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Signed: 9 July 2012

David A Elliott
INDEX

Introduction................................................................. Page 3
Executive Summary.................................................. Page 4
Programme................................................................. Page 5

Main Body

Case Studies
Operations- Chicago Field Museum ................................Page 6
Operations - Royal Tyrrell Museum ...............................Page 9
Fundraising - Chicago Field Museum ............................Page 12
Education - Royal Tyrrell Museum ...............................Page 13

General Observations
Collections & Laboratories...........................................Page 19
Exhibitions.................................................................Page 22
Museum Retail - ...........................................................Page 31
Building Design..........................................................Page 34

Regional Observations.................................................Page 35

Recommendations.......................................................Page 36

Conclusion.....................................................................Page 36
INTRODUCTION

My family became closely involved with the Qld Museum in 2001 following our discovery of significant dinosaur fossils on our property ‘Belmont’ near Winton, Qld. Knowing this was only a small percentage of what was in the district, we realised that the international importance of these discoveries could play a large part in contributing to the long term viability of regional communities throughout western Queensland. We also understood that this resource was never going to reach its full potential unless a regional institution could be developed to undertake digs and fossil preparation on a full time basis.

In 2002 we founded the not-for-profit ‘Australian Age of Dinosaurs Museum’ (AAOD) and a few years later opened a fossil preparation lab in a shed at Belmont. The prep facility was moved in 2009 to a large shed at ‘the Jump-Up’ (a 1,400 hectare mesa near Winton donated to AAOD by the Britton Family) which is still in operation. AAOD has continued to run dinosaur digs every year and in the decade since its conception has grown to such an extent that the museum now houses the world’s largest collection of Australian dinosaur fossils. The preparation of fossils and involvement of volunteer preparators has grown to such an extent that AAOD now operates one of the most productive fossil preparation facilities in the Southern Hemisphere.

With the first stages of the museum - a reception centre and temporary fossil preparation facility now operational, it is paramount that AAOD begin to develop strategies and concepts for an international standard museum. Through a business plan and feasibility study undertaken by ‘Grant Thornton’ we identified several international museums on which to base a comprehensive study tour. I was very fortunate to receive the James Love Churchill Fellowship which enabled me to complete this tour and this report is based on my visitation and research of some of the most significant natural history museums in USA and Canada. Although the main purpose of my study was to assist the development of operational strategies, educational initiatives, building design and gallery concepts relevant to the Australian Age of Dinosaurs Museum of Natural History, much of its content is relevant to museums throughout Australia and as such may be a useful comparative resource.

This study tour would never have been possible without the support of many people and organisations and I would like to first and foremost give my heartfelt thanks to Perpetual Trustee Company Ltd, Trustees of the James Love Estate. Without their generosity I may never have been given this opportunity and it is very much appreciated. I would also like to mention the generosity of Grant Thornton who made a substantial pro-bono contribution to the AAOD business case studies and who so kindly arranged so many meetings for me while I was overseas. My appreciation also goes to friends and family who advised me, organised me, chastised me and prepared me. It is a wonderful thing to have people behind you who care enough to make sure that you leave nothing to chance. I needed it and I appreciate it immensely!

Thank you goes to the Board of AAOD for their dedication and support and a special thankyou to my wife Judy who accompanied me, drove the car on the right (wrong) side of the road in Canada and washed our clothes in the hand basins of luxury hotels. And a big thankyou to my sons Bob and Harry who ran Belmont in our absence. I would also like to thank the many wonderful people I met during my travels who stopped at nothing to ensure I was able to get every scrap of information I wanted and more. Through their help I was able to gain a comprehensive understanding of the many subtle and not so subtle workings of some of the world’s most famous museums and it is something that I will never forget. Finally, thankyou to the Federal Minister for Regional Australia the Hon Simon Crean who arranged for us to brief the Australian Ambassador in Washington on our project (and whispered in the ear of the CEO of Qantas and had our flights upgraded to Business Class)!
EXECUTIVE SUMMARY

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The James Love Churchill Fellowship to study operations, exhibition development, collection management and educational initiatives of natural history museums in the United States of America and Canada

Highlights
Eight highly regarded North American natural history museums were visited in view of gaining a strategic direction to progress future development and operations of the Australian Age of Dinosaurs Museum (AAOD) in Australia.

• Dinosaur National Monument in Colorado: Due to its regional location and being situated at the site of a nationally important prehistoric event, this museum has a very strong relevance to Dinosaur Stampede National Monument at Lark Quarry near Winton. Important information collected from this visit was the way this museum has been developed to include additional displays to further tell the story of the site and its relevance - something that I believe could be of immense benefit to Lark Quarry.

• Chicago Field Museum: Being a not-for-profit organisation the Field Museum is an important example of how an organisation can remain viable for over 100 years through the development and careful management of exhibitions, education programs, membership, retail, and philanthropy. The Field Museum has exceptionally well cared for facilities and learning about its philanthropic initiatives and membership structure through meetings with relevant staff in senior management was a very important highlight of this trip.

• Carnegie Museum, Pittsburgh, Pennsylvania: Modern display techniques and good lighting and visitor access gave this museum an outstanding dinosaur display. The Carnegie Museum geology interpretation of a simulated lift was an excellent example of how to make an outstanding educational experience at low cost.

• Smithsonian Natural History Museum, Washington: Traditional display design, collection housing and architecture - important in understanding the relevance of some traditional exhibition styles that endure today.

• Smithsonian National Museum of the American Indian: An excellent study subject on how to adapt traditional museum design into a modern building of great beauty. The inclusion of artistically designed retail and café facilities into the gallery format was exceptional and an excellent method of fundraising was also featured as part of this museum.

• Australian Embassy: Brief on the AAOD Museum project to the Australian Ambassador, Hon Kim Beazley.

• American Museum of Natural History, New York: The modern outfitting of the collection room at AMNH gave important ideas and information on the development of best practice methods in this area.

• Royal Tyrrell Museum, Drumheller, Alberta, Canada: An excellent case study for the AAOD Museum due to its regional location, extreme climate variations and massive palaeontological resource. This museum’s operational initiatives, education programs, fossil preparation lab and collection size/design were comparable to what I expect the AAOD Museum will achieve within the next two decades.

• George Page Museum and La Brea Tar Pits, Los Angeles: This small museum was built on top of a significant Pleistocene deposit and provided excellent fossil recovery interpretations and building design ideas.

• LA Natural History Museum: A very modern dinosaur display with excellent ideas on electronic interpretations and an attractive model of a modern, practical retail outlet.

Dissemination and Implementation of Information
The major lesson that can be taken from this study tour is that there are many magnificent museums in the world that have all got to where they are today by developing strategies to achieve. By comparing the results of these strategies - some of which were put in place a century ago - and putting them into a modern timeframe, one can readily identify their relevance to the Australian Age of Dinosaurs Museum in regional Australia. An iconic institution is much more than a large and beautiful building full of important artefacts. In spite of a substantial dinosaur resource, without the backbone of their educational and scientific endeavours these icons of North America could well have failed. It is important we understand this as the Australian Age of Dinosaurs Museum must follow their lead. It is imperative that we manage the growth of AAOD so that education, science and public involvement keep pace with new discoveries and museum infrastructure. To this end, strategies identified in my Churchill Fellowship Report will be presented to the AAOD Board where they will be incorporated into concept plans being developed with AAOD Project architects Cox Rayner for presentation to governments, corporate businesses and everyday people.
PROGRAMME

Initial research identified several key museums that had a strong relevance to AAOD and meetings were organised based on this research. The following institutions were visited and meetings arranged in line with these identified requirements:

2nd May 2012 - Day trip from Grand Junction, Colorado to Dinosaur National Monument.

4th – 7th May 2012 - Four days inspection of Chicago Field Museum, Chicago and meetings with operational staff and senior management:
- Mr John McCarter, President & CEO
- Mr Jim Croft, Executive Vice President,
- Mr Ernst Pierre Toussaint, Director of Facility Planning and Operations,
- Mr Jaap Hoogstraten, Director of Exhibitions,
- Mrs Laura Biddle Clark, Vice President Institutional Advancement
- Ms Laura Sadler, Sr. Vice President Public Museum
- Michelle Clayton, Director of Membership
- Cate Goebel, Director of Institutional Advancement

9th May 2012 - Day visit to Carnegie Museum in Pittsburgh, Pennsylvania:
- Meeting with Dr Matt Lamanna – Assistant Curator of Vertebrate Palaeontology
- Meeting with Patricia Johnson, Shop Manager

11th May – 12th May 2012 - Inspection of Smithsonian Natural History Museum, Washington DC:
- Meeting with Dr Mathew Carrano, Curator of Dinosauria

13th May 2012 - Day visit to Smithsonian Museum of the American Indian

14th May 2012 - Visit to Australian Embassy, Washington DC
Meeting with Hon Kim Beazley, Australian Ambassador

16th – 20th May 2012 - Inspection of American Museum of Natural History, New York and meetings with:
- Dr John Maisey – Curator of Fishes
- Dr Mark Norell – Chair of Palaeontology
- Anna Balcarcel – Senior fossil Technician

22nd – 25th May 2012 - Four days inspection of Royal Tyrrell Museum, Drumheller, Canada and meetings with operational staff and senior Management:
- Andrew Neuman – Executive Director
- Jason Martin – Director, Operations and Finance
- Lisa Making – Acting Director, Exhibits & Communications
- Warren Nichols – Exhibit Services
- Dr Don Brinkman – Director of Preservation and Research
- Brandon Strilisky – Head of Collection Management
- Earle Wiebe – Science Education Administrator

27th and 29th – 30th May 2012 - Visit La Brea Tar Pits - George Page Museum and Los Angeles County Natural History Museum and held meetings with:
- Dr John Long, Vice President Research & Collections
- Dr Luis Chiappe, Curator, Dept of Vertebrate Palaeontology
MAIN BODY

To carry out a comprehensive study on the operational structure and programs of every museum was impossible in the given time frame, and to a large degree would have been irrelevant anyway. Initial research identified several key museums that had a strong relevance to AAOD in some way and meetings were organised based on this research. Key issues identified, and the organisations best situated to address these issues included:

Operations - Chicago Field Museum and Royal Tyrrell Museum
Fund raising – Chicago Field Museum
Collection management and lab management/design – All museums in general
Exhibition design and content – All museums visited
Building design and content – All museums in general
Regional relevance – Dinosaur National Monument and Royal Tyrrell Museum

OPERATIONS

CHICAGO FIELD MUSEUM STUDY

Early Comparisons
The Chicago Field Museum (CFM) has been in operation for nearly 120 years. Like the Australian Age of Dinosaurs Museum (AAOD) it is a not for profit organisation. Where AAOD was developed in 2002 to retain significant dinosaur fossils in the Winton District, CFM was started under similar circumstances when, following the World Fair hosted by Chicago in 1893, Chicago citizens raised funds to keep significant anthropological specimens brought from around the world in the city. The CFM has only changed location once and this was in 1921 when its current venue was officially opened specifically for its current purpose. The building was built on donated funds of approximately $7m which on today’s values would increase 100-fold.

The CFM can be divided into 4 major disciplines which include Anthropology, Zoology, Botany and Geology (which includes palaeontology). In comparison AAOD is focussed entirely on one discipline which is geology/palaeontology. Where the CFM collections have been amassed from around the world, in comparison AAOD’s collection and core business is based exclusively on the evolution of the Australian continent. For the purpose of this study, most of this report will focus on issues where a clear common theme or relevance has been identified and how it might assist AAOD in future planning and development.

Study of the early day operations of CFM identify the immense importance of two things that AAOD must achieve. First it needs to build a massive and significant product and secondly it must build a strong and affluent support base. Although both of these strategies are equally important, it is without doubt the rapid and significant growth of the palaeontological collection and its research that needs to lead the charge. This was clearly demonstrated by the CFM when almost immediately after its initial founding, the museum sent scientists across the globe to collect and catalogue as much as possible to build the collections of their 4 major disciplines. An almost identical story accompanies the development of the Smithsonian Natural History Museum and the American Museum of Natural history (AMNH). It was this massive collection resource that built their significance and popularity which in turn attracted philanthropic and government support. Without their significant collections and aspirations towards excellence in science from the very beginning, these institutions would have struggled to sell their initiatives to philanthropists and governments and it is important that AAOD follow this strategy. Although AAOD has already done this in a small way, it must be increased a hundred fold if the museum is to truly fulfil its objectives.

CFM Memberships
Individual Membership (over 65 and students) - $60 per year
Individual Membership $80.00 per year
Family Membership – Cost $100.00 per year
Family + (includes extended family) $125.00 per year
Membership of CFM has several benefits which include free entry all year round to the museum and 10% off all merchandise. Another benefit that is very popular is an open night where members are invited once a year to join staff for an inside look at the operations and collection rooms etc of the museum. Due to its popularity this is usually held on 2 consecutive nights to fit all members through.

