Creativity, the arts and innovation

Dr Terry Cutler

A Currency House Conversation

Sydney Opera House, 19th August 2008

As the current Review into the National Innovation System nears its end, and we are busy finalising our report, it is not a bad moment to take this brief time out to reflect on the role of creativity in the innovation process. I shall, of course, try very hard to keep you guessing as to what the Report might actually say.

Let me begin with not one but two texts to start the discussion. The first comes from our Prime Minister's closing address to last April's 2020 Summit:

> "*This false divide between the arts and science, between the arts and industry, between the arts and the economy: we've actually got to put that to bed. As if creativity is somehow this thing which only applies to the arts, and innovation is this thing over here which applies uniquely to the sciences, or technology, or to design. This is actually again a false dichotomy: it's just not like that.*
>
> "*Our ambition should be to create and to foster a creative imaginative Australia because so much of the economy of the twenty-first century is going to require that central faculty.*"

I owe my second text to a conversation with theatre director Peter Sellars during his troubled time at the Adelaide Festival in 2002. He commented that the arts provide "windows into realities under construction", and that phase has stayed with me and encapsulates much of what I would want to say, less elegantly, today.

There are four main points I want to highlight. The first follows from the Prime Minister's remarks, and this is the challenge with the balkanisation of innovation, and how the various players operate too much in disconnected ghettos. We need to tear down the fences around innovation's gated communities and build stronger linkages and platforms for collaboration.

My second message is about the role of the imagination in innovation, and how this imaginative *solution-seeking* role needs to complement the role of analytic problem solving. The imagination in the innovation process helps us to envision alternative futures.

Third, I will remind us of the growing role and importance of the creative economy across diverse industry sectors.

Finally, I want to emphasise the need for innovation policy to acknowledge and actively incorporate the role of the creative and liberal arts.

1. The challenge from the balkanisation of innovation

The Innovation Review received seven hundred and forty formal submissions, as well as many, many informal representations. (We received some thoughtful submissions from the arts sector, though not perhaps as many as one might have hoped for). To gain a helicopter view of so many submissions from so many different quarters we put them through some advanced semantic analysis software. What this confirmed was that we do not have a national innovation system; we have *many* systems, most of which are largely disconnected from each other. Industry, governments, artists, and researchers all have very particular agendas and priority concerns. It would appear we are all pulling in different directions, with not much in the centre holding the strands together. As a member of our team quipped, our innovation system is like a donut because there is a hole in the centre.

This is, of course, Adam Smith's curse of specialisation and the inherent bureaucratic tendency toward self-contained silos of activity and practice. Such gated communities of practice are the enemy of innovation, which thrives at the intersections *between* known bodies of knowledge and insight, and is about making new connections. New knowledge, however, is accumulating faster than our ability to digest it. A fairly recent book described Thomas Young (1773 – 1829) as "*the last man who knew everything*", and Young certainly demonstrated his credentials as a polymath by advancing Newtonian physics, studying optics and disease, and deciphering the Rosetta Stone. He was, indeed, one of the last Renaissance men[1].

The other unfortunate example of balkanisation is the marginalisation of cultural agencies such as libraries, museums and galleries within the innovation agenda. Housed within the silos of Arts ministries, many of these agencies perform and support crucial knowledge accumulation, knowledge preservation and research functions, especially in performing the role of building and maintaining collections of significant scientific and cultural record, and providing information repositories and resources. Regrettably the role of cultural agencies in research and innovation is seldom an explicit part of their mandate, and the important public goods of which they have custody are often underfunded. Formerly many of these institutions also played important roles as incubators of innovative talent, although this role has sadly diminished in the case of some, like the ABC.

The challenge today is how to get closer and more productive linkages and collaborations across the innovation system. This is the core role of the entrepreneur as the key organiser within the innovation system. It is worth noting that we had to import the term *entrepreneur* into the English lexicon from the French, although the Italian-derived *impresario* was originally used synonymously. The analogy of the impresario or entertainment producer energetically 'bringing the show together' exactly fits the description of the modern entrepreneur. And, as in showbiz, we remember the successful show or film and perhaps even recall the director and the cast members, but seldom the producer behind the scenes who made it all happen. The entrepreneur is the change agent behind innovation.

