THE UNIVERSITY OF MELBOURNE

—

Faculty of Architecture, Building and Planning

Atrium

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CONTENTS

Background image: James Rafferty

FROM THE DEAN JULIE WILLIS

THIS PAST MARCH I HAD THE PLEASURE OF LAUNCHING THE BE—150 PROGRAM. AS MANY OF YOU MAY ALREADY KNOW, THROUGHOUT THIS YEAR THE FACULTY OF ARCHITECTURE, BUILDING AND PLANNING CELEBRATES 150 YEARS OF BUILT ENVIRONMENT EDUCATION AT THE UNIVERSITY OF MELBOURNE.

BE—150 is an opportunity to showcase the talent of our students and staff. It allows us to explore the contribution we *are* making and *will* make in shaping the future of built environment forms, disciplines and professions. It also allows us to showcase less well-known groups and narratives.

There are a number of significant points that could be identified as worthy of celebration. For example, the first architectural subjects were offered at the University in 1861 (under the Engineering program). However, we have identified 1869 as a significant point in time; in that a student joined the University with the specific and expressed intent to practice within a built environment field. This year, 2019, marks 150 years since that enrolment.

That graduate was Anketell Matthew Henderson (1853-1922), an Irish migrant who went on to become a significant figure in Australian architecture, engineering and surveying, both as a practitioner and educator.

While the architecture discipline was the focus of the first built environment programs here at the University, the BE—150 program is much broader than that. It aims to celebrate and showcase the rich multidisciplinary history and legacy of built environments education at the University of Melbourne.

One of the key aspirations of our Faculty is to provide outstanding education to activate the next generation of built environment leaders, professionals and thinkers able to create and influence our world.

The BE–150 program has been carefully curated to enable these aspirations. It is also much more than a simple celebration of our past. It provides us with dynamic opportunities to examine the present and the future and aims to create instances for meaningful interaction and forming new connections.

The University's alumni group are both collaborators and a significant audience for the BE—150 program. One of the campaign's main themes explores 'How have our alumni impacted Melbourne and the world, and how will they?' This year's program incorporates numerous alumni reunions and networking opportunities.

The BE—150 program will highlight achievements and celebrate the impact of less acknowledged groups, including Indigenous voices, international students, women and regional and rural voices.

It is also a chance to have serious discussions about the work of embracing a strong diversity and inclusion agenda. This includes increasing gender representation, population parity for Indigenous employees and students, eliminating discrimination, focusing on inclusion, and building a more culturally diverse workforce.

We have many role models to draw inspiration from in this endeavour. The first woman to graduate – Eileen Good – within our discipline provides an exemplar. In 1920, she became the first woman to graduate with the Diploma of Architecture from the University, and only the 13th candidate overall. She was only the third woman to enrol in the course.

Good is one of a long lineage of high-achieving female graduates within our community. There are so many more – Ellison Harvie, Cynthea Teague and Phyllis Murphy to name but a few – all blazing a trail for us to follow within our disciplines.

Cultural diversity is one of the strengths of this institution – particularly within built environment disciplines. Students and staff have come to Melbourne to study and work with us from over 50 countries. We have a strong alumni body who hold leadership roles across Australia and the world.

When Professor Brian Lewis was appointed to a Chair in Architecture in 1947 he played a leading role in the University's efforts to engage with students from Asia, through the Federal Government's Colombo Plan scholarships and his contacts with Asian architectural firms. The prominent contribution of Asian students in contemporary University life was initially fostered by this pioneering activity.

The University has significant Singaporean, Indonesian, Malaysian, Chinese and Hong Kong based alumni cohorts who are actively involved in driving global built environment practices and education. The urban form and skyline of a number of cities – Singapore in particular – have been shaped dramatically by our graduates.

This legacy is manifest in the spaces of our current building as well as in the diversity of our current student cohort. Both provide a physical expression of this ongoing connection between the University and the global world. The BE–150 program is actively engaging with these groups through an elaborate program of offshore events and communications initiatives.

Within this issue of Atrium, you will find a pull-out detailing the BE—150 program from June through to the end of 2019. As you can see the program offers an exciting range of opportunities, and we warmly invite you to get involved with the celebrations through the diverse range of events, competitions and exhibitions. You can also explore the program online and become involved by visiting **unimelb.edu.au/be150**.

We look forward to sharing commentary from some of the leading thinkers and practitioners in our disciplines. This is, after all, your story too.

Portrait image: Paul Philipson

ALUMNI SHOWCASE: DESIGN INNOVATION IN MILAN

Sophie Hill

THIS APRIL SAW FIVE RECENT GRADUATES TRAVEL TO MILAN TO EXHIBIT THEIR WORK AS PART OF THE SALONE DEL MOBILE, THE WORLD'S LARGEST AND MOST PRESTIGIOUS DESIGN FAIR.

Exhibiting at the Salone del Mobile provided the perfect opportunity to experience and contribute to the latest and most creative work in the design world, as well as network with key players in the design industry.

For up-and-coming designers, to be noticed at the Salone del Mobile can be a career making moment.

2017 and 2018 graduates Fran White, Kristen Wang, Ivana Dancova, Leandro Jose Magat and Aimee Yuehui Lin each exhibited a design piece which was originally created in the *Ex Lab: Experimental Design Lab*, a graduate level elective at the Faculty of Architecture, Building and Planning.

The studio requires students to produce a major project in the form of a piece of furniture which has been developed through an intensive process of experimentation with materials, traditional craft methodologies and contemporary digital fabrication equipment to inspire unusual and beautiful finished pieces.

Encouraged by studio Leaders Jas Johnston and Adam Markowitz, the alumni submitted their work to the *Melbourne Movement*, an independent group set up to support local young designers, who were organising a contingent of Melbourne designers to exhibit in Milan.

All students undertaking the subject are encouraged to put their work forward for consideration at competitions and expos such as Fringe Furniture and VIVID, with many students receiving awards and recognition for their innovations.

VARYVASES BY FRAN WHITE

MATERIALS: QUICK SET RESIN, LATEX

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VaryVases are a family of mass-customised vase objects made by rotational casting quick-set resin in an adjustable latex mould. This parametric mould allows the vase's profile, size, number of openings and colour to vary, while the process of rotational casting creates thin, hollow, and curvaceous vase forms each time.

