

Discussion session: Future directions in the care of large technology

Note: The first part of the discussion was not captured on tape. Alison Wain therefore recapped this part of the session when discussion resumed after morning tea.

Networking

Alison Wain:

It seems to me that one point that was suggested was the value of having regular meetings attached to something like the ICOM-CC (International Council of Museums – Conservation Committee) Metals Triennial, so that we make sure that as large technology conservators we are actually getting together physically on a regular basis. And then we discussed various possibilities for discussions and information online such as a discussion list, linked websites, possibly wikis or blogs, and James Crawford talked about his idea for ‘Metal Link’ and ‘Metal Talk’ - respectively linked websites and a discussion list. And we talked about the need to share ideas in a non-threatening forum, but also to be prepared to share ideas without being afraid of being unfairly criticised - to share our disasters as well as our triumphs, because we often learn more from them.

Colin [Ogilvie] mentioned the skills gap in solid traditional trades that is happening because of the reduction in apprenticeship training. Nick [Langford] commented on the value of job exchanges as being a really really good way of sharing skills and information. And we also commented about the value of increasing the linkages between the private sector and the public sector, and also in finding ways to bring in people that run smaller, often amateur museums or volunteer based museums who don't have access to a lot of resources or information.

So out of that, David Hallam has suggested that we progress this discussion at the Metals [2004] Conference next week and try to come up with some firmer strategies as to ways to explore how we might set up some systems that really work for conservators, and that will actually take off and be used – and not just for conservators but for everybody working in conservation of large heritage.

David Hallam:

I think we need to discuss it on two levels. One is for metals and the other is for large technological objects, and I do think we actually need to keep those slightly separate because the needs are different, but I think they can be linked and work together.

Alison Wain:

Okay, does anyone else want to add anything or shall we move onto our second topic?

Nikki King Smith:

I would just like to say that what I was attracted to with this conference initially was that fact that it's ‘big stuff’, it's not just ‘big metal stuff’. Metals is an aspect of many of the collections that we are dealing with, but with big stuff, there is always the little stuff too and I don't want to get railroaded into going into just a metals scenario,

because I think there is a lot of other stuff that is associated with big stuff that isn't necessarily metal.

Alison Wain:

That's a very good point, and in fact Andrew Pearce was mentioning earlier the difficulties with a lot of the new materials that are coming out – the carbon composite materials and things like that that are not metal at all, but are increasingly big parts of a lot of modern technology. So that is certainly something that we must bear in mind.

Research

Ok well if people are happy to move on a bit then, I would like to have as the next topic – research. Do we feel that there are any areas of research which particularly need looking into? Is there anyone who is picking up doing work in them? Do other people want to pick up areas of work?

David Hallam:

I will be brief as I need to go and pick someone up from the airport. We are doing quite a bit of research into oils for the preservation of large objects. Now, at the moment, we're aiming really at motor vehicles, and what we're aiming to do is to test as many oils that are used in preservation as we can. Now we only have access here to stuff from the Australian market. We'd really like to get stuff from Canada, US, England and Europe. If you send it to us, we have developed techniques for testing thin oily films. We will put it through our testing program and in return we will actually give you the results.

Now one of the other things we are doing, is – it's great doing research – but you've got to get it out there. So one of the first things we're doing over the next twelve months is we're doing a handbook for enthusiasts – motor vehicle enthusiasts – “How to preserve your motor vehicle”.

The next project after that is a handbook for museums on how to conserve motor your motor vehicle. That's a somewhat bigger project. We've got a lot of the text for that already, but it's going to be aimed specifically at people who are not engineers. I think it has to be, because there's a lot of people who are conservators and curators who, quite honestly, do not know one end of a motor vehicle from another. So that's what we're doing at the moment and we are particularly, as I said, aiming at motor vehicles because we see it as a, dare I say, a niche market. Now a lot of things we discover will be applicable to other things. We'd love to collaborate with whoever would like to collaborate with us.

Chris Knapp:

I just want to say I would like to see an awful lot more research – I think most of us use the excuse that we are too busy, and we experiment on our objects. I know we have certainly done that in the past at Duxford; we have tried out a new inhibiting oil or whatever and lo and behold it hasn't worked so we've had corrosion problems two years later. We should research the materials before we use them, and I would just encourage anyone, if they get the opportunity, to carry out thorough research and then let people know what they found.

David Hallam:

I just want to say the National Museum [of Australia] has a firm commitment to research; it's one of our jobs, it's not something we do on the side. And in this case we have just purchased \$50,000 worth of impedance gear to do this research.

John Kemister:

I think another area where we need a lot of research is in paint surface examination. You'll see later on today what we have been doing – Andrew's going to give a presentation on examination of paint layers. I firmly believe that 90% of our work is best handled by that wonderful device that's been around for a while - it's an opto-mechanical neurological binocular device on either side of your nose – I think that's the most capable device we've got. But I have a dream. We have lasers – I'd love to have lasers that would scan through a layer, differentiate layers of paint. And the other dream that I have is a nice little hand held screen scanner that you can scan over a surface and see what's underneath – see patterns, see delineations between paint layers, delineation of camouflage patterns. That's my dream.

I'm very conscious that there's a lot of people here who are very very quiet and very very thoughtful and I'd like to encourage you people to share your ideas and your dreams – the people from the smaller institutions, private practice people – I want to hear your thoughts.

Andrew Pearce:

As people probably gathered from my discussion yesterday on the topic of fabric dope - it's something that we've found through looking at our collection - but the information we have is far from definitive. That this happens in all cases, what the process is behind what's causing it – that sort of thing. Alison Wain and I are certainly keen to do a lot more research in conjunction with other people, in conjunction with organic chemists, people who do SEM and goodness knows what. We really don't know exactly where it's going to lead us at this stage. But to try and understand what some of these processes are, that cause deterioration aside from just corrosion. But to see what's happening with things like dope films, and paint surfaces, what is causing them to deteriorate so that we can make more informed decisions in the future.

Alison Wain:

In particular it would be good – having got a lot of anecdotal evidence of this continued shrinking of butyrate – to work out what the shrinking mechanism is and whether it's the same in cellulose nitrate and butyrate, and what it is that seems to be making it continue in butyrate. That might even lead to the possibility of having a modified butyrate that doesn't shrink – there may be endless possibilities out there.

Andrew Pearce:

It may also be the case that it's purely an application fault. I have spoken to a number of people now who have said that they have seen aircraft that exhibit this problem, but then there are other aircraft that we have that we think are probably doped with butyrate where people haven't expressed that there is a massive problem yet, and it could just be the way things are being applied.

Colin Ogilvie:

There is an alternative – train people to use both of those dopes and then you will have some expertise in 30 years' time.

