1. An Approach to Understanding Change

Gabriele Bammer

Change happens all the time, so why is driving particular change generally so hard? Why are the outcomes often unpredictable? Are some types of change easier to achieve than others? Are some techniques for achieving change more effective than others? How can change that is already in train be stopped or deflected?

Knowledge about change is fragmented and there is nowhere in the academic or practice worlds that provides comprehensive answers to these and other questions. Every discipline and practice area has only a partial view and there is not even a map of those different perspectives. Further, it is no one's business to pull together the range of diverse understandings. Until now, no organised area of enquiry has set itself the task of developing a comprehensive approach to change.

The purpose of this book is to begin that task by gathering a variety of viewpoints from the academic and practice worlds. Eighteen perspectives are presented here to demonstrate that developing a better understanding of change, and more effective approaches to dealing with it, requires grappling with the complexity of change. Contributors have expertise in advertising, anthropology, art, demography, economics, education, evolutionary biology, global environmental change, industrial innovation, international relations, materials conservation, media advocacy, organisational change, philosophy, politics, psychiatry, security-based intelligence and sociology. (Of course there are many more viewpoints on change that are relevant—child development, ageing, neuroscience, history, psychology, chemistry, defence, international development, to mention just a few.)

The approach used in this book is multidisciplinary. Every contributor tackled the topic of change as they saw fit. There was no attempt to start with a shared framework or a common specific aspect of change. A multidisciplinary approach allows the richness of different perspectives to be demonstrated. The challenge comes in developing syntheses from the contributions, as it is not certain what the points of intersection will be, or even if there will be any. A multidisciplinary approach is therefore most useful when it is not clear what the focus of a project should be or when fresh thinking on a topic is required.

A case study of multidisciplinary synthesis is presented as the concluding chapter to the book. It explores how research impact can be improved by better understanding change, using the perspectives in the book to provide fresh thinking. In that chapter the challenges of synthesising multidisciplinary contributions are also discussed in more detail.

The remainder of this chapter describes the process used to produce the book, particularly the criteria for choosing participants and how they were invited to interact. The organisation of the chapters is also presented, along with a summary of each.

The 'intelligent lay reader' is the target audience. You do not need specialist knowledge, but you may need to look up specific terms or allusions to particular events. Rather than try to clarify everything that may not be widely understood, the aim has been to a) add enough identifying material to make such terms easily searchable and b) make sure that important meaning is not lost if such terms are skipped over. The book is deliberately not uniformly easy to read—some of the ideas are simply harder to grapple with than others. But all the chapters are worth the effort.

How contributors were chosen

I chose the contributors using the following criteria:

- final number of around 20
- diverse range of areas, but attention to policing and security
- covering both the academic and practice worlds
- as far as possible did not know each other or at least did not know each other well
- senior
- had not participated in a similar previous project (on multidisciplinary approaches to uncertainty)
- gender balance
- resident in Australia.

Twenty is a manageable number of contributors in several respects. It allows for a diversity of perspectives and a few drop-outs do not have a major impact (there were two drop-outs in this project, leaving 18 final participants). As described below, contributors were brought together in a two-day symposium and this number gives everyone a reasonable opportunity to speak

and to interact.[1] This number provides enough material for a relatively large book. Twenty does place obvious limitations on coverage of the topic, as well as on some aspects of the mix of participants, as will be discussed below. Nevertheless there are still enough contributions to allow a synthesis to be developed.

I chose areas that were as different as possible, rather than ones that were more closely aligned. For example, while there would be valuable perspectives from each of psychology, advertising, counselling, psychiatry, life-coaching and so on, I chose only two of these (advertising and psychiatry), so that other, quite different, perspectives could also be included. Apart from the considerations about policing and security discussed next, the choices were idiosyncratic— what I thought would be relevant and of interest—rather than following some pattern.