I was interested in designing a product that could be mass-customised. I wanted to make a product with all the efficiencies of mass-production, whilst ensuring each of the products would have their own unique design. Since finishing my degree, I have continued to work on the project, developing it into a range of vases.

Going into the Salone del Mobile, I didn't know quite what to expect. It has been a great experience to understand more about how the design industry works in areas such as product, industrial and furniture design, as it is quite different to architectural practice.

It was also a good push to continue developing yourself as a designer. I have definitely come through this experience more inspired and driven to further develop my own design projects.

One of the most valuable parts of this experience was getting first hand feedback and interest in our work from others. Many people from different areas in design stopped by our booth, from educators, manufacturers, suppliers, other designers, students and the general public. It was very exciting when I heard some IKEA designers stopped by the booth and liked my work! We also had the head of furniture at ArtCentre give our group at the Melbourne Movement stand some good pointers on how we could develop our work. I found it really rewarding to see how engaged students were with the work at our stand and hear how they were inspired by what we were doing.

RE.BEAN COFFEE STOOL BY KRISTEN WANG

MATERIALS: COFFEE GROUNDS

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Being a coffee lover, I started to think about the enormous amount of coffee grounds waste being generated by cafés, and how I could turn that waste into a beautiful, functional and sustainable design piece.

During the project development phase in Ex Lab, I realized that I needed to think beyond the act of using recycled materials to call a piece sustainable and move towards thinking about the end of the product life. Will this recycled or sustainable product generate more waste? Will it cause damage to nature when people dispose of it? My research found that many so-called 'biodegradable products' are, in fact, only partially biodegradable and still contain various (sometimes toxic) chemicals. Consequently, my goal was to create a truly biodegradable piece of furniture.

After much research, tests, prototypes and, of course, failures, I developed this brand-new material comprised of a coffee ground mixture and a style of formation which resulted in a truly biodegradable and structurally rigid product.

The reaction to my work at the Salone del Mobile was really positive, and I won the '*Special Prize Intesa Sanpaolo - 3rd Edition: Best Project on Food as a Design Object*'.

"WHEN PEOPLE REALISED THE RE.BEAN COFFEE STOOL WAS MADE FROM USED COFFEE GROUNDS WASTE, THEY WERE INITIALLY REALLY SURPRISED. THEY LOVED THE UNIQUE COFFEE SMELL, COLOUR, TEXTURE AND TACTILITY OF THE STOOL."

The Re.Bean Coffee Stool welcomes public interaction. It encourages visitors to touch, smell and of course sit on it to demonstrate its functionality and structural strength, which is quite different from traditional exhibition pieces with 'do not touch' sings on them. At one point a two metre tall body builder visited our booth and sat on the Re.Bean stool, which really highlighted the strength of the design.

FREAK THE CHAIR AND THE PET OTTOMAN BY IVANA DANCOVA

MATERIALS: PVC PLASTIC, POLYURETHANE GLUE, AND VINYL PAINT

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The Freak Chair and the Pet Ottoman is an inflatable chair and ottoman. I focused on the human body and health (mental and physical). I wanted to create a furniture piece that is playful and interactive, and that also allows people to physically experience furniture in a new way- you can sit or drape over it, hug it or lay down on it.

" I BELIEVE INFLATABLES ARE AN EXCELLENT MATERIAL TO FACILITATE THAT TYPE OF PLAYFUL RELATIONSHIP BETWEEN THE USER AND THE PRODUCT."

It was really rewarding to see that the Freak Chair and the Pet Ottoman had the exact inviting, interactive effect on people as I had hoped. Passers-by and viewers at the Salone del Mobile loved sitting on the chair, bouncing on it and were really curious about its materiality from afar.

They initially thought it was a hard product and were delighted to find that it was squishy, responsive, and quite comfortable to sit on. There were a number of viewers that really appreciated its aesthetic expression and found the set very beautiful, which was very satisfying for me as a designer, as one of the challenges and aims of Freak chair was to push inflatables away from looking like poolside toys and more towards a high-end collectible product realm.

Having access to other incredible artists and designers- emerging or established – allowed me to grow as a designer and recognize my own taste. The sheer number of people that pass through the Salone del Mobile, who view and interact with your work, allows you to gauge how your product is assessed by the public.

ROBOTIC 3D PRINTED STOOL BY AIMEE YUEHUI LIN

MATERIALS: PETG PLASTIC

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I am very interested in exploring and experimenting within the domain of robotic 3D printing. My design of the stool was informed in part by a setup limitation, in that the furniture piece needed to be printed in four parts due to the weight limit of the robotic arm.

Therefore, the top pattern is designed with an element of seamlessness to hide four interlocking joints. The contrast between the drop effect and the perfect layers gave the piece a sense of a melting effect. Whilst the mix of aqua colour creates a feeling of calmness and tranquillity, the overall piece celebrates a moment of melting and curdling.

"I REALLY WANTED TO SHOW THE UNIQUE TEXTURES THAT A ROBOTIC ARM IS CAPABLE OF PRODUCING, AND INSPIRE PEOPLE TO BECOME MORE INTERESTED IN ROBOTS AND DESIGNING WITH ROBOTS."

Visitors at the Salone del Mobile were really interested in the pattern, and curious about how my design was made.

Being an exhibitor at the Salone del Mobile / Salone satellite was a remarkable experience. I saw many masterpieces created by designers from all over the world, including Zaha Hadid Design who I really admire for passionately pushing the boundaries of contemporary design.

SWELL BY LEANDRO JOSE MAGAT

MATERIALS: MDF, WATER, FABRIC DYE

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MDF has weaknesses that make it an undesirable material to use; particularly, its intolerance to water. *Swell* is a representation of how a weakness can be exploited to create something purposeful and elegant. It explores the swelling properties of MDF as a locking mechanism rather than a defect.

The form of the side table highlights the process of pouring. The interlocking joints are activated via swelling wherein hot water is poured from the top and diverted through its channels. Both process and results are visually emphasized by the dye. The end product is the antithesis of the top-down design approach, as it celebrates unexpected results from an unconventional design process.

It was a surreal experience exhibiting at the Salone del Mobile, especially being in the midst of so many talented individuals. It was impossible not to be inspired by both the work being exhibited and the city of Milan itself. Many people commented on how brave and bold our pieces in the Melbourne Movement booth were, since we all focused on experimental design and making processes to create our works.

