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The Politics of Disciplinary Advantage

Steve Rodgers, Michael Booth, and Joan Eveline

Abstract

Interdisciplinary work avoids specialisation's growing fragmentation, but it also loses the political advantage of setting criteria and patrolling boundaries. Research that faces the challenge of bringing together concepts from several areas (e.g. in deep ecology, health studies, and natural resource management) is often criticised for blurring distinctions, for being unscientific, and for being conceptually trite.

In addition, disciplinary work produces advantages for its practitioners which those who attempt more open approaches rarely enjoy. Besides epistemic authority and public legitimacy, such advantages include a degree of control over resources, clearer standards for publishing, and a critical mass of disciplined members who protect the turf of their specialisation.

How can interdisciplinary work in future best play the political game? Should interdisciplinary scholars be between the boundaries of other areas, exhorting those protected within to choose relevance and come out and do as we do? Do we need boundaries for interdisciplinary work, carefully and vigorously controlled, so that we too can form distinctions based on criteria for methodological rigour? Is there a place for full theoretical awareness of what distinguishes interdisciplinary work? If interdisciplinarity is to mobilise support, does it need, just like any discipline, its own self-regulating guild?

The Politics of Disciplinary Advantage

Interdisciplinarity cannot simply be about filling in gaps between disciplines, as if the travelling was only along and around the boundaries. There is residual subject matter inadvertently forgotten by the disciplines (see Campbell, 1986) but not from absent-mindedness. Discipline is caught unprepared by complexity. And real and pressing problems are complex (Booth et al., 2000, p. 28).[1]

The way in which we dealt with the complexity of one hundred years ago — an essentially disciplinary mode — has lost much of its application in contemporary translation. This is because the methodological investigation which has brought us to the current juncture has been so effective. Conceptual simplifications enabling system complexity to proliferate have created new conditions which must now be addressed via fresh forms of clarity. This understanding is embedded within the interdisciplinary charter. Interdisciplinary scholars hold in common the recognition that we need to create a new structuring framework which makes it progressively

less attractive to continue thinking and framing practices of understanding in disciplinary terms.

The problem is that discipline, as a product of historical circumstance and driver of the hypercomplexity now overloading our capacities, is enshrined, at least in Australia, as the dominant mode of knowledge construction. The university is not just populated by fragmented disciplines, but defined as a place of learning through them. Using systems theory, Klüver and Schmidt (1990) extend this analysis to the European context, arguing that the university educates for the production of science, but only via the imperatives of the knowledge system (p. 306). In turn, this system is itself mediated by disciplines because they serve as the principal environments for cognitive activity. Accordingly,

> the university, as part — not sub-system — of the cognitive system which overlaps with the education system, is steered by the procedural norms of the disciplinary subsystems. As sub-systems, the individual subject disciplines mutually provide environments for one another, and are largely autonomous in establishing their internal standards. (Klüver &Schmidt, 1990, p. 307)

This inwardly referential character of modern discipline forms a major barrier to updating our approach to contemporary problems. Unless we find ways of challenging the hegemony of disciplinary "work,"[2] it is unlikely that universities will be capable of responding to the challenges posed by the metanarratives of our time: "ecocatastrophe, the world economy, the technologizing of the lifeworld," and the sexualisation of lived bodies (Taylor & Saarinen, 1994, cited in Luhmann, 1995, p. iv). These "incipient metanarratives involve . . . practices that have not yet been theorized," (Taylor & Saarinen, 1994, cited in Luhmann, 1995, p. iv) and they are likely to remain undetermined in the contemporary disciplinary regime. The problem of modern discipline is a concern for the university as a whole. The relevance of universities to the societies in which they are embedded is under threat.

In this context, any attempts to institute new models of understanding able to mediate contemporary complexity face a great deal of inertia. Discipline positions itself as a prototypical model for generating authority and thus sets the standards for judging what counts as knowledge and determines who will be afforded access to resources and influence. Deviance from its strictures can lead only to marginalisation. Under such a regime, interdisciplinarity can merely hope for reflected glory. It will retain a derivative status as long as practitioners frame their petitions for integrative strategies in the language of discipline — it will remain constituted as "otherised" research, inhabiting the gaps between authorised knowledge.

The Politics of Advantage

> Unless the economy is . . . deconstructively or purposively rewritten, it will write itself into every text of social theory, in familiar and powerful ways. When it is not overtly theorised [the economy] defines itself as capitalism because it lacks another name. (Gibson-Graham, 1995, p. 39)

When the words "economy" and "capitalism" are expunged from this passage and replaced with other socially formative pairings, the meaning of the text is altered little. The words, it seems, hold together as a pro forma template for expressing a truism of modern discursive formations. Try rephrasing it: fill the gaps with the dyads of truth and science, sexuality and heterosexuality, or epistemology and discipline, and see what happens. You will find, in each case, that a historically specific, contingently constructed artifice inserts itself into the equation as a naturally interchangeable substitute for the domain it inhabits. It makes no reference to what other formations could possibly be inserted, or how they might share the terrain. And this is precisely the strength of hegemonic narrative. The specificities which are capitalism, science, masculinity, or discipline display no deviance. To the contrary, a binding feature is their ability to define themselves by writing alternatives out of the equation, and in so doing, positioning themselves as essential, as natural.

The attention of this paper is directed towards the ways in which this dynamic plays itself out in studies of interdisciplinarity. Drawing attention to the ways in which discipline is discursively presented as the natural vehicle to epistemological certainty is concurrently an acknowledgment that establishing interdisciplinarity as a program and approach to understanding which is free from disciplinary coding requires more options than an antagonistic choice between discipline or revolution — that is, a binarised choice between acceptance or rejection of disciplinary method.