I did boost representation from policing and security, inviting contributions from four people in that field—former Victorian police commissioner Christine Nixon, criminologist and intelligence expert Grant Wardlaw, and international relations and security expert Michael Wesley, plus one other who had to drop out. The project was conducted under the auspices of, and funded by, the Australian Research Council Centre of Excellence in Policing and Security,[2] which was keenly interested in research impact. It made sense to draw on policing and security expertise and to compare and contrast that with expertise from other areas.

The decision to cover both the academic and practice worlds—combining 'analytic approaches with street wisdom' (Ravetz 2008, xvi)—was deliberate, as I would argue that both are needed to develop a better appreciation of change. The practitioners were leaders from different walks of life, with considerable experience to contribute. Indeed, some of the participants have held positions in both the academic and practice worlds during their careers.

I tried to go beyond people I knew or even knew of in issuing the invitations. Of the 18 participants, I knew 12 personally. I only knew of one of the other six (Dee Madigan), having seen her on television. Lindell Bromham, Craig Browne, Ian MacLeod and Francesca Merlan were referrals from other people in their fields. Robyn Gillies was found from a search on the internet of the highest ranking education departments in Australian universities. Of course, several other people were approached who were not available or interested. Another determinant of setting the number of participants at 20 was practical—I simply ran out of time to keep approaching potential participants,

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1   Two of the participants were not able to attend the symposium, but still made written contributions.
2   This Centre of Excellence operated from 2007 to 2014; for more information see www.ceps.edu.au.

especially finding suitable people I did not already know. I also attempted to ensure that the participants did not know each other, or at least did not know each other well. In addition, of those I knew, none were close collaborators of mine. I had not previously worked with eight, I had worked with three others more than 20 years before, and there was only one with whom I had consistently crossed paths for a long time and we had not actually worked together.

The rationale behind this selection process was to give the project freshness and edge. The idea was to invite people who enjoyed being out of their comfort zone, but also to try to ensure that everyone had similar levels of discomfort. I did not want anyone to feel isolated, either because there were cliques of people who knew each other or because there was an overemphasis on particular approaches. Consequently, I also aimed to have clusters of different kinds of participants. This involved ensuring not just that there was a cluster of practitioners, but also that there were academic clusters from science, the social sciences, and humanities and the arts. I wanted coverage of not only policing and security, but also clusters interested in the environment and in health. The clusters are described in Table 1. Finally, exclusion of participants from an earlier and similar project on uncertainty (Bammer and Smithson 2008; Bammer and the Goolabri group 2007) was primarily about ensuring similar levels of discomfort by avoiding the inclusion of participants who had a better idea of what to expect.

A key ingredient, given this mix of participants, was that everyone was senior and expert in their area. This was the foundation for building trust in the group. Trust is often dependent on the fact that participants know each other and have previously worked together successfully, but I had engineered this out as far as possible, so another basis for trust was needed. The process which is described below was designed to allow participants to rapidly figure out that they were in a group who 'knew their stuff' and that they could rely on each other's expertise, even though they could not necessarily judge it themselves. Choosing people who were senior was not just about their higher levels of expertise, but also because they were less likely to feel they were in competition with other participants. Those who are still establishing their careers often feel they have to prove themselves against the others in a project and this can block their ability to take a genuine interest in what the others have to contribute.

I aimed for gender balance in the group, but not for cultural diversity. Indeed I opted for homogeneity, concentrating on Western culture. This is not to denigrate the contributions of other cultures to understanding change. On the contrary, in the larger scheme of more comprehensively understanding change, inclusion of a wide range of cultural perspectives is essential. But in this initial project, and with a group size of around 20, I was wary of tokenism and of isolating those asked to represent a particular cultural viewpoint.

Restricting participation to those resident in Australia was partly about the expense of including international participants and partly about avoiding the dynamics that the inclusion of international participants often sets up, especially when there is only a small number in the group. One dynamic is that the international participants can dominate discussion, especially if they are from more powerful countries. A contrasting dynamic comes when participants are from less powerful countries; in such cases they are often marginalised. A final reason was that we had plenty of talented people close at hand.

