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Book Reviews

The Littlest Clue: The Resurgence of New Zealand Science and Technology

Selwyn Parker

Lower Hut, Industrial Research Limited, 2002, 200 pp., NZ$29.99,
ISBN 0-909040-91-5

This book provides a view from the inside of the New Zealand (NZ) science reforms of the late 1980s and 1990s. It will surprise those that do not think of NZ as a producer of research and innovation. In fact, the country has a vibrant science community doing world-class research on a number of frontiers of knowledge. Sheep are mentioned in the book, but only in connection with the invention of a whole line of world-beating meat cutting robots (chapter 7).

Written by Selwyn Parker, an Australian-based journalist, the book follows the ups and downs of a number of researchers employed first by the Department of Scientific & Industrial Research (DSIR) and then, after its dis-establishment in 1992, by one of its Crown Research Institute successors, i.e. Industrial Research Ltd. The foreword is written by Alan MacDiarmid, the US-based NZ-born Nobel Laureate in chemistry who has been very active of late in helping to promote science in his country of birth.

The book highlights the passion and commitment of scientists as they succeed against the odds to develop their research and take it to the market. The changing science policy and funding environment in NZ is illustrated by the changing fortunes of progress with superconductivity research and a number of other long-term surviving, highly successful, but usually haphazardly funded, research projects (like earthquake-proving technology, seaweed research, advanced ceramics research, robotics and intelligent automation research, optical camera research), the products of which are now being sold around the world.

Like in many Hollywood movies, the casualties along the way are mentioned only in general terms, instead of being personalised like the success stories winding through the book. One reads of sinking lid policies, staff leaving for more congenial scientific climates, scientists becoming the lowest paid professionals in the country etc. The fact that Industrial Research Ltd has survived is a major achievement in itself.

The cover page promises 'a unique insight into the fascinating and competitive "business of science" within one NZ research company'. This statement is largely correct. The assumption that it makes sense to have the qualities of inventor and innovator embodied in the same person, i.e. to have a new species of

entrepreneurial scientists, is, as in many other countries, accepted without question.

The book was written for and published by Industrial Research Ltd. It is therefore not surprising that the author follows the 'party-line' of current conventional wisdom: the critics of the new commercial world of entrepreneurial science are acknowledged, but their arguments are supposedly based on 'outdated assumptions' (p. 180). Moreover, the new era is said to be more fun and more exciting than aimlessly pursuing pure science (p. 181). Such statements should be taken with a grain of salt.

On the whole, the book is very optimistic about science, its achievements and prospects in NZ, but it probably will not entice parents to advise their children to pursue a science career given the much more attractive working conditions elsewhere in the economy. But then, it seems nothing would have deterred the successful scientists portrayed in this book. It must be that, at least in the harsh NZ environment, scientists by necessity have to be eccentrics or odd balls, as well as possess the required commercial prowess. Therein may lie an unresolved contradiction for all but the tiniest minority of people.

The chapters are interspersed with some basic facts about the philosophy of science (from Francis Bacon to Isaac Newton to Karl Popper; chapter 8), the changing nature of invention and innovation, and science policy (chapters 7, 9), and some specific facts about science reforms in NZ from the mid–1980s onwards, which mirror some of those introduced earlier in the UK and Australia (though some local variations and oddities were added). A brief history of the DSIR from its beginnings in the 1920s and its struggles in a largely anti-intellectual environment in politics and the wider society that had low regard for the usefulness of science is given in chapter 5.

Chapter 6 provides a crash course of the past and present Greats of NZ science. After discussing Alan MacDiarmid's exploits, the author goes back in time to discuss Ernest Rutherford. This is followed by Maurice Wilkins, who won the Nobel Prize with Francis Crick and James Watson for cracking the structure of DNA, and mathematician Roy Kerr. While all of the fore-mentioned scientists had to leave NZ to make their breakthrough contributions, the situation finally began to reverse in the 1990s when young scientists from around the world came to do science in NZ.

Many of the observations in the book about the struggles scientists had with public funding agencies will ring familiar to scientists in other countries: they had to become skilled in writing proposals for funding agencies, using the right bureaucratic language to compete with their fellow scientists for limited funds, struggle with issues of excellence versus relevance, cope with funding cycles too short to make much sense, etc. They have to engage in a relentless drive for commercial success, or face closure of research programmes due to funding cuts, and they have few good words for economists, especially those from the Treasury.

A nice example of the success against the odds is David Beach's development of KiwiStar, a successor to the Schmidt astrographic camera (chapter 8). He started with some research pocket money, working on the project mostly in his spare time during the mid–1980s. Today, KiwiStar Optics is a business unit of Industrial Research Ltd, offering a wide range of optical and related products.[1] In 1997, it designed a custom fast camera for a physics group at Los Alamos National Laboratory, and in 2003 obtained orders for building components for two of the

world's biggest telescopes in Hawaii. However, this success seems to have been due more to hard work and luck than any government science policy trying to make science more relevant to NZ's economic development. During the early 1990s, Beach applied for funding from the NZ Foundation for Research, Science and Technology (FORST) and was told that their budget was so tight that only existing projects could get funded. Re-applying, as suggested, the following year, he was told that the budget was reserved for new projects, and his therefore did not qualify.

