The Theoretical and Empirical Properties of Communities of Communicators

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Introduction

The quest which SASNET is embarking on is one which probably agrees with the two epistemological concepts that there is no knowledge without social networks, and that social networks in part define and constrain the nature of knowledge. Presumably the aim is either to enhance transmission of knowledge (either by enhancing access or by dissemination) or to enhance the generation of knowledge (within which term I include opinion-forming), by fostering this thing known as a network.

In this paper I will

I) pursue these ideas via an examination of sets, groups, and relations; PART I Sets, Bigger Sets, and Relations

II) see how sets and relations underlie consciousness at the individual and the social level;. PART II Consciousness, Serial Computing and Parallel Pandemonium

III) ask how some parameters that govern networks affect the beliefs held by network members. This I will do by the use of simulation models – which will be very abstract and simplified. The point is not to show exactly what can or does happen, but to illustrate the kinds of questions we are made to ask in defining parameters of interest; Part III Social Epistemology: Communication, Correspondence and Coherence

IV) I will reflect on some of my own experiences with different networks at different times. Part IV Empirical

I will attempt to draw some conclusions from these three strands: but drawing summary conclusions is not my purpose. After all, we have been invited to contemplate a range of issues, and to hear each other on these topics.

PART I Sets, Bigger Sets, and Relations

SASNET is implicitly talking about the sets People, Educational Qualifications, Locations, and Disciplines. (There is quite a powerful methodology at work here, described in better detail in Chapman (1995, 1997).

It would like SASNET-People to be a subset of all People defined by the twin relations {Swedish or South Asian} and Educational Qualification Adequate (which may mean competence in English.) . Expressly no relation is suggested between People and Disciplines. All Disciplines are to be incorporated.

I suggest that some hard thinking is necessary here. First of all, People relate to People in an infinite variety of ways for an infinite variety of reasons. We all connect with a myriad of other people through many networks, but within a time budget. If we therefore we have to change our attention from current channels to a new one, there will be an opportunity cost. The gain must outweigh this opportunity cost.

As an example, not all Geographers of India are either Indian or Swedish. Not all Geographers in India are Geographers of India – they could be Geographers of North America or elsewhere. In addition, the subset of all people defined by being a Geographer includes People from nearly all global Locations. If currently a Geographer of North America living in India is asked to join SASNET, what is the gain compared with the opportunity cost of giving up the same time on current relations with American Geographers of America? By extension, I think it unlikely that physicists and skin surgeons in South Asia will see an advantage in SASNET. It is most likely to appeal to those scholars whose subject matter lends itself to Area studies in some form: by definition much more likely to be from the social sciences and humanities.

When we define a new group (I am not using this work in the mathematical sense) of people, we define an entity (a set) of a higher scale. A set of 8 elements, say S={a,b,c,d,e,f,g,h} may be recombined in $2^{8.} = 256$ different ways. The set of all such combinations is the Power Set of S, denoted by 2^S. Two members of 2^S could be {a,b,c,d} and {e,f,g,h} which show an unconnected partitioning of S. Another member could be {b,c,f,g}, which shows 'overlaps' (intersections) with the previous two. But holistically {a,b,c,d} is completely different from {b,c,f,g} – think for the moment of a band or orchestra with different musical instruments – the whole is different by virtue of changes of some of the components. Given all the People on globe and the power set of People, 2^P, the SASNET will hopefully empower a member of 2^P that has not been empowered before.

There is of course a Power Set of the Power Set, with $2^{256} = 1.579 \times 10^{77}$ members, one of which is {{a,b,c},{d,g}} which has different logical properties from {a,b,c,d,g}. Think of the significance of the organisation of atoms into molecules, then of molecules into cells, then of cells into organs, and then of organs into organisms. I can do things because I have a heart and a brain – but what I do is the property of neither of these, but of the whole of me.

In a world of discrete physical entities which are partitioned, and which themselves are made of component parts, then as the hierarchical levels are climbed, there are fewer entities to think of. Each one of us is made of trillions of cells, but only thousands (hundreds?) of complicated organs, and finally we are, hopefully, singular. This seems contrary to the idea that there are astronomically increasing numbers of members of the power sets as the hierarchy is climbed. The reason for the difference is that the *amount of selection* of the *actual* from the *possible* also increases astronomically as the hierarchy is climbed.

But the social world we are creating is becoming less and less partitional, and more and more cover-set – that is, we all belong to multiple organisations, be it home, work, holidays , interest groups, etc and we communicate more and more through uncentred networks; once the post, then the telephone, now the internet. Although we all use only an infinitesimally small fraction of all the coordinations/coalitions we could theoretically manage, the number of such coalitions is much bigger now than in the historical past (that lost time of the golden and mythical 'local community', which some people would like to return to.) In other words, as we climb the hierarchy, we are now seeing more and more, even if fleeting, realisations of the members of the power set, so the idea of the hierarchy narrowing towards the top is less true. This is illustrated well by the fleeting emergence and disappearance of high-level single issue politics, and the demise of party politics. It

is also illustrated by the myriad attempts at defining new networks. My surmise is that precisely because so many more co-ordinations have been made possible by new internet technology, many more are and will be attempted, and the majority of them will fail and fall by the wayside, just like e.commerce. What will survive will not be determined by top-down planning, but by bottom up usage. And what will survive will be constantly changing and reforming, as the world collectively experiments in this new form of thinking. These ideas are elaborated more fully in the next section, where top-down is equated with Cartesian dualism, and bottom-up with our new understanding of consciousness.

Part II Consciousness, Serial Computing and Parallel Pandemonium

2.1

In a Jungian or Durkheimian fashion I wish to suggest that consciousness also exists at the social level. I wish to stress two ways of thinking about this. The first way, which is intuitively appealing but probably least valuable, is to extrapolate (or perhaps repatriate) the dualism of the Cartesian Theatre to these hierarchies. In the Descartes Theatre, where soul and body are separate, the little homunculus that is the soul takes up residence in the brain, and reviews on the stage all the incoming information portrayed there. (In modern parlance the Theatre would be a lounge, where the homunculus in your head rests on a little spiritual sofa in front of your mental TV set.) This is the view that says there is a central 'I', the 'I' who wants things, means things, does things, denies things. Most businesses and governments follow this model – with more and more information wanted at the top, to be reviewed, to 'get an accurate picture', in order to execute good policy decisions. At its most extreme, this model is best represented by communist central planning, where there was a central 'I', a Big Boss, or by a rigid company with a domineering Boss. Such assemblages respond slowly to their changing environments and often perish.

