Disciplines and their dynamics

Workshop 1, Cosener's House, 18th and 19th November 2004
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Introduction

This paper has been prepared for the first of six ESRC funded workshops on 'interactive agenda setting in the social sciences'.

The first workshop considers how agendas develop and evolve within academic disciplines and how non-academic priorities influence this process. In order to inform this discussion, we have reviewed a handful of relevant books dealing with

- The character and structure of academic disciplines
- The careers of ideas and of individual researchers
- The institutional contexts of academic research - and what these mean for the production of new knowledge
- The relation between 'internal' and 'external' influences on knowledge development

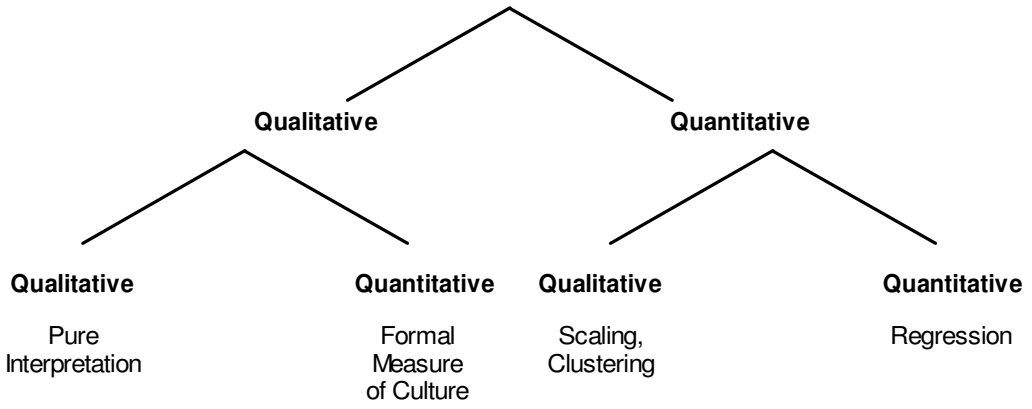
Authors writing about the 'new production of knowledge' (Gibbons et. al. 1994) or the 'triple-helix' of government, industry and academic interaction (Leydesdorff and Etzkowitz 1996; Benner and Sandstrom 2000) describe and comment on what are taken to be general trends in the organisation of academic life and in research policy. The suspicion and expectation is that research agendas will be subject to what Elzinga refers to as 'epistemic drift' (1985) - i.e. that priorities will shift as funding bodies respond to external pressures, as new reputational systems develop and as disciplines re-position themselves in response to non-academic demands.

Rather than pursuing this debate in equally general terms, we home in on the practical question of how research agendas are shaped. The three authors whose work we discuss below (Abbott 2001); Becher and Trowler (2001) and Whitley (1984) variously deal with the careers of theories, methods and concepts within and between disciplines; with the institutional contexts of knowledge production and with longer term trajectories of disciplinary development. We review each in turn, pausing along the way to comment on what seem to be key points to explore and develop in the course of the November workshop. We start with Andrew Abbot's book, *The Chaos of Disciplines* (2001).

1 Fractal division and disciplinary development

Abbott's central thesis is that disciplines follow a similar process of development, described as a fractal pattern of division and sometimes convergence. Rejecting the notion that research methods lie somewhere along a scale in which the extremely quantitative constitutes one pole and the extremely qualitative the other, he argues that qualitative-quantitative distinctions repeat themselves throughout the fabric of a discipline (his example is sociology).

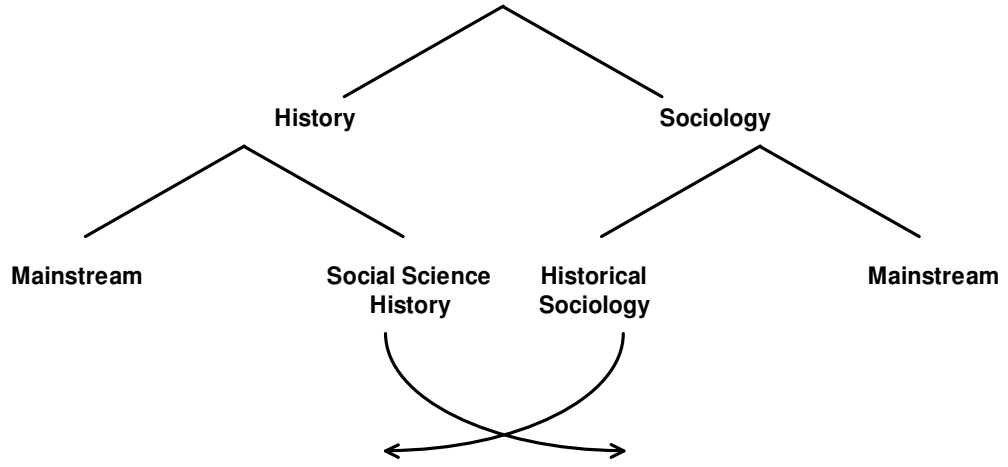
Fig 1.