"I'M EXCITED TO SEE HOW THE EXPOSURE FROM THE EVENT AND NETWORKING WITH LIKE-MINDED DESIGNERS CAN DEVELOP INTO FUTURE OPPORTUNITIES."

The highlight was definitely representing the Melbourne Movement on an international stage and Kristen Wang winning her award for the Re.Bean Coffee Stool.

Please visit the *Ex Lab: Experimental Design Lab* Instagram account to see the latest images of the unique projects produced by students undertaking the subject:

instagram.com/ex_lab

Images: Naveed Farro, Andy Nicholson, Kristen Wang, Ian Wong and Salone del Mobile

SMOKE AND MIRRORS

LED BY ARCHITECT JANNETTE LE, AND TUTORS MICHAEL MACK, MOND QU AND DENIS VLIEGHE THE SMOKE AND MIRRORS EXHIBITION OF STUDENT PROJECTS DEPICTED INDEPENDENT SCENES FROM A WIZARDING WORLD OF MAGIC.

The exhibition explored the intersection of stage sets, miniatures, architecture and narrative driven design.

Teams were tasked with designing and fabricating an animated film set model. Using techniques and discussions learnt over the course of 12 days, they produced highly detailed models created using a mixture of intricately laser-cut pieces, digital fabrication techniques, hand modelling, lights and motors.

The exhibition was run in conjunction with the Melbourne Design Week, and held in the Dulux Gallery, 25 February - 25 March, 2019.

Images – this page:
Flourish and Blotts: Archana Karunan, Shreyaa Shah,

Opposite, clockwise:
Ollivanders Wand Shop: Ping Meng, Sheng Zou,

The Shrieking Shack: Chenggao Li, Zichao Zhu, Haotian Wu, Siyang Wan, Xinhui Xu,

The Chamber of Secrets: Sara Tan, Ying Ruey Lee, Yohanes Richo Wirawan, Juan Carlos Planells, Mengli Pi,

The Great Staircase: Bin Wang, Hao Lin, Zhenyi Jiang, Zarrin Salami, Xiaohan Liu

All photographs: Jannette Le

PLANTS TELL STORIES OF CULTURAL CONNECTION

By Zena Cumpston and Dr Tanja Beer, University of Melbourne

ABORIGINAL PEOPLES' HOLISTIC RELATIONSHIPS WITH ALL LIVING THINGS IS EXPLORED THROUGHOUT THE LIVING PAVILION, AN EVENT SPACE AND LIVING LABORATORY THAT CELEBRATES INDIGENOUS KNOWLEDGE, ECOLOGICAL SCIENCE AND SUSTAINABLE DESIGN THROUGH PARTICIPATORY ARTS PRACTICE.

Across Australia there is very little acknowledgment of the connection urban areas have, and have had, to Aboriginal peoples over thousands of generations. Unceded sovereignty, histories, custodianship, and belonging have been actively erased, hidden and denied.

But when Europeans arrived in Australia, by all accounts, they were met by First Peoples all over this country who were healthy and well-nourished.

Here in Victoria, it is known that the peoples of the Kulin Nations utilised and had intimate scientific knowledge of more than a thousand species of plants. Because of the ravages of colonisation it is extremely likely there were many, many more which have remained unrecorded.

The Living Pavilion, which ran over April and May at the University of Melbourne, is a recyclable, biodegradable, edible and biodiverse event space and living laboratory that celebrates Indigenous knowledge, ecological science and sustainable design through participatory arts practice.

As an Indigenous-led project, The Living Pavilion is a call to the need for First Nations perspectives, histories and culture to take centre stage in the face of increasing ecological uncertainty. The work strives to forefront the specificity of the University campus as a Wurundjeri place.

The Living Pavilion features an artistic representation of Bouverie Creek, that once flowed through the site but is now hidden under concrete, designed by Aboriginal artist Dixon Patten.

The site is transformed into a haven of biodiversity and Indigenous stories through the installation of over 40,000 Kulin Nation plants alongside artworks, performances, talks and gathering spaces that celebrate Melbourne's eclectic flora and fauna.

The aim is not to recreate the landscape before disruption, but instead seek to corrupt the imposed landscape to reveal hidden stories of this Wurundjeri place.

A large part of the project has been focused on telling the stories of the 40,000 plants that form part of the design from an Aboriginal perspective. For example, the many grasses on display feature narratives which highlight their importance to Aboriginal people as the first bread-makers, with grass seeds being utilised to produce flour for at least 36,000 years.

Research presented with the grasses also highlights their uses in producing technologies such as nets and animal traps integral to subsistence.

The many wattles featured have been used to share information about the ways in which Aboriginal peoples have carefully observed plants over millennia to understand every possible use for that plant. Australia's First Peoples have employed careful observation, the fundamental backbone of science, to survive and thrive in one of the harshest environments on earth.

Aboriginal peoples' holistic relationships with all living things is celebrated and explored throughout the narratives of The Living Pavilion within the defining aim to ground the University of Melbourne's Parkville campus as Wurundjeri Country, as part of Wurundjeri past, present and future, always highlighting Wurundjeri peoples and culture as living, continuous, present and very much alive today.

When indigenous plants are reinstated within the environments they have thrived in for thousands of generations, cultural stories are reactivated. The opening up of cultural narratives invites all peoples to learn more of First People's living culture but also more of the Country we all, as Australians, call home.

The place-specific context within which the plants have been chosen, researched and presented may act as a portal though which people may better understand the living culture and knowledge systems of the people of the Kulin Nations and First Peoples of Australia further afield.

It is also our aim for people to better appreciate and understand the value of reclaiming imposed landscapes using indigenous plants to bolster biodiversity within urban areas, most especially along remnant habitat boundaries where nature and larger urban environments meet.

It is popularly perceived that urban areas have a lack of biodiversity but studies of the City of Melbourne over the past 20 years have identified over 1,800 species of insects, fish, frogs, reptiles, birds and mammals. Biodiversity in urban areas is dependent on greening initiatives. The hive of activity in insect populations on the site of The Living Pavilion, which have been tracked as part of our broad research on site, are already showing a marked acceleration in plant and insect interactions.