Resources for broadening the possibilities for challenging the hegemony of disciplinary discourse can be drawn from the feminist movement. Feminists within the equal opportunity movement of the early 1990s faced many of the quandaries interdisciplinary scholars are now encountering. At the time, feminists raised concerns about the openness of strategies which position women as either different from or similar to their male counterparts. By arguing that women have been systematically excluded from access to many of the advantages enjoyed by men, feminists have been able to generate a catalogue of claims for material redistributions along gendered lines. In the main, these redistributions have served as correctives, erasing the disadvantages which impede women from performing at the level of men. Claiming sameness has also worked to claw back appropriated ground by leveraging entry points to realms that exclude women based on their difference from men. Women, for example, have gained access to the corporate world by minimising the role of motherhood, positioning the care of dependents as an issue unrelated to their ability to engage in paid employment.

However, the strategies of claiming difference and claiming sameness share a common trait. Nancy Fraser (1997) argues that both are "remedies aimed at correcting inequitable outcomes of social arrangements without disturbing the underlying framework that generates them" (p. 23). Neither strategy questions the unremarkability of men's positioning. In each of these cases, it is women who are inscribed as disadvantaged. It is women who are to be given resources to aid their participation in the masculinised domains of paid work and public life. Through equal employment opportunities, women are granted access to careers. Through the provision of childcare, the burden of motherhood is minimised. But in neither case are males expected to relinquish any of the advantages which accrue to them by the having of wives and mothers. Feminist equality discourses have not demanded that men question their style of contribution to child rearing or rethink what constitutes workplace practice. In each case, redistributive equal

opportunity policies enable women to participate in malestream[3] activities for as long as they concurrently and continually reproduce the conditions that enable those proclaiming themselves to be unremarkably normal to enjoy differential advantage. As Eveline (1993) puts it, in a work which has inspired the title of this paper,

> Materially and representationally, advantage and disadvantage are unevenly weighted as oppositional halves, as is womanhood and manhood. Asking whether a woman is the same as a man is different from asking if a man is the same as a woman. Try it on a man and see. (1993, cited in Eveline, 1994, p. 55)

From an Australian perspective, we think interdisciplinarity needs to develop a similarly critical eye toward the strategies it employs in positioning itself as a legitimate organ for constructing knowledge. The political thought of interdisciplinary advocates has largely centred on the creation of typologies which distinguish levels of disciplinary integration. Good (2000), for example, argues the interdisciplinary label is to be used where "expertise from more than one discipline is required in order to achieve a common aim" (p. 386) and relies on an image of disciplines as "historical individuals or lineages characterized by their historical continuity rather than by a defining property" (p. 385). It is a model which takes for granted the primacy of reified institutions as the source of epistemic insight. It claims that interdisciplinarity is derivative of discipline. It also places the burden of proof connected with any claim to authority squarely in the court of the interloper — the disciplinarian need not justify her claim to authoritative speech, as this is taken for granted. However, when an interdisciplinary worker wishes to make use of an insight claimed by a discipline, her presentations are treated as unnatural and accorded due scepticism. In this model, all claims to interdisciplinarity require disciplinary sanction, implicit or explicit.

Interdisciplinary practitioners have much to learn from feminism. However, the process of generating and transferring metaphor requires sensitivity to the context from which the borrowing is drawn and understanding of the site to which it is applied. Mobilising feminist resources for thinking through the project of interdisciplinarity must proceed with caution. To state the obvious, women have a unique ontology, different from the organs of "non-disciplinary epistemology."

Such feminist thinking is, however, a resource for rendering visible advantages accruing to discipline, an institution restricting the relevance of knowledge production in universities. Consider three related stereotypes of interdisciplinarity:

a) Interdisciplinarity must develop its own disciplinary foundations if it is to flourish. Without a stable core, it will be unable to coordinate various research programs, remaining essentially fragmented;
b) Without a substantive ground of its own, interdisciplinarity is an exercise limited to exploring phenomena which fall in the gaps. In other words, interdisciplinarity has no basis for practice other than by drawing on resources from neighbouring disciplines; and finally,

c) Interdisciplinary forays often constitute little more than dilettantism. Disciplines specialise precisely because the level of detail required is so overwhelming. Precision will inevitably be lost in any attempt to combine insights from different areas. Here, interdisciplinary scholars necessarily make a trade-off between rigour and scope. With a bent toward the latter, the generalist results are likely to be less detailed and dubiously factual.

Each account gives the advantage to discipline: The first implies that resources enough for problem solving can be effectively accumulated only through the centralising force of discipline. Not only is "nomadic" thought thoroughly unregimented, it is also eminently unadministerable. Secondly, without its own channels of production, interdisciplinary effort must know more than one discipline. This logic makes it seem as if one must comprehend a whole discipline before a second can be added. Thirdly, there is also advantage to be gained by not attempting to do anything too complex. It is much easier to direct effort toward producing a primer on Foucault than it is to involve oneself in problems of natural resource management. This third stereotype enables an overall acceptance of mediocre standards.[4] This is useful for rendering universities cosy places to be. Disciplinarians can turn a blind eye, not by denying external realities outright, but by locating their interest in a pressing social problem as a context for exploring disciplinary interests.

Read this way, the project of interdisciplinarity looks to be a fanciful impossibility. At best, some sharing of ideas can occur, but not at the expense of disciplinary functioning. No scope for tackling hypercomplex, fuzzy problems is made available. Below, we explore in more detail the ways in which such advantages are maintained. We view our contribution as a resource for enabling an independent place for interdisciplinarity to be conceptualised more rigorously.

Dirt and Complexity

Much in the same way medicine has recognised that maintaining sterile environments works against the health of our bodies, we view current interest in interdisciplinarity as a suggestion that disciplinarity has gone too far in its attempt at tidying access to knowledge. Academic discipline suffers the same consequences of failing to allow children to experiment with dirt. Modern domestic life has excluded developing bodies from contact with micro-flora (on the advice of health experts) to the extent that they fail to develop resilience. Similarly, relying on convention more than insight, discipline is able to easily create interior and exterior surfaces of relevance. On the strength of communal consensus, it proclaims the safety of particular concerns and guards against contamination from "others outside." Discipline steeped in abstraction is unable, or unwilling, to work with the dirt of complexity. As such, it is being overwhelmed by new mutations — it has failed to explore contingencies in a way similar to how a sanitised environment fails to prompt a child's immune response: what is missing in both cases is playful contact with impure things.