This field of fund raising is fairly restricted with AAOD as, due to the museum’s remote location, it is very difficult to offer a comprehensive benefit to members. Free entry to the museum works well in a city of several million people but not in a remote location where free entry cannot be easily redeemed. However it is important that AAOD follow the lead of CFM and start promoting membership as aggressively as it can. In addition to this, if AAOD benefits could include something else that can be redeemed from afar such as web purchase discounts or similar it could be well worth considering. Suggestions offered include a reciprocating membership with a similar type of organisation as AAOD that is based in a high population area. This could include State museums or not-for-profit organisations that have an active membership (or are keen to develop one) who might be interested in forming a partnership with AAOD where we both deliver a benefit in return for a %age of membership proceeds.

One thing that might prove to be relevant to AAOD in the near future is high level memberships. The CFM has two categories that could possibly be initiated by AAOD to some extent (although monetary figures may not be relevant) and these include:
The Chairman’s Circle – Cost $25,000 per year
The Founders Council – Cost $2,500 per year
Although these figures would need to be reduced in value, there is almost certainly a core group of members within AAOD who would subscribe to this high level of membership provided AAOD could reciprocate with an appropriate benefit.

One of the biggest hurdles AAOD faces each year is maintaining its membership as some members tend to drop off. The CFM strategy in this regard is to send a renewal invitation 2 months before it is due, one when it is due and one as an overdue. From there, two follow up letters inviting the ‘ex member’ to special new exhibits or similar are sent. Although it would not work for AAOD to invite members in arrears to special functions, this information could be useful in the development of a similar token or invitation such as a newsletter or merchandise discount for members that might help to entice them back.

Management Structure

Board of Trustees
The management structure of CFM is quite complex due to the size of the organisation and the fact that it has 4 disciplines rather than one as with AAOD. Both organisations are not-for-profit with AAOD operating under a voluntary Chairman and Board of Directors and CFM operating under a voluntary Chairman and Board of Trustees. The biggest difference is that AAOD has a limited Board of 9 whereas CFM has a current Board membership of 85 members. It is also very interesting to note that many of these Trustees are people who regularly make significant donations to the CFM such as for exhibitions and have, over time, developed a very strong sense of belonging and ownership of the Museum. The Board of Trustees meets 4 times per year.

Operations Management
Management structure of the CFM includes:
1 x President/CEO
4 x Senior Vice Presidents including:
Public Museum - Public relations, exhibition, education, earned income (stores & events), marketing and visitor services
Collections and Research – Geology, Botany, Zoology and Anthropology
Environmental, Cultures and Conservation
Executive Vice President – Operations, Security and Finance. This person reports directly to the CEO
3 x Vice President positions including:
Admin & Human Resources;
Institutional Advancement (fund raising)
Technology
Although it is not easy to draw comparisons between the management structure of AAOD and CFM due to the size difference between the two organisations, it is important to note that the management structure of CFM will become more relevant to AAOD in the future. As AAOD matures it will need to start addressing some of the positions identified by the CFM and restructure its operational management accordingly.

**Exhibition Management**

The development of major exhibitions is something the CFM is constantly doing. The life span of exhibits varies, from temporary shows that might only last 6 months, to major exhibits that might last in excess of 25 years. Many exhibitions have an educational science theme (such as conservation) and are often linked to educational programs.

Major displays for in-house exhibitions are usually designed to have an optimal 20 to 25 year life span although some might be replaced in half this time and others may exceed it by many years. The costs of these major exhibitions varies depending on size and complexity but are usually in excess of $3m with one massive exhibition titled ‘Ancient Americas’ costing in the vicinity of $15m. Wherever possible these exhibitions are funded through philanthropy although labour, indirect costs and any shortfalls are usually borne by CFM. Work in this area is done in-house wherever possible.

The CFM also produces major travelling exhibitions for hire to other institutions throughout the world. Construction of these exhibitions does not commence until an appropriate number of museums have been approached first and the exhibition’s feasibility has been assessed. The CFM tries to produce one new major exhibition every 4 years and plans for 10 show venues of 6 months duration. Each show has a rental charge of $100,000 per month and merchandise marketing initiatives are usually associated with each showing. By the same token CFM brings in major exhibitions from other parts of the world for display when required.

Travelling displays usually take about 3 years to complete with the first year allocated to concept development, the second to final design and consultation and the third year devoted to construction. Although the cost of each exhibition differs, a new travelling exhibition usually costs around $3m with about one third of this being labour costs.

Following a tour behind the scenes of the exhibition construction section of CFM it was apparent that a workshop area with appropriate equipment can be built without the need for major investment. The real investment in this department however is employees with relevant expertise and employment of such people is not economically possible for AAOD at present. Nevertheless a study of the exhibition work performed by CFM shows that AAOD would benefit in the immediate future from a workshop operating on a small scale, particularly through the casual employment or secondment of skilled craftsmen when required.

**Volunteer Resources and Management**

In comparison to their size, it was surprising to learn of just how few volunteers there are associated with the museums we visited – particularly in laboratory operations, with most volunteers restricted to gallery interpreters – called ‘docents’. Although most of the museums we visited had a small number of volunteers working in fossil preparation, it was actually quite a lot less than currently used by AAOD in this field.

The Chicago Field Museum has a staff member and program dedicated to the recruitment and management of volunteers. To become a docent, people usually apply online and a fairly stringent process is followed before a person is accepted. Most docents work within the museum display galleries where they mingle amongst the visitors and talk to people about particular displays etc. At CFM a strong preference is given to people with a degree of some kind as the position requires a fair bit of training. Applicants are interviewed and if accepted, undergo training by curatorial staff and DVD’s. Training is provided on a single gallery basis and at the end of their training each docent sits through a test. Docents need to pass a test for every gallery they wish to work in.

There are approximately 50 docents working at CFM with about 3 on duty each day including weekends. Most work a few days per week but some might work as little as two half days per month. Every docent has a uniform which they need to purchase themselves. At the end of each year a volunteer recognition dinner is held where the CEO/President awards certificates etc. Special awards are also given to people who have been volunteering for long periods of time such as 15 years etc.
OPERATIONS

ROYAL TYRRELL MUSEUM STUDY

Early Comparisons
Of all the museums we visited in USA and Canada, the Royal Tyrrell Museum (RTM) was the most relevant to AAOD due to its smaller size and regional setting and for this reason a comprehensive study on the museum’s operations was carried out. Being a government owned and operated institution, the management structure and fund raising initiatives of the RTM do not have the same relevance to AAOD as the Chicago Field Museum. Nevertheless, its operational structure is still very relevant and being a much smaller organisation than CFM, it probably has more lessons for AAOD than any other museum in this regard.

Like the CFM and most other large natural history museums in USA, the RTM was developed on the strength of its dinosaur fossil collection. The RTM took over its collection in 1982 from the Royal Alberta Museum and a huge effort was put into its expansion in its formative years. This has now been greatly scaled back - so that where everything was collected in earlier years, many isolated fossil bones are no longer collected or wanted. The collection has tripled in the 30 years the RTM has been in operation. Like CFM, this ties in very strongly with AAOD’s current position and strongly supports my belief that AAOD needs to expand its dinosaur collection, preparation and scientific research programs as a matter of extreme priority.

Regional Significance
The RTM is situated about 7 km from Drumheller, a town of approximately 8,000 people that straddles the Red Deer River. The turn off to the RTM is about 3km from the town’s outskirts. Drumheller was once a coal mining town but this industry is no longer operating. There is now a natural gas industry operating throughout the area but it does not have the same dependence on the town as the coal mining industry did, so Drumheller relies heavily on the tourism industry to remain viable.

Comparing Drumheller to Winton is not easy in relation to its size, infrastructure and its close proximity to the city of Calgary (2 hours) and Edmonton (4 hours). Nevertheless, in regard to its reliance on tourism, regional setting and adverse weather conditions it is very similar. The close proximity of Calgary actually works against Drumheller to a large degree as it is easy enough to visit the RTM and return in the same day without even needing to refuel. The vast majority of visitors to the museum are Calgary day trippers who spend very little money in the town and those that do stay are often only accessing the motels, eateries and refuelling stations. Most do not visit the shopping areas in the town centre.

In an effort to entice people to use Drumheller’s shopping centre facilities and stay longer, the local businesses have developed a prominent dinosaur theme with an array of dinosaur related statues, businesses, playgrounds and business names scattered throughout the town. The dinosaur sculptures are designed to attract young children more than anything and are mostly painted in bright colours etc. According to one businessman this works better than having realistic statues as young children relate to them better. There were quite a lot of young children in the Drumheller hotel we stayed at so this philosophy may be working. It was also interesting to note that several hotels have heated indoor swimming pools with water slides...
built into them so young children definitely appear to be an identified target market. In addition to this, the town also boasts the world’s largest dinosaur which is a massive T rex sculpture standing several stories high. People can pay to climb up through the middle of the statue.

Museum Location
The RTM is situated about 2 km’s in from the fringe of the bad-lands that run either side of the Red Deer River Valley. The bad-lands are a series of eroded mesas very similar to the small mesas south of Winton, the main difference being that they do not have the rock plateau that is prominent on their western Qld equivalents. Although the bad-land deposits are very similar in colour and composition to the Winton Formation deposits, they are much more concreted so the rate they are dissolved by rain is quite slow in comparison. It is also interesting to note that the bad-land topsoil is an oxidised weathering layer similar to western Qld’s blacksoil, with bands of ironstone and poor grade coal throughout the exposures virtually identical to the deposits of the Winton district. This material becomes sticky and greasy when wet but due to its more concrete nature, probably does not get boggy as western Queensland’s soil tends to do.

The RTM is a perfect role model in many ways for AAOD due to very similar circumstances in its development and positioning. The Museum was purpose built near Drumheller as several very significant dinosaur discoveries were made in the bad-lands and there is still a plentiful resource of dinosaur bone material weathering out of the deposits. At the time of its construction, it was considered important that the museum first and foremost have a strong scientific research base so that it would have the integrity to develop educational science programs as it progressed. This appears to have been a very successful strategy as the education and science programs run by the Royal Tyrell are equal to or better than anything we observed in much larger natural history museums throughout the USA.

Seasonality and Weather Conditions
It is interesting to note that what we consider to be adverse weather conditions at Winton are actually quite tame. Drumheller has a temperature range that varies between 40 degrees and -40 with winter temperatures very often below -20. Summer days can reach 40 degrees with hot, dry winds blowing dust in from the bad-lands. In addition to this, the bad-lands are a sticky clay deposit and, as there are walking trails and look-outs leading out from the RTM, there is also a ‘muddy boots’ problem to contend with in the event of rain.

The RTM appears to have an even more seasonal visitation than AAOD with a peak season of just two months over the summer holidays (July and August) and two months of shoulder season either side. Annual visitation is between 375,000 and 400,000 people per year with visitation of around 5,000 (and up to 8,000) visitors per day during its busiest periods. In the off season numbers fall back drastically. In February which is the RTM’s lowest month, a similar visitation figure to that of AAOD in February is common with numbers down as low as 6 people visiting in a day. One comment from the RTM staff was that even then they are just looking to get in out of the cold!

It was heartening to hear and see firsthand the effect of the weather on visitors to the RTM. The people of Canada deal with far greater extremes than we do in regional Australia and yet the RTM still manages to operate a significant regional attraction in spite of this. A common comment that “40 degrees is much better than minus 40” suggests that AAOD may be able to develop an increased international visitation from the Northern Hemisphere if marketing is concentrated on ‘getting away from the cold’.

General Operations and Management Structure
The RTM is open every day of the year with the exception of Christmas Day. Opening hours are from 9.00am to 5.00pm from September to May but increase to 9.00am to 9.00pm from early May to early September. These longer opening hours are possible due to the extremely long days in this area where it is still quite daylight at 9.00pm. However the longer hours are not considered by everyone to be hugely successful as many evenings have low attendance, particularly in the shoulder months.

Staff numbers vary at the RTM peaking at about 190 during the summer and dropping to about 120 in the winter months. The staff structure is very complex with some staff being government employees, some employed by a regional Chamber of Commerce hired by government and some employed by a separate not-for-profit cooperative society arm of the museum. Employees during the 2011 winter season included: 35 government employees under the Culture and Heritage Department (management team are all included within this section); 41 Chamber of Com-
merce staff which include museum assistants, front desk staff and gallery; 5 government employees under the Alberta Infrastructure Department who manage the building asset; 2 university interns; 1 post doc; 15 Cooperating Society staff who control the gift shop and memberships; 3 cleaning staff; 6 café staff and 2 guards. An additional 54 staff are contracted for the summer months and all of these are employed in the public services and hospitality side of the museum.