From Abbott, 2001: 11

The quantitative – qualitative distinction repeats itself at each more detailed level even as the difference between positions narrows. Although simple, this idea of fractal distinction is regularly put to use by practitioners. In coffee bars, corridors and seminars, they position themselves as more qualitative than one colleague, but less than another. Abbott uses this fractal model to describe the relationship between history and sociology (fig 2). By conceptualising disciplinary distinctions in this way Abbot concludes that supposedly contrasting positions (social science history and historical sociology in this case) may have more in common with each other than with the mainstream of their parent discipline.

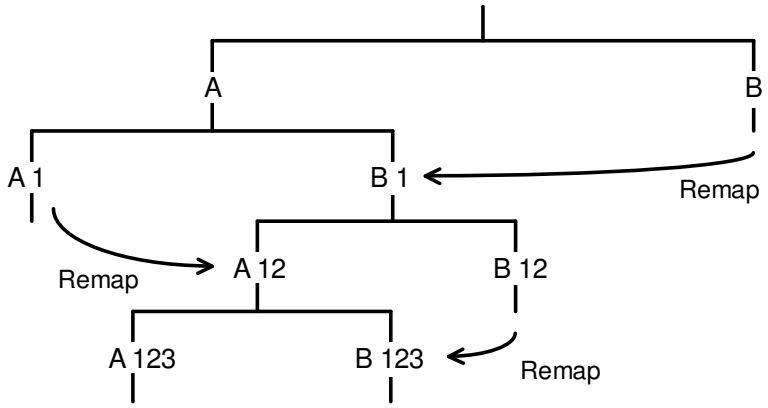
Fig 2.



From Abbott, 2001: 14.

The model becomes more complicated when Abbott uses it to show how distinctions play out over time; when lines of enquiry wither away their concerns are often 'remapped' onto other branches. Disciplines and sub-disciplines consequently evolve through processes of split, conflict and ingestion.

Fig 3



From Abbott, 2001: 23

As is already obvious, Abbott is mostly writing about the *internal* dynamics of disciplinary development. However, he recognises that moments of and opportunities for differentiation, conflict and ingestion depend on a range of *external* circumstances such as the availability of resources required for disciplinary expansion - jobs, journals, conferences and so on. The greater the resources, the more branches can be maintained for the fractal process appears to fill whatever 'space' is available. Where resources allow, fractal division generates eclecticism within a discipline; where resources are limited less diversity and more concentration results, as illustrated in fig 3.

Abbott argues that fractal distinctions and associated conflicts are cyclical: each development following a similar pattern: defeat of one side being followed by further fractal division of the 'winning' position and consequent re-mapping of the losers' concerns (along with some re-packaging and re-terming) onto the nearest equivalent branch on the 'winning' side. At which point the process is likely to start all over again. These cycles are often generational.

Abbott's formalistic model offers a simple but convincing (discuss!) account of novelty, diversity and periodic stability in the cultural production of knowledge. It is, however, limited when think about *interactive* agenda setting. While Abbott acknowledges the importance of resources in permitting or preventing disciplinary expansion, it is not at all clear how substantive issues and problems from the outside world flow into this neatly branching domain of academic debate. The model is particularly appealing in that it appears to apply to all disciplines, at all times and in all contexts. How could it be disconfirmed? What problems and challenges might detailed, culturally and historically specific analyses of different fields generate for Abbott's analysis? More positively, might this branching structure *also* apply to the formation and dissolution of non-academic priorities? If so, we could perhaps consider the *relation* between different but sometimes intersecting family trees of co-evolving preoccupations within but also beyond the academic domain.