How the book was developed

Invitees were asked to write a paper on 'how [their discipline or practice area] thinks about change', with the intention that these papers would become book chapters.[3] They were asked to be descriptive and to communicate what is known (rather than write a speculative essay). Those writing perspectives from particular disciplines were invited to cover one or more of the particular ways their discipline thinks about and deals with change. Those contributing practice perspectives were encouraged to reflect on lessons from their experience in bringing about and/or dealing with change. The boundaries between these two types of contributions were not sharply drawn. For many of the practitioners, I had to reinforce the message that they were invited to write a chapter based on their experience, not an academic paper.[4]

While these were the terms in which the invitations were couched, the intent was to encourage a group of smart senior people to write chapters on aspects of change that they had direct experience with—either as the focus of their academic work, or in the practice of their employment, or both—and to see what that uncovered.

The second part of the invitation was to discuss each other's contributions at a two-day symposium. Instead of presenting their own work, everyone was assigned two chapters and was asked to describe them to the whole group, as well as to comment on them in light of their own chapter. I aimed to apportion the chapters so that at least one was likely to be outside the reader's comfort zone and the allocations are shown in Table 1.[5] One stated objective of this exercise was that it would allow each author to see how well two 'intelligent lay people'

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3   The chapters were given more evocative titles after they were submitted and edited.
4   My basic message was 'If I had wanted an academic paper, I would have asked an academic'.
5   Four participants had not submitted their chapters at the time assignments were allocated. Three of these late chapters were divided among the four authors for comments. The fourth chapter was not produced before the symposium and the perspective was presented at the symposium. Because this chapter was not available to comment on, two of the late chapters received three sets of comments. Francesca Merlan and Dee Madigan

had understood their contributions, which could guide any post-symposium revisions. The process also aimed to be an efficient way of sharing the information produced, getting everyone up to speed and initiating engagement between the participants. By and large, participants summarised the gist of each other's chapters very well. With the author in the room, questions could be answered, misperceptions clarified and missed points added—but mostly this was not necessary.

The symposium was structured to ensure everyone had the same amount of time to present their two assigned chapters and enough time and flexibility was also provided to allow free-ranging discussion after each report, including giving right of reply to the authors when their work was presented. The proceedings were audio-recorded and transcribed. After the symposium, participants were given a copy of the transcript relevant to their chapter and the opportunity to revise the chapter.

Table 1 Participants and their topics, the clusters they represented and their assigned chapters.

Participant	Topic (and clusters)	Assignment: read and presented on chapters by (see footnote 5 for more detail)
Lindell Bromham	evolutionary biology (science)	Peter McDonald (demography) and John Reid (art)
Craig Browne	sociology (social science)	Sarah Pearson (industrial innovation) and Grant Wardlaw (security-based intelligence)
Jim Butler	economics (social science, health)	Paul Griffiths (philosophy) and Mark Stafford Smith (global environmental change)
Kate Carnell	politics (practice)	Robyn Gillies (education) and Michael Wesley (international relations)
Simon Chapman	media advocacy (practice, social science, health)	Ian MacLeod (materials conservation), Grant Wardlaw (security-based intelligence) and Dee Madigan (advertising)
Robyn Gillies	education (social science)	Christine Nixon (organisational change) and Francesca Merlan (anthropology)
Paul Griffiths	philosophy (humanities and the arts)	Mark Stafford Smith (global environmental change) and Beverley Raphael (psychiatry)

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were not able to attend the symposium. Francesca produced comments on her assigned chapters, which I presented. Dee opted not to comment on other chapters, but welcomed comments on hers. Two participants were therefore assigned her chapter as a third paper to read.

