

INTERDISCIPLINARITY

Building bridges and nurturing a complex ecology of ideas

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Abstract: Much discussion of interdisciplinarity shows one or more of the following defects: 1. conceptual confusion - lack of a refined and consistent set of terms for analysing interdisciplinarity and its variants; 2. utopianism - lack of realism about constraints and possibilities in the social organization of science; 3. monism - advocacy of a single simple organizational model, rather than a complex heterogeneous model with multiple niches, nodes and forms of interaction. The paper presents a more refined, realistic, and pluralistic approach to interdisciplinarity. It does this with special reference to development studies, whose interest in long-run change and common combination of a case-focus and policy-orientation guide it strongly to interdisciplinarity; and to problems raised by the dominant economics conception of itself as a self-sufficient alpha-status discipline. The paper conceptualizes a range of types of interdisciplinarity, and considers how far exemplars of each—such as social capital theory and entitlements analysis—offer ‘bridging capital’, accessible paths to effective social analysis.

1. INTRODUCTION

The need to avoid a fixed, let alone a single, disciplinary frame for conceiving and considering situations acquires special importance in development studies, in order to deal with cases in their own right, their own complexity, not by imposition of oversimplified universal models from a metropolis. Development studies has used interdisciplinarity as legitimation for its distinctive organizational space. Sustaining that claim to legitimacy is neither simple nor always attended to, though the organizational space ultimately depends on it. Speaking of one of the first development studies institutes, van Nieuwenhuijze recalled that 'In starting the Institute of Social Studies [in The Hague in 1952] it seemed feasible to build an organization that offered the least impediments to budding interdisciplinarity' (1979:58). Reviewing the institute's first 25 years he regretted that: 'The various disciplines have shown little interaction. Economists have by and large "done their thing"..' (1979:59). Aware of arguments for development studies as a field with a global interdisciplinary perspective, providing a window on the emergent One World, he warned that such a claim will 'be held to ridicule unless [it] proves effectively innovative' (p.62).

This paper examines rationales, problems, and varieties in interdisciplinarity, to give a realistic perspective on its prospects and roles. It synthesizes and extends earlier discussions on interdisciplinarity and development studies, such as by Hettne, McNeill, Norgaard and Seers, and places them in broader methodological context.

Inter-disciplinarity concerns interaction *between* disciplines. This covers many patterns of activity and outcome, which need to be distinguished, not moved between opportunistically in discussion. Lack of a consistent and insightful terminology can be fatal when competing interests and strong emotions enter. The term is mostly used loosely, including by many an individual author, to mean various different things, such as: multi-disciplinarity (MD), knowing and/or using something of more than one discipline; poly-disciplinarity, the mastery of more than one discipline by a person; mega-disciplinarity, synthesis of disciplines into a mega-framework; or trans-disciplinarity, the transcendence of standardized frameworks. Some authors treat interdisciplinarity (ID) as an unattainable ideal of mega- or poly-disciplinarity (e.g. Johnson, 1986; Dogan & Pahre, 1990; Easton, 1991), or as a synonym for InDiscipline, though this picture of ID Studies programs is remote from their best practice.¹

Interdisciplinarity must be judged by its fruits. Some surveys report the greater fruitfulness of 'cross-border research', work at an intersection of perspectives (e.g. Gerstein et al., 1988; Dogan, 2000). In possible contrast, the prominent Harvard development economist and China specialist, Dwight Perkins, warned that: 'There is a long, long history of the failure of multi-disciplinary work' (cited by Norbye, 1992:154). He held that multi-disciplinarity (MD) is required for many policy problems, but may not fit theory building. Section 2 will start from Glenn Johnson's similar claim of the need to recognize three modes of social research: traditional disciplinary research led by methods and theory; case-oriented research, led by pressure to understand a specific situation, not only selected aspects; and policy/practical-problem oriented research, led by pressure to respond to a perceived life problem. In the latter two modes, there are strong reasons for ID and MD work. We then go further, to see the case for ID in much general explanatory work too. One cannot in general sustain a claim of separate, only occasionally interacting, 'social', 'political', 'economic' and 'physical' aspects. In the environment-and-

development field for example, the deeper insights and greater adequacy of inter-disciplinary work appear glaring, to those with the commitment and skills to read it. But deciding what are cost-effective forms and levels of inter-action requires careful thought.

Understanding ID requires understanding disciplinarity, and considering how science works as a social, psychological, organizational enterprise. Section 3 considers the nature of disciplines and the constraints and requirements implied for ID. Mainstream economics receives special attention because of its problematic engagement in ID, in fact proneness to resist it (Lipton, 1970:12), and the significance of this tension within development studies.

Section 4 looks at possibilities for promoting and implementing ID. We need in particular better language to discuss and facilitate various types of ID. A proximate objective of the paper is to provide a sharper picture of types and of relevant niches, roles, and constraints. An old and still useful image is 'building and using bridges', which draws on 'the island metaphor' noted by Berge & Powell (1997) and is more optimistic than the 'cactus metaphor' for disciplines. Cactus deserts, bridge-connected archipelagi, poly- and multi-disciplinarity (joint use of multiple separate disciplines) are far from the only relations. (Klein, 1996, and Salter & Hearn, 1996, illustrate many others.) We should recognise and promote a complex intellectual 'ecosystem' with multiple legitimate types of life-form, sub-system, and of interaction of ideas, inquirers and users.

Section 5 therefore looks at styles of cross-border relations—whether cooperative or not, whether marginal or central. It specifies types of inter-disciplinarity and some of their respective limitations and attractions. The OECD/CERI classification of 30 years ago remains a good starting point, and can be refined. It remains superior to trying to handle a mass of variants with one or at most two terms, and quickly leads us to interesting comparisons of variants.

We need empirically grounded and theorized ideas on factors which favour ID, bridge-building and fruitful growth of the intellectual ecosystem. Some suggested steps have already been mentioned or implied: distinguishing between modes of research; terminological clarification; understanding disciplines as culture-bound islands, dealing with whose natives demands special skills; promotion of some shared values or (as in much practical problem-solving work) shared incentives or pressures or experience - 'common interests' in various senses; and building and using mutually accessible intellectual formats. Section 6 focuses on types of 'bridging capital', intellectual frameworks to promote interaction and mutual deepening. With reference to the special need in development studies to bring and keep economics in fuller conversation with other disciplines, it asks what makes some bridges feel accessible and yet not too crude, entice rather than repel.

2. THE RATIONALES OF I.D. AND A FIRST MAPPING OF THE ECOSYSTEM

What are the grounds for interdisciplinarity? We open with a common picture of kinds of research, which links ID to case-focused or policy-focused research. For at least those purposes disciplinary loyalists must work with other disciplines: this is ‘exogenous’ ID (OECD, 1982). We see however that the rationale of this link also justifies much, ‘endogenous’, ID in general explanatory-oriented research. We then enrich this picture with Wallerstein’s historical perspective of how the conventional disciplinary divisions in social science emerged and continue to evolve. The conventional divisions remain dominant but have been significantly modified at the margins in the past two generations. We examine how these rationales of ID are reflected in development studies, one of the margins which emerged post-1945, and some of the challenges it faces to sustain its ID aspirations.

Purposes of research: theory-oriented, situation-oriented, policy-oriented

If one wishes to understand a particular person, group, locality, or country, one must become ‘interdisciplinary’, attend to a variety of aspects and how they interrelate. If one wants to study the impact of say economic structural adjustment on India, Yugoslavia or Rwanda, one cannot sensibly ignore political impacts, plus their feedbacks into economic life. In studying any country, qua country or even only qua ‘economy’, one cannot ignore the possibility that economic power will be converted into political power, through campaign funding, favours, bribes, media control, acquisition of greater knowledge, and other means, and that this in turn will affect economic systems. If one studies the impacts of education in and on, say, Kerala one cannot sensibly ignore cultural impacts, such that almost no one with a certain amount of schooling will do heavy manual work: a major economic fact.

Similar considerations apply when we consider ID in policy-oriented research. Much of this is a special case of situation-focused research, though some policy work aspires to widely applicable generalizations. The complexity of policy cases frequently exceeds the grasp of discipline-gained knowledge, even when brought together from various disciplines. Much ID is in response to life-problem situations where we cannot wait for eventual discipline-gained knowledge. Such work may sometimes then not be tidy or conventionally scientific rewarding, but it requires sophisticated skills of judgement, selection and synthesis (Brewer, 1999; Rein & Schön, 1994).

Glenn Johnson, a distinguished agricultural and development economist, was also an unusually reflective methodologist (e.g. Johnson & Zerby, 1973). His book *Research Methodology for Economists - Philosophy and Practice* distinguishes three modes of research—positive, evaluative and prescriptive—and three possible purposes: to generate theory, to obtain case-illumination, and to support action (the last two often coexist). From this I derive Figure 1. The elucidation of the modes and the illustrative contents in the boxes are mine; the ‘disciplinary’ and ‘subject matter’ labels are Johnson’s.²

Figure 1: Types of research, classified by purpose and mode (based on Johnson, 1986)		PURPOSES OF RESEARCH		
		<i>'DISCIPLINARY'</i> (in <i>Johnson's sense of</i> <i>having a general-</i> <i>theory orientation)</i>	<i>'SUBJECT-MATTER'</i> (description/ explanation of a specific issue/ situation/ case/ location)	<i>PRACTICAL</i> <i>PROBLEM-</i> <i>SOLVING</i>
KINDS OF KNOW- LEDGE CLAIM	<i>POSITIVE</i> (more neutral description & explanation)	E.g.: core economics; or the sociologies of economics, of law, of ethics	E.g. area studies, much history, some biography	As a contributory component, basis for prescriptive work; including in the absence of mature general theory
	<i>EVALUATIVE</i>	E.g. ethics: theories of the good	E.g. much history and biography; strategy review.	E.g. program evaluation. And as a basis for prescriptive work.
	<i>PRESCRIPTIVE</i>	E.g. ethics: theories of the right; and some general legal theory	From Johnson's definition, 'subject-matter' work is 'seldom prescriptive' (p.212); but in fact the case- and problem-solving orientations can co-exist	Prescriptive-problem work: e.g. prescriptive policy analysis, legal casework

Johnson's classification gives a worthwhile starting point, but not all disciplines are centred on theory. We can identify 'subject-matter' focused, and problem-solving focused, *disciplines*; e.g. in the first category, history or Chinese studies, and in the second, engineering and law, which can also be seen as families of disciplines.

