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Abstract

Although network ideas are fashionable in recent social science, there has been only limited engagement with the two bodies of thinking where networks have been subject to extensive methodological and theoretical reflection over a fifty-year period. This paper examines the use of networks in social network analysis and social anthropology in order to highlight enduring problems and difficulties of network thinking, as well as its potential. We show that despite the methodological virtuosity of social network analysis and its genuine potential to operationalise network ideas, it paradoxically operates as a bounded community rather than as a network, and that one implication is that it does not unravel significant differences in approach amongst its own ranks. We examine network thinking within anthropology to show how this reflexive concern has been an enduring feature of its interests in networks, and is an important reason why it moved away from network thinking since the 1960s. The last part of the paper discusses how emerging issues from both bodies of work offer the promise for exciting new kinds of network thinking, which are an alternative to fashionable network thinking such as actor-network theory. We pay particular attention to the work of Ann Mische and Harrison White on cultural SNA approaches; anthropological interests sparked by Riles on 'the network inside out', and emerging inter-disciplinary debates about the character of 'network sociality'.

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Social networks and spatial relations: networks as method, metaphor and form

Today, the idea of networks proliferates to an astonishing extent. We are told that we are living in a 'network society' (Castells 1996; 2000). Technical networks, such as those of the internet and other kinds of virtual communication, are said to surround us. It is claimed that businesses and organisations more generally are organised along network lines (see the discussion in Thompson 2003). Actor-network theory is currently the most popular means of examining the relationship between technical and social relations (Latour 1990). The sociology of science and technology has become highly influential, and fascinated by the ubiquity of 'networks' in contemporary political and economic life, networking and interactivity have been seen to dominate contemporary western thinking, operating as both 'metaphor and model of individual and collective life' (Barry 2001:85). Increasingly, network ideas are championed within numerous sciences and a host of popular books have emphasised the new appeal of networks in scientific endeavours (Barabási 2002; Newman, Barabasi, and Watts 2003).

This proliferation raises a number of deeply puzzling issues. For one thing, network ideas are remarkably poorly networked amongst themselves, with very little dialogue between different traditions of network thinking. In recent times this has been so marked as to lead to bitter recriminations between researchers in social network analysis (SNA) who see themselves as 'genuine' network scientists, and a number of exponents of network ideas in the popular science writing who have claimed that they have discovered this new 'holy grail' (Barabási 2002; Newman, Barabasi, and Watts 2003). For another thing, there is also very little awareness of the long history of network approaches, and little sense of learning lessons about the difficulties of thinking about networks which have been raised in these older debates. Indeed, rather the reverse: network ideas appear, are then dissipated, and re-emerge again. They have never defined the core concerns of any discipline or research specialism to the extent that they form part of its canon and are seen as fundamental to its ongoing concerns.

This paper shows that we can better understand the prospects for network thinking by learning how networks have been understood within the two traditions where they have the longest history - firstly Social Network Analysis (SNA), as practised predominantly by (American) quantitative social scientists (especially sociologists), and secondly, social anthropology. Network analysis began as a method which straddled the two disciplines of anthropology and sociology at the point at which they were marking out for themselves distinctive intellectual territories, and the different paths that network thinking has taken in the two disciplines diverges interestingly. In sociology, network approaches have emerged as a distinct specialism, one rather detached from 'mainstream' concerns, whereas in anthropology early interests in networks have not been sustained, and there is indeed suspicion of network thinking. Discussing these two bodies of work allows us to develop a greater understanding of why network approaches have been so appealing and are periodically rediscovered in multiple arenas in the social sciences; and, second, to understand some of the problems faced by network approaches, some of the difficulties of grounding network thinking, by exposing some of the pre-theoretical assumptions (Moore 2004) that the concept of the network mobilises. We examine the complex shifts in sociological and anthropological approaches to networks as methodological tools, as metaphors for understanding forms of relations and as descriptors of social forms. Finally, we want to show that there is a potentially exciting turning point, associated with the cultural turn, which offers new potential to re-engage different traditions of network thinking.

We firstly examine the theoretical underpinnings of Social Network Analysis (SNA), the most self-conscious of the network traditions. This has a high level of institutionalisation through holding its own conferences, organising a specific *Social Networks* journal, and it claims a long history (see Scott 1991; 2003 and recently Freeman 2004). Undoubtedly, SNA has developed a high level of formalisation of network measures and has an impressive grasp of mathematical foundations for networks. It has also announced a distinctive origin story, in which early network ideas, found mainly within psychology and anthropology have increasingly developed into a distinctive social science niche, In exploring the history of the field, we are interested in how SNA itself has defined itself as a cohesive community, rather than as a more diffuse network, and we suggest that in fact the SNA tradition is actually less homogenous and coherent that it sometimes claims to be. We are particularly interested in examining how its structuralist assumptions pose fundamental problems for its own emphasis on networks.

In some respects our observations echo the cultural critique of network thinking which has been elaborated within social anthropology since the 1960s. The second section explores the value of anthropological reflections on networks. Trends in anthropological thinking about networks are less well known, and we show here how anthropologists' sporadic engagement with networks for the purposes of data collection or analysis might be seen not as a deviation from other theoretical positions but re-articulations of an ongoing concern with questions of space and social relationships. The use of the term 'network' as a separate field of interest hides the fact that anthropologists have long been concerned with questions of connections between people, most clearly demonstrated by the central disciplinary tenets of kinship and exchange, and demonstrates the difficulty of abstracting the study of networks from their disciplinary contexts.

While our first two sections draw critical lessons about the difficulties of using network thinking, in our final section we highlight three areas, drawing on recent debates within SNA and social anthropology, which we think do offer prospects for new and insightful ways forward. We firstly examine the cultural turn within SNA, associated with the recent writing of one of the leading network writers, Harrison White (1992), and his colleagues. We secondly discuss the value of Annelise Riles's recent anthropological call for looking at networks 'inside out' which insist on placing the observer into the networks which they also study. And finally, we examine the potential for new studies of network sociality, where networks are not seen as a structural given, but 'networking' is seen as an increasingly important component of economic, social and cultural relations.

1: The contested field of Social Network Analysis: method.

Exponents of SNA are confident that they really understand the potential of network thinking, and have developed a progressive story in which an increasingly sophisticated network tradition takes shape from the 1950s, driven by a series of methodological advances and institutional developments (Wellman 1989; Scott 1991; Freeman 2004). The story here is that early progenitors of SNA, such as Jacob Moreno, Elton Mayo and Kurt Lewin were followed in the 1950s by writers who placed network methods on a more 'precise' footing (e.g. Kephart 1950). The origin stories of explicit theories of social networks in both disciplines are usually centred around the influential work of the anthropologists Elizabeth Bott (1954) and John Barnes (1957), as well as American sociologists such as Edward Laumann (e.g. Laumann and Guttman 1966; Laumann 1973), Mark Granovetter (1973), and Lin Freeman (1963).

This process involves an increasing specialisation of SNA around a shared set of methods. As Lopes and Scott (2000: 61) note, 'social network analysis is not, in itself, a specific theory or set of theories'. Rather, it relies on 'a series of mathematical concepts and

technical methods', drawing specifically on graph theory, which has led over the past fifty years to a distinct cluster of methodological expertise for measuring networks, seen as ways of connecting nodes through ties, and institutionalised in specialised software packages. Thus distinctive ways of measuring the hubs of networks, cliques and factions, blocks, and the like have all been created. This methodological expertise has made it possible for SNA writers to claim a monopoly on 'scientific' network thinking, by providing them with a means of going beyond 'loose', metaphorical approaches to networks, and providing a range of formal tools for 'precisely' mapping networks.

Ironically, perhaps, this rendering of SNA defines it as a more or less cohesive community, rather than a network. United in large part by its use of a common set of technical methods, writers within the SNA tradition tend to gloss potential theoretical differences around a common commitment to a shared project. However, on those occasions when theoretical underpinnings are articulated, greater diversity of opinion is revealed. The main pitch has been to emphasise the structuralist foundations of SNA, championing its abilities to map structural relations through delineating the ties between parts of social bodies (see Wellman 1988 and especially Freeman 2004 for a particularly strong statement in these terms). The argument here is largely directed against mainstream social science's reliance on sample surveys, which observe random individuals, making it difficult to infer structural properties from these observations. Network methods are seen as a means of mapping roles comprehensively, so allowing the 'real' qualities of social structures to be delineated. As Lopes and Scott (2000: 59) put it, 'the basic presumption of social network analysis is that sociograms of points and lines can be used to represent agents and their social relations. The pattern of connections among these lines in a sociogram represents the relational structure of a society or social group'.