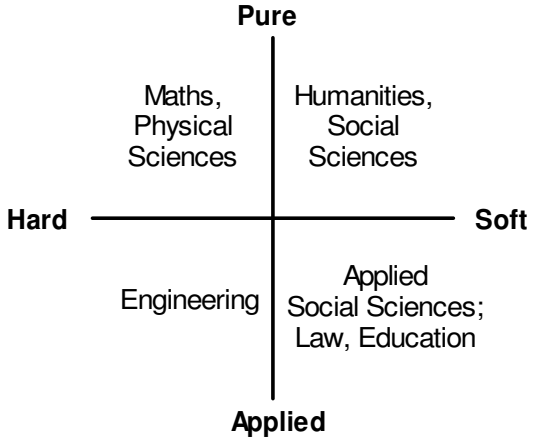
2 Tribes and Territories

Becher and Trowler's (2001) *Academic Tribes and Territories* (second edition), is a much more conventional, much more descriptive work organised around the basic

premise that the social and institutional characteristics of knowledge communities (or tribes) matter for the epistemological properties of the knowledge they produce (i.e. for their territories). The book examines a fairly predictable range of pressures - globalisation, relations with industry and with 'the market' (Gibbons, 2000); the rise of managerialism within universities - all of which have a bearing on what research is done.

In figuring out quite what these pressures mean in practice, the authors distinguish between hard, soft, pure and applied forms of knowledge (fig 4). They suggest that real and pre-existing differences between these four types mediate both the effect and the impact of external changes in the social and institutional contexts of academic work.

Fig 4.



Becher and Trowler also argue that the fragility or maturity of different disciplines is important for how external challenges are handled and managed. Following Kuhn (1996) the supposition is that pre-paradigmatic disciplines are characterised by ambiguity and internal difference in contrast to those organised around a settled set of debates, methods and problems. As the history of physics illustrates, the implied trajectory from disagreement to consensus does not always work out in practice for seemingly stable domains can be fragmented by new disagreements - for example about quantum electrodynamics. Yet the general point remains, disciplines are likely to be more or less stable at different moments in their career.

Becher and Trowler conclude that degrees of stability and patterns of consensus and dispute are not entirely determined by the forms of knowledge that are produced or by some unstoppable process through which disciplines mature. Conditions and circumstances that are (more or less) external, like how universities, faculties and departments are organised, can and do make a difference to disciplinary status and identity.

This is partly because those who form a disciplinary community also contribute to its definition. Since disciplines are constituted and carried by their practitioners, recruitment and reproduction are vital. While much has been written about how new members socialised, how core concepts are imparted and how 'situated practices' are learned through interaction and experience, rather less has been said about how

practitioners transform, develop and disrupt the disciplines of which they are a part. This is curious for academics generally aim and claim to produce *new* knowledge.

For Becher and Trowler, the potential for disruption depends, in part, on the solidity or otherwise of a mainstream discipline and on the sorts of networks and inter-institutional associations through which disciplinary affiliations are formed. A mature discipline characterised by a high degree of consensus amongst practitioners arguably constitutes a single network. By contrast, pre-paradigmatic disciplines consist of an aggregation of different networks or communities. This is relevant for the experience and significance of defection and dispute is different in situations where values and modes of operation are not, in any event, strongly shared. The methods by which individuals might achieve 'recognition' within close or loose knit disciplines and/or within their own institutions are also likely to differ. Where the knit (our terminology) is tight, it is usual to find stars and elites as well as guardians and gatekeepers who permit or prevent access to the tribe.

Summarising these ideas, Becher and Trowler distinguish between 'urban' (close knit) and 'rural' (loose knit) modes of knowledge production. They claim that these forms have implications for methods of communication and for patterns of collaboration and competition within and between disciplines and specialisms.

The more concentrated form of the 'urban' mode means that knowledge does not have to (and perhaps can not) travel far. It circulates through a limited number of journals and via articles that assume and rely upon shared terminologies, theories, meanings and techniques. In 'rural' situations, problems are more diverse and concepts less commensurable. The pattern is therefore one in which quite literally longer forms of research output are favoured (e.g. books and monographs), and in which more attention is given to positioning and justifying research and explaining concepts and approaches.

Forms of collaboration and competition also differ between the two modes. In 'urban' settings, many researchers compete to address a handful of recognised problems. By contrast, researchers in rural modes are more spread out. There is (arguably!) less competition because there is scope to address a wider range of questions and to do so in a variety of different ways. All in all, this is a potentially useful way of characterising different disciplines - though of course we might also expect movement between one mode and another as disciplines fragment or coalesce.