The senior management of the RTM consists of 4 people, namely an Executive Director and 3 Directors with each Director responsible for a section of the museum and the staff that manage it. The three management sections and their responsibilities include:

- Preservation and Research – collection, preparation, resource management and research
- Exhibits and Communications – design, strategic initiatives, exhibitions and gallery security services
- Operations and Finance – financial reporting, business and visitor services and education services.

As AAOD’s museum operations expand the RTM’s general management structure will become very relevant as the operational requirements will be very similar in time. One thing I found intriguing was the fact that very few people working within the museum’s general management structure have titles – they are simply in charge of an area or department. For example, the collection comes under a ‘Head of Collections Management’ but there is no specific title to this effect. This person has one person reporting to him who is in charge of systems and data entry – also untitled. Each section of the museum is divided into similar departments with one person in charge of the department and others under them with their own specific role. A similar system applies to researchers heading the various palaeo departments who are simply referred to as ‘researchers’ and not curators.

This system seems to work well and when I asked about the reason for it I was told it maintains a good working environment within the museum. From what we could see during the short time we were there, staff members at the RTM appeared very dedicated and seemed to share a cooperative workplace environment. This could be attributed to the fact that most people working within the organisation’s management structure have their own responsibilities and are less likely to be in conflict with one another – or maybe we just struck them all on a good week! Either way, the morale within RTM appeared to be very high.

One aspect of the RTM’s management process that I found very interesting is an annual performance document where all of the government employees including department leaders list their goals for the coming year. Each person’s goals are then discussed at a meeting of the departmental team and from this an operations plan for the coming year is produced. What I feel is important here is that this plan is put together with involvement of all staff within each department so that everyone is contributing to the operations plan and striving for the same result. I think this is an excellent way of involving all staff in the future direction and management of their department as well as inspiring them to do their best to help their team achieve its goals. An annual review and performance assessment of the previous year is also carried out as part of this process.

Another operational initiative of the RTM is a full management staff meeting at the beginning of each week where key employees from every department can voice their concerns or disperse relevant information as required. This helps to keep everybody informed of progress or problems within other museum departments as well as contributing to a more unified and informed approach in decision making.

**Revenue and Expenditure**

The RTM’s revenue for 2011 was $8.866m which can be broken up into 41% earned revenue, 5% sponsorships and 54% state government funding. Earned revenue was through admissions, education/science programs and gift shop rental whereas government funded revenue was money provided by the Alberta Government for government employee wages, building maintenance and capital project grants (which vary from year to year). The Museum’s 2011 revenue was expended as 57% wages, 18% building operations, 10% operations, research, marketing and education and 15% on exhibits. No profits are recorded by the RTM as all income becomes the property of the Alberta State Government. However this does not apply to profits raised by the Cooperative Society which is a not-for-profit organisation with a voluntary Board of Directors. The objective of the Cooperative Society is mainly to raise funds toward the RTM’s operations so profits from this area are usually channelled into the development of exhibitions, bursaries or similar exercises. The Cooperative Society employs 15 staff who sell RTM memberships and lease/operate the museum’s gift shop.
Admission
Admission is $11.00 for 1 adult without concessions. (This excludes daily education programs which are usually booked in advance). The museum exhibits section carries no additional galleries with separate charges attached so admission is a one off payment upon entry to the museum. In its early years admission was free with charges not being applied until several years later.

FUNDRAISING

CHICAGO FIELD MUSEUM STUDY

Endowment Funds
The CFM endowment fund is contributed to by people who wish to leave a legacy towards the museum’s perpetual operation. Money donated to this fund is invested and the earnings on investments are then used for the museum’s operational objectives. Any money donated to the fund cannot itself be spent, thus it is only the money earned by investing the fund that is available each year.

Although investment income from the majority of donations to the endowment fund is available for general use by the museum, there are other forms of endowment managed by the CFM where funds are donated to the museum for a specific purpose. One of these is Endowed Chairs, where money is donated (for example) to fund a paid position such as a curator or post doc position etc. In this case the investment revenue from the donation must be used for that specific purpose.

In spite of the fact that certain amounts within the endowment fund are allocated to specific purposes, there is no splitting of the fund for investment and the fund is invested as a single entity. This gives the fund much more ‘buying power’ when investing very large amounts. However the CFM always keeps a certain amount of the fund as ‘on call’ investments so that they can be redeemed at short notice if need be. Splitting endowed chair investment income from overall income is carried out as an accountancy exercise at the end of each year for auditing purposes etc.

One important strategy carried out by CFM in operating its endowment fund is to ensure that all of the earnings from the fund each year are not spent. This means that a sufficient amount of the fund’s annual income must be left in the fund to cover the annual cost of inflation and other influencing factors. This ensures that the fund is not devalued over time. With additional donations being received continually into the fund and existing donations keeping pace with inflation, the fund has the ability to meet future obligations at a maximum capacity. The CFM endowment fund is currently over $300m so investment proceeds from this money play a significant role in meeting the museum’s operational expenses. A down side is that any economic downturns such as the current Global Financial Crisis can impact heavily on operational expenditure when it is heavily relied upon.

The operation of an endowment fund is one aspect of the CFM’s operations that is totally relevant to AAOD and it is imperative we seek legal advice on the development and operation of an endowment fund as soon as possible. AAOD has a very strong support base in spite of its size and this strategy has the potential to make a large difference to the operating budget of the organisation in a relatively short space of time.

Sponsorship and Donations
One of the most significant sponsorship attractions in regard to major donations is offering naming rights in return for investment. A walk through the major display galleries of the CFM (as with other not-for-profit museums including Carnegie and AMNH) quickly identifies the museum’s success in this field. Virtually every gallery or display section is named for a person or company who made a significant donation towards its development. Walking through CFM’s ‘Ancient Americas’ exhibition (which is quite massive) identified no less than 16 galleries of which many had been sponsored by more than one company or individual. On one plaque there were 10 names of sponsors who presented the gallery and some others named groups of 5 sponsors. Many were in the name of a company or family. No museum did this better than CFM and it is obvious that their fund raising and recognition strategy works very well for them in this regard.

Research into the sponsorship of CFM’s galleries revealed that virtually all of the major gallery sponsors come
Chicago or are companies based there in some way. Although many of the sponsorships appear to be from companies or trusts, an interview with the CFM’s fund raising team revealed that the bulk of their sponsorship comes from the private sector with about 2/3 of the donations raised coming from this area.Naming rights for each gallery are usually based on the donor contributing one third of the cost of the exhibit.

The raising of funds for a new permanent exhibition usually starts about 5 to 6 years before it is opened. The fund raising team of CFM identify what opportunities exist for naming display galleries and from there make a list of appropriate people or companies who might be interested in sponsoring them in return for naming rights to the gallery. From this list they then identify the top 2 or 3 people who might be interested in a particular gallery and approach them first. Although many donors are happy to unconditionally sponsor a display, in some cases a particular person or company may have a specific request such as a minimum length of time the exhibition or gallery remains open or similar. In cases like this a gift agreement may have to be entered into between both parties to ensure that the person’s wishes are met. In some cases where it has been impossible to meet the express wishes of the donor, such as a display needing to be replaced before its originally intended date, a further agreement may need to be sorted out with the donor in compensation such as adding to the names of donors in new displays or an ‘originally funded by ...’ plaque.

Perhaps one of the most exciting initiatives that would work very well for AAOD was a major fund raising effort that had been held by the Smithsonian when building the American Indian Museum. This involved the donation of a relatively small amount (we were told $150) in return for having the donor’s name/s on long walls that curved around to the upper staircase. This looked great as the many thousands of names gave the wall an almost artistic finish when viewed from a medium distance. There were so many names that they were hard to distinguish as names until you got close to them.

![Image](image.png)

Smithsonian American Indian Museum. Each panel contains about 440 names wrapped around the upper staircase walls

This sponsorship must have raised a lot of money as there were 15 panels of names on one floor and 12 panels on another. Each panel was about 2 metres wide and .8 metre high with about 300mm of space below so that the total height of the wall that ran around the staircase was a bit over a metre high. Each panel consisted of 44 rows of names and averaged about 10 names per row. Names consisted of singles, couples and families but there were no corporations, businesses or trusts included as far as we could tell.

At around 440 names per panel by 27 panels, this made approximately 11,880 sponsors which, at $150 per name comes to just under $1.8 million. Although the figures may be a bit beyond AAOD at present, I think that this is something that AAOD certainly needs to do as, apart from being a great fund raiser, it would also be a fantastic way of promoting the new museum around the country when the time comes to build it. A goal of $1m from the people of Australia is something that is totally possible and should be considered. It will also empower people who contribute money by giving them a little bit of ownership and provide a reason for families to return in later years.

**EDUCATION**

**ROYAL TYRRELL MUSEUM STUDY**

One area that the RTM excels in is the promotion and delivery of education programs. This is one field that is totally relevant to AAOD and a huge amount of very exciting information and ideas were gathered in the short time that we had to learn about them. The education programs at the RTM are geared toward students of all ages, from preschool right through to Grade 12 and are divided into several categories. These include public programs, camp-ins’, science camps, school programs, credited courses and distance learning. All of these categories are areas that are relevant to AAOD in some form or other and some could be started almost immediately.
The education centre of the RTM was not allowed for in the original planning and construction phases of the museum and was added to the museum about 6 years after it commenced operating. Funding for the centre was provided by ‘ATCO’ a gas company operating in Canada and the facility was named after the company. It is divided into several sections which include a large audio/lecture theatre used for both public talks and school groups, a small room where the distance learning video conferencing is set up and 4 class rooms with a division between each class room so that they can be enlarged if necessary. Each room is adequate for a class of 30 children but 150 children could be addressed if need be simply by lifting the partitions.

Each class room was set up for children of different ages and included cupboards, white boards, tables and chairs and relevant tools and equipment to suit the age group the room was allocated to. There was a mobile chest of drawers in each classroom that contained a large assortment of relevant fossils and other associated objects with fossils in each mobile station geared toward the particular age group the room was designated to. These are pulled out at will and used as discussion points etc by the RTM’s teaching staff. There was also a small assembly/foyer area down one end that had showers and toilets (for sleep ins) and adjoining this area were a couple of baggage rooms for their gear such as suit-cases, sleeping bags etc. There were two baggage rooms, with one room allocated to each visiting school but this has been identified as a problem by staff as there is often not enough storage area in peak visitation times.

The RTM’s education and science programs are only available in summer and are designed to suit different age groups. The programs are many and varied and often include the same activity but geared to a different level to suit the age group. The education program is not really geared toward university level students and although 2 universities in Calgary make day trips to the museum occasionally, it is to study fossil material in the collection rather than partake in RTM programs. Rather than list every program and what it contained, I have endeavoured to simply comment on the more outstanding activities the RTM hold and in all cases these are restricted to what we could identify as having a strong relevance to AAOD.

**Indoor ‘dig site’ – age 3 to 6 years**
This is very well done and consists of a large 2m long x .8m wide x .4m high box with a fossil skeleton glued to the bottom. The skeleton is covered with pine wood pellets (used for burning in pot belly stoves etc) and the kids are given a bucket and shovel (think sand castles) and long handled paint brush to excavate the skeleton with. When their bucket is full it is dumped in a large tub. This way they can uncover the whole skeleton with minimal mess and when they are finished it is just a matter of emptying the tub back over the skeleton for the next group. The wood pellets are safe and enviro-friendly and are very easy to clean up. The skeleton box is hinged in the middle so that the whole thing can be folded into a 1m x .8m box with a bag of pellets in the middle. Ten kids are allocated to each box. The RTM has two of these and they are something that AAOD could quite easily set up for kids of this age. The indoor dig site was part of a 1 hour activity that included making a craft and an educational game. Cost was $10 per child and parent or teacher needed to be present as per state laws of 1 minder per 8 kids.

**Trivial pursuit game – Grade 3 to 7**
This game can be adapted to primary school kids of different ages and is based on a large mosaic carpet set out like a game board with road, train tracks, bridges etc. The game involves the kids forming teams of about 5 or 6 and choosing a plastic dinosaur as their marker. Each team takes turns at rolling a large dice to move around the mosaic game board. When they move their marker to a particular spot it will call for the team to answer a question before they can move on. Questions vary between age groups but are all dinosaur related. This incorporates a bit of fun and learning together and is also quite an easy thing to construct. It would be quite suitable for small groups of primary school children.