The second way follows Dennett's (1992) account of consciousness, in which dualism is rejected. There is no central "I" at all, which sounds intuitive nonsense. The stream of consciousness that is identified with self is mostly expressed in linguistic terms - language being a central (but arguably not necessary) element of consciousness. Language above all would seem to need a central "I", the subject of verbs like 'want', 'mean' etc., the homunculus in Descartes' Theatre. Dennett reviews a mass of psychological and neurological evidence to suggest that there can be no central "I". Dennett's solution is to say that language is generated in another way - that it is the product of an iterative process invoking the generation (randomish but historically constrained by recent and older experiences) and selection of candidate attentions, foci, phrases, words, and even while they are expressed they feed back into the stream of selection - so that meaning emerges rather than is ordained. He calls his model the Multiple Drafts Model. There are always bubbling in the brain multiple drafts of different reports on different topics, the vast majority of which have a very short shelf-life, but some of which achieve maximum "attention" and current dominant expression. I put "attention" into commas for the obvious reason that one must not fall into the trap of an Attender. So attention in this context means evolutionarily successful. That is to say Dennett invokes the idea of *memes* (a unit of concept, idea, thought, word, construct etc etc) which multiply and replicate, compete, die, mutate, so that what is expressed is the most successful one. (The fullest explication of memes is in the more recent book by Blackmore 1999.) So, from this maelstrom of replication, mutation, infection, a message struggles up to the level of consciousness. Dennett makes an analogy with contemporary academic writing and publishing. When is a paper finished, when is it actually published? There are many drafts, on paper, on E-mail to colleagues, on copies to referees, revisions which occur on copies not yet seen by referees who read older drafts, and at some stage samizdat release at a conference, followed by, last and least perhaps, a printed and outdated version in a 'respected' journal.

The Buddhist doctrine of *Anatta* (no soul) also rejects Cartesian dualism:-

> There is no unmoving mover behind the movement. It is only movement. It is not correct to say that life is moving, but life is movement itself. Life and movement are not two different things. In other words, there is no thinker behind the thought. Thought itself is the thinker. If you remove the thought, there is no thinker to be found. Here we cannot fail to notice how this Buddhist view is diametrically opposed to the Cartesian *cogito ergo sum*: "I Think, therefore I am." (Rahula, 1967:26).

2.2 Serial and Parallel Computing

The multiple drafts model is well illustrated by reference to the history of computing. Until recently all machines were von Neuman type serial processors. All instruction and data had to queue in order to go through the central processor. This constraint made and makes these machines simple to programme once an algorithm has been found. Parallel computing invokes the idea of multiple processors acting simultaneously. Parallel machines, are orders of magnitude faster, but very difficult to programme. It is easy for a programme to go berserk, and for a programmer not to be able to debug it.

The distinction between parallel and serial computing is important enough to warrant a further analogy. Conferences often meet in (Cocktail) Reception and in Plenary Mode (amongst others). In Reception Mode, a room full of people buzzes with conversation. Let us assume that it is meaningful conversation, so that real information processing is going on, in parallel. From time to time people move from one group to another, sometimes conveying information between groups, sometimes not. This is when delegates claim not just to be enjoying themselves, but, to give the party a veneer of 'work', they claim to be '**networking'**. Let us assume that in a parallel session there are on average four people in each group. Let us assume the party lasts two hours, and that there are 200 people present. Then, each of 200 people will speak for 30 mins.: or, there will be 100 hours worth of speaking in the 2 hour party. In the Plenary mode, only one person speaks at a time, either the Chair, or a Speaker, or a member from the floor. This is clearly serial speech, controlled by or going through a gate. (In correct English meetings one member may only speak to another "through the Chair".) In two hours there is by definition only two hours of speaking: therefore in simple quantitative terms (although there are of course many qualitative differences) it would take 50 Plenary sessions to process as much information as one Reception. But note that it is in Plenary rather than Reception Mode that one would be most prone to identify the "Cartesian self-awareness of the collective group."

It is important to realise that the architecture of the brain as a massive parallel processing device is Pandemonic - that is it is a Pandemonium in the sense that there is no captain, no boss, no central meaner. This does not mean it cannot co-ordinate. If some (probably lower brain – see McCrone(1999)) dedicated circuit screams 'attention' or 'danger', then all other circuits can focus for the interim on that danger. It is a bit like watching a herd of antelope with sentries posted. The herd browse haphazardly, foraging here and there, but if a sentry barks a warning, the whole herd rivet their attention in the direction indicated, until such time as the danger passes or they all stampede together. But for most of the time our brains can happily bifurcate endlessly into all sorts of parallel competitions and co-operations, yet make patterns like uncoordinated termites make intricate termite mounds.

Consciousness is therefore an emergent property of parallel massive information processing devices that have multiple purpose components, and pandemonic architecture. It is a product of the shifting and evolving emergence of dominant foci from the work patterns of uncentred networks.

Good, creative, and ultimately self-conscious networks are like this. And on the basis of the definitions of consciousness that I have given, we can claim consciousness emerging in many of these networks.

2.3 Communication as Community

Carey (1992) has proposed that in addition to the dominant Western tradition of studying communication as transmission, we ought to reconsider the model of communication as ritual. Such an approach

> exploits the ancient identity and common roots of the terms "commonness", "communion", "community" and "communication" (Carey, 1992:18)
>
> It sees the original or highest manifestation of communication not in the transmission of intelligent information but in the construction and maintenance of an ordered, meaningful cultural world that can serve as a control and container for human action. (Carey, 1992:18)

In Hindu philosophy, communication is not complete until mood has been conveyed (this is elaborated in proper depth in Kumar, 1981 and 1994), and mood is often not conveyed until mood is harmonised. Anyone who knows India will recognise the first phase of the day in for example the Superintendent Engineer's Office (see Chapman 1998). Everyone simply sits around the boss' desk, drinking tea. Conversation may be limited, or spirited, apparently off the point or on the point. The meeting may go on for more or less time – the more or less that it takes to harmonise mood.

In my opinion, the transmission accentuated by the transmission view is actually dependent on the culture noted by the ritual view. (This argument is spelt out in Chapman, 2000). Culture is the deepest and most concealed harmony. It is the wave that is modulated, used as the basic signal carrier of the most basic information – that of mood. What will be the carrier signal of SASNET? What will SASNET modulate to create its community? Literally, which 'vibes' will be harmonised to achieve collective consciousness?

Part III Social Epistemology: Communication, Correspondence and Coherence

3.1 Knowledge: Correspondence and Coherence through Communication

Two standard concepts in epistemology, are correspondence and coherence. To the extent that there is an attempt to marry theory with observation, we can speak of a 'correspondence' between our ideas and an observable world around us. To the extent that there are any objective facts about an objective external world – perhaps called an environment – then what we know is based upon correspondence. Knowledge then "corresponds" with the facts. In the experimental sciences the strength of the correspondence is reinforced if results are replicated in repeated experiments.