There are also some critical comments on NZ's Foresight project, which was hailed by the OECD as a best-practice example:[2] 'Was this Utopian nonsense or just sensible forward planning?' (p. 92). My guess is that a number of PhDs have to be written about the exercise before we can answer this question with any degree of certainty. Anyway, not much has been heard of the Foresight project since the government that introduced it was voted out of office.

By the end of the 1990s, Industrial Research Ltd had become an international organisation largely out of necessity. Although the science reforms assumed that domestic private industry would come to the party, it largely did not, requiring Industrial Research Ltd to often look overseas for partners. In fact, most of the big commercial successes were due to offshore relationships, and overseas money often paid for domestic research. NZ just was and is not big enough to sustain Industrial Research Ltd. This shows one of the major deficiencies of the NZ innovation system, i.e. its relative lack of integration compared to other OECD countries. Maybe not so much has changed from the bad old days before the late 1980s.

The science discussed in this book has mostly to do with pushing the frontiers of knowledge (and commercialising new frontier inventions), rather than with absorbing existing knowledge, the vast majority of which is produced abroad, although it is recognised that any such distinction is somewhat artificial. Important as it is for a country like NZ with a small science community to be up there 'on the frontier' with the best in the world, diffusion and uptake of existing knowledge play a major role in economic development and have a lot to do with other aspects of the national innovation system, i.e. the general level of human capital, industry structure, firms' ability and willingness to spend resources on R&D, a whole range of government policies in addition to those explicitly aimed at science and technology development. Impressive as many of the stories reported in this book are, the scientists at Industrial Research Ltd cannot reasonably be expected to compensate for all the weak points in NZ's national innovation system.

To sum up, the book is a nice complement and contrast to studies like those by Winsley and Hammond[3] that represent more of the science administration view of the dramatic restructuring of NZ's science and technology system from the late 1980s onwards. I found it a minor irritation that, especially in the later chapters, the author seems to rather abruptly jump between topics. On the whole, however, this is an easy to read book written for the intelligent layperson that wants an introduction to the changes in science and technology policy in NZ and to find out about some of the exciting research that has and is being conducted there. The latter should also be of interest to some specialists. Moreover, the book is fun to read. Those wishing for a deeper analysis, however, will have to look elsewhere.

Notes and References

1. For up-to-date information on the research of Industrial Research Ltd, the reader is referred to its website at http://www.irl.cri.nz/

2. OECD, *Managing National Innovation Systems*, Paris, 1999, Box A1, p. 70.
3. P. Winsley and L. Hammond, 'Policies for transforming the science and innovation system in New Zealand: 1988–1997', *Prometheus*, 15, 2, 1997, pp. 267–78.

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Public Policy in Knowledge-based Economies: Foundations and Frameworks

David Rooney, Greg Hearn, Thomas Mandeville and Richard Joseph

Edward Elgar, Cheltenham, UK; Northampton, MA, 2003, 208 pp., hbk
ISBN 1-84064-340-4

Given that it is intended to influence public policy processes for dealing with the knowledge-based economy, this book works quite well; it provides clear policy principles based on a complex-system paradigm, that is self-referencing, self-transformative, and self-organizational. The 14 guidelines that governments could adopt (pp. 74–5) include

- taking 'a long term view towards building stocks of social capital' (self-referencing);
- creating and maintaining social and economic micro-diversity (self-transformation);
- facilitating 'access to skills and knowledge bases to enhance communication and social networks' (self-organization).

The argument is, by and large, well-researched and sophisticated, although there are some bumpy bits that leave the authors open to criticism.

Their theory of knowledge (Chapter 1) begins by separating data from information and knowledge, so that knowledge 'consists of [facts] . . . beliefs and values acquired through meaningfully organized accumulation of information through experience, communication and inference' (p. 2). Given that they 'believe in socially constructed truth' (p. 2) and Polanyi's concept of tacit knowledge, it is clear from the outset that they are going to challenge the bits-and-bytes approach to the knowledge economy that governments usually adopt. Unfortunately, they weaken their case with two rather inappropriate examples to explain their concept of knowledge (p. 5): if their concept of knowledge includes values, beliefs and wisdom, then riding a bike hardly makes the case. Notwithstanding this hiccup, their scheme for arraying knowledge from tacit to explicit according to the degree of procedural/declarative, (un)articulated, and intuitive/formal characteristics (pp. 6–8) is useful.

The book is strongly normative, adopting the position that 'Settings in which anti-social behaviour predominates amount to poor economic settings for knowledge-based economies' (p. 9): but why should this be so? Though desirable, the positive expression of such a claim—that sociable behaviour in the economy advances the knowledge economy—rests on the efficacy of social capital in the economy. This normative assumption is where the book will be embraced or rejected. Social capital, they assert, 'is accumulated through repeated positive social

interactions in dense networks of social exchange' (p. 9). Of course, we've had a similar sort of argument for some time now about how the Internet will build new alliances that will challenge the capitalist assumptions that infuse society. The truth is that, while anti-globalist, anti-racist, etc. alliances, can use the Internet effectively to mobilize politically, capitalism relentlessly commodifies those things that can turn a profit from bottled water to electronic commerce. As well, university research is to a large extent based on getting an idea to the patent stage, where it can't be shared, or is shared at a price. It is this economic aspect that I believe is understated in the book (although the Epilogue provides a form of rider that power is a significant issue that needs to be accounted for).

