

# THE SOCIAL PROCESSES OF INTEGRATED SUSTAINABILITY DECISIONS: a review of challenges and best practice

Response to a discussion paper by Elizabeth Kington and Anna Littleboy, CSIRO

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## **Abstract:**

Multidisciplinary scientific research and collective social decision-making make related, but markedly different contributions to integrated sustainability assessment. The Kington/Littleboy paper *Integration and social processes* addresses the first, discussing the role of social processes in supporting internal integration among the scientific research disciplines. The present paper addresses the second, exploring the role of social processes in the integration of scientific research into whole-of-community decisions.

A wide range of integrative tools have been developed to further collective decision-making on sustainability issues. Many of these tools bring together evidence from the key sectors involved in sustainability decision-making, namely, the specialised disciplines, local communities and government agencies. The construction of each form of evidence is in itself a social process, with each requiring its own form of knowledge management and validity checks. Integrated sustainability assessment of any particular issue or site needs to be approached as a cross-cultural learning process, in which scientific research becomes an equal partner with the knowledge cultures of individuals, community, and government, within a shared holistic focus. A decisions-into practice open learning spiral is offered as an integrative framework.

## **Context**

The Joint Academies' Committee on Sustainability is constructing a "state-of-the-art" picture of integrated sustainability assessment in Australia, within four domains:

- A) integrated understanding of cause and effect (modelling);
- B) evaluative integration (prioritisation and trading off of conflicting values);
- C) integration of options into strategic decision making; and
- D) integration of decisions into practice compatible with the socio-political context.

The Kington/Littleboy paper *Integration and social processes* considers social processes as *services* which support the integration of the scientific research disciplines in contributing to the domains A, B, C, and D. In this context, its authors examine social processes as *tools* for defining, informing or delivering integrative research outcomes, and as *constraints* on the achievement of those outcomes. Another potential approach is from the perspective of the social sciences, for whom social processes are the *focus* of their research.

This paper takes a third position. It examines social processes as the *vehicle* by which multidisciplinary research is enabled to contribute to integrated sustainability assessment, in *collaboration* with the local knowledge of communities and the strategic knowledge of government. These matters are relevant to integrated decision-making in domains B, C, and D.

Increasingly, the research community is being asked to take integration of their contributions to sustainability decision-making with those of community and government as seriously as they take the need for integrated multidisciplinary research. From the World Resources Institute combined with the United Nations Environment Program 1996, the combined United States research institutes in *Our Common Journey: the transition to sustainability* from the United States National Research Council 1999, the state-of-the- global-environment reports from World Bank 2002, and the *Final Report* of the ten-year anniversary of the first global environment and development conference, the World Summit on Sustainable Development (WSSD 2002), all urge such a direction for sustainability research. Each of the reports identifies the integration of specialised, community, and government knowledge in all sustainability decisions, with their combined decisions forming the cornerstone of sustainable use of resources.

Pleas for collective decision-making have not fallen on deaf ears. An entire transdisciplinary body of research has developed around the effectiveness of measures for integrated sustainability assessment. From this perspective, transdisciplinarity applies to integration not only within the specialised disciplines, but extends to their relationship with the other stakeholders knowledges. Box 1 contains a short list of the wide range of integrated sustainability strategies in current use. The examples in brackets are based on integrated decision-making between science, community and government.

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**Box 1. Integrative sustainability frameworks and tools, with examples**

- Integrated Town Plans, Place Management, Common Ground designs (*Local Environment Journal* 2004 9 5);
- Local Action Plans, Local Agenda 21 Plans, Healthy Cities Projects (sponsored by ICLEI, UNEP, WHO, respectively);
- National Greenhouse Office initiatives (Cities for Climate Protection, Cool Communities);
- State-of-the-region Reports, Community Score Cards, Integrated Sustainability Assessment (Strategic Impact Analysis Matrix, ICLEI);
- Sustainability awareness projects (Greenweb, No Waste, Waterwise);
- Sustainability Strategies, replacing or adding to Environmental Management Systems, Local Environment Plans and Conservation Strategies (Manly, Sutherland, Leichhardt Councils, NSW);
- Sustainability role models, guides, and case studies (*Sustainable Development Journal*, all issues); and

- Triple Bottom Line decision-making, accounting and toolkits (Natural Capitalism, Natural Edge Project, Brown 2004).
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Scientific research contributes to all phases of the development of the integrative tools, both as single disciplines and as multidisciplinary teams. In order to be effective, however, research findings need to be linked explicitly to the contributions of the other decision-making groups. These include the ideas of individuals, the on-the-ground experience of the affected communities, the relevant policies and regulations of government and the holistic focus of integrative programs.