Various practice-oriented fields have tried to be, like engineering and law, simultaneously a profession and an academic discipline, but not all with as much success. Public administration and urban-&-regional planning, to take two important examples, are better seen as 'interdisciplinary fields' (Gasper, 1990, 2000a)³; so too is development studies. Public administration works at the crossroads of several disciplines and a set of practical demands. Compared to general management it requires stronger involvement also from law, history and economics, and cannot be simply a sub-discipline of management or political science. Whereas disciplines can attain a high degree of enclosure around self-defined concepts, methods and questions, and leave aside matters not convenient to this disciplinary matrix, a practically oriented, maid-servant (or public servant) enterprise like public administration should never adopt such a prioritization of tidiness above usefulness. It has to draw on various types of understanding to tackle various types of pressing and inter-connected real issue; it links material from different fields without unifying them (Gasper, 2000a). It never has been, and never should be, a unified discipline: 'Integration does not so much result in a coherent body of knowledge but points at a process of continuously striving for the confrontation of diverging approaches in order to better understand some aspect of (what constitutes) administrative

reality.... integration not only results in bridge building between theories but also points at unbridgeable differences' between their underlying perspectives (Rutgers, 1998: 561-2).

An interdisciplinary field is inevitably marked by competing definitions and conceptions. This helps to explain the failure, even more than for general management, to make public administration a closed profession with well-defined compulsory entry conditions. Full consensus on disciplinary identity and location is in fact unnecessary: we can gain through competition of ideas, and there are many legitimate intellectual bases, from various disciplines and the schools within them, so that room exists in public administration for diverse specializations and niches (Gasper, 2000a).

In seeking to persuade a disciplinary economics audience of the value of ID, Johnson presented it only as for case-focused and practical problem-solving research. But for purely explanatory purposes too the case for ID often stands: the limits of any one disciplinary view, the need for a broader perspective. If one cannot respectably analyse the results of structural adjustment in Yugoslavia or Rwanda while ignoring their (disastrous) political—and hence also economic—impacts (Woodward, 1995; Uvin, 1999), nor education in Kerala while ignoring the indirect economic impacts of mass aversion to menial work, nor the results of economic liberalism while ignoring the impacts of massive concentrations of wealth upon politics and conflict, nor can one do so in an adequate theory of economic adjustment or economic development. Seers argued this forcefully a quarter of a century back, and Myrdal before him. Hayek warned that 'the economist who is only an economist is likely to become a nuisance if not a positive danger' (1956:463). Admittedly, to build joint theory is usually harder than to get cooperation on policy related cases, where as in an art one creatively relates relevant general tools to a particular time, place and case, in contrast to a science where one aspires to capture all or most variation within a general formulation. This does not change one's scepticism about single-disciplinary abstracted theory.

Disciplinary and inter-disciplinary in historical perspective

Johnson's picture takes the now traditional disciplines too much for granted (the first substantive cell in Figure 1). Immanuel Wallerstein adds awareness of how they are not eternal, but emerged—not identically in all countries—and are evolving; notably in the Report of the Gulbenkian Commission on the Restructuring of the Social Sciences which he chaired (Wallerstein et al., 1996). I summarize the report's vision in Figure 2. It highlights four conventional, established divides in the terrain of social studies:

1. past- versus present- oriented;
2. whether the focus is on supposedly 'modern' or 'non-modern' societies, as seen from Europe (Europe and its offshoots and posited precursors, versus the rest of the world);
3. nomothetic (seeking general laws) versus idiographic (seeking knowledge of unique cases); and
4. economics versus political science versus sociology: the three main nomothetic, present- and 'modern'-oriented distillates which fractionated out from more integrated social studies in the late 19th or early 20th centuries. (Political science has however been less nomothetic than sociology or especially economics.)

Figure 2: Wallerstein's anatomy and genealogy of modern social studies		
	NOMOTHETIC	IDIAGRAPHIC
PRESENT ORIENTED I. 'Modern societies' II. 'Pre-modern societies'	- "The Triad", the outcome of 19 th C. evolution of European social thought: 1. Economics: market 2. Political Science: polity 3. Sociology: 'society' - Post 1945 expansions of the Triad to discuss the non-European world	- Cultural studies & newer anthropology (which have somewhat undermined the old social sciences v. humanities division) - Some older-style anthropology / ethnography (but some other anthropology became nomothetic)
Emergent cross-cutting sub-fields, across the past-present divide, etc.	Post 1945 mushrooming of overlap sub-fields (e.g. quantitative economic history) which span one or more of <i>the four divides</i> : 1. past/present oriented; 2. 'modern/ non-modern' societies; 3. nomothetic/idiographic; 4. economics/politics/sociology. Much work in such sub-fields (like economic anthropology) and cross-fields—area studies, development studies, etc.—has been concerned with coming to terms with (and keeping tabs on) particular 'non-modern societies', no longer left for the ghettos of Orientalism and ethnography.	
PAST ORIENTED I. 'Modern societies' II. 'Pre-modern societies'	- Economic history - Post 1960 expansion of the field of attention of economic history	- History - 1. 'Classics' (about the supposed precursors of the modern) - 2. Orientalisms (study of the supposed non-precursors); partly absorbed now into area studies and the broadening historical focus of formerly overwhelmingly present-oriented fields
	NOMOTHETIC	IDIAGRAPHIC

Wallerstein et al. emphasise the conditionality and changeability of disciplinary boundaries. Science appears as partly driven by power and rewards, and by whatever types of data are created and available, and thus directly and indirectly by the needs of states and the types of study they have encouraged. 'Nearly all social scientists assumed [that] political boundaries fixed the spatial parameters of other key interactions - the sociologist's society, the macroeconomist's national economy, the political scientist's polity, the historian's nation.... social science was very much a creature, if not a creation, of the states, taking their boundaries as crucial social containers' (pp.26-7). With the expansion of the 'three [main] nomothetic social sciences into the non-Western world, these areas too became subject to state-centric analyses. The key post-1945 concept of "development" referred first and foremost to the development of each state, taken as an individual entity' (p.81). 'Human Development' thinking and International Political Economy may nowadays diverge from this.

The Gulbenkian Commission thus highlight the efflorescence of work since the 1950s which in one or other way crosses the standard lines, though they doubt whether it is enough. Building on work by Jean Piaget, Dogan & Pahre (1990) consider this trend in

detail, under the name of hybridization. They see an unending cycle leading to ever more specialized but ever more cross-fertilized study areas. Scientific fields show continually growing specialization, narrowing of focus, and sub-division: the creation of sub-disciplines. This produces deeper work, but also leaves gaps and progressively encounters diminishing returns. Innovators then identify higher returns from cross-border hybridization with another specialized fraction, often from another discipline. A new, more specialized, sub-field emerges; and the cycle then repeats, again and again. Dogan & Pahre conclude with 'no recommendations' (p.230), but in fact simply and strongly advocate recognition of the specialization-hybridization cycle as desirable and inevitable. Inter-specialization interaction is a dynamizing, enriching, crucial aspect of science (see likewise Klein, 1996; Salter & Hearn, 1996). Whereas the type of ID service work advocated by Johnson is usually seen as in the long run parasitic on strong disciplines, the disciplines are in fact themselves dependent on cross-fertilization from ID work (Hansson, 1999).

Wallerstein et al. in contrast are worried 'that the concession of "inter-disciplinarity" has served as much to salvage the legitimacy of the existing disciplines as to overcome the waning logic of their distinctiveness. [They and others] have urged a more radical reconstruction to overcome what they perceive as intellectual confusion' (p.47). Further, hybrid fields flourish when resources are plentiful. When scarcity bites, the old established disciplines try to bite first, so one can no longer avoid the issue of how to reconstruct them (p.96). However, the disciplines possess organizational clout and large power bases from stock teaching, and declare that they have deepened and become more subtle since the 1950s when the need was felt for transcending them via area studies and inter-disciplinary fields.

