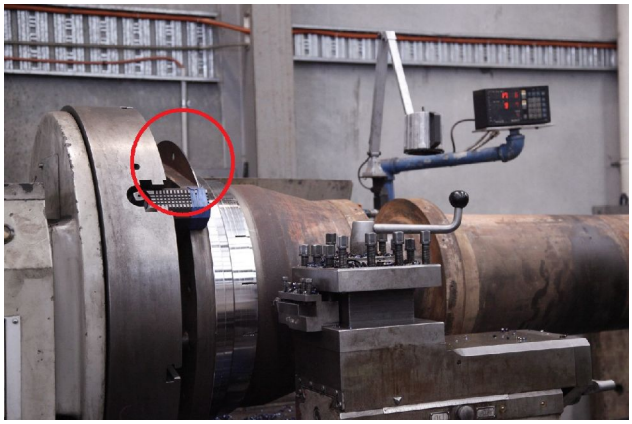


The lathe has room for bigger things:

With unskilled work, the holes in the flange would have made the cutting tool jump and shatter. Careful work by a skilled operator reduces the chatter, but you can still see shock waves in the turned-down work.



Soon the flange was down to a narrow thickness, whereupon it worked loose and could be removed.



And removed it was! Here's the bare axle, back at Moreland with a now very thin (and razor sharp) EX FLANGE.

This has been the final item of Flange News.
Thank you for watching.
Stay tuned for Flange Sport and Flange Weather.

Contact from Portugal

Through a wide distribution of Phoenix - and it could be wider, please spread it around! - the GMT project has established contact with a Portuguese engineer who is beset with similar restoration problems, and worse:

(1) Hi Steve,
I'm reading the newsletters you wrote about the GMT and I'm learning a lot. Once you're in Europe why don't you come to Portugal and visit Porto? We are rebuilding a Grubb&Parsons 30" Reflector Telescope at the Astronomical Observatory. I restored a Meridian Circle of Mirror before, the only one available in the world without any major organization but now I'm enjoying to read your newsletters and I'm having new ideas concerning the catalogue of parts. Very very interesting. Follow me on Facebook. I've been posting Solidworks print screens of the model I'm drawing.

Best Regards,
Bernardo Carneiro Leão Relvas
Mechanical Engineer
Astronomical Observatory of Oporto
benny_mecanic@hotmail.com
https://www.facebook.com/brelvas

(2) Bernardo,

Thanks for your interest in our project. May I print your letter and Facebook details in the next issue of Phoenix? As you'll see from previous issues of Phoenix, we have been going 5 years so far but engineering work has only recently started.

We were restoring and drawing the parts before that. Most of the original 1868 parts were in storage in the Museum of Victoria, because the telescope was very heavily modified when it went to Canberra in 1946, so we do not have to use many parts that were in the bushfire.

Australian bushfires are terrible experiences - the eucalypt trees explode, the air itself burns and the fire can spread at 200 kph. Here's a video made by someone who nearly died of oxygen depletion, and his sunglasses melted: http://media.theage.com.au/terrifying-sound-of-bushfire-383655.html In the 2003 Canberra fire that destroyed our telescope, the entire street in Duffy where I lived in 1988 was destroyed.

We are about to order the mirror and optics so we hope to get the telescope working in 2-3 years time, and installed in its original location where it will become a major tourist attraction of Melbourne. Government departments are involved, so there are some delicate issues of diplomacy, and also, we are looking for sponsors (both companies and individuals) to help pay the costs.

The Museum of Victoria do a very good Twitter feed with updates most days, it gives a better and more detailed reporting than Phoenix so please have a look at it - https://twitter.com/GMT21stC

I wish you success with your work and I will certainly visit if I come to Portugal. I travelled overseas too much in 2012 and 2013 so I am having a quiet year at home this year. My wife visited Portugal in 1974 and she loved it, so, it is 'on our radar'.

With best wishes,
Steve Roberts
for the GMT Restoration Project

(3) Hi Steve,

Please print my letter and use it as you wish, facebook included.

The last time I wrote to you, I hadn't read all the Phoenices which is something that I did already. I found them very educational on the view of

organization. Before this project, I functionally restored a meridian circle of mirror but I only drew the instrument and that was it for organization.

At the moment I am creating an Excel spreadsheet with the part name, model, original drawing, pics and so on, everything with hyperlinks to help me manage the collection and to have all details upon disassembly. I'm doing this based on your article. I do feel better now :-)

This project is beginning now. The telescope hasn't been working for 30 years because it is inserted in a very intense electric field area provoked by UHF antennae and the people here weren't able to fix the jumps in current on the 80's. We will have to isolate the circuits somehow.

I have started some contacts with the Canarias observatory as well because they have the JKT telescope there or in South Africa (I didn't understand it yet). JKT is a Grubb & Parsons telescope too and I hope that they can aid me by sending drawings and the modifications that they did. I wish they had produced Phoenices :D

That's all for now. I'm looking forward to read the next Phoenix and tell you're wife that Portugal is very different now ;)

Best Regards, Bernardo

(4) Hi all at the GMT project,

Through my search for old drawings of Grubb Parsons I came across this which made me recall your disassemblage of the cube and the axis. http://www.britishpathe.com/video/giant-telescope-parsons-reel-2

My search for drawings came to no result yet and I have got no drawings of the sidereal drive. Have you got any idea where I can find a deposit of old Grubb Parsons drawings?