Participant	Topic (and clusters)	Assignment: read and presented on chapters by (see footnote 5 for more detail)
Ian MacLeod	materials conservation (practice, science)	Robyn Gillies (education), Kate Carnell (politics) and Dee Madigan (advertising)
Dee Madigan	advertising (practice)	n/a
Peter McDonald	demography (social science)	Lindell Bromham (evolutionary biology) and John Reid (art)
Francesca Merlan	anthropology (social science)	Lindell Bromham (evolutionary biology) and Christine Nixon (organisational change)
Christine Nixon	organisational change (practice, policing and security)	Simon Chapman (media advocacy) and Peter McDonald (demography)
Sarah Pearson	industrial innovation (practice)	Craig Browne (sociology) and Ian MacLeod (materials conservation)
Beverley Raphael	psychiatry (science, practice, health)	Mark Stafford Smith (global environmental change) and Paul Griffiths (philosophy)
John Reid	art (humanities and the arts, environment)	Sarah Pearson (industrial innovation) and Michael Wesley (international relations)
Mark Stafford Smith	global environmental change (science, environment)	Paul Griffiths (philosophy) and Beverley Raphael (psychiatry)
Grant Wardlaw	security-based intelligence (social science, practice, policing and security)	Simon Chapman (media advocacy) and Francesca Merlan (anthropology)
Michael Wesley	international relations (social science, practice, policing and security)	Craig Browne (sociology) and Kate Carnell (politics)

How the book is organised

Six chapters describe how academic disciplines think about change (those by Bromham, Browne, Butler, McDonald, Merlan, Wesley). Two are based on the author's experiences in bringing about change (those by Carnell, Nixon). The 10 remaining chapters (those by Chapman, Gillies, Griffiths, Madigan, MacLeod, Pearson, Raphael, Reid, Stafford Smith, Wardlaw) take a more eclectic approach—some describe the author's activities in making change happen but also add an appraisal of the field or results from a research study, some focus on a particular topic in their field, some describe several topics in their field. The strong point of the chapters is their diversity, hence rather than grouping them into the three categories, discipline-based, practice-based and eclectic chapters are mixed but follow a loose narrative thread.

The opening chapter is by former Chief Minister of the Australian Capital Territory Kate Carnell, and describes her key learnings about change during her years in politics. Although making improvements is a prime motivation for people to enter politics, it is sobering to experience how hard this is. Among the challenges of making change happen in government, she discusses managing risk averseness by public servants and others, the art of negotiation and compromise, and key ingredients for some of her major policy successes, concluding with how the accumulation of policy failures, even when they are greatly outnumbered by successes, leads to change fatigue.

The next two chapters discuss change focusing on two of the most critical challenges faced by societies and the politicians who lead them: respectively, global environmental change and war.

Scientist Mark Stafford Smith offers fresh thinking on responding to key environmental challenges, particularly global climate change, which is uniquely characterised by certainty about the long-term direction of change coupled with uncertainty about the detail, much of which comes from not knowing what actions humanity will take. He works through difficulties for individuals and organisations in understanding and responding effectively, highlighting the value of 'requisite complexity'—using cheaper simple actions when these are sufficient, and more expensive complex approaches only when they are essential. Importantly, he suggests that considering climate change in the day-to-day decisions of policymakers and other societal actors, where relevant, can provide a way through the paralysis that can come from confronting this issue.

War between nation states, and how explanations by the discipline of international relations are influenced by ideas about change, provides the focus for the chapter by scholar and practitioner Michael Wesley. He describes three competing schools of thought, each of which has considerable evidence to support it and none of which is easy to discredit. Teleology provides an optimistic view, seeing the world on a solid trajectory to becoming more peaceful, based on the power of rational thought and behaviour. Cyclicality argues that the constant pressures for change on internal and external state relationships result in a perpetual cycle alternating between relative peace and widespread war. Episodism focuses on the complexity and unpredictability of changes in relationships between nation states, as well as conditions that result in inertia and inability to respond flexibly when new conditions for war arise.