Alison Wain:

Certainly that was one big bonus of the project that we did. But I would still like to understand more about what's happening, perhaps at a chemical level.

Colin Ogilvie:

Don't drop the other end!

Alison Wain:

No - agreed.

Another thing I would just like to pick up on is something that John mentioned; the laser thing. Currently [several] institutions are having some discussions with the ANU laser laboratories. They've got new femtosecond lasers which work differently to the ND-YAG lasers used a lot in Europe and America for cleaning. And they have done some tests which show that they can get a wax layer off a black paint layer. Now usually you can't do that, because the black absorbs all the energy and you get the black off first. One of the problems that we've found is trying to get later paint layers which are inappropriate off original paint layers; we can't do it mechanically and we can't do it with solvents without chewing up the underneath paint layers. So that's something that we are hoping we will be able to get up in the next year or so. So if anyone would like to join that move, then the more people we get on the less everybody has to pay – at the moment we are looking at providing about \$20,000 to \$25,000 per year for a research student to do the actual work, and splitting it between three institutions would make it about \$7,500 and if we could have any other institutions interested, we could cut that down a bit. I know my institution sounds as though it's interested in about \$5,000, but is not keen to stretch much beyond that. So if anyone else is interested, I would like to know.

Tony Colman:

We've got several problems and one that we need to work on immediately is in Parliament House in Hobart, that recently had some repainting and refurbishing done - new carpet, the whole works in the Members' Lounge. But the painters have coated the cedar panelling which is about 2 metres around the room (several hundred square metres almost), with 2 coats of urethane over the existing – what is probably a varnished – finish; not French polish. I have tried to dry strip it, but because the urethane is thin and is only a couple of months old, the stripper is going straight through – I can't slow it down enough. So if anyone knows how to get urethane off without stripping – I've got to start next week.

David Thurrowgood:

For some of the larger organisations here, I would just like to emphasise the importance of carrying on research as part of your business as usual. Some of the things that we are doing with oils, for example, are aimed at producing very low cost advantages for people, that can be used by private individuals or by members of museums – something like an inhibited oil – they only cost \$2 or \$3 extra, and you get all these benefits for the object. Now it costs a lot of money to scientifically go

through the processes of finding out what it is you need in an oil to provide effective corrosion solutions. But as big organisations, what we are able to do is produce very cost effective, low intervention processes which can save a lot of people a lot of time and effort. Similar sorts of things that we are doing is with boilers in steam engines and I would be very interested in hearing peoples' experiences with those. We are looking at using tannate inhibitors – we have one particular steam engine which has been used for many many years, and the boiler itself has remained in almost perfect condition, whereas others that have been run on water, as tradition specifies, are effectively destroyed. They come at a cost of \$80,000 to try and replace a boiler. So if we can develop those sorts of small, cost effective measures – a few hundred dollars of tannate is nothing compared to \$80,000 for a boiler. Those sorts of very simple measures which are developed through research; it's important that as much as possible, big institutions with larger resources can develop those and then get that information out to the broader public and other organisations.

Alison Wain:

Is there anyone else out there who's pursuing any research programs that it would be useful for us to know about, or would like one started? And they might find other people here that have similar interests, and again, form a collaborative group?

Davina Bonner:

I'm just wondering – it used to be that we were able to provide research topics to conservation students when they were at the University of Canberra. Does anyone know if the new Melbourne course is still doing research?

Alison Wain:

They're doing masters programs - they must be doing research of some kind even if it's only

Davina Bonner:

If we were able to provide them with things that we are looking into and get research from them that way?

Alison Wain:

However, it does seem that their focus is rather strongly on art and paper and so forth, so something that shares an aspect with those may get a guernsey, but I don't know whether their students would be so interested in some of the topics that interest us. Though the non-metals stuff may well...

James Crawford:

May I respond to that Alison? From what I understand, there's two masters' streams going through. If you have an undergraduate degree in a non-conservation related field, you can basically do your masters by course work to then enable you to practice as a conservator. However if you already have the undergraduate degree, you can do your masters by research. And interestingly there's no HECS or upfront fees on those as I understand it, from speaking to the course co-ordinator, Marcelle. These are free basically, and also I was talking to someone who is doing her masters by research and it's basically funded, or subsidised, by the Australian Research Council. So if anyone is looking at doing their masters by research in a particular field - it's up to the student to determine what that is.

Alison Wain:

Chris, could I ask you if you are doing anything at the Imperial War Museum in the way of research programs?

Chris Knapp:

I have got a couple I want to start, but that won't be until the New Year. Unfortunately deadlines and pressure from a new project is stopping everything at the moment. I want to investigate some of the inhibitors that we use. And I was at a conference earlier this year and in one of the case studies the guy from the National Museums of Wales, was talking about 'Resiwood' [moulding mortar]. It's a resin-based wood replacement that you can mould, so if you have wood that is totally unusable or just missing, you can use this to build up your object and keep what you have left. But it has the same properties as wood - the expansion and contraction with the varying humidity and suchlike - so you're not putting in a foreign body that's going to just make your problems worse. And that is something I want to look into in the very near future.

John Griswold:

Two topics come to mind, again from related sub-specialties. I have now worked on about four outdoor sculptures of fibreglass, very large scale public commissions, one of which actually was on the First Lady's *Save America's Treasures* program and was actually designated as a National Treasure. It was the first publicly commissioned fibreglass sculpture, which incorporated a polychrome scheme on a gel coat underneath a catalysed clear coat. And I worked closely with [the artist] in coming up with an acceptable treatment protocol that would respect his intent of what in Southern California became known as the Fetish Finish aesthetic - the very smooth, seamless, very sleek, glossy sort of appearance that was absolutely key to the perception of conceptual art, minimalist art in Southern California. [The artist] turned this into socio-political caricatures on a massive scale - but it would have a direct application to large technology objects obviously made out of fibreglass components. Just establishing a protocol was an extremely useful methodology, because if the artist had had his way he would have scrapped the whole thing and refabricated it. But we actually came up with a method where we were able to compromise and come up with semi-reversible, documentable/compatible infilling, patching consolidation methodologies that satisfied everyone. There's also now a student at the graduate conservation program at Buffalo who's looking into this as well and doing some FTIR analysis of the different layers and the stratigraphy of the fibreglass structure. So just for everyone to be aware that that's something that is in the beginning stages of being looked at. And we now have a body of large fibreglass things outdoors that are starting to exhibit fairly similar deterioration phenomena. We now have maybe 20 to 30 years' worth of good aged samples to establish a research project on, so we would like to expand that scope to samples from around the world.