An example of the appeal of this argument lies in the study of social mobility, where Harrison White (1970) popularised the importance of the idea of 'vacancy chains'. Orthodox sociological approaches to social mobility (e.g. Blau and Duncan 1966; Goldthorpe, 1980) relied on sample surveys, inferring the significance of structure from these individual accounts. Such an approach led to a 'supply side' approach to social mobility where the focus rests on identifying the variables which correlate with people's mobility prospects (gender, class, qualifications, ethnicity, etc). Structure thus becomes conflated with the operation of such categories, with the resulting impoverishment of a complex understanding of structure (for instance, through reference to the 'class structure', as in Goldthorpe 1980). White, by contrast, argued that social mobility is driven not by individuals, with their various attributes, but instead by 'demand' processes, notably the need of organisations to fill job vacancies vacated when their incumbents retire or move on (see generally, Levine and Spadaro 1988). The attributes which individuals moving into such positions possess are secondary compared to their propinquity to the vacant position. Therefore our understanding of mobility should focus on the processes by which vacancies come about, and how they are then filled, rather than just the characteristics or attributes of the specific individuals who move into them.

There thus seems to be an affinity between SNA and a throughgoing structuralism, where social networks here became a means of mapping the social structure, and the rise of SNA was thus an attempt to emphasise the importance of social structure in social science milieu dominated by methodologically individualistic approaches. American SNA writers, in particular, have certainly been attracted to this definition as it unites them in common purpose against the power of the individualistic assumptions that characterise mainstream quantitative research that pervade fields such as economics, (much) sociology, and political science. In the hands of Granovetter (1973; 1985) it has emerged as probably the most powerful counter to individualistic, rational choice approaches which span the social sciences and are especially important in economics. Network approaches are thus used to define the terrain of a distinct 'economic sociology'. In his famous article on 'the strength

of weak ties', Granovetter (1973) argued that people looking for jobs were better placed if they had a wide range of 'weak' contacts than a smaller number of 'strong' contacts, since this maximised the chances of getting relevant information about job vacancies. By linking arguments about the formal structure of dyadic and multiple ties, and relating them to the substantive concerns of 'mainstream' economists and sociologists about job search processes, Granovetter was responsible for popularising network thinking to new audiences.

However, the apparently structuralist underpinning of SNA is more complex than might at first appear. Within SNA there is a well-known distinction between analysis of 'whole networks' and 'ego-networks' (e.g. wellman 1989). The former certainly appear to offer a means of mapping structural role relations, but although the latter are often also seen as central to network approaches, they are also different in not being able to map the relationships between all members of a (sub-) population, but only between a given individual and his or her 'alters'. An example of the latter is Elizabeth Bott's *Family and Social Network* (1957). She collected data on the household relations and social ties of 20 'ordinary' households living in London in the early 1950s. None of these households knew each other, and she was not in a position to explore the relationships between them. She noted that those households where there were a large number of social ties in neighbourhood and workplace were likely to have segregated gender roles, whilst where households had weaker social ties, the couple had few external ties, tended to be more privatised and tended to share their social lives. The point here is that this kind of analysis uses networks to unpack the context in which individuals live, and is reconcilable with more individualistic perspectives within the social science. Indeed, Granovetter's celebrated metaphor of 'embeddedness' precisely captures this idea that networks are a means of examining individuals in their context.

Hence, although this approach uses network methods, it is actually compatible with individualistic mainstream social science perspectives, since it defines networks as attributes of individuals. Just as individuals have a class, gender, ethnicity, etc, so they can be said to have a network of ties to others. And indeed, network methods have become a key part of survey analysis in recent years, with questions asking about respondent's friendships, their social support, and the range of their social contacts. The recent popularisation of the concept of social capital has done much to promote the popularity of this approach and has helped to 'mainstream' SNA concerns within quantitative social science (see, notably, Lin 2001). Here we should note how this reconciliation of SNA with sample survey analysis has lost much of the richness evident in earlier more qualitative 'ego-centred' approaches. Bott (1957), for instance, used her intensive ethnographic knowledge of 20 households, based on up to 20 repeat interviews for each household, to enumerate every single family member identified, and every salient friend, and acquaintance. Survey questions are much more limited about the range of questions they can ask about such ties, and are normally limited to one or two summary questions (e.g. about your 'best' friend). Although some ingenious attempts to use summary questions to explore the social range of people's networks have been devised, (e.g. Erickson 1996; Lin 2001, who use 'position generator' questions where respondents are asked if they know anybody from specified social groups), this still leads to an individualised conception of networks. Furthermore, in these kinds of cases, SNA is used to explain 'outcomes', or to put this in more positivist language, dependent variables. Ultimately, then SNA becomes articulated to variable centred mode of analysis where the focus is on the explanatory power of different independent variables on specified outcomes (see the critique in Ragin 1996).

Although as part of their community identity, SNA writers often see ego centred approaches as compatible with whole network approaches which demand data on 'whole' populations (e.g. of organisational members, families, etc), there are undoubtedly

differences of emphasis. When such data is collected, all the ties in a given population can be assessed to understand the complete structure of role relationships, and different modes of analysis adopted. A particularly influential approach has been that of structural equivalence, as developed by Harrison White and his associates (1976). Structural equivalence exists between individuals when they are in the same 'equivalent' relationship to third parties, even if the individuals concerned are not tied to each other. Thus, (e.g.) independent farmers, who may not know each other, but share a common relationship to (e.g.) a landlord or supplier, are in structurally equivalent positions. This approach often involves breaking from a reliance on sociograms and devising formal methods for measuring the size of blocks and the relationships between parties in such blocks (called blockmodelling, by White and his associates). SNA here is not seen as a way of mapping connections, but as a means of delineating structural relationships, where it can be the absence of connection, or the existence of similar kinds of connection, that is important.

This indicates a tension, within SNA, between those stressing 'contact' and 'field' (or 'proximity' and 'position', see Ansell 1997; 362f, or 'contagion' or 'role', see Burt 1987) arguments about the mechanisms of networks. Networks work though 'contact' if they are based around the ties which link a person (or institution) to someone (or something) else. Thus, in the well-established SNA research on interlocking corporate elites, the extent to which members of the elite know each other is seen as important for establishing their cohesion and degree of 'class formation'. SNA maps connections. This however, has real problems in assuming that contact is necessarily significant. Bourdieu criticised network methods for assuming that power needed to circulate through personal networks of this kind, and his elaboration of the concept of cultural capital, and relative downplaying of the importance of social capital, was in part concerned to redress this. His correspondence analyses in Distinction (1984) are a means of showing that people who do not necessarily know each other can still have similar positions in social space if they have similar amounts of economic and cultural capital.

'Field' approaches are more consistent with structural perspectives, particularly the emphasis on structural equivalence developed by White, and seek to use SNA to elaborate the relationships between parties in a field. This kind of SNA does not necessarily see the existence of ties as being important: rather it is the 'holes' or 'gaps' in networks which may be of greater interest. This interest has had a particularly pronounced application in what Burt calls 'structural holes', areas within a whole network where there are few connections between various socially important activities. Thus Burt's (2000; 2002) study of an American bank showed that those who were most successful were not necessarily those who had the most connections. In fact, many connections may be 'redundant' in that they are to similar kinds of people who know the same kinds of things. Rather, those who were most successful were able to span groups who were otherwise little connected, since these would be able to gain access to very different groups and make 'connections'. .

This distinction points to a subtly different theoretical underpinnings. In many respects, the more structuralist approaches associated with 'whole network' analysis do indeed appear to offer a robust critique of perspectives derived from mainstream economics, and suggest a distinctive kind of political economy. It is certainly no accident that radical political economists have been attracted to SNA especially as a means of analysing elite power. However, two major problems of this kind of SNA need to be emphasised. Firstly, it is pragmatically hard to collect data on entire populations. It is no accident that most celebrated studies use documentary data collating published or historical sources, which are taken to report exhaustively the members of a given group and their salient ties. Examples here include Padgett and Ansell's (1993) study of the rule of the Medici in Florence, Roger Gould's study of the Paris Commune (1995) which used data from militia enlistments and prosecutions to show that militancy was based on the overlap between neighbourhood and occupational networks; Peter Bearman's (1995) study of elite

formation in 17th century East Anglia which shows that before the Civil War the gentry was become more interlocked through marriage alliances. This kind of research draws on assumptions about the boundaries which constitute the whole which tend to rely on pragmatic, administrative, limits.