One of the major challenges for research into transdisciplinary sustainability assessment is to make explicit the links between the contributing knowledges. Another is to incorporate the appropriate validity checks for each of their contributions. These come from the life experiences of individuals, the shared stories of communities, the strategic plans of organisations (including governments), and the shared aim of the assessment (Figure 1).

Tools which incorporate all decision-making sectors include *triple-bottom line accounting*, the linking of social, economic and ecological evaluation processes. This tool is now frequently referred to as the ‘single bottom line’ in deference to the pressures for integration (von Weizsäcker, Lovins, & Lovins 1997, Arrow et al 1995). The *ecological footprint* of individuals, communities and nations have proved an influential social tool in their own right, since the concept integrates social, economic and ecological interests in the decision-making system (Wackernagel and Rees 1996). Sets of integrated *sustainability indicators* of progress towards sustainability (or the reverse) include COMPASS, Dashboard, sustainable community headline indicators, and many others (AtKisson 1999, The Australia Institute 2000)

*Systems perspectives* explore the complexity of the links between social and physical realities. ‘Soft systems’ are ‘groups of interacting, interdependent parts linked together by exchanges of energy, matter and information’, to distinguish them from purely biophysical (hard) systems (Costanza and Jorgensen 2002) A systems approach taking into account multiple interactive processes is that of *complex adaptive systems*, which include a learning process, feedback, boundary-setting, communication and recognition of uncertainty (Checkland 1993).

Tools which provide a single integrated measure of progress across all sectors include *The Genuine Progress Indicator* (GPI, The Australia Institute 2000). The GPI is a single value that attempts to adjust Gross Domestic Product to account for its effects on well being and sustainability. For example, GPI includes adjustments for personal consumption, unpaid work, costs of unemployment, crime, overwork, commuting, accidents, pollution and loss of forests. The *Is Oregon Making Progress?* Report uses the broad goals of *quality jobs for all Oregonians, safe caring and engaged communities and healthy, sustainable surroundings*. Sweden’s sustainability report takes a more integrated

approach and has the themes of *efficiency, contribution and equality, adaptability and values and resources for coming generations.*

Integrative responses have become so many and varied that there is now pressure to find methods for integrating the integrating tools. One response to such pleas has been the collaborative action research of the Local Sustainability Project (Brown 1997). Between 1996-2002 the Project examined the social processes involved in the introduction of sustainability practices into urban, rural and indigenous communities, local governments, and the professions of public health and environment management.

Workshops held Australia-wide 1996-2002 brought individual change agents, community members, expert advisors, representatives of strategic government agencies and project coordinators (holists) together in addressing local sustainability issues. The consistent pattern of responses found in all of those contexts is summarised in Box 2 and Figure 1. The marked differences between the social processes of the five sets of contributors to integrated sustainability decision-making were found to amount to five different constructions of knowledge.

The manager of an integrated sustainability assessment will need to be alert to the social processes that must be accommodated if the key contributors are to work together, in reaching an agreed assessment, and in acting on that assessment later. .

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## **Box 2. Dimensions of sustainability decision-making**

### **Resources needed for action:**

- Individuals: Confidence, trust, being heard.
- Community: Networking, personal contacts, sympathetic advice.
- Specialists: Funding for programs, support from community and government.
- Organisation: Negotiating strategies, legislation, common ground.
- Holists: Collaborative teamwork, linked regulatory and voluntary frameworks.

### **Sources of authority:**

- Individuals: Reflection on own experience
- Community: Shared experience, resources of government agencies, advice of experts they can trust.
- Specialists: Own power and authority through profession, discipline and research reputation.
- Organisation: Own power and authority through strategic plans, legislation, and power base.
- Holists: Case-by-case integrated project design and management, a firm sense of direction.