The other topic is, my firm are the architectural conservators for Green and Green's Gamble House in Pasadena. I'm not sure if any of you are familiar with that, but it's the pinnacle of the arts and crafts movement in architecture in the United States. We have undergone a massive treatment of several million dollars worth of treatment of the exterior wood components - redwood, douglas fir, various other components - that had been rotted away because of previous improper epoxy patching techniques. We

have looked closely at a replacement system for rotted-out areas, so we were also looking closely at yet another epoxy, but one that was bulked with special materials that allowed the expansion and contraction - thermal response, moisture response to be closely similar to the wood – with terrific results, but it really deserves to have a systematic research program followed up on that. Thank you.

Alison Wain:

I guess that picks up on what Andrew was saying earlier about carbon composites as well – that they share a lot of the same characteristics in many ways.

Andrew Pearce:

In talking to some of our curators when we were working on the Beaufort project, the basic situation is that there aren't any Beauforts around, so it had to be built completely from scratch. And quite often there is a museum situation where things only become valuable when there's none of them left. Now talking to people – and this is again is very War Memorial centric but, quite a few fighter aircraft, when they crash them, people go in with 'moon suits' to pick up the pieces because these things make asbestos look 'friendly' in their deterioration and combustion products. And so you get people saying, "Oh goodness, we don't want to get something like that in our collection, because otherwise in the future we are going to have a massive problem". This is going to, the way I see it, result in situation where, in fifty years time, we'll have exactly the same situation as we have with the Beaufort, where people will say "We haven't got any late twentieth century/early twenty-first century fighter aircraft because everybody ran away from them as fast as they possibly could when they were around". And so doing a lot more research into some of these composite materials - resins, Kevlar, carbon fibre, etcetera - I think is going to become more and more and more vital in the future if we don't want to lose a massive chunk of our cultural heritage from the present day.

Chris Knapp:

Just picking up on what you're saying there - we're finding in the UK now that we are getting aircraft into the museum as soon as they come out of service, so they are coming to us in good condition. So we can start conserving them straight away, whereas twenty years ago you would get Second World War aircraft in boxes, so we would have had problems. We have an aircraft where the leading edges are made of blue asbestos – I dread the day I'm told to rub it down and paint it. Fortunately we have the original paint surface on there and we can consolidate that and keep that much longer. What we've got to be very careful of - certainly on sixties/seventies type aeroplanes - some of metals used on there are quite wacky. The early F15's had back plates made of beryllium, or faces of beryllium – it's not uncommon from that era – military aircraft aren't designed to be safe for the museum, they are designed to be effective – they are not user friendly. So we have got to be careful, and the chemicals - that leads on to general safety. I insist that ejection seats are treated as live even though I have a free-from-explosives certificate for every one. Because a lot of things are spring loaded or under pressure – you get a very well meaning, enthusiastic conservator coming along, the best will in the world - if they are lucky what they will do is blow their hand off. We have to be very careful with the materials and the mechanisms of the things we deal with. That's why I wouldn't touch something like a locomotive – I don't know enough about them to start taking them apart. We've got to be very wary of the materials we use - and on some of the Second World War stuff,

especially some of the German stuff, where they were making their own oils and experimenting with oils – it's dangerous stuff. And of course everyone knows about the ingredients of some of the early paints – when you're rubbing down be careful with them.

Barbara Reeve:

Do you have a policy on how to handle radioactive materials? Because our first rule is DON'T in any way abrade any kind of paint that might be radioactive. Test it, find out if it is radioactive and then if it is [get advice on how to handle it].

Chris Knapp:

Yes, what we have done (and this a subject dear to my heart, because it took some major grovelling on my part to the environment agencies to stop us going to court – two, possibly three national museums have been charged over the radiological hazards in museums) - we have had to survey the whole collection. Certain aircraft, usually the more popular aircraft with visitors to be shown round - the Lancaster is the prime one - are hot; they're not dangerous if treated properly. People panic when you mention asbestos or radiological hazards. We restrict the entry time, members of staff must wear a dosimeter. If something is particularly bad we have removed it and put it in a store. Ironically the [...] manager wanted to put a pyrotechnic store next door to our radiological store until I told him what was in there – and then he went white.

We have replaced some instruments. The levels in the UK have been set because they don't really know what is dangerous, so they are just being very very careful. The big hazard is ingestion of dust and such like. So yes, you can seal them and make them safe that way and we have been allowed to leave instruments and suchlike in aircraft that are, they term it a "closed source"; ie the glass isn't broken – no dust is going to get out. If it's an open source then something's got to be done with it. The sort of thing we have found is on something like the T33 you have got circuit breakers in the engine bay that had luminous figures on there – all the vibration and all the rest of it, you could get the whole engine bay [being] hot. You've just got to be careful, take it out, follow the legislation. What I have found very useful is to talk to the Health and Safety Executive. They really don't want to prosecute if they can avoid it as it is very time consuming for them; they have got a bad name, nobody likes them. They will help you, or they certainly will in the UK. It's the same with asbestos – we have got to survey the whole collection and manage the problem and we are about to get the same with PCB's...don't ask me what that stands for because I couldn't pronounce it to save my life.

Alison Wain:

Polychlorinated biphenyls.

Chris Knapp:

Thank you!

Barbara Reeve:

We are now committed to refining our policy on PCBs by the end of February. We have just finished writing our policy on radioactive material. We actually hold a licence from the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to hold radioactive material, and also ultra violet radiation – we have a

licence for our 'black lights'. But we have to have demonstrated to them that we have all sorts of procedures in place – how to look after them, how to care for them, we have to explain exactly what we are going to do, what limits we have set for our staff and for the public on exposure, we have to demonstrate with risk management across the board every aspect of collection management with these materials. If I was a bit out of it on Wednesday morning, it was because on Monday I finished writing the policy and procedures for that. We sent it off to ARPANSA today. We have the same thing across the board for all the other hazardous materials in our collection: asbestos – we have a draft policy which we will finish by December; lead – we have a draft policy which we will finish by January; PCBs... it is one of the most important things for us, the safety of the staff and the public. One of the things that Gillian Mitchell showed us yesterday - the Anson Trainer; those were radioactive dials that she took out and put into storage. But one of the things ARPANSA require of us is that we present them every year with a complete inventory of everything we have and a stocktake, and we argued successfully that having a stocktake every year - a 100% stocktake of our radioactive material - actually exposes our stocktake officer to unnecessary levels of radiation. They accepted that and they accepted that the collection management security control that we have here at the Memorial is sufficient, that a 10% check each year is okay. But then we had to do radon monitoring as well, of our storage areas, because that is the by-product that you can breathe in a lot easier. But it is a serious issue for people who aren't aware that maybe there are a lot of dials, wrist watches, night vision things that have radioactive paint on them, and how hot - the Lancaster in particular, how hot some of those instruments can be.

