Draft for Chapter 7 of

**Interdisciplinarity**

*The true voyage of discovery consists not in seeking new lands, but in seeing with new eyes.*

Marcel Proust (1934) *Remembrance of things past.*

*You must become an ignorant man again And see the sun again with an ignorant eye And see it clearly in the idea of it*

Wallace Stevens (1942) *Notes Toward a Supreme Fiction*

**The bones of the problem**

I have made some rather large claims for interdisciplinarity. In chapter 2 I suggested that interdisciplinary enquiry can involve the kind of contestation that opens up new and critical understandings, as accepted ideas and identities are challenged. In the last chapter I argued that activity that is interdisciplinary can provide an opportunity for academics from different disciplinary backgrounds to learn from each other about their academic practice. Moreover, if the university is to relate to the wider society that it serves, then it must engage across the boundaries between disciplines as well as the boundaries between higher education and that wider society. In these ways, at least, the enquiring university needs and welcomes interdisciplinarity. Crossing boundaries is an important feature of the enquiring university that is engaged with the wider society it serves.

But such claims need careful consideration. What exactly is meant by interdisciplinarity in this context, how (if at all) is it possible and under what circumstances does it lead to critical questioning? While interdisciplinary enquiry sounds very well in theory, can it work in practice? How can interdisciplinary work be enriched by the variety of its disciplinary languages rather than degenerate into a Tower of Babel as competing disciplinary perspectives fail to understand, or even listen to, each other? These are the kinds of questions I shall now explore.

Davidson (2004) draws our attention to a legal wrangle that is ‘an enlightening example of interdisciplinary debate’ involving conflicting values in interdisciplinary engagement (p. 299). This wrangle is worth exploring in some detail as it highlights, in a somewhat dramatic form, some of the difficulties to be encountered when different disciplinary positions clash.

In July 1996 a skeleton, estimated to be 9200 years old, was discovered near Kennewick in the state of Washington. Reported in the *New York Times*, it was claimed that the Caucasoid nature of these remains added credence to theories that some early inhabitants of North America came from European stock. Further investigation of the remains was needed to confirm this idea.

Native Americans saw it differently. If this individual is truly over 9000 years old, they argued, it only substantiates the theory that the skeleton is of a Native American, rather than a European. From their oral histories they know that their
people have been part of the land since the beginning of time. They reject the claim of some scientists, that if this individual is not studied further, they, as Indians, will be destroying evidence of their own history. As Native Americans, they already know their history. It is passed on to them through their elders and through their religious practices (Egan 1999). They don’t need scientists to tell them.

Rebecca Tsosie, a professor of law who serves on the Supreme Court of Justice for Fort McDowell Yavapai Nation Supreme Court, rejected the scientists’ hypothesis saying: ‘It would be only too convenient to find that Native Americans are merely another 'immigrant' group with no special claim to lands within the United States’ (Lee 1999). Indian understanding of the past has been disadvantaged in other ways, Tsosie said. She calls scientists ‘secular priests’ in a culture driven by values of knowledge and progress, and argues that Indian oral traditions and beliefs don’t have to bow to science. If the controversy boils down to a disagreement over who settled America - and that shows no hope of ever being resolved, even by scientists who disagree on what ‘evidence' counts - then presumably Native American theories on this should be entitled to as much weight as scientific theories, Tsosie said. For ‘western science,’ according to Tsosie, ‘gives us a way of knowing the world, a noble goal, but it's not the only way to establish something as the truth.’ (Wilford 1999)

American courts debated the question of whether or not the bones should be excavated by archaeologists against the wishes of the native Indian groups who claim the right to protect the final resting places of their ancestors.

After nine years and several court rulings, the bones are (at the time of writing) in a Seattle museum, and scientists have been permitted to study them since a court ruling of 2004. But at a Senate Indian Affairs Committee hearing in July 2005, it was still not finally decided whether a genetic link would have to be established between Kennewick man and present day native American Indians in order for them to be turned over to the Indians for burial (Blumenthal 2005).

As in many interdisciplinary disagreements, the difficulty of resolving the competing claims of the scientists and the Amerindians is reflected in the different meanings given to the terms of the debate. The perception of the indigenous tribe that they had always been there is not necessarily inconsistent with the claim of the DNA specialists that a migration had occurred. The ‘populations’ and ‘races’ of the scientific account, is not the same as a ‘people’ of oral history. Indeed, the very statement that ‘our people have always been part of this land’ is a complex assertion of identity that actually has little to do with DNA and matters of migration. Nor is the relationship between DNA and race agreed. From the Indian point of view, even if archaeologists were to establish that the bones were of Caucasian origin (as determined by DNA), this would not be inconsistent with their being Indian. Scientific knowledge would therefore have nothing new to offer them and thus could not justify disrespecting their ancestors.