The challenges for development studies

Development studies combines Johnson's grounds for ID: extensive case-/situation-orientation and policy-orientation, and Wallerstein's: the need for a broad view on a world too complex and interconnected to be adequately described by single disciplines. For Björn Hettne, in his *Development Theory and the Three Worlds*, development studies is 'a problem-oriented, applied and inter-disciplinary field, analysing social change in a world context [of material disparities], but with due consideration to the specificity of different societies in terms of history, ecology, culture, etc.' (p.4, 1990 edition); it is typically marked by normative and policy concerns (1995:12).⁴ While 19th century social science often retained much of that orientation, even if Eurocentrically, it was gradually largely replaced by more abstracted, static and compartmentalized work. Much post Second World War work on and in low-income countries found it had to transcend this now mainstream social science. Contributions came both from Southern intellectuals and practitioners who found problematic the divisions of intellectual labour established to describe the reproduction of mature industrial capitalist societies, and from Northerners on the periphery of those disciplines. In the present phase, the overwhelmingly Third World focus of development studies declines as old definitions of 'Worlds' dissolve, but its approaches acquire broader application, found to be necessary in North and East too - a view championed by Dudley Seers.⁵ Crude application of neo-liberal and modernization theory in the former Communist world, for example, can produce the sorts of crises and

reactions seen earlier in the South. The disintegration of the former Yugoslavia is a prime illustration of effects outside an economics field of vision, in the wake of easy loans in the 1970s, soaring 1980s interest rates and then a crudely enforced structural adjustment (Woodward, 1995).

Development theory's significance is thus, according to Hettne, as 'a precursor... [and] catalyst... forcing the excessively specialized and static social sciences to focus on development and change... [and return to] the classical tradition of a unified historical social science' (1995:xiii), though now on new, non-Eurocentric, foundations. Harriss (1999) argues similarly, with the illustration of how economic and social planning for India were hobbled by failure to see the implications of introduction of political democracy in a pre-industrial and hence rich-peasant dominated country. He regrets that much of development economics has never perceived the need for a broadened field of vision.

Hettne recognised the predominance from around 1980 of neoclassical economics and Anglo-American managerialism. But development studies was not 'a "discipline" in disintegration' (1995:249). Recognition around the world will continue to grow of the social requirements and impacts of markets and economic growth, and of their human and ecological costs. Further, development studies has always needed to be an interdisciplinary field intellectually, not a separate discipline, even more so when defined 'in terms of problems rather than countries' (p.287). It will neither consolidate as a separate discipline nor wither. Given the disciplines' internal preoccupations and norms, and that the needs in low-income countries are 'still, and for good reasons, regarded as the core area of development problems' (p.265), he advised that it was not 'time to give up [the development studies] space [organizationally]. Rather it is important to defend it against the rising wave of monodisciplinary fundamentalism...' (p.286).

Having considered rationales for interdisciplinary approaches, we must consider the constraints set by the rationales and practices of disciplinarity. Subsequently we look for feasible steps forward.

3. THE SOCIAL ORGANIZATION OF SCIENCE

Understanding disciplinarity, as a basis for understanding and attempting interdisciplinarity

The terms 'discipline' and 'disciple' are not close by coincidence; nor are the two meanings of 'discipline' accidental twins, as Foucault and others have underlined.⁶ 'Disciplines' contain social as well as intellectual formations. They are organized groups or networks which discipline members and students—by rewards, punishments and bestowal/withdrawal of identity and recognition—to create disciples. In this sense they are successors to the priestly orders. They seduce as well as drill, providing to young people of an impressionable age a nest, a community, a style and set of habits, a gradual induction to mysteries, and many intellectual rewards from the excitement and tractability of the bounded puzzle. For a variety of reasons, treated by theorists of science such as Kuhn (1970) and Ravetz (1973), an in-depth rather than in-breadth approach is often functional and even necessary. In cases when this is not so, disciplines sometimes discourage exploratory work which crosses borders, in order to maintain their territories.

Sheldon Rotblatt (1999) defends disciplinarity as a system that shields academic freedom against political domination: it asserts the existence of areas of deep and organized knowledge which is established and to be governed by scientific criteria only. Universities are indeed cradles of disciplinarity, given their roles as a machinery for validating suitability for entry to professional paths and in the socialization of the next generation of academic teachers; given too the incentive structures for academics to play safe after and even during their PhD studies and publish prolifically by doing detail work (Earl, 1983). By basing the structures for research on the structure for training, most universities constrain that research. Co-operation in teaching is sometimes harder still, thanks partly to turf- and budget-defence. Academics frequently have little or nothing to do with their colleagues on the same campus from supposedly sister disciplines.

The depth and virulence of disciplinary chauvinism is in many ways surprising. Consider the struggles common within joint sociology-anthropology departments: Giri (1998) cites several instances which led to splitting, and one can add others. Even after having established their own territories, flags and passports, disciplines continue to often have poor relations with some others: to largely ignore and (yet) disparage each other (Salter & Hearn 1996: 157). The generalist-linker is typically a role with low status. Why a closed rather than an open disciplinarity? Reasons might include the arrogance of science; fear of the unknown; single-discipline social science first degrees; the defence of departmental budgets (so that conflicts with one's closest neighbours tend to be fiercest); and the delightful convenience of disciplinarity, like bureaucracy, for those who can then ignore most aspects of other people's situations.

In addition, we should note three fundamental factors. First, the social science disciplines have historically emerged as in some respects competitors rather than partners. Second, disciplines are cultures, and cultures differ; relatedly, they provide 'homes', bases of identity. Third, disciplinary boundary setting is often underpinned, especially in economics, by a 'Newtonian' ontology which declares that the whole is the sum of the parts, which can therefore each be examined separately.

First, the social science disciplines and fields did not grow as partners. Aidan Foster-Carter argues that the social sciences are competitors for dominance, not a chain of emergent subsets like physics-chemistry-biology. They represent competing perspectives, some of which may consider that they can cover everything or subsume the others as special cases. And: 'Each and every specialization was started in response to incidental historical events or circumstances. Problematic issues were taken up, and when the going was good the effort expanded, regardless of others' (van Nieuwenhuijze, 1978:18). Little reference was made to each other's roles.

Secondly, disciplines are cultures and cross-cultural contact is problem-ridden and demanding (Schoenberger, 2001). The different styles of writing between different social sciences, and between natural and social sciences, form one barrier (Salter & Hearn, 1996; McNeill, 1999). Economics uses the style of the detective story: characters of restricted depth interact in intricate but standardized ways. For some readers this is a delight, for others a bore. Analysis of these genre differences, including of root metaphors and key exemplar cases and illustrations in different disciplines, might improve mutual awareness and communication. (See e.g. the work of Apthorpe, McCloskey, and Roe.)

Relatedly, disciplines often serve as bases of personal identity. Consider two stances. In stance A my discipline/training is my *allegiance* (a choice comparable to that of Jesuit versus Dominican), my noun-expressed identity ('I am an economist'), a caste-mark, for life. In stance B my (original) discipline/affiliation/ label/training is one of many relevant adjectives or descriptive clauses about my *background* ('I trained in economics, thirty years ago'). Stance B is healthier, including for inter-disciplinarity; but stance A is common, probably more common. ID works more readily when people act as representatives not of disciplines but of themselves, their experiences, values and insights. Rajni Kothari (cited by Giri, 1998) argues that the key step in ID is formation of a community of conversers who each seek to cross and maybe transcend conventional bounds: 'For true interdisciplinarity to develop, it is the individual that has to become inter-disciplinary, not the group'. Since disciplines can become sources of personal identity, advice to treat ID as a follow-on phase in education, after people have first been immersed overwhelmingly in one discipline, is problematic. In addition the pressures of professional life after PhD studies make acquisition at that stage of adequate grounding in other disciplines less likely.

Thirdly, several authors argue that disciplinarity reflects dominant premises in modern Western thought, accepted due to their immense success in parts of the physical sciences. Following Norgaard (1994:62-5), the first two are: (i) Atomism: systems consist of unchanging parts, and a system is the sum of those parts; and (ii) Mechanism: relations between the parts do not change. Given such premises, a disciplinary field of study may take most things as exogenous, constant, separable, unaffected by the remaining things which the discipline does consider. The other premises, particularly influential in economics, are as follows: (iii) Universalism: the same parts and inter-relations apply for all cases, everywhere. (iv) Objectivism: people acting on systems are not parts of the systems they seek to understand and act on. (v) Monism: there is one correct way to understand a system; any plurality of ways will merge into a bigger picture; so the various sciences will fit together without any fundamental difficulties. Each of these premises is adequate in the older parts of physics, but not for complex systems involving people.⁷

Much of economics can be even more fiercely monist: it may not recognize other valuable ways to view an economic or human system (Söderbaum, 2000). Thus, in contrast to in other social sciences, only one paradigm, neo-classical economics, is now taught in many economics departments, let alone much on other disciplines and mutual roles; and forms of neo-classicism seek to become imperial also beyond economics (Fine, 1999a).

The special case of mainstream economics

'Anyone who works in an interdisciplinary way is considered a bad economist', reports the prominent environmental economist David Pearce (in Ravaioli, 1995:26). Discussion of ID in social sciences and development studies remains politely vague, and the later treatment of 'bridging capital' unfocussed, unless we recognise that difficulties in this area more commonly involve economists than human geographers or anthropologists or even most sociologists, political scientists and cultural studies folk. For sustainable development, ecologists are far better trained to consider systems which cross traditional science boundaries than are most economists. Mainstream economics'

box of tools, boundary-markers and standardized formulations dominates many of its practitioners: 'Elegant error is often preferred to messy truth. Theoretical tractability is often preferred to empirical relevance', regrets Richard Lipsey in a major critique by a troubled elder statesman (2001:169). The economics mainstream constitutes a special problem in inter-disciplinarity given a combination of comparatively poor 'external relations' with other sciences, assumptions often chosen for convenience more than realism, and yet strong policy-orientation and influence.