However, this leads to a major problem in reflexively operationalising network presuppositions. If one is concerned to examine whole networks, and if one also recognises that everyone is in some ways connected to everybody else, then it is not clear how coherent boundaries around any 'whole' can be meaningfully devised. To a large extent SNA writers sidestep this problem by using pragmatic, administratively defined boundaries. There are thus network studies of children in particular classes at school, or of interlocking directors in certain companies chosen by particular criteria (such as size of firm). However, imposing this kind of boundary to define a whole population is in fact logically inconsistent with network ideas themselves. Given that networks are seen as spanning groups, then any attempt to define a bounded group (within which one can examine the whole network) will ultimately contradict the network idea itself. However, understandable it may be to take the pragmatic decision to define a group as a whole population for the purposes of a study, a serious cost is still to be paid.

There is then, a kind of irony which is that because SNA writers nurture a cohesive community, rather than a network, their ideas tend not to themselves take the kind of network form which their expertise is designed to unravel. There is little translation between their own practices and their theoretical and methodological writings, a point which will stand in comparison with the work of anthropologists which we will move on to discuss now. However, before leaving this discussion, we should note that there is clear evidence that some SNA writers have sought to recognise enduring problems in the structuralist foundations of SNA and have tried to develop a cultural approach to social networks in recent years. Part of the impetus here has come from particular applications of SNA within the study of social movements, by scholars such as Charles Ansell, Peter Bearman, Roger Gould, and Ann Mische. The study of social movements have raised unsettling issues because they are more fluid than many more institutionalised areas of social life, and numerous theorists have drawn attention to the way that social movement organisations arise from cultural framing processes. In the case of social movements, it is not clear that there is a pre-existing 'whole network' on which network ties are generated and which might lead to social movement organisations. Rather, the logic might work the other way around, with the definition of the relevant whole population depending on the cultural framing. This body of work offers a new and distinct way of operationalising networks, and we turn to consider its potential in the third section of this paper.

2: Anthropological Network Approaches

The work of Bott (1957) and Barnes (1954) reminds us of the importance of networks to the broader concerns of the emerging discipline of anthropology in the 1950s. As we have seen Bott's (1957) work was focused on ego-centred networks, in order to explain household relationships and their link to social class. Likewise, Barnes (1954) took an individual-centred approach to social networks to understand the formation of community and class in Norway. Barnes, used the network as a concept[1] which could reveal the ways in which 'class' inequalities emerged despite the fact that people living in the Norwegian parish in which he conducted research emphasised social equality in their relations with one another. Barnes' contention was that although most people considered their friends and neighbours to exist in a socially equal position to themselves, the acquaintances of

[1] See Mitchell (1974) on how Barnes raised it from a metaphorical to a conceptual statement.

these friends or neighbours might in turn be of a slightly higher or lower social ranking to themselves. Cumulatively, as people in the community imagined the chain of friends of friends they were able to perceive social differences in a way which did not compromise their experiences of direct face-to-face relations with one another as socially equal. By seeing people as situated in networks of relations, class was revealed not to be drawn along clearly demonstrable boundaries, but rather to be discernable only from a position within the network of relationships within the parish where people further out along the chains of connection could be seen to be more different to oneself.

Both of these studies were notable for the way in which they used networks to effect a departure from structural functionalism which had been so pervasive within the British anthropological tradition up until this time. Structuralist approaches to culture had already been mobilising the notion of the network in a way which was very similar to White's later sociological work on whole networks. This was typified in Radcliffe-Brown's famous presidential address 'On Social Structure', published in JRAI in 1940. Making a clear distinction between the identification of an empirical social structure, as 'the set of actually existing relations, at a given moment of time, which link together certain human beings' (1940: 4) and the role of the anthropologist to reveal structural form, Radcliffe-Brown contrasted the fact that 'human beings are connected by a complex network of social relations' (1940: 2) with what he saw as the scientific role of the anthropologist to create abstractions regarding the general characteristics of these social networks, or social structure. This interest in social structure as determined by structural connections between individuals was an extension of a long running concern within anthropology as to another kind of structural explanation - kinship. Functionalist kinship studies, like structuralist SNA, had paid great attention to the ways in which roles and actions were determined within social groups by relationships that were defined according to kinship rules. Classic kinship studies had many similarities to early structural network analyses, as anthropologists sought to understand the social structure of definable groups through the mapping and analysis of kin relationships.

Radcliffe-Brown's interest in networks as a way of characterising social relations might be seen as an extension of an interest in kinship and descent as determinants of social structure in small-scale societies to questions of wider structural relations in complex and large scale societies. The metaphor of the network enabled structural-functional anthropology to move from local kinship studies to wider questions about relatedness and interconnection at a much greater level of complexity and a broader scale. As Radcliffe-Brown made explicit in this address, the purpose of an analysis of social structure (or networks of social relations) was to generate greater understanding of the spacialised structural dimensions of human sociality.

> At the present moment of history, the network of social relations spreads over the whole world, without any absolute solution of continuity anywhere. This gives rise to a difficulty which I do not think that sociologists have really faced, the difficult of defining what is meant by the term 'a society'. (p4)

By looking at the ways in which this question of how to understand 'society' was differently approached within SNA and social anthropology we can better understand the perceived utility of network approaches.

Whereas social network analysts continued, as we have seen, to find ways of explaining aspects of social life as determined by structures of network relations that could be contained within bounded social groups, early network-based ethnographies were a response to a perceived need to deal with issues of 'scale' in a grounded, empirical way (Barth 1978). The invocation of large-scale categories such as 'social class' or 'society' was problematic because of the clear discontinuities with people's explicit understandings

of their life circumstances. This was not primarily an issue of the gap between abstract heuristic models and local categories (the emic/etic distinction) but rather concerned the implications of applying abstractions which were assumed to be universally valid to contexts in which they were only superficially relevant. For example there are problems involved in invoking 'class' to explain inequality in contexts where notions of ownership and production processes are such that a 'class' analysis is insufficient to explain people's lived experience. The anthropological response to the question of how to understand society was to turn away from structural-functional approaches to social life and look to new ways of answering questions about the constitution of boundaries and communities as socially produced ways of living in the world.

Despite claiming both Bott and Barnes as shared origins, the value of their work has been reconstructed in different ways within each discipline. Within SNA, their work has come to be seen as a staging post on the way to developing structuralist perspectives critical of individualistic accounts. Within anthropology, however, their work was a staging post in the other direction, a means of developing more culturally sensitive accounts of the social, which went beyond the structural-functional theories which networks had previously described2. The work of Barnes and Bott is interesting for the way in which it provided a bridge between a commitment to issues of relatedness which had informed structural anthropology in the past and required the mapping of social networks, and a more inductive methodology which attempted to discover how people's interrelationships with one another produced particular kinds of understandings about the world in which they lived, and the people with whom they interacted. Social network analysts looked, as we have seen, to explain society through the identification of patterns of roles and relationships (either ego-centred or whole) and developed networks as a methodological tool for exploring the theoretical power of the network as an externalisable entity. For anthropologists in pursuit of an understanding of the human condition of being in the world with a commitment to a focusing on individuals in their contexts and a critical understanding of human being, the explanatory power of the network was much less clear.

It is this which partly explains why anthropology has been seen as dropping out of network theory in recent years. However, anthropologists did not entirely neglect methodological issues in network analysis. In the decades following the publication of Bott and Barnes work a number of well known anthropologists spend time exploring the possibilities of technical forms of network analysis in order to answer questions of anthropological interest (c.f. Boissevain 1979). Networks provided a generic notion of connection that seemed to hold the potential for understanding social cohesion in settings of disruptive social change, without limiting the analysis to functionalist explanations based on kinship, religion or economics. Of the anthropologists who were interested in the potential of

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[2] The most explicit development of the method and theory of network analysis in anthropology has been that conducted by a small group of American anthropologists who are much more closely aligned to SNA as it has been developed in *Sociology*. Their aim is to use social network analyses in their work alongside other mathematical forms of analysis as a complement to ethnographic research (Schweizer 1997; Schweizer and White 1998; White and Johansen Forthcoming) in particular in relation to kinship studies. These network theorists also position themselves against the limitations of structural and functional anthropology, stressing that nowadays in particular, with the development of more sophisticated analytical techniques made possible by increasing computer power, it is possible to make assertions regarding social structure by using network analyses in ways which acknowledge complexity and change at the micro-level. Rather than using network analysis to reveal a static structure, anthropological network theorists see themselves as asking "*a series of questions about emergent properties in kinship networks, about how structures change, and about the role of individual actors versus systemic effects in the processes of change*"(Schweizer and White 1998: 4-5).

network analysis to inform ethnographic research at this time, Mitchell (1969) was broadly concerned with how to conduct a cultural analysis of life in industrial urban settings; Barth (1978) saw networks as means of developing his interest in transaction analysis; Kapferer (1973) whose initial interest in using networks was to understand kinship in urban situations went on to develop a wider concern with questions of power and social change; and Noble (1973) worked to extend Bott's work on social networks in the analysis of family life. All of these anthropologists were exploring the possibility that network analysis held for understanding new social forms. Networks seemed to hold the potential to combine the explanatory power of 'culture' whilst being able to account for human agency in ways which structural-functional theories of social life had made impossible.