Now what we have here might be seen as a contest between two cultures, or between two epistemologies. Drawing on Foucault’s idea of a ‘regime of truth’, disciplines may be seen ‘essential structures for systematising, organising and embodying the social and institutional practices upon which both coherent discourse and the legitimate exercise of power depend’ (Lenoir 1993: 73).
According to a definition such as this, the oral historians of Indian America and the
scientists might be seen as representing different disciplines. The problem is how are we to adjudicate between their different accounts and claims?

**Interdisciplinary dispute**
The idea of interdisciplinary collaboration, or interdisciplinarity, in this case, seems to be at least somewhat problematic. It is difficult to see how the court could have reached a decision without giving preference to either the Amerindian or the archaeological set of structures. What seemed to be at stake here was not just a decision about a collection of bones, but a world view.

Richard Dawkins, Professor of the Public Understanding of Science at Oxford University (UK), was critical of the sympathy which had been given in U.S. for the Amerindian claims regarding their ancestry and the sacredness of the bones. He views this as a consequence of a ‘voguish fad’ which holds science to be ‘only one of many cultural myths’ (Dawkins 1998:18-19) which had no special claim over Amerindian oral history. It is worth bearing in mind, however, that the ‘voguish fad’ that science provides only one way of understanding, or ‘storying’, the world (and thus of deciding upon the significance of the bones) resonates well with the writings of many scholars including some, such as Rorty (1982) and Feyerabend (1975) who have had a particular interest in the philosophy of science.

My purpose here is not to argue for one side or the other in the dispute over the bones, or over the wider question of whether scientific method is universal or culturally specific. Rather I want to acknowledge, at the outset, that discussions of interdisciplinarity raise questions not only about difference in areas of expertise and knowledge, but about the difference in the very nature of what counts as a claim to knowledge or expertise. Dawkins’ ‘voguish fads’ and ‘cultural myths’ are typical of the terms of abuse that signify the ‘culture wars’ and a breakdown in understanding across disciplinary boundaries, rather than a struggle for critical interdisciplinarity.

One does not need to look at such a dramatic case as the bones of Kennewick man in order to see such interdisciplinary strife. Drawing upon his book *The Two Cultures* (Snow 1959), C. P. Snow argued in his 1959 Rede Lecture that there was a gulf of mutual incomprehension between literary intellectuals and scientists. Things have changed since 1959. With university research funding now increasingly directed towards science and technology, power within university culture is more strongly concentrated in the sciences rather than the humanities. Thus, in his 2005 Reith Lecture, Sir Alec Broers – a prominent engineer and past Vice-Chancellor of Cambridge University - was able to claim ‘the triumph of technology’ (Broers 2005). However, any claim that the gulf of incomprehension has been bridged by this Reith Lecture, has been rejected by some (Raffle 2005).

Where interdisciplinary dispute is as extreme as in the story of Kennewick Man, and the ‘regimes of truth’ are so far apart, how can some accommodation be made? If, as Lenoir suggests, we understand disciplines to have their own legitimating structures, then the only approach to resolving the issue is with reference to some further, superordinate, set of legitimating structures to which both parties would consent. But this would amount to an appeal to, or the creation of, a new discipline rather than a case of interdisciplinarity.

The story of Kennewick Man certainly presents a somewhat extreme case. But even where there is no disagreement about the fundamental status of scientific reasoning, reaching consent across disciplinary boundaries can be difficult. In a
study of the emergence of the interdisciplinary field of chemical engineering in French higher education, for example, the coming together of the two constituent disciplines, chemistry and engineering, involved a passionate ‘war of words’ (Detrez and Grossetti 1998). Significantly, in a later reflection upon this development and that of other cross-disciplinary engineering fields, Grossetti showed how interdisciplinary struggle was part of the process by which computer science and speech sciences also emerged to become autonomous disciplines (Grossetti 2005). Indeed, he suggests that the process of interdisciplinary engagement in science is a natural part of the development of disciplines. It expresses the critical and dynamic nature of disciplinary life. Disciplines, from this perspective, are not so much fixed ‘regimes of truth’ but dynamic systems whose boundaries shift as research (and teaching) from different fields is drawn into new relationships in order to respond to new social needs.

This coming together of different disciplines to produce new disciplines is not only possible in the sciences. In the case of feminist scholarship and women’s studies, Pryse (1998) argues that when interdisciplinarity combines the insights of two or more fields of study it can produce new fields. She goes on to argue that such new fields bring to visibility previously suppressed knowledge. While her concept of ‘suppressed knowledge’ is perhaps peculiar to a particular feminist (rather than, say, Freudian) theory, the idea that interdisciplinarity can lead to new forms of knowledge is not uncommon in the humanities as well as the sciences.