Economics has greater problems in its relations with other social sciences than we see at other social science interfaces. Its universalist claims, the absence of stated limits to its reach, typically produce a weak concern for history and qualitative change; while its achievements sometimes induce a superiority complex, seen for example in some interviews in Swedberg (1990). Yet the famous economists interviewed by Swedberg were clearly worse read in sociology than their sociology counterparts were in economics. The pattern is characteristic: citation patterns indicate that economists import little (Dogan & Pahre, 1990). While only a minority hold an explicit vision of economics as the master social science—the science of choice in general, able to absorb the other fields—most economists do not see their subject as only one perspective amongst other social and human studies with which they vitally must interact. Education in other fields often early on situates the field in relation to others (see for example the classic sociology textbook by Tom Bottomore); economics textbooks do not.⁸ Even some economists who practice ID, learning from other areas, formally decry the notion, perhaps identifying it with mega- or trans-disciplinarity or just indiscipline.

Economics seems to have problems on other frontiers too. Natural scientists can find its assumptions and methodology odd (as reported in Anderson et al., 1988; Waldrop, 1993): the common insistence that its core presumptions are not supersedable or in need of testing, priority to abstracted deduction above broader empirical exploration, and failure to collect much of its own data and to converse with people.

Yet no other social science matches economics' long history, prestige, scale of research and membership, and influence. In a money-based and growth-fixated world, societies are routinely referred to as 'economies' and the world itself often becomes 'the world economy'. Economics is uninhibited in policy advice by feelings of being polluted or demeaned; on the contrary, it gives policy advice high status. Gunnar Myrdal examined the contrast here with other social sciences, and Salter & Hearn add that most natural scientists too shy away from the common demand in policy discourse for radical simplification. Whereas: 'Economists often prefer theories that produce unambiguous policy results over theories that do not, irrespective of their relative evidential bases' (Lipsey, 2001:169). Economics has no explicit scientist-versus-engineer distinction: economists are supposed capable to both theorize and prescribe. In policy debate an absolutist style—emphatic proclamation of supposed general truths—often gives them rhetorical advantages (Baker, 1998). Not content to report their findings and leave others to use them in policy argumentation, economists frequently race on to pen a paragraph or two on 'policy implications', from extremely narrow premises and data. To take a standard example, a study of schooling from a respected journal (Bedi & Garg, 2000) finds that in Indonesia private school graduates earn more, and notes other studies which concluded that these graduates have also learnt more, more cost-effectively. The study immediately 'suggests the need for greater private participation in the education sector', despite having given no attention to issues such as

nationbuilding or brain-drain or willingness to work in priority sectors, or possibilities for reforming public schools. Underlying mainstream economics' narrow formats for policy analysis are typically the prioritization criterion of willingness-and-ability to pay in the world economy; and a style of abstraction derived from physical science which can become dangerous when applied to social and environmental systems.

Abstraction and its dangers

A 'Newtonian' style of theorizing has contributed to making mainstream economics resistant to ID and partial to emphatic one-eyed policy advice. Norgaard, Wallerstein and especially Kurien critique the permanent, not just temporary, inattention to *key* socio-political variables, treated in economics as constants. Norgaard observes that: 'Five hundred years ago, based on the hypothesis of a relationship between bad blood and disease, blood-letting was commonly practiced. We know now that the hypothesis had some basis but that the cure *lacked a systemic view of the body*. And taken to an extreme, as it sometimes was, death by blood-letting is certain' (Norgaard, 1994: 188; my italics). Using predictions from highly abstracted economic models as the basis for massive social engineering—as in IMF stabilization programmes, World Bank structural adjustment policies, and 'big-bang' transition plans in the former Soviet bloc—has been all too close to this. Newtonian abstraction thrived in economics not only because of the prestige of Newtonian physics. The particular abstractions used—from power relations, ownership arrangements, social environment and justice—made neo-classical economics a handmaiden of those in power (Kurien, 1996:103), who thus provided institutional backing.

We must abstract in order to analyse clearly; but we must abstract from incidentals, not from essentials, and still not confuse our abstracted models with reality. Mainstream economics has often abstracted with priority to its analytical convenience.

..."the economy" is not an independent entity but something that is mentally carved out for purposes of enquiry... not an entity with well-defined boundaries, but always merging with other social spheres... porous at the boundary... always in a state of flux within because it is the result of the interaction of diverse social forces... [There is no precise boundary to the economy.] ...since the household and the state are constituents of the economy, their "non-economic" considerations will seep into the functioning of the economy... [Whereas] neo-classical theory slices off the economy completely from the rest of the social processes and confers on it an autonomy which it does not have.... [By] insisting on symmetries, regularities and uniformities as the essential logical properties of theory, neo-classical economics provides a conceptualisation of the economy devoid of its essential features. (Kurien, 1996: 56, 144-5)

Kurien concludes that the economy is an evolving mosaic of units of heterogeneous structure and agenda and diverse patterns of interaction, which require case-by-case examination and an evolutionary perspective (p.64). But developing and teaching a tidy self-enclosed mathematicized body of doctrine that gives clear-cut standardized claims is easier than to grapple with this reality.

Economics has largely abstracted from the physical world too, as have sociology and political science, unlike geography or anthropology: 'the disciplinary organization of knowledge in which economics abstracted from the physical world and focused on exchange, exchange value and monetary transactions... [thus] not dealing with the real world any more' (Herman Daly, in Ravaioli 1995:28.) The environment, physical and

social, is assumed constant, even if being saturated with pollutants. 'What economic thought exists on the longterm potential for development is either inconsistent with knowledge accumulated in the natural sciences or relies on an as yet unidentified [i.e. unproven] source of energy' (Norgaard, 1994:37). While fear of major environmental decline has induced a response from economists and institutional backers, the mainstream economics mind-set offers considerable resistance. The environment is not a compulsory topic in economics training. Many of the top economists interviewed by Ravaoli had not read a single book on ecological economics or the environment. The topic is often considered relatively trivial intellectually and practically: price signals, aided by some internalization of externalities, will convey the required information and incentives when appropriate, opined Milton Friedman, Gary Becker and Frank Hahn - as if markets were complete and represent the poor and future generations. Attempts to change lifestyles and reduce consumption are 'nothing to do with economists' (Malinvaud, on Ravaoli, p.94), or pointless and/or unacceptable (Friedman; Spaventa); as are attempts to change world distribution, unless and until a catastrophe happens (Hahn).

When pressed, Ravaoli's mainstream economist interviewees fell back on faith: we must simply hope for technological salvation, notably a clean and cheap mass energy source; or, in some replies, on disciplinarity itself as justification for not considering the physical environment centrally. For Hartje: 'Most social sciences necessarily have a limited perspective.... like any other discipline economics should be aware of its limits' (in Ravaoli, p.134). Being aware of one's limits could mean humility as to what one understands, and imply interacting with others, or being defensive and having an excuse for remaining restricted and non-interactive. For Hahn: 'The right question is one for which you can conceive of an answer' (Ravaoli, p.67). He may presume the criteria of disciplinary research (Johnson's Type 1) for urgent concrete and policy problems (Johnson's Types 2 and 3). Even then, should one work in one's familiar disciplinary corner with its familiar types of 'answer', or interact with others who might introduce one to types of answer and question of which one has not conceived ?

4. SUGGESTIONS ARISING FOR INTERDISCIPLINARITY

Grand visions and feasible proposals

Having identified limitations of disciplinarity, some authors make bold calls for interdisciplinarity. Norgaard makes a persuasive case for dropping monism, the premise that there is one correct way to understand a system. Major 'participants in processes of learning and deciding [must]: 1 - be conscious of their own conceptual frameworks, 2 - be conscious of the advantages and disadvantages of the frameworks used by others, and 3 - be tolerant of the use of different frameworks...by others' (p.101). Full coherence in the understanding of many issues, e.g. climate change, is 'inherently impossible for the knowledges of the scientists from separate disciplines cover different variables, different spatial scales, and different time scales. And multiple incongruent patterns of thinking are being used' (Norgaard, 1994:140), such as the mechanical models of physical scientists versus the evolutionary models of biologists. Integration

of these partial, limited perspectives should be through a sort of democratic, multi-cultural politics of science:

...knowing must be a social process whenever separate disciplinary understandings must be merged... [for] the patterns of thinking really are incommensurable... Scientists would be obliged to stay abreast of the important findings in the sciences around them.. [and] to participate in the sharing of knowledge and the building of the collective understandings necessary to work with or to avoid complex problems. (Norgaard, 1994: 147-8, 154)

In Martinez-Alier's terms, drawn from Otto Neurath, we can essay 'orchestration of the sciences', bringing them together and interrelating them, without expecting or desiring to absorb them all into one discipline (old or new). Some areas of consensus are indeed emerging on for example climate change, through intensive interaction of disciplines and gradual increase of mutual respect and trust. But Norgaard notes elsewhere (p.102) that:

Any given framework is better understood by, or more appreciated by, or results in answers which are more advantageous to some people than others. Any framework that has been highly elaborated to stretch its usefulness can only be understood by a few who are well informed of its technical details. The use of a single framework, without modification for regional differences, facilitates control from a single center of analysis. Thus the use of a single framework disenfranchises or disqualifies the majority, facilitates the tyranny of technocrats, and encourages centralization.

This harsher analysis of science identifies a series of major obstacles to broader-based understanding.