As Mitchell (1974) has shown, however, despite an interest in the methodological possibilities of network analysis, few of these studies actually ended up developing an explicit methodology for identifying and studying social networks. These anthropologists were more concerned with networks providing a method of analysis rather than a method of data collection. But even as an analytical tool it was questionable how far these studies could be seen to have been contributing to a distinct network theory. Rather than focusing on the kinds of questions about connection and communication that we have seen as concerning some of the proponents of SNA, these analysts utilised the idea of the network to extend already existing theories such as exchange theory, action theory and role theory in the analysis of data collected during fieldwork. Mitchell (1974) questions the extent to which even the most vociferous proponents of the study of social networks could be said to have developed a 'network theory' which could be utilised to test the validity of propositions about the forms or structures of social relations in the way in which network analysts in sociology were trying to do.

In a review of the network studies of the 1960s and early 1970s, Mitchell (1974) concluded that despite claiming to be a critique of structural-functional anthropology most network studies differed from structural analysis only in the level of abstraction at which they worked. Bax (1978) concurred with this view in his summary of the state of the field, where he suggested that despite claims to the contrary, network analyses ended up reproducing an untenable opposition between structure and agency, characterised by the opposing positions of what he called network structuralism (following Bott) or network activism where the focus is on the individual's social network. Network analysts sought to answer the same questions as structural-functional anthropologists regarding the normative basis of people's behaviour but did so by focusing on relationships between individuals rather than the effects of institutions, whereby the network itself came to be the structural form.

Whether for the reasons that Bax gives or not, the methodological and theoretical value of the network waned in social anthropology after the 1970s. Other ways of exploring questions of power, agency, and social action replaced the initial interest in network theories, and subsequently new questions began to be posed about the how social worlds were constituted, could be described and produced effects, that were antithetical to the rigorous scientism of formal Social Network Analysis. As social anthropologists became concerned with issues of representation, reflexivity, meaning, personhood and identity, the theoretical and methodological potential of social network analysis to answer these questions diminished. Methodologically then, the network came to pose different questions within anthropological thinking as it did in more formal SNA. The interest in network analysis in anthropology in the 1970s was tied to wider questions over how to account for power and agency in descriptions of social lives, and how to account for human action and meaning in socio-cultural terms when ethnographic attention moved from culturally defined groups in delimited locations, to complex social settings where culture and stability were less important than conflict and change. The benefits of social

network analysis were explored but the effect of networks to replace one kind of structural explanation with another led ultimately to their demise as a technical tool of investigation.

At the same time as the demise of network analysis within anthropology, however, networks were proliferating in common parlance as a way of describing and characterising the contemporary world. The spread of information and communication technologies and new reproductive technologies, the globalisation of trade, migration, travel, development and science came to mobilise concepts of networks to describe new ways of being in, and understanding the world. Though networks had become diminished as an analytical device within anthropology, they were none the less becoming pervasive as a common-sense way of describing the importance of connection, communication and exchange in ethnographic accounts of globalisation and social change (e.g.Appadurai 1986; Escobar 1996; Hannerz 1992; Hassan 2003; Sassen 2000; Stoller 1996; Wittel 2001). Thus the position of networks within ethnographic accounts moved from a distinct methodological tool to a metaphorical device that pointed and described to the shifting contexts of social research.

In the past few years some social anthropologists have begun to take seriously the effects of the concept of the network as a cultural form (Green 2002; Green, Harvey, and Knox n.d.; Knox 2003; Riles 2001; Strathern 1996; Strathern, 2005). In a reflexive engagement with both the metaphorical power of the network within scholarly discourse and the organising effects of the network as a model of social organisation, these studies have developed cultural analysis of 'the network'. In the following section we look at these more recent anthropological analysis of the network alongside examples of the cultural turn within SNA mentioned above, in order to explore how current network thinking might illuminate some of the assumptions, limitations and possibilities of Social Network Analysis,

3: New Network perspectives

In this paper we have so far sought to reveal the long history of network thinking in SNA and anthropology as a means of recognising potential pitfalls. In SNA it was a means of developing a structuralist alternative to economics, but in anthropology it was a means of breaking from structural functionalism. In both cases, it has proved difficult to sustain network approaches: within SNA methodological virtuosity has come at the price of relative inattention to their theoretical underpinnings. Anthropologists have become suspicious of the appeal to network, and have become more interested in how the network is not a neutral scientific method so much as a form of activity and performance. This difference is indicative of the need to recognise the limits of any simple appeal to networks as a kind of a holy grail. However, we want to conclude our discussion by suggesting that there may be a new moment of potential cross fertilisation between currents in SNA and anthropology which might offer potential for fuller engagement. This potential rests in the turn to 'culture' in both areas, and in this section we unpack the different ways this has come about in the two areas.

Within SNA, a new cultural sociology of networks has appeared as a means of offering a resolution to the problem of defining the boundaries of networks and hence rescuing problems with the structuralist SNA framework. This approach is exemplified in the recent writing of Harrison White, for instance in his book *Identity and Control* (1992), though the esoteric nature of this book means that it has not had as much impact as a series of articles by him and his associates. A particularly important paper by Mische and White (1998) indicates the flavour of this thinking, and seems to mark a clear break from structuralism.

> The network approach has so far … centered on formal techniques to the detriment of substantive theoretical grounding. Early structuralisms in linguistics, as well as in sociology and anthropology focused on the conjecture that sets of roles fitted together to yield coherent, if not cohesive, structure. But little of such coherent structure is actually to be found in the modern civilisation that is the actual (if unacknowledged) subject and context of social science …. Instead in our civilisation there are domains and networks that coalesce over time into recognisable genres and institutional forms … social process in this view comes from the shifting overlays of constituent sociocultural processes

Mische and White's arguments take the following form. Following the distinction between 'contact' and 'field' approaches to networks elaborated in section 1, they insist that networks need to be related to the domains (fields) which they organise: 'the phenemology and theory of network ties has thus far remained ad hoc, casual, indeed largely implicit, because networks have not been understood as embedded in domains'. The boundaries for such domains can be identified only through the 'stories' which are associated with them, with discourse identifying the 'insiders' as those who belong to networks, their roles and identities, and by implication outsiders: 'normally networks and discourse are co-constitutive around stories. Modernity gives rise to multiple cross cutting networks'. We belong to multiple overlapping networks, in which we switch routinely from one network to another in our daily lives (family/ work/ neighbourhood/ leisure etc), and in each of which there are different stories and discourses. Networks are hence not measures of structural roles, but are themselves cultural constructions - they do not pre-exist, or exist apart from, their enactment in conversation and discursive communication processes. In certain times and places these storied networks become institutionalised, so that rather than discourse arising from network structures, more enduring and institutional ties can coalesce from storied networks. An example is Ansell's (1997) account of how the emergence of French socialist politics in the period between 1890 and 1914 rested on the way that certain symbols were used to generate stories around which networks form: 'through the interplay between organizing symbols and social or organisational networks … organisational cohesion emerges'. (Ansell 1997: 360). Rather than begin with a whole population defined by an organisational boundary, and using network methods to assess how this population is structured, one starts from discursive unities in the form of stories to consider how far they lead to organisational boundaries.

Mische and White here take a distinctive 'temporal turn'. Given we all live in overlapping and multiple networks, it is important to focus on the 'switching processes' by which we move from one network to another. They are concerned with those 'public' arenas in which multiple stories can coexist and jostle alongside each other, and in which people can switch between networks. (They draw here on Goffman's idea of the presentation of self). They are interested in those 'situations' which arise when the normal stories around which a network coheres break down, for either internal or external reasons, leading to a moment of crisis or tension and the potential for change and conflict. Understanding how routine 'occurrences' become 'situations' is crucial to their concerns, and connects with the now considerable literature in American sociology concerning the social scientific use of narrative methods (see e.g Abbott 2001).