This view seems to support that of the philosopher Heidegger (1977) who, in a short essay arguing the need for reflection on the inner dynamics of contemporary science, points out the mysterious way in which science depends on both disciplinarity and interdisciplinarity.

It appears, then, that when disciplinary cultures intersect, their differences may be irresoluble and collaboration impossible; or they may experience difficulties which can be overcome, and they may eventually lead to new fields of enquiry or disciplines. As with many intellectual endeavors, the difficulty involved in bringing together different disciplines – either to form a new field or simply to work on a specific project – can be a measure of the significance of the collaboration. The most valuable innovations in academic (as in many other areas of) life are often the most hard won. Interdisciplinary work, as Martin Mueller put it, from his perspective as a literary critic, is most difficult but also most productive when it involves the collision of strongly articulated disciplinary ethnicities (Mueller 1989).

Despite – and perhaps largely ignorant of - the difficulties involved in bringing together different regimes of truth, or strongly articulated disciplinary ethnicities, the term ‘interdisciplinary’ has become a buzzword in universities over the last fifteen years or so.

This enthusiasm for interdisciplinarity often emphasises the value of bringing together different kinds of knowledge and skill, usually in order to solve a problem. The Genome Project is often seen in this light. The accounts of institutions keen to demonstrate that they are at the leading edge of problem solving research, also display a commitment to interdisciplinarity. The problems, however, are often viewed primarily in terms of the management of intellectual resources. Interdisciplinarity (and multidisciplinarity and transdisciplinarity – the difference is rarely explained) is seen as contributing to the expansion of knowledge and the need for universities to provide for the economy by directing its research towards
practical problems. Thus, for example, a programme of an international conference held by the Canadian Association of Graduate Studies (CAGS 2005) emphasised that training in transdisciplinary research is vital to the promotion of innovation for social and economic advancement. This is part of a wider concern for collaboration, particularly in the sciences, that has developed since at least 1993 (Smith 2001: 137).

**Multi-, inter- and trans-disciplinarity**

There are many different terms used to describe different kinds of work between disciplines, but little articulation of what these terms mean. While ‘interdisciplinary’, ‘multidisciplinary’ and ‘transdisciplinary’ are common enough, ‘pluridisciplinary’, ‘cross-disciplinary’ and ‘meta-disciplinary’ also appear in the literature. Given that there is also intense debate about the significance of the term ‘discipline’, this multiplicity should warn us that there is much confusion amongst the enthusiasm with which these matters are addressed. Some attempt to distinguish between how the various terms might be used might help in clarifying the situation and attempting to be realistic about the potential of such innovation.

There appears to be no generally agreed definition of how the prefixes ‘inter’, ‘multi’ and ‘trans’ are used in this context. In the following summary I shall try to make some helpful distinctions, bearing in mind that any actual project or development is likely to have elements of each.

Multidisciplinarity and interdisciplinarity can be viewed as two ends of a continuum. At one extreme, multidisciplinary work is perhaps the simplest in its realization and conceptualization. It involves different disciplines working side by side in relation to a shared problem. The tasks involved in addressing the problem can, in principle at least, be divided up between the disciplines involved. While there will be some need to co-ordinate the separate activities involved, the assumption is that each discipline contributes from its own expertise on its own aspect of the problem. While those working in such a multidisciplinary team may learn something of the work of the other disciplines involved, their own expertise is not challenged and nor would they challenge that of other disciplines. Thus the fundamental concepts of each discipline, its normal practices and methods are largely unquestioned by those in the collaborating disciplines. Respect for disciplinary expertise is a fundamental prerequisite of multidisciplinary teams.

The difficulties involved in such collaboration are primarily ones of managing the co-ordination of tasks and boundaries between them, rather than disputing disciplinary assumptions. While different disciplinary cultures are involved, the assumption is that these differences can be managed through the separation of responsibilities in which professional boundaries remain, as far as possible, uncontested. Such multidisciplinary collaboration is common in professional groups involving health and social work. For example, nurses, social workers, general practitioners and psychotherapists address such problems as the rehabilitation of stroke patients in multidisciplinary teams (SIGN 2002).

At the other end of the continuum, interdisciplinary collaboration takes place where the problem is not divisible. It is investigated, as a whole, from the standpoints of the different disciplinary perspectives. This naturally leads to a range of different theoretical positions and underlying assumptions which need to be challenged and negotiated between the different disciplinary perspectives. Elsewhere in this book I have used the term ‘critical interdisciplinarity’ to draw attention to this feature of
challenge and negotiation that is distinctive here, rather than in multidisciplinary work.