But knowledge also requires tests of the subject, that in order to know something they must believe that they are justified. So, to the tests of knowledge therefore is added the idea of 'coherence', that the ideas of two or more observers confirm each other. Coherence provides justification for belief. Since there is more than one observer, they have to be able to communicate; 'coherence' is thus intimately concerned with communication. The more developed our social networks, the more we turn to correspondence, and to testimonial knowledge of experts and witnesses, and the less we are able to turn to or own correspondence. To know that the Himalayas are suffering from deforestation requires more coherence than correspondence (see Thompson (1995) for a discussion of the range

of estimates of reforestation and deforestation in the Himalayas.) One observer with his thermometer may have a record of atmospheric temperature change at a location – and observe what he believes to be knowledge by correspondence of a warming trend. But coherence is necessary for this trend to be established as part of the knowledge of a global trend in warming.

Computer models of climate are by definition devoid of correspondence. In the absence of correspondence, the real test of whether these are good models or not ultimately rests entirely on the coherence of the views of those who talk about them. This leads to an uncomfortable situation in which the strength of the belief, i.e. the degree of certainty with which the hypothesis of the anthropogenic origin of global warming is accepted as a fact, is directly proportional to the number of people who believe the output of the models.

It follows that the quantitative strength of the coherence is at least in some measure associated with the reach of the communications system. The scientific community internationally is seemingly quite well connected on issues of climate change, and the size and spread of the community that coheres is part of the strength of the knowledge of climate change.

Political revolutionaries in Rumania, fascist dictators in Belgrade, NATO Air Chief Marshals, campaigning green groups all know that the mass media are the quickest and most effective means of instilling the coherence in a target audience that then justifies any given belief as 'fact'. From the pandemonium a message emerges to become part of social consciousness, to be a centre of collective Attention. For scientists embedded in society Attention is often synonymous with funding.

3.2 Simulation of correspondence and coherence

Here I explore these issues by means of a computer simulation. What I have set out to do is to create a community, of communicating observers, each with some understanding (a 'world view') of what the world is like. (More is said about this is in Chapman et al, 1997). These observers initially know a lot about their own local circumstance, but only guess what distant places are like. But we then let them talk to each other by "telephone", so their world views can be modified by what they hear about distant places. By varying different parameters relating to local correspondence (local observable 'truths') and the way other observers' views are incorporated (the sharing of beliefs) and the rates of communication, we can generate further questions about the relationship between networks, communication and knowledge. I will use only three cases out of innumerable possible ones.

3.2.1 CASE 1. The Discovery of a True World.

What I have postulated is a very simple world, consisting of a 5x5 board, rather like a chess board. On this board a True World is created by randomly painting each square either black or white. There are of course 2^{25} = approx. 34 million possible True Worlds, one of which is randomly selected in any simulation run as the map of the True World. I would never defend the hypothesis that the actual world is finite and knowable in this manner - but for the purposes of this exercise I am happy to use a finite model world to begin with.

Next I hypothesise a sentient person (Senper) inhabiting each of the squares of the True World , and each one has its own image of what the True World is like. This image is made up of two parts:
1) *truths* which it can verify about its own square, and the truths it can verify about those neighbours with which it shares a common boundary ,

2) *beliefs* about the state of the rest of the world. At the beginning of a simulation for all the 25 boards (windows) of the 25 Senpers, all the non-neighbouring squares are randomly painted either black or white.

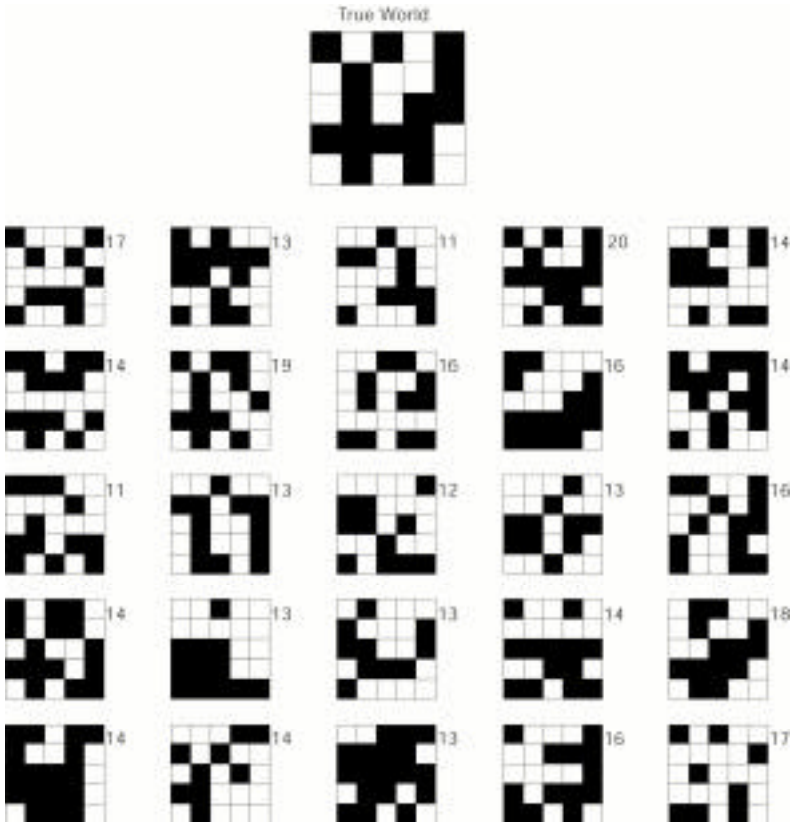

Fig. 1a World views: reasonable believer's case

The top board is the random allocation of black and white which constitutes the True World. The other 25 boards represent the starting world-view of each Senper living on each of the squares of the world. The top left board represents the knowledge and world-view of the Senper living on the top left square of the True World, column 1 – row 1, etc. The Senper knows the state of its own square and the state of the two adjacent contiguous squares (Rook's Case). Initially all other squares are filled at random – the fantasy of the Senper's highly active Imagination. The numbers represent the accuracy of the world-view. Senper 1,1 scores 12 – less than half the squares are imagined correctly – but this is a score the Senper will never 'know' by direct comparison with the True World. On average, the starting scores should be a little more than 13 (i.e. more than 50 per cent of 25), because there is a 50:50 chance of imagining distant squares correctly, plus the island of knowledge about neighbours and self.

In this case the Transition Roles are the Reasonable Believer's Rules, and the Communication Rules are that neighbours randomly phone each other. This diagram shores the starting position of knowledge and fantasy for this run.