Nevertheless, Rooney *et al.* mount an interesting case using complex distributed system theory. Their 'socio-phenomonological context' (p. 12) encompasses the notions of creating knowledge through social networks and the processes by which knowledge is given meaning in application and interpretation. The economic aspect of knowledge begins with the statement: 'experienced complexity . . . may have far reaching efficiency consequences if the contextual conditions that maximize communicability are found in an economy' (p. 13). The knowledge economy is defined as 'that part of the economy that creates wealth essentially through intellectual activity' and a knowledge-based economy is one where 'knowledge is the most important productive factor' (p. 16). This raises the question of how one measures knowledge in order to apply economic principles to it. The authors share the concern of Sheridan Roberts, the Director of Science and Technology Statistics at the Australian Bureau of Statistics, who acknowledges the difficulty of measuring the extent to which an economy or society is knowledge based. In acknowledging that there are 'various ways of viewing and defining knowledge', Roberts refers to the difference between knowledge, information, and data, as well as codified and tacit knowledge, which includes 'skills such as insight, creativity and judgment'.[1] Any measure, of course, will be as good or as bad as its definitions and factors chosen. Rightly, Rooney *et al.* reject the Information Sector approach as imprecise (p. 34), but remain inconclusive about an alternative. Roberts could have been useful here as he directs us to the four dimensions of the APEC KBE framework (Innovation system; Human resource development; ICT infrastructure; and Business environment) and their three core dimensions (Innovation and entrepreneurship; Human capital; and Information and communications technology). In a sense these dimensions provide a set of indicators about the state of the knowledge-based economy that would be useful in policy formulation. Furthermore, these dimensions are largely compatible with the 14 policy guidelines that Rooney *et al.* devised.

The heart of the book:

- surveys the global economy, concluding that the globalizing knowledge system has produced inequities and destroyed cultural ecologies within a hegemonic paradigm that incorporates the free market and consumerist culture (Chapter 3);
- argues that 'transformative innovation . . . occurs best when the system has an abundance of micro-diversity and variety' (p. 70), and that there needs to be isomorphism between system, environment, and the order (Chapter 4);
- discusses decision-making and risk from a micro-contextual viewpoint, asserting that explicit knowledge needs to be tempered by intuition, negotiation, and group dynamics (Chapter 5); and

● argues that the prerequisite for effective government policy is to view knowledge as a process, rather than as a thing, and to understand that good science occurs when there is 'a culture of inquisitiveness and curiosity, a cultural affinity with the world of ideas, [and] a spirit of intellectual enterprise' (p. 109) (Chapter 6).

Their case study, in Chapter 7, of Australia's information policy approach since the 1970s concludes that there was 'a sporadic flirtation with the notion of a national information policy over the past thirty years' that showed 'scant concern' for understanding the significance of an information policy (p. 113). One effect of that is that, as an enthusiastic ideological adherent to 'free market' and small government, Australia has become a net importer of technology (p. 127). Not only are there harmful economic effects if there is not an effective knowledge-based approach, but also cultural effects. Thus, because the social value of knowledge is realized only when it is connected, to allow knowledge elites to monopolize the processes is to diminish its social benefit. The second concern is more pervasive and culturally entrenched. That is, as culture becomes increasingly commodified and instrumentalized, people's involvement with the culture—I would say, regardless of the level of technology, but definitely heightened in a technology-rich culture—'becomes restricted to the act of economic consumption rather than an act of enjoyment independent of any economic imperative' (p. 135), as Rifkin too has argued.[2]

The book's guidelines, presented in Chapter 8, for creating knowledge-based economies that are equitable, efficient, and dynamic had me alternately cheering and then thinking 'Yes, but' as my yin and yang of idealism and political realism challenged to control my thoughts. In short, Rooney *et al.* argue for a knowledge commons, readiness to exploit knowledge waves, and preparation for community participation. These are indeed admirable and worthwhile processes and objectives, but those of us who are politically committed to social justice can't become 'hippy' about this, believing that we'll change the world by wearing a Knowledge Commons t-shirt. These principles and processes have to be fought for in the academies, in new virtual and real coalitions stronger and more positively oriented than the anti-globalists, and the political halls of power just as nineteenth century workers fought for dignity and decency by taking the debate into the very faces of the powerful. Capital fought tooth-and-nail then and they will again. The enormity of the power confrontation is seen in the book's proposal to 'curb natural monopolies that unfairly exploit the knowledge commons' or to 'reset IP regimes' (p. 136). Thus, while it is true that the Internet is a good example of self-transformation in action (p. 137), its use as a precedent for a future 'commons' needs to take into account that the computer hardware originated in the military–industrial complex. These are issues of power and political economy, about which the authors have already written, and could not reasonably be dealt with in this book. But more difficult still is a call for 'a more sustainable regime of consumption' that is not driven by 'fast-paced ego-driven individualism' (p. 142), for this requires a profound cultural change in the citizenry.