Table 1: Urban and Rural Forms of Disciplinary Organisation

Urban (close knit) ⟷ **Rural (loose knit)**	
• Clustered • Demarcated problems • Few Topics • Quick Solutions • Competition • Close communication	• Dispersed • Less delineated problems • Multiple topics • Long range View • Division of academic labour • Dispersed communication

Again the problem is that this analysis tells us really very little about how *interactive* agenda setting works out. Presumably the processes are different in 'urban' and 'rural' settings, not least because of the degree to which problems are already formulated. Should we therefore conclude that non-academic priorities can *only* penetrate in loosely formed 'rural' environments? Do we also subscribe to the (implicit) view that there are moments in a discipline's career at which it is more and less open to outside influence? Perhaps the points made about the density or otherwise of research communities and the reach and range of discipline-related networks are more relevant for understanding how research questions are generated, formulated and deemed worthy of investigation.

3 A System of Disciplines

In *The Intellectual and Social Organization of the Sciences* (1984), Whitley develops and extends an institutional approach of the type adopted by Becher and Trowler. He does so in order to produce a systematic map of academic endeavour (he uses the term ‘sciences’ to denote all academic disciplines, including social sciences and humanities). He begins by distinguishing between ‘intellectual fields’, which he treats as social organisations in their own right, and disciplines. Unlike fields, disciplines are more firmly connected to the institutions and structures of higher education (note that Whitley uses fields to describe what Abbott and Becher and Trowler call disciplines). Fields are like other types of organisation in the sense that raw materials (resources) are converted into outputs (new knowledge). Intellectual fields are characterised by two distinctive but somewhat contradictory features: the pursuit of novelty and the collective appropriation of research output as new knowledge. Researchers working within intellectual fields must therefore generate new concepts and results but must at the same time do so with reference to collectively agreed concepts, methods and theories.

Having defined fields as organisations, Whitley goes on to discuss a number of common problems like those of managing task uncertainty under different forms of social and bureaucratic control. Task uncertainly is a more important issue for fields than for many other organisations. The ambition of generating new knowledge means that outcomes are uniquely hard to predict. As described by Whitley, field-based control structures revolve around a ‘reputational system’ in which the ability to generate research, and to have it accepted by others is the (only) means by which reputations develop. This, along with a reward structure linked to reputational

control, maintains some consistency within a field and inhibits continual fragmentation as novelty is pursued.

University structures represent a blend of reputational and bureaucratic control. The result is a dual system in which reputational control is shared in varying degrees by a bureaucratic employer, which provides funds, facilities, trainees through the undergraduate system and so on, and the elite members of a particular field, who evaluate performance and generate research agendas. The relation between the university's multiple goals - for instance to produce research which can be commodified and sold, or which might contribute to industry or government policy - and the relative cohesion of field-based elites is important for how the dual system works out, and for whether it results in fields that are strongly bounded or dispersed.

Whitley generates a complex typology of intellectual fields on the basis of his analysis of this system of multiple controls and controllers. The key elements of his typology are a) the degree of mutual dependence within a field, and b) the degree of task uncertainty, again within a field.

Mutual dependence refers to types of relations researchers must build in order to contribute to the intellectual goals of the field, and so acquire reputation and reward. It has two aspects. Functional mutual dependence (FMD) refers to the degree to which researchers are expected to adhere to standardised ideas, procedures and results; high FMD implies that set methods must be followed in order to gain recognition and reputation. Strategic mutual dependence (SMD) describes the lengths to which researchers must go to persuade others of the significance of their work; low SMD would be characteristic of a field which does not have a dominant set of ideas about what counts as acceptable and valuable research.

Different levels of mutual dependence within a field are associated with different organisational qualities; for instance an increase in FMD is likely to mean that a field becomes more distinct or compact as members focus on shared problems, language and techniques. Dependence is affected by three contextual or social (rather than cognitive) factors. These are reputational control, control over access to resources and the plurality and diversity of audiences for research output. Reputational control and control over resources has been mentioned as one element in the dual structuring of fields; the plurality and diversity of audiences is important for the number of potential outlets for research, which is in turn linked to the reward and reputation system. Intellectual elites and employers generally find it harder to control research strategies and goals when researchers address a range of different audiences and when there are multiple routes through which reputations might be enhanced. By attaching reward and reputation to a handful of research topics institutions and elites can (in theory) contain risky and uncontrollable diversity and so keep better grip of what goes on.