The next step is to see if these Senpers can learn the state of the True World by talking to each other. There are two kinds of rules, each with different possible variations. There are Communication Rules which specify whether a Senper can contact neighbours only or distant squares etc., and Transition Rules which say how Senpers respond to information received.

The simulation begins by using Communication Rules which randomly allow any one Senper, say S located on Cell 3,4 , to communicate with any other, for example Q located on Cell 2,5. S compares its map of the world with Q's, and then changes its own map according to the following set of Transition Rules (many variations are clearly possible for both sets of rules). If S is uncertain about a square, then he will accept Q's views if Q has a definite belief. This is the case for a Community of Reasonable Believers.

Q S	Black	White	Uncertain
Black	Black	Uncertain	Black
White	Uncertain	White	White
Uncertain	Black	White	Uncertain

I now show two cases of Communication Rules, for this table of Transition Rules. Firstly (Mappa3), the world can communicate equally with itself, but the Senpers randomly talk only to their neighbours. This means that long distance transmission is indirect - but in the end any Senper can 'hear' by implication what any other has said. The Senpers gradually converge on a common understanding of the True World, and ultimately all achieve this understanding. But it is not a smooth process - their knowledge scores go down as well as up along the way, when they pick up a more recent but less correct world-view from a more recent phone call. Convergence on a good degree of truth is rapid - but convergence on complete Truth takes a very long time indeed (more than 40,000 calls on average) (Fig 1b). But even then, the point remains , that *they never know that they know the True World* - so what criteria could they use for assuming that they do? Our response to this is that it occurs when any Senper finds it is not necessary to change its view of the world, or that the rate of change of its views is approaching zero, then it assumes it is:- a) near the truth, and b) that its views are held in common with most other Senpers.

The next simulation (Mappa5) changes the Communication Rules, to conform more to what I think is the actual pattern. The North is represented by the top line of five squares, and the South by the rest. This approximates to a 20/80 split in population between developed and developing nations. Any North Senper phones another North Senper 50 times more often than it phones a South Senper. In the South, the Senpers make on average only one call for each 50 made in the North, and phone neighbours only , which can include of course North neighbours (Morocco phoning Spain). (Apparently (Guardian, 2001) 80% of the world's population has never made a phone call, and the Internet connects 100 m PC's, but only 2% of the world's population. The same article is a celebration of a new Simputer invented in India for connecting illiterate people to the Net.)

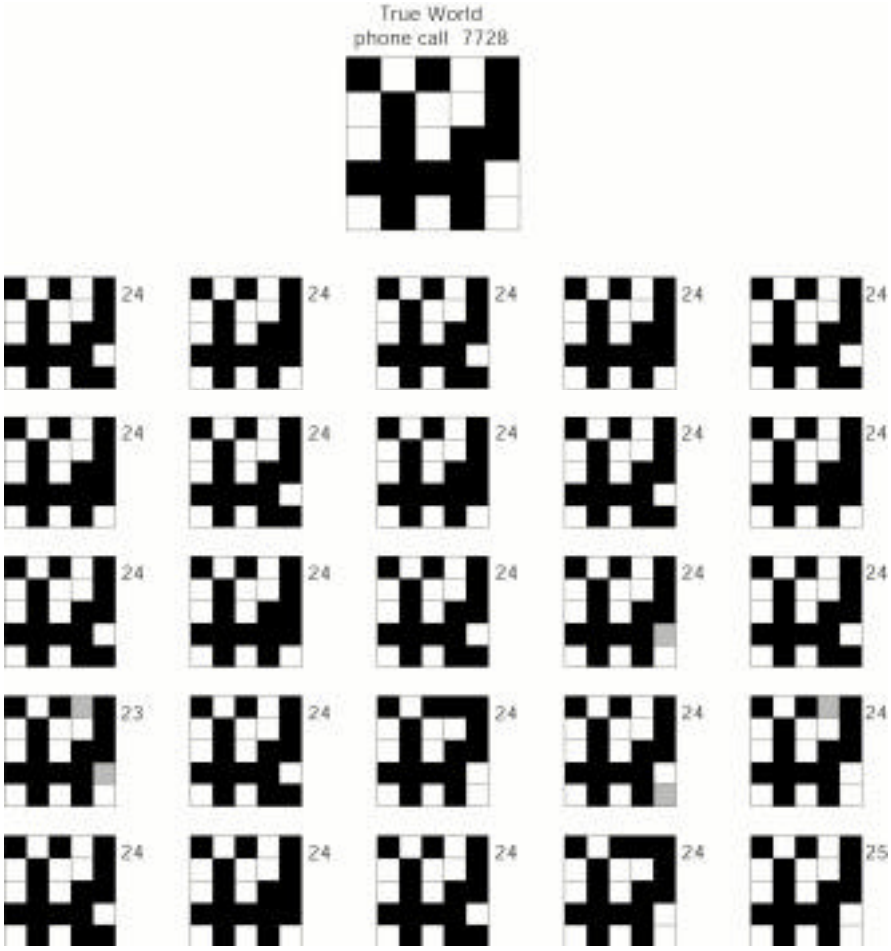

Fig 1b

After 7,728 random neighbourly calls there is a high degree of convergence on a common view of the world. The rate of convergence slows rapidly the closer the system gets to a common accurate view, because a mistaken view about one cell might pervade most of the system (good coherence) until it conflicts with a phone call to that cell or its neighbours (local correspondence fails) – and then that has to filter through the rest of the system. This does not happen irreversibly since the Transition will first cause others to doubt their view of the cell, but they might then find their uncertainty again replaced by the mistaken view of another neighbour. This simulation took 42,556 phone calls before all Senpers agreed on one world vision.

