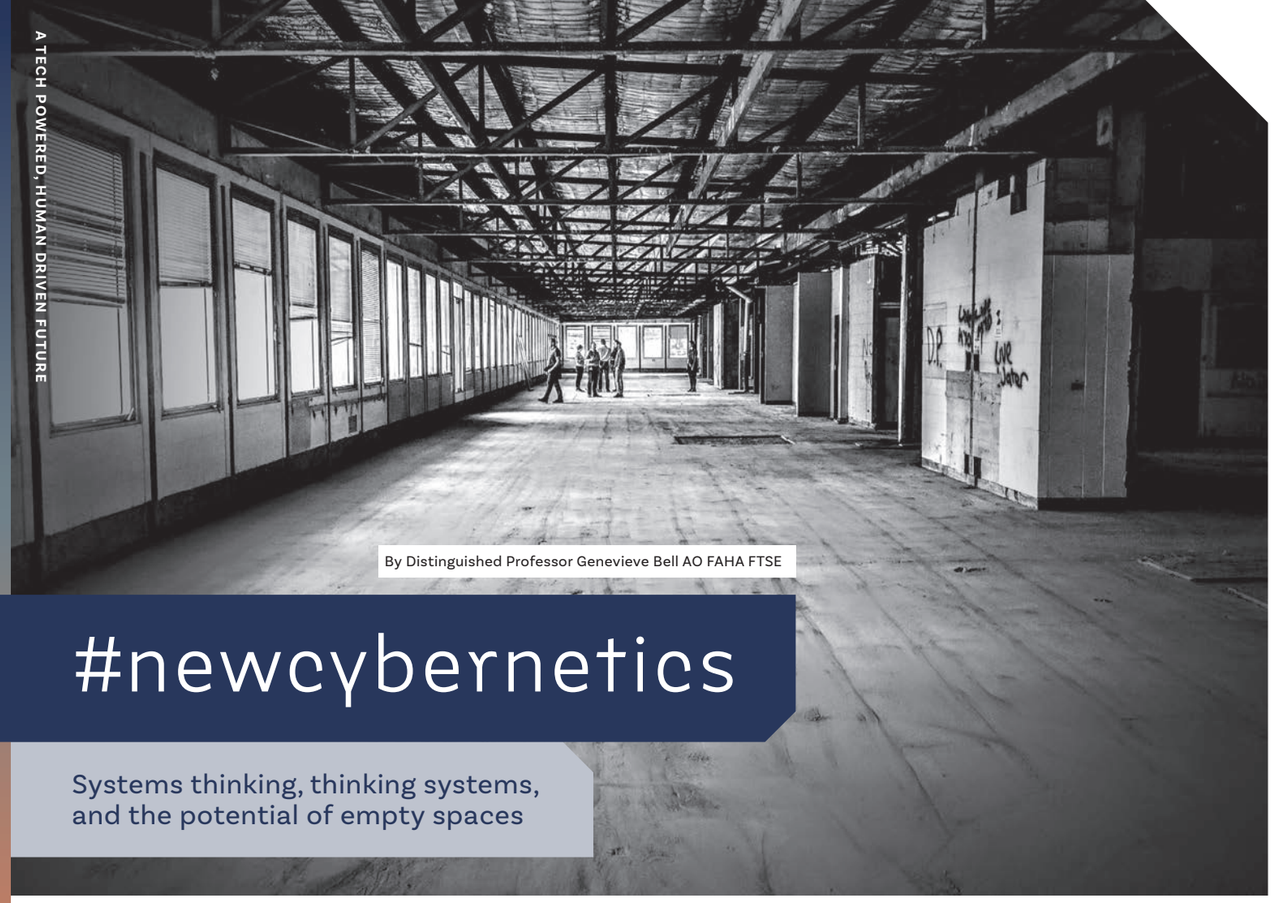

By Distinguished Professor Genevieve Bell AO FAHA FTSE

#newcybernetics

Systems thinking, thinking systems, and the potential of empty spaces

Birch Building, The Australian National University April 2019

Distinguished Professor Genevieve Bell
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Genevieve Bell is a renowned anthropologist, technologist, and futurist. Genevieve completed her PhD in cultural anthropology at Stanford University in 1998 and is best known for her work at the intersection of cultural practice and technology development. She is currently the Director of the School of Cybernetics at the Australian National University and a Vice President and Senior Fellow at Intel.