According to Whitley, task uncertainty is subject to two contrasting ideals. Bureaucratic institutions seek to reduce it in order to increase the predictability and manageability of the research process. Meanwhile, academics value this aspect on the grounds that it ensures a measure of autonomy and freedom from external control. Whitley differentiates between two types, these being technical task uncertainty (TTU) and strategic task uncertainty (STU). The technical version has to do with uncertainties of outcome. The strategic form relates to the relative stability and integration of research goals. Again, both are influenced by external factors; for instance high STU, and therefore a lack of uniformity of strategies and goals, occurs where there are many audiences and a range of different channels for funding and dissemination.

By combining the two forms of task uncertainty and of mutual dependence, all of which can be either 'high' or 'low, Whitley produces a matrix of 16 different combinations (table 2). Nine of these are considered unlikely to develop, leaving seven distinct types of field or reputational system.

Table 2:

16 possible combinations of degree of mutual dependence and degree of task uncertainty. Shaded boxes indicate 'unlikely' combinations:				Degree of Functional Dependence			
				Low		High	
				Degree of Strategic Dependence		Degree of Strategic Dependence	
				Low	High	Low	High
Degree of Technical Task Uncertainty	Low	Degree of Strategic Task Uncertainty	Low	1	2	3	4
			High	5	6	7	8
	High	Degree of Strategic Task Uncertainty	Low	9	10	11	12
			High	13	14	15	16

From Whitley, 1984: 155

Although somewhat complex, this scheme does not depend upon realist distinctions between types of knowledge (like Becher and Trowler). It is instead organised around the interplay between internal and external processes and what they mean with respect to degrees of agreement with a field; the relative influence of non-academic bureaucratic and administrative structures, access to resources including external funding and the range of potential audiences for research. Despite these structural properties, Whitley's analysis has little to say about the substance of research activity, about how non-academic priorities actually shape research agendas (where they do), and about what this means for the content of enquiry and hence the development of a field.

Discussion

Having reviewed these three representations of the production and transformation of discipline based knowledge we now take stock of what they offer a discussion of *interactive* agenda setting.

Organising disciplines - and interactive agenda setting

Abbott's fractal model characterises the formulation and fragmentation of disciplines from the point of view of those involved - i.e. members of disciplines. Disciplinary dynamics are based on conflict and agreement, but this time between concepts and ideas rather than institutions and structures. Partly because of this, Abbott does not get tangled up in detailed arguments about hierarchies, elites and gatekeepers or about the historically specific conditions and circumstances under which people contribute to the processes he describes. According to Abbott, academics position themselves within disciplines or sub-disciplines through critique as well consensus. As he suggests, cycles of conflict, victory and remapping are frequently related to a recurrent process in which up-and-coming academics challenge established methods

and ideas. The result is a twenty-year pattern in which paradigms and positions turn round as new generations take centre stage and as they are, in turn, ousted. This is implicitly so for all forms of science - an idea that runs counter to the importance Becher and Trowler attach to *a priori* distinctions between more and less mature disciplines and between those that produce hard, soft, pure or applied knowledge.

Abbott also sidesteps some of the problems involved in categorising and bounding fields and disciplines and talking of them as if they are, or as if they necessarily seek to become, recognisable and stable entities. Whitley's organisational approach carries with it the assumption that disciplines 'want' to be homogenous and distinct and that they mobilise resources to this end. This leads to the parallel conclusion that diversity - in content and in research agendas - only arises when there are multiple and multiply divergent 'controlling' forces. Again Abbot's analysis differs in that diversity and convergence are necessary outcomes of fractal development. In the bigger scheme of things, this is what generates situations in which elements of one discipline end up being more closely aligned (in terms of content, theory and method) with parts of another than with the mainstream from which they are directly descended. Abbott supposes that alliances between outlying parts of different disciplines are important not in their own right but for arguments 'back home', that is back within the parent discipline. It is, however, possible that completely new disciplines and research agendas might emerge as a result of interaction - whether conflictual or not - between outlying branches of a range of existing traditions and perhaps between these and the branches of non-academic forms of knowledge production. In this way we might imagine some heady mixture of fractal division on the one hand and triple-helix type interaction on the other!

