Part I
Breaking Out of Traditions

Traditions are very important to a culture because they embed what has, over time, been judged to be useful practice. The risk for any culture is that a tradition can become a blind spot when it evolves into practice lacking any manner of critical reflection being connected to it. When a society stops looking back and no longer appraises the value of a set of practices it quickly becomes blind to the relevance of its origins, the circumstances which were current at the time, and which triggered the practice into existence. The upshot is that there are no longer processes which foster the ongoing modification of the practice as a result of what we experience in daily living. The effects of blind spots can be observed at the level of the individual, the group, the organisation, the nation or culture and in the metaphors and discourses in which we are immersed. Such has been the case with 'research' and 'development' in rural communities. What began as a wonderful idea has evolved into blind practice as a consequence of the loss of connectedness with its context, the very connectedness that gave meaning and thus relevance to its existence in the first place.

What follows is a critical account of a systemic learning and researching approach to rural research and development (R&D). This approach arose from the need both to respect and to challenge the traditions which had given rise to a particular rural 'research and development system' in the semi-arid rangelands of New South Wales, Australia. The issues which this approach addresses have relevance beyond this specific context as exemplified in the works of Robert Chambers (Chambers 1993, 1996) and others (e.g. Pretty 1995; Roling 1997; Roling and Wagemakers 1998). This is a story of a systemic action research project (Table I.1) that sought to appreciate how the relationship between the rural community and the community of experts might be differently, and hopefully more fruitfully, managed.

The experiences which gave rise to the research described here arose out of a shared concern that the existing practice of rural development, or agricultural extension, was not meeting the espoused needs of some of the key stakeholders involved. Specifically, the majority of the rural community were not experiencing the expected benefits and the funding bodies, particularly those in the public domain, were dissatisfied with the return on their investment. As is often the case, this pragmatic concern was matched by a keenly felt intellectual concern, namely, that the conceptual under-

Table I.1
The contrast between traditional action research (a first-order tradition) and systemic action research (a second-order tradition)

Traditional action research	Systemic action research
The espoused role of the researcher is that of participant–observer. In practice, however, the researcher remains 'outside' the system being studied.	The espoused role and the action of the researcher is very much part of an interacting ecology of systems. How the researcher perceives the situation is critical to the system being studied. The role is that of participant–conceptualiser.
Ethics and values are not addressed as a central theme. They are not integrated into the change process; the researcher takes an 'objective' stance.	Ethics are perceived as being multi-levelled as are the levels of systems themselves. What might be 'good' at one level might be 'bad' at another. Responsibility replaces 'objectivity' in a whole systems ethic!
The system being studied is seen as distinct from its environment. While it is spoken of in 'open system' terms, intervention is performed as though it were a 'closed system'.	It is the interaction of the system with its context (its environment) that is the main focus of exploration and change.
Perception and action are based on a belief in a 'real world'; a world of discrete entities that have meaning in and of themselves.	Perception and action are based on one's experiences of the world. Especially on the experience of patterns that connect entities and the meaning generated by viewing events in their contexts.

(Source: After Russell, 1986).

pinnings upon which practice was based were faulty. They were faulty because they simply did not work! Theory that does not nurture useful practice is not useful theory.

The principle notions that were the driving ideas behind the movement for externally funded rural R&D were that 'best' knowledge and practice can be clearly articulated and that it can be effectively disseminated via a process of education. The implication is that the entire community will thus benefit through improved sustainability of the enterprises, increased production, and higher standards of living. Lived experience has confirmed that there is much that is obviously valid and useful in these principles. It is as though they worked but only up to a point. Over a period of forty years considerable effort was expended in an attempt to make the system more effective. Strategies included field-days, farmer groups and the involvement of farmer representatives on decision-making bodies, all of which resulted in little or no obvious improvement. Such was the general disillusionment of government agencies that this particular study had its origins in a political climate characterised by the dominant theme of: *any further expenditure on rural extension or rural development would be a waste of money.* This political climate was not confined to Australia, as examples in Chapter 1 demonstrate.