The political agenda that Rooney *et al.* set requires a paradigmatic shift by brave and intelligent governments with a long-term perspective that counteracts capitalism's myopic vision. Essentially, governments 'are responsible for setting the contextual conditions for innovation and the development of knowledge structures' (p. 91) and for building trust in contemporary risk societies. They must not

get caught in the 'logic of infinite regress' (p. 95) that deals with uncertainty by calls for more knowledge based on explicit, declarative, formal knowledge. Rooney *et al.* join another Australian voice, Fred Argy, who also argues for the economic sustainability of egalitarian policies. That the times are propitious for more egalitarian, socially and environmentally aware modes, processes, and structures is asserted in the fin-de-siecle comparisons (pp. 145–8); however, the claims are more hortatory than empirically established. Nonetheless, these authors have articulated what it is that needs to be done for a more equitable knowledge-based economy. This is a worthwhile achievement, and governments would do well to read and contemplate.

Notes and References

1. S. Roberts, *The Knowledge-based Economy*, Organization for Economic Co-operation and Development, 1996. URL: http://www.oecd.org/dsti/sti/s_t/inte/prod/kbe.pdf, accessed 9 December 2003.
2. J. Rifkin, *The Age of Access: The New Culture of Hypercapitalism Where All of Life is a Paid-for Experience*, J.P. Tarcher, New York, 2000.

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Helping the Difficult Library Patron: New Approaches to Examining and Resolving a Long-standing and Ongoing Problem

Kwasi Sarkodie-Mensah (Ed.)

New York, London and Oxford, The Haworth Information Press, xviii + 303 pp., pbk, ISBN 0 7890 1731 8

'Libraries host a range of clientele, some of whom arrive without literary agendas.' So writes Polly Thistlethwaite, in 'The homosexual as problem patron', one of a collection of interesting and sometimes (unintentionally) amusing essays in Kwasi Sarkodie-Mensah's edited collection on problem patrons in public libraries. The book is intended as a librarian's reference source and help guide, offering insights and practical advice on how best to deal with numerous varieties of problem patron. Sarkodie-Mensah introduces the collection exclaiming, 'how unchallenging our daily work lives would be if we did not have such a daunting and practical problem as the difficult library patron to deal with'. And indeed, most of the contributors take a similar view.

Part one, 'The nature of the problem' examines historical and current perspectives. The *Eastern Region News* (1993) defines a problem patron as 'the person who gets a library staff member riled up'. This includes 'the demanding, the emotionally disturbed, the homeless, drunks, babblers and starers, the lonely and the angry; liars, exhibitionists, sleepers, criminals and the fragrant' (p. 13). In 'The problem patron: is there one in your library?' (pp. 11–22), Calmer Chattoo argues that librarians should strive for greater understanding of the problems of 'challenging' patrons, and learn to discriminate between problem patrons and 'patrons who have problems' (p. 11). Mary Chelton continues this theme in 'The

"problem patron" public libraries created' (pp. 23–32). Although Chelton sees modern library literature as constructive insofar as it seeks to describe 'problem behaviors' as opposed to 'problem patrons' (p. 24), she maintains that one group—teenagers—is persistently seen as problem patrons.

Chelton writes, 'adults have been lamenting the fecklessness of the young since the time of Aristotle' (p. 24). She maintains that there is a 'long-held American myth that the age group is somehow in crisis and needs to be contained' (p. 24). This, she says, is a 'direct legacy of psychologist G. Stanley Hall, the so-called "founder" of the concept of adolescence' (p. 24). Chelton believes that library services have always been 'dichotomized' between adults and juveniles, because prior to the establishment of compulsory secondary schooling, young people went to work at the age of 14, and so technically were adults at that age, thus 'the organizational services dichotomy made sense' (p. 25). Now that this is no longer the case, groups of adolescents often found in and around public libraries tend generally to be regarded with fear and loathing. Much staff energy is taken up 'controlling them rather than assuming such groups are normal and planning for them' (p. 26). And Chelton laments the 'irrational assumption that a group of healthy adolescents should behave like shy, friendless, hearing-impaired seniors', recommending instead that libraries ought to make it policy to 'hire and keep public library reference staff who like and relate to youth'; and suggests that libraries should keep in touch with schools to find out what learning resources may be required during the school year, and even to consider 'changing collection development practices to purchase materials to meet school needs' (p. 30).