This critique of disciplinarity's tendency toward abstraction is extended by Mary Douglas' anthropological study of the symbolic use of pollution metaphors:

> If we can abstract pathogenicity and hygiene from our notion of dirt, we are left with the old definition of dirt as matter out of place. This is a very suggestive

> approach. It implies two conditions: a set of ordered relations and a contravention of that order. Dirt, then, is never a unique, isolated event. Where there is dirt there is a system. Dirt is the by-product of a systematic ordering and classification of matter, in so far as ordering involves rejecting inappropriate elements. (Douglas, 1970, p. 48)

Her reading enables a vision of discipline as an attempt to impose order in a world where "the facts of existence are in a chaotic jumble" (p. 193). Disciplinary methods have created simplified models which valorise clarity and exclude substances that would defile its purity. However, we are suggesting that interdisciplinarity has garnered so much attention because the cultural boundaries created by disciplines have been drawn too tight to enable a fruitful engagement with the challenges of late-modern society. Interdisciplinarity needs to create simplified models, but in a manner which respects the role of untidiness — it needs to field apparatuses which orient us to hypercomplexity. This requires new methods and new approaches to the question of epistemology.

Despite this growing unease, members of disciplinary communities continue to be motivated to keep things simple and not try anything too difficult. We argue that this motivation is structurally related to the question of masculine advantage. In a patriarchy, men's and women's relationship to dirt is structured by differing abilities to claim purity — that is, a freedom from contamination.

> Man's choice of fatherhood and his claim to the right of paternity always carried with it that obverse side of right, the notion if not always the practice of responsibility. Motherhood has been a duty without rights, and in this sense is easily perceived as a form of exploitation to be rejected. (O'Brien, 1982, p. 110, cited in Eveline, 1994, p. 169)

Women find themselves in an autopoietic[5] world where they cannot choose to take it or leave it. Maternity is an issue which cannot be ignored by women; their biology means they must entertain contamination (as it is defined through malestream culture) more frequently.[6] The biological cycles of women's bodies conflict with the structure imposed on social productions — structures designed with male figurations in mind. Under this regime, men have responsibilities but not duties. They are more easily able to walk away from those aspects which pose danger to their efficient functioning in society such as child rearing or domestic duties. "[P]ollution behaviour is the reaction which condemns any object or idea likely to confuse or contradict cherished classifications" (Douglas, 1970, p. 48).

Interdisciplinary scholars face a similar problem. Taking complexity seriously means being unable to ignore dirt and its polluting effects. Interdisciplinary workers need to act and reflect in the world without the luxury of distance that a static concept of purity provides. An adherence to disciplinary method limits the range of resources available for negotiating an understanding of the problem at hand in a way that is prone to systematically misrepresent the array of opportunities open to human action. Method reduces multiplicity (Booth, 1989) and with it the possibility of dealing with novel and non-discursively organised issues. As such,

interdisciplinary effort must be directed elsewhere. As Douglas puts it: " . . . as life must be affirmed, the most complete philosophies . . . must find some ultimate way of affirming that which has been neglected" (1970, p. 193).

A concern for the non-discursive places interdisciplinary workers differently to their disciplinary counterparts in relation to dirt. The latter are committed to abstraction and simplification. Such a commitment is enabled (as we detailed above) by a self-determined conception of disciplinary values. Discipline views itself as an autonomous entity, able to reflect and act on its own priorities — as a complete system interacting with other such systems. "As sub-systems, the individual subject disciplines mutually provide environments for one another, and are largely autonomous in establishing their internal standards" (Klüver & Schmidt, 1990, p. 307). These internally defined standards protect disciplinary workers from the dirt of complexity. Purity within disciplinary systems is defined in such narrow terms that its practitioners (those swearing allegiance to the conceptual projects of the respective disciplines) are exempted from facing the ambiguity of late-modern conundrums. They are granted the right to engage with complexity, but are not bound by duty to do so.

Practical Ideology

Maintaining the purity of discipline and the advantages this enables is an active process involving a continual defence against dirt. In this section, we seek to outline the particular style of thought and cognition which enables discipline to effectively neutralise danger. To do this, we mobilise the concept of practical ideology. This is used to effect by Eveline (1994) to detail the discursive techniques used to maintain the unremarkability of male advantage. She illustrates how, in the face of challenges to male identity posed by equal employment opportunities, men are able to control the representation of affirmative action in a way that neutralises its disruptive potential.

Practical ideology constitutes itself as an advantage over interdisciplinary methods. It enables efficiency in a way unavailable to interdisciplinary work. The human consciousness is able to hold in place, at any one time, between five and nine categories — an insight developed in a (1956) paper by George Miller called "The Magical Number Seven Plus or Minus Two." As such, any attempt at understanding complexity involves working within these prescribed limits. But not all efforts lead to an elucidation of complex problems. Discipline, we argue, has developed an economy of thought based on the circulation of sanctioned, institutionally approved statements.[7] The premium placed on journal articles, as witnessed by the sheer volume of resources deployed to prevent their depreciation (by their continual replication in other settings), points to this phenomenon and away from the possibility of dealing with novel and non-discursively organised issues — the very problems interdisciplinary thinkers are trying to work with.

All elaboration begins with the apprehension of experiences lying beyond current conceptual schemata. Take, for example, the phenomenon of ecological dysfunction. It has been with us for centuries, but only in the past fifty years has it been rendered remarkable, as an object for public comment and concern. Here, "the environment" has been constituted as a new category positioned alongside traditional concerns. Such classification makes the job of conceptualising responses to ecological disease much easier than would otherwise be the case.