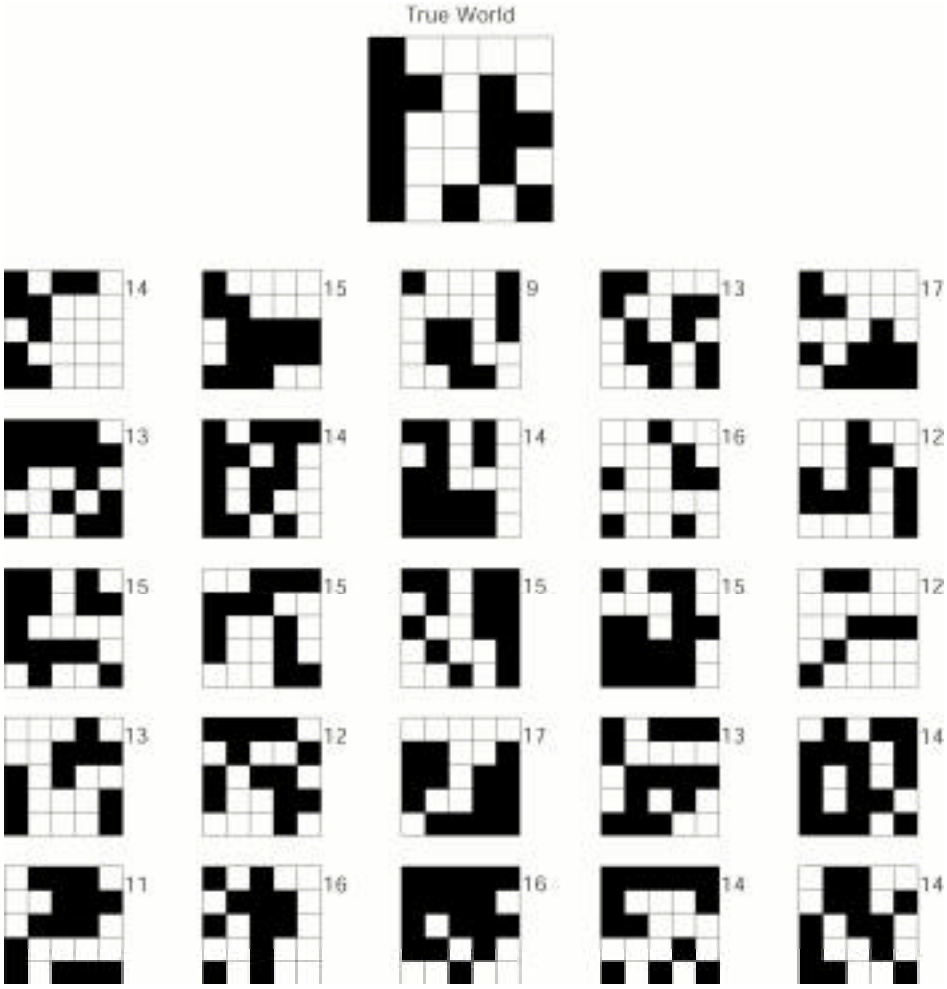

Fig 2a World views: reasonable believer's case and unequal communication

The starting states for a simulation involving Reasonable Believer's Transition Rules, but Unequal North-South Communication Rules. The top line of 5 Senpers represents the North. They make 50 phone calls for every one phone call made by any other Senpers in the rest of the world, the South, and they can phone anywhere, but 95 per cent of phone calls are made to Other North Senpers. In the South, with the 50 times lower rate, phone calls are to neighbours only (including to North neighbours for the second row)

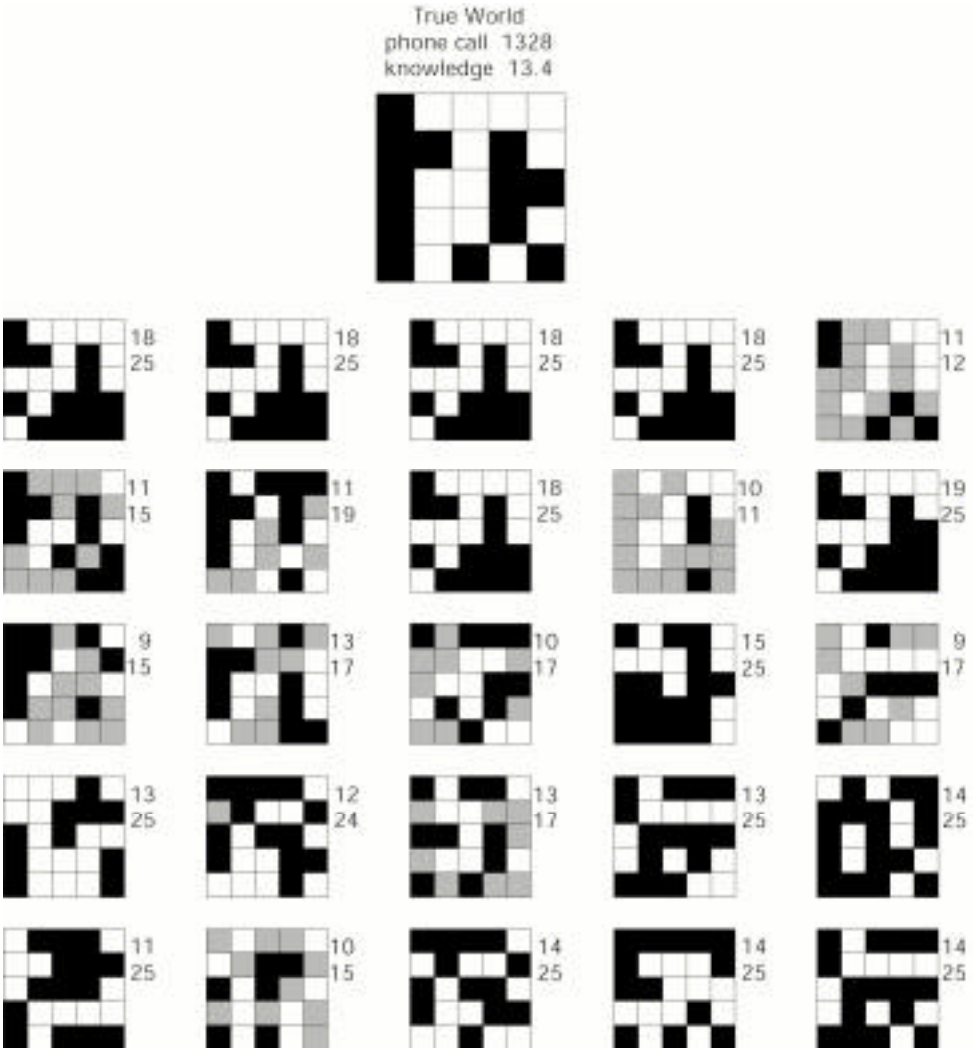

Fig. 2b

The top of each pair of numbers represents the accuracy of each Senper's world-view. The bottom number represents the Senper's degree of certainty – or lack of doubt. After 1300 calls the North all share the same world-view and are mostly certain of it, but they are wrong in significant respects. In the South there are islands of certainty – those who have not yet had any communication with anyone else. For others uncertainty is increasing.