Best Regards, Bernardo

(5) Bernardo,

I am a member of the GMT Reconstruction Team, and have read your emails with interest. I have just seen a TV news item about the terrible storm affecting Oporto and other places. I hope that both you and the telescope are safe.

Although I do not have specialised knowledge of RF effects, I have worked with specialists in that area. Is the radiation affecting the telescope coming from directed beams? What is the source- radar? What is the frequency?

Barry Clark

(6) Hi Barry,

I'm also sending this letter to the Director of the faculty of sciences of the Oporto University for his knowledge of this first contact between the Great Melbourne Telescope restoration project team and our 30" reflector telescope restoration team, both built by Grubb & Parsons.

First of all, thank you for your concern. The truth is that as always the news exaggerate. Apart from rain and some wind and big waves it's all normal. I leave my window open at night when it's not raining and nothing happens.

Concerning the telescope electronics the problem is that there are 9 big radio senders around it. The Portuguese communication authority measured the electric field in 2005 and the value reached, for frequencies between 1MHz and 300GHz, in the worst site (which is very near the telescope) was 51,64 V/m which apparently is beyond the limit of 28V/m imposed by law. As one of our specialists told me it seems that this electrical field increases the body temperature by 0,3 degrees Celsius which is body cells destruction and so on. Now, from 2005 two more illegal senders were built without the knowledge of nobody, which we call "the pirates". Measures will be taken.

Please ask your friends if they have any ideas for dealing with this extra difficulty.

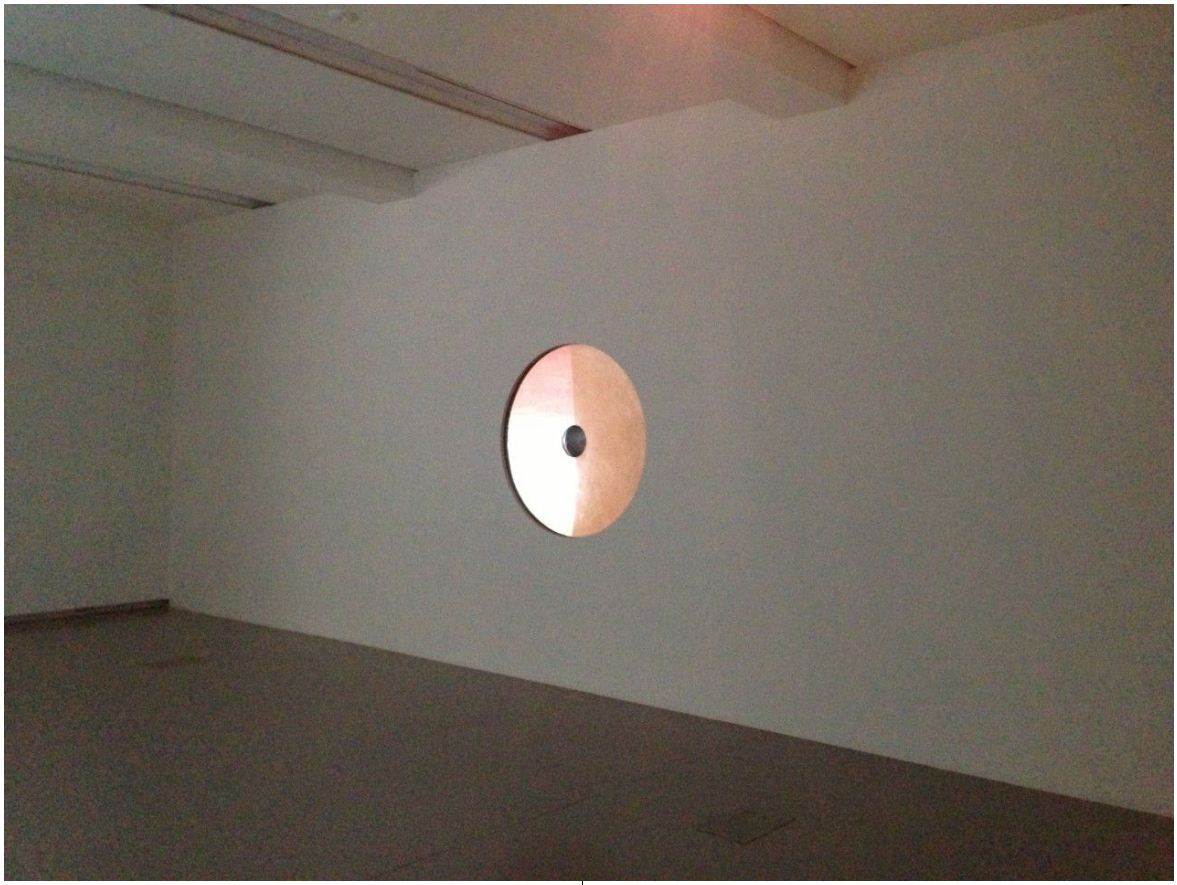
Best Regards, Bernardo Relvas 

An Unusual Work of Art!

