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(Actor-Net)Working**

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ABSTRACT

Using insights from actor-network and post-structuralist theory, this paper attempts to describe the relational processes of virtual organizing. An ethnographic case study of a virtual organization is outlined. The paper concludes by considering ways in which organizations—virtual or otherwise—may be studied in order to provide the possibility of a form of research that reconfigures and reanimates current conventions of inquiry.

DESCRIPTORS: virtual organization, virtuality-reality, ethnography, actor-network theory, post-structuralism.

INTRODUCTION

Cartesian Legacies, Newtonian Principles and the Ensemble of Reality-Virtuality

Since the late 1970s, the term 'virtual' began to be used to describe highly interactive computer-generated environments, such as the 'virtual cockpit' used in military flight simulators. By the late 1980s, 'virtual reality' was being manufactured and marketed, and, by the 1990s, the term 'virtual organization' started to appear in management magazines and journals. Indeed, many contemporary management writers claim that developments in technologies of information and communication such as electronic mail, groupware, the internet and virtual reality are powerful drivers towards the creation of the virtual organization as the dominant mode of organizing in the next century (e.g. Davidow and Malone 1992; Handy 1995).

Virtual means being in essence or effect, though not in fact. Virtual reality and virtual organizations are evident but illusory. The very existence of virtuality forces the re-tracing of boundaries between reality and virtual reality, between an organization and a virtual organization. In this paper, we attempt such a task and consider how a virtual organization may be theorised and researched, and especially how such an organization might be co-ordinated and controlled.

Just as an experience in virtual reality may be accepted as 'true' despite the fact that there are no 'external' things corresponding to an individual's sensory inputs, the virtual organization may be said to exist even when there may be no obvious physical evidence of an office, factory or formal grouping of organizational members. Herein lies an ontological problem for the researcher of organizational behaviour habitually used to defining and categorising organizations in terms of objects such as buildings, technologies, structures and formal operating procedures. Virtual reality and virtual organizing problematises and blurs boundaries between real and representation, presence and absence, internal and external, realism and relativism, fact and fiction.

This paper attempts to move beyond the impasse of oppositions such as reality-virtuality, materialism-idealism and fact-fiction—Cartesian dualisms which constitute the substantive foundations of Western conceptions of knowledge. We argue that the exploration of organizing, virtual or otherwise, requires the dissolution of dualistic thinking, and that this would help organizational behaviour release itself from the unrealisable work of providing a 'virtuality-free' organizing reality. From a perspective which refutes a reality-virtuality dichotomy, the central analytical issue becomes understanding how situated human and non-human components that constitute an organization are constructed, negotiated and held together long enough to create a

symbolically, materially and textually identifiable and ordered reality for its members and to the outside world. In order to attempt this we need to focus on effects rather than facts, on processes rather than structures, on organizing rather than organization. This, however, is no easy task for the researcher located in the Western social scientific tradition of knowledge. This conceives reality in Newtonian terms as clear-cut, as an explicit thing which occupies a definite place in time and space, and change is considered as a linearised, step-like progression (Whitehead 1925, 1938); we are not adept at conceptualising virtuality or movement.

The controversial assertion that reality and virtuality are constitutively and simultaneously interfused leads to the fundamental expression of experience as emerging at the intersections of bodies, minds and cultures. It is not a question of an ephemeral consciousness as materialists assert, nor, as idealists claim, of excluding the order of nature. In stating that the world either exists independently of our minds, or only in our minds, materialists and idealists alike pose a dualistic question that is insoluble (Bergson 1950). Once this exchange is initiated all sides are sceptical; how can we have a 'choice' between revealed religion, enlightenment rationalism and post-modern relativism (Rose 1995)?

A common ground that dissolves materialists and idealists claims emerges if organizations and individuals are constituted as relational and moving configurations and densely compacted locations in time and space. Configurations have no absolute speed or pulse outside of context and movement, so that at whatever speed organizing movement occurs, it is conceptualised as an on-going and never-ending rearranging processes of fluid jigsaw-like parts straining towards wholeness (see Cooper 1989, 1995). Some configurations move extremely quickly, and some move extremely slowly (Star 1995). Once processes begin they continue and are constantly and contingently open to interactions with an endless variety of humans and non-humans.

To consider the organizational world in these terms completely changes the manner in which matter and spirit is analysed. An organization is not merely a physical building with a plethora of other artefacts, and the human brain is not merely a lump of meat with electric pulses flowing through pre-determined channels. Rather, material, textual, symbolic and natural arrangements known as organizations or individuals become conceptualised as aggregated locations of dense, on-going, transient and transforming space-time network arrangements. This provides the basis for resolving reality-virtuality, realism-relativism, fact-fiction dichotomies.