**Crime scene kits – Grade 3 to 7**
These consisted of a small box which housed a fossil and a list of clues relevant to the fossil. For example, one held an Edmontosaurus leg bone with teeth marks on it and the child had to work out what animal made the tooth
marks on the ‘victim’. The answers are similar to a multiple choice style with each answer holding clues that either point to or away from the suspect. The child uses simple logic to work out which animal could have left the tooth marks by comparing the clues to information about the victim, for example: ‘is the tooth shape correct; was the animal around at the same time as Edmontosaurus; is it a meat eater or plant eater? In theory this is a very easy thing to make as the small box is not really necessary. In effect all that is needed is a fossil (or replica) that has something notable about it that can be solved by comparing different suspects and deducing whether they could have been the ‘guilty’ party.

**Bone Excavation Program** Grade 3 to 6
This program consists of 3 x 2 metre long tables with lowered tops and surrounding sides 18cm high. A fossil skeleton has been glued to the table top and is covered over with a mixture of sand and plaster etc. This sets quite hard and can only be removed with dental picks and small screwdrivers similar to digging a fossil out of hard clay or very soft rock. There is also a wire grid that consists of (5x13) 12cm squares that fits over the table. Each table has room for 8 to 10 kids.

In this activity children are shown the correct method of mapping the fossils within a grid system using the coordinates marked around the grid frame. They then learn the proper technique of removing matrix and excavating around the bones while becoming familiar with using relevant tools. (Although pneumatic scribes were not used it would be quite possible to introduce these to older classes). The children are also given a sheet of paper in which they have to document the co-ordinates they were working in, what they had discovered, what tools were needed etc.

As the material surrounding the fossil is quite hard it takes a long time for kids to uncover the skeleton so each skeleton usually lasts the full summer season. The fossils are covered over again in the down season in readiness for the next year’s classes. This is something that AAOD could do although casting the fossil bones is an area of expertise that still needs to be introduced into the museum’s technical department. The mixture used to produce the fossil ‘matrix’ is a mixture of plaster, vermiculite, salt and water with various additives to make he mixture harder or softer or to change its colour or texture to replicate different local deposits found in Alberta.

Getting a suitable consistency and colour for fossil burying matrix is obviously something AAOD will need to experiment with but this would not be a difficult thing to achieve. In addition to excavation techniques used by the RTM, it would also be a very good idea to make a hard mixture suitable for pneumatic tools so that older children can experiment and get used to using this equipment to remove matrix from around fossils without the risk of damaging them.

**Skeleton Casting** – Grades 5 to 12
This activity takes place in the same room as the Bone Excavation Program and is in fact the same three tables with a plastic lid over the bone bed. This was an excellent program where a class of 30 kids can each make a plaster replica of fossil bones. (The moulds were made from silicon rubber and apparently last for many years.) Dental plaster was used for casting as it sets quicker and 20 to 30 kids could fit around the 3 x two metre long tables. A plastic table cloth and plastic sheet was used to keep plaster off the tables.

What made this different from other fossil casting programs is that all 30 of the bones were different and when put together made a complete small theropod skeleton. Some of the pieces comprised several bones such as 3 or 4 tail vertebrae or 2 or 3
All of the bones were still attached to their ‘matrix’ backing so when all of the casts were made they fitted together to make a skeleton on rock. When the casts were dry the kids were given 4 water paint colours – 1 pale earth coloured background for the rock and 3 shades of brown for the bones. Painting the bone is done by a spot painting technique which involves painting about 1/3 of the bone with each shade in a blotched pattern and then using a wet brush to blend the colours and give it a shaded effect. This was most effective and gave the bones a realistic ‘fossil’ look. The kids could take the completed skeleton back to their school and mount it in a frame on the wall or something similar. This was particularly good as all of the children were contributing to the end product as a team and the end product was quite impressive. Cost is $8.00 per child and a similar program where children can make a claw or similar fossil cast is also available for this price.

**Distance Learning - All ages**

This is operated using interactive video conferencing technology and a variety of programs aimed at different aged children are available. A special room at the RTM’s ATCO Learning Centre is allocated to this department and is set up with cameras and a large screen where the teacher can see all of the children in the class room. The room also contains a ‘green’ screen which the teacher can walk in front of and appear on any imagery that is projected to the school.

We had the privilege of being invited to sit in on one of these sessions where the presenters were linking to a school in Texas for the very first time. This is a surprising simple process that can be run by 2 staff teachers. Apparently the two girls we watched take it in turns to present to the schools. The person who is presenting stands behind a desk which has drawers full of fossils and other teaching resources that can be grabbed at short notice. On one end of the desk there is also a magnifying camera that can be used to zoom up the fossil on the school’s screen so that the presenter can show the children any fine detail such as serrations on a tooth for example. When images such as this are on the schools screen the presenter is still present on their screen in a small circle so the children never lose sight of her/him.

During the on-air lesson, the other person in the room who is not on camera operates the computer system. This involves accessing a very large resource of images etc that are filed in an easy to grab format. This person has a very intense job as it involves predicting where the lesson or question is going and then finding relative imagery in advance so that it is available for the presenter to use. This is flashed on a second smaller screen mounted on the wall near the main projection screen and if the presenter decides she/he can use the image they have the appropriate controls to put it onto the school’s screen. Once the image is on the school’s screen the presenter has the option of walking in front of the green screen which is a blank screen off to the side. By standing in front of the green screen (and not wearing anything green), the presenter can appear on the children’s screen walking around on the image. This was extremely effective and enables the presenter to appear on a Cretaceous scene for example and point to the different trees and animals etc.
The RTM has developed an alliance with an IT company that supplies and installs the appropriate equipment in schools throughout Canada and the US. This is a very successful arrangement as the IT company approaches schools with free demonstration packages that involve a live link up to the RTM. Although it normally costs the school $120.00 for a session, this cost is borne by the IT company who set the equipment up in the school and are present for the lesson. If the school is suitably impressed it will buy the equipment which works for the IT company and will then hold further distance learning sessions which works for the RTM.

With the rollout of a national broadband network (NBN) in Australia in the near future, the technology required for distance learning is going to be available in many areas including regional communities. Exciting initiatives being developed within the Sydney Chapter of AAOD have already identified the exceptional contribution AAOD can make in this regard and it is extremely important that development of this field be given the highest priority. Many schools around Australia will never be able to visit the AAOD Museum but with this technology we can take the museum to them. This will not only broaden the education of Australian children, but will provide an important income stream for the museum and help develop a very significant trust in its product.

**Guided Hikes**

The RTM holds several different guided hikes designed to suit different age groups and requirements. In all cases these involve a hike into the badlands and different trails have been developed to suit different themes. The length of time each hike goes for varies from 60 minutes to 90 minutes. A 90 minute hike is 3 km long and participants are advised to bring their own water, sunscreen etc. Cost is $8.00 per child. A 60 minute hike is 2 km long and costs $5.00 per child. These hikes are routed to take in relevant points of interest which are explained to the children at a series of stopping points as the hike progresses. Hikes are operated in spring, summer and autumn (6 months) and are available twice a day every day in summer but only on weekends in the shoulder months.

Another very similar hiking program is the dig site experience. This has been developed to suit both primary and secondary school students and involves hiking 1km out into the badlands to a constructed dig site. Here fossils have been set into the ground with a concrete/plaster/sand mixture and the children bring tools to work on the skeleton. Two sites are set up in different areas, one for each age group. The site for older kids uses actual fossils that are expendable and the rock is harder to dig than the site for younger children which has replica fossils. Both fossil sites are designed to last a full year and are repaired or replaced in the off season. This is only available once per day for two months of summer and costs $15 for older groups and $20 for the primary groups as it includes a souvenir hat.

This kind of experience is something that AAOD can offer almost immediately as it entails very little set up cost. It would be an excellent addition to the program AAOD offers school groups and is a very easy thing to instigate.

**Science Camps**

The RTM holds numerous camps throughout the summer and employs one person full time to organise and manage this program. There are 2 additional people employed for 4 months and a further 3 people employed for 2 months during the peak summer season of July and August.

Six camps are held over the peak season months of July and August and these include 2 junior camps for kids aged 9 to 11 years, 2 senior camps for kids aged 12 to 15 years and 2 family camps. The junior and senior camps are designed for a maximum of 36 children and run for 5 days (six nights) whereas family camps are only 2 days and 3 night’s duration. The camps are held in the badlands only 20 minutes walk from the RTM. Toilets are a permanent fixture at the camp site but accommodation is in 9 large tepees on wooden platforms which are put up and pulled down again each year. Each tepee houses 1 staff member and 6 campers although staff have their own tent for family camps. Tepees are kept gender specific with girls in one area and boys in another. There are 24 boys’ tents.
and 12 girl’s tents. Showers are only available once during the camp (at the local pool) although they can be held at the museum in emergencies.

Both junior and senior camps start on a Sunday evening and run through to the following Saturday morning. Cost is $445.00 per child excluding GST. Junior camp activities include prospecting for fossils in the badlands, hiking and digging around a pre-planted replica fossil that is in the same mixture as used in the RTM’s bone excavation program. Seniors also have a prospecting and fossil excavation program in the badlands although this is more comprehensive and (I think) involves talks with palaeontologists etc. Apart from these outside activities and sleeping in the badlands, much of the day’s activities are at the RTM and include participation in the education programs such as casting a fossil etc as well as visiting the exhibition galleries. The only camp meals are breakfast and bedtime supper around the campfire, with all other meals eaten at the RTM cafe. The only problem encountered sometimes with children in the younger age groups is apparently homesickness.

The RTM’s science camps are very popular and book out every year. Some children who attended their first camp at a young age keep returning every year. Once a child has turned 16 they are no longer eligible to attend camps except in a family group but the RTM has a process in place where these kids who really want to remain involved can apply to become a Leader in Training. This involves a screening process and the successful applicants can attend the camp as a Leader in Training for half price which includes an additional 2 days of training. These kids look after some of the more mundane jobs. As 17 year olds (providing they have performed well) they can become a Councillor in Training which involves an additional week of training and they do not pay to attend. Once they are 18 the best applicants are designated as staff and are paid to attend.

Science camps are something AAOD could do very easily as it has almost everything required to hold a small camp already. The main thing needed here is qualified staff which highlights the necessity of developing other AAOD educational products and the employment of qualified teaching staff to manage them.

Sleepovers
Suitable for primary school kids aged 5 to 13. This activity requires one staff member per 30 kids and 1 parent or guardian per 5 kids. The activity is only available in the off season and is limited to Friday and Saturday nights. Each program starts in the early afternoon and finishes 10.00am the next day. The kids go to bed in the dinosaur exhibition hall among the skeletons at about 10.30 at night and parents/guardians are required to sleep there with them. A staff member walks through every hour or so and makes sure everything is OK. First day activities include lectures, a hike, fossil casting and hands on workshops in the classroom. An hour is also spent in the exhibition gallery before tea time. On the second day they have an interactive auditorium presentation (Q’s and A’s) and ½ hour in the gift shop then go to Drumheller to see a reptile park. Cost of this activity is $39 per person regardless of whether it is a child or parent and includes museum admission, tea, breakfast and 2 snacks as well as activity materials and a special take home surprise.

Playground
The RTM playground was external to the buildings and although much of it was fairly stock standard for similar Australian facilities, it had an exceptional dinosaur dig. This consists of a large T rex skeleton covered with sand but unlike many similar kids dig sites, parts of this skeleton were very deep and took a lot of uncovering. It is something that would keep children engrossed for a long time as although part of the skeleton was well buried, other areas were fairly shallow. This meant that there was enough exposed to inspire kids to keep digging. Because of its depth, most of the skeleton would be relatively easy to back fill by pushing the sand back in. There was a very large sand area surrounding most sides of the skeleton so sand being thrown out onto paths and lawns etc would be minimised.
Due to AAOD’s Jump-Up site and hard rock surface, concreting a large skeleton onto the rock face would be a fairly simple thing to do and if this was positioned a sufficient distance away from buildings etc it would be fairly easy to keep covered under a large sand pit area.

Prehistoric Arts Competition
Categories include kindergarten; grade 1 - 2, grades 3 – 4, grades 5 – 6, and grades 7 to 12. This is a worldwide competition although entries are mainly from Canada. There is a different subject each year for the various grades. Winning artwork hangs in the RTM gallery for a year and the winners get $100 with $50 for second. There are two overall prizes (primary and secondary) worth $200. Each child’s school is listed in a lucky draw and there are 2 prizes valued at $1000 each.

COLLECTIONS AND LABORATORIES

A GENERAL STUDY OF USA & CANADA MUSEUM COLLECTION FACILITIES, PROCEDURES & LAB DESIGNS

Fossil Preparation facilities
A study of the fossil preparation labs in the USA Museums showed that, although the facilities were much more comprehensive than AAOD’s, the average number of people working on fossils at any given time was in most cases quite a lot less. As many of these institutions have been established for a very long time they have massive collections and the cost of preparing material that is not needed for scientific study or display appears to make this exercise uneconomical.