This manifesto is a long way from the SNA of Granovetter, Freeman, and other 'mainstream' writers and indicates very different theoretical preconceptions at work. It might be seen as indicating a third generation to SNA. The first generation is a kind of 'enriched individualism', and might be seen most clearly in the work of Granovetter. Here, the concern is to criticise purely rational actor models within the social sciences by emphasising that individuals are 'embedded' within a web of relations and ties, and that these web of relations offer a vital context in which individual actions need to be placed. However, this still identifies networks as important to the individual, so that they become identified effectively as individual attributes. A second generation is more fully

'structuralist'. Here, the focus is on looking at how network techniques can be used to understand the role relations within a 'whole' network. Researchers here are not primarily interested in individuals at all, but in the dynamics and properties of certain kinds of network structure. Individual agency might arise because of a specific bridging position, but this can only be understood as agency bestowed by one's network position. However, we have argued that this approach is theoretically problematic because of the difficulty of defining whole networks in any but pragmatic or arbitrary terms. The third generation is undeveloped and although a series of exemplars have been published in top American sociology journals its application and popularity remain restricted. In part this is due to its rather narrow disciplinary base within a particular kind of historical comparative sociology and the sociology of social movements: it has not attracted interest from a broader constituency of SNA users, (e.g. researchers in business schools), and currently has few if any practitioners outside North America.

This third generation is interesting because it pays little attention to recent debates within anthropology, even though, as we discuss shortly, there are some parallels. In this respect it is very different to the structuralist SNA theorists who often thought they were building on specifically anthropological approaches to social structure: in Lopes and Scott's (2000: 60) words 'SNA has systematically developed the relational focus of the German social theorists and the British social anthropologists, seeing structures of social relations as defining a multidimensional social space within which agents can be located and their actions explained'. By contrast, the new cultural approach within SNA rarely makes any reference to anthropology (for instance, the only reference within Mische and White (1998) is to Victor Turner's concept of liminality which they see as a way of exploring 'switching processes'). In fact this is not entirely surprising when one notes that most of these cultural studies have not used ethnography, but have instead concentrated on historical case studies using documentary data3.

Given this lack of dialogue it is worth exploring how there may be links to current anthropological debates, which have emerged in confrontation with a more abstract sense of the world becoming more 'networked' (Castells 2000) through globalisation and the development of new technologies of communication that has provoked anthropologists to re-think the tools that they have used in their research, rather than developing 'networks' as a tool in their own right. In the 1980s problems surrounding the use of 'culture' as an explanatory framework for interpreting social life constituted a central debate on the distributed nature of cultural knowledge. As Hannerz (1992) points out, during the 1980s there was a 'recognition that … structures of meaning and meaningful form are not uniformly shared but problematically distributed in populations and that both culture itself and the order of social relationships are significantly influenced by this distributive complexity.' This was leading to new ways of thinking about connection and relationality which was informed by a sense of the world being a place which was constituted through complex flows and extensive networks.

As the network became more common as a way of describing changes in the world, new kinds of objects and subjects came to be seen as possible research sites for anthropological research. Realisation of the complex global flows of commodities and objects around the world led to a reinvigoration of approaches to objects and their meanings (Henderson 1998; Pels, Hetherington, and Vandenberghe 2002), and to commodities and their effects (Appadurai 1986; Bestor 2001; Kopytoff 1986; Mintz 1985). New reproductive technologies have challenged the basic categories of kinship, leading to invigorated research on the kinds of connection and relatedness that discourses surrounding NRTs and genetic science make visible and draw upon (Franklin 2003).

[3] The main exception here being the work of Mische (xxxx) which has used qualitative data (though not ethnography) on political activists

Networked technologies have also provided a context within which anthropological methods have been challenged to rethink their assumptions and their possibilities (Miller and Slater 2000). The emergence of the internet provided seemingly novel 'virtual' spaces where people were able to play with their online identities in ways which had not been possible before (Robins 1996; cf Wilson and Peterson 2002). These networks have provoked questions both about identities and how they are constituted in different spaces (Fung 2002; Panagakos 2003), questions about the validity of online research where the 'truth' behind the claims could not be verified, and the partiality of observing interaction in such a limited arena where the only cues to social interaction available were those 'online', and not the interactions and forms of socialisation which took place 'offline' (Hine 2000).

Many of these studies which have come to look at the manifestation of different kinds of networks, have been influenced by and contributed to the development of actor network theory. However it is important to note that anthropologists offer different perspectives to actor network theorists, such as Bruno Latour, which purports to endorse an anthropological approach to the study of modern science. In his view anthropological studies of non-modern peoples reveal the continuity and entanglement of domains of practice that modernist thinking separates out, and resolutely keeps apart. Moderns assume the ontological reality of Nature and Society as distinct orders of being. Latour challenges these realist assumptions, claiming furthermore that modernity is an aspiration rather than a reality, but an aspiration with strong delusional capacity and institutional backing. The purification process through which the twin poles of Nature and Society emerge as discrete, generates many parallel and related distinctions, including the separation of domains such as science, belief, ontology and politics. Taking as his starting point the limits of assumptions about the integrity of the Cartesian subject (the ideal scientist) who knows himself and the world through doubt and reason, Latour pushes his readers to recognise how scientific truths are in fact produced through rich collaborations of human and non-human agents in networks of relationships that inevitably inhere in the realities that any particular scientist sets out to describe and understand (Sykes 2002). It is in these networks that subject/object distinctions are collapsed. In the modern world, such networks proliferate in direct relation to attempts by modern subjects to hold apart the twin poles of Nature and Society.

Latour believes that the anthropological methods of participant observation are not suitable for the study of contemporary western settings. In his view, the ethnographic approach can be effective in small social groups where face-to-face encounters are typical of the contexts in which people know each other, and know about the world and where networked sociality is limited. For this reason it has been the study of networks, rather than ethnography per se, that has characterised the field of STS. Some would argue that such studies *are* ethnographic, but from an anthropological perspective there are important differences that should be clarified here. The actor network theory that Latour's work inspired (although he subsequently disavowed much that was done in the name of ANT) is perhaps best described as an approach rather than a theory, an approach that prioritises the empirical study of the complex entanglements through which western sciences and technologies are constituted. A central concern for much of this work has been to reveal the diversity of non-human agents in these networks, and to describe the socio-technical assemblages through which modern political life is conducted.

However there are important differences between the ways in which anthropologists and STS scholars tend to integrate ethnography and 'networks'. Sophisticated STS scholars such Barry, often very widely read in anthropological theory and in the philosophy of science, maintain a distance from the lives of the people they are writing about, in such a way that people become abstractions in their hands. On one level this could be taken as an

aesthetic difference - a choice about how the intimacy of the ethnographer's work appears in the final analysis - but of course such choices, as Latour taught us, are never innocent. Thus, for example, while both Barry and Latour find the work of Strathern very useful and provocative, it is interesting that the 'translation' involved in incorporating Strathern into their own knowledge networks, involves leaving behind what was for her a motivating force, namely the attempt to engage, at a deep and empathetic level, with Highland New Guinean perspectives on the world. Sykes (2002) has pointed out how Latour, by contrast, is silent about his own networks and this lack of reflexivity is also a crucial difference between ethnographic and ANT approaches. (We have also seen that the lack of reflexivity is also striking within SNA). Latour's own intellectual biography as engineer, reluctant philosopher and convert anthropologist marks his work deeply and encourages him to produce 'the network' as solution to the dilemmas posed by realist science - namely the powerful misrepresentations entailed in claims to the ontological separation of a non-human world of objects and a human world of subjects. Anthropologists produce ethnography, a response that remains resolutely person-centred, and anthropologists look, through attention to practice, at 'how humans energise their relationships, and thereby explicitly create difference among themselves'. This perspectival shifting, which requires the ethnographer to acknowledge their entanglements in the social networks of field sites, is fundamental to anthropological methods. Latour, by contrast, is interested in how humans create differences between themselves and an external, objective order of being - humanism is reductionist in this approach. From an anthropological perspective however, the erasure of one's own circumstances of knowing flattens what is known and reduces the complexity and integrity of the knowing4.

It is thus important to understand that what STS and Anthropology hold in common is not a micro-approach. The scaling effects would be understood as part of a social process and not be assumed in advance. What they share is a passionate interest in the ways in which attention to practice reveals networks of collaboration that destabilise those theoretical constructs (often constructs with significant social force) that rest on claims to autonomous reason. Neither Anthropology nor STS holds disdain for social facts, for knowledge or for theory, both are looking to widen what it is possible to know, and how it is possible to know. However, they do not do this in the same way. Anthropology works by addressing the networks of relations through which people know the world. This has led to a number of studies by anthropologists who have come to take an interest in networks as social forms. These 'network' forms of sociality are, incidentally, as ubiquitous and extensive in non-western as they are in western contexts - such contexts themselves having been thoroughly entangled from the moment of their first imaginings.