### **Timescale for effective action:**

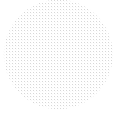
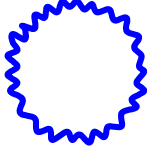

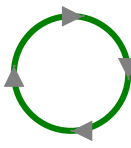

- Individuals: Timing within each person's power to act.
- Community: Action needed today, if not yesterday.

Specialist: Time to develop a sound research proposal, usually a year.  
 Organisation: Time to identify stakeholders, check the legislation, about 3 months.  
 Holists: Time to establish a coordinating agency, set up a multi-stakeholder meetings, depends on what is already in place.

Source: Brown et al 2001, Nicholson et al 2001, Aslin and Brown 2004)

Figure 1. contains a set of diagrams designed to represent the distinctive ways in which individual, community, specialised, organisational and holistic knowledges are constructed. Individual knowledge is multiple and varied, as in the scattered black dots. This form of evidence is drawn from each person’s lived experience, including their personal store of knowledge. Local community knowledge varies from community to community, but is stable and predictable within each community, as represented by the blue wavy line. The community evidence base is constructed from the stories and events its members have shared (Geertz 1983, Wynne 1995).

**Figure 1. Decision-making sectors, knowledge cultures, evidence and ignorance (Brown et al 2005)**

Knowledge cultures and content	Structure	Sources of Evidence	Assignment of Ignorance
INDIVIDUAL KNOWLEDGE Lived experience, identity		Memory Learning style Five senses	Subjectivity Narrowness Vagueness
LOCAL KNOWLEDGE Shared experience of people and place		Stories Events Histories	Gossip Anecdote Inaccurate
SPECIALISED KNOWLEDGE Mono, multi & trans-disciplinarity, the professions		Case studies Measurements Observations	Jargon False certainty Irrelevant Narrowness
STRATEGIC KNOWLEDGE Administration, government, organisations		Agendas Alliances Networks	Deals Mates Corruption
HOLISTIC KNOWLEDGE Essence, core of a system		Synthesis focus	Airy-fairy Impossible Ambiguous

Research workers remain oriented to their particular specialism, within their own frameworks (the ring of boxes). The evidence they collect on sustainability topics is validated by measurement and direct observation, according to the rules of their particular specialisation (Funtowicz and Ravetz 1990). Organisational knowledge is strategic, moving towards a given goal, hence the arrows. Government, the primary form of organisation contributing to sustainability assessment, constructs its knowledge from the interactions between policies, regulations and stakeholders' agendas. Evidence is collected towards the feasibility of different courses of action (Vickers 1972 Ralston Saul 1992).

Holistic knowledge provides the focus, aim or purpose of a complex enterprise (not as it is often misrepresented, knowing all about everything) (Smuts 1936). A collective understanding of a dynamic system such as local and global sustainability is achieved through dialogue between individuals, a common language and exploring the implications of paradox (Berlin 1979, Brown 2005). In practice, the different sets of knowledge can form segregated silos which continue to argue past each other.

Case studies of sustainability management by professions, communities and governments have identified both the strong walls of the silos, and a well-established hierarchy (Brown et al 2005, Keen et al 2005). The assigning of ignorance to each form of knowledge by their sister knowledges serves to maintain those divided relationships (Figure 1).

Research-verified specialist knowledge competes for supremacy with organisational strategic knowledge. Local community knowledge is becoming increasingly acceptable, but usually on sufferance and only as secondary evidence. Individual knowledge is belittled as anecdotal, and holistic knowledge is rejected altogether as either unrealistic, or pretentious.