The term ‘critical interdisciplinarity’ appears to have been pioneered by Kroker (1980), a scholar of Canadian Studies and later related to Critical Theory (Horkheimer 1972). In relation to the study of higher education specifically, it was developed by Barnett (1997). These rather different accounts all emphasise the dialectical and reflexive nature of critical interdisciplinarity that takes place when different disciplinary approaches contest each other’s assumptions and ideological underpinnings. In the context of the theme of this book, critical interdisciplinarity is thus seen as a site of contestation between different perspectives in the attempt to come to new understandings.

Interdisciplinary work therefore often raises difficulties at the level of language and concepts. The idea of ‘a people’ in the Kennewick Man case meant one thing to the archaeologists and another to the Indian community. In interdisciplinary research (and teaching) even more fundamental terms become contested. One such term is ‘evidence’. The concept of evidence is arguably the most fundamental concept in all disciplinary enquiry. As the philosopher Jeremy Bentham pointed out, ‘the field of evidence is no other than the field of knowledge itself’ (Bentham 1810: 2). What counts as evidence, and how it is valued, varies across disciplines. Thus, for example, in health policy the randomised control trial (RCT) provides the ‘gold standard’ of evidence, while the particular case is viewed as merely anecdotal and of little evidential value. For a historian, on the other hand, no such trials are possible, evidence is invariably a particular event, document or artefact. The different ways in which the concept of evidence is approached is often therefore at issue in interdisciplinary work.

Problems concerning the different meanings and uses of ‘evidence’ and ‘facts’ in different fields of enquiry are the subject of considerable research. A research project at the London School of Economics (LSE 2003) focuses on how well evidence travels between and within disciplines and examines why evidence considered acceptable in one context retains or loses its status as evidence in another. Another, at University College London (UCL 2003), addresses the issue by attempting to advance a conceptual and methodological framework for a Science of Evidence, or Evidence Science. According to Schum (2001), evidence, and the ways it is handled, shares certain common features regardless of the phenomena to which it relates. Where this is so, it would certainly facilitate interdisciplinary enquiry.

Advancing this idea further, Twining proposes a ‘field’ of evidence as a multi-disciplinary field in its own right, although it might be closer to the term ‘interdisciplinary’ as I am using it. Significantly, he finds the term ‘Evidence’ preferable to ‘Evidence Science’, ‘for the latter might carry some association with the dubious idea of disciplinary “autonomy”’; it may also suggest that the subject belongs to the “hard” more than the “soft” disciplines, rather than at their interface (Twining 2003: 1). Moreover, if the term ‘science’ is appropriate in this context, it presumably means science in the widest sense of sustained intellectual enquiry, rather than in the narrower sense that is applied to the natural sciences. A possible confusion here arises because the term ‘science’ in the English language is often distinguished from arts and humanities. In most continental European languages, however, ‘science’ has the wider meaning of disciplined enquiry.
The interest (and funding) which has been directed towards the interdisciplinary possibilities of evidence arises from a perceived social need. Terrorist outbreaks in a number of countries gave prominence to the importance of evaluating intelligence (as a form of evidence) from different sources and different disciplines; policy makers in a range of professional fields are increasingly advocating ‘evidence based policy’; new technologies such as DNA identification give rise to evidential questions. Such developments all point to the need for ways of assessing evidence which draws upon different disciplinary perspectives.

Grossetti (2005) claims that new disciplines often emerge as a consequence of interdisciplinary activity in response to a social need. If he is right, and if the current interest in evidence (or evidence science) develops, it is possible that evidence science does indeed become a new discipline with its own disciplinary autonomy. But whether such autonomy would be ‘dubious’, as Twining suggests, might depend upon whether it maintains its dynamic as a consequence of continued engagement with its bordering disciplines.

A difficulty which arises in any discussion of disciplines and interdisciplinary research concerns the disciplinary status of the discussion itself. How is one to make a judgement about any single discipline except from a disciplinary standpoint? This problem is acknowledged by Messer-Davidov (1993) in the introduction to her edited collection on the history and critical study of disciplines. She acknowledges that the studies in the volume are from the discipline of historical and critical studies. It is therefore not surprising to find the accounts of the disciplines that are offered all take the broad view that disciplines emerge as social or cultural phenomena and that epistemological differences are consequent upon social formations. A philosophy of the disciplines, on the other hand, is likely to foreground the epistemology as the defining feature of a discipline.