Within the university, new departments for environmental studies, sub-disciplines within sociology or ecology specialising in the cultural construction of "ecocatastrophy" or biophysical aspects of the "environment" respectively (but not both), and economies of environmental technologies are enabled by the functional differentiation (Luhmann, 1995) of the environment as a social sub-system. In this scenario, sustainability is constituted not as a singularity, requiring an overhaul of university practices, but as a problem to be solved through mobilising the existing institutional edifice.

This is practical ideology in action. Here, a new challenge is incorporated into one's conceptual schema by creating space for it alongside existing figurations — as something else to think about. In the above example, the number of categories considered in thought is effectively extended by one, so that additional concerns can be incorporated without any imposition on existing conceptualisations. This is, of course, a process mirrored in other social analyses. Its dynamics extend to all forms of practical thought. Further examples would include male awareness of feminist claims on work, where equal opportunity is viewed as a subset of specific workplace practices, detached from the issue of "motherhood," which Eveline (1994) carefully links to career trajectories.

The problem with practical ideological thought is twofold. Firstly, it provides no adequate model for mediating conflicts that arise from the mismatch of categorical imperatives. The ability to manage the interactions between different categories is increasingly threatened by the continual addition of new information. Conceptual slippage between categories which would otherwise go unnoticed is rendered insoluble, as the number of items accounted for is expanded. When the process of practical ideology is followed to its conclusion, a mounting crisis of representation ensues. If a conceptual schema's categories remain inflexible, the need to account for increasing complexity strains it to the breaking point — we quickly surpass the number of thematic foci which can be kept in mind at any one time. The result, at least theoretically, is confusion.

This brings us to the second problem of practical ideology. It revolves around the recognition that the sort of meltdown postulated above rarely occurs in actuality. The question is thus: if one's conceptual schema retains a stable core, how might new concerns be accounted for? We suggest that users of practical ideology are able to respond to novel situations only by minimising the effective content of newly acquired categories, so as to provide nominal disruption to the ongoing practice of "doing-being-ordinary" (Sacks, 1995).[8] Many have roundly criticised the routine use of terms such as coordination (Wiess, 1981), community participation (Rodgers, 1998), sustainability (Davison, 1999), and most notably, interdisciplinarity by practitioners, for their inattentiveness to the substantive challenges these concepts pose to "business as usual." Their rhetorical use can be framed as specific cases of practical ideology in action.

Disciplinary communities are often firmly committed to this process, continually regulating and distinguishing between those variables or features which need be accounted for and those that can safely be ignored in creating an ordered account of the world — diffusing the "unreasonable." We have heard hydrologists, for example, discount their role in resolving issues of dryland salinity, preferring to see themselves as providers of "the facts." They have argued that farmers will modify practices only when economically viable alternatives can be

found. This places the question of change squarely at the feet of economists, and does not require active participation on the part of biophysical scientists. We are sure the receiving economist would baulk at the ameliorative task this logic presents to her and want to divide the problem otherwise, and most likely in ways that defer ultimate responsibility to stereotyped others. If we follow this process to its end, ultimately little will be contributed by the university, defined as it is through its composite disciplines.

Threat Management: Practical Ideology in Action

Val Plumwood's (1993) compelling exploration of the common oppression of women and nature gives over resources for an account of practical ideology's resilience by tracking the process through which the extra-discursive is evacuated of any disruptive potential.[9] She recognises that the discursive construction of foreign bodies is not a neutral ascription of pre-existing, self-same characteristics, as positivists would have it. It is instead a highly politicised process whereby the constitution of what passes as the normal and acceptable is framed, deviance is defined, and strategies which separate the two are formulated. For the purposes of this discussion, the normative takes the form of a stable conceptual schema (which can itself be read in feminist terms as an expression of phallocentric commitment to the metaphysics of presence). In order to minimise the threat new information poses to its functioning, challenges are rendered as exterior to the system. Phenomenologically, this makes sense — a new experience is likely to confront one as an ostensibly unintelligible oddity (Schutz & Luckmann, 1973). But, as Plumwood notes, it is not that we make distinctions that counts; it is what we do with them that is of principal concern. She suggests that the reception of difference within a framework of practical ideology is marked by the label of threat — its status as "other" than sameness:

> It is not just the fact there is a dichotomy, that distinctions are made between two kinds of things, which is the key element in establishing a dualistic relation . . . A dualism is more than a relation of dichotomy, difference, or non-identity. . . . In dualistic construction . . . the qualities (actual or supposed), the culture, the values and the areas of life associated with the dualised other are systematically and pervasively constructed and depicted as inferior. (1993, p. 47)

Disarming a threat, be it a particular knowledge or distinctive subject position, is therefore a complex process, involving a multifaceted representational strategy that codes the "other" as ineffectual and insignificant — that is, unworthy of one's attention. Plumwood highlights five strategies which are deployed to this end. These are backgrounding (denial), radical exclusion (or hyperseparation), instrumentalism (via objectification), homogenisation or stereotyping, and incorporation.

It must be stressed that Plumwood is not presenting a list of independent strategies, as if it were possible to employ one but not the others. The strategies she notes being used are not alternatives but an embedded set of practices adding up to a process. For example, radical exclusion works to maximise the perceived distance between discipline and interdisciplinary methodologies. Constructing interdisciplinarity in this way, as "other" to discipline, provides a

resource for the practice of backgrounding. Backgrounding minimises the visibility of interdisciplinary contributions, and obversely maximises the exposure of discipline. Backgrounded practices are constructed as inessential or "not worth noticing," and the process of hyperseparation acts to exaggerate this. The distance between the two is maximised by combining strategies: Discipline = essential, natural / Interdisciplinarity = derivative and a distraction from the activity of producing real science.