Although all of the museums we visited had a large laboratory behind the scenes, most of them had a satellite laboratory in or near their dinosaur exhibition hall as well. The CFM, Carnegie and Smithsonian all had two prep laboratories, one being the main lab and the other a smaller demonstration lab in the public gallery area where visitors can watch fossil preparators work through a glass window. The demonstration labs varied in size and shape but all had 3 to 6 prep stations. The CFM, Smithsonian and George Page Museum in LA all had circular designed glass fronted labs so that people could walk around and watch while the Carnegie Museum and Royal Tyrrell had a long glass wall with lab behind. Some were set up more as a display with very little work happening while others such as the Royal Tyrrell which had the main lab on display behind a glass wall was very much a working laboratory. This lab did not have tables or people working close to the glass and relied on cameras and outside screens to project what they were working on to the people watching from outside. A similar system to this was used at the Carnegie, Smithsonian and George Page Museum’s demonstration labs with camera fitted microscopes projecting what was being worked on onto a large LED screen presented to the public outside. This was very effective when sorting through sieved material looking for tiny bones as the public could easily see what was being selected. The Smithsonian’s lab had a door at one end and a glass window at the other and volunteer preparators were encouraged to talk about what they were doing if a spectator was particularly interested.

Fossil preparation lab design varied. The Smithsonian and American Museum of Natural History (AMNH) both consisted of a long room divided into identical open sided alcoves with 1 or 2 stations in each section. The AMNH had an excellent lab set up this way and was one of the busiest labs we saw. The Royal Tyrrell had a very effective laboratory that followed an open plan design. This was a very practical lab with large roller doors fitted on both sides of the lab and a 3 tonne gantry overhead for lifting very large plaster jackets etc. Roller doors led to the moulding and casting room on one side and to the exhibition construction room on the other. The exhibition construction room was a large workshop that had a very wide and high door that opened into the public galleries. It was pointed out
to me that doors such as this were extremely important to enable large fossil skeletons etc to be moved into and throughout the exhibition halls. Another very worthwhile comment was to make sure that electricity cable access points are built into the floor at close intervals throughout the work areas so that power can be located for work benches, machinery and fossil preparation equipment.

Most prep stations had a dust vacuum pipe fitted above but it was very interesting to note that some museums had very little or nothing in the way of dust extraction. With the exception of the Royal Tyrrell which had a large number of mobile ‘Micro Air’ dust extractors, most other laboratories we visited had an inbuilt dust extraction unit. The AMNH had a very effective system where two extractors were mounted back to back on the wall between lab sections while others had a height adjustable pipe mounted above or nearby. Some were simply a series of extraction vents at ceiling height.

All of the museums had a sandblasting unit where fine fossils can be prepared. Preparation with this kind of equipment appears to be very common in the USA and works well where the fossil is significantly harder that the surrounding matrix. Unfortunately its usefulness would be very limited on typical Winton Formation material which is typically softer or more fragile than the matrix surrounding it. Sandblasting units were very similar to those seen in Australia that fill a multitude of purposes but the Carnegie Museum had a very unusual home-made facility where the preparator could step into a small see-through plastic enclosure and work unrestricted in protective clothing. This appeared to be very effective and some very fine work on large fossils was being done here.

Apart from mechanical preparation facilities, most museums had a acid prep facility and sieving area although disposal of by products was a definite disadvantage experienced by some of the large inner city museums in this regard. Large sieving tubes on wheels at the RTM were a very effective way of solving an issue AAOD has with sieving and is much better than using wheel barrows as is currently the case. The TRM also had a very effective acid prep facility which was located in a room of its own with necessary equipment and safety products. Although this does not need to be large, it is important that AAOD include a small, designated room for acid preparation as this activity definitely needs to be allowed for.

**Fossil Collection Facilities and Management**

Fossil collection storage facilities varied between the major museums. All had very large dinosaur fossil collections,
particularly those of the Smithsonian, Carnegie and AMNH. The Smithsonian’s collection was massive and spread over an area of over 2,000 square metres although no compactus units were installed in this collection. The Carnegie Museum’s collection room was about 875 sq metres with compactus units. Most of the other museums we visited in USA had compactus units fitted and in most cases they were all still looking for additional storage. The AMNH has a large proportion of its collection stored off-site for this reason although the collection room at the museum was still quite large.

The collection room at AMNH was outstanding. This area has recently been refurnished with fire retardant roof linings and air purification system that kept the collection and room spotlessly clean. Of all the compactus units we saw these were the most practical as they had open sides and their contents could be very easily seen. Large fluorescent lights were positioned so that the area between every unit was very well lit when open. All of the compactus units in the USA museums were manually operated and in some cases we were advised against obtaining electrically operated systems.

One very practical method of collection room shelving was at the Royal Tyrrell which consisted of pallet racking specially modified with ¾ “ plywood shelves. All fossils were on special pallets of ¾” ply with 3 beams underneath and no base meaning that the wheels of small electric forklifts and pallet jacks could be easily inserted under the pallets without jarring the fossils. Each row of pallet racking was two pallets wide and accessible from both sides. A 3 metre wide bay between the columns of pallet racking gives forklifts room to operate and when researchers wish to access material, the pallet is simply lifted down from the racking and placed on the floor below. All pallets have a laminated card stapled to them which has a record of the pallet’s number, rack position and the collection data of all fossils on it. This was an excellent and simple system and the same method was used by the RTM for its storage of unprepared fossils and plaster jackets. It is ideally suited to a small to moderate sized collection and of all the collection spaces visited, was probably the most practically suited to AAOD. The RTM also had a section of ‘Lane’ and ‘Rousseau’ lockable cabinets (800) for smaller items. One comment we received in relation to these was that when purchasing cabinetry it is very important to ensure that all cabinets have interchangeable drawers as drawers often have to be removed to make room for bigger specimens and spare drawers take up a lot of collection room space if they can’t be fitted elsewhere.

The total collection storage area of the RTM is 1,442 square metres and is divided into three main areas, namely: prepared fossil material – 1,094 sq m; unprepared fossil material – 348 sq m and holotype material – 37 sq m. In addition to this there is 65 sq m of office/computer space. These areas are very relevant to AAOD as the RTM’s collection is in a similar position to where I would expect the AAOD museum to be in 20 to 30 years time. Having an intimate knowledge of the Winton Formation fossil resource and with many of AAOD’s specimens being large sauropod bones, I would suggest that the RTM’s prepared and unprepared fossil material sections are a realistic starting point that will allow for expansion for about 20 years after the museum is built. The RTM holotype room however is probably a bit too small due to the fact that the AAOD collection is likely to contain more holotype fossils and many of these will belong to large sauropods.
The construction of fibre-glass cradles for dinosaur bones is now becoming a high priority in some of the older museums in USA. Consolidants and cradling materials 100 years ago were not as good as today’s products and in some collections there is a massive amount of material that is in dire need of reconsolidation. Due to the massive amount of dinosaur material collected over 100 years ago by these institutions; this is now a major job that can only be revisited at huge cost. This is an important lesson for AAOD and being a young collection it is paramount that we ensure all fossils are consolidated and cradled to the best modern practices as soon as they are prepared rather than later when the collection is much larger.

One of the most heartening things about visiting these very old institutions was being able to compare their collection recording systems with those of AAOD. Being such a young organisation, AAOD is fortunate in that all of its fossil preservation techniques are based on modern best practices and the documentation of its collection has commenced after digital recording of collection data became available. In many of the older USA museums we visited there is a massive backlog where much of the collection is still waiting to be catalogued electronically. In some cases many of their historical specimens were not originally catalogued at all, with any information on them disappearing with the people that collected and prepared them (in many cases) over 100 years ago. These issues have now developed into a massive and very expensive job as in some institutions the historic specimens form a very large part of the total collection. It is also interesting to note that the electronic database system ‘T Emu’ is considered by many to be the best available.

All collection area spaces we visited had a controlled environment and it was interesting to note that both the RTM and George Page Museum at the La Brea Tar Pits have buried their collection rooms under earth. The George Page Museum has a very unusual design where the whole museum is surrounded by earth walls built up to roof height and the collection room circumnavigates the building as a low ceilinged, narrow hall. This helps to keep a fairly stable environment by insulating the rooms from fluctuating temperatures outside. The CFM’s dinosaur collection is also stored in one of 2 underground floors along with all of the museum’s botanical, zoological and anthropological collections. Climate control strategies such as this are very important to AAOD due to the extreme weather temperatures of western Queensland.

EXHIBITIONS

A STUDY OF EXHIBITION DESIGNS IN USA & CANADIAN NATURAL HISTORY MUSEUMS

The size of many natural history museum exhibitions in USA is well beyond the reach of AAOD in the foreseeable future, thus research has been focussed on the comparison of displays and display methods used by different museums and identifying how they might work best (albeit in a reduced capacity) for the Australian Age of Dinosaurs Museum. Although this exercise was not undertaken with the intention of being critical, to establish what might work best for AAOD we also need to identify what doesn’t work very well. This is important as a lot of money and energy could easily be wasted on a display that fails to achieve its objective.

Gallery Lighting and Noise Management
Visiting and researching numerous displays and galleries as a member of the public brought a few things to light and one of the most apparent was dealing with noise levels. Many of the older museum exhibition halls in USA were of marble, concrete or similar with very poor acoustics. This often made hearing a problem as rebounding voices and gallery noises made interpretation screens etc very hard to understand. Although noise does not seem to worry the younger generation, it has a significant effect on older people and it was particularly noticeable when school groups were going through the museum. Fitting sound absorption materials may work in certain areas but could be unsightly in others so it is necessary that this factor be considered in the designing stages of the museum.

One thing that helped combat high noise levels around interpretation screens was to enclose the screen in a small open-sided booth. This not only helped to keep interfering noise at bay enough to be able to hear, but also shielded
the screen from outside light and display interference which made viewing the screen a much easier and more enjoyable experience. However the addition of these structures throughout the gallery takes up space and they did tend to take away from the aesthetics of the displays in places where they couldn’t be hidden within the flow of the gallery. In many galleries the only way of offsetting noise around interpretation screens was the use of sub titles running in conjunction with the voice-over interpreting the screen. This made a huge difference when viewing screens that were mounted in a large room with high noise levels, particularly when a large group of school children came through. In spite of the huge range of nationalities visiting these museums, it is interesting to note that all sub titles were in English with very little variation away from this anywhere in the USA museums that we noticed.

One thing I struggled with in some displays was being able to read the interpretations, as they were too far away to use reading glasses and the writing too small to read without them. This was particularly apparent where the display interpretation was mounted beside display specimens on a wall which was a fair distance back from the glass front. It is important that lighting and imagery be designed to cater for people without perfect vision as a large portion of AAOD’s visitors probably fall into this category. This is something we need to be aware of, particularly when young people with 20-20 vision are setting up displays and interpretations as they may not realise older people cannot see them properly. If an interpretation cannot be mounted close enough to be read easily with reading glasses then its lettering needs to be expanded accordingly.

One exceptionally good printed display interpretation was used at the RTM and consisted of a simple paper poster mounted behind glass on the wall beside the display cabinet. A track mounted light aimed at the interpretation from above gave it a bright and almost ‘backlit’ effect. What made this work was the fact that it was on a white background, clear and bright and the text big enough to be read very easily. I noticed that virtually everybody in the gallery was stopping to read these as the interpretations were a simple story about the fossil – not so much about its scientific relevance but about its discovery and any quirky additional information that could be associated with it. This achieved a far better result than many interpretative panels we saw that would have been much more costly to produce.

If one single thing can make or break a quality display it is lighting – or lack of it. Dull or insufficient lighting was quite noticeable in many galleries and in some cases this greatly devalued their impact simply because they were not lit well enough to see the exhibit or read its interpretation properly. Although very effective in most instances, some galleries with tracked lighting had many dark or dull areas within which darkened the overall gallery but this may have been simply that there were not enough of them to light up the room. This problem was very pronounced in areas that relied on internal display lighting that was triggered by motion sensors. Although very good when there were plenty of people going through to keep them awake, these all turned off when only small numbers were going through which darkened whole areas of the gallery and gave them a ‘closed’ appearance.