Developments in actor-network theory (e.g. Callon and Law 1995; Latour 1988, 1993, 1995; Law 1992, 1994) and post-structuralist theory (e.g. Deleuze and Guattari 1986, 1988; Derrida 1976,

1978; Foucault 1979, 1981) offer guidance to the researcher desiring to deconstruct the totality known as 'organization' into an assemblage of ever-moving fluid parts. Using insights from actor-network and post-structuralist theory, the case study below attempts to describe the relational processes of virtual organizing.

This ethnographic case study is both real and dramatised: a social science fiction. This does not mean that the case study is in any sense untrue as all the events described truly happened; nor does this negate the ontological status of events as constructed or establish the authority of relativism. Rather, reason is open to new claimants. The case study is written as a story of how independent fictions, or independent lies, interrelate and entwine. As Star (1996) points out, in organized sense-making activity, each local truth is partial and flawed (i.e. partly fictitious). No *a priori* specification can encompass a global truth, but when employees and other human and non-human actors join local truths they create an emergent and continually negotiated order known as the 'organization'.

The refutation of the reality-virtuality dichotomy works through several paths, one of which is thinking of organizations in terms of fiction. As Mantovani (1995) opines, this offers several advantages. Firstly, it frees us from the reality-virtuality dichotomy, which we argue has limited and restricted theoretical value. Secondly, resorting to the concept of fiction and, in particular, certain forms of fiction, notably in literary and cinematic texts, make sense only because they are actively (re)interpreted through actors' interests, aspirations and desires. Once the 'factual certainties' of structure, physical location and operating procedures in interpreting organizations are removed, it is clear that employees and researchers alike make sense of organizations in a similar manner. A key question then becomes: how are such interests, aspirations and desires re-assembled, created, stabilised and held in place in order to sustain the fiction of 'an organization'? Thirdly, referring to fiction foregrounds the importance of distance. Mantovani (1995) suggests that distance, which separates fictional texts from reality, is granted by the incomplete and open sketch offered on the written page (see Barthes 1986). He contrasts this with virtual reality and other technologies of information and communication which attempt to simultaneously overcome both material and symbolic distance by offering a closed world requiring little or no active interpretation, but which prompts actors to do things, rather than inciting further reflection and thought.

Such a view resonates with the concerns of contemporary management writers such as Handy (1995) who problematise the notion of distance in virtual organizations. He poses the question: how can managers trust people who are physically and symbolically distant from them and from

each other? The problems of such space-time construction and space-time travel inform much of the ensuing stories.

THE INSTITUTE AS A CASE STUDY OF A VIRTUAL ORGANIZATION

Research Settings

The Institute [a pseudonym] is the largest provider of English language courses to adults in Denmark. About forty teachers provide English language courses to over 5,000 adults each academic year. The Institute was established in 1975 in Copenhagen, and is partially state-supported by twenty-five municipal boards of education in the Greater Copenhagen area. It is a non-profit, non-political, adult education institution whose purpose is to offer English tuition at all levels and preparatory courses leading to the University of Cambridge Examinations in English as a Foreign Language.

The Institute's only management centre is situated in the most prestigious and auspicious precinct of Copenhagen. The management centre is governed by two administrators, and the Institute's Principal, with all of the Institute's dispersed activities organized and co-ordinated from this single site. The Institute's courses take place in municipalities' schools and colleges in the Greater Copenhagen area, and in commercial and public sector organizations. Courses take place within an approximate fifty mile radius of the capital's centre. A small number of courses take place at the management centre's two meeting rooms, which adjoin the administrative office. Teachers come from Britain, Ireland and occasionally from America to work at the Institute.

Research Format

Research took the form of an ethnographic case study (Denzin 1997). It illustrates how virtual organizing is multiple organizing and ordering, and explores the ways in which human and non-human actors are attributed, distributed, connected, circulated and transformed. The ethnographer strives to catch the spirit of events, scenes and realities of virtual organizing at the Institute by following some of the heterogeneous actors that perform the Institute, and positioning utterances, the interplay of voices, dialogically and polyphonically (Clifford 1986). It represents a journey, both as personal condition and collective endeavour; an invitation to undertake a journey which does not seek to placate.

Ethnography is about watching, listening, experiencing and iterating. It is about individuals, but it is also as much about evoking a sense of overlapping cultures, of a set of places, and of various

times. Our method is to shift through and explore a series of spaces and places, the similarities and differences between receptions, restaurants, training rooms, a city, suburbs, school gates, classrooms, cinemas, theatres, and offices. To shift through time, from the beginning to the end of an academic year, from daytime to night-time, from now to then. And to shift through multiple ontologies, from the visible and creative performance of ordering a virtual organization, to the deletion of ontological processes.