Chris Knapp:

My advice to all the groups is "don't panic". Just think about it sensibly and logically, the same as you would any other problem. Use specialists, because it is a very specialist area and laden with jargon and most people are too embarrassed to ask what the jargon means. We have to, by law, have a specialist advisor either on the staff or in most cases, contracted in, to advise us. In the UK we have the BAPC which is the British Aviation Preservation Council. For my sins I am the Vice Chairman of that one. But we have a lady who is very highly qualified, and she has very kindly written a manual for the smaller independent museums, the volunteer museums and it's called 'Don't Panic' and it lays it all out in words of one syllable that the average conservator can understand. It's not a major problem unless you want it to become one – you just have got to work it through logically and sensibly.

Alison Wain:

I wonder if that is something [where] we could develop a bit of a resource - perhaps a website where documents like that were listed. But also where perhaps we listed some FAQ's – frequently asked question sheets - or examples of different museums' policies. Because it strikes me again this is something where the bigger museums are easily targeted by health authorities. We have to do this work - we do put in a lot of work. Situations do vary from country to country, and even from state to state in the precise details, but as you say, the overriding commonsense of it is reasonably clear. And one thing I am very aware of is that we usually have to do a quite a reasonable stack of work in adapting industry guidelines to museums, because industry guidelines are usually about getting rid of this stuff - and we often have reasons for actually preserving this material - or they are about vast quantities of it and we usually

have a little bit here and there. Or they are about things which are in daily use and ours are only accessed by trained people once in a while. So there is usually quite a difference between how you handle an industry “wodge” of this matter and how you handle it in museums. Certainly with the PCBs - we had a student do his third year thesis a couple of years ago on that, and came up with basically the policy that if it isn't cracked and leaking, don't worry about it. If it is cracked and leaking use a spill kit and tidy it up, and then you either clean the canister by appropriate means or dispose of it depending on whether you want to retain it or not. And that was the distillation of quite a lot of research and then some commonsense thinking. And we could easily I would assume put that up on a website which people could then access, and in fact if there was a website that had that sort of documentation, that might be an encouragement for people to use that as a central point, and then become a nexus for other information to be attached to as well.

Chris Knapp:

Once we had actually surveyed our collection and sorted through the problems we had, the most I had to do to allow my guys to carry on working on [radiation] sources was to clear a space in the secure workshops and buy a new bench and a new locker, and they're dedicated for radioactive hazard objects. And that is all we had to do. We didn't have to restrict time to any great degree - alright the guys have got to wear a dosimeter, but that is all I had to do, it cost me a couple of hundred pounds, once we had sorted out the initial problem. And now we can carry on quite happily.

Bill Lang:

Just to recount an incident, an aircraft which I happened to be working on – a MiG 15. Preparing a section for display, had all assurance that this particular item had been declared free of radioactivity, of materials that cause a problem, they hadn't entered the collection...we did our thing and prepared it ready for display, quite confident that everything was okay. But in this particular case, I had just finished tacking up in preparation for welding and painting the armature of the base of the section, and a staff member who was into looking at Russian at the time, managed to find that the site we were working on had 200 litres of Cold War aviation fuel. Now all the exotics had been found, all the policies had been followed –somehow or other that had slipped through. Now obviously it was stable – oxygen and sparks from our work wasn't engaging it. But to be a metre away from 200L of flammable material isn't much fun. Thankfully Andrew was able to pick it up. That only came about, I believe through the fact that he was undertaking identification of tags, names, letters in Cyrillic around some of the fittings. Now with an intimate knowledge of the MiG this would have come to light, but because it was a strange aircraft and didn't fit into the realm of what I assumed at the time to be the norm – it was overlooked. So I wonder if that goes along with the procedures for radiation and asbestos; that the nooks and crannies could just quite simply have hands-on examination because there must be little things scattered through these aircraft that go unnoticed for some time.

Alison Wain:

I actually think that is very relevant. We have found the same thing – we have found radioactivity in the oddest places. Like on an oxygen bottle, just one line of paint that looked the same as all the other colour paint, but that bit was radioactive. Machine gun sights and hidden springs and so forth. That again might be a useful central thing

to have, a checklist of likely hazards to look for in likely types of objects. Again that might be helpful for people in smaller museums perhaps.

Bill Lang:

I encountered somebody about to do some work on a dragonfly in Bankstown. It was only for the fact that the wire had broken off [...] that the rounds in the chamber didn't fire. It was just ironic that it had been fretted because people had been playing with it.

Michael Eisen:

One of my mentors at Eton, he works at the Diefenbunker, which is a Cold War site that we have near Ottawa, and Doug's hobby is going around and trying to find things that are radioactive. And so he goes to all the flea markets with his Geiger counter, and he has built up a collection of things that are radioactive. Because whenever something new comes out, everyone jumps on the bandwagon and [says] it has "medicinal" properties. So he has found radioactive suppositories, radioactive clocks, radioactive glasses, radioactive glassware, and there are a lot of things out there that are radioactive besides the obvious, like luminescent paint. So there are more things we have to look for than the obvious.

Alison Wain:

The Museum of Victoria had a sample of apatite, a geological specimen. We'd had just got our Geiger counter, and so we were happily throwing it at everything, and this thing went WWWWWOOOPPPPPP! The Health Department officials came out immediately and were really fascinated – they had never seen anything like it.

Chris Knapp:

I think one thing we have got to bear in mind is that historical integrity of objects, and conservation issues, have got to take second place to safety. Most damage to our objects is caused by access and equipment. It's not the object deteriorating, it's people trying to do things and not thinking, not taking their time. Safety has got to take priority, and that would also then ensure the safety of the object as well.

Alison Wain:

And that actually gets back to what Col was saying about skills too – people actually knowing backwards what they are doing.

Chris Knapp:

We are hoping to get government funding to set up a nationwide scheme for aviation heritage volunteers. We have had to slide safety training into the modules without people realising, because as soon as you mention health and safety in the UK, people go blank - they are not interested. "They have always done it this way, all their lives" that sort of thing – that's why they only have three fingers – one leg... It is just simple things. All my guys are certified for erection of lightweight staging, forklift trucks, working at heights, supervising people in confined areas, and they do it now as second nature. We just have got to be so aware of these things.

Alison Wain:

And I think another thing that is coming out for me quite strongly here is to give ourselves permission not to know, and to say as a conservator "I don't know this. I

can think about good processes for approaching the problem, and one of those processes is finding the people who do know". And maybe that is something we need to make much more explicit to people. We produce conservation graduates who are trained in a wide variety of materials, but they are not trained in the specific problems of how those materials may interact in a larger object. It may be easy to feel that you are expected to know everything and just to be given the permission to not know [is important].