It was big. Really big. That's what I thought to myself.

If you're old enough, you can't think those words without hearing Douglas Adams intoning that 'space is big, really big. You just won't believe how vastly hugely mind-bogglingly big it is. I mean, you may think it's a long way down the road to the chemist, but that's just peanuts to space.'

In this case, it was a building that boggled my mind. In April 2019, I found myself on the third floor of Birch — the old chemistry building at The Australian National University (ANU). It was nearly 3500 square metres of space in a neglected mid-century pebblecrete gem with zany heritage portal windows and a travertine floating staircase.

There was dust and debris and broken venetian blinds. The ceiling had been torn out leaving behind exposed metal struts and silver insulation. Holes in the concrete floor and walls were covered with makeshift timber partitions and spray-painted signs screamed 'CAUTION' in dripping black letters.

And yet despite all that, it was beautiful — full of light, and space and possibility. Full of prospect, for this new space was to be our new home. Of course, before that could happen, we had to decide on the renovations, and where to put the walls, and bathrooms, and kitchens and offices.

We had to work out how to fill this space — this big, really big space.

A NEW BRANCH OF ENGINEERING

It seemed ambitious, but ambition has characterised much of what we had done together in the years leading up to that moment.

We had gotten started back in September 2017, when we created the Autonomy, Agency, and Assurance Innovation Institute (3Ai) to establish a new branch of engineering to take artificial intelligence safely, responsibly, and sustainably to scale.

We started with artificial intelligence because we believed it was not a technology per se. It was, in fact, part of a system, and we knew that system needed a different kind of conversation. So, we set about to create that conversation: one with a multitude of moving parts and potentially global implications. Ambitious certainly, possible crazy, but important.

By necessity, we were aggressively iterative and interdisciplinary. We built on existing core strengths in computer science and engineering, as well a novel blend of design ethnography, critical studies of science and technology, philosophy, and business strategy.

We brought together researchers and practitioners from across the higher education sector, as well as the public sector and private industry. Within the first year, we had a staff of ten. By the time we were standing in Birch, we also had our first cohort of Masters students, and we were experimenting with short courses.

We had early partnerships with Macquarie, Microsoft, KPMG and CSIRO's Data61. And we were growing — we had plans for more students, more courses, more staff, more collaborations. Enough perhaps to fill that space, if we pushed hard.

We had no idea, standing there, our voices echoing the length of the building, that our plans would be impacted by a global pandemic, a country-wide COVID-19 lockdown, an economic shock to the higher education sector, and a complete restructuring of the College of Engineering and Computer Science.

By the time we moved into the Birch building in July 2021, with its now white walls, and timber panelling and huge light spaces, classrooms and corridors, our world was very different than the one we had imagined.

WHAT IS CYBERNETICS?

In January of 2021, we had taken a leap of faith and paperwork, and 3Ai became the heart of the School of Cybernetics — the first new school at the ANU in decades.

Now for some of you, I suspect, cybernetics is but a faintly familiar thing; this thing you think you know but can't quite place. It is a familiar stranger, or an echo of an earlier conversation, or at the moment, the field of Professorship of the father of the President of Ukraine.

But really, for me, it starts, in the aftermath of World War II. Thinkers around the world discussed what to do with all that computing power and data; and about what this would mean for how the world could — and should — be. Cybernetics offered one way through.

Cybernetics, as articulated in 1940s America, was a framework for managing the introduction of computers into existing machinery and practices.

It was a systems view that privileged the relationship between the pieces and the whole; that required an understanding of feedback and feedback loops; and that insisted that the system was always and already composed of human, technical and ecological components.

For me, one of the abiding lessons from the last two years has been about the importance of such systems — complex dynamic systems that bring together technology, culture, and ecology.

Indeed, when what was sometimes most clear was the fragility of local and global systems, it was hard to resist the appeal of cybernetics as a way to make sense of these systems and re/build them anew (see 2021 Garran Oration).