DELEGATES OF VIRTUAL ORGANIZING

White Walls, International Alliances and Smiling Faces

Organizing is constitutively intersubjective and interobjective. In actor-network terminology, virtual organizing is a heterogeneous assemblage of human and non-human actors. The virtual organization is a relational effect created by a network of individuals linked together by technologies of information and communication, and numerous other materials. Teachers are both sets of relations and nodes in sets of relations. One teacher reminisces about the first occasion she entered the Institute's management centre and witnessed some of the patterns of relations that constitute and extend the effect of a virtual organization. She witnesses some of the present yet often absent, silent yet often meaningful, non-human and human actors that help to constitute the landscaped hallucinogen known as the Institute:

I knew I was in the right place because I saw the discrete brass sign next to the entrance. It had the Institute's name engraved on it. I remember noticing the sign was rather worn; I felt reassured. I checked my papers, I mean my application form and references, one final time. I took a step back and looked up. I pressed the security intercom and the gate unlocked with a buzz. Unsure of what to expect, I climbed the narrow, winding and solid stairwell to the fourth floor, which the Institute inhabited, and entered the reception. The office was decorated in a style typical of the national culture's desire for floors with acoustics that reverberate, and clean-lined, laboratory-like interiors: richly varnished wooden floors, pure white walls, and a large, green yucca plant standing in the corner. I announced my arrival to the smiling receptionist, and sat down on L-shaped, soft leather sofa. I was offered a cup of coffee and placed it on the marble coffee table in front of the sofa. The phone rang. Across from where I sat hung a series of Tourist Board-type posters encased by polished, silver-edged frames: Christ Church College, Oxford; the River Cam with King's College Cambridge in the background; and Shakespeare's birth place, Stratford-upon-Avon—photographic reminders of the Institute's institutional standing and faraway links. I sipped

the coffee, flicked through a couple of the glossy magazines on the table, and waited for the Institute's Principal.

Deleuze and Guattari (1986) capture the power/knowledge relations that are performed by the people, the machines, and the formal organization of the Institute's management centre. For Deleuze and Guattari (1986: 86), architectural spaces are 'simultaneously [one] of powers and territories—they capture desire by territorialising it, fixing it in place, photographing it, pinning it up as a picture, or dressing it in tight clothes, giving it a mission, extracting from it an image of transcendence to which it devotes itself'. Human and non-human delegates effectively organize, indicate, force, restrict and permit the path and voice of teachers and customers across the polished wooden floor.

Only a small proportion of the Institute's activities take place at the management centre. Individuals who are interested in courses might drop in for informal advice or inquire about various programmes and services, or pay for courses in person. But the majority of the Institute's customers would never come into physical contact with the cultivated management centre; they would never see or respect the management centre's various optocentric accessories of power (Burrell 1997). Hence, for the Institute to be successful it needs to have mobility in time and space, and to do this it needs to translate its identity, its various assemblages of power, to the world outside the arranged space of the management centre. The Institute needs to create the effect of size in relatively standard and regular ways.

THE VIRTUAL ORGANIZATION AS A WRITING MACHINE

Restaurants, A4 Folders and Teachers' Orientations

Newly appointed teachers' first contact with other new teachers is in a Copenhagen restaurant. Just before the start of the academic teaching year, the ten or so new teachers meet the Principal and the administrators for an informal and congenial social evening organized and paid for by the Institute. As the Principal writes:

[it's] hopefully a "hyggelig" [literally *asy*] staff get-together where new teachers can meet other new teachers, talk a little shop over a drink, and get to know each other better.

The stories and myths that are told during the evening give birth, credibility and texture to virtual organizing. Such jointly created fictions position the teachers' and the Institute's reputation through appeals to impeccable curriculum vitae and official accreditations. None of the new

teachers are appointed as an individual in their own right. Neither teachers nor the Institute are powerful in themselves, they are in the restaurant because they signify and are linked to numerous, heterogeneous others. Each teacher will symbolically and materially help translate and represent the power of the Institute vis-à-vis its customer, institutional and international associations.

The symbolic, material and textual content of the following days, weeks and months help sustain the distributed processes of virtual organizing. The day after the staff 'get-together', new teachers meet at 8.30am at the Institute's management centre for a four-day orientation. This four-day training programme—a kind of 'theory-methods package'—provides teachers with much of the knowledge and materials they need to present the Institute to the world outside the management centre. Teachers are positioned ostensibly by a carefully choreographed A4 'Institute folder'. Every new teacher receives one, and every current teacher has one. The folder contains written inscriptions detailing operational codes and expected behaviours. This portable organizational map is, as Rudwick (1976: 151) comments, 'a document presented in a visual language; and like an ordinary verbal language this embodies a complex set of tacit rules and conventions that have to be learned by practice'.