This theoretical difficulty has very practical consequences in interdisciplinary collaboration. Difficulties in reaching agreement about, say, how evidence should be treated, or what should count as significant evidence, are often difficult to resolve because even where participants are prepared to adjust their own disciplinary perspective or standpoint, one has to adopt some standpoint. It might be thought that the standpoint to adopt would be the one that is most appropriate to the problem to be addressed. However, different disciplines reflect different interests and therefore different formulations of the problem. This is why interdisciplinary projects typically involve an extensive negotiation (and sometimes break down over differences) about the nature of the problem that is being addressed.

Difficulties of this sort can lead to a third version of work across disciplinary boundaries: transdisciplinarity. Transdisciplinary approaches are based upon the idea that the very concept of the discipline is itself inappropriate, is outdated, or is a device to preserve special interests. Some feminist writers (such as Salvaggio 1992) view disciplinarity as a gendered and oppressive construction to be ‘transgressed’. Others have argued that disciplines are an academic form of knowledge which is inappropriate for collaboration on real problems. Gibbons et al (1994), for example, recommend new forms of knowledge – which they call Mode 2, rather than Mode 1, knowledge – which emerge in a context where collaborative university research engages with problems which are situated in the world outside academia.

The value of the transdisciplinary approach is that it emphasises the crossing of boundaries and leaving behind of familiar disciplinary structures and conventions. It
also emphasises the importance of open mindedness in research which is innovatory and involves working with new people in new ways and on new problems. Conciliation – rather than contestation – becomes important as attempts are made to reach out across disciplinary boundaries.

The danger, however, is that, in seeking to avoid interdisciplinary contestation, transdisciplinarity can lead to the collapse or denial of the forms of critique that characterize the disciplines. It is as if the lowest common denominator is sought in order to reach consensus, rather than facing the challenges of disciplinary difference. For this reason such an approach may lack the depth of interdisciplinary work.

A transdisciplinary approach is inclined to view the disciplines as static structures whose boundaries need to be overcome, rather than dynamic structures which grow and change through engagement across disciplinary boundaries. From a transdisciplinary (Mode 2) perspective, the disciplines represent disciplinary rigidity. From the perspective of critical interdisciplinarity, however, transdisciplinarity lacks disciplinary rigour.

C. P. Snow (1959) uses the metaphor of Hadrian’s Wall to indicate the division between artistic and scientific cultures. This metaphor can be extended to apply to the multi-, inter- and trans-disciplinary approaches as I have described them. In multidisciplinary collaboration participants co-ordinate their activities and speak to each other across the walls that divide them. Interdisciplinary work involves the renegotiation and repositioning of the walls, with all the struggle that this inevitably involves. Transdisciplinary approaches envisage the crossing or even knocking down of walls.

In practice, projects involving different disciplines are likely to use a combination of multi, inter, and transdisciplinary approaches. While the interdisciplinary approach, as I have described it, involves the highest degree of critique and contestation, there is little value in a project in which critique and contestation between participants means that nothing is ever agreed! The story of Kennewick man may appear (so far) to have contributed little to raising awareness of aboriginal rights or of the relationships between science and culture.

**The discipline as a site of contestation**
The situation is more complicated than this, however. For the ‘regimes of truth’ or ‘essential structures’ of many disciplines, at many times, are hotly contested within disciplines. This is probably more especially so within the humanities and social sciences. There may even be more agreement between academics working in different disciplines than there is between members of the same discipline. As Amarglio et al (1993) argue, for example, ‘Marxian economic thought shares more concepts, approaches and methods – may have more discursive regularity – with Marxian literary theory than do Marxian economic thought and neo-classical economic theory’ (p.151). Thus, if it is ‘a regime of truth’, or ‘essential structures’, that distinguish disciplines, then Marxist economists and Marxists literary theorists, might be said to belong to the same discipline more than do Marxist economists and neo-classical economists.

Taking this point one stage further, contestation between members of the same discipline about its ‘essential structures’ can be seen as an essential feature of the discipline. This was the view of the architect who said: ‘Architecture is a discipline in
which the question “What is architecture?” must always be a valid and live question. Once we stop asking that question the discipline is dead.’ (see chi. 5 p. 13??). From this perspective it is not simply interdisciplinarity that represents a site of contestation, but that the discipline itself is, or should be, such a site. From this point of view, contestation about the ‘regimes of truth’ and ‘systematising of structures’ embodied in knowledge is fundamental in all university intellectual work, not only for those working across the largely institutional boundaries represented by the disciplines. Thus interdisciplinarity is nothing particularly new, but reminds us of the contested nature of knowledge, the continual need to challenge one’s own assumptions and be aware of how one’s standpoint might be viewed by those who do not share it.