This North-South unequal access model (figs. 2a and 2b) , produces what for me is initially a counter-intuitive result. Here it useful to distinguish between Belief and Truth. Belief is scored by counting how many squares on any Senpers map are not uncertain (grey). The North very quickly has few squares of uncertainty, because the Northern Senpers keep adjusting their views to each other - and they actually achieve an accurate True picture of the North (the top line) very fast .In Fig. 2b they all agree except for the east-most Senper. These moments of doubt are so fleeting it is quite good to have captured one here. Since most phone calls by this Senper will be to the North, it will soon realign itself with the dominant view. But their True knowledge of the whole world, though they do not know it, is actually considerably less, because they agree with each other what the South (the other four lines) look like, but they are often quite wrong. The problem is that the South is not well connected, and its views do not get represented often enough. The South has both poorer Truth, and a variety of believe (coherence). Some South Senpers have as much certainty as

the North, even though it is not True, because they have not had enough communication to cause doubt or modification of their views. The conclusion is that for the World to Know Itself, for Belief globally to converge with global Truth, then all parties must be equally able to communicate. In other words in some respects unequal access to communication can disadvantage the well connected as much as the less connected. If the world is changing, or if there are linguistic problems blocking communication (neither are simulated here), then presumably convergence is even more difficult.

3.2.2 There No True World: Coherence Alone In A Differential Communication Structure

I abandon the idea of correspondence - that is to say there is no longer a True World, and the Senpers start with nothing but their own individual unconstrained random world view. Coherence alone will produce some agreement (or perhaps not) on what the world is like.

In Mappa15 I deliberately introduce a structural difference into the model. The top two lines constitute one group, and the bottom three the other group. Phone calls may start randomly in either group, but a parameter is set to say that phone calls will be within their own group with probability "p" where this is set at different values. At p=.5 then there is as much chance that the phone call will be outside the group as within, at p= .9 then mostly the call are within group. Fig. 3 shows the result of several simulation runs. Not surprisingly, the level of agreement about the world comes down as the within-group communication increases. But both groups are quickly sure that they know what the world is like. However, there are little elements of uncertainty that creep back in. The one output variable that changes most with increasing in-group communication is the number of telephone calls till stability is achieved – this escalates rapidly.

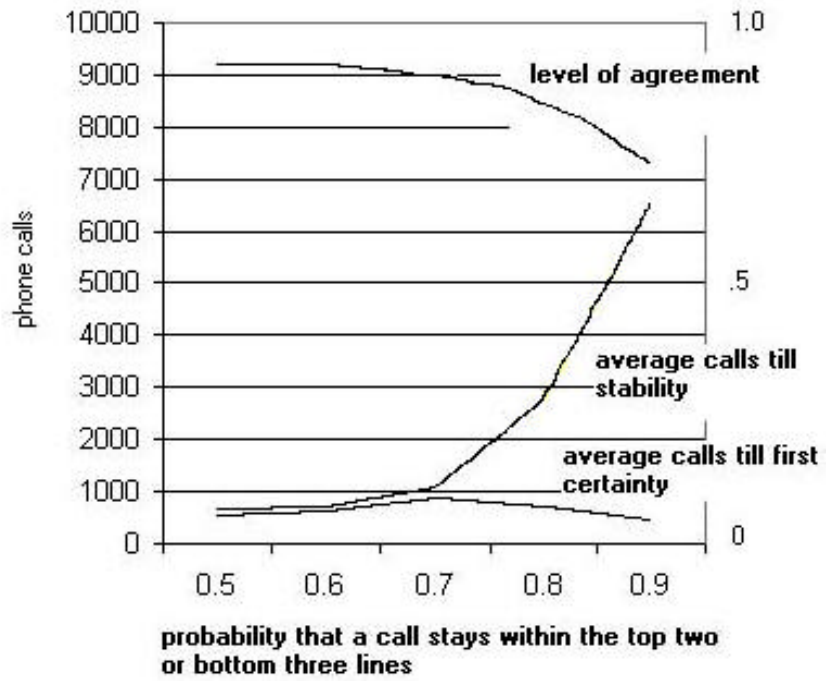

Fig 3. Average results from ten simulations at each power. Note that the average number of calls till first certainty is low, and gets lower as people prefer to talk to friends only – but calls still stability increase rapidly.

In Mappa19 again there is no true world, and everyone starts with a random world view. The difference between this and the former run is that instead of introducing structure, I let the Senpers evolve preferred phone calls to their 'friends'. They change the probability with which they will call a destination according to the degree to which their beliefs were similar last time they phoned. I use different power functions to determine how fast and how strongly the Senpers begin to discriminate.

In the majority of runs with lower powers of discrimination, usually one pattern is agreed quite quickly. With higher powers quite often different patterns emerge, as different groups of friends agree on their own idea of what the world is like. This happens again quite quickly. Fig 4 shows a case where there is strong disagreement between two groups which have evolved out of random incoherent starting points.

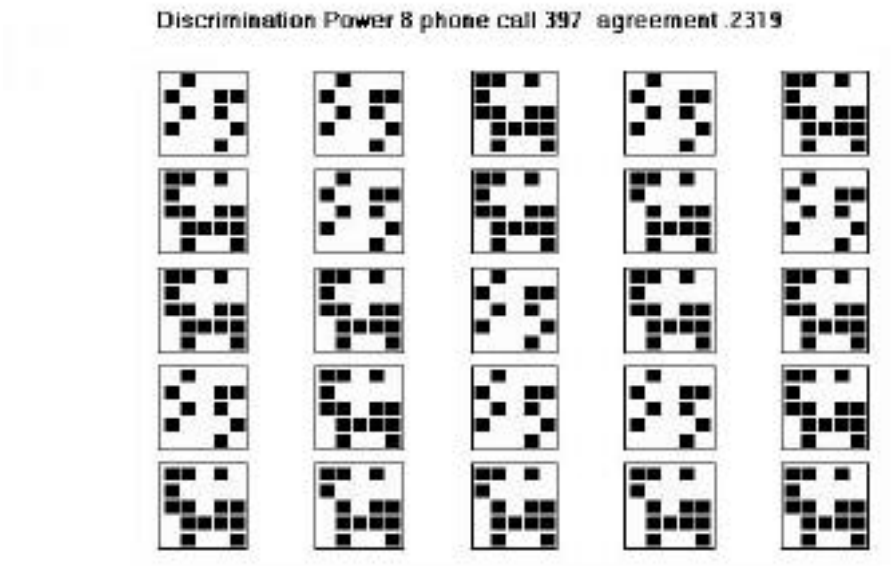

Fig. 4. In this run there is no True World. Senpers become much more likely to phone people with similar views than those with whom they had great differences of opinion. In this case certainty has been reached very fast, and two different patterns have evolved.

What can I conclude?