The four-day archetypal orientation consists of the Principal clarifying and reiterating the operational routines and administrative details which will help ensure a uniform identity across the Greater Copenhagen area, and follows Durkheim's (1973) assertion that to assure regularity, it is only necessary that habits be strongly founded. Teachers are trained in the use of class registers, Institute signs and promotional material, letterheads and envelopes, personalised business cards, class diaries, salary claim forms, payment forms, linguistic diagnostic tests, examination regulations, and given the first set of 'Notes to Teachers'. The latter consist of a list of all staff addresses and telephone numbers, telephone numbers for local libraries, bookshops and theatres, a list of common complaints and detailed schedules for conducting the first few lessons with course participants.

Without organized or informal communication mechanisms such as teachers' meetings, and without introductions to existing teachers, except for an introduction to one of the Institute's so-called 'successful' teachers and a one-off Christmas party, the Institute is substantially the effect of collective yet individualised material arrangements such as the bi-weekly 'Notes to Teachers'.

Hence, the Institute is made visible, manageable and predictable through formal and instrumental principles. Kallinikos and Cooper (1996) capture the powerful effect that written inscriptions—such as those within the Institute's orientation folder—have on cultural and cognitive behaviour.

They state that 'once on paper, the copied information can be safeguarded against the vagaries of the elements and the vulnerability of memory ... and transformed into knowledge to be used for future operations' (1996: 1). Inscriptions simultaneously become one node in which the Institute remembers and calculates its past and transmits future activities; teachers become another.

'Be better at English', Enrolling Customers and the Promotional Spin

Before students enrol on courses the Institute attempts to reach them through advertising inscriptions in national and local newspapers, libraries and direct mailings. These are promotional fictions or stories about a possible future world, a realm in which they can learn and improve linguistic skills and make new acquaintances. These intentional and non-subjective promotional inscriptions, as systems of writing which are immutable and capable of acting at a distance, help in the active process of creating an organized world of believed knowledge that surrenders the publicity of the city streets and its environs to the Institute: a mobile and informational world of sustained knowledge that attempts to regulate intellectual and practical lives (see Grint and Woolgar 1997: 65-94).

The Institute's pre-eminent position in the provision of English language courses is partly due to its success in becoming indispensable to individuals who wish to improve their English language skills. In Callon's (1986: 204) terminology, the Institute determines a set of actors and defines their identities in such a way as to establish themselves as an 'obligatory passage point'. Advertising and promotional inscriptions make an important contribution to the social and technical constitution of the Institute, and help transcend the Institute's physical limitations. Whilst asymmetrically, and paradoxically, asserting the boundedness between institutions, other institutional networks of relational power are appropriated, enrolled and translated, and put to use in the Institute's name. As Cooper (1989: 488) comments, 'it is the act of separation which creates the perception of something that is also a whole'. Associations to other entities contribute to the Institute's reputation, customer interest and commercial success because implied affiliations become a constituent element in the Institute's attempts at making itself the only choice for individuals who want to improve their English. The competition is disenfranchised and customers are 'empowered' to choose the Institute. This deletion process takes several forms including explicitly implied links with the University of Cambridge and its world-wide network for administering examinations in the English language, as well as the 'Be better at English' advertising campaign (featuring Big Ben and the allusion to a non-existent London office), a partly fictional detailed listing of courses with teachers allocated to each individual course, and the guarantee of 'university educated' native English speakers that are both 'inspiring and engaging'. Becoming obligatory

foregrounds the complex and problematic nature of agency, discretion and choice. Through such processes are organizations written as they write, and customers chosen as they choose (see Derrida 1978).

VIRTUAL ORGANIZING, BOUNDARIES AND BODIES

The Carnival of Communication, Handshakes and Glasses of Sherry

The Institute is not a large, diversified multinational, but much of its apparatus for displacing and suppressing time and space is the same as organizations that operate across far greater geographical distances—all organizations need apparatus for monitoring and evaluating events which are dispersed, multiple and characterised by shifting dependencies. The Institute attempts to actualise its identity to the world outside the management centre by dynamically and remotely reproducing itself at a distance—by migrating to the schools, colleges and institutions where courses take place. Whilst large organizations often magnify their size through company-owned structures such as regional offices, manufacturing plants, or research centres, the change in scale that the Institute accomplishes is through the performance of other social and technical repertoires.