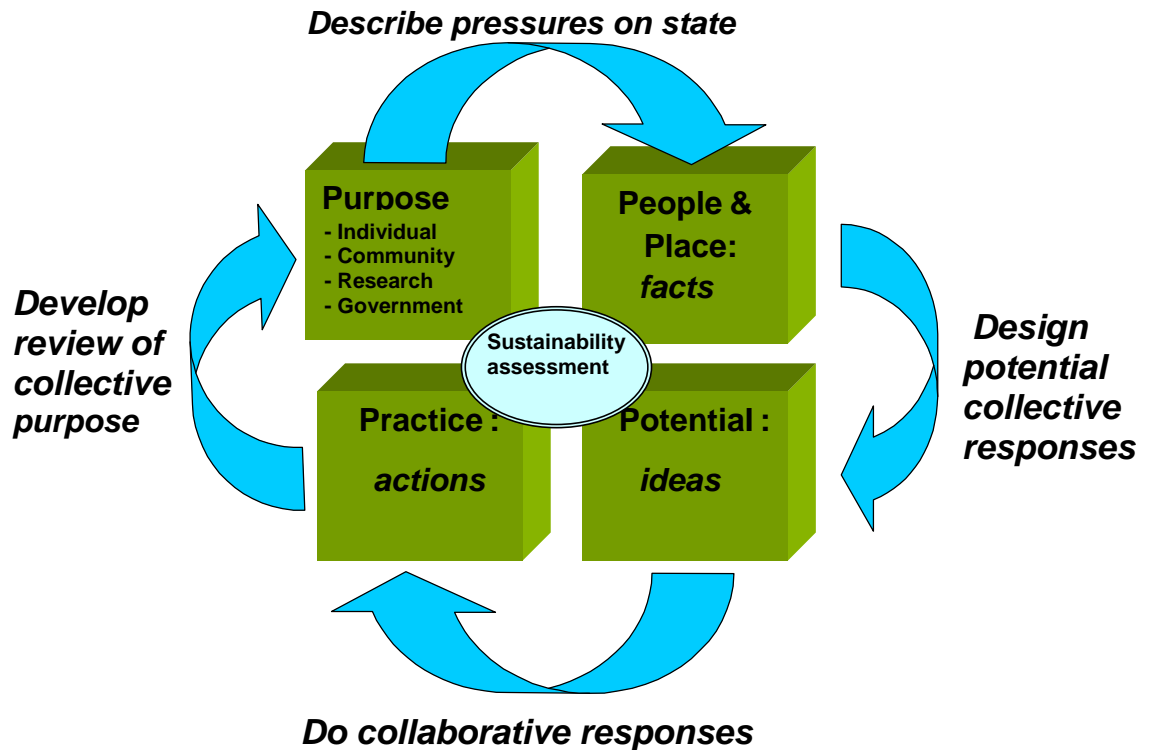
In successful cases of sustainability decision-making, the knowledge cultures have been relating to each other in a synoptic learning system, in which each learns from the other. The combined outcome is more effective than, but still inclusive of, the different contributions. The resulting sustainability assessment is not a lowest common denominator, but an over-arching solution which brings with it the collaboration of the full set of decision-makers. Examples range from the World Commission on Dams to strategic applications of the tools in Box 1.

## **Conclusions**

Given the differences between the knowledge cultures and the strength of the knowledge hierarchy in the Western construction of knowledge, the practical requirements of integrated sustainability assessment is no straightforward matter. Experience has shown that expecting the different knowledge cultures to agree, without a mediating social process, risks creating further conflict, rather than progress towards integration.

To apply the integrated sustainability tools in Box 1 requires the capacity for making effective integrated decisions. Such decisions require the fresh ideas of key individuals, community expectations of the future, the combined findings of relevant objective research, and an informed understanding of the government sustainability agenda.

**Figure 2. Integrative decisions-into-practice (D4-P4) in sustainability assessment: learning stages for combining knowledge cultures (Brown, 2005, Brown forthcoming 2005).**



Multidisciplinary specialised research is frequently represented as having the capacity to incorporate the other forms of knowledge. This is not only a category error, it serves to reinforce the compartmentalised knowledge hierarchy. By definition, evidence derived from research into the other knowledge cultures must be second-hand. Field-based examples confirm that no one form of knowledge can fully take the place of another in arriving at concerted decisions. .

Integrated knowledge management for sustainability decision-making is sufficiently different from current practice to require some affirmative action. The aim is to convert the compartmentalised knowledge hierarchy into a synoptic alliance. One social process which has been applied in local sustainability practice is the open-ended learning cycle (Figure 2) (Brown 1997, Aslin and Brown 2004).

Partners in the knowledge alliance contribute equally to each stage of the learning cycle (Kolb et al 1974). First they establish a common purpose (pressures on sustainability), then share the documentation of the condition of people and place (state of sustainability), followed by creating a rich pool of possible ideas and actions (potential

for change). The ideas are then tested by reviewing collaborative practice in the field (response). Such a social process follows the precedents already established for the Pressure-State-Response form of state-of-the- environment reporting, recommended to all industrialised countries by OECD 1993a, 1993b. It has here been expanded as a cross-cultural social learning process.