Lighting methods used throughout the galleries we visited varied greatly. Where low walled galleries had very high ceilings, the lighting tracks were often lowered substantially so that they were closer to the exhibition. In most cases the majority of lights were trained on to the exhibits so that the area between exhibits was only lit by refracted light from each display. Tracks and light fixtures were usually painted black and in many high roofed galleries there was no attempt to fit an artificial ceiling above. Surprisingly this was not really noticeable unless one was looking for it as being well lit below and quite dark above, all attention is automatically focussed on the exhibits and not upwards. Very high ceilinged galleries with large displays such as large mammals and dinosaur skeletons etc made use of powerful spotlights and these seemed to be very effective.
One of the most outstanding dinosaur exhibits in regard to lighting was at the Carnegie Museum which is displayed in a series of halls with very high ceilings. Although quite large lights were installed, the gallery’s main light source was a series of huge skylights mounted around the top of the walls and it was this natural light that really enhanced the display. Huge conifer tree trunks were taken up to the roof and the natural light coupled with the stretching of the display to this height gave the whole gallery a magnificent effect. This was an outstanding display but it was the height of the gallery and its lighting that gave it a feeling of spaciousness and realism.

In contrast to this display, one dinosaur gallery we visited that was also in an area with very high ceilings, but with no natural lighting above was quite dark. This dullness had a major effect on the attractiveness of the overall gallery in spite of the fact that the exhibits themselves were very good. Likewise, another dinosaur exhibition which had many magnificent specimens appeared smaller and more cluttered simply because it was enclosed in a gallery with low ceilings and this one feature reduced its impact considerably.

One aspect of the dinosaur hall in the Carnegie Museum was the use of high balustrades around part of the circumference of the dinosaur gallery where visitors could view the display from above. This is an excellent idea, particularly when viewing large dinosaur skeletons as it gives an open plan view of the whole display and everything in it – something that is not possible when walking through the display – and it provides excellent photograph opportunities. Likewise, the Great Hall of the CFM is also surrounded by very high balustrades and as with Carnegie these are put to very good use as they overlook their two iconic display pieces – namely a skeleton of ‘Sue’, the world’s largest specimen of T rex and two large African elephants that were mounted around 100 years ago. A magnificent Rotunda at the Smithsonian’s Natural History Museum that is surrounded by balustrades and large skylights around the walls also has this effect whereas the Theodore Roosevelt Rotunda at AMNH has a spectacular rearing sauropod skeleton and attacking T Rex mounted in its centre.

**Instant impressions and the human element**

To get an idea of what really makes a museum gallery striking, one needs to look past the small things that contribute to the displays and focus on the overall display itself. Although attention to detail is a very important factor, it is even more important that the overall effect of the display on the viewer forms a breathtaking first impression. If one has to keep looking at a display to fall in love with it then it is simply not as good as it could be. In spite of the many beautiful and unique displays on offer, it is only those galleries that have an instant effect – that simply leave you amazed, that have really achieved their true purpose.
From viewing all of the museums in USA it soon became obvious that they were all designed so that a breathtaking entrance gallery was the first thing people saw when entering the museum. In almost all cases this was a very high, beautifully sculpted room – usually a rotunda or hall - with skylights, balustrades and an outstanding plinth mounted display. Although these were all designed 100 years ago, the use of this same technique at the Smithsonian’s American Indian Museum through modern architecture produced a gallery entrance that was absolutely spectacular. High walls and balustrades such as this might be hard to achieve financially in the AAOD Museum but they are certainly a desirable feature, particularly when coupled with large wall (not roof) mounted skylights. (Obviously with western Queensland’s climate, skylights would need to be shielded from direct sunlight or the room would cook).

There are so many things that can make or break a display and it is not always the ones that cost the most or are the most dramatic that are the best. Sometimes it is simply a twist of human curiosity within the display subject – a fascination that will not let you leave without finding out a little bit more.

I found it important to take note of what people were spending that little bit of extra time reading or looking at and what they are strolling past. One fascinating display that was actually one of the most basic layouts within the Chicago Field Museum related to a meteorite that hit a house in Illinois, USA in the 1930’s. The meteorite ploughed through the roof of a garage and then through the roof and back seat of a car inside. The meteorite formed part of the display along with original pieces of the roof and car seat (complete with hole) and relevant photos with a few news reports etc. It was the human element to this story written as a short account of the event with the actual artefacts alongside it that really made this simple presentation work. Although it was nestled amongst a very scientific display, this display struck a chord simply because it broke the pattern of information on top of information and people could relate to it.

In spite of the fact that a natural history museum is expected to be all about natural history, when designing displays I think we need to remember that human beings have an in-built fascination with what other people are doing – something that is taken advantage of by the vast majority of magazines for sale in newsagencies and book stores around the country. Whether it be a good/bad luck story, a freak happening or something inspirational such as courage or tenacity, anywhere that we can link a human element to the core theme of palaeontology within our display galleries is worth considering as it breaks the monotony and continual information on the same subject.

One of the most jam-packed displays in the Smithsonian’s Natural History Museum was an exhibition on the mine disaster in Chile in 2010 where miners were trapped underground for over 2 months while 3 separate drilling rigs drilled down to them. Although the display had photos of the people involved along with drill bits, the rescue cage and written information, it was a short video on the event that really made this work as it captured the humanity, heroism and perseverance of everyone involved. This display was nicely nestled into a gallery on minerals which included the mining methods of different minerals. It had nothing to do with natural history and yet it attracted more attention than any other display in the gallery simply because it broke the pattern of the information.

The AMNH had a very good inclusion throughout their dinosaur and mammal gallery of small information plaques which were each devoted to a fossil hunter or early palaeontologist. These people were the more famous personalities who had played a significant role somewhere in the history of American palaeontology. The plaques contained a basic outline of the person as well as a couple of historical images. Small inclusions such as this were very good as they helped to put a human element into the display, particularly when they were located beside some of the work they were associated with.

The Time Line Theme
Virtually every prehistory gallery we visited has interpreted a time-scale theme through the displays which shows how the planet and evolution of species has progressed throughout time. Some of these were very well done but
nevertheless, even the very best of them struggled to keep people engaged in the theme right throughout the course of the exhibition. There are simply too many distractions to keep focussed on the theme and once you lose concentration and miss part of it then it is hard to pick it up again. The Carnegie Museum kept information in a relatively simple format to keep the viewer engaged and this seemed to work reasonably well. A particularly good model was AMNH which used a video at the start of the evolution gallery to explain the way the displays had been set out and why. This was a very good concept but even then it appeared to be lost on most visitors who charged through the display in a very short space of time.

It is impossible to take in too much information at a time and a visitor very quickly becomes immune to the displays through ‘information overload.’ This was very apparent when watching other visitors walking through the galleries. As they progress through the exhibit they gradually increase their walking pace, spending a little less time to look or listen and skirting displays that don’t catch their eye immediately. Unfortunately by doing this they are missing the flow or thrust of the exhibits that are designed to follow a sequenced theme. Thus, much of the exhibitions educational intent is lost.

Although it is extremely desirable to include an educational element into evolutionary based display galleries, from our observations it was lost on most people. Perhaps this judgment is too harsh as it comes from someone who is visiting as a ‘one off’ guest with very little likelihood of return. This tends to make one try and cram as much as possible into the given time frame. Many people living in the museum’s city probably have the opportunity to spend many days going through the museum and eventually they will develop a firm grasp of what the displays are trying to achieve. However, for the AAOD Museum which is based in a low population area, it is important we understand that visitation will mostly be on a one-off basis with the majority of people having time constraints. Thus AAOD must address this issue if it is to achieve its purpose of providing a comprehensive educational experience in Australian evolution.

Rather than spending money on comprehensive, themed interpretations, AAOD needs to work smarter to achieve a memorable educational experience for its visitors. One of the most inspirational and memorable experiences of 4 weeks inspecting museum galleries was also one of the simplest and easiest things to make. This experience was at the Carnegie Museum and it was at the very beginning of the evolution themed gallery (which included sensational displays of dinosaur and mega fauna skeletons etc). This experience consisted of a simple small room big enough to hold about a dozen people with a door that was shut from the inside by pushing a button in the same fashion as a lift – in which effect is what it was built to simulate. When people entered the room a screen on the opposite wall that was designed to look like a glass window came to life and the rather battered face of an old miner told the audience to hit a particular button to take a ride down several miles below Pittsburgh. The button closed the doors as in a lift and the screen took over from there.

This experience was fantastic. It involved the same grubby old miner speaking in general terms – bad jokes, slang and all – to the audience as he manually operated the lift in its descent. The ‘lift’ vibrated as the screen rolled upwards giving a very convincing effect of travelling downwards. The old miner stopped the lift at appropriate deposits (with the help of a huge brake handle) and with his geo pick would chip off a piece of coal (for example) and talk
about the amount of plant material that took to form it and how long ago it was deposited. The ‘lift’ went through coal layers, ore deposits and a host of other things that were relevant to Pennsylvania’s geology. As it went deeper, its depth and temperature was displayed on a scale and the lower it went the hotter it got so that sweat and coal dust streaks were running down the old miners face. This prompted him to act faster so he could get out of there and it was a profoundly realistic experience. The line-up of kids waiting for a turn throughout the morning was testimony to its success and it appeared that many of them had been in there more than once before as they seemed very sure about what they were getting themselves into.

I found this experience inspirational, not so much for what it portrayed, but for what could be done within the AAOD display galleries. Experience is extremely important and it is this type of thing that breaks the pattern – that gives people the feeling that they are doing something – going somewhere, and not just walking through a static gallery. Rather than relying on printed information to lead visitors through an evolution sequence as so many museums do, it would work so much better to completely discard this ‘written theme’ in the galleries and use a ‘time travel’ lift to take visitors from one time period to the next. In other words, rather than walking through a maze of galleries trying to read interpretations and keep them in context, visitors can simply take the ‘lift’ to the next time period. This is a relatively cheap experience to build and through the use of 2 doors – one coming in from the display previously visited and the other leading to the next display in the time sequence, visitors will be able to get a very comprehensive feel for the core theme of the gallery as well as get to enjoy a fun experience. In addition to inter-galley interpretations, this method of interpretation would also be an excellent way of interpreting the geology of the Great Artesian Basin.

Dinosaur galleries
One factor that worked against some excellent displays, particularly in the dinosaur galleries, was lack of space. Although most of the dinosaur skeleton exhibits were outstanding, many of the galleries presenting them were extremely cluttered - so much so that rather than help the display by having ‘more,’ it actually did the reverse. In some cases exhibits worked against each other rather than complement each other as they should. Most of the dinosaur skeletons displayed in these galleries had a small amount of written information or touch screens accompanying them which worked well but what did not work as well is the way the skeletons had to be fitted among each other in the gallery. As pointed out by the Curator of one institution we visited, many of the dinosaurs on display were not even around at the same time as the animal beside them they were trying to eat – or vice versa.

Looking at a skeleton gives very little information on what the animal looked like to the average viewer – one only has to see the skeletons of modern day faunas to realise that they are fairly open to interpretation. This is but one of several reasons that I believe AAOD needs to look for a more modern and informative way of displaying its dinosaur fossils. Huge numbers of skeletons mounted in lifelike poses are everywhere - in some museums there were literally hundreds of them - particularly of megafauna, but also of prehistoric humans, dinosaurs and everything in between. Virtually all of them are outstanding specimens but although this is an iconic portrait of natural history museums one cannot help but feel it is a somewhat dated way of depicting them. You just don’t see animal skeletons standing around in real life and when there are literally hundreds of them displayed it takes a staunch visitor to study each and every one of them in detail. From watching the time spent by virtually everybody in front of each bank of specimens it was obvious that they were not looking for this depth of information.

Looking at the major natural history galleries and knowing it will be many years before AAOD will get to this stage was not as demoralising as I thought it would be. There are many identifiable strategies that AAOD can follow to build a world class dinosaur display without the need for numerous, comprehensive skeletons. An exhibit of just one dinosaur that includes the original fossil bones, a life-sized skeleton or model along with other fossils that inter-
pret its environment and associated faunas and floras – what the world looked like at the time - would make a very comprehensive educational dinosaur display – on just one specimen. In addition to this, a relevant fossilisation process or death scene would make an excellent display as would an interpretation of the dig. Combined, these features would enable AAOD to make a very interesting exhibition without the need for numerous skeletons to display.

**Real or Fake!**
From observing the interest and excitement of children viewing the major dinosaur galleries of the United States and Canada, it is obvious that the mounting of complete skeletons is virtually expected. However there has been much dilemma among museums over the years as to the best way of doing this. Although it is often impossible to tell the difference between a fossil and a high quality replica, some people think they are being cheated by not getting to see the ‘real’ thing. Intriguingly, my meeting with the Curator of Dinosaurs at the Smithsonian Natural History Museum revealed that their interaction with visitors suggests that many people think the skeletons are fakes regardless – even though when in many cases they are not.