The remote representation of the Institute is partially facilitated by a seven-page written schedule detailing how to conduct first-contact meetings. This is given substantial attention during the four-day orientation. The inscriptions that the Institute generate attempt to transcend the contextually-constituted actions in the local schools and colleges. As Kallinikos (1996: 7) states:

representation is able to augment the spatial-temporal ability of human agents and to place their actions in extended, co-ordinated networks. Local and isolated actions and events become connected and co-ordinated by the capacity of representation to construct and sustain standardised and shared codifications of objects in time and space.

Latour (1988) describes devices or texts as immutable mobiles because they keep themselves constant wherever they move; immutable mobiles are visually consistent and have standardised interfaces. These writing machines hold stable because they can translate or displace themselves from one place to another—even if there are substantial geographical distances between two regions, in a network they are close together. The space-time travel, or space-time suppression, of networks is an inter-topological effect with network effects folding regional surfaces (Mol and Law 1994).

Writing machines, as forms of control (Derrida 1978), can be stretched, displaced and imported to an 'outside' environment, but the loops between 'inside' and 'outside' also require active engagement by individuals. Teachers and students become delegated characters in the Institute's organizing story. This story delimits behaviours and defines resistance because human and non-human actors are bound up in scripts and roles. A teacher recounts the scripts she followed, the personalisation of anonymous events and the passages of meaning that occur just before a course starts. She narrates the making of the Institute's relations, the creation of an articulate, prioritised and temporal space populated by human and non-human intersections and interconnections, whilst standing, together with three other Institute teachers, outside the vernacular school gates (or, as the 'Notes to Teachers' labels it, the 'Institute teaching centre'):

I've done everything as per the instructions. I rang the Institute to confirm my schedule for the day, and then I headed out to the school on the bus. I arrived about an hour and a half before the course started, aired the room, and arranged the tables and chairs. I cleared the room of assorted papers, bags and any other odds and ends lying on the floor. Although this is a Danish state school, in an hour's time it would be a state school *and* an Institute. I put the Institute's welcome letters and name-cards on the desks, and then taped the Institute's signs to all the entrances of the building. I nearly forgot to put the room number on the signs! There was quite a crowd of us standing at the gates, but I didn't know any of the other teachers. I did feel a bit uncomfortable standing at the entrance to the building, holding an Institute sign, and formally welcoming the students by reaching out my hand and saying, "Looking for the Institute? Ah, yes, it's here. Pleased to meet you". I felt like a cog in a big machine, really. It went down very well with students, though. They all thought it was very, very British.

Without the combination of devices, documents and drilled bodies (Law 1986), the Institute's intentions, activities, and programmes of action would be limited and narrow. However, if successful, actors are arranged and recombined, and enact a distal background to an ephemeral interaction (Cooper and Law 1995). The creation of a single, unified and structure-like virtual organization known as the 'Institute' is complete. Iconographic course conformation letters sent out by the Institute, on-arrival welcome signs, inscriptions which are part of other networks such as road names, postal codes, hour and minute hands on students' and teachers' watches, and the calibration of daily clock time, combine with a programme of human and non-human actions set in motion by students' registration a few days or weeks earlier. Students, laden with the power and grace of signs and symbols, who have never seen the allotted building, and do not recognise it as

an 'Institute building', will see the Institute's signs, and know that the two-storey building that stands alone in the low-level suburb, near the end of one of the train lines, is their correct destination. The signs correspond with the information sent to them, and allows the establishment of distant connections between the Institute and teaching centres.

As Latour (1995: 297) succinctly states, 'correspondence not resemblance is what will lead them through the blind referential chains'. Inscriptions do not mirror the world, just as a map is not the territory—the reality of the Institute is actively constructed through a multitude of heterogeneous connections, rather than reflected in the nature of things. The Institute does not conquer distance, but allows the effect of organization through the fluid shifting of delegation and chains of translation of various human and non-human actors.

Pre-planned behaviours, mannerisms and personal interactions were also suggested for the first few hours of the course. Detailed instructions included suggesting what to write on the overhead projector, administering the diagnostic test, and the timing and length of breaks. Everything should begin and end at exactly the right time and place. The 'Notes to Teachers' for the first lesson include:

Your presentation of yourself and the programme is of vital importance in the task of winning the confidence of your students, and should be planned thoroughly before the first meeting. A bottle of sherry very often helps to get things started on the right foot!

Other advice given to teachers before courses began includes how to respond to re-enrolling and new students' questions about why the teacher they had last year (and the name stated on the Institute's detailed course programme outline for the coming year) was not the teacher who would be taking the class. As the Principal orally informs teachers:

Many of our students re-enrol to be with the same teacher on the next level up from the course they did in the previous year. Because a quarter of all teachers are new every year, many courses won't be taught by the advertised teachers. So, initially, students will be a bit surprised to see another face. If this happens, and if you're asked about it, tell students the teacher decided at the last minute to return home to start on an academic course.