The conclusion of the research team prior to launching this work was that the existing system had gone as far as it could go and that 'more of the same' would not be of much use. Change which is 'more of the same' we shall call first-order change. The question that was left begging from an earlier 'critical review' of the overall situation was: perhaps we cannot see what the problem is because we cannot identify our own blind spots (Russell *et al.*, 1989). In technical terms, it is only when we step out of the system that we can begin to see the system from another perspective or from another level. The implication is that the other perspective or other level has a different rationale or basis for its existence. Change from this perspective we describe as second-order change. It is change which modifies the whole system.

The dominant tradition which gave rise to this situation we shall describe as the first-order tradition. This has been very powerful because of the manner in which it has shaped the actions of individuals, organisations and their structures, technology and the very language chosen to make sense of doing rural research and development. For this reason we will use the term R&D as a noun to break away from the traditions typically associated with 'research' and 'development'. We do so because models of understanding of 'research' and 'development', as with all models of understanding, grow out of a *tradition* – a network of prejudices (literally understood as a pre-understanding) that provide possible answers and strategies for action. Notions of what constitute both research and development are widely and firmly held in the community at large and by practitioners. This is why we choose instead to talk about R&D.

Having accepted that the traditional practice (including its underlying theoretical principles) had failed the pragmatic test: 'Does it work well-enough to keep doing it?', the challenge of designing and evaluating a more appropriate set of practices remained. What followed was three years of R&D by a group of 'systemic action researchers' concerned initially with exploring the context of their research and then linking themselves (by espousing a rationale of mutual benefit) to a community of wool growers (known as 'graziers') in the semi-arid rangelands of Australia.

The region in which this research was conducted is the Western Division of New South Wales, Australia. In 1990 there were 314 'establishments' in the NSW Western Division, a region totalling 32.5 million ha or 42 percent of the state of NSW, and 9.1 percent of the total area of semi-arid rangeland in Australia. The part of the Western Division in which our research was based covered 17 600 km^2 and included 45 properties, aggregated into 33 holdings (Figure I.1). Properties or 'stations' thus averaged *c.* 40 000 ha or 53 500 ha per family unit although these data mask the range in property