The original GMT mirror was shipped to Monash University and put to a most unusual use in late 2013. At the Monash University Museum of Modern Art, in an exhibition of work by Simon Starling, the mirror was the centrepiece of an art installation ... well, read it for yourselves.

In Speculum (Studio Edit) 2013
35mm film transferred to HD
4:10 minutes
Courtesy of the artist and The Modern Institute / Toby Webster Ltd, Glasgow

Great Melbourne Telescope Speculum Mirror 1866
speculum alloy
145.0 x 145.0 x 35.0 cm
On loan from Museum Victoria



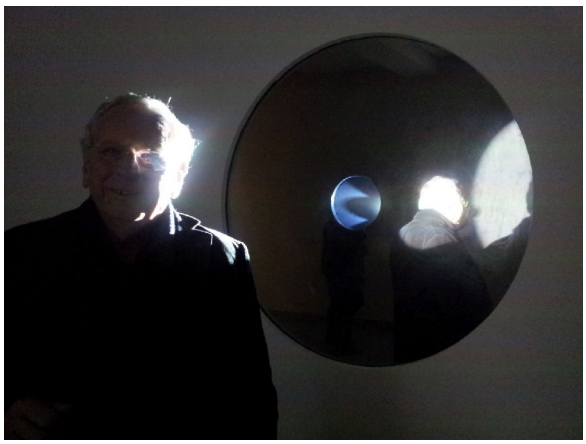
In Speculum (Studio Edit) exists somewhere between a film and a perfomance. Realised in collaboration with the Swedish artist and cinematographer Maria von Hausswolff, and using a precision-made concave telescope mirror in partnership with a telephoto camera lens, the work was produced in an improvised film-shoot. This took the form of a duel,or game of cat and mouse, as Starling manipulated the telescope mirror and von Hausswolff operated the camera . While the mirror was swung from side to side in pulsing movements, tracking the space between itself and the facing camera, the camera operator attempted to

respond to these unpredictable movements by pulling focus to hold the passing imagery momentarily sharp.

Here the artist's studio exists as a disorientating and impossibly layered hall of mirrors - a decentered, spectral space. In the resulting "real-time" edit, which is as long as a single roll of 35-mm black and white film, the pulsing movements of the telescope mirror drag the wide variety of images found in the studio into view. *In Speculum (Studio Edit)*'s cinematically impressionistic approach conflates a diverse constellation of historical and contemporary photographic images, diagrams, models and technical drawings, resonant to the exhibition as a whole, as well as to the particular staging of the film at MUMA.

The film is projected through the hole at the centre of the 1866 speculum mirror from the Great Melbourne Telescope. This 19th-century wonder, one of the largest mirrors ever produced using speculum, a brittle but highly reflective metal alloy, was a key component in the Dublin-built telescope. Housed in the former Melbourne Observatory (now the site of the Royal Botanic Gardens), the Great Melbourne Telescope once surveyed distant nebulae in the skies of the southern hemisphere. A key inspiration for the making of *In Speculum (Studio Edit)* and the subject of much of its imagery, the telescope's mirror serves to both mask and, in turn, reflect the projected image. A contemporary film made in a studio in the northern hemisphere thus meets its ancestor in an optical, geographical and historical face-off.

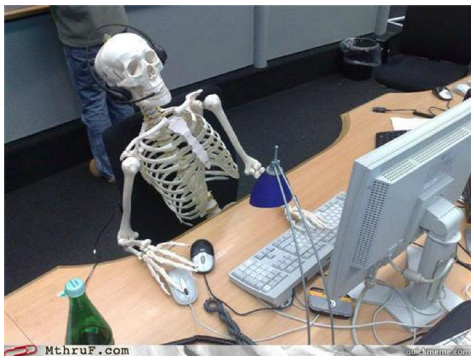
Our art critic comments:



As you can see, the video has the accidental use of highlighting the presence of Mr George Littlewood, a gentleman normally reluctant to occupy the spotlight.

Swinging the 1240-kg GMT mirror "from side to side in pulsing movements" must have been quite a feat - a worthy show in itself. No doubt this priceless and irreplaceable artefact was mounted very carefully and firmly for the occasion. The mirror had been polished for the show - not to a telescopically working shine, but a lot better than it was; a 2009 picture (page 2 of Phoenix 5) of it shows no reflection at all. Or perhaps that was taken by a vampire.

Ah, what glory! The movie - projected through the hole - and the general concept were quite novel; I am open to art, but also suffused with the wonders of science. Call me an old fashioned philistine ... I'd be happy with just the mirror ... or better still, a replacement modern mirror in use in a telescope.



PHOENIX, issue 10

Written/edited/layout (eventually) by Steve Roberts,
for the GMT Restoration Project

PLEASE DISTRIBUTE WIDELY! You can download this issue and all the back issues, freely, from these sites:

www.asv.org.au/greatmelbournetelescope.php

www.greatmelbournetelescope.org.au/newsletter