Chris Knapp:

The two groups I have had the most problems with with health and safety have been elderly engineers - who learnt years ago how to do it - and volunteers, because they say "I'm a volunteer - the Health and Safety at Work Act does not affect me anymore because I am not at work". Obviously it does and I explain that to them quite firmly when they start and I explain that it is non-negotiable. I have actually had a volunteer refuse to wear rubber gloves when using Nitro-Mors paint stripper because it made his hands sweat. Half an hour later his hands were burning. I am afraid with people like that, I just get rid of them. They are too much danger to me, my staff, my objects and themselves.

Alison Wain:

Lyndsie, you work at CCI where there is a lot of research done. Are you doing any research on large technology stuff?

Lyndsie Selwyn:

Right now CCI is undergoing major renovations, and our labs are all shut down, so our research has shut down. Right now there is nothing in the works for large technology. But we are open to suggestions, and I think if there were some good ideas for research, that were of international interest, that the students at Queen's University would be very interested.

Clara Deck:

I would love it if you sent your questions to Lyndsie to send to the Queen's students, because then there would be a new crop of Queen's students coming up with an interest in this type of object, and I am going to need to replace staff in a few years, and it would be great for me, so please send your questions!

Nikki King-Smith:

We have a small research section at the Maritime Museum and I would love it if you guys would all send in your questions to them. We have got organic and non-organic chemists who work there and to pry them off their maritime archaeological stuff would be a great thing for me!

Alison Wain:

When I was asking people for suggestions for topics yesterday, and I said we should talk about research and people's research needs and ways of getting research done, David Hallam said that he would like to keep treatment development quite separate from that. It is a pity he is not here to talk about that, but does anyone have any ideas on that? There is basic research, such as the cellulose nitrate/ butyrate thing - where I would like to know what is happening there with the whole shrinking mechanism -

but that is different to the treatment development side and I guess that's what David's talking about. John Griswold talked about fibreglass patching treatments - do people have any particular treatment problems that perhaps there are already answers out there [for], particularly if we utilise links with scientists? That we could develop treatments fairly quickly for?

Chris Knapp:

We have problems and we attract a lot of criticism - most of it quite justified - because we have aircraft standing out of doors. With civil aircraft it is not too big a problem, because they can put dehumidifiers in the cabin. In a civil airliner of course you can go from end to end. In equivalent size military aircraft you don't walk end to end - they are not designed for that. We are constantly fighting to try and inhibit or slow down any corrosion problems. Obviously the paint is fading in the sun light, that sort of thing. But internally, trying to find some sort of protective treatment that will withstand down to about -10°C in winter occasionally and in summer rocket to some phenomenal temperature - like 12°C [laughter]... we should be so lucky! Sometimes the aircraft tend to act like an oven and it goes up to 15°C! But then melts and runs away. But that is a problem and I know a lot of large objects are out of doors. They've got to be, and of course on something like an aircraft, you have got multimedia. Rubber is our favourite one; if it's the foam rubber in seats it just powders, if it's seals or oxygen hoses or something like that, it melts and runs down the windscreen. So if anyone's has got any suggestions on what I can do there, please let me have them.

Alison Wain:

Rubber and plastic things are an interesting one, aren't they? I got sent the report that NASA put out on its investigation into its space suits, and we're currently having a look at that. It is a world wide problem. How do you make a material - that was never intended to last remotely - last, in particular in severe conditions?

Chris Knapp:

One of the biggest hazards we get is our commercial department - obviously trying to raise money - and we have a film crews coming in. They are always a major problem with their high temperature lights. I have now convinced the commercial department; first requirement they have got to get is low temperature lighting. I believe one of the American museums had one of the lunar modules damaged by a film crew with hot lights, and this thing had re-entered the Earth's atmosphere without being damaged, and then a good old film crew came in. Unfortunately we have to let them in to a certain degree, but we have got to control them.

Documentation

Alison Wain:

The other thing I had down for discussion this morning was documentation. I talked a little bit about documentation in my talk on the maintenance program. I certainly believe it would be good to share information and use similar documentation if possible, to prevent reinventing the wheel. Does anyone else have thoughts on that? Would they like to see more generic documentation available?

Andrew Pearce:

I [would like to mention] the point that we have raised about the work that Andrew Schroeder is doing, of finding what commercial equivalents there are already out there, that are designed basically to solve the problem that we have got. In this case it is management software to help people who are running vehicle fleets. If you have got a fleet of vehicles in the Memorial or museum environment, then ¾ of the work, 95% of the work has already been done for you – it is simply a matter of locating the off-the-shelf applications that are there that you can use.

Chris Knapp:

In the UK, for registration with the Department of Culture, Media and Sport (DCMS), we have the Spectrum Handbook, which is a lovely name because it is huge. It lists in great detail what you should be doing as far as paper work goes for your object – from the time it comes through the main entrance to the time it goes out again. I think there are 20 different stages they allow for and when it comes to the conservation paperwork, it gives you quite a bit of flexibility to have a system that suits your organisation. The trouble is with some generic systems, they are too rigid and then they fall into disuse.

John Ashton:

Just wondering if any of the other institutes in the UK use that Spectrum Handbook as a generic?

Chris Knapp:

I don't know if they use it as a generic, but they must at least match its basic standards if they want to be registered with the DCMS. It is really a guideline, but it is such a good guideline that most people stick quite close to it.

Col Ogilvie:

You have spoken more or less from a conservator's point of view, but from an engineering point of view - I am operating a lathe and I have coolant all over myself. I am building a part of an object; the object I have may be small and sitting on top of my lathe; I am using it as a measurement device. I want to document all this, but being sixty odd years old, I start to get a bit feathery at the end of the day. If I don't stop and wash up - and I might add the wash bay is some 42 metres away from my lathe - I have got to go wash up, clean hands, come back, write it up in my day book, and then apply it to the computer so the museum has got some form of copy. This gets awfully tedious, awfully hard, and if it wasn't for young David the Pup, I wouldn't be bloody well doing it, because it is so difficult to achieve.

Chris Knapp:

The documentation of any work that you are doing on the objects is as vital and as important as the work you are doing on the object. But I can understand what you are saying in that situation. But have you thought of getting a Dictaphone for you to talk to while you are doing it?

Col Ogilvie:

Actually yesterday I thought about it!

Chris Knapp:

Also, you don't want a novel. You just want facts. Too many people try and write reports that are flowing novels. It is not necessary, you just want main points - what you have done, why you have done it, and that should be adequate. Then you can write up a report at the end of the job on the whole thing, rather than just minute details.

Alison Wain:

Yes, that is what I was trying to say in my talk about maintenance and things. That if you can have standard report formats [in which] you identify what information you actually want to capture, then you may only be saying a couple of sentences. You may have spent all day making that part, so what you need to say is "6 hours lathe work on part X, using coolant Z". That should be probably sufficient, plus perhaps any particular comments that you want to note.