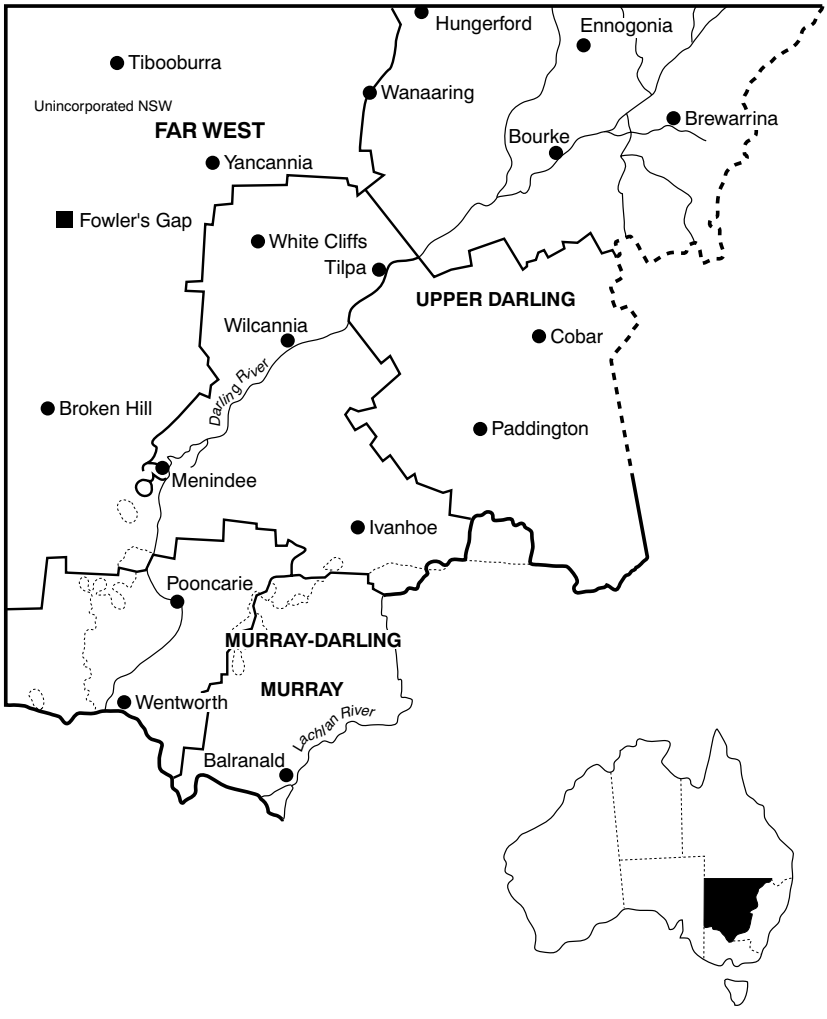

Figure I.1
A map of the Western Division of New South Wales and its location in Australia.

sizes. Estimates in the early 1990s suggested an economically viable property in this region needed to carry between 6000 and 9000 merino wool producing sheep. This figure is however highly variable depending on international commodity prices. The main agricultural product of the region is merino wool, described locally as 'middle micron' wool, indicating a fibre diameter in the range 22 to 26 microns. The Fowler's Gap area in which the research was centred, experienced a severe 'drought' – a natural and common phenomenon – for over two of the three years of this research

project which, when combined with very low wool prices, produced a state of crisis for most graziers in this region. Road travel in the area was on unsealed roads made impassable by more than 10–15 mm of rainfall.

This R&D project resulted in an alternative design for rural development and all that is entailed in developing and sustaining mutually beneficial relationships between the so-called experts, the respective government bodies, and the primary producers themselves. Thus the book is a also a description of our attempts to break out of a first-order tradition and to design ways of doing rural R&D within a different tradition. This different tradition we shall call a second-order tradition. The major characteristic of this tradition is the continual attempt by researchers to be *aware* of their traditions of understanding.

As authors our collective concern has been with exploring, from a range of perspectives, the distinctions we make between first and second-order traditions. Heinz von Foerster (1992) highlights the profound implications of these distinctions when he says: 'Am I apart from the universe? That is, whenever I look am I looking through a peephole upon an unfolding universe [the first-order tradition]. Or: Am I part of the universe? That is, whenever I act, I am changing myself and the universe as well [the second-order tradition].' He goes on to say that 'Whenever I reflect upon these two alternatives, I am surprised again and again by the depth of the abyss that separates the two fundamentally different worlds that can be created by such a choice: Either to see myself as a citizen of an independent universe, whose regularities, rules and customs I may eventually discover, or to see myself as the participant in a conspiracy[2] whose customs, rules and regulations we are now inventing.' It is the response of a researcher or practitioner to this question that creates for us the distinction between action research (a first-order tradition) and systemic action research (a second-order tradition) (Table I.1). It is when what is done at any moment in privileging something and marginalising the other, without awareness, that one is operating in a first-order tradition. It is important to emphasise that both first and second-order traditions are modes of *doing* R&D, not labels for 'a tradition'.

An attempt to appreciate, or explore, one's context is one means to break out of a first-order tradition. Ison and Blackmore (1997) point out that an approach to dealing with complexity is to stand back from the apparent

2 / Von Foerster is of course using conspiracy here in the sense that has now been almost lost – to act in combination or to contribute jointly to a result. From its etymological roots it might also be defined as to breathe together and to bring forth the spirit, in a metaphorical sense.

issue and explore the wider context before inviting stakeholders to participate in a process of formulating and reformulating problems and opportunities or 'systems of interest'. At issue here is whether one is aware that all R&D is sensitive to its initial starting conditions and its on-going mode of practice.

At the start of our research it was possible to recognise three potential streams of inquiry which we felt it would be necessary to pursue if we were to fully appreciate our context. These were explorations of: (i) the traditions which have given rise to our very conception of rangelands, rangeland management and rangeland science (Chapter 1); (ii) the traditions which give rise to the meanings we give to human communication, and from this to information, knowledge and human understanding (Chapter 2) and (iii) the traditions which give rise to concerns about the lack of technology adoption and the common notions of technology transfer and the diffusion or trickle-down of innovations (Chapter 3). Chapters 1–3 explore what these traditions reveal and conceal and lay the theoretical groundwork for breaking out of existing traditions.