This anthropological interest in understanding how networks of relations work to make the world meaningful to people, has led to a new kind of network thinking in anthropology which explores how people know that they are in a network and what difference it makes to know one is in a network. 'The network' in this sense is an abstraction, a metaphor, a pre-theoretical concept (Moore 2004) through which the world is externalised. This realisation of the metaphorical role of networks has been recently explored by Laura Otis (2001). She looks at the importance of metaphor and analogy in the process of building knowledge. She does not suggest that scientists confuse metaphors with the realities they were trying to understand, in other words it is not an argument about false-consciousness or cultural blindness. Nevertheless the aim is to show how knowledge is mediated by

[4] It is important to stress that STS and Anthropology are only heuristically differentiated here – and unevenly so. Latour and Barry are taken as influential STS scholars because of their interest in networks. Anthropological approaches work against such demarcations, and thus produce no parallel 'ethnographers of networks'. However there is no claim made here for the impossibility of conjoining ethnography and STS approaches – and such collaborations are certainly underway in both directions.

metaphor, to the extent that there is no other space from which to know things - metaphors can be changed and their potential developed or curtailed but there is, in this argument, no space outside language. This work thus raises the question of how the image of the network inhabits contemporary social analysis. Henrietta Moore (Moore 2004) has suggested that it is worth thinking about how people live in relation to grounding tropes, and in particular in social studies of science and technology have introduced new tropes into the social sciences. Replication has certainly become an idea that has begun to act alongside ideas of reproduction. The network metaphor has become intrinsically engaged with discussion of self-organising systems rather than control centres. Thus, just as 'networks' emerged as the universal social form when 'communities' became the focus of analytic attention, so 'the network' and 'the relation' are now subject to greater critical analytical scrutiny as grounding tropes with pre-theoretical assumptions that researchers have not always thought through.

Otis asks 'what is new about networking' and answers 'everything and nothing'. Focusing on the development of telegraph technologies and drawing primarily from the work 19th century scientists, philosophers and novelists, Otis identifies the 'network' as the quintessential communications system, the core metaphor through which technical systems and bodily processes are imagined and made to stand for each other. An interesting suggestion that emerges in this work is the way in which the network metaphor is seen to hold together two quite different network forms (the web and the network). The notion of a web allows for a hierarchical structure with a centre and concentric spheres of influence while the network invokes a more horizontal and open-ended 'weave'. The suggestion is that there is a tension between the notion of networks that bind and immobilise, and those that invoke mobility and liberation. In technological terms this analogy is apt and recreates the tension at the heart of technical innovation in industrial histories.

Ethnographically, this critical appreciation of the power of the network metaphor has been demonstrated in analyses of how 'networks' are revealed as certain kinds of social form. This brings together the observations on metaphor, and the exigencies of method into a consideration of the ethnographic fact of networks. This concept of the network as a particular kind of form which exposes certain understandings of relatedness, has emerged as networks have begun to appear not just as methodological or theoretical tools but as ethnographic 'facts' and indigenous means of describing and acting in the world. On the one hand there has been an identification of network 'effects' - new kinds of connection that have come about as a result of technological advances which have enabled greater movement of goods, people and ideas along routes and trajectories that come to be described as networks (Castells 1996; Castells 2000; Hannerz 1992). On the other hand, as we have been attuned to notice the appearance of these spontaneously emerging network patterns, people who are engaging with the implications of this networked movement of capital, populations and power both in terms of resistance to the local effects of these processes and the promotion of 'new' forms of capital accumulation are self-consciously organising themselves into 'networks' of their own (Escobar 2001; Riles 2001; Wittel 2001).

It is the analysis of networked organisational activities where most of the cultural analysis of the network as a cultural form has emerged. Escobar's (2001) work on environmental activism shows how activists' networks are formations which are able to avoid an opposition between place (as local and traditional) and space (as global and transnational) through the creation of regional networks of protestors with very much place-based causes but yet, through their participation in networks, global reach. Also considering a similar kind of organisational formation, Riles (2001) looks closely at a global women's network, but her theoretical elaboration goes much further than Escobar in considering the cultural form of the network itself.

Riles sees networks (with a focus on activist's networks) as 'a set of institutions, knowledge practices and artefacts thereof that internally generate the effects of their own reality by reflecting on themselves.' By this Riles articulates much the same tension that Actor Network theorists were pointing to when they first talked of networks - the fact that the network form was neither simply a description nor simply an object. Riles is interested in the ways in which the network is utilised by people as a way of describing their commonality to one another. Through close attention to the ways in which people participate in networks as a means of engaging in global issues, Riles shows how the network allows people to 'share everything and nothing', in particular engaging with issues of space and scale by showing networks have the effect of generating 'the global'. Riles provides very detailed ethnographic engagement with the ways in which people articulate their relationships with one another as network relations, and are able to envisage those relationships through the use of pictorial and diagrammatic representation of networks. Riles shows how in doing so they do not bracket these relations off as something other than the thing being represented as a network but shows how the network and relations exist as the same thing 'seen twice'; 'for networkers in Suva, the Network and "personal relations" are versions of one another seen twice.'p26.

Andreas Wittel has located other network effects in a very different setting of self-consciously produced social 'networks'. Wittel's (2001) work on the networking activities of employees of new business start-ups in London leads him to claim the emergence of what he calls 'network sociality'. Wittel identifies network sociality as a new social form which entails 'integration and disintegration', positioning it in opposition to 'community' which is based upon notions of 'belonging'. The network not only reveals an 'imperative to connect'(1999), but suggests that those connections will be informational (rather than narrative), exchange based (rather than historical), and ephemeral (rather than enduring).

We can get a sense of the possible ways that SNA and anthropology may be able to speak to each other from this more cultural perspective by looking at the ethnography by Mayfair Yang (1994). Interestingly the starting point is again in relation to network as method. By working through networks the researcher gets privileged access to the informality of everyday social process. The possibilities afforded by network as method in this study were related to the 'observer's paradox' in some respects, in the sense that in the context of a hierarchical and controlling state structure which demanded conformity from individuals, it was difficult to access the more informal forms of sociality that operated alongside official practice. As in the linguistic study, there was the worry that researchers (as outsiders) might provoke official response and formalised interactions. By working within the relational forms that people themselves mobilised to circumvent the restrictions of the state, the researcher could access a far richer and more complex understanding of contemporary Chinese social life. However there are important differences from the earlier, more formalistic studies of networks in anthropology described above. Yang's focus is on the 'art of networking', and networking is explicitly taken as a mimetic technique rather than an exercise in mapping a social domain. The difference is also crucially related to what it is that the researcher is trying to understand. While Milroy (1980), for example, wanted to provide a systematic explanation for linguistic change (or lack of it), Yang identified a particular Chinese form of sociality (*guanxixue*) which she wanted to learn about through participation, *Guanxixue* is an informal network of exchange that involves creating social debts through doing favours for others. It is important because of the ways in which it creates social links across social classes and builds networks of mutual dependence among people who otherwise have very 'weak social ties'. The 'strength of weak ties' is highly significant in contemporary China where visible social groups are rapidly assimilated to state process. These informal networks are highly valued possibilities for getting round the system in small ways and are used by people across the social spectrum. Thus while this work confirms previous work on network density, what Yang is really interested in is the particular circumstances of

network sociality in China, and in making a political (and cultural) argument about the differences between the relational ethos of network sociality and the universalistic ethos that adheres to centralised power. The contrast that the Chinese study evokes is the distinction between a *guanxixue*-cum-kinship polity and a centralising authoritarian state.

The added relevance of this study is the suggestion that the recognition of networks as forms of sociality is perhaps simply the study of kinship and exchange by another name. Put in this way it is possible to understand (i) why anthropology seems to have abandoned network analysis, despite disciplinary prominence in the early years of this approach and (ii) how a focus on contemporary approaches to kinship, and the diversity of kinship 'systems' suggests the need for a deeper understanding of the differentiation of network forms, beyond the assumption that a formal network method or network theory could be applied to all human groups. Emphasis is thus shifted to the complex social and cultural work involved in forging or severing connections.

Conclusion

Amidst the proliferation of network approaches in recent years we have in this paper explored the potential for learning from network thinking in two forms of work which have been central to network thinking over several decades: social network analysis and anthropology. We can learn valuable lessons from the way networks have been understood and researched within these two approaches, which offer more subtle and sophisticated ways of reflecting on networks as method, metaphor and social form than in other recent thinking.