---

[1] Andrew Robinson, *The last man who knew everything*, Pi Press, NY, 2006

2. The role of the imagination in innovation

The challenge in studying change or innovation is that both exhibit all the characteristics of a *'wicked problem[2]'*. Horst Rittel first talked about wicked problems in 1973[3]. He described them as problems where the solution spawns new problems, not black and white answers. The characteristics of wicked problems have been subsequently defined by Jeffrey Conklin[4] in the following terms:

> *You don't understand the problem until you have developed a solution*

> *Wicked problems have no stopping rule*

> *Solutions to wicked problems are not right or wrong, simply better, worse, good enough, or not good enough*

> *Every wicked problem is essentially unique and novel*

> *Every solution to a wicked problem is a "one-shot operation."*

> *Wicked problems have no given alternative solutions*

Some of the great innovation challenges of our day are wicked problems: climate change, water, sustainable land and ocean management, urban congestion, population health, or food security. All six characteristics of wicked problems thwart tidy research and innovation funding processes which are more oriented to that other class of problem identified first by Rittel as *benign problems*, and later described by Conklin as *tame problems. A tame problem* also has six defining characteristics:

> *Has a well-defined and stable problem statement*

> *Has a definite stopping point, i.e. when the solution is reached*

> *Has a solution which can be objectively evaluated as right or wrong*

> *Belongs to a class of similar problems which are all solved in the same similar way*

> *Has solutions which can be easily tried and abandoned*

> *Comes with a limited set of alternative solutions.*

It all sounds very much like Karl Popper's account of scientific method, revolving around falsibility. It is hard to formulate a null hypothesis around a wicked problem.

One of the international advisers to the Review, Richard Lester from MIT, makes a strong point about the different modes of innovation associated with analytical problem solving, the focus of much of the work in applied science and technology, and what he terms the interpretative or *solution seeking* processes around wicked

---

[2] This outline draws on the helpful discussion in the submission to the Review from RMIT University's Spatial Information Architecture Laboratory (SIAL), and discussions with its Professor Mark Burry.
[3] H. Rittel and M. Webber, "Dilemmas in a General Theory of Planning", *Policy Sciences*, Vol. 4, 1973.
[4] J. Conklin, "Wicked Problems and Social Complexity" , CogNexus Institute, 2001. Online at
http://cognexus.org/wpf/wickedproblems.pdf .

problems. These interpretative processes are most useful when the possible outcomes are unknown and the task is to create them and understand their properties. This is where we need to call on the creative imagination.

Now I believe one of the core functions of the arts is to help us envision alternative outcomes and to enable us to put ourselves in the shoes of others. The remarkable aboriginal artist Sally Gabori from Bentinck Island in the Gulf of Carpentaria explains how her people can see things that we cannot: "we have many eyes", she says. "Many eyes" is a prescient way to describe the creative imagination.

Neuroscientists tell us that the brain functions through pattern recognition – we search for ways to connect the dots. What the expressive arts do is to help us explore new connections, to perceive new patterns. This is where pure science, innovation and the arts converge: each is concerned with the endeavour of making sense of apparently random phenomena, to explain why things are as they are or could be. Applied science, on the other hand, is driven by finding a particular solution to an identified problem. Problem solving and problem definition are very different activities.

Great artists allow us to explore, experiment, and experience novel ways of looking at the human experience, in a low risk setting. The writer, the painter, or the performer shoulders the risk on our behalf. And where the artist succeeds, we learn or take courage vicariously. Our appetites are whetted, or our ambition extended.

In the harsh language of innovation and research, we talk a lot now about rapid prototyping. Modelling, simulation and prototyping are the ways we test and experiment with solutions. And this is precisely what the arts do, and develop tools for. Computer game engines and popular social networking architectures like Facebook are now adapted for very serious purposes.

So the creative arts provide 'safe places' for vicarious experimentation and risk taking. They help us, they challenge us, to think outside the box. But this means that our creative artists and thinkers must themselves take risks, and we need to support them in that risk-taking. I believe that, in the arts as in science, if we do not build in an allowance for, and an expectation of, a certain level of failure then we will soon end up with a very tepid culture around innovation. Scientists have been trained to believe that the null hypothesis advances knowledge as much as the proof. The important thing is that we learn from failure and experimentation.