This is one area where it will always be difficult to please the viewer. A lot of conservation compromises need to be made in order to display a fossil in life pose, and when a large portion of the audience believe they are replicas regardless, it does make this practice fairly questionable. A dilemma faced by curatorial staff at the Smithsonian (and in all of the institutions we visited to some degree) is that when a fossil specimen is on permanent display as a mounted skeleton it is very difficult for a researcher to gain access to it without ruining the display. If the fossils could be laid out (for example) in the position they were found in - regardless of the fact that the animal may be nowhere near complete, not only does it become more realistic, but it is also much easier to remove a bone without major disruptions to the display.

The public admittance as to which fossil material is real and which is not, varied between institutions. The Chicago Field Museum made a strong point of ensuring that replica fossils were labelled as ‘casts’ as did AMNH and the Royal Tyrrell. However some museums did not differentiate much between them, meaning that many ‘complete’ dinosaur skeletons were possibly fairly incomplete. Associated information rarely stated which bones were real and which were not, and it was often impossible to tell due to the replication quality of the missing bones. Although this makes for an incredible display it is very open to misinterpretation as some people believe that the whole animal is real while others believe the whole animal is a fake. One major problem encountered by curatorial staff is that sometimes they themselves cannot distinguish between the fossils and replicas and this also has detrimental effects on both conservation and research.

Another practice that was fairly common is the mixing of skeleton components to present a complete skeleton of original material. In this case bones belonging to different animals of the same species that are of similar size are
matched so that the resultant skeleton is very close to authentic. Although these representations are probably not showing anything different to what the original animal may have looked like, it is really no different to displaying replica material as the public is not looking at an authentic original animal. As with replicas, I found that not knowing exactly what the original fossil discovery consisted of and not knowing exactly what I was seeing took away from its integrity. Like staff at the Smithsonian have observed, I found myself assuming that what I was seeing was probably not the real thing.

Although seldom noticed, there were occasional instances where modelled bones within a skeleton were painted (usually grey, black or in a lighter colour) so that they could be identified as an interpreted fossil rather than a real one. This theme was promoted very strongly by the RTM and I found it gave the exhibit a lot more integrity as it clearly stated what was actually found of the animal and depicted what the missing pieces looked like. The most fascinating skeleton displays at the RTM were actually fully replicated skeletons with the real bones portrayed to viewers as part of the display but in the position in which they were found fossilised. This is an accurate depiction of a real life event, showing how the animal lay as it died and as such is a powerful reminder that this was an animal that lived and died just as animals continue to do today. It gives the exhibit a level of integrity and marvel that cannot be matched by a manmade interpretation.

**Iconic display methods that still work**
The most uniformly magnificent displays in all of the American Museums were the dioramas on living animals. In most (possibly all) cases these were done a long time ago and consist of real animals stuffed and mounted in lifelike poses by taxidermists amid a background of the type of country they lived in. The display, which might consist of deer on a grassy plain for example, backed onto a very realistic image – painted or photographed, that was curved so that no corners were visible. The painting was designed so that it perfectly matched the diorama in front of it, with the diorama always dropping away at the back so that where it came in contact with the painting was not visible to the viewer. This gave the exhibit a seamless flow that appeared to blend into the distance. These displays were exceptionally lifelike and judging by the number of people photographing them they obviously struck a chord with the majority of visitors - particularly children.

Although this type of display may not be relevant in the short term for AAOD it is something we need to remember as it would be an exceptional way of depicting Australian wildlife as part of a broader evolutionary theme. In the meantime, AAOD could still draw from the popularity of this type of display by depicting dinosaur habitat dioramas which might include relevant dinosaurs within the exhibition halls. An example of how this could be done for instance might be to build a glass display case on the outside of the building that presents the Jump-Up with the natural rock and cliff face as part of the diorama. Obviously this would rely heavily on the site of the museum but it is certainly worthy of consideration when planning the museum building.

**Electronic initiatives**
All museums had touch screens and many of these were very good. One thing that I found that was particularly important was the way information was presented and the RTM had a very distinct way of doing this. As mentioned previously in this report, people burn out from too much information that is focussed on education and after awhile it is difficult to concentrate or enjoy listening to interpretations. The RTM has combated this by bringing a distraction into their information and this makes a tremendous difference. One outstanding video was on the Burgess Shale deposits of the Red Deer Valley – a not particularly interesting subject except that it was done by actors that included a group of lost children meeting a stranger. This was enacted similar to any popular children’s TV program except that it was all based on geology. It was a very enjoyable way of learning all about something that would normally be very hard to get a kid to watch and by all accounts they all seemed to enjoy it.

The RTM used this fun theme to present many of its educational screen interpretations and I considered them to
be the best we saw. These varied from small galleries with seating for a dozen people to simple screens with a single bench seat in front of them. Even the most mundane of subjects were put forward in such a way that once you started watching them you didn’t want to leave until they were finished. The key to this is definitely the use of actors – including child actors, (in contrast to professional experts) who can portray the story with plenty of upbeat interaction, laughter, jokes, slang, surprises, music and whatever else it takes to get someone’s attention and introduce the information without it becoming tedious.

Some of the better interpretation screens encountered in USA museums concentrated on introducing a subject as a question or series of questions. Many of these were very good as they explained why scientists reach various conclusions and as such help people to understand the complex issues dealt with by palaeontologists on a regular basis. I have always believed the depiction of front leg (arm) movements of sauropods to be impractical but an excellent interpretation screen at the Carnegie Museum explained this so thoroughly it was hard not to take notice.

One thing that is being introduced into a lot of museums is interactive screens with a strong educational theme attached to them. Some of these were very well done and up to ten minutes could easily be spent on them. However, after watching numerous children operate them it is hard to comment on their success. Although some small groups of children under supervision of an adult did appear to navigate these with some success, in the vast majority of cases kids spent less than half a minute on them and abandoned them as soon as they realised it didn’t make a quirky noise or do something visually enticing. It was also apparent that screens need to be very resilient as the treatment they received was often very rough and a large degree of malfunctioning screens may be due to this.

At the RTM it is possible to hire an interpretation handpiece for $4 which is synchronised to numbered banners throughout the galleries. Although this is a good way of getting an understanding of the displays, our queries with staff suggest that they are not very successful from an economic point of view as they are quite costly and sometimes do not get returned.

**Theatres – lecture and 3D**

The first 3D theatre we saw was at the Smithsonian Natural History Museum and was quite massive - certainly many times larger than anything AAOD will ever need to do. In this theatre the viewer put on a special pair of glasses to bring the images into 3D although technology apparently now exists where glasses do not need to be worn. This technology is quite commonplace but one cannot fail to be inspired by it, particularly when they are nearly knocked down by a swooping pterosaur or trodden on by a 30 tonne sauropod. The inclusion of a 3 D gallery is an absolute must in the AAOD Museum – more so than any other as it is this experience that really puts the size and majestic bearing of the sauropods into perspective.

Many of the museums had a very good lecture theatre and this is another aspect of a world class museum that is very important. This type of facility is never going to be used by everyone who visits but it is an integral part of any educational science institution. Very interesting presentations can be scheduled for special events and the ability to address children, teachers and speciality groups is something that must be catered for.

**Gallery design – things to think about**

A walk through the galleries of the RTM with the staff who manage them revealed many important features behind the scenes that need to be allowed for. One of the most important of these is space. It is very important that equipment such as ladders, trolleys, cleaning equipment and spare light fittings etc are kept in close proximity to the displays as lugging large equipment through glass corridors and large skeletons is not practical. It is paramount that corners and small spaces between curved wall designs are left throughout exhibition areas and there must be room in at least some of them for large equipment.

Another important factor is electricity for cabinet lighting etc. As with the prep lab, there needs to be allowances made in flooring for ample access to power and it was suggested that these be positioned at no more than 8’ apart. The RTM has floor power at 12’ intervals and this is considered to be too far. All power outlets are under stainless steel floor plugs which replaced plastic plugs that were not sturdy enough to last any more than a few years.
One particularly interesting feature about the RTM’s original design is that the gallery section of the building is one large rectangular room that has been since subdivided into galleries. This division includes ramps and half floors so that displays are actually crossing over each other in some places. These low areas are used for galleries based on the display of small exhibits such as Cambrian fossils etc where high ceilings were not necessary to be effective. Lighting in these low ceilinged areas was often above the ceiling shining through glass panels whereas the full height ceilings were equipped with track mounted spotlights. The light mounting system throughout the RTM’s full height galleries consisted of 1” pipe rails running across the building high against the roof. Power points were spaced about 600mm or 700mm’s apart along the rails and these powered rails were positioned about 6m apart. Half way between the powered rails were unpowered rails which were close enough that lighting power leads could reach across to the power points. Although this system is very effective and reasonably simple, staff members were experiencing some problems with them as often circuits closest to particular displays were incompatible due to different lighting requirements of other displays on the circuit. This meant that long leads needed to be fitted to reach a suitable power point.

Cretaceous Garden
We were unfortunate that the Royal Tyrrell Museum’s cretaceous garden was undergoing major construction renovations when we visited so we were unable to see it. The only other living garden themed to a time period we saw was at the George Page Museum in LA which had a small garden that represented the Pleistocene age. This was built in an open roofed area within the museum’s walls and included a waterhole with fish, turtles etc. Although this garden was not relevant in content to what AAOD could do, it certainly is an easy thing for AAOD to build as there are several very good areas along the edge of the Jump-Up near where the museum will be built that will offer shaded and sunny areas, windbreak, excellent drainage and natural water channels. An excellent outdoor Cretaceous garden could be built at very little cost that could easily compete with comparative themed gardens around the world.

MUSEUM RETAIL – DESIGN AND MERCHANDISE

General observations of museum retail
All of the very large American museums we visited had more than one gift shop - usually set out as one main store near the museum’s exit with satellite shops in strategic areas near the exit of major galleries. Merchandise in the satellite shops was mainly geared toward the theme of the exhibition closest to where they were situated although there was a repetition of merchandise in all shops to some degree. The Smithsonian Natural History Museum even had 2 shops virtually beside each other, with one children’s shop and the other catering for adults. In addition to several shops within the museum, CFM apparently has two shops in the Chicago airport and by accounts these are hugely successful. This is something AAOD definitely needs to work towards as once the museum is internationally known a gift shop in this type of location could have a massive appeal as well as direct international visitors to the outback.

One thing we could not help but notice was the lack of high priced ‘collector quality’ merchandise in many of the shops, with cheaper, off-the-shelf items making up the bulk of sale stock. I expected that a unique bronze model of a dinosaur or something similar that included its name and the name of the Museum is something people would want to buy as a souvenir but these things were very rare in the stores. Only AMNH and the Los Angeles Natural History Museum (LANHM) had a limited range of this type of product available with the only 1:20 scale skeleton model I saw (priced at $435 American) being at the LANHM gift shop. The model was made of a polycarbonate and not bronze as the AAOD models are. Although AAOD does manage to sell a reasonable amount of high valued ‘collector’ items, it is apparent that this type of product is not a big enough mover in the large museums to warrant
space in the shop as most of the major museums did not cater to this market.

Books were plentiful in all of the museums, as was jewellery, clothing and especially fluffy toys. Palaeo themed products such as dinosaur excavation kits, plastic models of prehistoric and modern animals, stationery, writing kits, school bags etc were also everywhere as was a broad range of novelty merchandise such as games, badges, key rings fridge magnets etc. A large range of culturally related items such as clothes, tools, musical instruments, worshipping icons, ornaments and figurines etc was present in many of the shops, with the culture being represented usually linking to a major gallery nearby on that particular subject.

In looking at the range of products available, it was apparent that the shops are catering to a very large audience of young children and this is an area that AAOD will need to enlarge on in the near future. Although the AAOD Museum’s audience is mostly older generations, their gift requirements for grandchildren may not differ much in many instances. There was also a fairly comprehensive range of jewellery in all stores and while much of this was related to fossils and gemstones, there is often a range dedicated to different cultures around the world (depending on the location of the shop) such as African beads near the African peoples gallery, South American/Indian jewellery near the early American displays and so on. Although the sale of culturally based jewellery is not something relevant to AAOD, the sale of quality items such as a silver/gold replicated tooth of Banjo on a chain or stylised gold miniature of Diamantinasaurus would be very attractive. In view of the large amount of fossil and gem stone jewellery in USA museums, perhaps a small range of local opal and polished petrified wood jewellery would also be worthwhile items for AAOD to consider.

One thing CFM pursues very strongly is marketing ‘Sue’, the world’s largest and best known tyrannosaurus. Instead of a mass of different images of Sue on cups, posters and souvenirs, there is one image that is particularly outstanding that is used on everything. The main lesson we could gain from this is that AAOD needs to market its iconic specimens i.e. Banjo and Matilda mercilessly and have a large range of good merchandise that relates to these icons available to the public. It might also be advisable to concentrate more on one or two very identifiable ‘hero’ images that are used everywhere rather than a large range of different media.