Backgrounding

Backgrounding is a strategy which not only makes distinctions between two kinds of things, but also naturalises a hierarchical order — in this case the primacy of discipline over interdisciplinary endeavour. Even in this discussion, the term "interdisciplinarity" is constructed as a product of the disciplinary economy. The etymology of the word suggests as much. Interdisciplinarity is seen by its advocates as a means of transcending the limitations of compartmentalised knowledge. And interdisciplinary work can create understandings to meet the complex demands of looming socio-environmental problems. But reading interdisciplinarity as a practice going beyond established boundaries does not reveal disciplinarity as a dispersed network of locally produced practices, mythologies, and artefacts. It simply reinforces the image of discipline as a coherent and primal unit of analysis. Without detailed and incisive description, disciplines will remain conceptual black boxes on the ground that seem in need of supervention by a transcending spirit.

Incorporation

> The definition of the other in relation to the self as a lack or absence is a special case of incorporation, defining the other only in relation to the self, or the self's needs and desires. . . . Because the other is defined and perceived in relation to the master, he or she is not encountered fully as an independent other, and the qualities attributed or perceived are those which reflect the master's desires, needs and lacks. (Plumwood, 1993, p. 52)

The trope of incorporation is highly visible in the debate over interdisciplinarity. Constructing discipline as the proto-typical model for any legitimate attempt at generating knowledge enables the "master" to undertake a second project of threat abatement. This involves creating a discursive form which highlights the primacy of disciplinary activity. It is common among both interlopers and disciplinarians to begin a defence or rejection of interdisciplinarity with the categorical insistence that discipline breaths life into the possibility of interdisciplinary study. In its strongest formulation, this argument asserts the primacy of discipline as a resource for innovative study. But even defences of interdisciplinarity targeted as a rejection of this logic often do no more than reinscribe its dominance. This is evident in many works (e.g., Hodge, 1995; Nissani, 1997) which argue for an interdisciplinarity which crosses borders and lives within the interstices, or otherwise transcends the corporeality of discipline (Rapport & Klein, forthcoming). Selling interdisciplinarity as a provider of skills which patch any holes in existing modes of epistemological articulation (theorisation) presents

interdisciplinarity as a complementary endeavour, obscuring the independence of interdisciplinary method.

Instrumentalism

There is much pressure to present interdisciplinarity in this way. One question which gets a fair airing concerns when interdisciplinary methods should be employed. They are often resource-intensive, time-consuming, and frequently have uncertain outcomes (i.e. cannot guarantee the delivery of pre-specified products), so it would seem obvious that criteria able to distinguish real demand for interdisciplinary approaches from more mundane situations are needed. The most direct way to develop new criteria is to posit a model for mediating different levels of risk and decision uncertainty similar to that provided by Funtowicz and Ravetz (1985; 1991) and presented in figure 1. This model creates some fuzzy categories able to accommodate the concerns for criteria for deciding when to employ interdisciplinary methods. When the problem is sufficiently well-bounded, then normal science methods can be deployed ,[10] with complementary strategies being invoked at more diffuse levels.[11] Here, the primacy of discipline is maintained — super-science is needed simply to augment normal science (presumably drawing on normal science as a proto-typical resource).

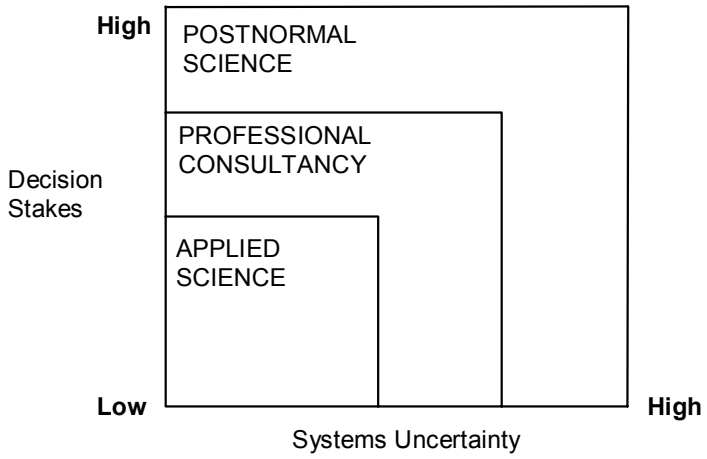

Figure 1 – Three Kinds of Science. (Based on Funtowicz & Ravetz, 1991).

Here, disciplinary advantage is maintained by appropriating interdisciplinarity as a resource for supplementing normal-science in abnormal situations.

> Since the relationship is seen as that of a superior to a separate inferior order, it is also seen as fitting and natural that the lower side serves the upper as a means to his ends. The upperside is an end in itself, but the underside has no such intrinsic value, is not for-itself but merely useful, a resource. (Plumwood, 1993, p. 53)

In Funtowicz and Ravetz's two-dimensional model, the need for post-normal science is exceptional. Only when concepts become fuzzy and the number of variables overwhelms normal methods is interdisciplinarity advocated. Here, interdisciplinarity is not presented as a

challenge but as a complement to disciplinary method. The interloper is a resource for the disciplinary project.

We have worked to break down this stereotype. Elsewhere (Booth et al., 2000), we have argued interdisciplinarity is not simply a tool like a Swiss Army knife — useful in an emergency but of little value where precision is required. Although an interdisciplinary worker draws on a number of fields for inspiration, she uses the methods from those fields with a sense of their differing appropriateness in differing contexts. Precision for a person using an algorithm is getting the measurement exact. For an interdisciplinary research team worker, it may be saying clearly what options there are and how no one can be exact. The degree of commitment to the established methods is very different.