Indigenous plants are sustainable, climate tolerant, require little water and are a favoured habitat and source of food for many native animals which are still very much a part of biodiversity within all urban areas, even cities.

It is our hope the stories being told, through aspects such as design, research and programming, will help a wide audience to see this 'urban' space in a new context. To come to know some of the hidden stories of this place.

The stories help us to see that all land in Australia is Aboriginal and Torres Strait Islander land, whether urban or remote, and that Aboriginal and Torres Strait Islander culture and people are strong, diverse, dynamic, intrinsically connected to and embedded in place, and living in all places in Australia.

The Living Pavilion is the seventh iteration of a series of projects called 'The Living Stage' which explores how participatory arts can act as a medium to build community resilience in response to climate change and biodiversity loss.

The arts have been used as a communicator for change over the last few years. The Living Stage concept, of which the pavilion is an example, has progressively become more engaged in place-making tactics through the participation of local communities in creative processes, and the desire to enhance the connectivity and integration of more-than-human places in response to climate change, social inequity, food scarcity and biodiversity loss.

Since making its debut at the Castlemaine State Festival in 2013, the concept has travelled to Cardiff, Glasgow, Armidale, New York and Lorne, winning multiple awards. As each living stage evolves out of a direct response to the localities of site, ecology and community, no project is ever the same.

This careful attention to detail allows us to value the subtleties and uniqueness of place and to celebrate in its authenticity.

This is what First Nations-led projects do, they allow us to open up new approaches and aesthetics that powerfully and undeniably assert and celebrate the presence of Aboriginal place to create thriving cities of the future.

Images by Alison Fong and Sarah Fisher

SIMON COOKES: HARNESSING TECHNOLOGY IN ARCHITECTURE

By Nicole Engwirda and Sophie Hill

SIMON COOKES FIRST CONSIDERED THE POTENTIAL OF 3D TECHNOLOGY TO IMPROVE EFFICIENCY IN ARCHITECTURE DURING HIS UNDERGRADUATE STUDIES.

After developing this interest during his years working in the industry, and further exploration through graduate research at the Melbourne School of Design, he has launched *LARKI*.

Mr Cookes said its highly detailed 3D surveys would help architects get the site context information they need to design with confidence and precision.

"For a long time, I felt there were crippling inefficiencies in the site context discovery and planning assessment processes that I knew I could fix with LARKI 3D surveys," he said.

"Currently architects need to cobble together site context information from 2D land surveys, low accuracy sources like Google Earth, and multiple site visits."

According to Dr Dominik Holzer, Senior Lecturer in Digital Architecture at the Melbourne School of Design, traditional methods for capturing Geospatial Information and integrating it in to the architectural design process can be inefficient and outdated.

"Better solutions are required to rethink the way we design and allow complex projects to unfold", explains Dr Holzer, who believes experimenting with different solutions is an important factor. "Technology is transforming our industry from the ground up as we learn to connect design to data in unprecedented ways. An advantage of supporting a generation of young practitioners is that they really embrace the opportunities new technologies offer."

Here, Mr Cookes shares insights from his journey from student to start-up founder, and how *LARKI* took shape.

What attracted you to architecture and the built environment?

I've always had a broad interest in visual arts, the built environment and natural environment. This led me to study planning, property, construction and architecture at the University of Melbourne, including an exchange to Tokyo for art history.

Has your career followed the trajectory you expected while studying?

Not really. That is the great thing about architecture study; it is a strong foundation for many different directions: design thinking in business administration, tech start-ups, aesthetic pursuits, project management, etc.

While studying I worked on a construction site, then in a small Melbourne architecture office, then for a renowned architect in Tokyo. After graduating, I worked for AIA Gold Medal winners *ARM* on very exciting projects like Perth Arena. After three years at *ARM* I started my own practice, *DB architecture*.

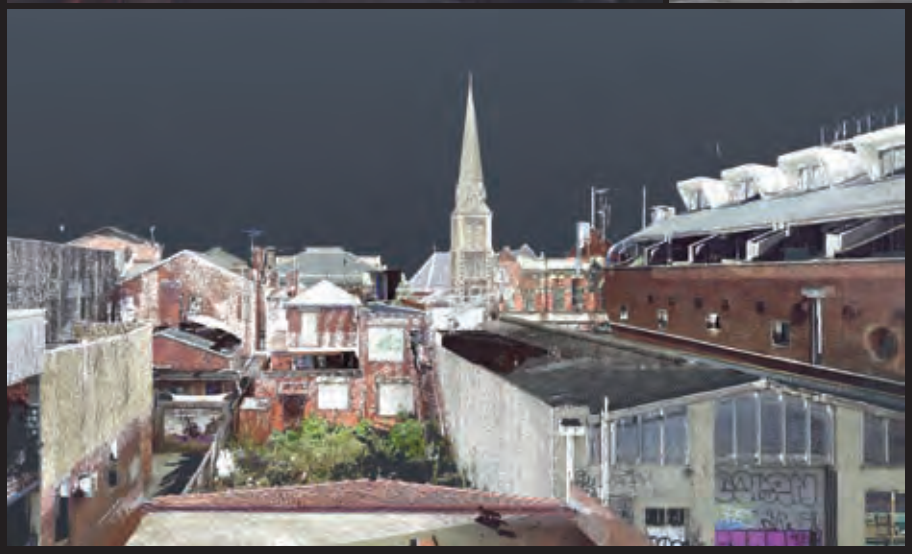
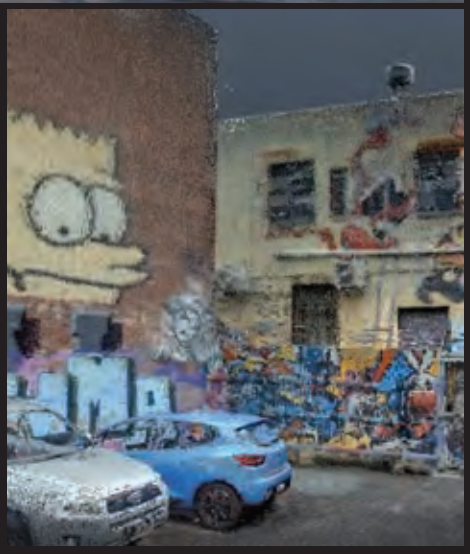
While working at *ARM*, I was invited to teach final year architectural design with the *Victorian Eco Innovation Lab*. I also did Environmentally Sustainable Design and Building Information Modelling (BIM) consultancy to various architecture practices. Teaching is a common side pursuit for architects (and artists).