Technology has had a powerful influence in the design of what we distinguish and experience as rangelands. This is very evident from the technological trajectories within the 'Western Division' of NSW, as these semi-arid rangelands are sometimes called (Chapter 4). Not only do the rangelands arise out of traditions in understanding and technology but also the organisations which have been formed to research and develop the rangelands. This is revealed in Chapter 5, a case study based on the main organisations operating in the NSW rangelands over the three-year period of our project. What this story reveals, however, has more widespread relevance than just the semi-arid rangelands of NSW.

This book, and the research on which it is based, is constructed around the experience of the editors and the authors who were all involved in the project. It is the experiential history of practitioners and researchers which informs all action yet when this action is reported it is usually done so in a way that excludes this history from the conversation. We think it is important to bring this back into the conversation because it is one of the most important aspects of understanding or appreciating a context (Chapters 3 and 6). Recent R&D approaches, whether under the banner of 'farmer first', 'farming systems research' or whatever have focused our collective attention on the need to appreciate context in the R&D process. We suggest, however, that insufficient attention is still paid to the context of the researcher or development manager. By this we mean the traditions out of which they think and act.

A number of key concepts are at the core of our attempts to break out of the dominant, first-order tradition. Our central concern has been with the

emotion of *enthusiasm,* and how this might be developed as both an organising concept and a methodology. This is explained in Chapter 6. Our research design for triggering enthusiasm was built around the experiential model of doing science proposed by the Chilean neurobiologist and epistemologist, Humberto Maturana (see Maturana and Varela, 1987). We know of no others who have used this model to conduct 'social research'. In Chapter 7 we describe in more detail how we went about our research to ellicit enthusiasms for R&D action. Our intention has been to avoid recipes to follow but rather to ground our work and enable an appreciation of the care and detail for process design that is required for this type of R&D.

As is most often the case there is often a disparity between design and realisation – any systemic action research over a three-year period almost inevitably will produce a rich and somewhat unfinished story. 'Rich' because of the contrasting needs of the respective groups and 'unfinished' because of the exploratory nature of the task. This richness can be conveyed in a number of ways, and as is increasingly the case, it is necessary to evaluate or judge actions from a number of perspectives. Different stakeholders will judge from different perspectives. The graziers who became our co-researchers based on their enthusiasms, describe their experiences of this way of researching in Chapter 8. For some, but not all graziers, we had designed a context where they were able to respond and ultimately to see themselves as 'researchers'.

Finally we are concerned with exploring what it means to break out of a tradition, what forms of rural R&D might be possible within this different tradition and how might we develop the skills to do this type of R&D (Chapter 9). A 'person specification' for a position in South Africa which combines the elements of what we see as being necessary to both build and utilise capacity for addressing rural R&D problems is shown in Figure I.2. This particular combination of abilities matches well what we envisage will be needed to move the R&D system more towards a second-order tradition whilst retaining the strengths of the first-order tradition.

Clearly there were strengths and limitations to our research, but what have we learnt from the experience and how has it informed what we have done since? What do we aspire to do in the future? We re-emphasise our claim for greater critical reflection on practice. As professionals, researchers, activists, facilitators, managers, academics and learners the challenge we face is to recognise and 'design' contexts which provide the capacity for effective response by stakeholders. However the question we must ask is how would we know the capacity for effective response when we see it? This is not a question of empowering the individual or enabling the individual to participate; for us it is the emergent relationship between