The Decisions-into-Practice learning cycle (D4-P4) has now been trialled in regional natural resource management (Aslin and Brown 2004), evaluation of local government progress towards sustainability (Griffiths 2004), and development of regional sustainability indicators (WSROC 2000). This supplies a possible integrative framework into which the wide range of transdisciplinary tools can be slotted into the relevant learning stages.

## **Bibliography**

Arrow, K., Bolin, B., Costanza, R., Dasgupta, P., Folke, C., Holling, C.S., Jansson, N. O., Levin, S., Mäler, K.-G., Perrings, C. and Pimental, D. 1995. Economic growth, carrying capacity, and the environment. *Science* 268, 520-1.

Aslin, H. and V. Brown. 2004, *Towards Whole of Community Engagement: a practical toolkit*, Murray-Darling Basin Commission, Canberra

AtKisson, A. 1999. *Believing Cassandra. An Optimist Looks at a Pessimist's World*, Scribe Publications Pty Ltd, Melbourne.

Bohm, D. 1996. *On Dialogue*, Routledge, London.

Brown, V.A. 2005. *The synergy of social transformations. A change agents' guide*. London. Earthscan. In press. (Check this is the current title)

Brown V. A. 2004, Sustainability Leadership in the Local Government Sector: Working from the inside out. in C.Hargroves, M Smith and J. Moody *The Natural Advantage of Nations*. Earthscan, London.

Brown, V.A. 2001. Monitoring Changing Environments in Environmental Health, in *Environmental Health*, vol 1, no. 1, pp 21-34

Brown, V.A. 1998. The Titanic or the Arc?, in *Measuring Progress: is Australia getting better?*, ed. R. Eckersley. CSIRO, Melbourne.

Brown, V.A. 1997. *Managing for Local Sustainability: policy, problem-solving, practice and place*. National Office of Local Government, Canberra.

Brown, V., Grootjans, J., Ritchie, J., Townsend, M. and Verrinder, G. 2005. Sustainability and health: supporting global ecological integrity in public health. Allen and Unwin. Sydney and Earthscan, London. Source for Figure 1, p 5,6

Brown, V.A. R. Nicholson, P. Stephenson, K.-J. Bennett and J. Smith. 2001. *Grass Roots and Common Ground: guidelines for community-based environmental health action*. Regional Integrated Monitoring Centre. University of Western Sydney, Canberra.

Checkland, P. 1993. *Systems thinking, systems practice*. Wiley, Brisbane, pp 214-221

Costanza, R. & Jorgensen, S. [eds]. 2002. *Understanding and Solving Environmental Problems in the 21st Century: toward a new, integrated hard problem science*. Elsevier, Oxford, UK.

Berlin, I. & Hardy, H. 1979. *Against the Current : essays in the history of ideas*. Hogarth Press, London.

Environmental Protection Authority Victoria, *EPA Victoria and Eco-footprint*, URL: < [www.epa.vic.gov.au/Eco-footprint](http://www.epa.vic.gov.au/Eco-footprint) > last viewed 5 August 2003.

Funtowicz, S. and Ravetz, J. 1990. *Uncertainty and quality in science for policy*. Kluwer Academic Publishers, Dordrecht, Netherlands.

Geertz, Clifford. 1983. *Local Knowledge*. Further Essays in Interpretive Anthropology. Basic Books, New York.

Griffiths, R. 2004. How shall we live? Case studies of introducing sustainability into the local government sector. Unpublished PhD Thesis, Richmond, University of Western Sydney.

Global Reporting Initiative, 2002, *Sustainability Reporting Guidelines*, URL: < [www.globalreporting.org/guidelines/2002.asp](http://www.globalreporting.org/guidelines/2002.asp) > last viewed 6 August 2003.

The Australia Institute, 2000. *Genuine Progress Indicator*. The Australia Institute, Canberra. Available from: [www.gpionline.net/index.htm](http://www.gpionline.net/index.htm) > viewed 14 December 2004.

International Institute for Sustainable Development, *Bellagio principles*, URL: < <http://www.iisd.org/measure/principles/1.htm> > last viewed 6 August 2003.

Keen, M., Brown VA, and Dyball, R. 2005. *Sustainability in environmental management*. Earthscan, London. In press.