It is not simply that scholars from various backgrounds need team skills to help others understand their particular specialism, as if the problem was one of informing others. What counts as expertise in interdisciplinary settings centres on an ability to remain collectively focused on the text at hand. Without this, we have fragmented knowledges, not a scholarship of between-ness. It is only through ongoing and effortful engagements which ensure communication between practitioners that independent methodology emerges[12] (Boulding, 1989). People talk constructively if they are able to share experiences, tell stories, and build through narratives a sense of each other's insights and practical skills. A coherent solution that is sufficiently adaptive needs many disciplines. However, the knowledges they contribute are aspects of an emergent pattern, not like tiles whose contribution to a pattern is just the sum of their individual aspects, but like an orchestra whose individual sounds make little sense until they are merged into the experience of the whole performance. Interdisciplinarity is thus a craft, like that of an artist, a musician, or an actor. In order to remedy the image of knowledge still prominent in interdisciplinary work, practitioners need easier ways to speak of how problems can be dealt with skilfully in a diverse group of professionals and locals and worked through collectively.

Including skill and teamwork in the definition of post-normal science breaks up the neatness of Funtowicz and Ravetz's quasi flow diagram in a way that unsettles the assumption of disciplinary axiology. It is no longer possible to see the problem in terms of an isotropic and planiform abstraction, where different skills are needed for different tasks (i.e., normal science vs. professional consultancy vs. post-normal science); rather, the issue of skill interpenetrates all levels. This implies the need for post-normal institutions: those which are able to mobilise skill in order to identify what sort of action is appropriate at any one time. Skill is latently present in each situation even if normal science activities are undertaken every time. Skill enables discernment in a way that avoids contradictions between managers who operate in a professional consultancy mode, scientists who work at the level of normal science principles, and complex problems which reside in the realm of the post-normal. These groups are no longer in discrete conflict but are armed with the capacity to see interconnections between their different modes and are able to see how they contribute.

Radical Exclusion

Interdisciplinarity is viewed not only as dependent, but also as radically different from discipline. Emphasising the distance between the two approaches is important for the practice

of practical ideology. Maintaining the productive functioning of an existing but static conceptual structure requires any force which might interrupt its algorithmic flow to be neutralised. As Plumwood writes, this is achieved through the action of dualised thought, which posits the existence of mutually exclusive interior and exterior surfaces:

> A major aim of dualistic construction is polarisation, to maximise distance or separation between the dualised spheres and to prevent their being seen as continuous or contiguous. . . . Thus men are defined as active, intellectual, egoistic, competitive and dominant, while women are defined as possessing the complementary qualities, as passive, intuitive, altruistic, nurturant and submissive. (1993, p. 49)

In the same way, interdisciplinary scholars are treated as, at best, a distraction from the main "game." They might be recognised, but not as sharing similar concerns and valuing the same projects. As Booth notes, "politics is always about inclusion and exclusion. Even a practical query such as 'What shall we do next?' raises as an issue the 'we' to whom the question is appealing" (1997, p. 132). Disciplinary work clearly understands the identity of the "we" — that is, those to be included (see Opotow, 1990).

The specificities of hyperseparation can be elucidated through what we have termed the "morning after effect."[13] The morning after effect emerges because within the contemporary disciplinary framework, there is no clear way of articulating what the interdisciplinary worker is interested in; one day she may be engaged in vigorous conversation but the morning after she may be distant. The means used by others (their tools) may be fascinating, while the ends they feel deeply attached to receive no strong commitment from the interdisciplinary practitioner. Because she disregards the normal terms of friendship (sharing both means and ends), the practitioner becomes suspect, ambiguous, or even viewed as dangerous. This happened to Harold Garfinkel, whose *Studies in Ethnomethodology* has given sociologists major new tools for inquiring into social processes. Garfinkel applied this concept to radio astronomy and traced the development of a couple of researchers' conviction that they had made a new discovery in their field. Garfinkel refused to reframe their delight in any other terms but the emergence of a new discourse. A reviewer of Garfinkel's study (in *Philosophy of the Social Sciences*, 1981) finished his piece on it with the sentence "Garfinkel is a dangerous man." The judgement wasn't clarified, but the feel of it seems to be Garfinkel's refusal to enter the spirit of the game of facts. In this case, he had studied the game of radio astronomy in great detail but without any commitment to its self-image. For some of those on the receiving end, such blind reaction can be devastating, and therefore unacceptable. An interdisciplinarian is frequently using the tools but not playing the game. This is why some people will tend to shy away from interdisciplinarity. It can mean exile from established communities. Under the current regime, there is no warm reception, and to be interdisciplinarity you either need a thick skin or a sufficiently rich history. Either way, the interdisciplinary researcher is likely to be labelled an "outsider."

Homogenisation

Currently, we have few labels for describing what interdisciplinarians actually do. The existing framework distributes titles based on discrete speciality. This involves the ability to account for a small aspect of the world with precision. To those able to easily place themselves within this system of categorisation, the interdisciplinary scholar will look out of place, even nameless. And without a way to locate their projects, it will seem as if interdisciplinary workers hold an amorphous set of interests devoid of a unifying theme. The inability to easily describe what such scholars "do" using existing terms of language results in the ascription of a default identity — one based on nondescriptness. Because interdisciplinarians cannot often be described as belonging to a collective but differentiated "us," then logically they must belong to the black box category labelled "them."

> More than polarisation is needed if a relationship is to be an appropriate one for domination. The dominated class must appear suitably homogeneous if it is to be able to conform to and confirm its 'nature'. In homogenisation, differences among the inferiorised group are disregarded. . . . Homogenisation supports both instrumentalism, incorporation (relational definition) and radical exclusion. It produces binarism. A division of the world into two orders. (Plumwood, 1993, pp. 53-54)

Plumwood's account of dualised thought chronicles the mechanisms by which discipline maintains its advantage. Combined, these strategies reinforce in the mind of the "master" the naturalness of form in her (or his) conceptual schema, exempting her from having to take note of the "monstrous" (Hodge, 1995). Practical ideology stands as a cognitive schema which supports an analytic/synthetic vision of reality[14] and an associated algorithmic mode of functioning. It enables the valorisation of simplified models in a quest for Taylorist efficiency[15] over and above a concern for complexity. The sociologist, for example, shaped by ongoing learning centred on the study of sociality, becomes interested in psychology only where its conception of the subject can be converted into her local currency. Practical ideology works at these boundaries — psychology becomes all that which is over there. The sociologist can discount psychic concerns, rendering them beyond the pale, by maintaining the separateness of her own projects through the methods noted above. These practices work against interdisciplinarity by setting practitioners against one another. Where integration is needed, we find tribal factionalism, the maintenance of discrete positions, and the spectre of relativism. Discipline has a method for managing complexity overload, but its method (as per Plumwood) is divisive, hierarchical, and increasingly seen as ineffective.