3. The Craft of innovation – embedded practice (and learning by doing)

The other great cultural divide is between the realm of the conceptual, the intellectual, and the artisan and craftsman. The role of crafts and trades in innovation has been massively neglected, particularly in the important areas of continuing incremental innovation in the workplace, whether that be a workshop, a factory floor, office, or farmyard. We know that often major breakthroughs come from seemingly little ideas or insights arising from hands-on engagement, and from learning by doing. The classic exemplar here is Joseph von Fraunhofer (1787 –1826), after whom the famous German Fraunhofer research Institutes are named. Fraunhofer made European breakthroughs in optical science but his insights and

capabilities were based on his personal skill as a glassmaker[5]. Fraunhofer was an artisan first and foremost. We tend to forget that much of the scientific progress since the Renaissance has depended on the innovative development of new tools and instrumentation. Craft is important to innovation.

Film and TV, architecture and design are all examples of such embedded practice[6] linking the artist and the artisan, and each area is trans-disciplinary in terms of the technical and creative skills that need to be marshalled within collaborative teams for collective creativity. There is an increasing need for multi-disciplinary practice and collaboration in virtually all areas, and we need to learn how to do it better.

4. The role of the creative industries

The creative industries are the epitome and at the leading edge of the service industries which now dominate advanced economies. Think design, creative content, or communications. It is significant that we now have an ARC Centre of Excellence in the Creative Industries and Innovation, and the government is committed to establishing a Creative Industries Innovation Centre as part of its Enterprise Connect network. The creative industries, which feed off the creative and liberal arts, are important for four reasons:

1. They create cultural value and public goods

2. They are major growth industries, globally

3. They drive economy-wide growth and value-creation

4. They represent a crucial infrastructure or platform for the whole innovation system (similar to our science and education infrastructure and capabilities).

The creative industries also provide many of the platforms for next generation methodologies for science and technology. What we talk about as the new eResearch cyber-infrastructure for research and innovation is in fact, a digital content architecture and management system[7].

Over time, four different perspectives on the creative industries have emerged (and these are also related to different economic models and different policy frameworks for innovation). Each is important; these perspectives are cumulative in effect and they are mutually reinforcing[8].

1. **A welfare model** of the subsidy for cultural goods – this model emphasises the non-market value of activities.

2. **The competition model** - "just like any other industry" industry policy. This model tends to focus on mature parts of the industry like film, TV and publishing, and highlights industry share of GDP and growth rates (about

---

[5] Myles Jackson, *Spectrum of Belief: Joseph von Fraunhofer and the Craft of Precision Optics*, MIT Press, 2000
[6] Interestingly, each was part of the Australia Council for the Arts' original brief.
[7] See, for example, the work of Science Commons.
[8] I am indebted to Stuart Cunningham and Jason Potts of the ARC Centre for the Creative Industries and Innovation for these insights. See Jason Potts and Stuart Cunningham, "Four models of the creative industries", *International Journal of Cultural Policy*, Vol. 14, no. 2, August 2008

twice the norm), and has prompted the development of new industry development strategies.

3. **The growth model** - creative industries become drivers of growth across the economy. This model emphasises their crucial input to other areas of economy ("the creative industries are the new concrete") and highlights the role of design, for example, in competitiveness and productivity. This model is the thought behind the talk about a 'creative economy'. Recent English data backs this up: it shows that innovation performance is strongest for those industries with the highest spending on creative industry products as a percentage of their output.

4. **The innovation model** – the creative industries emerge as an enabling platform for national innovation. The insight from this model is that the creative industries originate and coordinate change in the knowledge base of the economy (equivalent to the role of science and technology in innovation). These industries perform a special function in that they embed and acculturate the socio-economic change arising from innovation. From this perspective the role and importance of the creative industries is that *they convert human and creative capital into social capital* (and social networks) which then translate into productivity growth.

5. Recognising our underinvestment in creative innovation

If we believe this narrative about the importance of creativity and the creative industries, then we should be prompted to question whether we are investing in them in proportion to their potential benefit. If the creative arts and industries are important, then how might we look to strengthen their contribution? My personal view – and I stress it is no more than my personal view – is that there are at least four areas requiring greater attention. These involve:

1. Promotion of better linkages between the creative and liberal arts and science and technology through ensuring that government programmes tap into a wider base. Eligibility for claims on contestable funding or collaborative projects should be based on merit and excellence, not institutional status;

2. A greater emphasis on arts education in schools, alongside the need for an increased emphasis on science. We have talked about this for years, researched the impact of a creative curriculum on skills development, but have done little about it;

3. Increased recognition of the distinctive training needs within the creative arts, renewed funding models, and more open public access to the facilities and collections of important cultural institutions; and

4. Greater support for institutions as incubators of talent, and explicit acknowledgement of the role of cultural agencies in innovation and research.