The concept of a discipline has many similarities with the concept of a curriculum at the school level. At a seminar in a Canadian University, the development of interdisciplinary study in higher education was likened to curriculum integration in schools, which has intensified in Canada over the last fifteen years (Panayotidis 2001: 7). It is not currently fashionable in the UK, however, where the National Curriculum and over-emphasis upon testing and target setting has succeeded in fragmenting the curriculum within disciplinary confines. Things were different a generation ago. In the period 1965-1975, books such as The Integrated Day in the Primary Classroom (Brown and Precious, 1968) recommended an approach in which children explore across disciplinary boundaries. Such more open forms of learning were supported by the influential government sponsored Plowden Report (CACE 1967) which encouraged project work which drew together different disciplinary or curriculum areas. This was also underpinned by prominent educational philosophers at the time such as Dearden (1968). This ‘progressive’ approach to primary education was, however, rejected by policymakers who followed the UK Prime Minister Callaghan’s famous speech at Ruskin College (October 1976). This argued that such ‘progressive’ approaches undermined disciplinary rigour, the basics or the three Rs.

I do not want to be diverted into a further set of questions which arise if we consider interdisciplinarity as a feature of earlier phases of education, or indeed the history of primary education in UK. It is significant to note, however, that such moves towards integrated forms of study at primary school level – like moves towards interdisciplinary study in higher education – are at best recommended for their emphasis upon critical, questioning, or dialogical, approaches, and at worst are accused of lacking disciplinary rigour and being academically lightweight. Aware of this accusation, the President at Stanford University (USA) gave an address on ‘The Vital Role of Multidisciplinary Scholarship’ (Hennessy 2002) in which he felt the need to claim that ‘interdisciplinary’ scholarship was not academically lightweight. The claim was, however, supported by little argument.

Further parallels might be drawn between the enthusiasm for the ‘integrated day’ during the 70s in UK primary education (and its subsequent demise through the 80s and 90s), and the current enthusiasm for interdisciplinary research and teaching in higher education. These are similar to those explored in chapter 4 in relation to skills. Both emphasise generic skills and more integrated forms of enquiry. These can be seen as responses of the educational system to demands that education and knowledge construction should be more closely aligned with social and economic needs. They are both critical of a rigidity and narrowness which has tended to characterize academic education and disciplinary research. In reacting to this criticism, however, they risk undermining the disciplinary knowledge which
forms the basis of criticism. Both have been fuelled by enlightened progressivism, yet risk being undermined by narrow pragmatism.

My interest, then, in exploring the possibilities of interdisciplinary research (and teaching) is not so much to advocate interdisciplinary work indiscriminately – with its various interpretations and contradictions – but rather to examine the potential of interdisciplinary study for critical dialogue.

This potential, however, is limited by a number of constraints that hold up interdisciplinary work. In this final section of the chapter I shall consider these constraints – and opportunities for overcoming them - drawing upon a range of experiences and studies including the UK based Evidence, Inference and Enquiry research programme (UCL 2003), which is in its early stages, and the USA based National Research Council 2005 survey, Facilitating Interdisciplinary Research (National Academies 2005), which is probably the most wide scale survey of views about interdisciplinary research.

**Constraints and opportunities**

1. **Valuing interdisciplinary research.** There is a general impression that funders tend to give little regard for interdisciplinary research proposals. This is interesting in the light of the fact that most research funding councils have explicitly sought submissions for such research. This is likely to be a consequence of the fact that individuals who themselves have experience of interdisciplinary work are rarely to be found on panels who judge proposals. In this respect there is an inbuilt conservatism. Academic work has traditionally been defined in narrowly disciplinary terms and thus the referees of research proposals have little interdisciplinary experience to draw upon. There is thus a danger that judgements that proposals lack disciplinary rigour may, at times, mask an underlying conservatism and inexperience. In fact, the lack of experience of interdisciplinary research amongst referees means that there is little ability to judge what kind of interdisciplinary research is likely to lead to opening up new and challenging opportunities rather than merely dilute disciplinary rigour. Funders should actively seek referees who have an interdisciplinary background.