We must take into account the gravitational pull of the disciplines, for reasons good and bad. Resistance to ID comes not only from chauvinism, misidentification of ID with cafeteria-curricula or polymathism, or views that ID is unnecessary, which we addressed earlier. It reflects also concerns that ID fails or is too difficult and costly. Lipton (1970) and Berge & Powell (1997) warn for example that each new discipline added to a team seriously increases coordination costs, so that one must be very selective. This second half of the paper tries to identify manageable proposals and working examples.⁹

Wallerstein makes recommendations at two levels. First, a revolutionary vision: we should rebuild the social sciences on a new plan: for example, perhaps a division between macro (large-scale, long-term social processes) and micro (individual action) studies, rather than between economic, political and social; and that all social scientists and social science should be historical *and* sociological *and* economic (p.96). Secondly, he presents suggestions for the shorter-run (pp.103-5): (1) year-long mixed research groups at international centres, each on an urgent theme; (2) fixed-term cross-disciplinary research programs with specific objectives, to test the programs' potential; (3) all professors must serve two departments; (4) all research students must have a minor, via coursework or research. These arrangements appear relevant and feasible. Yet they remain exceptions. Not even schools of development studies routinely practise most of them.¹⁰ Professorial designations and professional training often remain weak for building ID.

Johnson's recommendations were based on fuller review of experience from a variety of modes and purposes of research. His book stresses the legitimacy and importance of multi-disciplinary work, by which he means not only the presence of several disciplines but also an open ID interaction in case-focused research and policy

research. But since these approaches are demanding, complex and costly, including in management terms, subdivision and specialization are sometimes better. Both disciplinarity and inter-disciplinarity are legitimate and necessary, separately and in research teams. They are also strongly complementary. Kenneth Boulding observed in his foreword to Johnson's book that intellectual division of labour brings economies of specialization, which as in other cases of specialization must be complemented by inter-specialization trade if full benefits are to accrue. Interchange need not lead to consensus, indeed consensus sometimes hinders intellectual progress; but competing views should be formed in awareness of each other, not in mutual ignorance.

Boulding did not ask how, if intellectual specialization brings narrowness and mercantilist chauvinism, trade will happen. An MD team will not automatically lead to interaction. And ID can occur also outside teams, by interaction with those in other disciplines through their writings. Some of the best ID work happens within one person – a Jon Elster, Albert Hirschman or Tibor Scitovsky. As Kothari saw, true ID requires ID individuals, whether in teams or not. Giri (1998, 2002) diagnoses the required shift as from a nest of identity as a professional of type T, to a self-conception as pilgrim and seeker. We should expect only a modest rate of progress here. Johnson himself identified as predisposing factors for effective open inter- (but in his terms, ‘multi-’) disciplinary work: being ‘free enough of disciplinary chauvinism’ (p.204) and ‘philosophically flexible’ (p.205). These factors are neither self-nurturing nor non-nurturable. Johnson leaves them as exogenous: some people have them, others don’t, so pick the first type for certain jobs. We have to do more than this, not least in Johnson's own discipline of economics.

While being clear on forces of habit and vested interest, a reading of the psychology of economics must recognize important space for motivation by puzzle-solving and social ideals.¹¹ Economics' allure has lain in the promise of combining the joys of science—commoditization in modern societies has provided a universe for measurement and calculation, in imitation of physics—with the satisfactions of social relevance. Highlighting likely contradictions in economics, both internal problems and contradictions with other findings, has some influence; for example, showing that mainstream economics has an ideology of value pluralism yet has ignored some types of value-system. Broadening the methods used and known by economists—by adding interviews, group interviews, testimonies, participatory exercises, contingent valuation surveys, and involvement in ID projects—often provides evidence incompatible with their disciplinary assumptions and contributes to re-thinking.

Similarly, one can examine forces of self-interest in economics itself, such that economists may choose assumptions that are most convenient for producing papers and status, avoid disputes with their funders, and concentrate on manipulating data of dubious quality. Norgaard provides this central challenge (1994:124-5). The delimitation of the range of economic agents, to individuals, firms and governments, is based on a notion of persons as self-standing, asocial, not formed by and also engaged in forming cultures and groups: families and communities at various levels. Yet those groups better fit the presumptions of economics: the ability to scan and know their environment and to bear all the costs and benefits of their actions. They are ignored because if economics took them seriously it would lose its determinacy—for behaviour then emerges out of discursive interaction at and between these levels of agency and

through culture modification—and economists would lose their high-priest, econocratic role.

It may be more fruitful in the short run to support change processes in power-centres like the World Bank than to concentrate on university economics departments. Policy agencies appear more reality-oriented and under pressure to respond to failures of their prescriptions, as in Sub-Saharan Africa and post-communist Russia, and to unexpected crises such as East Asia 1997. Söderbaum considers that ‘little can be expected in terms of pluralism from departments of economics as they stand at the end of the 20th century’ (2000: 128). There is too much vested interest, too much rent-taking from the near monopoly position of mainstream economics, whereas other locations, like schools of business studies, often provide better settings for new thinking. On the other hand, declining student numbers for economics, especially at PhD level, might eventually force change; and, remarks Wallerstein, one cannot sensibly abandon the traditional disciplines to the narrower-minded.

A complex eco-system of inquirers

From the examination of both disciplinarity and inter-disciplinarity, I propose a picture similar in some ways to Johnson's, recognizing different valid types of work plus many feasibility constraints on ID. But I draw more on the critique of disciplinarity and thus go beyond him, to look at longer-term restructuring of ideas.

We will always need regular communication between a diversity of types and styles of work. In intellectual life as in other spheres, we need 'bridging capital' to span between communities, as well as 'bonding capital' to bind within them. This bridging and communication involve a variety of networks and roles and some shared 'languages'.

(1) By *networks* I refer to organizational and inter-organizational linkages and meeting places, as well as to their members and informal contact. We need ID work both in distinct centres, as of development studies, and as a leavening factor within the disciplines (Klein, 1996, gives many examples). From ID centres some members should maintain links to their 'own' disciplines, while from disciplinary centres some members should link to ID work.

(2) Inter-disciplinary work cannot flourish merely by interaction of disciplinary specialists. Two sets of *roles* which are sometimes disputed yet of considerable importance are methodologists and, not least for action-oriented work, broker-generalists (Easton, 1991). The needed bridgers and synthesizers may be based in one discipline (e.g. in the interaction of economics and psychology, Scitovsky in economics and Lea in psychology); or, unusually, true masters of more than one discipline (e.g. Sen in the interaction of economics and ethics); or hybrid intermediaries.

(3) While 'bridges' and 'bridging capital' are useful metaphors, in many ways a superior image is that of an *eco-system*, within which many species and hybrids co-exist and interact (and sometimes eat others, or get eaten): a plurality of research activities and corresponding intellectual communities, as hinted at by the maps we borrowed and extended from Johnson and Wallerstein. A complex eco-system requires a complex system of concepts and models to describe and understand it. In Section 5 we try to become more precise about types of interdisciplinarity.

(4) Interaction requires mutually accessible and acceptable *intellectual frameworks*. Sometimes a superior framework is not sufficiently accessible and acceptable to others whose cooperation is needed. Scitovsky's striking work to draw from psychology a more empirically grounded basis for consumer and welfare theory apparently demanded too much adjustment by economists. It had impact not in economics but in a new cross-disciplinary enclave, economic psychology. Possibly social exclusion theory includes better social analysis than do social capital theory or capabilities theory yet lies beyond the reach of most economists. Inferior theories might sometimes function better as bridges. In Section 6 we will ask how far particular research programmes might lead economics into the social world.

5. A FULLER MAPPING: I.D. VARIANTS DEFINED

'Interdisciplinarity' can be a problematic label. First, it has become a hate-term to opponents of cafeteria education. Second, 'inter-' connotes between, but not all usage respects this. These first two problems might be transcended, but thirdly, even if we respect the connotation, many forms and outcomes of the relations between disciplines are possible (Klein, 1996). Operating with just one or with an undifferentiated set of labels often brings inconsistency or reductionism, the equation of ID with just one variant. We need a clear and fuller set of terms.

Figure 3 suggests some of the possible relationships between disciplines.

Figure 3: Relationships between disciplines	UNFRIENDLY	FRIENDLY
NON-RELATIONS	Ignoring the other(s). Planned autarky	Distant well-wishers
LIMITED RELATIONS	Mutual ridicule of the other(s) despite non-trade	Trade (= part of open-disciplinarity)
	Antagonism and ignorance in unhappy partnerships. Mercantilism	Friendly partnership: Multi-disciplinary shared activities
INTENSIVE RELATIONS	Competition	Marriage, and production of hybrid offspring
	Conquest	Merger

All of these relationships sometimes occur. Klein (1996:22-3) records corresponding terms like 'trading zone', 'pidgin' and 'creole' in the literature. The relationships somewhat mirror those between nations; and just as most nations' history books highlight their victories and pass more quickly over defeats, disciplines tend to downplay their own failings.

Which of these relationships fit the ID label? According to Webster's and Collins' Dictionaries the adjective interdisciplinary means 'involving two or more disciplines'. Universities involve many disciplines, so by this definition they are ID, even if the disciplines ignore each other except when they meet in management committees. The Oxford Dictionary is more helpful: interdisciplinary means 'of or between more than one branch of learning'. This matches the prefix 'inter-', which means 'between, among (e.g. intercontinental); or mutually, reciprocally (interbreed)' and suggests ex-

change. (See also Karlqvist, 1999.) Furthermore, we have a better term already, 'multi-disciplinary', to describe constructive relationships which involve only separate contributions without interaction.