The next chapter describes the broader perspective of one of the disciplines that international relations draws on, namely sociology, where change is a central consideration. Sociologist Craig Browne provides a masterful overview of major themes and debates about change in the discipline, both historical and current. Just two are considered here. First is the 'double character' of society

as made up of the actions of individuals and the extent to which individual actions are constrained by what society 'allows'. Different ways of approaching this relationship between 'social action' and 'social structure' characterise many of the major streams of sociology. This interaction also explains significant differences in the ability of various groups within society to control and modify their lives and also the difficulties of making change happen. Second is work on social movements, some of which are directly concerned with the promotion of change and others with resistance to change, especially by mobilising resources and citizen participation to challenge state power.

Another discipline, psychology, underpins the work of the advertising industry, where changing consumer behaviour is the core business. Dee Madigan draws on her own experience as an advertising 'creative' to describe some of the simple, yet powerful, messages the industry employs to exploit basic human needs, especially for security, love and belonging. She also describes techniques, especially the use of images, for circumventing rational thought, as thinking is not only ineffective in getting consumers to purchase a product, but is actually counterproductive. More sophisticated messaging and ways of manipulating the mind have developed in parallel with new media, progressing from newspapers to radio to television, to, now, the internet. The internet has also given greater power to consumers to 'talk back' and provides a potential lever to enhance corporate social responsibility. In particular, the role of corporations and the advertising industry in promoting obesity and other social harms remains a topic for lively debate.

Banning advertising of cigarettes and other forms of smoking has been an important part of the strategy for controlling availability and use of tobacco products. Simon Chapman provides insights into how the most recent advertising ban—the introduction of plain packaging—was achieved, especially the role of media advocacy. He demonstrates not only the need to exploit opportunities for change when they arise, but also how a media profile can assist in preparing fertile ground. As well as being a successful public health campaigner, Simon is a researcher and the second part of his chapter reports on a study of the use of advocacy through the media by other public health academics who are considered to be influential. Like Simon, these researchers rate the media as 'peerless' in its power to influence, and they also provide lessons on managing simplification, framing, having an opinion and being available.

The next chapter takes a different tack, presenting many of the conundrums in dealing with change. Grant Wardlaw describes the difficulties of understanding, directing and assessing change in the high-pressure, rapidly evolving world of intelligence for national security, where he has worked in both practice and academic capacities. He highlights the challenges in grasping a) what change is necessary, b) how, and how much, the intelligence world has actually changed

and c) whether change has been effective. He also demonstrates how general understandings about change management, as well as resistance to change, are complicated by the specifics of context. Although his own position is that both fundamental change and the capacity for continuous adaptation are required to address transnational threats from 'targets' who are small, constantly changing and have 'no permanent addresses', he also presents other competing views.

Continuous adaptation is a hallmark of evolutionary biology, with the inevitability of change in the genetic make-up of all living creatures and in their environments described by biologist Lindell Bromham. Her chapter begins with the 'breathtakingly simple' mechanisms of evolution: mutation, natural selection and substitution, and divergence. Knowledge of these evolutionary principles is essential for humans to begin to understand and manage our own interactions with the changing biological world. But considerable caution is required because the outcomes of evolution are often 'devilishly complex'. Using extinction as an example, Lindell demonstrates how relevant data can be interpreted in multiple ways, which are open to modification as the discipline of evolutionary biology itself changes in the face of new ideas, analyses and findings.

The discipline of demography focuses on human population change on a shorter (non-evolutionary) time scale. Demographers study life transitions ranging from the fundamentals of birth, death and migration, through to changes in, for example, occupation, disease status and area of residence. These changes are a consequence of human decisions, which in turn are shaped by what society makes possible. As researcher Peter McDonald lays out, demography is about not only how and why populations change, but also the consequences of change, especially repercussions for public policy. Regardless of whether the demographic changes are relatively stable (such as population ageing) or more fluid (such as distribution of occupations), they have many influences, including on consumer behaviour, voting patterns and preferred leisure activities. Public policy responses can be through mitigation (i.e. influencing the determinants, for example restricting migration or encouraging the use of birth control) or adaptation (i.e. dealing with the consequences, for example building more aged care facilities). However, Peter demonstrates that demographic forecasting is very inaccurate, which poses problems for developing policy responses.