2. **Journal publication.** The problem manifests itself in a somewhat different way in relation to publication. The number of interdisciplinary journals has risen rapidly in order to meet the increased interest in interdisciplinary research. However, with a few exceptions (such as Science and Nature) interdisciplinary journals lack the prestige and impact of single-discipline journals (National Academies 2005: 139). As a consequence, academics and research students are less likely to receive professional advancement by publishing in interdisciplinary journals. At the same time, submissions to disciplinary journals from the boundaries of interdisciplinary research are readily rejected by those committed to what Becher (1989) calls the ‘disciplinary ideology’, which is ever concerned to defend its boundaries. It seems again that despite the current rhetoric of university managers and external funders to promote interdisciplinarity, the established university culture of academic journals may well inhibit it. This could be viewed as a proper concern to defend disciplinary knowledge from increasing commodification and the associated undermining of disciplinary integrity. But more often it is likely to be the consequence of inbuilt conservatism. Journal editors might give more attention to identifying possible members of editorial boards who have experience working at and across the boundaries of their subject area.
3. **Research Assessment.** In UK, the Research Assessment Exercise (RAE) has compounded this effect. The National Academies Policy Advisory Group reported in 1996 on the research capability of the university system (the Harrison Report) that ‘the RAES tend to disadvantage interdisciplinary research’ (NAPAG 1996: 18). There is little evidence to suggest that this problem was addressed in either the subsequent 2000 RAE or the plans for the 2007 RAE. Given the discussion above, however, of the varied and often inarticulate notions of what is meant by ‘interdisciplinary research’, it may well be that such work is supported, or not, depending upon the definition employed. In this rather confusing situation, academics were advised to submit interdisciplinary work to the single discipline to which it most closely related and also to suggest a second, related, panel for consideration (Geuna and Martin 2001: 7). Such a procedure is unlikely to advance the prestige of interdisciplinary research and is likely to confirm the suspicion that it lacks disciplinary rigour.

One possible solution to this kind of problem is to view interdisciplinary activity as a specialism in its own right. The difficulty then, however, would be that new specialisms would emerge and fade with such rapidity that it would be difficult to capture and measure their achievements within such an inherently conservative structure as the RAE. It is of the nature of innovation that it is difficult to evaluate until it is no longer innovative.

3. **Recruitment and Promotion.** The problems encountered in attracting funds for interdisciplinary research, publishing research findings and research assessment obviously impact negatively upon recruitment and promotion. Nevertheless, while a concern for career advancement may incline academics towards keeping within the safe confines of their discipline, many of the most exciting and influential intellectuals have been those who have made new connections between fields of enquiry. Interdisciplinary research may be difficult, but the rewards of conducting exciting work across boundaries can, in the longer term, lead to considerable advancement. As the then Chief Executive of the Arts and Humanities Research Board noted: ‘many of the most exciting areas of research lie between and across the boundaries of traditional disciplines or subjects’ (AHRC 2004).

4. **Departmental boundaries.** Whatever sense we are to make of the concept of a discipline, in the light of the preceding discussion, it appears that disciplinary boundaries and departmental boundaries are not the same thing. While institutional difficulties of working across departmental boundaries inhibit interdisciplinary collaboration, interdisciplinary collaboration within departments can also be difficult. While the fragmentation described in chapter 5 disables communication between colleagues, bureaucratic structures exacerbate this effect. One consequence is a lack of reflective space in which the kind of critical conversations can take place that stimulates critical forms of interdisciplinarity. As a consequence, interdisciplinarity is often seen as presenting a management problem which is open to managerial solutions, rather than an intellectual one. This tends to promote instrumental rather than critical forms of interdisciplinary collaboration. Given the difficulty that university managers have of setting up interdisciplinary institutional structures, interdisciplinarity is often best developed from the bottom up.

5. **Risk aversion.** Stimulating interdisciplinary work from the bottom up is risky, however. One often needs to keep trying in the face of conflicting possibilities. Interdisciplinary collaboration inevitably faces the possibility of redundancy and the risk of failure. The dominant regime of accountability discourages risk taking,
particularly when its methods of measurement are disciplinarily based. These risks are perhaps most sharply felt by research students. Feller (2005) gives an illuminating account of how even in a department known for its interdisciplinary work, research students were encouraged not to pursue research that was too interdisciplinary, because of the risks involved. While senior academics may be able to afford to risk the difficulties of interdisciplinary research, less secure junior academics and students should play it safe. Such an approach perpetuates the lack of interdisciplinary PhDs. Indeed, where students do follow an interdisciplinary route to a PhD, there is some evidence that this is not a satisfactory route to gaining an academic appointment (Feller 2005: 6).

6. **Disciplinary insecurity.** Some disciplines are more clearly defined than others. It is commonly held, for example, that the natural sciences tend to be more confident in their disciplinary status than disciplines in the arts, humanities and professionally related areas. It is important to remember, however, that even physics only became an established discipline in the mid nineteenth century and some of the boundaries between the natural sciences seem much less secure now than they did a generation ago. It was claimed by people who identified their discipline as being less secure (English Literature, Education) that this quality actually encouraged attempts to seek collaborative relationships with others from different disciplines (Rowland 2002b).

One might expect, however, quite the opposite tendency: that insecure disciplines are, for that very reason, concerned to protect and defend their boundaries against incursion. The development of psychology as a discipline during the early nineteenth century might be seen as an instance of a new discipline which was concerned to establish itself as a natural science and thus defended itself from more humanistic forms of enquiry.