1) it is necessary to have a community of communicators, if each can verify as true only a small part of the world.
2)if different communities and cultures, or different disciplines, have different styles of debate and presentation - different forms of communication which may be opaque to varying degrees to other communities- then this may help the internal dialogue in the community in promoting belief, but often inhibits verification against the views of other communities.
3) The density, or frequency, of communication affects the patterns of coherence. Also (not demonstrated well in this paper so far, but backed up by other runs and by articles in the scientific press), random long distance links are very important in hastening the speed with which a network coheres

4) because knowledge is achieved through communication in community, the acquisition of knowledge is an historical process in time, where the eventual outcome is the result of the accidental sequence of events in that history - there is no *a priori* known state on which the solution will converge. The corollary of this is presumably that by influencing the patterns of communication, it is possible to influence the kinds and amounts of knowledge in the community. (This is the raison d'être of SASNET.)
3) if different communities have different rates of communication, those with the higher rate are more influential (but as intermediaries rather than originators) in defining the ultimate agreed true world.
4) Following on from the last point, it is *easy to misconstrue who is communicating what to whom*. In these simulations S will phone up Q, and S will consult with Q and change his own state if he thinks this warranted. In that case, it is the information content of Q that is changing the state of S. Suppose there are some persons who are often phoned, but rarely phone themselves. Then they become gurus, preachers of the faith. **To be asked may be more influential than to ask.** Reputation or status in community may be the most important asset.
5) Even if all people *can* phone all others equally, if they *prefer to talk with those of similar outlook*, their world views may diverge very fast.

A recent real-life example of the impact of points 4 and 5 is to be found in a paper by a Nepalese lawyer and a consultant, Bipin Adhikari and S.B. Mathe (2001.) They make a savage indictment of the BBC, Time, New York Times, the Web, for undermining Nepal's democracy. The charge is that they propagated a story that the Crown Prince killed the Royal Family (and himself), even thought there are so many objections and questions about this simple theory. As a result, Nepal has been gripped by conspiracy rumours, and official investigations have become a farce in the face of the 'established facts'.

Part IV Empirical

Here I reflect on a few of the networking organisations I have known.

IIC

This is my view of the International Institute of Communications, whose first 25 years is recorded from different perspectives in Vision and Hindsight (Winsbury and Fazal, 1994). It was set up with Ford Foundation money, and if rumours are to be believed, with CIA involvement as well. Its mission was to act as a forum where issues of global communication could be discussed, including such problems as the international allocation of the radio spectrum, gate-keeping policies to protect domestic TV production, and inequalities in the world information order. It initially attracted third world and first world members, academics, and media practitioners and business men. It started in Rome, but found that that city was not a good international hub, hence and whence it transferred to London. When I first came across it its Executive Director, answerable to an international Board of Trustees, was a charismatic but lonely multi-lingual Swedish lawyer, Eddi Ploman, who made it his life's work to keep the organization going. At that time it had chapters in different countries that ran the odd seminar, it produced an almost academic journal, InterMedia, and held a successful and good-fun conference once a year at different cities around the world, mostly, but not always, in the first world, because the conferences were heavily dependent on big sponsorship. Eddi Ploman wanted it to get a research profile too, and that was where I joined in, running a project in collaboration (but not at) IIC, looking at domestic and imported TV productions in Europe. Part of the desire for the research element was that the IIC was being weaned off Ford money, and needed the overheads, but our arrangement actually gave them little money. Ploman became ill, retired, and died. The IIC then went through a number of short-lived Executive Directors, one of whom confided in me that she could not take it anywhere "because it is liked but so many, but it is

marginal to them all, and central to no-one". It has continued - but it has changed. It has commissioned reviews of world communications which are sold at very high prices to consultancy groups, it has also helped me undertake further research, some of it high profile. It has more and more corporate members, and fewer academics and third world representatives. Its annual junket has become a good-fun talk shop for the wealthy. I no longer can afford to belong.

But I am left with one indelible image from the many conferences and meetings I attended. The Americans by and large wanted to install more and more TV capacity everywhere. Third World countries did not like that: they thought that content mattered too, and they were worried about the dominance of Northern programming. The Americans could hardly ever see the point: they thought the market would sort that out. But when Bangladesh TV got more air time and did not have the money for its own teams of reporters and cameras, it used to (perhaps still does) show on the news things like, the Southampton Yacht Show in the UK, or the Hubert Humphrey Astrodome in Minneapolis USA collapsing under the weight of winter snow. These old clips costs next to nothing. Capacity needed cheap content.

Coordinating Council of Area Studies Associations (CCASA)

As Secretary for BASAS I have become its representative on two other organizations, which claim to some sort of umbrella status. The first is the Coordinating Council for Area Studies Associations. This was set up some 15 years ago in the UK to lobby for Area Studies in the funding councils of higher education, and in the foreign and commonwealth office. CCASA has had no constitution (until this year), few meetings, many secretaries and Chairmen, and virtually no money. It has achieved one or two successes. It has persuaded the Higher Education Funding Council of England and Wales, that Area Studies is a subject, and should have its own subject benchmarking and Research Assessment Exercise (RAE) panel. More recently it organized a meeting at the British Academy between 200 people in area studies in some way or other, and representatives of the Arts and Humanities Research Board (ARHB). This was a modestly disastrous meeting – since the 200 delegates spent the whole day arguing about what they were there for and what they represented, and collectively they presented an image of incoherence to the AHRB. CCASA has also, after an earlier underfunded and aborted effort, succeeded in compiling a database of area studies experts in the UK. This database exists in a printed book version in very limited circulation (and it is a book which is hard to search through.) It also exists as a searchable database on the Web. I know this for a fact – and that the Foreign and Commonwealth Office use it. But I have not been able to track the base down since the responsible person, and current Acting Chairman (I do not know when he will cease to be Acting and just be) whose is an IT specialist and who helped create the database, moved from Manchester to Northumbria, and it has not been visible since. Although I am supposed to have free access as a member of a subscribing body, the database when I looked at it once, had security screens to prevent 'free rip-off.' I am no longer sure what this network is about, nor whether it will survive.

The Academy for Learned Societies in the Social Sciences

The second group to which I have gone as a representative is the Academy for Learned Societies in the Social Sciences. This is a comparatively recent development, which has a Web-site, which is only modestly out of date. (http://www.the-academy.org.uk). The Academy has its origins in resisting Margaret Thatcher's attacks on Social Science. It has virtually no money, and hence hunts for likely member societies to increase its subscription. Its organization is clumsy, with both individual Academicians, and Learned Societies as members. It has a Chairman, who is a full-time academic outside of London, and a Secretary, who acts part-time for the Academy from its London registered address. He is a Company Secretary, a bureaucrat, who has no special interest in the

Social Sciences. The Academy has so far achieved very little. Its recent (July 2001) annual general meeting was not quite a farce, but not far off it. The Academy's one great deed so far has been to commission a grandly sounding *independent* Commission on the Social Sciences with a budget of _20,000,. The Commission has so far in one year done precisely nothing (actually produced six pages of musing, which could have been cooked up by anyone over a reasonable bottle of wine) – but since it has much vaunted independence from the ALSiSS, the Academy does not seem to know how to hurry the Chairman, Professor David Rhind. At the same AGM the one matter that all agreed on was that there had to be a Chief Executive (how is he/she to be paid?) who could give the Academy some impetus. To be fair, these are early days, and it may yet take off. I have to say that so far for the subscription it has paid, BASAS has got precisely nothing. So far, ALSiSS has generated neither traffic nor consciousness.