Gary Peatling's chapter 'Historical perspectives on problem patrons from the British public library sector, 1850–1919' is another excellent piece of writing. He describes how the 1850 Public Libraries Act gave rise to concerns that there would be 'considerable problems in maintaining order and silence in the public library, especially in protecting bona fide users from the "coarse mannered and unwashed"' (p. 34). He shows how staff often considered newspaper and journal browsers to be synonymous with 'problem' patrons: 'loafers, gamblers and betting men' using newspapers and journals to obtain 'information relevant to their habits of gambling' (p. 39). He relates that Wolverhampton public library used to black out columns of 'betting intelligence', believing it to be successful discouragement (p. 39). Modern day equivalents include South Lanarkshire's ban, in March 2000, on mobile phones and 'smelly people' (http://news.bbc.co.uk/1/hi/uk/1021800.stm); and concerns in American libraries about achieving the right balance between providing a safe public space and serving all patrons, irrespective of residential status—including those who are homeless and who use air-conditioned libraries as a place to stay cool in hot weather (http://newsobserver.com/news/story/2703381p–2506795c.html). Peatling also maintains that much of the current literature fails to acknowledge the phenomenon of the white-collar problem patron, those 'from socially comfortable backgrounds (whether "ratepayers" or "taxpayers") with unrealistic expectations of service standards' (p. 41).

Polly Thistlethwaite takes a sensitive and sympathetic view of the 'The homosexual as problem patron' (pp. 91–104). She does not accept the notion that homosexual 'public' sexual activity is any more prevalent, or of any greater concern than heterosexual activity; maintaining that much of the literature 'discounts the private nature of most consensual sex in public places' (p. 91); and pointing out that 'citizens offended by public sex usually have to exert themselves to find it. Public sex is generally uninteresting and unnoticeable to those without a mission to

shut it down' (p. 99). She muses at some length on Bruce A. Shuman's recommendations, in a 1999 American Library Association (ALA) publication on library security, concluding from them that the ALA's 'advice about same sex cruisers is discriminatory, uninformed and abusive' (p. 95). She calls for problem patron policies to be aligned with professional goals, so that librarians can 'provide equal treatment and meaningful service for all library patrons' (p. 102).

Shuman's own essay in this collection, 'Personal safety in library buildings: levels, problems and solutions' (pp. 67–81), contains recommendations about how libraries may be made more secure public places through special equipment, building layout and staff training. He writes, 'strange and troubled people have always found library and museum buildings appealing' (p. 69) but, bypassing the opportunity of a light-hearted moment, he fails to consider that some of these queer folk might as easily be staff, as the patrons they serve. He does wonder whether someone might yet invent 'a new type of goggles that, when worn by a staff member seated at the front door, would cause dangerous people to appear to glow cherry red or pulse, when viewed through their lenses' (p. 77).

Unlike the Wedding at Cana, the best has not been kept until last, and the chapters in the book's opening section are the ones that most cogently and articulately present the issue of the 'problem' patron. Unfortunately, many of the chapters in parts two and three are simply not as interesting, or, in one or two instances, serve merely to confirm that there are a few librarians who consider all patrons to be problems. Such attitudes, however, do not appear to be justified by the statistics. In 'How psychotherapists handle difficult clients: lessons for librarians' (pp. 181–96), Brian Quinn acknowledges 'rarely is it the case that a librarian must contend with difficult patrons on a frequent and extended basis' (p. 182). And Glenn McGuigan, in 'The common sense of customer service' (pp. 197–204) argues that 'in many circumstances, the person we think of as the angry patron or the irate customer may actually be someone who is simply in a state of confusion or misunderstanding about a certain policy or service' (p. 199).

In part two, 'The problem patron in the electronic age', many of the authors call for new policies and measures to govern Internet and web-based communication. Charlotte Cubbage, in 'Do we really have an Internet problem?' (pp. 115–27) reports an empirical study where 'Little Brother' tracking software was used to monitor patrons' time on the Internet, as well as the nature of the sites visited. Cubbage seems to regret and resent the passing of the time when librarians 'were the main selectors of materials used', and 'exercised quality control and made judgment calls based on the perceived needs of our clientele' (p. 118). But she does make an important point, which is that, despite the large amounts of money spent providing electronic access to scholarly journals, many students instead 'focus their research on materials they happen upon surfing from page to page' (p. 118). Perhaps librarians might conclude from this that there may at least be an economic argument to support the use of tracking to provide 'credibility and focus with which to deal with Internet problems' (p. 127) in publicly funded libraries.

In 'Problem or challenge? Serving library customers that technology left behind' (pp. 129–47), Sara Baron examines the issue of information literacy in the age of the Internet. She acknowledges that one of the biggest issues is the ongoing debate between educators, administrators and library staff over who should be responsible for information literacy in educational institutions, writing that 'lack of administrative and institutional support puts a cloud over technology in the classroom' (p. 133); and 'teaching students research skills often requires more than

a 50 minute class session, which many faculty do not have the time or patience to relinquish' (p. 140). This debate is as relevant to the universities as it is to primary and secondary institutions.

In 'The problem patron and the academic library web site as virtual reference desk' (pp. 163–72), Daniel Taylor and George Porter maintain that e-mail and Internet use can increase the demands on the library, without always increasing its effectiveness. But they conclude that librarians providing digital reference services 'enjoy several advantages compared to their traditional counterparts': including being able to consult with other staff, control their response to user enquiries, maintain emotional detachment and send a response that may provide 'resolution or closure to the situation' (p. 171). In other words, they can disengage themselves from patrons from a comfortable, virtual distance.