The noun, interdisciplinarity, could then similarly be variously used, to mean: 1. the actual state of relationships between disciplines, even if this is to ignore each other or fight; more narrowly, 2. constructive relationships between disciplines, including non-interactive complementarity; or 3. active relationships between disciplines, even if antagonistic; and narrowest, 4. co-operative relationships in which disciplines learn from each other, to improve themselves or do new things together, even to build new fields. Cases 1 and 2 would be covered by Webster's definition, and much American usage includes a weak variant of case 2: any combination of courses, or academics, from more than one discipline. Interdisciplinary Studies programs in American colleges allow students to combine diverse topics rather than fulfil the prerequisites for further specialized study as many academics prefer. 'Between the disciplines' refers in those cases neither to the content of the components nor to interactions between them—the disciplines may not relate to others and students may be left to make the links—but instead to their combination and to the location of the programs outside the control of the disciplinary departments: in-between. It can mean isolation from, not interaction between, the disciplines. Derogatory usage of the ID label seems to derive from such a picture of North American cafeteria-choice study programmes. In a more adequate usage, ID means cases 3 or 4, interaction or coordination. Thus Leeson & Minogue, writing of creating a Masters in Development Studies at Manchester in the 1980s, record that the goal was 'to create from the many separate offerings a genuine interdisciplinary course and not to be content with a mere adding together of a fascinating but uncoordinated menu' (1988: vi).

We can extend and modify the set of labels presented in an oft-cited OECD report (CERI, 1972).¹² Let us distinguish the following variants of and successors or partners to disciplinarity.

1. *Multi-disciplinarity*. While 'multi' implies only the presence of more than one discipline, when contrasted to 'inter-' it suggests that complementary but non-interacting disciplines are drawn on, as happens in a construction or agriculture project, or in some area studies publications, where each discipline makes its separate input, often presented in an independently authored chapter. This can also be called pluri-disciplinarity.¹³ It involves an uncritical addition of different mono-disciplinarity. It does mean though that the member disciplines are less likely to become imperial in style.

We must distinguish these non-interacting multi-disciplinary cases from all the variants below, where there is interaction of disciplines and which hence better fit the ID label. Most work calling itself ID in development studies has been MD (Minogue, 1988). While some development studies journals substantially take interdisciplinary articles—like *Development and Change*, the *European Journal of Development Research*, *Forum for Development Studies*—many others mainly take articles from a range of disciplines, such as *World Development* and the *Journal of International Development*. An interesting test would be: do economists who publish in *World Development* read many or any of its non-economics articles, and vice versa?

2. *Open-disciplinarity*. Here disciplines interact and seek to learn from each other, especially in analysis of a shared issue. Minogue (1988) arrived at a similar usage. Berge & Powell use another term but capture what I refer to: 'researchers identifying and confronting differences in perspectives and approaches; not in order for one to be [judged] "better"... but for each to learn from, and contribute to others; and hence also become more aware of the merits and limitations of their own' (1997:5). Van Nieuwenhuijze too sometimes espoused this usage: 'In upholding our claim to interdisciplinarity...we in fact lay claim to no more than the systematic attempt to give second thoughts, perhaps a bad conscience, to the person who trusts that his own discipline is all he needs to be a student of development... [to make them] realize the need to look across the fence, to see what colleagues in the other disciplines are trying to do' (1978:19).

3. Inter-disciplinary openness and exchange may lead to:

(a) *Interdisciplinary fields*, in the sense described earlier, such as public administration, regional planning, and development studies. An ID field can involve all the forms under #1-3 here, and more, since it works at the crossroads of several disciplines and sets of practical demands. Such a field never can, nor indeed should, be integrated by a single agreed definition.

(b) *New sub-disciplinary fields*, in which a discipline pursues with existing methods new problems perceived by learning from other disciplines; exemplified by environmental economics.

(c) *Hybrids*: here new fields arise with new methods as well as new problems, and with cross-disciplinary participation. Ecological economics for example is not only economics as attempted by ecologists, or by economists who have read some ecology, but by any one who has absorbed an ecology perspective. This involves real re-thinking not just extension of an existing approach to a new topic. It insists on pervasive and fundamental linkages, complexity and hence a broader perspective. Environmental economics in contrast often sticks to mainstream economics' approach of high abstraction, with the world treated as disconnected so that the *ceteris paribus* condition holds, sometimes followed by a race to policy conclusions. It has had far more money and power behind it (Brasso in Ravaioli: 121-2).

Figure 4 identifies more of these hybrid fields and new sub-disciplines. It extends McNeill (1999)'s classification of intersections of methods and topics, by including also the third of Wallerstein's Triad, political science, and its traditional quarry, the polity.

Figure 4: An extension of McNeill's map of core- and cross-disciplines				
STUDIED BY:	STUDY OF:			
	NATURE	ECONOMY	SOCIETY	POLITY
ECOLOGY	Core discipline	Ecological economics	Human ecology? Socio-biology?	
ECONOMICS	Environmental economics	Core discipline	'Rational choice'; new instl. economics; (some) social capital theory	'Public choice'; 'new political economy'
SOCIOLOGY/ ANTHROPOLOGY.	Ecological anthropology	Econ. anthropol., econ. sociology	Core disciplines	Political sociology
POLITICAL SCIENCE	Political ecology	Some 'political economy'	Power-centred social theory	Core discipline

4. (a) *Imperial-disciplinarity* is where an existing discipline tries to absorb or displace another. Here the eco-system includes predators who wish to eliminate others, or at least to colonize them. '...“economic imperialism” is probably a good description of what I do' said Gary Becker (Swedberg, 1991:39). His close colleague George Stigler rode under the same banner (1984). Their associate James Coleman expected instead to absorb economics to sociology, but through reforming sociology by importation in a central role of rational choice concepts from economics (Swedberg, 1991).

(b) *Mega-disciplinarity*: here a well-integrated all-purpose social science discipline is aspired to; as in rational choice social science and some Marxism), and socio-biology (whose more sophisticated versions allow for *co*-evolution of culture and genetic traits; Norgaard, 1994). It will transcend existing disciplines but not disciplinarity. Mega-disciplinarity might be even more dangerous than disciplinarity if it heightens the hubris concerning the knowledge claims made and eliminates counter-perspectives.

5. (a) *Super-disciplinarity*. 'Super' denotes above, beyond, or over. Here a theory is provided that claims to span, locate and delimit a number of competing disciplines, indicating how they fit different contexts: e.g. perhaps as in more refined Marxism or Mary Douglas's Cultural Theory (CT).¹⁴ Sometimes their advocates proceed into a mega-mode, seeking to subsume not merely link.

(b) *Supra-disciplinarity*. 'Supra' also denotes above, beyond; but in addition transcending. Here a framework claims to locate and delimit competing approaches and then guide context- and purpose-relative selection. Emery Roe (1998) seeks to surpass CT's super-bid, by defining a variety of types of theorizing which one moves between according to purposes as well as context, with CT as only one such type. This transcends disciplinarity because methods no longer determine the selection and definition of problems; inquiry is driven by externally defined issues and purposes. (Note that CT and Roe deal with approaches, not only disciplines.)

6. *Trans-disciplinarity*: For the International Center for Transdisciplinary Research (CIRET) in Paris, a trans-disciplinary approach goes across disciplines, brings them

together, and goes beyond them (CIRET website). This adequately respects the original sense of trans-: across, on the other side of, beyond.¹⁵ Trans-disciplinarity is necessary because ‘there are no “economic”, “social”, or “psychological” problems, but just problems’, which do not respect disciplinary boundaries (Myrdal, 1975: 142). The aim is to connect and transcend, not make a unified super-formulation.

One can also speak of *meta-disciplinarity*: ‘meta-’ denotes after, beyond, with a suggestion of change of type. Here, as in systems- and some policy analysis, and various fields of design, we seek case-specific and purpose-specific framing of issues, not a standardized disciplinary frame nor even a wide set of them to choose between. (See e.g. Stretton, 1969; Rein & Schön, 1994.) All relevant disciplines are drawn on, as tools, not granted major independent status; instead they are starting points, then left behind in the process of dealing with real cases, as done also in good historiography, good biography, good area studies.

This gives a dozen or so variants, shown in Figure 5. They are groupable into fewer major cases, shown in the right hand column. We could refer to forms 1 through 6, and combinations of them (which are common), as ID. In this usage, multi-disciplinarity is not automatically ID. However, some people use the term ID more loosely to cover that case (#1) also; while others use it more narrowly, for only cases 2, 3 and 5.

Figure 5: Some forms of disciplinarity and inter-disciplinarity		
VARIANT	EXPLANATION	CONDENSED CLASSIFICATION
0. Closed disciplines	Islands model	Pure disciplinarity (D)
1. Multi-disciplinarity	Presence of more than one discipline	Multi-disciplinarity MD
1a. Pluri-disciplinarity	Use of more than one discipline: complementary, additive but not influencing each other.	
1b. Poly-disciplinarity	Mastery by an individual of more than one discipline	
2a. Open-disciplinarity	Some disciplines interchange and learn from each other; also cooperate on shared topics and tasks. Without necessarily formalizing new sub- or cross- or ID-fields.	Open-disciplinarity OD
2b. Bridge-format	Interchange is facilitated by a format to mobilize and relate a variety of inputs	
3a. ID field	A practical problem-oriented field draws on various disciplines and may devise its own additions; it remains loosely integrated (e.g. public administration.)	ID field

3b. Sub-disciplinarity	A discipline expands to deal with a new field, e.g. one previously in another discipline, with no change of its concepts and methods	Sub-disciplinarity (Cross-disciplinarity A)
3c. Hybridization	A new integrated specialized field emerges as a hybrid from interaction of problems, concepts, methods and theories at the intersection of more than one (sub-)discipline	Hybridization (Cross-disciplinarity B)
4a. Imperial-disciplinarity	A discipline seeks to displace other disciplines	Mega-disciplinarity
4b. Mega-disciplinarity	Goal of a single integrated social science, whether by imperial absorption, fusion or some other route	
5a. Super-disciplinarity	A theory which purports to show which discipline fits which context; and a practice which draws upon whichever disciplines ('pre-cooked meals') help in the given case	Supra-disciplinarity
5b. Supra-disciplinarity	A theory which purports to show which discipline fits which purpose and context	
6a.. Trans-disciplinarity	Understand, connect, and transcend disciplines	Trans-disciplinarity
6b. Meta-disciplinarity	One does not proceed by choosing between or combining bits from 'pre-cooked meals'; instead one selects variables and tools more flexibly, according to the situation studied, using post-disciplinary craft skills.	