South Asian Networks in Britain

Of course, BASAS is not unique in representing the interests of South Asianists in Britain. There are innumerable links between networks in Britain and in South Asia. There are many different trade organisations – representing textiles, or engineering etc. and links between religious and temple groups, caste associations etc.

Even within the Academic side there are many different ones. There has been, perhaps still is, South Asia Research Forum, some of whose members belong to BASAS too. Most curiously, there is a Society for South Asian Studies, founded in 1972 as another of the Schools and Institutes founded and grant-aided by the British Academy. The Society supports research into the history, visual and material culture, ethnography, language, religion and literature of South Asia. The Society produces an annual Journal, South Asian Studies, in which it publishes some of the results of the research it supports, and it also publishes a monograph series. Some members of BASAS are members of SSAS – but I do not think many. In some ways BASAS appears to me (but I am very partial) from the outside to be more dynamic. I get the impressions that SSAS seems mostly interested in the archaeology, religion and ethnography of South Asia, seen very much as an 'other' within the orientalist tradition. BASAS has a very thriving young membership concerned with *inter alia* the South Asian diaspora in Britain: this is certainly something that might not sit so easily in SSAS. But we need to cooperate more. This could mean throwing our membership lists together for all circulars. As a first step, SSAS have asked me as BASAS Secretary to join their Council. What impact having an office holder with one foot in each camp will have is yet to be seen.

The Asia Pacific Foundation, clearly something with business money behind it, has just started publishing its Bulletin – the first in June 2001. That issue was mostly concerned with security in South Asia. There is a Society for Economists of India with about 70 members, but it seems young and fitful: it may yet fold its conferences into the annual BASAS bash. Then there are the web sites – take CASBAH as an example. http://www.casbah.ac.uk, - a project dedicated to bringing together the archival resources for studying the history of black and asian people in Britain, run from the Institute of Commonwealth Studies, a sort of off-shoot of the School of Oriental and African Studies. This is {South Asia AND UK diaspora AND Caribbean AND history }

IPTRID

Finally let me mention IPTRID – the International Programme in Training and Research in Irrigation and Drainage. This started in the late 1980's with British aid support for HR Wallingford in collaboration with the new IIMI (as it then was, now IWMI) in Sri Lanka. Part of the thinking was that there was a lot of 'grey' material being published in reports around the world, of interest to researchers elsewhere . but inaccessible to them. The idea was computer-based: with a central

computer in Wallingford and local hubs at centres around the world. Grey material was scanned as optical files (bit maps – a kind pf primitive PDF) and held on special discs with what in those days was very high capacity, at Wallingford and elsewhere. I do not know how much material was canned like this, nor how much of its was accessed, and most importantly by whom from where. Did local scheme managers in Maharashtra ever 'talk' with researchers in Peru?

All of this pre-dated the development of the WEB by a few years, and of course it has now been superseded by the capabilities of the Web. Now, anyone, anywhere, even in Bihar, theoretically can post some pages with their research results in some internationally recognised format, so that someone else can find them with the right searches. IPTRID has not died: it has changed and grown – it has hived off its document centre to Delhi, but retained bibliographic search capabilities in Wallingford. It has divided its management between Wallingford and FAO Rome, and as far as I can see has actually now become little more than the sum of some major member institutions. These are: **Cemagref,** Irrigation Research Unit, France; **CIHEAM,** Mediterranean Agronomic Institute, Italy;, **FAO** Land and Water Development Division, Italy, **HR** (Hydraulics Research) Wallingford, UK; **ICID** Central Office, International Commission on Irrigation and Drainage, India; **ILRI** International Land Reclamation Institute (ILRI), The Netherlands; **IWMI** (International Water Management Institute), Sri Lanka; **USBR** US Bureau of Reclamation, USA.

All of these pre-existed IPTRID, and its is difficult to say how if at all IPTRID has affected their continued missions. There probably is some-value-added in IPTRID's existence – perhaps these institutes coordinate their research better because of IPTRID. But they could co-ordinate their research anyway, and often it will be with non-IPTRID members. So perhaps the value is political – making a bigger impressionistic impact for irrigation and development in general.

Celebration: The Best Network

This is the Hash House Harriers, a network of 'cross-country drinking clubs that have a running problem'. The Hash started just before WWII in Malaya, when three British expatriates eating at a restaurant called the Hash House realised that they were getting fat and unfit. So they started their club. The principle is simple: once a week or thereabouts each of the now numerous Hashes around the world will organise a run in the countryside, following a trail laid by a Hare, using saw dust, shredded paper, or spray paint to mark symbols on the ground. The trail has false turns in it, so front runners often end up at the back. Usually there is a Hash Horn with a bugle, who blows his horn when a trail is picked up. There is a lot of yelling and chanting of "On-on" when a trail is picked up, a lot of mud and obstacles where possible. After a run, beer is consumed in great quantities, and anyone guilty of anything, like being pleased with coming in first, is made to drink a pint of beer very fast while the Hash chant rude songs. Ritual humiliation to level all to the same base standard is important. Fit athletes and old wrecks join in on equal terms; as do unemployed alcoholics and company directors.

Each Hash is autonomous: none have written constitutions: all usually have a treasurer Hash Cash, an On-Secretary, and newsletter editor Edit Hare, a Grand Master or Mistress, and a Hare Raiser. Though with no written constitution, it is possible to travel from country to country keeping in contact with local Hashes, and even great national and international jamborees (Nash Hashes and InterHashes) are hosted around the globe.

I first started Hashing in Bangladesh, and joined the Cambridge Hash (http://www.ch3.co.uk/) when back in the UK. It runs on Sunday mornings from and back to a different pub each week. Through contacts at the Hash I have arranged accountants, mortgages, insurance, and bought and sold houses and bummed beds abroad. It is a classic example of Puttnam's networks of social capital. This one is global, beery, and rather schoolboy British.

End piece

I said at the beginning that I did not want to write any conclusions. I content myself with the following brief comment.

Networks are networks of people. The technology is enabling, but it alone cannot be used to create new networks. These emerge when a community with the same culture emerges. And when they

have emerged, with a life, intellect, and consciousness of their own, they mutate and change. Sometimes they can be helped, by a good gardner, who knows how to cultivate and encourage the ecosystem. Sometimes they need to be the most important interest for at least one person who is committed to their well-being – but for their sake, not for his.

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