Kington, E. and Littleboy, A. 2005. Integration and social processes: a review of challenges and best practice. CSIRO. Melbourne.

Kolb, D. A., I. M. Rubin and J. M. McIntyre. 1974. *Organizational Psychology: an experiential approach*, Prentice Hall. New Jersey.

Kuhn, T. S. 1970. *The Structure of Scientific Revolutions*, University Of Chicago Press, Chicago.

Lonero, E. E. 2002. *Local Government and the Johannesburg Summit*, International Council for Local Environmental Initiatives (ICLEI), Toronto.

McMichael, T. 2001b. *Human Frontiers, Environments, and Disease : past patterns, uncertain futures*, Cambridge University Press, Cambridge, New York.

Nicholson, R., P. Stephenson, V. A. Brown & Mitchell, K. [eds]. 2001. *Common ground and common sense: community-based environmental health planning*. Commonwealth of Australia, Canberra.

OECD (Organisation for Economic Cooperation & Development) (1993a). *The State of the Environment*. Paris, OECD.

OECD (Organisation for Economic Cooperation and Development) (1993b). *Core Set of Indicators for Environmental Performance Reviews*. Paris, OECD.

Oregon Progress Board, *Is Oregon making progress? the 2003 Benchmark Performance Report*, URL: < [www.econ.state.or.us/opb/2003report/Report/2003BPR.pdf](http://www.econ.state.or.us/opb/2003report/Report/2003BPR.pdf) > last viewed 5 August 2003.

Saul, J. Ralston. 1992. *Voltaire's bastards: the dictatorship of reason in the West*. New York, Free Press. cited p 6

Smithson, M. 1989. *The Changing Nature of Ignorance, and Managing in an Age of Ignorance, New Perspectives on Uncertainty and Risk*, J. Handmer. Centre for Resource and Environmental Studies, ANU, Canberra: p.5-66

Smuts, J. C. 1936. *Holism and Evolution*, Macmillan, London.

Soskolne, C. L. & Bertollini, R. 1998. *Global Ecological Integrity and 'Sustainable Development': cornerstones of public health*, WHO International Workshop, WHO European Centre for Environment and Health. Rome Division - Rome, Italy, 3-4 December 1998.

Statistics Sweden, 2001. *Sustainable Development Indicators for Sweden – a first set 2001*, Statistics Sweden

United States National Research Council. 1999. *Our Common Journey: a transition towards sustainability*, National Academy Press, Washington.

Vickers, G. [Ed.]. 1972. *A classification of systems*. Washington, DC: Yearbook of the Society for General Systems Research/Academy of Management Research.

von Weizsäcker, E., Lovins, A.B. & Lovins, L.H. 1997. *Factor Four: Doubling Wealth – Halving Resource Use* (A New Report to the Club of Rome). Allen & Unwin, St. Leonards, NSW.

Wackernagel, M. and W. Rees. 1996. *Our Ecological Footprint: Reducing the Human Impact on the Earth*, New Society Publishers, Gabriola Is, Canada.

World Bank. 2002. *Sustainability Report*, World Bank, New York.

World Commission on Dams. 2000. Dams and development: A new framework for decision-Making. The Report of the World Commission on Dams (released November 16 2000) <http://www.dams.org/report/> (accessed 6/12/2004).

World Commission on Environment and Development. 1987. *Our Common Future: report of the World Commission on Environment and Development*, Oxford University Press, Oxford, New York.

World Resources Institute, United Nations Environment Program, United Nations Development Program and World Bank. 1996. *World Resources 1996-97*, Oxford University Press, New York.

World Summit on Sustainable Development. 2002, *Health and Environment: supporting sustainable livelihoods*, Towards Earth Summit 2002. Social Briefing No 3 linkages, World Information Transfer. <http://www.worldinfo.org.2002>.

WSROC (Western Sydney Organisation of Councils). 2000. Western Sydney Regional State-of-the Environment Report 2000 Blacktown, WSROC

Wynne, B. 1995. May the sheep safely graze? A reflexive view of the expert-lay Knowledge divide, in Scott Lash, Bronislaw Szerszynski and Brian Wynne [eds]. *Risk Environment and Modernity. Towards a New Ecology*. Sage Publications, London.