Why classify, given the inevitable imperfection and incompleteness of any list? Because there is remediable confusion both between and within authors, even some of the best. Wallerstein *et al.* oscillate between the terms 'multidisciplinarity' and 'interdisciplinarity', and do not provide a clear terminology. The same applies for Easton, Dogan & Pahre, van Nieuwenhuijze and Johnson, amongst others. Johnson for example declared: 'There are people who call themselves interdisciplinarians, implying that they can serve as sources of many different kinds of disciplinary excellence. By and large, interdisciplinarians fail to furnish hard-core excellence from all the disciplines they purport to represent' (1986:205). But few inter-disciplinarians claim poly-disciplinarity, mastery of more than one discipline. Nor need they, since adequacy of grasp for particular work demands is instead the criterion (Klein, 1996).¹⁶ More of them are ID in the sense of openness, willingness and ability to interact, communicate, learn. Indeed elsewhere Johnson himself advocated this, but having made ID a pejorative label he lacked a term to describe it:

It is not asserted here that economists should be multidisciplinarians [masters of other disciplines; the meaning he gave to *ID* on p.205]. Instead, it is implied that economists involved in practical problem-solving and subject-matter research should be prepared to accept guidance from the philosophies and the different methodological views and

techniques associated with the disciplines to which economists contribute (Johnson, 1986:4).

They should in other words be interdisciplinary in the sense of open to learn from others.

6. 'BRIDGING CAPITAL' - ENGAGING ECONOMICS IN SOCIAL SCIENCE

Stepping stones come before craft skills in interdisciplinarity

Trans- and meta-disciplinarity place higher demands. Albert Hirschman has brought concepts from political science and sociology into economics, and vice versa, not on the basis of a sweeping manifesto like Becker's 'The Economic Approach', but by sensitive experimentation. Finding out which imports help in which cases is highly skilled craft work. It requires a wide repertoire of concepts and methods, and the ability to select, apply and assess. 'There is no master key, no master way of integrating the social sciences; it is a matter of case by case invention essentially. This is not satisfying for my colleagues or for younger people' (Hirschman, in Swedberg 1991, p.157). Paul Krugman (1994) argues that Hirschman has correspondingly founded no school, no research program; he has admirers but not disciples.

More widely manageable may be identifiable ID frameworks which link or transcend disciplinary models; Hirschman himself created the exit/voice/loyalty framework. These frameworks can help to fill some of the roles played by a discipline: to provide shared foci, language and morale; to structure training; to mould public discourse. From such a basis and training some master craftsmen will emerge. Without intermediate stepping stones the leap from disciplinarity may be too great. And for those who cannot be master craftsmen, worthwhile steps will have been made towards cross- and open-disciplinarity. We need 'a kind of *cognitive boundary object* (Star & Griesemer 1989) facilitating communication across different cultures' (Jasanoff & Wynne, 1998:37). Given the power and insularity of economics, we particularly require frameworks that can fruitfully link economists and other social (and environmental) scientists. Some of them may be inferior as social science to available alternatives, yet superior for this function. Let us briefly note some candidates. The purpose is to illustrate this general theme, not make strong judgements on particular contenders.

The imperial advance of 'public choice' theory and of rather narrow interpretations of 'rational choice' into political science, administration and sociology in the past generation has been very significant. These models are accessible and popular with many formally oriented social scientists. If taken as offering ideal-types that give first approximations for some situations or simply a base-line for seeing how far the situations diverge from the model, they are helpful (see e.g. Dunleavy, 1991, and the work of Robert Bates and Jon Elster). If they become bridges with only one-way traffic, treated as offering accurate renditions of nearly all situations, they become disastrous, a degenerate version of ID. (See Stretton & Orchard, 1994.) They are high-risk approaches, easily misused.

New Institutional Economics is less imperial, for its roots are in organization theory and law, not exclusively in transaction cost economics (Oliver Williamson in Swedberg ed.). While risks remain of reification of ideal types, compared to rational choice theory NIE functions more readily as an arena for two- or more way learning. Its

supersession of public choice theory, as main underpinning for the World Bank's 1997 World Development Report on the State and Development, constituted progress (Moore, 1998). NIE remains however limited and limiting in its informational base and assumptions (Harriss et al., eds., 1995), as seen in its approach to management of common property resources (Mosse, 1997). For Kurien (1996:20) NIE shows the futility of trying to graft selected substantive aspects, selected still with priority to analytical convenience above realism, on to a neo-classical base.

In this context, the appearance of a new star in the (World Bank) firmament—'social capital'—has major potential significance, argue commentators whose views deserve attention. Abashed by their weakness in creating sustainable development projects, some World Bank and associated economists have sought an explanatory factor to add to the trio of traditional capital goods, human capital, and 'environmental capital'. Impatient with the various interpretations of 'social capital' in other social studies, some think these can be fused (Serageldin & Grootaert, 2000) and then measured.

Despite its limitations, 'social capital' could perhaps be a surprise package that brings more of the real world into the mental worlds of the Bank and even of mainstream economics. Import of small numbers of anthropologists to the World Bank since the late 1980s, aided by Kottak's argument that more participatory projects had sharply higher economic returns, had worthwhile effects in some areas of program design. Yet in the mid-1990s the Bank still employed 28 economists for every other social scientist (Edwards, 1999). Few World Bank staffers will continue listening if they hear an attack on 'homo oeconomicus', but many more will accept a discussion of 'social capital', remarked one of the economists forwarding such discussion.¹⁷ Anthropologist Steve Rayner observes that, for many economists, 'social capital' is a way to talk about the social without yet having to consider society! In the words of a leading development administration thinker, 'social capital' becomes the battering ram to bring social analysis into economic development (a conference statement reported by Desmond McNeill). Unhappy at the inelegance of the concept, Nobel Prize economists Arrow and Solow (in Dasgupta & Serageldin, eds., 2000) overlook this ID role, seeing only the poor fit to traditional notions of 'capital'.

Many expectations will probably not be fulfilled, at least when checked by others: for reliable measurement, aggregation, worldwide generalizations, transferable models, manageable promotion projects. The concept itself might even later disappear. The key question is will economists then withdraw to disciplinarity or will there be a longer term and deeper impact, after the entry of extra non-economist staff and new variables in analysis, which may in time demand and legitimate new methodological stances by economists. Found in many circles other than in the World Bank, 'social capital' discourse might be functioning as one ID meeting point and vehicle for bringing more historically aware, less universalistic, more humble thinking into economics (Grahame Thompson, 2000). This would be sufficiently unusual that the forum should not be lightly discarded.

Usable frames or mega-pretensions?

Ben Fine (1999) has provided a well-argued critique of Social Capital theory. An earlier piece by him gave a similar assessment, albeit somewhat more kindly, of Sen's

entitlements approach (Fine, 1998). One can agree with most of Fine's points on the content of 'social capital' ideas, yet note that the sociology of knowledge perspective which he uses is reductionist: how such ideas might fit current needs of world capitalism. He misses their unruly potential, as a bridge or staging-post in an evolution of thought. In the background of some such critiques the implied alternative is a sophisticated Marxism. Marxism's great virtues have stemmed from its determination to connect across the conventional divisions of thought: to see the social and psychological significances of the commodity form; to highlight the linkages from economic power to politics, neglected in disciplinary social science (even public choice theory): the power often of money to buy police, judiciary, legislature and governors; and much more. Its decline reflects the failures, intellectual and practical, of reductionist mega- and super-disciplinary versions. It serves better as a source of questions than a set of fixed, clumsy frames and models.¹⁸

Let us take another example, the 'cultural theory' created in the 1960s-70s by the anthropologist Mary Douglas. It has been elaborated and applied by others, notably her co-workers Steve Rayner and Michael Thompson (see Thompson, 2000 for a streamlined and deepened version), and prominent political scientists Aaron Wildavsky and Christopher Hood (Thompson et al., 1990; Hood, 1998). It figures strongly for example in the 4-volume report (Rayner & Malone, 1998) of the Battelle Foundation project on social science approaches to climate change, directed by Rayner, which drew on large numbers of social and environmental scientists from a range of disciplines. 'Cultural theory' attempts to provide a super-disciplinary synthesis of many matters, but its simplifying character and grand-theory claims might sometimes be a barrier to inter-disciplinary interaction. It could become perceived as a cult with a set of too-ready answers, rather than a forum where analysts of various backgrounds can find help to pursue their questions, not least by talking with each other. Promotion of ID via a theory which makes strong claims and is mainly propounded by one school from one discipline would be less effective than propagation of a common frame-for-work. More promising is Hood's light handling, using the 'theory' as a 'variety-generator' to spawn ideas and options.