Interdisciplinarity requires its own form of discipline. The question of interdisciplinarity does not hinge on being or not being disciplined, but rather centres on the form of rigour demanded by respective approaches. That late-modern complexity is not well handled by discipline suggests that post-disciplinary approaches need a penchant for working with overdetermined concepts and unarticulated possibilities and require "cultivating a readiness to see what remains to be shown" (Bontekoe, 1996, p. 115). Disciplinary method is not sufficient in creating purified and abstract approximations of experience. Disciplinary modes of working

systematically exclude the dirt which is needed for creative solutions. Mary Douglas uses the metaphor of a garden:

> A garden is not a tapestry; if all the weeds are removed, the soil is impoverished. Somehow the gardener must preserve fertility by returning what he has taken out. The special kind of treatment which some religions accord to anomalies and abominations to make them powerful for good is like turning weeds and lawn cuttings into compost. (1970, p. 193)

Paradoxically, in seeking efficiency, discipline sacrifices a more mature form of discipline. This is one which allows untidiness to serve a productive function in resolving complex problems. The West has few resources for elaborating modes of understanding which refuse categorisation.[16] As such, we turn to the Zen Buddhist Oxherding pictures of Kaku-an (Suzuki, 1950). This set of ten images has been used as a teaching tool and source of reflection for seven to eight hundred years. Its protagonist seeks a wild "undisciplined" ox that turns to white as it becomes settled with the ox herder. Symbolising "self," this ox becomes the source of something beyond discipline, a wisdom that culminates in new understanding. Its central motif is of a passage from a state of undisciplined confusion, through the narrow defile of discipline to a mode of acting and being that is constructive, responsive, and creatively at one with nature. It is to this form of discipline that interdisciplinarity normatively aspires.

Conclusion

Interdisciplinarity faces two interwoven problems in presenting itself as a real and coherent alternative to disciplinary actualisations. The first concerns interdisciplinarity as a positive program of understanding. An answer to the question of "how to do" interdisciplinary research — a concern which continues to perplex many scholars seeking a systematic account of the term and the practices which it organises — is found in the delineation of interdisciplinarity as an independent method. This is an undertaking we have developed elsewhere (Booth et al., 2000).

Articulating these dimensions of interdisciplinary method is an important component of any program seeking to render late-modern complexity intelligible. On its own, this functional program does not resolve the question of strategy, however. The theoretical virtues attached to interdisciplinarity notwithstanding, its future as a practical project lies in negotiating the material and representational economy into which it is deployed. Eveline (1994) points to the impossibility of envisioning an interdisciplinarity which would seek to up-end the relative positions of discipline and interdisciplinarity, in a reversal of hegemony. This is because the latter needs to discover its own positive program of research. Whatever this might be, it will be different, in form and structure, from that of discipline. As such, its mode of representing and organising itself will involve renegotiating the criteria about which judgements of epistemic legitimacy are framed.

The second problem, then, concerns how we might move toward a new regime of knowledge production, one more sensitive to the complexities inherent in the late-modern world. The attention of this paper has been directed towards developing clearings in which strategies enabling an adequate response to this dimension of the interdisciplinary problem can

emerge. In other words, we ask if the interdisciplinarity we need can grow from the structural arrangements and current understanding there is about epistemology and its manifestations in social relations.

We believe it can and must. Interdisciplinarity practitioners have no choice but to move with the present regime as part and parcel of a strategy for going beyond it. In arguing that discipline needs replacing, an image of interdisciplinarity is often mobilised which emphasises interdisciplinarity's ability to process complex problems in ways unavailable to discipline. Nissani (1997), for example, sets forth ten virtues of interdisciplinarity, claiming that interdisciplinarity extends the capacity of normal science by bringing to it resources otherwise unavailable. This strategy of introducing interdisciplinarians as innovators against a backdrop of "business as usual" works to point out differences in epistemic approach. It is an insufficient basis on which to mount a challenge to disciplinary hegemony, however. Discipline is more than a cognitive schema. Embedded in the wider political economy, it is sustained by maintaining linkages and regulating resource flows and via the selective irrigation of particular subjectivities (with all the infrastructural investment this entails). Discipline is not simply an intellectual pursuit; it is also institutionally produced. Accordingly, in addition to the question of interdisciplinary method, we require an understanding of how activists of interdisciplinarity might contest the structural determinations of discipline.

Framing the problem in this way gives insight into how interdisciplinary work in the future can best play the political game of making a difference. Should interdisciplinary scholars be between the boundaries of other areas, exhorting those protected within to choose relevance and come out into the cold? Or do we need boundaries for interdisciplinary work, carefully and vigorously controlled, so that we can always point to interdisciplinary work that has been done sloppily? Is there a place for full theoretical awareness of what distinguishes interdisciplinary work? Does it need, like any discipline, its own self-regulating guild? In response to each question, we maintain that without holding in mind a framework based on processes for handling such political concerns, any attempt to formulate answers will inevitably involve the re-inscription of disciplinary codes. And this, we are sure, provides no real answers, just disciplinary practice in a new guise, coming no closer to meeting the demands of a hypercomplex world.

Notes

1. In several places, material from Booth et al. (2000) has been added to this paper. Locations are not marked but can be sourced via a downloadable copy of the report at: http://wwwistp.murdoch.edu.au/publications/ projects/srodgers/lwrrdc.html. This research emerges from work sponsored by the then Land and Water Resources Research and Development Corporation (LWRRDC), Canberra (now known as Land and Water Australia).