Part three is 'Providing solutions to the problem: ideas from other professions and the world of library and information science'. In 'How psychotherapists handle difficult clients: lessons for librarians' (pp. 181–96), Brian Quinn wonders how psychotherapists 'are able to listen to and work with a steady stream of belligerent, complaining, obnoxious individuals and still take considerable satisfaction in their work' (p. 182) and wonders whether librarians can draw lessons from them. Louisa Toot's 'Zen and the art of dealing with the difficult patron' (pp. 217–33), recommends adopting a Zen Buddhist approach in order to 'shift the focus from one's own involvement to the patron and the patron's difficulty' (p. 232).

Less tolerantly, Sharon Bullard, in 'Gypsies, tramps and rage: coping with difficult patrons' (pp. 245–52) laments, 'today's libraries have become a haven for the homeless, the young, the substance abuser, the sexual deviant, the elderly, the criminal-minded and the mentally disturbed' (p. 246). However, by the close of her chapter she has relented somewhat, writing that complaints can be used 'as an invitation to review policies and procedures in an effort to improve service and minimize encounters with enraged readers' (p. 252).

Wolfgang Ratzel's chapter, 'Core competencies of front-line employees: the German contribution to new service culture' (pp. 277–84), is the only essay that attempts to explore the link between politics, public policy and public libraries. He traces the two phases of library electronic data processing: internal computerisation and later the proliferation of 'campus, national and international networks' (p. 279). He links these two phases to reforms introduced in Germany in 1986 to 'increase efficiency in public administration, to identify cost drivers, and to develop customer service' which in turn led to the 'Neues Steuerungsmodell' that enabled German libraries to change 'bureaucracies to service driven organisations' (p. 279).

The final chapter is Joyce Wright's 'Partnership with community resources— campus police: revisiting policies to reflect the 21st century' (pp. 285–90). It consists mostly of a list of the University of Urbana-Champaign's library's polices including 'consumption of food and beverages, criminal behaviour, unattended children, use of library staff telephones, animals, mobile phones and pagers'. It ends with a section on the campus police, and describes the work of the library's own specially assigned officer.

Probably only librarians and library science students will buy, or borrow this volume. A few of them may read it. So it is a pity that a collection which is in the main, perceptive and thought-provoking, could not have come to a close with a more uplifting theme than Wright's dreary list of rules and regulations. Perhaps instead, best turn again to Chattoo's tolerant reflections (pp. 11–22) where she observes of the homeless, 'they share a syndrome of human conditions from which

they cannot easily escape'. We are all of us flawed and imperfect, and, as Chattoo gently reminds us, we need to be mindful not so much of the speck in another's eye, but to 'think about what bother we all are when we play the role of customer, patron, user, in our personal lives' (p. 20).

Finally, there are even rare occasions when the 'problem' patron can turn into the celebrity patron: the London Borough of Islington's library service now proudly advertises its 'Special Collection' of books, cuttings and reproductions stolen, and 'defaced and doctored' by Joe Orton and Kenneth Halliwell at their flat at 25 Noel Road, and for which crimes they were imprisoned for six months in 1962 (www.islington.gov.uk).

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Managing *and* Measuring Social Enterprises

Rob Paton

London, Sage Publications, xiv + 192 pp., UK£21.99 pbk, ISBN 0 7619 7365 6

This book, as the title suggests, is primarily concerned with the management and measurement of performance in social enterprises. The social enterprise theme reflects one of the distinguishing features of the book: its main concern is not with private sector, shareholder owned organisations. Thus, page 1 proposes that the term social enterprises:

> [I]s both positive and virtually self-explanatory—more than can be said for the 'nonprofit', 'voluntary', 'charity' and 'third' sector labels. It is also broader, encompassing co-operatives and socially-oriented businesses, even if they do not have a nonprofit or charitable legal form (p. 1).

Such social enterprises 'exist in order to make a difference to lives and societies', but they are increasingly being required to demonstrate their worth and how well they are run. Some argue that this means becoming 'more business-like' and imitating private sector trends towards better measurement and management of performance. The success or failure of such shifts in social enterprises drives the discussion.

The book's nine chapters are principally targeted at a postgraduate audience, and particularly those on MBA and other taught courses, who have a particular interest in public and non-profit management. But the text should also serve a more general readership. Its emphasis on performance measurement affords rare insights into some innovative techniques. Moreover, institutional and other theories are deployed to explore the reasons for innovation. Meanwhile, uninitiated readers might welcome the coherent introduction to core concepts (constructivism, institutional theory, managerialism and social enterprise) that appear in the 'Key Words' section.