Entitlements analysis seems to encourage open-disciplinarity: it provides a bridge. This framework devised by Amartya Sen for explanatory and policy analysis has attracted attention and been relatively fruitful across a number of disciplines and in inter-disciplinary discussion (Gasper, 1993). This is despite some internal obscurities, misunderstandings about Sen's categories by many users, and even their perhaps rather limited content as social analysis.¹⁹ Sen is indeed an open-minded economist but only strongly cross-disciplinary in respect of philosophy rather than other social sciences (see his interview in Swedberg 1991; Gasper, 2000b). Yet entitlements analysis has proven suitable to help economists, geographers and others pose relevant questions that take them beyond their inherited frames. It opens not just conversations within economics, but windows beyond. We should accept the inevitability of many lines and styles of conversations; and, while situating his or her work, praise anyone who generates sustained inter-disciplinary conversation.

A recent example of influence is in the 'environmental entitlements' work by Leach, Mearns and Scoones (1997, 1999), a team at IDS Sussex drawn from anthropology, human geography and agriculture. They and collaborators from Ghana, India and South Africa report that they found entitlements analysis helpful in forcing them to systematically consider a whole range of connections they would probably otherwise have neglected.

Sen's capability approach, adopted by Mahbub Ul Haq as basis for the UN's Human Development work, has functioned in a similar way. By forcefully directing attention to other determinants of quality of life besides commodities, it has contributed to broadening development economics and increased inter-disciplinary co-operation (Gasper, 1997 & 2000b).

Entitlements and capability analysis are examples of flexible formats that yet give considerable help in identifying factors to consider. Also important for ID work, in helping to avoid *a priori* exclusions of factors and issues, are formats for analysing and constructing policy arguments (see e.g. Dunn, 1994; Gasper, 1996). These can provide both space and specific prompts to bring in issues. They can help us to ask, in the example we saw earlier, about private education's comparative impacts on nationbuilding, the brain-drain, and willingness to work in priority sectors, not only on graduates' earnings. The less pre-emptive and more exploratory is problem formulation, the more trans-disciplinary will be the endeavour (see e.g. Brewer ed., 1999).

CONCLUSION

Development studies has relied in considerable part on the case for interdisciplinarity, to justify its distinctive organizational space. Yet it has often become absorbed in routine and paid little attention to the theory and practicalities of ID. One widely sees ID, the interaction between disciplines, confused with the mastery of multiple disciplines, or the mere addition of disciplinary contributions without substantial mutual influence, or identified with an extreme variant like mega-disciplinarity.

This study has highlighted and tried to respond to needs for sharper concepts, a pluralistic picture of valid relationships, non-utopianism about ID, and practicable measures for shorter- and longer-run progress. We must distinguish multiple modes and purposes of social analysis, and employ a more complex ecology of the social sciences, such as sketched above. This includes being clear on the roles and roots as well as limits of disciplinarity, and observing the variety of types of multi- and inter-disciplinarity. We have in particular to strengthen effective, enriching collegial interaction between economists and others. Practicable measures include promotion of 'bridging capital', notably intellectual formats attractive across groups, to counteract the 'bonding capital' within disciplines.

In the shorter term, as suggested by Johnson and Perkins, inter-disciplinary situation analysis and cooperation on policy related-cases are typically more feasible and sometimes more important than inter-disciplinary theory building. Recognition of broker- and liaison roles, in decisions on posts, training and funding, can help. In the longer-term, multi- and especially, inter- disciplinary education are probably vital for better ID in research and for softening monogamous bonds of allegiance and identity. Joint degrees, or at least substantial Minors, should be the norm in social sciences, Foster-Carter suggests. As well as providing intellectual resources, they raise the readiness and felt legitimacy for later ID.

I have emphasized that whatever the time perspective we need frameworks that open and facilitate inter-disciplinary conversation, and offer attractive concrete activities. The 'salutary' or 'avenging angel' approach to ID—'Countering my dear colleague's ignorance and grotesquely crude assumptions about topic X'—may be less effective than the 'Getting to Yes' approach: aiming to jointly generate new activities

and insights that transcend and benefit all the starting points. The urgency of issues of environment and development provides one opportunity for this, and by involving natural scientists and many others keeps the division between economists and other social scientists helpfully in perspective.

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¹ See e.g. the website of the Association for Integrative Studies. ID can stand in this paper for either inter-disciplinarity or interdisciplinary, depending on context; similarly for MD.

² The three-fold classification of purposes matches that in Sigma Xi (1988). Johnson added a third dimension: types of philosophical orientation. For economics he distinguished logical positivism, normativism and pragmatism. Thus he presented a 3x3x3 cube of types of research (1986: xvii), with illustrations for each cell.

³ The term is used in the same way by Klein (1996) and Salter & Hearn (1996), though they do not discuss these two examples.

⁴ These remarks draw from my review of Hettne's 1995 edition (*European J. of Development Research*, 1996(2)).

⁵ In contrast, the conventional stance a generation back was that 'interdisciplinary studies (IDS) are more strongly indicated in less developed countries... because the interactions among variables normally dealt with by separate disciplines are unusually strong' (Lipton, 1970:5). In fact, IDS was hardly indicated at all for the North: first, social science divisions supposedly 'correspond to the division of variables into sets that can safely be treated as "nearly independent" in the cultures for which the SDS [single discipline specialisms] were designed: those of rich countries' (ibid: 7); and second, Northern social scientists allegedly could grasp the psychology ('rely quite plausibly on empathy with', p.10) of Northern agents, unlike that of under-studied and alien Southerners, and could specify their models accordingly.

⁶ The Oxford English Dictionary traces the term 'discipline' to the Latin *discipulus*, meaning disciple. Salter & Hearn (1996; and sources therein) show how this reflects the history of the European university.

⁷ C.T. Kurien (1996) gives a similar characterization of a Newtonian style adopted by neo-classical economics to study 'the economy'.

⁸ For example: (1) Lipsey's best-selling *An Introduction to Positive Economics* (1975 edition) did not acknowledge the existence of other social science disciplines. It opened instead with a long extract from William Beveridge on the aspiration to be like physics. The 8th edition does not mention other disciplines at all (Lipsey & Chrystal, *Positive Economics*, 1995). (2) Joseph Stiglitz & John Driffil's *Economics* (2000 edition) is equally blank on other social sciences or humanities. (3) Samuelson's *Economics* (1976 edition) acknowledged in a few sentences the presence of bordering, indeed overlapping, fields of study - in a section entitled 'The Queen of the Social Sciences'. The section, topic and acknowledgement had disappeared by the 1992 edition (by Samuelson and Nordhaus). Fine (1999a) argues that mainstream economics' indifference to other disciplines matches its active intolerance to alternative approaches within the discipline.

⁹ Salter & Hearn (1996) is a valuable source, from ID work in many fields in Canada, though not development studies.

¹⁰ The Centre for Development and Environment at the University of Oslo involves all its graduate students in the Centre's interdisciplinary projects, with significant benefit.

¹¹ We need more sociological and psychological studies, and self-analyses, of economists and the economics discipline, for their importance is not matched by the relatively little work so far. Note the confirmed finding (Frank et al., 1993) that in America economics students both begin and become more selfish than other students; and work by e.g. David Colander, Arjo Klamer, and Deirdre McCloskey.

¹² The CERI report contrasted 'multi-', 'inter-', 'pluri-' (for juxtaposition of related disciplines) and 'trans-' disciplinarity..

¹³ The prefixes pluri- and poly- differ only in provenance: the former Latin, the latter Greek. I allocated them in Figure 5 below in light of the familiar concept 'polymath'.

¹⁴ 'Cultural Theory' claims that we can helpfully understand the range of viewpoints on almost any issue of social organization in terms of four perspectives which are permanent contenders, and whose weaknesses in each case reinforce the other perspectives. One stock viewpoint is 'hierarchical', reflecting acceptance of high group loyalties and high regulation of individual behaviour (high group - high grid); the second is 'individualist' (low group - low grid); the third is 'egalitarian' (high group - low grid); the fourth is 'fatalist' (low group - high grid) (Thompson *et al.*, 1990; Hood, 1998).

¹⁵ The 1972 OECD report in contrast used 'trans-disciplinary' to mean mega-disciplinarity: subsumption of more than one discipline by a common set of principles.

¹⁶ Klein warns that bilingualism is thus a false metaphor for ID: 'Pidgin and creole are the typifying forms of interdisciplinary communication' (1996: 220). Thus interdisciplinary PhD research should not face the further barrier, beyond the difficulty of its greater scale and complexity, of subjection to an MD style of examination by a battery of disciplinary specialists. Their criteria are often inappropriate: demanding maximum elaboration and precision on what are only sub-aspects of an ID study, as opposed to a depth sufficient in terms of the whole inquiry. Alternatively, mono-disciplinary theses should be exposed to the critical glare of other disciplines. Many of them will be highly vulnerable.

¹⁷ This and the following two remarks were made or reported at the May 2000 Solstrand conference on Social Capital, University of Bergen.

¹⁸ Jessop & Sum (2001) argue plausibly for a 'cultural political economy', which 'take[s] the argumentative, narrative, rhetorical and linguistic turns seriously in the analysis of political economy', and thus also examines 'the cultural and social construction [and reconstruction] of boundaries between the economic and political' and of agents and their modes of calculation.

¹⁹ See Apthorpe (1999).