2. The concept of work used here is given specific meaning by Hannah Arendt. As Booth (1989) elaborates, her rendering enables us to conceptualise disciplinary productivity in a manner which evacuates it of any hubris which discipline may attach. In *The Human Condition* (1958, p.7) Arendt writes: "Work provides an "artificial" world of things, distinctly different from all natural surroundings. Within its borders each individual life is housed, while this world itself is meant to outlast and transcend them all." For her, work is an abstracted entity, describing inauthentic practice, which is to be juxtaposed with

"action" — "the only activity that goes on directly between men without the intermediary of things or matter," which "corresponds to the human condition of plurality" (cited in Booth, 1989, p.197).

3. This is a term commonly used within feminist discourses. It is designed to denote the unquestioned normalcy of masculine traditions — i.e. of history being both all about men and severely neglectful of talking explicitly about them. "Malestream" is associated with the work of Mary O'Brien, especially O'Brien (1981).

4. Eveline (1994) traces this phenomenon in practices of corporate and bureaucratic management, arguing the lowered bar is a consequence of masculine culture. The career support networks which are often enjoyed by men but not women are governed by the logic of gaming, where the intention is not to win but to see the game continue. This means the player (read "man") must "pick his battles" strategically, and lose others just as strategically, to keep the game from getting lopsided. Her narration of one woman's perspective on this issue is illustrative:

> . . . having seen how seniority was often accorded men who had lengthy and compliant service but relatively little expertise, she now understood that the problem hinged on an overall acceptance of mediocre standard. Those lowered standards showed also in the "deals" that provided the basis on which bureaucratic business was done. The sort of activities that Edmund saw as perfectly legitimate, like trade-offs about budgeting and policy, Rhonda saw as morally inappropriate. . . . The bureaucracy, as she saw it, supported self-interest and shoddy decision-making. Rhonda felt that mediocrity was encouraged in most of her male peers, as a hedge against them threatening any major changes to either the bureaucracy or those at the top. (Eveline, 1994, pp.148-149)

5. Autopoiesis literally means "self-production" and refers to a system able to retain its stability despite being subject to the forces of change. It is a term brought to prominence by Maturana and Varela (1980) in the exploration of the links between biology and cognition.

6. DiQuinzio adds insight to this idea in her detailed questioning of motherhood:

> Sexism and male dominance in an individualist ideological context rely on and perpetuate the naturalization of women's difference in terms of female embodiment. . . . On the other hand, avoiding the issue of embodiment does not preclude the reconsolidation of essential motherhood. Thus, it seems that feminist theory, especially feminist accounts of mothering, must confront directly the issue of embodiment despite the risks that this poses. (1999, p. 88)

7. Latour and Woolgar (1979) illustrate the existence of such an economy through the use of a hypothetical observer of a scientific laboratory, who is neither a "total newcomer" to society nor a complete participant in scientific endeavour, but has a working knowledge of contemporary culture and its artefacts. Never having entered a laboratory, this individual is bewildered by its activities. It has all the characteristics of a manufacturing production line but what it claims to be its outputs aren't "value added" materials, but reports about those products; moreover, they are ones created through juxtaposition with the outputs of other like institutions. "How is it that the costly apparatus, animals, chemicals, and activities of the bench space combine to produce a written document, and why are these documents so highly valued by participants?" (Latour & Woolgar, 1979, p. 48).

8. Agnes Heller's *Everyday Life* (1984) maps this process of doing-ordinariness closely, arguing it is a default mode of social existence for those who have not taken up the challenge of individuality, marked as it is by its realisation of species essentiality. Abstract as it sounds, she argues that this inauthentic mode enables survival within a given context by instrumental appropriation of social standards and moral codes, but not engagement with one's authentic concern.

9. This trace can also be undertaken using the resources provided by Douglas's analysis of purity and danger.

10. The term "applied science" is used to draw attention to the everyday Kuhnian practice of puzzle-solving in science. "Puzzle-solving" puts the scientist in the intellectual elitist position of the detective, who, often bugged by police bungling and public delusory assumptions, at last finds the hidden realities in all their puzzle-box complexity.
11. With increased complexity and decision stakes, we pass through the realm of professional consultancy — which is more like the practice of social work than the magic technological fix of Dr. Who — to post-normal science. This is a domain for activity which can be viewed as what "nice educated expert people" would rather not have. Applied scientists will characterise this domain as arbitrary and irregular, "peopled by NIMBYs, NGOs, activists, anti-science elements and all sorts of other nasty creatures" (Funtowicz & Ravetz, 1998), all of whom have to be accommodated by the practitioner.
12. Booth and Eveline (1990) extend this analysis to account for solo efforts of interdisciplinarity. They combine insight from hermeneutics with the grieving process of death and dying in showing research to be an emotional process of nurturing and letting go as ideas shift and develop. A readiness and ability to expose oneself to the emotionality of seeking to remain open to new experiences characterises interdisciplinary endeavour at an individual level.
13. This term was coined as a way of linking the dynamic described here with the uncomfortable feeling one sometimes encounters after an invigorating discussion with a new acquaintance. The energy of this first conversation generates expectations that cannot always be carried through to subsequent meetings. It's confusing to know a past conversation was rewarding but be unable to resume where you left off. This dynamic also seems to account for the awkwardness experienced after a "one-night stand."
14. This is an approach which attempts to "divide complex problems down into distinct items and then seek to regain the whole through their reassembly" (Booth, 1993, p.185).
15.The simplicity of Adam Smith's account of pin manufacturing is an apt metaphor for describing the sort of logic driving disciplinary specialisation.
16. Contemporary hermeneutics has articulated this problem in terms of the need to frame attempts at understanding phenomena by recourse to diachronic and synchronic dimensions simultaneously.

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