We actually thought of using a Dictaphone before too. I believe there are expensive ones, but ones that will go straight through to text on the computer. So I think if we can start utilising technology to cut down our times... it is at the moment expensive, but it should come down in price, all this technology does seem to. So if we could start aiming for those things - where we can take a palm pilot with us and have a stylus where we write straight into the palm pilot, or you take a Dictaphone that you can just download into the computer, or it may even work wirelessly, remotely across the computer [network]. Then you could get that information free enough of mistakes, so the person who is collating the report at the end (which I think should be the project manager), knows what you are talking about and can interpret that information. The Beaufort and Lancaster reports we have just done; I think everyone thought they were going to be a really really big job - and they have been - but at the same time, we sat down and thought about how we could streamline that, so we made sure what information we wanted to capture. Then I put in some over-arching [treatments] - when we had aluminium we generally did "this" or "this", when we had ferrous metal we did "this", because - they are big aircraft, but the treatments were by and large the same all over the whole aircraft. So really a couple of sentences were enough to sum up months and months of work.

John Ashton:

Just commenting on the use of the Dictaphone. I have been in the same building as Col when he has been grinding, lathing and making lots of mechanical noises, and I could not see that a Dictaphone system could possibly work unless it had some filtering device to cut out mechanical noise and only take human voice.

Nick Langford:

Another interesting little story which is amusing. When we were doing the Leyland truck for the [Memorial], one of my guys - who is a very interesting character - what we did in recording was we went up there every two hours and ran off a whole heap of digital photos. Now the reason for doing this: this guy is a manufacturing jeweller by trade, I found him working as a boiler maker, he is pretty well afflicted with industrial deafness, he has got a temper which you wouldn't believe, his nickname is Captain Grumpy in the organisation and on top of that he can't read or write because he is totally dyslexic. But he is one of the most wonderful craftsman you ever could employ. Now to get him to even write down his timesheets is a major task for us, so you can't get him to write things down and you can't get him to talk into a

Dictaphone because every second word would be... you could imagine... so the only alternative for us was to go up there on a two hourly stint with a digital camera, so that's what we did. I think we found that satisfactory.

Col Ogilvie:

That has been part of the solution for us. That quite often I'll be engrossed in machining or some form of work in the shop - the next thing there's a flash going off around me and I turn around and there's the Pup shooting a few films. It has been the only way he's been able to keep control of me.

One of the big problems as an engineer that I have got is that 50 years in the industry - you get to a time schedule in your own mind. You get a job, you go for the job, that job is 100% the most important thing in your mind for the next three hours. And that is how you go at it. Now there is evidently skin and hair and flesh flying around everywhere when you are going flat out. I don't see it, I don't feel it, and he is always telling me to slow down, but I think if I slow down, I'll stop. That's a problem, it's psychologically a problem. If I have to stop every now and again and write something up, I have broken that 100% concentration I have on the job. And when I do that, it means I have got to rebuild to get up to that level, and that takes a hell of a lot of energy.

Alison Wain:

I'd say don't stop. Why stop? You can say what you have done at the end of the day. I would also say again, we have got to work out what information we want. I don't want things like lawyers do, in six minute bursts of time so they can divide their hour into ten parts and bill it against customers. I don't want that, that wouldn't help my managing at all. If I know that you have spent one day - which is approximately 6 or 8 hours - working on that particular part, and the report builds up and you have got three days working on that part, then all I'd estimate was that you spent 3 days or approximately 24 hours working on that part.

Col Ogilvie:

That would normally be alright, but where the real problem occurs is when...let's say we are building something on the milling machine, which is a never done before type job, and here we are doing it. We have to photograph and record every way in which it was done, especially if it's part of an object. And what springs to mind here is the final drive housing out of the Bean car - so badly mutilated by people with hammers that I had to re-machine the bearing surfaces. This was an artisan's job more than a craftsman's job. But it was done, and we recorded it - thank God the Pup recorded it - on digital film. Now, that's excellent - it was great, but I didn't have time to stop and record it.

Alison Wain:

I'd think that's an ideal use for volunteers. It's perfect. You don't have to have a particularly skilled volunteer to hold a camera - and be involved in the job through that and to learn - but that is a great way to use an unskilled person.

Col Ogilvie:

There is one problem there. If it is me taking the photograph and I don't have my glasses on - best of luck.

Alison Wain:

Suit the volunteer to the job. You're on the milling machine – hopefully with your glasses on...

Col Ogilvie:

If have a volunteer there he had better stand clear, he had better be well aware of machining practice.

Alison Wain:

Yes, but in the same way as you taught David how to be aware ...

Col Ogilvie:

But it's taken me four years to train him! [Laughter.]

Alison Wain:

But I certainly do think as conservators particularly, we can get bogged down in an awful lot of detail. And with large technology - one of the things I think is that we are trained on small objects, and when you do a conservation course, I know it was my experience that you were expected to note down every little crack and blemish on the surface. If you are working on something like paper or textile, it is what you do. If you are working on a tank, you can't, you really can't. I think a broad description saying there are chips in the surface and a picture, "see picture X", is far more effective and saves you a lot of time that could be better spent actually doing work on the object or work to stabilise the object.

And plus, I was thinking earlier about you stopping – about the noise issue – you've presumably got to stop the lathe to speak into the Dictaphone?

John Ashton:

Yeah, which doesn't work.

Alison Wain:

Doesn't it?

John Ashton:

Again he's going away from the concentration on the machinery. Which once you lose that concentration is very hard to restart, or it's dangerous.

Alison Wain:

In that case, he knows exactly what he has done during that operation, [so] he talks through it afterwards.

John Griswold:

I tried to make the point, maybe too briefly in my talk yesterday, about the documentation of the Space Shuttle mock-up. I said that digital photography and the way we used it was really key in being able to do that at all. And one of the things that has grown out of that for me was upgrading to a set of professional SLR digital cameras. Basically taking our Nikon conventional 35mm system in the studio and getting the digital set-up for that using all the same lenses. But the key thing was the

extra battery pack. It looks like a motor drive, but it's not, it just is a housing for two batteries that lets you go and go and go. But there is a little button on there that allows you associate a sound file with an image. You can either do it as you are photographing - and all it takes is just a second to indicate that you're done with this section of the fuselage and now you are moving on to this section or something. Or you can do it later on while you are reviewing the photographs that you have taken, so you have got a hundred images all of a sudden that you would only be able to document in real time under intense conditions, but then when you have got a chance to sit down and review things, you can make annotative comments associated with each image. Then I often will turn that over to my office assistant who will turn them into text captions in my catalogue files. It is almost second nature now. It is really wonderful to get so much more detail than we ever would have before.