Perhaps a distinction here needs to be made between insecurity which arises from a concern to keep ‘regimes of truth’ open to reinterpretation, and insecurity which arises from a concern to establish an emergent discipline within a wider field of disciplines competing for resources and status. The former sort of insecurity is characteristic of the established arts and humanities. At its best it represents a preparedness to listen and keep open the possibilities of challenge; at its worst it leads to continuing internecine dispute between conflicting ideological positions. The latter is more commonly associated with emergent disciplines in the sciences. At best this is a proper concern to develop rigorous methods; at worst a narrow minded defence of boundaries. It is sometimes difficult to have enough confidence in one’s disciplinary perspective in order to set it aside and listen to the different stories of others.

7. **Social need.** Drawing upon the work of Grossetti (2005), effective interdisciplinary often results from the identification of a social need which academics interpret and respond to. Social needs are, however, often open to different interpretations and, in consequence, different relationships between the constituent disciplines. An interesting example of this is in the field of Medical Humanities as this has developed in UK. In an announcement in the British Medical Journal of a new journal Medical Humanities, Evans and Greaves (1999) articulated two very different conceptions of the new field.

An "additive" view, whereby an essentially unchanged biomedicine is softened in practice by the sensitised practitioner and an "integrated" view, whereby the
nature, goals, and knowledge base of clinical medicine itself are seen as shaped by the understanding and relief of human bodily suffering. This more ambitious view entails that the experiential nature of suffering be brought within the scope of medicine's explanatory models, if necessary by reappraising those models.

Evans and Greaves (1999: 1216)

Here the ‘more ambitious’ interpretation demanded a critical relationship between the disciplines involved as the humanities would be involved in ‘reappraising those models’ of biomedicine. While the ‘additive’ view aims to improve the situation by ‘softening’ practice through the introduction of humanities, the ‘integrated’ one challenges the knowledge base of clinical medicine by introducing the insights from humanities into its field. It therefore questions the very basis upon which judgements about improvement are made. The ‘additive’ view corresponds to what I have called multidisciplinarity, while the more ambitious ‘integrated’ view corresponds to interdisciplinarity.

Bolton (2003) argued in the pages of The Lancet for this more ‘integrated’ or interdisciplinary view of medical humanities that would challenge medical judgement. But five years after the launch of the new journal of Medical Humanities, leaders in the field were still asking whether the field was multidisciplinary or interdisciplinary (Evans and Macnaughton 2004). The unresolved question here was not simply a matter of research management or methodology, but concerned the purpose of medical humanities. Is the need to soften clinical practices or to question the basis of medical judgement? The former required a multidisciplinary or ‘additive’ approach; the latter an interdisciplinary or integrated one.

Thus the potential, in cross disciplinary work, for critical interdisciplinarity depends to a large extent on how the social need is interpreted. Where this involves challenging existing assumptions and practices, then critical interdisciplinarity is likely to be appropriate. Critical needs demand critical methods.

Conclusion
A major theme of this book has been that the university exists within a tension or dialectic between compliance and contestation. This tension is reflected in the ways that university knowledge is constructed. The very term ‘discipline’ denotes compliance, in this context within a well grounded framework of methods, purposes and practices. But progress involves reaching beyond, testing the boundaries and stepping into uncharted territory. Close interaction between disciplines raises one possibility for contesting and stepping beyond disciplinary boundaries.

The discussion of this chapter indicates that interdisciplinary research (and the same applies to teaching) is complex. At one extreme it can involve contestation between conflicting perspectives to such an extent that little is achieved and collaboration and learning becomes impossible. At the other extreme, multidisciplinarity can present no more than a management problem in which participants are able to work beside each other but within their safe disciplinary boundaries and the different ways of thinking do not impact upon each other. Between the two extremes there is a possibility for spaces in which really challenging and innovative work can take place.
Institutional constraints and conservative academic practices, however, have the effect of reinforcing compliance and encouraging work within safe disciplinary boundaries. These need to be addressed if interdisciplinary work is to flourish. But even if these could be resolved, interdisciplinary work would still be difficult. It involves individuals being prepared to listen to the unfamiliar and often conflicting ideas of those from different backgrounds. In the most general terms, it raises the question of how individuals (be they researchers, students or teachers) learn from each other as they engage in a shared subject matter. In the end, the success of interdisciplinarity depends upon the ability to learn together. This – the nature of enquiry itself - is what I want to consider more closely in the next chapter.

References


Canadian Association for Graduate Studies (CAGS) (2005) Challenges to Innovation in Graduate Education, Toronto, 2-5 December.