During the orientation programme teachers were encouraged to associate themselves with the vast network of associations known as the 'English Language'. The reception's posters of Oxford, Cambridge and Stratford, and the legacy of the Institute's promotional inscriptions become absently present in classrooms across Greater Copenhagen; teachers, while introducing

themselves and the course, are joined by the ghosts of Britain's world-famous universities and the entire school of English. One teacher describes an event all teachers experience:

At the beginning of each course we hand out a 34-page booklet of detailed regulations for sitting the University of Cambridge's English as a Foreign Language Examinations. This is produced by the University of Cambridge. This material, together with all the other material the students receive before and at the start of the course, has the Institute's logo placed prominently on it. The logo and font are exactly the same as the University of Cambridge, and so the students arrive at the course sincerely believing they're being taught by the University of Cambridge. This is then reinforced by the Cambridge University Press textbooks and workbooks we give them. I've lost track of the number of times I've been asked: So, how long have you worked for Cambridge University? What can I do? It's not me that's given them this impression. It's always really tricky to explain that we've no links at all apart from those all language schools have.

During the four-day orientation one of the Institute's 'successful' teachers gives the following advice. He states:

Try and play on your Britishness as much as possible. In the past teachers have found that saying 'jolly good' a couple of times during the first few lessons works well. It's also good to use exaggerated intonation. To a Dane, who has a relatively flat and constant intonation, this sounds very British.

The ease with which teachers manage these particular linguistic performances is contingent, but such explicit actions may be aided by principles which are beyond consciousness. As Scarry (1985: 109) comments: 'it is said that within a few months of life British infants have learnt to hold their eyebrows in a raised position'. Although retracted from the supervision of consciousness, what is remembered in the body is well remembered: a learned culture in the body which does not so much take us back, but takes us forward. Remembrance can also be rendered useful in a different national context.

After two or three weeks the Institute's signs disappear and virtual organizing relies upon cognitive routines. The Institute is made and unmade each week during the academic year through a fluid shifting of delegates caught up in a spiral time of reversals and progressions (Burrell 1992). Classes begin at either 9.30am, 12.00pm, 5pm, or 7.30pm; signs go up and then come down, desks are arranged and then rearranged, bags are unpacked and repacked, teachers and students arrive

and then leave, in schools and colleges across Greater Copenhagen. The Institute's fragile effect, its carnival of communication, takes place in many geographical locations over a few short hours.

Foucault's (1979: 201) description of crowds and groups being replaced by a 'collection of individualities' resonates with teachers' experiences of peer isolation. Teachers who work in the same schools and often in adjoining classrooms tend not to communicate with each other. Rather, teachers interact with students and learn to review their classroom activities and voice thoughts and dissatisfactions in relation to the Institute's inscriptions, such as 'Notes to Teachers', rather than other teachers. A teacher comments about teacher-teacher interactions which become an option, not a necessity:

I see the same faces every week, but there's little more than a "hello; how are you". Sometimes I pretend I need some chalk or something just to strike up a conversation with another teacher.

Throughout the duration of courses the Institute's teachers travel by bicycle, foot, car or public transport from homes, cafes or other places to classrooms and schools. Star (1995: 20) captures the moment of movement from one location to another with the example of a person sitting alone in a room. For Star, this kind of in-between momentary aloneness is entirely relative to context, and

is analogous to holding your breath—you still need oxygen, but you take your lungs "out of play", or put them on hold, for a moment. So the alone person is aside in the sense of not being together with others. Aloneness seen in this way is not a vindication of mentalism or for the primacy of the individual; it's just a special kind of relocating ... [so that] once something is perceived, the action of perception continues indefinitely, changing and being changed by other events near it, sometimes resonating, sometimes clotting up or clumping up, sometimes fading into background noise.

The Institute that teachers learn about during the four-day introduction, and the practises which are subsequently performed in the schools and colleges, are generally very different from previous teaching experiences, and in the weeks that follow teachers begin to follow the Institute's novel practises. Teachers learn to fill in class registers, conduct diagnostic tests, place signs where appropriate and adopt certain roles. The numerous schools and colleges where the teaching takes place are remarkably similar to each other and to the Institute's management centre scripts if the human and non-human actors are translated and migrate without faltering. This, however, is only one mode of ordering at the Institute. As the teachers migrate or flow to the schools and colleges,

there is the possibility that the transformation which the Institute's and teachers' identities undergo will not lead to abrupt changes— notions of inside and outside become problematic and undecidable (Derrida 1978). Whether teachers pass through the Institute of free will or ostensibly by chance, it does take possession of them, but not because the Institute's management centre is *the* single obligatory passage point, *the* single strategy, or *the* single centre of translation or of calculation through which teachers pass. The Institute's management is just a node in a network (albeit a relationally powerful one). As Foucault (1979: 177) states: 'although it is true that ... pyramidal organization gives it a "head", it is the apparatus as a whole that "produces" power and distributes individuals in this permanent and continuous field'.