Alison Wain:

And you can batch treat photos very easily digitally. We will actually be talking after lunch about digital photography.

Fred Haynes:

Probably a bit of a facetious comment - but I am one of those old dinosaurs like Col - but maybe you conservators should be developing strategies to manage us old dinosaurs before Alzheimer's sets in.

Alison Wain:

We actually do and it's called paper and pencil! We at the moment are in a transitional phase in that we have all those paper log sheets attached to the objects, and that is partly because at the moment a lot of people don't feel that comfortable with [computers]. A lot of the people who are working - the volunteers and even until recently some staff - felt quite uncomfortable with working with computers and preferred the paper and pencil. So what we then do, once we have filled up one of those log sheets, is send it to the office assistant, who will then put it on the computer. So yes, it is a transitional thing, but it does take that into account.

David Thurrowgood:

Thank you, Col, for some of those comments. I think as a conservator, it is interesting working with people of Col's generation. Many of them have come through trade school backgrounds, and never been big on record keeping of any sort or form except perhaps filling in quick log books. Whereas conservators - we in our training were taught the extreme level of documentation. Then, when you move into large object conservation, you actually need to take a more balanced view and as Alison was saying, talk about general chips rather than measuring 3mm chips all over an object. At our museum, we are pretty keen on making sure, though, that people like Col do record some of their knowledge about an object, simply from their experience. Because [I], as a young person coming into conservation, am not going to know what they have picked up in the course of their life span. So we're very keen on people like Col sitting down at the end of the day and actually going into in a bit more detail than "machined up part for differential", because I have had the experience on several occasions, where you ask a volunteer or someone with that innate expertise to fix something. They will go away and fix it, and the documentation at the end will say 'fixed differential'. Now that might be fine if you were working in a workshop, but in a museum, where we actually want to know what was done to that differential, which

parts were replaced, it is very important to try and keep track of that sort of information.

Our approach to it is very much to have everyone who is working on objects keep a day book. At the end of the day, they write down notes in whatever form is possible. And then the conservator at the end of the project will go through and put that into a format where it can exist in the museum's records into the future.

Alison Wain:

I think what you are talking about is agreement on the information that you want and the format you want it kept in, because yes, I have gone through reports with people - even with the Lancaster and Beaufort - and it has said 'cleaned' and I say "What did you clean it with and how did you clean it? Did you clean it mechanically or chemically; if chemically what did you use?" So, trying to get people to recognise that they don't just say "cleaned", they [should] say what with and how they did it. But that is an agreement on type of information and format - and still needn't make [the report] that much longer.

David Thurrowgood:

It can be difficult to get that across. Some people take it to the nth degree and try and give you every fraction of a detail, others will say "cleaned".

Alison Wain:

[Yes], it can be difficult to get that across to people - what is the correct balance. And I guess that comes back to training and supervision, and saying, 'Well okay, perhaps that was a bit too detailed today, you could knock back that a bit and then you may have to do this for a while'.

The other thing I wanted to mention - I spent about 9 months working in the Photo, Film and Sound Section of the War Memorial this year, and what we were beginning to realise was that we were commissioning photographers to do work on current conflicts for us. And photographers that are in our collection from past decades are now revered as icons - people like David Parer and so forth. They are revered for their own artistry. And so what we suddenly started thinking was, while we have got these people here - they're current, they're living, they're "now" - we should do an oral history about them. About what they found about that experience, how it affected them as a photographer - did they have any particular problems? And so we did a number of those oral histories.

So another way of doing that may be to try and capture some of that surrounding knowledge by doing an oral history session with people like Col, and sitting them down. Most of them will talk the hind leg off a donkey - I know Col will. And so all you have got to do is just push them and let them go.

David Thurrowgood:

That's exactly one of the reasons why I try to encourage people like Col to write a few notes about what they have done, because it is translating their thoughts and feelings as an engineer on into the future. Those records, as much as I can possibly get them to, [are] written in pencil on good archival quality paper. They will go and sit with the object [and write down] their engineering culture, thoughts and feelings

about the object - which we are hopefully keeping with the object - and the experience of working on it and conserving the object.

Alison Wain:

But even if they are not so keen on writing stuff, sometimes you can get them talking more easily.

David Thurrowgood:

Yes.

Chris Knapp:

Have you thought of getting people like Colin to sit down and be interviewed by your Sound archive people, and then that interview actually becomes part of the collection?

Alison Wain:

Yes.

David Thurrowgood:

Absolutely yes, oral histories are something that our organisation and many organisations in this country do conduct surrounding objects.

Chris Knapp:

One of the things we have had to overcome is - they wanted to interview the pilots, but they never thought to interview the mechanics. They have got the pilots up there [in the collection]. So people like Colin, who have got all these years of experience, are worth listening to.

Alison Wain:

That is something that Clara Deck's presentation brought out so nicely - all those interviews with people who worked with Henry Ford.

Chris Knapp:

Another point about documentation of large object conservation is we have got to be realistic. The larger the object, the more documentation you will probably have to have. And at some stage, somebody is going to want to research that. And it has got to be ordered so the information can be found.

What we have done for our aircraft collection is, I have broken it down into zones, and all the aircraft are treated in the same way – so the fuselage is zone 1, port wing is zone 2, starboard wing is zone 3; and then they can be subdivided for the larger aircraft. But if at some stage in the future you want to know what was done in the cockpit of the Lancaster Bomber, you can go to the file and you've got zone 1 - or 2 I think it is - so you are limiting the area you have got to search for information. It is really just a way of cataloguing it so that people can find it.

Vanessa Roth:

Just a couple of comments on volunteers. I have been involved in a couple of projects, where I have supervised volunteers, and I have found that getting documentation off volunteers is extremely difficult. And initially I used to just basically interview them at the end of the day and record things, because I realised I couldn't get any decent

amount of documentation. But we actually had quite a good system when I worked at the West Australian Maritime Museum, where we divided basic treatments into categories, so all they had to do was record numbers. So if they had brush-vacuumed you just put a “1”, and if you had done some mechanical cleaning you would put a “2”. Then those numbers were taken to the secretary who typed it up into the computer system. It was much easier to get those numbers than to get any words recorded.

Nick Langford:

You people are very lucky. The main reason we take so many digital photographs is so we can justify the bill to the private client. Which is something you don't have to do.

David Rockell:

In my limited time at the Powerhouse Museum, we have gone through three stages of documentation. I should start off by saying I am a tradesman who is now conservation trained, like Col. But when I first started at the Powerhouse, we were expected to write novels whenever we did a treatment. From writing novels we moved on to noting in boxes that we had “10%” corrosion and “15%” damage, and we then found after 2 days or 2 months that [that] meant absolutely nothing to us. So we have now settled on photo documentation and annotated images and at the bottom of each image there is room for brief handwritten notes. I am an absolute computer Luddite and my English skills are very limited - because of my classic British education - and I don't find this a bother at all anymore. The other thing I would like to say is that documentation of any treatment is a minimum requirement and it's a mindset. Even if you have got volunteers, it's a mindset – it's a discipline. And you just have to do it, we need to do it.