Becher and Trowler and Whitley are much more obviously interested in the institutional environments in which disciplines flourish and fail. For present purposes, their discussions of reputation and reward are potentially useful in understanding how fashions in ideas take hold and how research questions become institutionalised. Academics are probably not only motivated by the pursuit of reputation and recognition but to the extent that they are, they might well make strategic decisions about which lines of enquiry to pursue and what topics to avoid. Much then depends on what counts in the making of reputation - who are the leaders and what are they following - and the relative significance of academic and non-academic circles in which one might be known. Whitley's interest in the density and coherence, or otherwise, of disciplinary and perhaps also non-academic networks is undoubtedly important in this respect.

On the other hand, the idea that certain disciplines are, at different points in their respective careers, variously capable of resisting outside influence revolves around a fundamentally oppositional interpretation of 'us' and 'them'. For Whitley and for Becher and Trowler, non-academic influence figures as outside intervention, not as an entirely normal dimension of everyday agenda setting. The 'us' and 'them' representation is problematic on another count. For all the discussion of fields and specialisms, these authors suppose that disciplines have meaningful boundaries and identities. While this is clearly the case in organisational terms - there are departments of sociology, history, geography and so on - such certainty is not always found on the ground. In organising this workshop we have worked hard to find people willing to speak about the 'discipline' of which they are a part.

Institutional contexts - and interactive agenda setting

Becher, Trowler and Whitley make much of the relation between 'internal' and 'external' factors in shaping academic life. On the inside, we have the gatekeeping

practices of elites, selection mechanisms and criteria for disciplinary membership, reputation management, generational overthrowing and fractal distinction. On the outside we have an array of employer-based considerations: student demand, pressure on resources, research funding and research policy.

So far receiving little attention, but figuring in Whitley's, work we also have the audiences of and for research. Consistent with the internal/external framing of the debate, audiences are of one of two types, they are either peers or outsiders. However this is not the only way to think about relations between the consumers and producers of research. We might, for instance, ask more generally about how actual and potential audiences - academic or not - figure in the framing of research questions, in setting priorities and in the distribution of resources within universities, within disciplines and by research funders.

We should also take note of the persistent importance of accumulation (not reinventing the wheel), novelty and originality in judging and evaluating academic research. What do these criteria mean for the framing of researchable questions and so for the development of different disciplines? This is not only a matter of when, whether and how creativity can be managed, costed and programmed (see Whitley's discussion of bureaucratic control) but a more general issue about the traditions and conventions of problem formation. How is novelty recognised and understood?

Ideas - and interactive agenda setting

Whitley, Becher and Trowler barely mention the part that ideas play in giving shape and direction to different forms of disciplinary development. Abbott comes closest in so far as divisions and agreements are about concepts, methods and positions. However, this is a far cry from the detailed accounts of trends and positions that one would find in histories of specific disciplines. For example textbooks on social theory generally start with the work of Marx, Weber and Durkheim. Subsequent developments such as structural functionalism or symbolic interactionism are then positioned as the emergent outcome of a concerted process of reinterpretation and critique. Although these histories rarely mention what else might be going on in the world at the time, there is almost certain to be some seeping influence. After all, academics are also people engaged in different ways in the politics and practices of the cultures and contexts in which they work. This kind of interaction, perhaps the most important, is also the most elusive.

Some of the ideas rehearsed above may provoke and inspire thoughts and contributions relating to the four themes around which the workshop is organised: These are:

1. **fashions and trends** - how do new research topics come into and go out of fashion within different disciplines. We would like to hear about specific examples, particularly of declining interest.
2. **the careers of ideas** - how do specific fields and sub-disciplinary areas develop. On this point, we are interested in tracking sequences of argument and debate, and how they divide and branch.
3. **reproducing and transforming disciplines and their followers** - how are people attracted to new topics and how does their work shape the trajectory of the field(s) in which they work? Here we recognise that disciplines are made by the work of previous practitioners and by the strategies of those who follow them today. Individual careers are of consequence for the careers of entire disciplines. Personal histories are as relevant for ordinary members of a discipline as they

are for its leaders. What are the mechanisms through which people end up studying and developing one field and not another?

4. **the outside world and setting priorites** - how do processes of disciplinary change relate to non-academic priorities and pressures? This is the central question of the workshop. Many of the arguments rehearsed above suggest that there is a tension if not opposition between 'internal' and 'external' pressures on disciplinary development. Is this exaggerated and can we generate other ways of thinking about the consumption and production of different types of knowledge, and about how priorities become established and how they circulate between as well as within academic and non-academic domains.

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