Now I am a tech start-up founder specialising in 3D surveying and context modelling for architecture and planning.

What prompted your return to university for graduate research?

While back on campus teaching architectural design, I found out about scholarship opportunities for research. I had long known the power of technology to improve professional practice and built outcomes, being the BIM implementor at *ARM*.



But it was really back when I was an undergrad doing my year out of professional practice at a small architecture firm – doing tedious measurements for tenancy drawings – that I heard about 3D laser scanning and thought, 'wow, why am I wasting my life with these boring hand measurements when a 3D scanner could do it in much more detail, with much more accuracy and much quicker than I ever could?'

Years later I desperately wanted access to these 3D surveys to make my architecture practice more efficient and effective but found them cost-prohibitive for my clients.

I had the idea to create a marketplace for these 3D survey files, then they would be more affordable, and thus accessible for all projects.

I wanted to know more about how such 3D technology could impact the surveying, architecture, planning workflow, so I applied for (and received) a scholarship to research this topic at the University of Melbourne.

How has your graduate research influenced your career?

Researching (or as they say in the lean start-up world, "getting out of the building") and the synthesis of that research is key to the success of new technology.

I learned how to do rigorous, defensible qualitative and quantitative research. Doing research that would be peer-reviewed, published and backed by the University of Melbourne opened doors to the best academics and industry professionals in my field. Many academics I sought advice from and industry professionals I interviewed have stayed great connections and supporters post-Masters, now that we are commercialising LARKI 3D surveys.

The research was of a calibre that got me speaking at top conferences and published in journals. The outcomes were important to lift my profile as an expert in 3D surveying for architecture and planning.

Why do you feel architecture should embrace this technology?

A typical LARKI 3D survey point cloud file has 30 million site data points (compared to only 100 on traditional surveys), with each point geo-positioned to Map Grid of Australia and Australian Height Datum. Architects go to *LARKI* to download 3D point cloud surveys or BIM files in minutes. LARKI 3D files can be imported into any architect's software, so they can do elevations and sections with a few clicks of a mouse. Which means less time drafting and more time to spend on creativity and realising great architecture.

"I LEARNED HOW TO DO RIGOROUS, DEFENSIBLE QUALITATIVE AND QUANTITATIVE RESEARCH. DOING RESEARCH THAT WOULD BE PEER-REVIEWED, PUBLISHED AND BACKED BY THE UNIVERSITY OF MELBOURNE OPENED DOORS TO THE BEST ACADEMICS AND INDUSTRY PROFESSIONALS IN MY FIELD."

Images: Supplied by Simon Cookes.

CURVECRETE: CURVING THE FOOTPRINT OF CONCRETE

By Paul Loh with Aengus Cassidy

RESEARCHERS FROM MELBOURNE SCHOOL OF DESIGN, LED BY PAUL LOH, HAVE DEVELOPED AN ADJUSTABLE MOULD FRAME FOR CASTING DOUBLY CURVED CONCRETE PANELS. WITH THE INCREASED USE OF COMPUTATION TOOLS IN ARCHITECTURAL DESIGN, ARCHITECTS AND DESIGNERS ARE INCREASINGLY INTEGRATING THE USE OF COMPLEX CURVED SURFACES IN THEIR DESIGNS.

Producing bespoke and variable panels makes buildings distinctive and raises their perceived value both commercially and aesthetically. These striking design possibilities are beyond the scope of most construction projects, as double-curved panels are made using expensive, complicated and specialised techniques.

Today, large, customised equipment with expensive maintenance, such as CNC machines, 3D printers, incremental formers and multi-pin moulds are used to make casting moulds for double-curved elements. Moulds typically made from expanded polystyrene foam are often discarded after use, contributing to the embodied energy of the project and generating significant construction waste. Similarly, robotic 3D printing and milling processes allow casting of doubly curved concrete panels to reduce construction waste but typically require a specialist skill in operation and the procedure is significantly time-consuming.

PAM (Parametric Adjustable Mould), the bespoke computer numerically controlled (CNC) machine developed at the University of Melbourne allows simple, precise fabrication of elements with any double-curved shape, using a flexible, low-cost material that is understood by builders worldwide: reinforced concrete. Consisting of a single adjustable mould frame, PAM interprets digital information from a panelised surface to actuate the mould into desired positions for concrete casting.

Once cured, the concrete panel is removed from the mould with no immediate waste. This technology eliminates the need for individually unique mould design in the manufacturing of curved panels, reducing manufacturing waste and improving cost efficiency. It makes fabricating double-curved construction elements affordable to a wide range of construction projects due to the significantly reduced mechanical part in the system, resulting in a lower capital cost.

Australia produces 24 million cubic metres of concrete annually, 10% of which is pre-cast concrete[1]. Formwork, the mould into which concrete is poured, typically constitutes up to 15% of the weight (approx 0.9 million tonnes) of total waste from concrete usage. Currently, PAM is designed to produce non-structural panels for external cladding or interior use. If this technology can service 25% of market demand for pre-cast concrete it could save a projected 225,000 tonnes of waste in formwork annually. This is equivalent to the waste created by 112,500 Australians per annum, or comparatively, the entire population of Ballarat.

In receiving support from the Translating Research at Melbourne program and Wade

Institute, the PAM research and technology has been geared toward commercialisation with Curvecrete born as a start up through this inquiry. Curvecrete was shortlisted in the 2019 Melbourne Design Week 'NGV Victorian Design Challenge' inviting design professionals and students to tackle the challenge of 'waste'.

One of five professional firms shortlisted for the design challenge, the Curvecrete team, in collaboration with RMIT industrial designers Marcus Cher, Paul Meeuwsen and Travis Gemmill, centered their proposal around the concept for a chair manufactured using PAM's innovative fabrication techniques. Titled Superleggera (Italian for Superlight), the design demonstrated the functionality of PAM in its ability to produce refined decor alongside large scale industrial manufacturing.

Bested by the strong design of a competitor at NGV Design Challenge, the momentum behind Curvecrete continues unabated. Recently accepted into the Melbourne Accelerator Program, this opportunity will provide an expanded support network, additional mentors for the Curvecrete team and allow for a concerted focus on growth and commercialisation. Keep your eyes open for Curvecrete in the coming months.