Recently, there has been considerable interest in the way that Latour (2000) has moved away from the idea of networks. His unease has come in response to people taking the metaphor of the network as a truism. Rather than being a provocation, as it was originally intended it has come to stand as an unquestioned alternative to other ways of thinking about relatedness. ANT provided a vocabulary for talking across disciplines but found itself beholden to this vocabulary whereby certain metaphors started to become mistaken in terms of what they were claiming to be - heuristic devices rather than descriptors of structure. Though many actor-network theorists have abandoned 'the network', the reasons given for this abandonment reveal a sensitivity to what the notion of the network has come to imply which has proved influential in reflections on the cultural dimensions of the network form. What we have shown in this paper is that this turn away from networks has earlier progenitors and is indicative of limitations within network thinking itself.

To register this point, we must firstly recognise the ways that the idea of the network must be placed within a larger understanding of its disciplinary contexts. We have traced the very different character of network thinking through a focus on the two areas of social network analysis which emerged as a distinct social science specialism, and anthropology. In the former, it marks a critical engagement with mainstream social science's individualistic assumptions and championed a kind of structuralism; but in the latter it marked a critical engagement with structural functionalism and signalled a recognition of fragmentation and complexity. For a few years, in the 1950s and 1960s, some writers played a role in both traditions, but this should not obscure a longer term tension. The lesson here is to recognise that network thinking does not itself offer a coherent or convincing theoretical foundation for itself, and we should be cautious of attempts to suggest it offers an easy interdisciplinary resolution of deep seated disciplinary differences.

We have explored theoretical issues with social network analysis as championed from within SNA, noting that its apparent methodological expertise is bought at a cost of oscillation between individualistic and structuralist perspectives. We have questioned the view that network methods were developed mainly within SNA while anthropology apparently 'dropped' them. In fact if we look in more detail at what happened to networks we can see that it was not so much dropped, as not necessarily developed in these terms as a structure for analysis. The insights of the early network analysts were clearly incorporated into anthropology's on-going core concerns with the analysis of kinship and exchange, and the study of kinship and of relatedness remains the defining core of contemporary anthropology (Carsten (2004; 2000), Strathern (1992), Franklin (2003; Franklin and McKinnon 2000; Franklin, McKinnon, and Modell 2003). Anthropology offers a series of important lessons.

Bringing the question of spatial relations into the debate has allowed us to begin to interrogate network theories not simply for their salience but to question what we might consider to count as salient in our analyses. The strength of the network metaphor has been to encourage us to rethink questions of relatedness, and to consider what the implications of distance(s) of different kinds might be addressed by the network. But beyond this, anthropology has also come to be sensitive to the limitations of networks. As Strathern (1996), Riles (2001) and Green and Harvey (Green 2002; Green and Harvey 1999) have shown, the network is not simply an analytical tool for the analysis of social life, but an ethnographically significant form as well. Interrogating the idea of the network itself, being sensitive to what its effects are and also its limitations, reveals to us some of the assumptions that anthropologists have inadvertently imposed through the mobilisation of the network metaphor as an explanatory device.

The network thus seems to provide both a challenge to rigidity but in use it has the effect of reintroducing new kinds of rigidities, just in a different form. This may account for the sporadic re-discovery of networks in social theory. It is important therefore to recognise the limitations of networks as an explanatory tool, however, this does not mean that the concept of the network is not useful for posing interesting questions in social research. People find it useful to the extent to which it can challenge the received understanding of the spatial and relational dimensions of social life but as soon as the network itself becomes a blueprint for spatial relations, that is, as soon as it stops challenging and starts prescribing, then the productive capacity of the network is diminished. We might see the recent work criticising structuralism within SNA and developing more cultural approaches as testimony to this point. As we have seen, one way around this has been to find new idioms and metaphors to articulate anew the project of describing and explaining social life. Another has been to turn the network from the form of analysis to the focus of analysis and back again - to turn the network inside out in Riles' terms, in a self-reflective form of engagement. This poses a difference from the cultural SNA writers who still seek to formalise their understanding of networks through reference to mathematical techniques. Of course, it must also be remembered, that the explanation of social structures in terms of networks has its own effects that a more reflexive analysis cannot achieve. For example, the development of formal network analysis has created a means by which social scientists can converse across disciplinary boundaries, for example enabling conversations between social network analysts and economists.

The ideal of the network and the claims that are made for it are never achieved in actual social relations as the ethnographic cases have shown. Despite their claims, networks, it seems, do not connect, transfer and emancipate in the ways that they promise to do in popular usage. Ethnographically, we have come to realise that networks are not neutral tools for describing social life, but rather entail a particular politics in their description of social life as fluid and contingent. In fact, as we have seen networks are usually anything but fluid and open, for as soon as they purport to describe, like any description they fix.

This produces a tension which continually re-appears in discussions of networks, for as they fix things they produce what Callon might call 'overflowing'. Now this overflowing can either be included in the network - so then networks are conceptually endless even if they are practically curtailed, or can be excluded from the network making the network a delimited and bounded entity. The latter scenario provokes the question upon what basis and according to what criteria is the network delimited. For the network to be of any explanatory use, these questions must first be considered.

We have noted the recent emergence of a cultural sociology of networks within SNA which responds to various methodological problems within SNA itself and which offers a potentially stimulating and exciting way of connecting with debates in anthropology. As we have shown, networks can be seen in their usage as methodological tools, metaphors or analytical abstractions and as descriptors of empirically identifiable social forms. Ethnographies of social networks as social forms have shown however, that the political and powerful affects of being in or outside networks are generated through the ambiguities created by the fact that the network simultaneously points to a structural or morphological form, recognisable through forms of inscription such as that conducted by Social Network Analysts; is used in a metaphorical sense to evoke connectedness and produce exclusion through relationships which are performed in new spatial ways - either by crossing physical space through new forms of communication and transport, creating other kinds of spaces e.g. virtual/online environments, or being sensitive to the ways in which the network itself stands as a critique of Euclidian basis to our thinking about space (ANT); and as a design for action and prescription of how to organise. All contained within the same term, these different meanings come to stand in for one another in ways which produces discursive engagement amongst those who mobilise them either as a form of social organisation or a form of analysis.

References

Abbott, A. (2001) *Time Matters*, Chicago: University of Chicago Press.

Ansell, C.K. (1997) 'Symbolic networks: the realignment of the French working class, 1897–1894', *American Journal of Sociology*, 96: 359–390.

Appadurai, A. (1986) The Social Life of Things: Commodities in Cultural Perspective. Cambridge, UK; New York: Cambridge University Press.

Barabási, A.L. (2002) *Linked: The New Science of Networks*, Cambridge, MA: Perseus Publishing.

Barnes, J. (1954) Class and Committees in a Norwegian Island Parish. Human Relations 7: 39–58.

Bax, M. (1978) Figuration Analysis: A Better Perspective for Networker: With an Illustration from Ireland, Anthropological Quarterly, 51: 221–230.

Bearman, P. (1995) *From Relations to Rhetorics*, Rutgers N.J.: Rutgers Universty Press.

Bestor, T. C. (2001) 'Supply-Side Sushi: Commodity, Market, and the Global City', *American Anthropologist*, 103: 76–95.

Boissevain, J. (1979) 'Network Analysis: A Reappraisal', *Current Anthropology*, 20.

Bott, E. (1957) *Family and Social Network : Roles, Norms, and External Relationships in Ordinary Urban Families*, London: Tavistock Publications.

Breiger, R. (1989)

Burt, R. (1992) *Structural Holes: the social structure of competition*, Cambridge: Harvard University Press.

Burt, R. (2000) *The network structure of social capital, Research in Organisational Behaviour*, 22: 345–423.

Burt, R. (2002) 'Bridge Decay', *Social Networks*, 24 (4): 333–363

Burt, R. (2000)

Carsten, J. (2004) *After Kinship. New Departures in Anthropology*, Cambridge: Cambridge University Press.

Carsten, J. (2000) 'Boundaries, and identities 2000', *Cultures of Relatedness: New Approaches to the Study of Kinship*, Cambridge: Cambridge University Press.

Castells, M. (1996) 'The Net and the Self: Working Notes for a Critical Theory of the Informational Society', *Critique of anthropology*, 16: 1–46.

Castell, M. (2000) *The Rise of the Network Society. Information Age*, *Vol,1*. Oxford; Malden, Mass.: Blackwell Publishers.

Erickson, B. (1996)

Escobar, A. (1996) 'Welcome to Cyberia Notes on the Anthropology of Cyberculture' in D. Porter (ed.) *Internet Culture*, pp. 111–137. London: Routledge.

Escobar, A. (2001) 'Culture Sits in Places: Reflections on Globalism and Subaltern Strategies of Localization', *Political Geography*, 20: 139–174.

Franklin, S. (2003) 'Rethinking Nature-Culture: Anthropology and the New Genetics', *Anthropological Theory*, 3: 65–85.