A WORLD OF SYSTEMS

I have an affinity for systems; my friends joke about it all the time. I see them everywhere I go.

As a child I grew up surrounded with stories of systems — the human systems that unfolded as my mother studied anthropology at Monash University in the 1970s.

Those systems of kinship and social organisation were circles and triangles and lines on blackboards. Those systems organised, in the most abstract sense, marriage and inheritance as building blocks for human societies.

As a five-year-old I knew none of those things. I just knew that the triangles and circles and lines made patterns. And I knew those patterns — or at least I recognise the outline of their magic. I suspect this was no comfort to the adults who shared my mother's learning experience when the five-year-old could intuit what made matrilateral cross-cousin marriage work and they could not!

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A TECH POWERED, HUMAN DRIVEN FUTURE

IMPACT 2022
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I also grew up with stories of technical systems. My father did, on one memorable occasion, let me help him dismantle and reassemble a diesel-powered vintage engine. It was all metal pieces. Some blackened with age and grease, others with chipped red and green enamel paints, and bolts that held it all together.

The sound it made as everything moved: that was the pattern, the magic.

Standing here in 2022, it is easy for me to see a world of systems and their interdependencies, fragilities, and breakpoints. In pondering the world that we are building and the world that we must inevitably inhabit, seeing systems is both a blessing and sometimes a curse.

The curse is that not everyone sees the systems, and not everyone wants them to change. The blessing is that it helps, for me at least, prompt action — systems are things we can build, things we can shape, things we can change, and systems are something for which we can prepare others, and for which we can train others to engage with — critically, carefully, and thoughtfully.

It takes many voices. As I always tell anyone who will listen, the seduction of the hero's journey story — the Joseph Campbell archetype of a lone inventor battling a cruel and complicated world only to emerge victorious — is immensely powerful in the annals of technological innovation.

Stairwell Birch Building February 2022

IT'S ALSO JUST WRONG.

With surprisingly few exceptions, our key inventions, especially those in the digital realm, were not solo gigs. They arose out of the complex interplay of ideas, personalities, corporate cultures, university politics and late-night conversations and disagreements.

(Walter Isaacs' book The Innovators does a splendid job of unpacking and unpicking the lone inventor mythos in Silicon Valley; it is worth a read just for that thread alone.)

The School of Cybernetics has been no exception. Our priority is growing a community of remarkable humans who share a belief that we can and should actively build a better future. Our journey has been a collective, collaborative and occasionally conflict-filled one — and we've made amazing things because of that productive discomfort.

We have a cohort-based Masters (2019-), a cohort-PhD program (2020-) and a suite of micro-learning activities (2019-). To date, we have had four vibrant and robust cohorts of students with a diversity of academic and cultural backgrounds, professional experiences, age range, life stages, gender, and sexuality.

Our track record of having 50 per cent female students is striking in engineering and computer science. We lay claim to graduating the first Indigenous Masters students in the history of the College — the first to be sure, and we sincerely hope not the last.

Our micro-learning activities have seen us engaged with industry and government leaders, as well as local community organisations, and we have continued to partner with Microsoft, KPMG, and others to help provide access to our experimental curriculum and pedagogy.

We knew we could, and should, equip people with the capacity to see the full dimensions of systems and have the tools with which to engage in designing, building, regulating, securing, resisting and even decommissioning systems.

That said, there is probably a rulebook somewhere that says you should not start a new School in the middle of a pandemic. We did it anyway, together.

And, as we keep telling our students, it's never about the technology per se, it's about the people, the stories we tell, and the places we tell them. It is about the worlds we want to make in the future, and the things we need to do today to make that possible.

As humanity faces down monumental systemic challenges, it's worth remembering that it's never the wrong time to invest in building new ideas and new kinds of thinkers and doers. And finding ways to occupy big — really big — spaces!

MORE

Podcast
Interested in how systems inform innovation, from the kitchen to stars? Listen to our podcast of Genevieve Bell's ATSE keynote address:

atse.org.au/190613

A TECH POWERED, HUMAN DRIVEN FUTURE