Philosopher Paul Griffiths return us to the gene, but explores a different facet of change: conceptual evolution and how it assists scientific development. He illustrates his argument with two different—and concurrently used—meanings of the concept 'gene', showing how each allows valuable scientific work to progress. Indeed he posits that 'stretching and warping' constructs to fill 'epistemic niches' resulting from different scientific requirements is a functional part of the scientific process. Attempting to impose definitions and

to stifle this process is counterproductive. He goes on to posit that concepts, such as 'innate', which have entrenched vernacular meanings that conflate different scientific constructs, hamper scientific investigations by obstructing the evolution of new conceptions which could serve specific scientific purposes.

Conceptual evolution in the understanding of mental illness is one theme in psychiatrist Beverley Raphael's chapter. Over time there have been changes in the distinction between normal and pathological grief, for example. Determining when grief and other human attributes like violence, fear and forgetfulness are disorders or just part of life is an ongoing challenge. The chapter provides a broad overview of mental illness from the perspective of evolution in definition, diagnosis and prevalence, as well as models and systems of care and treatment, and describes how these are influenced by various changes in society, culture and the environment. Three other drivers of change are also highlighted: 1) scientific research, including the promise resulting from advances in neuroscience and genomics; 2) technology, which has provided access to information and treatment, as well as producing new problems of its own; and 3) the advocacy of those affected by mental illness and their carers.

In contrast to the sweeping overview of changes in mental illness and psychiatry, the chapter on education by researcher Robyn Gillies analyses contemporary changes and what they mean for Australia. She employs three ways of examining change. First, she reviews negative unintended consequences, based on the case of the widespread introduction of standardised national and international assessments. Second, she explores how negative impacts can be anticipated based on lessons from past changes. The example used is current and past curriculum changes in Australia. Third, she describes how ingredients for successful interventions can be extracted from exemplar overseas cases. Here she draws on lessons from the introduction of education reform agendas in Canada, Finland, Singapore and Hong Kong.

The analysis of changes in education is from an academic perspective. Much can also be learnt from the inside story of introducing change as a leader and manager, which is provided in the next two chapters by Christine Nixon and Ian MacLeod.

Reflecting on 40 years in policing, which was capped by reaching the highest position as Chief Commissioner, Christine Nixon distils 10 lessons. Some of these are about the proposed changes (understanding and communicating the reasons for change, understanding organisational culture, using research to know what does and does not work), some are about working with the people who will be involved in the change (setting the environment, getting to know and involving the people inside the organisation and the stakeholders outside

it, finding leverage, setting goals and accountabilities) and some are about the person leading the change (being a good manager, being resilient, as well as overcoming fear and finding courage).

Ian MacLeod, who is both a manager and a practising conservator, lives up to the double meaning of his chapter title (change management in materials conservation) by providing additional, and sometimes different, perspectives on some organisational change lessons, as well as providing insights into the preservation function of museums. As an organisational change manager, he reiterates points made in the previous two chapters about the importance of involving those affected, of using (and in his situation, conducting) research, of aligning personalities with tasks, of drawing on overseas experience, and of having courage. He also demonstrates the effectiveness of measures that work in specific situations, such as introducing change gradually or without notifying anyone, and of bringing in contractors to introduce new processes. In terms of materials conservation, a key lesson is that it does not mean doing nothing, but instead it requires effort whether it be seamstresses 'stitching down degraded fibres of sacred and preciously embroidered fabrics onto sympathetic new support structures' or treating cannonballs excavated from the sea with appropriate chemicals to stop them from falling apart 'in a matter of hours'.