One thing I found surprising was the small range of unique, branded merchandise in many of the shops. Although there was certainly plenty of cheap, branded merchandise, it was in most cases a reproduction of what every other museum sold with virtually identical tea spoons, key rings, magnets, playing cards and the list goes on. All that was different was the museum’s name on the item. Each of these institutions has an iconic building and dinosaur specimens that are unique in some way and I am sure original, good quality, named and branded souvenirs of this nature would sell well if they were available. The Chicago Field Museum’s use of Sue was almost an exception and even here there was nothing available in the way of expensive, collector quality items. A small bronze model of Sue would have come home with me if it was.

The only thing I could assume from the range of replicated branded merchandise in the major USA Museums is that this type of merchandise is not sold much elsewhere throughout the city so the range appears unique even though it is not. Another factor that might be relevant is that many of the USA museums do not operate their own stores and these are run by a separate external entity.

One shop that marketed its brand extremely well – particularly for its size, was Dinosaur National Monument. The gift shop here had a broad range of replicated fossils from the area as well as other unique branded merchandise items. In fact the majority of their merchandise appeared to be branded or connected to Dinosaur National Monument in some way. This shop was quite small and its display area was only about double the shop display space at the AAOD reception centre but its range of souvenirs was excellent.

Most of the major museums had a shop dedicated to geology and sold common fossils, gemstones, minerals and a range of items relevant to this theme. These shops were outstandingly popular with children between 8 and 12 (or thereabouts) and I think AAOD needs to concentrate on developing its own range of relevant merchandise in this field. Although AAOD cannot be seen to be marketing fossils of significance, there are numerous items such as pol-
ished fossil wood, carved boulder opal, marine bivalves, and plant fossils etc that have no scientific value but are a fascinating thing for a child to own. Most of these fossils were priced below $10 although better examples did sell for more. These shops also catered for a high quality collector’s market with some exceptionally large, (about 50cm across) beautiful polished slabs of petrified wood priced up to $2,800. Again, this is something AAOD could look into getting done as large, quality items of this nature could be sourced locally. An appropriate business would need to be located to get them cut and polished or, alternatively, professional equipment would need to be purchased so that this can be done in-house.

Although there is a massive range of products in the museum shops, much of it is very similar to that sold in gift shops in Australia. Some additional merchandise ideas that we noticed that might work well for AAOD include:

- Small fold up (adult) umbrellas with AAOD branding – very useful for people when walking across to the Prep Lab from Reception and can fit in a handbag when not in use
- Caps or rag hat for people without a hat
- Good quality attractive coats
- Hot liquid cups with a dinosaur that turns to a skeleton when hot liquid is put into it. The cups we saw were bulky and unattractive and kids don’t have hot drinks often but if AAOD could get a ‘Banjo’ soup/porridge bowl made, it might work well
- Fluffy toy dinosaurs – (Banjo and Matilda) every shop had heaps of them and little kids seemed to like them.
- Branded writing pens, stationary and school bags, lunch boxes pencil cases etc
- Branded jigsaw puzzles
- Cheaper poly-resin versions of bronze skeletons
- Branded pewter/silver/gold medallion (collector’s item)
- Gimmick toys such as squeaking dinosaur pen etc
- Jewellery – both gold/silver replica and gemstone
- AAOD branded Australian dinosaurs range
- Fossil replicas with authenticity certificate

Although we did not get an opportunity to discuss retail with most institutions we visited, discussions with one museum store Manager revealed that their most popular merchandise is toys and jewellery which each take up about 20% of sales. Jewellery is particularly lucrative with a 250% margin and amber jewellery is a particularly high seller. Books were considered low margin – down as low as 40% and are kept mainly because the shop would be inadequate without them

In regard to shop design, all shops were similar in a way with merchandise packed tightly into the given area. All had a similar style of presentation and in all cases the quality or expensive items – particularly jewellery, were located at the counter or close by. Of all of the museums we visited, the shop design and furniture of the Los Angeles Natural History Museum (LANHM) stood out. This shop has only recently been renovated and the use of a very stylish, easy to install shelving system and tall glass cabinets that led into the shop and framed the counter was quite beautiful. All merchandise in this shop was lit up by track lighting above and this gave the whole shop and range of merchandise a very attractive appearance. The tall cabinets held the shops high quality range of merchandise and all were very bright with inbuilt lighting in the base as well as above.

The biggest advantage of the LANHM’s shop shelving style is that the mounting system can be fitted to any shape or size so that all available wall space can be utilised. This included columns, corners etc. The shelving could then be fitted to suit the merchandise with shelves, clothing racks and hanging merchandise racks
all interchangeable. This enabled the shop staff to decorate the shop so that it was extremely attractive. Another advantage is that the whole shop can be easily given a face lift from time to time simply by rearranging the layout. Although this kind of display system may be more expensive to install initially, it would certainly be the most adaptable and it was the most attractively set out gift shop we visited. The area of this shop was 13 metres deep and 23 metres wide.

Another gift shop we visited that was particularly well designed was at the Smithsonian’s American Indian Museum. This shop was more of an architectural masterpiece and followed the curved theme of the museum’s galleries and café etc. The shop area extended in an arc behind the counter and had a very wide frontage to the gallery walkway rather than being a room with a door-like entrance like most of the museum shops. Although this shop didn’t have the instant, bright enticing effect of the LANHM’s gift shop, it was also a very attractive shop as well.

**BUILDING DESIGN**

One of the more noticeable things about the older style museum buildings was the uniformity of their layout. Galleries are confined to large square or rectangular sections which, as necessary, have been sub divided into a wide range of shapes and sizes to suit the flow of the enclosed exhibition. This works very well, but from a more modern perspective probably does not need to be restricted to square corners and uniform shapes or sizes. The majority of iconic natural history museums in USA are in buildings that are around 100 years old or even older and their style is quite irrelevant to modern day architecture. However, there were a couple of institutions visited that had a strong relevance in modern building design and a fairly comprehensive file of photographs was compiled on these buildings.

Without doubt the recently constructed Smithsonian’s Museum of the American Indian in Washington was the most outstanding in its field. The internal arrangement of this building is beautifully designed and its gallery design and flow is spectacular. The building is 4 stories high and all stories opened onto a large atrium below that is fronted with an arrangement of wide staircases. Although the galleries were purpose built within larger, open spaces, their curved, flowing entrances and the winding frontage design of the gallery halls was magnificent. The shop area and dining area was also fitted into this scheme and all other internal walls were contoured to fit within each other so that there was no wasted space. The shop and café were one of the nicest we experienced and were a brilliant combination of practicality and art. The result was quite spectacular and the inclusion of boulders and water features around the building gave a magnificent effect when viewed from both inside through glass walls and outside.

The American Indian Museum building was constructed at a cost of around $200m and obviously AAOD cannot expect to do anything anywhere near this scale. Nevertheless, there were definite attributes to this building that can be considered in future planning of the AAOD Museum. This building was modelled around a high walled, skylight lit central area from which the museum’s floors and galleries were taken. This feature is something that seems to be a standard form of design in virtually all of the 100+ year old museum buildings we visited, and the Carnegie Museum, Smithsonian Natural History Museum and the Chicago Field Museum all take advantage of this feature. In all cases it is the most spectacular part of the building and it would certainly be an excellent model to base the AAOD Museum on, albeit on a greatly reduced scale.
Other Regional Observations
Dinosaur National Monument

Dinosaur National Monument (DNM) is in Colorado on the Utah border. It is about 30km from the town of Vernal which has a population of 9,000 people. DNM has a very strong relevance to Dinosaur Stampede National Monument at Lark Quarry (LQ) near Winton as it consists of a large building over a very significant dinosaur site. Instead of a large dinosaur trackway as with LQ, DNM has a world famous dinosaur bone-bed deposit that was discovered in 1909. Although numerous bones were removed from the site, many still remain partly uncovered on a sloping cliff face and the building surrounds them.

I consider this facility to be an excellent role model for Lark Quarry as, although it does not have as severe isolation problems, it does have similar management issues. In addition to this, moving foundations have led to significant building problems and DNM only reopened in October 2011 following about 5 years of closure while repairs to the building were being made. There is staff housing close by but as with LQ, DNM experiences problems with year round staffing, isolation, extreme weather and security. Like LQ, DNM is situated on State Park land and apart from locals, most visitors need to travel quite long distances to visit. In spite of its challenges, DNM is a world famous site and although LQ is very well known internationally, it appears that there is potential for it to greatly expand in this regard.

Some excellent initiatives have been taken by DNM which would certainly help LQ if funding could be obtained to build relevant infrastructure, and permission obtained from various authorities to operate it. These include a range of displays depicting the environment at the time the bones were deposited including dioramas, murals, fossil replicas of relevant faunas etc. There is also a small gift shop that sells a range of dinosaur merchandise related to DNM as well as a small projection theatre. Although the gift shop used to be on site beside DNM, it is now located a couple of kilometres away and tours and tour guides are based at this facility. Tours are a tag along which leaves every hour or so. Visitors follow the guide’s vehicle and park at DNM when they arrive. There is a new payment booth at the DNM turnoff although this was not in use when we visited.

I don’t believe the DNM visiting process would work well for LQ as it is much more labour intensive and would require more staff that necessary. However, I do think that what LQ offers would be very comparable to DNM if the visitor experience could be improved. The addition of interpretational material, relative merchandise and limited refreshments would enable yield per customer to increase significantly while greatly improving marketing opportunities and future visitation.
**Recommendations**

All recommendations pertain to the development of the Australian Age of Dinosaurs Museum, but although some of them can be actioned almost immediately, others may not be relevant for several years. The recommendations below have therefore only been categorised, not listed in order of merit or priority.

**Strategic Recommendations**

- It is paramount that AAOD rapidly increase its dinosaur collection and the number of scientists working on it. For this to happen new preparation techniques need to be introduced into the laboratory that will see the preparation of existing and new material greatly expedited and digs increased accordingly.
- The development of a AAOD Endowment Fund needs to be started as soon as possible and the public needs to be informed of its existence and invited to contribute to it.
- Membership of AAOD needs to be readdressed to include higher profile membership levels with corresponding benefits and more attention put into redeemable members benefits.
- Marketing, branding and publicity around AAOD iconic specimens, particularly ‘Banjo’ needs to be prioritised with much more attention put into developing an iconic status.
- AAOD’s educational product and its availability to the public needs to be fast tracked to include video conferencing, provision of curriculum based product and museum visitation school programs for primary and secondary students.
- Develop promotional strategies to market AAOD Museum to Northern Hemisphere.

**Operational Recommendations**

- Build infrastructure for Primary and Secondary student education programs at Museum including laboratory activities, geology/paleontology hikes and working dig site simulation on the Jump-Up
- Work with Government and other organisations to get a high speed broadband internet video conferencing unit operational from the AAOD type room and connecting to Australian schools
- Commence concept planning for AAOD Museum, Stage 3 with project architects and exhibition designers ensuring that all operation and infrastructure requirements identified in this report are considered and addressed.
- Ensure that all prepared dinosaur fossils are adequately cradled while the collection is still small so that the Museum does not start to build a large, time consuming and expensive backlog of unsupported material.
- Commence training staff in modern moulding and casting techniques and start making fossil replicas for sale and experimenting with new products
- Identify and design branded merchandise items for retail
- Develop commissionable packages to include other regional businesses and attractions
- Full management meetings once per week to keep all staff informed of progress and events
- Initial development of identified departments with operational strategies and performance reviews put in place within each department.
- Build facilities for 5 day school science camps and dinosaur packages
- Start sleep-overs at the museum for short term school visitors
- Fit dust extraction facilities and expand laboratory
- Start planting Cretaceous garden at the AAOD Museum site so it will have time to mature before museum is built and operational
- Acquire special pallets for plaster jacketed fossil material in view of positioning all AAOD collection ready for a smooth transition to new collection and unprepared fossil storage facilities in future museum buildings

**Report Conclusions**

At the end of the day it is impossible to make comment on everything I have noted or been inspired by through this study without filling multiple pages with text on obscure observations. Even if this could be done, much of it would likely be a facetious account of little current importance. There are so many minute things that can be observed and noted – in many cases subconsciously, by immersing oneself in the multiple halls of the world’s most famous natural history museums. All of these things contribute to shaping thoughts, ideas and opinions. They become an invaluable resource that is stationed in the obscure background of one’s mind, to resurface one day in the future as the tiniest hint of an idea or a simple ‘gut feeling.’ This knowledge is more valuable to me than anything else, and it will stay with me for the rest of my life as the proud recipient of the James Love Churchill Fellowship.