6. In summary

In summary, I want to suggest that the creative and liberal arts are important to us because:

1. **They stimulate and open up our thinking**. The arts serve and advance innovation by challenging and destabilising existing understandings. One of the challenges in innovation, whether in companies or government, is strategic vision and adaptation: how do we keep ourselves open to signals of change and groundshifts in our operating environment, and respond in an appropriate and timely manner. Conventional wisdom is the enemy of innovation, and we need to value players within the innovation system whose role is to destabilise and challenge the *status quo*. Here the arts play a special role. William Blake reminded us - in chilling words – that the person who does not alter their opinion in the face of new knowledge is like a "stagnant pool which breeds reptiles of the mind". (Certain totalitarian States spring to mind).

2. **They underpin the crucial imaginative and interpretative function in the innovation process (**complementing the analytical mode).

3. **They provide 'safe places' for vicarious experimentation and risk taking.**

4. **The arts build social capital and create platforms for social networks. The arts embed and 'domesticate' new understandings within our culture.**

5. **Creative industries are an increasingly important part of the economy.**

Adam Smith was very concerned that his economics of the specialisation of labour would create a brutish, uncivilised population, equipped for only one thing. His remedy was a broad, public education for everyone. Two centuries later another great economist, Maynard Keynes, saw the reconstruction challenge after World War II as involving not just bricks and mortar, but also the nurturing of "a communal civilised life". To this end he proposed the establishment of an Arts Council. Two decades later Keynes' Australian counterpart, Nugget Coombs, successfully campaigned for the foundation of the Australia Council for the Arts. Today we need to rediscover why people like Keynes and Coombs saw the arts as so important to our society. Today I hope that the current spotlight on innovation will lead to a new appreciation of the role of the creative arts in innovation and prompt us to see them as a crucial and essential component of a national innovation system.

Finally, we need to celebrate the rich variety of innovator and the diversity of the inspiration to innovate. The imagination is sparked in unexpected places.

Talk about innovation can be very abstract. Perversely, however, we tend to be quite specific and stereotypic when we talk about the innovator and entrepreneur – the mad inventor in a lab coat, or the white shoed commercial hustler. Or we get people offside by implying there is a special 'creative class' of persons to whom the general population should pay due deference. Even across disciplines hackles are raised. Scientists understandably get upset when folk in the creative arts appropriate the term "creative industries". Such territoriality about highly regarded attributes is not particularly new within our gated communities of the mind.

Innovation is about change, and innovators are change makers. I believe we can identify at least seven varieties or types of change maker who, collectively, fuel innovation. Many individuals combine multiple aspects of being a change maker; others are firmly in one camp or another.

Thus teasing out the different varieties of and role models for innovation might help to restore it as a topic of conversation and importance to everyone and to every facet of civic life. It also generates useful analogies, narratives, and illuminating metaphors for each of our own particular fields of activity. So my tentative taxonomy of the varieties of the innovative experience is along the following lines:

Role Models: The seven varieties of change maker

Type	Mode	Motivation
1. EXPLORERS	discovery	curiosity
2. ARTISTS	expression	meaning
3. INVENTORS	designing solutions	problem solving
4. COLLECTORS	assembling and sorting	ordering
5. HELPERS	finding ways and means	caring
6. PRESERVERS	accumulation	valuing
7. ADVENTURERS	experience	risk taking

It is instructive to recall that Charles Darwin, for example, was first and foremost an obsessive collector, and it was this obsession with taxonomy that generated his world-changing insights about the evolution of species and living systems. Today he would probably be a Director of a museum.

In closing, I will return to the opening line from Peter Sellars. If, as Peter Sellars commented, the arts provide "windows into realities under construction", then innovation is what actually builds substance around these new possibilities and allows us to do things differently and, hopefully, better. Each of us can be a change maker and play a role in building these futures.