PROJECT TEAM:

Paul Loh Lecturer in Digital Architecture at the Melbourne School of Design. He is a partner of LLDS Architects and a unique micro-manufacturing facility, Power to Make. Paul is also a director of the Architectural Research Laboratory.

Daniel Prohasky is an Architectural Engineer and Roboticist. He is the Innovation Fellow at Swinburne University | Faculty of Health, Arts and Design.

Warren Rudd is a Chartered Accountant and Master of Entrepreneurship graduate (from the Wade Institute, University of Melbourne).

The team acknowledges the contribution of David Leggett (Power to Make / Architectural Research Lab) as one of the key inventors for the PAM technology.

[1] Cement Concrete and Aggregates Australia, 2010

Images: Left page – Curvecrete prototype on display at the ARUP Melbourne office during Melbourne Design Week by James Rafferty

This page – The Curvecrete project team and collaborators on stage at the NGV during the Victorian Design Challenge by Aengus Cassidy

INTRODUCING THE CONNECTED CITIES LAB

Sophie Hill

THE CONNECTED CITIES LAB IS A NEW CENTRE BASED WITHIN THE FACULTY OF ARCHITECTURE, BUILDING AND PLANNING. LAUNCHED IN JANUARY 2019, THE LAB SEEKS TO TACKLE THE MORE-THAN-LOCAL ISSUES WHICH UNDERPIN URBAN GOVERNANCE IN AN INCREASINGLY URBANISED WORLD, FOCUSING ON THE INTERNATIONAL DIMENSION OF CITIES AND CITY LEADERSHIP. CONNECTED CITIES LAB DIRECTOR MICHELE ACUTO SHARES HIS INSIGHTS INTO HOW THE LAB CAME INTO BEING AND THE RESEARCH FOCUS HEADING INTO THE FUTURE.

What led to the development of the Connected Cities Lab?

Increasingly, any work or research into cities in this day and age really needs to be done in an international context. Many challenges facing our cities these days are very much inter-connected with the global community.

What happens in Melbourne is often determined by what happens in any other major city. For example, Melbourne is currently experiencing a recycling crisis. This has come about partly due to a decision by the Chinese government to impose a ban on the importation of some of Australia's recyclables, but international politics is only one component.

The crisis is also the result of the global political economy of resources and materials, and the fact that Australia itself has poor recycling infrastructure in general, which in turn is also affected by the fact that Mexico produces glass in a way that's cheaper than what it costs to recycle it here.

The Connected Cities Lab is trying to develop a centre of expertise on these kinds of globally-oriented conversations and considerations. That is, thinking of cities internationally, not just as individual places existing in their own space.

The University's Deputy Vice Chancellor Research and the Faculty, who supported the establishment of the Lab, wanted to facilitate research that explored cities in an international context, and contributed dynamically to global discussion and research.

How do cities shape the way we live and how does the lab begin to address the issues faced by cities?

There has been a growing interest in the rapid urbanisation of the world. More and more people are living in cities and there has been a realisation that many of the problems the world is facing, like climate change, resilience and health equality, are fundamentally shaped by cities, given that cities account for over 70% of greenhouse gas emissions and 60% of the global consumption of energy, but also nearly 80% of the world's GDP.

Over the last few years, this attention to cities and their significance in shaping a sustainable future has been formalised through many major global agendas, like the Paris Agreement on Climate Change, the establishment of the UN's Sustainable Development Goals (SDGs), the Sendai Framework for Disaster Risk Reduction, but also the steep rise in formalised international city collaborations, or ' city networks'.

The Lab is following on from these agendas to put the spotlight on the global role of cities.

The main spirit of the Connected Cities Lab is to broaden the mindset of people that work in or on cities and expose them to a more globally-oriented approach to thinking about urban issues and solutions.

We want to go further than finding best practices. We want to explore different contexts where similar problems have occurred, and facilitate an understanding that for people living in an urban age, the urban condition in, for example, Melbourne is not unique.

Great solutions to our current local challenges also do not always come from London and the 'West'; many cities in the Global South having much to teach us about urbanization. There are other cities that will be facing similar or different challenges and we need to recognise that it's worth working with them rather than in parallel to them.

What research is currently being produced by the Lab?

The Connected Cities Lab is set up so that almost all the research projects involve partnerships with other institutions, for example, with local governments, with

WE HAVE RECENTLY LED AN INTERNATIONAL EXPERT PANEL ENDORSED BY NATURE SUSTAINABILITY ON "SCIENCE AND THE FUTURE OF CITIES" LOOKING AT THE WAYS URBAN RESEARCH CAN SHAPE HOW WE TACKLE PRESSING CHALLENGES FOR CITIES.

the private sector or with other universities. The purpose of the Connected Cities Lab is not to be a purely academic research centre, it is to be a dynamic, globally focused centre of expertise. We consciously chose to start the Lab with actual projects which are actively doing things, rather than with just a statement of principal.

The Lab's research is also set to support, as a hub for 'urban governance' in partnership with the Executive Office of the UN Secretary General, the *Local 2030* program, which is a global multi-stakeholder initiative to support the local-level implementation of the Sustainable Development Goals set out by the United Nations. In this sense we are aiming to support international research and capacity building on city leadership that can make tangible difference at the street level. Partnering with relevant multilateral institutions is an important factor in realising this.

For example, our "Knowledge in Action for Urban Equality" (KNOW) program, sponsored by the UK Department for International Development and in partnership with University College London, is working with urban experts and local government in Cuba, Sierra Leone, Peru and Southeast Asia to think of the ways research-practice connections can contribute to more equal cities.

Similarly, we have recently led an international expert panel endorsed by *Nature Sustainability* on "Science and the Future of Cities" looking at the ways urban research can shape how we tackle pressing challenges for cities. Gathering 30 of the world's best minds on urban research across many disciplines, from art and history to engineering and planning, the expert panel has advocated for the development of a more 'global' urban science and establishment of scientific advice for cities.

We have seven ongoing projects underway at the moment, four PhD researchers and a total of 13 staff making up the core lab team, with collaborations across the faculty and internationally. We were very specific about being called a "lab" as we strive to incubate projects where we can experiment with international thinking about cities.