Anthropologist Francesca Merlan takes up a similar theme, elaborating on the requirement of energy and active production for maintaining continuity. Her focus is on culture, including but also beyond material artefacts. She contrasts anthropology—which is focused on continuity as well as change—with sociology, which as Craig Browne also demonstrates in his chapter, concentrates on change. Francesca explores the historical roots of the difference, stemming (simply put) from anthropology's historical and continuing, but no longer exclusive, focus on premodern societies, as compared with sociology's founding focus on understanding great changes involved in modernisation. The bulk of Francesca's chapter examines how investigation of Australian Indigenous culture has been distorted by the lens of continuity and how this has been exacerbated by the legal requirements placed on Indigenous people to achieve land rights. She uses two key examples: the lifestyles, especially religion and ritual, of the Mardudjara of Australia's Western Desert and the art of the Yolngu people of north-east Arnhem Land.

In complete contrast to the continuity focus, industry open innovation champion Sarah Pearson takes us to the fast-moving consumer goods sector. She presents two cases about the introduction of open innovation, which involves companies enhancing their internal research and development efforts with external input to solving specific problems or generating new products. She brings us back to the energy required to make change happen and also adds lessons from her practical experience working at Cadbury. Key success

factors for the innovation she concentrates on include demonstrating early wins achieved either by working 'under the radar' or targeting 'low hanging fruit'; linking external searches to internal company needs, while maintaining an openness to serendipity; involving people widely across the company; and learning to fail fast, in other words halting unsuccessful activities quickly while also learning from them. The key drivers for open innovation are competition and opportunity, with companies seeking to shorten the time to develop new products and enter new markets, by harnessing—globally—ideas and skills that already exist in non-competing areas.

Economist Jim Butler's chapter, describing economics as the science of scarcity, provides further insight into the trend towards open innovation, where 'cost-reducing technological change' enables 'more efficient use of limited resources'. In addition to technological change, Jim explores two other main areas of change which concern economists—structural change and climate change. A common theme of all three is growing interest in causality, moving beyond simply accepting and describing change to understanding its economic determinants. This is a big shift, especially in the economics of technological change and climate change, where the determinants of change were previously seen to be 'exogenous' and therefore outside the domain of economics.

The final contribution in words and visual imagery by fine artist, researcher and teacher John Reid has three broad themes. One links back to the chapter on economics, where the recognition of universities as knowledge-based industries has affected the role of schools of art. In order to survive, artists have increased collaboration with scholars from other disciplines; the contribution of artists is to provide 'aesthetic assessments' of the topic or project. John predicts that artists will enhance that partnership role by adding other research methods and also project management skills to their repertoires. The other themes are the role of art in assisting with the perception of change by providing an aesthetic audit or archive of change, and art as a 'potent' agent for or against change.

The concluding chapter, which I have written, draws out insights from all of these contributions, as well as from the two-day symposium which brought together most of the authors. As mentioned above, it uses this range of perspectives to examine how better understanding change can improve research impact. Demonstrating research impact is gaining increasing prominence, as researchers and those who fund them want to see research findings move beyond providing greater understanding of a problem and also used to bring about improvement in the problem.

The chapter is also a case study of multidisciplinary synthesis. As I argue in the chapter, multidisciplinary synthesis requires a specific focus, but that focus can vary depending on who is undertaking the synthesis. My focus ties in with

my role in the project as a specialist in the nascent discipline of Integration and Implementation Sciences (I2S). The primary focus of I2S is to improve research contributions to tackling complex problems—like global environmental change, organised crime and escalating health care costs—and to this end I2S is developing a repository of methods and associated concepts, along with illustrative case examples, that researchers can draw on. A detailed description of I2S can be found in Bammer (2013).

A core mission of I2S is the job which is currently no one's business, namely drawing together knowledge about change, so that it is better understood and managed, particularly by researchers contributing to tackling complex problems. While the primary focus in the immediate term is research impact, the longer-term goal is to catalyse the drawing together of knowledge about change to provide general principles to guide thinking about change, and a roadmap to the specific issues of interest to different disciplines and practice areas.

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