The first three chapters introduce concepts from the performance measurement literature and developments in public policy. Chapter 1 outlines the book's underlying purpose and demonstrates the varied nature of work performed by social enterprises, together with the different degrees of success and failure that

such organisations have experienced. Vivid portrayals of successful and failing social enterprises (even the best-intentioned enterprises can 'go wrong') capture the reader's attention. Performance is presented as a social construct that is in growing demand amongst those who want to evaluate social enterprise. The author further suggests that responses to these demands have been varied and involved different forms of measurement, greater accountability, benchmarking, quality issues, human resource approaches and balanced scorecards. But how comprehensive is this 'roster of the management ideas'? Justification for the selection of these essential ideas is one area that I thought could have been strengthened.

The second chapter relates social enterprise to government policy and concerns with 'new public management'. Movements in government policy away from the direct control of state run services to a more decentralised and privatised form of regime have resulted in a need for governments to '*manage performance without managing organisations*'. Thus, it is argued that there is a greater emphasis on performance management and the processes by which it is achieved.

Chapter 3 addresses the performance measurement literature, but does so at a conceptual level. It embraces questions about the appropriateness of any form of performance measurement (given that all such attempts will essentially be limited and socially constructed); questions that have often been ignored, forgotten, or de-emphasised in other performance measurement works. The chapter finishes by refocusing the discussion on social enterprises and the need to think about specific measurement systems, in an attempt to: 'distinguish a crude and imperfect but "good enough" system of measurement from one that was more trouble than it was worth?' Immediately, the author recognises that any such attempt is problematic, but argues that, if wide ranging evidence could be provided and dysfunctional effects acknowledged, then a judgement could be made, although this 'might well be equivocal'. Despite these problems, it is exactly this type of appraisal that is attempted in the chapters that follow.

Chapters 4–7 engage with evidence of developments. In each case, the measurement or management innovation is introduced and illustrated with one or more case studies of its adoption within an organisation. Chapter 4 first looks at responses to the increased interest in Administrative Costs to Expenditure (ACE), which is a measure that can be calculated from information that charities are required to publish. Use of such ratios to measure efficiency suggests that organisations are reporting greater efficiency and that differences between organisations are becoming smaller over time. The chapter then moves to other new measurement models, outcome measurement and 'social audits'. Quite why there are so many techniques in one chapter is not clear to me; the studies themselves are interesting, but their diversity militates against sharp conclusions.

Chapter 5 looks at how Best Practice Benchmarking (BPB) is implemented. Rather than measurement per se, the concern is with the process of BPB and how this works in specific cases. Again, interesting evidence is provided from both the literature and a number of cases. Judged against the previous chapter, a larger number of cases support the evolution of a much stronger story. It generates revealing insights into how BPB can help or hinder social enterprise.

Chapter 6 considers a range of 'kitemarks', which are now being used by organisations to verify and signify some 'standard of good practice'. The chapter touches on Power's (1997) 'The Audit Society' and grapples with the perceived need for such kitemarks. The chapter specifically considers ISO9000 and Investors In People (IIP), combining extant literature with four case studies. Although the

exploratory nature of the studies produces some conflicting findings, the inherent ambiguity and uncertainty associated with the award process erodes aspirations to objectivity.

Chapter 7 considers quality models, specifically PQASSO and the Excellence Model. These models are again considered through the use of case studies. As before, multiple case studies cover extremely varied experiences, raising questions about selection criteria and the messy nature of diverse data. Conflicting messages abound and only tentative conclusions can be reached. Such data may be confusing to managers: no clear message shines forth. However, the primary audience of this text lies in postgraduate students who should be made aware of the conflicting evidence and different experiences. The rich case studies suggest that it is not necessarily the actual approach adopted (whether it be social audit or PQASSO) that matters most, but the processes that situate it in a specific context.

The final two chapters provide some conclusions and recommendations for practising managers and policy-makers. Chapter 8 actually advocates a 'Dashboard', based very broadly on the concept of the balanced scorecard, but significantly adapted for the social enterprise context. It is suggested that five areas should be incorporated in the Dashboard: current results, underlying performance, risks, assets & capabilities, and change projects. The author suggests that this dashboard comprises an appropriate framework for social enterprises and provides an interesting case study of an organisation attempting to adopt this approach. As with the other case studies, the evidence is somewhat mixed. Interestingly, little detail is provided on specific measures, which might reflect the bewildering variety of possible measures and appropriate priorities across a range of organisations.

The final chapter reiterates the pressure for performance measurement and management, but underscores the need for policy makers and managers to remain aware of the people side:

> In short, communication and the people side of management remain fundamental. Familiarity with measurement methods and analytic tools, and the ability to gauge their potential in new settings, are now additional requirements for many managers of social enterprises. But they do not make the basics any less important (p. 167).

I feel that this is a fitting conclusion: the book is not concerned so much with specific measures as with the pressure for measurement and managerialism within social enterprises.

The book should be a prized resource for postgraduate students who seek a deeper understanding of social enterprise measurement and management practices. It covers extremely relevant and topical issues, while the case studies offer a perspective on the complexities of real social enterprises. The messy nature of this data creates ample scope for discussion and debate of the techniques covered. Although more attention might have been devoted to the criteria for selecting these techniques, the breadth of coverage is considerable. In some ways, further details of each technique would have been useful and extending the chapters with 'sources and resources' sections might have guided curious readers without making the book overly long.