The general ethos of all the projects is to aim to produce globally relevant evidence which does not only apply to one specific place but can give you a sense of the global landscape of international urban issues. Instead of studying one city network we look at what it means to be a network, a city connected to other cities.

You are technically trained in international politics and international law. How did you become involved in working in the realm of urbanity and cities?

I became interested in cities because I was working with the European Commission in the aftermath of what was the Severe Acute Respiratory Syndrome (SARS) pandemic flu, just before the period of the H1N1 Swine Flu in 2009.

To understand why SARS became a global phenomenon, you really had to understand how cities were connected to each other.

Figuratively speaking, a new virus develops in the outskirts of China. Someone catches that virus and travels to Hong Kong and becomes sick whilst staying at their hotel. There are other people in that hotel who pick up the virus, and travel on from Hong Kong to Toronto, to Singapore, to London or any other city. All of a sudden, hospitals need to be shut down or contained in Singapore and all of a sudden, the media is reporting grim images of apocalyptic pandemics.

I realised that it was important to find new ways of thinking about cities as more than stand-alone entities.

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The Faculty would like to thank the generous donors that have in recent years endowed scholarships and awards in perpetuity, ensuring that outstanding students receive support to excel in their studies and research, and make a contribution to shaping the built environment.

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The Faculty also thanks the generous donors that have supported the Dean's Honours Awards during their life time or through a will, supporting the Faculty's acknowledgement of academic excellence.

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Image: 3D printed vase by Yuehui Lin. Photograph: James Rafferty.

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The Faculty of ABP is grateful to its supporters who have made a gift in their will, so their legacy will enrich the lives of future generations.

Estate of John Stevens Gawler

Estate of Donald Emsley Napier

We have made our best attempt to ensure the list is correct, but we are aware that our records may not be complete. If you notice any errors or omissions please contact Andrew Middleton, Senior Development Manager, on **(03) 8344 3111** or **miaj@unimelb.edu.au**.

BEEN & SEEN

01.

Dean Julie Willis and alumni at the BE—150 Hong Kong event in March.

02.

Dylan Brady kindly gave up time to speak to new students during O-Week about his experiences at ABP and ways to get the most out of their time. Of course, the Archi Revue got a mention.

03.

Shanghai alumni take part in a tour of ANKEN projects as part of the BE—150 alumni functions in March.

04.

Many alumni attended the Dean's Honours Awards for 2018 students, some as benefactors of prizes and scholarships. Congratulations to Jaqlin Lyon (Bachelor of Environments 2018) for winning the Undergraduate Medal, watched on by family and friends, including her father, Corbett Lyon (BArch (1979), Doctor of Architecture (2016)).

05.

Richard Leonard from Hayball speaking to guests of the Annual ABP Supporters Bus Tour about the design for the first Victorian bespoke vertical school, South Melbourne Primary School. Thank you to Ryan Johnston and Kerstin Thompson who generously presented during the day, and to Professor Philip Goad for hosting us.

06.

There was a big turnout at the first Women of ABP Network event for 2019, held at Maddocks.

07.

Hong Kong alumni take part in a tour of the Tai Kwun Centre for Heritage and Arts (including the JC Contemporary building) led by Joe Lui, who is one of Dean Julie Willis' former students.


01

02


04


03


05


06


07

BE—150: A CELEBRATION OF ABP

Andrew Middleton

The year was 1869, when Anketell Matthew Henderson, an Irish migrant joined the University with the expressed intent to practice in a built environment field. In celebration of this milestone ABP has developed a year-long program titled BE—150. The program offers an opportunity to celebrate the impact our community has made.

It's been an exciting first half of the year for BE—150 with a myriad of activities. For example, the Dean and Professor Philip Goad, along with Cameron Logan, delivered the book launch of *Architecture and the Modern Hospital*, a presentation they'd "rehearsed" in London, last November. The Dulux Gallery has also hosted some beautiful exhibitions, including Smoke and Mirrors and Waterlore, remarkable and relevant for very different reasons. We learned the significance of sustainability in the property market at the lecture *Avoiding Green Lemons*.

While, the Dean and our Advancement team have hosted alumni events in Hong Kong, Shanghai, Sydney and Melbourne.

This is only the beginning of a truly absorbing year of activities. One of the next significant activities on the program is Australia Modern. Taking inspiration from the latest book on Australian modernism *Australia Modern: Architecture, Landscape & Design 1925 – 1975* edited by Hannah Lewi & Philip Goad and published by Thames & Hudson, this exhibition celebrates twentieth-century architecture through newly commissioned photographs and archival images that vividly capture how modernism has shaped Australian society.

The exhibition invites you to explore modernism's influence on every facet of life in Australia. Featuring projects from the iconic and the urban to the everyday, the regional and the lesser known, Australia Modern celebrates the modern architects and buildings that will constitute the heritage of tomorrow. The book was made possible by the generous support of Lovell Chen, Seidler Architectural Foundation, The Chisholm Family, Ronald Jack (Gus) Ferguson, and National Trust of Australia (Victoria).

BE—150 is a celebration of your alma mater and its future.

We hope you are able to visit *Australia Modern*, or join us at one of our other upcoming events in Melbourne, interstate, overseas or virtually. To learn more about the BE—150 program, **unimelb.edu.au/be150** or for our interstate and overseas alumni you can find recordings of lectures at our events page **msd.unimelb.edu.au/events**

As for Anketell, he went on to become a significant figure in Australian architecture, engineering and surveying.

INSIDE THE FACULTY

News, People, Recent Events

NEWS AND PEOPLE

Chair of Urban Planning Nicholas Phelps has been appointed as the Faculty's Associate Dean (International). Nicholas joined the Faculty in 2018 and came from The Bartlett School of Planning at University College London. His research interests cover suburban planning and politics, international aspects of urban planning, the economic geography of urban agglomeration and the economic geography of multinational enterprises and foreign direct investment.

Alan Pert has been working with alumnus Andrew Simpson, with research support from Rebecca McLaughlan, on a prototype for a new eight-bed Children's Hospice in Melbourne. The project was supported by former Minister for Jobs and Industrial Relations Kelly O'Dwyer, who announced the Federal Government would be providing a $7.5 million Commonwealth grant to allow the children's charity to demolish its existing hospice and build a world-class facility in its place.