Col Ogvilie:

The unfortunate part about it - and I do appreciate the fact that documentation is imperative - where the problem comes up for me personally, is I do not feel I am productive. Now, the worst boss I have got up there - especially when the two Davids are gone - is me, because that bastard tells me to go so much harder. Because I want to impress the two blokes, who are going to walk in the door in the afternoon, and say “look what I've done”. That's a mindset that's come about through 50 years of training. Now it's awfully difficult to lay down the lathe or the mill or the grinder or the hammer and chisel -which David won't ever let me pick up – it is hard to lay those tools down and pick up a pencil. When I do pick it up, then it's with brevity. And that sometimes gives David a small heart attack. So I do appreciate the problem. I do think conservation - and that goes throughout every museum where they have volunteers or engineers like myself - that it is the conservation staff that is going to have to look after that documentation, more so than the people who are there doing the job. I know that is putting an added responsibility onto the staff, but it is the only way we are going to complete real documented evidence on the job.

Alison Wain:

Well, in some cases it is just a useful division of labour. We have been talking about how the conservation staff - particularly where they don't have the in-depth engineering skills - they are perhaps better using doing some of the planning; the

resource planning, or logistical planning using the advice from their team. And that documentation role is perhaps one that they are also best fitted to.

Col Ogilvie:

I do believe that this is the way in which conservation must look at their engineering staff. That they must utilise their engineering staff and volunteers to the best of their ability. Don't sit us down. For instance, when I had to write up the Crossley at the end, I had five and half pages of parts that I had to log, and write down particularly what was wrong with them, then pack them into boxes, and in each box a detailed report on those parts - what was in there and so on. Now I found it interesting because I had never done it in this manner before. But it still took me 11 days.

Alison Wain:

And it is something that could perhaps have been done easier by pairing a more documentation minded person, such as a registrar, with you to go through it. And two people always have far more fun than one!

Lee Davies:

To a degree it also comes back to the background the person comes from. I am technically trained – naval aviation. Part of the naval aviation philosophy is that you document the work you do because you keep a record of the aircraft's history. So for me to come into the conservation world - to carry out the documentation thing is only a part of the job. It is a very important part of the job, and it is just part of the training I undertook during my naval career. So some of it is the history and the background you come from. Andrew Schroeder who is part of our team, he comes from a mechanical car industry, heavy vehicle industry background. Part of his work would have been to document it - you have to bill the customer. So he had to record the work that was done. So for him, part of his ability to also carry out the documentation as part of the job – is part of the nature that he grew up with and his career history as well.

Col Ogilvie:

That's fine - it is case of depth of documentation. As a technical teacher for 20 years, documentation is imperative. I would have to document a student right through the [tertiary] TAFE system. [But] there is a limitation of depth to which you go. This is where I find it very difficult as an engineer to come into an institution and document the depth. The unfortunate part about it - I realise what it is - I have this terrible problem. That I do not feel I am productive enough documenting, where if I was on the mill, I would be.

David Thurrowgood:

The problem that Col and people of his upbringing and work experience often find is that they don't feel that they are working if they are documenting an object. I actually have to go to great lengths to say that a particular cylinder in an engine has failed because of such and such. Now these people know why that cylinder has failed, and their experience will give a very different insight to what I, as a conservator, will have. And actually writing down 4 or 5 lines about what has happened in that particular instance is very important. The problem is that often people from these technical backgrounds don't feel that if they are sitting down with a piece paper, they

are physically working, as compared to working with tools or machines or any other of the types of work they will be undertaking during the day.

Tony Colman:

I am of the same era as Col, and I think one of the problems that we have is we come from a private enterprise background too, as Nicholas [Langford] is too. And the fact that if you're not doing what you are supposed to be doing, you are not working. I still do my museum bookwork on a Sunday morning, because for thirty five years I did my bookwork [then]. Because I wouldn't want to stop - I couldn't stop - to write something down for somebody else.

And taking photos of work done to satisfy customers is good. The work that I am doing at the moment in trams for the Hobart City Council - the City Council employed a person to come round and film me, because that is the only way they can keep a track of what I'm up to. They come in and video me when I need them and they come and photograph me every week and take their records. And that's good.

It's a private enterprise mindset, and dare I say - with a room full of public servants - we do look and think quite differently.

Alison Wain:

I agree, we do. And I think it is one of the reasons we really need to have discussion sessions like this, because certainly from the point of view of a public sector person sending work out to someone like Nick, I usually want more documentation than you guys will send back, because I feel that quite often, the private sector level of documentation doesn't give me what I would like to put in the history of the object. But I know these guys are working to a commercial imperative, so again, we need to work out exactly what information we want and what format, so they are not writing a novel for us, but they do give us what we want. But equally we recognise their limitations - their time.

Nikki King-Smith:

Just a quick comment about the 'shared experience'. We take engineers in to help us out with areas that we don't understand fully, and it is part of the sharing process that they take on the requirements we need for us to run our facilities in the appropriate manner. I think it's a shared experience, we learn from you - you learn from us, and if you are not willing to take on an aspect that is crucial to us, I think we need to question as to whether we can actually manage in this area.

Alison Wain:

I am sure we can, it's just we have got to have that dialogue, but I think it's a good point.

Nikki King-Smith:

Yes, dialogue is what it's about isn't it? It's about the give and take of information and how you do it. And our documentation process is crucial to us and it is necessary for the folks who come in and help us out to understand and appreciate the level at which we need to operate and to have some empathy and sympathy for us as well.

Chris Knapp:

A comment really for Col and Tony. Colin has very passionately and eloquently advocated that we preserve skills, and I think he has got the agreement of just about everyone in this room - "Yes, that is what we should be doing". I will say - lead the way and write down your skills.

Col Ogilvie:

I would rather talk about it!

Chris Knapp:

Not good enough, you are not going to be here forever – write them down.

Alison Wain:

Or video them.

Chris Knapp:

Or video them. But you have got those skills, you have got the opportunity to start passing those skills on. I would seriously, or very strongly, suggest you take that opportunity while you can and look on it that way. You are not record keeping, you are actually building an object, almost, in the museum - that can be passed on. You are passing on your skills.

Alison Wain:

Which is exactly what you said in your talk actually, that that's what you view your role as.

Okay – I think it's lunchtime!

[The discussion session ended here and was followed in the afternoon by further talks and tours of the Memorial's large technology displays.]