Franklin, S. and McKinnon, S. (2000) 'New Directions in Kinship Study: A Core Concept Revisited', *Current Anthropology*, 41: 275–279.

Franklin, S., McKinnon, S. and Modell, J.S. (2003) 'Relative Values: Reconfiguring Kinship Studies', *Journal of the Royal Anthropological Institute*, 9: 585–586.

Freeman, L. (1983) 'Locating leaders in local communities', *American Sociological Review*, 28: 791–798.

Freeman (2004) *The Development of Social Network Analysis: a study in the sociology of science*, Vancouver: Empirical Press.

Fung, A. Y. H. (2002) 'Identity Politics, Resistance and New Media Technologies: A Foucauldian Approach to the Study of the Hknet', *New Media & Society*, 4: 185–204.

Goldthorpe, J.H. (1980) *Social Mobility and the Class Structure in Modern Britain*, Oxford: Clarendon.

Gould, R. (1995) *Insurgent Identities: class, community and protest in Paris from 1848 to the Commune*, Chicago: University of Chicago Press.

Granovetter, M. (1973) 'The Strength of Weak Ties', *American Journal of Sociology*, 78: 1360–1380.

Granovetter, M. (1985) 'Economic Action and Social Structure: The Problem of Embeddedness', *American Journal of Sociology*, 91: 481–510.

Green, S. (2002) 'Culture in a Network: Dykes, Webs and Women in London and Manchester' in N. Rapport (ed.) *British Subjects : An Anthropology of Britain*, Oxford: Berg, pp. 181–202.

Green, S., and Harvey, P. (1999) 'Scaling Place and Networks' *Internet and Ethnography Conference*, Hull.

Green, S., Harvey, P. and Knox, n.d., H. (Forthcoming) 'Scaling Place and Networks: An Ethnography of the Imperative to Connect through Information and Communications Technologies', *Current Anthropology* .

Hannerz, U. (1992) 'The Global Ecumene as a Network of Networks', in A. Kuper (ed.) *Conceptualizing Society*, London: Routledge.

Hassan, R. (2003) 'Network Time and the New Knowledge Epoch', *Time & Society*, 12: 225–241.

Henderson, K. (1998) 'The Role of Material Objects in the Design Process: A Comparison of Two Design Cultures and How They Contend with Automation', *Science, Technology and Human Values*, 23: 139–174.

Hine, C. (2000) *Virtual Ethnography*, 8: 179.

Kapferer, B. (1973) 'Social Network and Conjugal Role in Urban Zambia: Towards a Reformulation of the Bott Hypothesis', in J. Boissevain and J. C. Mitchell (eds) *Network Analysis: Studies in Human Interaction*, The Hague, Paris: Mouton, pp. 83–110.

Kephart, W. M. (1950) 'A Quantitative Analysis of Intragroup Relations', *American Journal of Sociology*, 55: 544–550.

Knox, H. (2003) *Blocks to Convergence in the New Media Industries: An Anthropological Study of SMEs in Manchester*, University of Manchester.

Kopytoff, I. (1986) 'The Cultural Biography of Things: Commoditization as Process' in A. Appadurai (ed.) *The Social Life of Things. Commodities in a Cultural Perspective*, Cambridge: Cambridge University Press.

Latour, B. (1990) 'Drawing Things Together' in M. Lynch and S. Woolgar (eds) *Representation in Scientific Practice*, Cambridge, MA: MIT Press, pp. 19–68.

Laumann, E.O.and Guttman, L. (1966) 'The relative associational contiguity of occupations in an urban setting', *American Sociological Review*, Vol. 31, No. 2, pp. 169–178.

Levine, J.H and Spadaro, J. (1988), 'Occupational mobility: a structural model', in B. Wellman and S.D. Berkowitz (eds), *Social Structures: a network approach*, Greenwich, Connecticut, JAI Press, pp. 452–477.

Lin , N. (2000) Social Capital, Oxford: Oxford University Press.

Miller, D., and Slater, D. (2000) *The Internet : An Ethnographic Approach*, Oxford: Berg.

Milroy, L. (1980) 'Language and Social Networks', *Language in Society*; *2*. Oxford: Basil Blackwell.

Mische, A., and White, H, 'Between conversation and situation: public switching dynamics across network domains', *Social Research*, Vol.65, No. 3, pp. 695–724.

Mintz, S. W. (1985) *Sweetness and Power : The Place of Sugar in Modern History*.

Mitchell, J. C. (1969) *Social Networks in Urban Situations: Analyses of Personal Relationships in Central African Towns*, for The Institute for Social Research University of Zambia, Manchester: Manchester University Press.

Mitchell, J.C. (1974) 'Social Networks', *Annual Review of Anthropology* 3: 279–299.

Moore, H. (2004) 'Global Anxieties', *Anthropological Theory*, 4: 71–88.

Newman, M. E. J., A. L. Barabasi, and D. J. Watts. Editors. 2003. The Structure and Dynamics of Complex Networks,. Princeton: Princeton University Press.

Noble, M. (1973) 'Social Network: Its Use as a Conceptual Framework in Family Analysis', in J. Boissevain and J. C. Mitchell (eds) *Network Analysis: Studies in Human Interaction*, The Hague; Paris: Mouton, pp. 3–14.

Otis, L. (2001) *Networking : Communicating with Bodies and Machines in the Nineteenth Century. Studies in Literature and Science.* Ann Arbor: The University of Michigan Press.

Padgett, J. F., and Ansell, C.K. (1993) 'Robust Action and the Rise of the Medici, 1400-1434', *American Journal of Sociology* 98: 1259.

Panagakos, A. N. (2003) 'Downloading New Identities: Ethnicity, Technology, and Media in the Global Greek Village' *Identities-Global Studies in Culture and Power* 10: 201–219.

Pels, D., Hetherington, K., and Vandenberghe, F. (2002) 'The Status of the Object: Performances, Mediations, and Techniques' *Theory Culture and Society* 19: 1–21.

Radcliffe-Brown, A. R. (1940) 'On Social Structure' *Journal of the Royal Anthropological Institute*, 70: 1–12.

Riles, A. (2001) *The Network Inside Out*, Ann Arbor: University of Michigan Press.

Robins, K. (1996) 'Cyberspace and the World We Live In' in J. Dovey (ed.) *Fractal Dreams : New Media in Social Context*, London: Lawrence & Wishart, pp. 1–30.

Sassen, S. (2000) 'Spatialities and Temporalities of the Global: Elements for a Theorization', *Public Culture*, 12: 215–232.

Schweizer, T. (1997) 'Embeddedness of Ethnographic Cases', *Current Anthropology*, 38: 739-760.

Schweizer, T., and White, D.R. (1998) *Kinship, Networks, and Exchange. Structural Analysis in the Social Sciences*, Cambridge; New York: Cambridge University Press.

Scott, J. (1991) *Social Network Analysis : A Handbook*, London; Newbury Park, California: Sage Publications.

Stoller, P. (1996) 'Spaces, Places and Fields: The Politics of West African Trading in New York City's Informal Economy', *American Anthropologist*, 98: 776–788.

Strathern, M. (1992) 'After Nature: English Kinship in the Late Twentieth Century' *The Lewis Henry Morgan Lectures: 1989*, Cambridge; New York: Cambridge University Press.

Strathern, M. (1996) 'Cutting the Network', *Journal of the Royal Anthropological Institute*, 2: 517–535.

Thompson, G. (2003) *Between hierarchies and markets: the logic and limits of network forms of organization*, Oxford, Oxford University Press.

Wellman , B. (1988) 'Structural analysis: from method and metaphor to theory and substance' in B. Wellman and S.D., Berkowitz (eds), *Social Structures: a network approach*, Greenwich, Connecticut: JAI Press, pp. 19-–61.

White, D. R., and Johansen, U. (Forthcoming) *Network Analysis and Ethnographic Problems*, Lexington.

White, H., (1970) *Chains of Opportunity: system models of mobility in organizations*, Harvard: Harvard University Press.

White, H., Boorman, S.A., and Breiger, R.A., (1976) 'Social structure from multiple networks 1: blockmodels of roles and positions', *American Journal of Sociology*, 81: 730–781.

Wilson, S. M., and Peterson, L.C. (2002) 'The Anthropology of Online Communities', *Annual Review of Anthropology*, pp. 449–468.

Wittel, A. (2001) 'Toward a Network Sociality' *Theory Culture and Society*, 18: 51–76.

Yang, M. M.-h. (1994) *Gifts, Favors, and Banquets : Art of Social Relationships in China, The Wilder House Series in Politics, History and Culture*, Ithaca: Cornell University Press.