CENTRES AND EDGES OR ASSOCIATIONS AND FLUIDS?

Ontological Politics, Multiple Responsibilities and the Medley of Tongues

Networks of ordering, like networks of knowledge, are constitutively implicated in multifaceted, relational and distributed power. After courses have been running for a number of weeks the relational associations which constitute the Institute in the schools and colleges subtly transforms without discontinuity for teachers, students and the management centre. The operational, behavioural and performance rules generated at the Institute's management centre are displaced to other spaces (Cooper 1992), but this is only one node in the Institute's virtual organizing story. In fact, the Institute's attempts to co-ordinate and control its organizational identity, and create neat divisions with no overlaps requires a succession of new negotiations and translations. With the emergence of new actors and alignments, virtual organizing relies on teachers working across and appropriating neat divisions and boundaries (Latour 1993). Otherwise, 'the folded surface of the region starts to flatten out, and the space-time tunnel of the network dissolves' (Mol and Law 1994: 652).

Compliance is transformed without disjuncture and drama into consent and complicity, and the crude, external panoptic gaze of the Institute's management centre and its bi-weekly 'Notes to Teachers' is transmogrified. Subject and object shift and coincide as continuous flows, and concerns about teachers' behaviour flow in both directions. Kallinikos (1996: 18) argues that this occurs through

individual appropriation of a heterogeneous ensemble of methods and techniques put into circulation by regimes of truth—professions, disciplines—and sustained by extensive networks of institutions and organizations ... The categories, definitions and techniques that disciplinary power puts into circulation are not simply extrinsic and adjacent, the material of

reflection and judgement; rather, they form interpenetrating networks of references by means of which the world is conceived, segmented and acted upon.

A teacher describes the multiplicity of interdependent networks of relations constituted by teacher-student interactions, and the transmutation of virtual organizing at the Institute. Teachers are not only the interface between the Institute and students, they are the ‘vehicles of power’ that consolidate the Institute across the Greater Copenhagen area:

As far as the students are concerned, I *am* the Institute. I represent the power of the Institute for them. Although they never actually see the Institute, they think it exists through me. They believe me, so they see it. For students it’s not a formal organization—for many of them it only exists in their minds. They also think it’s a huge organization in the centre of Copenhagen, but I’m only five feet eight inches! [Laughs]

Kanter (1991: 91-92) alludes to virtual organizing’s employment relationship. She asserts that ‘the new loyalty is not to the boss or the company, but to projects that actualise a mission and offer challenge, growth and credit for results’. A teacher echoes this but, importantly, adds the fluid, shifting dependencies that also characterises virtual organizing:

I feel very little commitment to the Institute itself. Its success or failure means nothing to me in and of itself. What I care about are my students. I try to be a good teacher not for the Institute’s sake, but because I want the students to do well. I want them to learn and pass the exams. I want them to enjoy the course and to have a good time. I also need this job; I need classes to continue. I’m in a foreign country and I need a certain amount of work to maintain my residency permit and personal CPR [Danish identity] number.

And another teacher comments:

Success at the Institute means producing the right figures—figures that tell of students continuing and re-enrolling with the Institute, not about academic performance. Our jobs depend on the numbers of students, not on examination performance. We’re not even informed of our students’ examination results.

Another teacher describes the inverted and shifting working relationships at the Institute which are set in motion by the dynamics of the levelling gaze of teacher-student interactions. He comments on why teachers ‘pull their weight’ and don’t need to be tightly monitored:

I effectively purchase my own job—that's very much how I see it. I'm responsible for the work I bring in. We're all individuals. For example, I collect the textbooks from the Institute, physically carry them out to the schools and allocate them to students. The cost of the books is automatically deducted from my pay—I'm responsible for collecting the cash from students. This is standard practise at the Institute. I also have to pay the Institute to use its management centre's services. I pay, again out of my wages, for photocopying. I pass this cost straight on to students. I think I would even pay the Institute to remain part of its collective apparatus. For me, it's useful to draw on the Institute's various resources and its reputation. I know some teachers feel powerless and unheard, but I feel empowered. Why not buy my own private job?