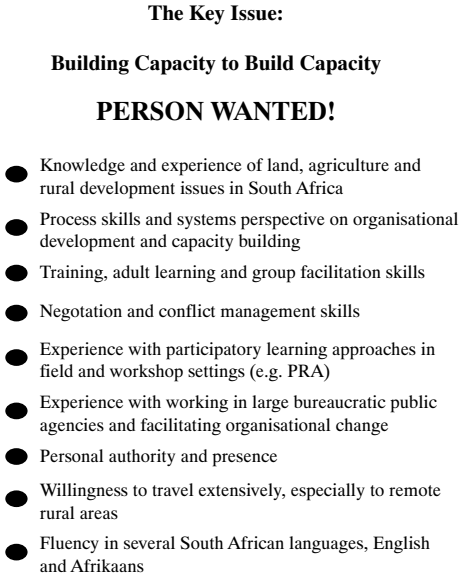

Figure I.2
Person wanted! A possible person specification for delivering R&D within a second-order tradition. (Courtesy of Ian Scoones and derived from a South African National Rural Development Forum advertisement in the Weekly Mail in June 1994 and a request from the Department of Land Affairs, November 1994.)

the enthusiasm of the individual and any consensus which is generated responsibly and accountably by a collective (Chapter 9). These are of a different level or order and thus do not represent a dualism, an either/or, but a duality, a unity (see Chapter 1).

In our research we learnt that enthusiasm was something that could be triggered, and that where there was enthusiasm there was action which was meaningful to that individual. We also learnt that processes which lead to consensus can get in the way of enthusiasm – there was loss of emotional energy for action. This is often experienced in relationships subject to repeated compromise. Based on this experience it would be easy to see enthusiasm and consensus as opposites, as belonging to the same logical level and forming a dualism. The logic behind this relationship or dialectic is negation. This we suggest is a trap. In contrast it is possible to see enthusiasm and consensus as belonging to two different levels such that one emerges from the other. The logic behind this dialectic is self-reference. This is exemplified by considering the pair predator/prey from ecology. They do not operate as opposites but generate a whole, a unity or an autonomous ecosystem where complementarity, stabilisation and survival are common values for both.

Thus we wish to ask more than just the question: How would we know the capacity for effective response when we see it? We wish to explore what

a possible R&D system might be that retained some of the strengths of the first-order tradition but which explored and developed some of the opportunities presented by moving more of the overall R&D system towards the second-order tradition. The system we imagine would pay greater attention to project formulation – systems to express demand, to use a now common metaphor – systems of process consulting, novel systems of evaluation, and a rich array of co-researching activities. Any move in this direction would challenge many individuals and organisations, not least being higher education in which we are both engaged.

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1 The research–development relationship in rural communities: an opportunity for contextual science

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1.1 Introduction

This chapter argues for a contextual grounding for research and development (R&D) in rural communities. The history of science reveals many examples of how science has failed to recognise its context. So, what is context and how does one recognise it? It would be all too easy to answer these questions by simply adding social and political insights to the science equation. (What is necessary is that we look at the bigger picture!) Almost always, the bigger picture is nothing other than more of the same.

In this chapter we explore how our understanding of R&D is developed and how our understanding of 'change' is constructed. We are proposing what we believe to be a critical distinction based on the perceptions and actions of the researcher. In **first-order R&D**, which remains most common, the researcher remains *outside* the system being studied. The espoused stance by researchers is that of *objectivity* and while the system being studied is often spoken of in *open system* terms, intervention is performed as though it were a *closed system*. Perception and action by researchers and those who manage and maintain the R&D system are based on a belief in a *real world*; a world of discrete entities that have meaning in and of themselves.

In contrast to this tradition we stress the need for a **second-order R&D** in which the espoused role and action of the researcher is very much part of the interactions being studied. How the researcher perceives the situation is critical to the system being studied. *Responsibility* replaces objectivity as an ethic and perception and action are based on one's experiential world rather than on a belief in a single reality 'real' world. There are of course implications in any move towards a second-order R&D, not least of which are the forms of behaviour and organisation that might be required by, and for, a future cadre of 'researchers'. This is taken up specifically in Chapter 9, but much of the rest of the book is concerned with doing or moving towards second-order R&D.

1.1.1 *The global R&D system*

In his study of how scientists and engineers go about their work, Bruno Latour (1987) demonstrates with some simple statistics that those who call themselves scientists and engineers make up only a small proportion of the people interested in the generation of 'new knowledge' within the 'R&D