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Mechanising Proof: Computing, Risk and Trust

Donald MacKenzie

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Computers have invaded the modern world and have achieved a significant impact upon many aspects of social interaction ranging from the functioning of the financial system, at a personal and an international level, to the operating of the utilities and other service industries, to the provision of national security. So it seems that computers are ubiquitous and pervasive, being considered essential to the operating of society. Given this essential nature of today's computers, then, how can we know that they are trustworthy? This book seeks to provide an answer to this important question. Along the way, the author draws together the disciplines of sociology and the history of technology, technical details about computer science and artificial intelligence, and a wide range of perspectives from engineers and scientists. He is concerned with the context of the relationship between computing and risk, on the basis of trust and mathematical proof.

As might be expected from the subject matter, it is not a light-hearted account. While the style of writing is clear and makes the subject both comprehensible and interesting, the issues and arguments are complex. The author succeeds well in dealing with this complexity by making extensive use of endnotes to enhance explanation without impairing readability. Indeed, the text is eminently readable and flows well from issue to issue. Moreover, for a nonspecialist in these topics, such as myself, it is comprehensible and I suspect that an expert would also find much of interest.

The book begins with accountability issues. It documents problems caused by software lagging behind hardware development, setting this in the context of dependability—a matter of particular significance when computers began to be used for the control of critical systems. MacKenzie discusses the development of methods of testing as an empirical approach to understanding the functions of computer systems, but also focuses on the development of logic-based and philosophical concerns, along with concerns about the dependability of these rapidly developing computers and their applications.

And so the argument turns to proof, which is considered philosophically in the context of Hume's question as to how one knows that a claimed proof is correct, but also through a consideration of the automation of mathematical proof. For Mackenzie, the development of such proof systems is linked to the rise of artificial intelligence and people involved with its development in the 1950s and 1960s. In fact the book is full of descriptions involving specific individuals and contexts. This increases its interest value. Accounts range from the views of logicians such as Hao Wang to mathematicians such as Roger Penrose. Godel's well-known theory of incompleteness is dealt with from a formal logic perspective, as well as in terms of the development of artificial intelligence. The argument then draws upon mathematics itself and uses the example of the four-colour conjecture for colouring maps. Although the conjecture was first proposed in 1852, it took a computer presentation in 1976 to provide 'proof'. A controversy ensued as to whether this kind of computerised demonstration constituted actual proof with part of the debate turning upon the reliability of a computerised contribution to mathematical proof.

And so the argument returns to the issue of dependability and progresses to the dependability of systems that are vulnerable to intruders. This is a cause of obvious

concern when computer systems deal with security. At a national level, MacKenzie uses the US National Security Agency (NSA) and the Department of Defense's Advances Research Projects Agency (ARPA) to explore their concerns, during the 1960s and 1970s, with computer security and related technical developments, together with claims and counterclaims about their effectiveness or otherwise. MacKenzie recounts how issues of mathematical proof and computer reliability become intertwined with politics and maintaining the national security of the United States. Hence, cost issues were more easily overridden; a far cry from early cash-constrained academic attempts to grapple with similar technical challenges. Issues of mechanical proof, risk and dependability moved from the periphery to the centre of consciousness, although MacKenzie does not particularly make this point.

Some commentators expect the expression of proof to be such that 'a human being could understand, check, accept, reject, modify, and use in other contexts' (p. 17). Thus, a computer-generated proof was questionable to the extent that it was not realistically possible for outsiders to penetrate and check the meaning embodied in thousands of lines of code; thereby raising issues associated with philosophy and the nature of proof itself. Here arguments diverge between those in favour of a formal proof and those who are swayed by a sociological proof. MacKenzie offers interesting insights into the personalities involved in these debates, as well as the way in which the nature of the debate has moved and changed over time. As a history of the relationship between philosophy, mathematics and computer science, this is a worthy read in its own right. The relationship between proof and the real physical world is also addressed and the relationship between philosophy and practical application is considered here by the use of examples.

Aircraft control systems place a premium on human safety. The SIFT (software implemented fault tolerance) system is described, together with the aspects of proof and the personalities involved. MacKenzie reveals how errors in approaches to proof shaped the attention thrust of software and hardware developments, with implications for applications in a range of industrial applications. And so the book moves on to consider the major components of mechanised proof. The possibility of hidden or undiscoverable bugs illustrates further barriers to mechanised proof's reliability and utility. Trust, particularly the social nature of trust, is investigated and considered with regard to what constitutes valid proof. Firewalls and accidents— particularly the fact that 'software based systems appear to have killed relatively few people despite software's dependability problems' (p. 20)—frame representative examples.

Although the book is expressed as an argument about the nature of mechanised proof, it is apparent that there are a number of other recurring themes. One of these represents both a central message and a conclusion: mechanised proofs are neither good nor bad (except insofar as people allow them to be); ultimately, there is no substitute for human involvement and judgement. The book is well written and clear; well annotated and indexed. An attractively produced volume that covers complex arguments with commendable clarity and compelling examples: worthwhile and rewarding.

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