A team of Masters students from the Melbourne School of Design, alongside **Georgia Warren-Myers**, have won the 2019 CoreNet Global Academic Challenge 4.0 in Hong Kong. Competing against 40 submissions from 6 continents, Mina, Fiona and Chao's pitch was shortlisted as one of three finalists, resulting in an invite to the final in Hong Kong where they took out first prize.

The Foodprint Melbourne research team, including **Jen Sheridan**, released a major report focusing on policies needed to ensure a resilient and sustainable foodbowl for Melbourne titled 'Roadmap for a resilient and sustainable Melbourne foodbowl'. It makes policy recommendations about how to protect farmland, promote farm viability, increase water access including from recycled water, increase nutrient recycling (from city waste streams to farm fertilisers), and support more sustainable agriculture in Melbourne's foodbowl.

Gideon Aschwanden and Andy Krause received the best paper award from the American Real Estate Society (ARES) for their real estate market analysis paper called "To Airbnb? A Question of Returns".

Jason Thompson released new maps and data on locations for car vs cyclist crashes across Melbourne and Victoria. This work was conducted by members of the University of Melbourne's Transport, Health and Urban Design (THUD) Research Hub. The data these maps are built on comes from all crashes recorded by VicRoads that have occurred between January 2010 and early February 2019.

Michele Acuto has coauthored 'Leading Cities: A Global Review of City Leadership', recently published by UCL Press in open access. Drawing on research into 202 cities in 100 countries, the book provides a broad, international evidence base grounded in the experiences of all types of cities. Michele and his fellow authors focus on three elements of city leadership: leaders, the structures and institutions that underpin them, and the tools used to drive change.

In March, **Ross King**, Faculty Dean from 1995 to 2002, was appointed as Emeritus Professor. The current focus of his research is the question of contested identities in the cities of Asia and the roles of urban planning, urban design and architecture in such contestations. His work is in large measure building on experiences as a frequent visitor to East and Southeast Asia.

Janet Stanley's co-authored a research paper through the Melbourne Sustainable Society Institute (MSSI) looking at issues surrounding Melbourne's rapid urban sprawl and the lack of infrastructure investment to support the exponential growth. Titled 'Melbourne: How big, how fast and at what cost?', the research was given coverage by *The Age* and syndicated nationally.

Heather Mitcheltree and Mitchell Ransome presented to representatives from the United Nations on the potential of large scale 3D scanning for urban heritage documentation within conflict zones, and for use in training for peace keeping operations.

RECENT EVENTS

BE—150 Program Launch

The BE—150 program was officially launched in March by Professor Julie Willis and University of Melbourne Vice-Chancellor Duncan Maskell. Held amongst the 'Smoke and Mirrors' studio exhibition in the University's Dulux Gallery, the BE—150 program celebrates 150 years of built environment education at the University of Melbourne. The BE—150 program includes an exciting mix of events, activations and exhibitions programmed across 2019, ranging from alumni and industry panels, keynote lectures, competitions, a hackathon and alumni reunions, culminating in both a gala and celebration of the first graduating cohort of the Bachelor of Design. The program is designed to engage both young and old, those connected to the Faculty through scholarship and industry, as well as to a broader audience who are simply curious about the impact of the built environment on both our past and future.

WaterLore: Learning From the Drylands Exhibition

Curated by landscape architects Gini Lee & Antonia Besa, the WaterLore exhibition presented an intensive deep mapping project as a medium for shared knowledge, novel systems and sustainable ecologies for arid regions, aimed at benefiting urban communities facing drying Anthropocene conditions. Based on interdisciplinary secondary research together with field work and site explorations, the exhibition displayed a large-scale water map of dryland Australian landscapes, specifically two major Australian river systems, the regulated Murray Darling and the unregulated Cooper Creek. The curators looked to identify 'hotspots' where critical conditions overlap, with these 'hotspots' provoking discourse on future cultural water strategy and possible design projects for communities and landscapes.

BE—150 Dean's Lecture – Beatriz Colomina: X-Ray Architecture

The inaugural BE—150 Dean's Lecture brought world-leading architectural historian, theorist, researcher, curator and author Beatriz Colomina into the Faculty's built environments community. She challenges the normal understanding of modern architecture by proposing that it was shaped by the dominant medical obsession of its time: tuberculosis and its primary diagnostic tool, the X-ray. In her lecture Beatriz suggested that if we want to talk about the state of architecture today, we should look to the dominant obsessions with illness and the latest techniques of imaging the body—and ask what effects they have on the way we conceive architecture.

Adrian Lahoud: Rights of Future Generations

Special guest Adrian Lahoud, Dean of the School of Architecture at the Royal College of Art London, visited the Faculty to present a lecture focusing on climate change. In his lecture titled 'Rights of Future Generations', Lahoud argues that climate change is the consequence of societies that have learned to apprehend the world as nothing more than a resource to be exploited. Lahoud questioned how inheritance, legacy, and the state of the environment are passed from one generation to the next, how present decisions have long-term intergenerational consequences, and how other expressions of co-existence, including indigenous ones, might challenge dominant Western perspectives.

Book Launch: Architecture and the Modern Hospital

In April, Julie Willis, Philip Goad and University of Sydney's Cameron Logan officially launched their recently published book titled Architecture and the Modern Hospital. The launch included a panel presentation by the authors, where they discussed how the rise of modern architecture in the twentieth century is inextricably bound to ideas of health, welfare and social progress. The new "modern architecture, with its clean lines, functional approach and emphasis on the health-giving properties of sunlight and fresh air, aligned closely with changing medical practices and treatments of the time. Soon, modernist architecture would find its apotheosis in the design of the modern hospital.

ATRIUM IS GOING DIGITAL!

In the interests of sustainability the Faculty will be moving Atrium to a digital-only publication from edition 38, 2020. To continue to receive regular news and event invitations please update your email address at **alumni.unimelb.edu.au/alumni.**

Read past current and editions of Atrium here: **msd.unimelb.edu.au/atrium**

Image: Waterlore, Learning from the Drylands, exhibition. Photograph: James Rafferty.

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Image: Smoke and Mirrors exhibition – 'The Burrow' by Andrew Rahman, Zoe Jo Bratcher, Alison Hammer, Wei Lyn Song, Edwin Jupp
Photograph: Jannette Le

36 | 2019

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