The logic of virtual organizing is the logic of multiple and simultaneous responsibilities. This means new approaches that require people to exercise discretion, take initiative, and assume a much greater responsibility for their own organization and management. Handy (1996) terms these individuals 'portfolio people'. In the absence of any formal job descriptions at the Institute, one teacher captures the committee of ontological voices, the medley of tongues, performed by every Institute teacher:

Teaching is about acting, but at the Institute you have to keep many other plates spinning at the same time. I am teacher, accountant, administrator, performer, salesperson, marketing manager, customer care manager, leader, company representative, academic advisor, and friend.

The 'Notes to Teachers' make it clear that teachers need to embrace multiple roles in order to encourage students to re-enrol and remain part of the Institute's virtual organizing. The Institute is reproduced outside of the schools, colleges and the management centre, and the effect of virtual organizing translates Greater Copenhagen's cinemas, theatres and hotel restaurants into the rim of its organizational world, into its space, and into its signification:

An integral part of the Institute's course programme is to satisfy some of our students' social and cultural needs. Teachers are expected to arrange for their classes various extra-curricular activities such as film evenings, music or theatre evenings, Christmas meals, parties, etc. during the course of the teaching season. These social activities for students are part of a teacher's unpaid duties and are common at leading adult education institutions in Denmark. Most teachers find these activities an enjoyable part of the job and an excellent way of establishing personal friendships with their students.

Hence, teachers are both subjects and objects of continuous self-evaluation and self-control, self-disciplining themselves vis-à-vis their own actions and the representational world of the Institute's inscriptions. Their actions are the effect of a complex mosaic of network fluids arrived at between the continuous movement of previous experiences, the Institute's static and abstract inscriptions and real-time classroom contexts—the public and collective orderings of affiliation to an organization ambivalently meets and acknowledges the private orderings of the individual. Thus, as the following observation by a teacher clearly shows, in re-presenting the Institute, the teacher enters into an ontological realm of inconsistent and disorientating responsibilities. Inscriptions such as the Institute's orientations and 'Notes to Teachers' do not provide everything that is needed to equip a teacher for a Danish winter.

I was teaching in Gentofte—an affluent suburb north of Copenhagen—one Wednesday. It was bitterly cold. In a language that was no longer my own I described to myself the conditions outside the window; I can speak some Danish. I remember that every snowflake had an intricately different form, yet from a distance it looked identical and solid. I'd never really noticed this before. The class hadn't started yet, but I remembered thinking that there are so many competing things we [as teachers] need to think about: keeping the students motivated, or “welding them to you” as the Principal says, and ensuring course numbers are up; keeping to the course texts although students find them boring; encouraging students to enrol in the exam; making sure students have a good time during the lessons; managing the introduction of new students into a pre-existing course which is mid-way through the academic year and, similarly, mid-way through the course textbook—that always causes grumbles, for old and new students and for teachers.

Twelve Students, Many Places of Judgement and Nodes in Networks

The patterns of measurement and numbers created by the Institute tell stories about the performance of the Institute and its teachers, and illustrate how vulnerable human experience is to abbreviation. Events become objects and, consequently, organizations are increasingly seen as organizers of information. Systems of information and communication become one important obligatory passage point, an interstice, through which all actors must pass (see Bloomfield and Vurdubakis 1997). For 'real' organizing to be gleaned from the organized world of representation and to stand for organizational activities, 'individuals become “cases” who are measured, described, evaluated, examined and compared. Real lives are converted into case notes' (Burrell

1988: 226). Humble and mundane administrative questions, which have real effects on individuals' lives, are made out of the political structure of social relations and moral choices (q.v. Foucault 1979). Latour (1986: 28) reiterates this; '[i]t is hard to overestimate the power that is gained by concentrating files written in a homogeneous and combinable form'. Technologies of information and communication, rather than just aiding activity, enable activity while simultaneously underpinning particular scripts and the exigencies of taxonomies.

At the end of each ten week term classes are reviewed in terms of class size. Most classes do continue, perhaps for several terms, but many stop because of a lack of numbers. A teacher comments on the complicity and active interpretation by human and non-human actors, the possibility of agency within relational networks, and the subordination of local events to functionality—of events stripped of production history:

At the end of the first term I went into the office to discuss my classes. I sat in the reception for a few minutes, waiting to see the Principal. The office is busy, energetic and cluttered. Another teacher is also waiting. Four desks, filing cabinets, a photocopier, desk-lamps, telephones, a fax, metal shelves with blue and red plastic archive file folders, and countless quantities of paper. I sat down at the Principal's desk. He's got a nice smile ... He looks at the figures for my five classes, for the numbers of re-enrolled students, then dextrously swings his finger down the forms. All okay apart from two. Ten students. A quick judgement. Not enough. It's a relatively unambiguous story. I'm informed that two classes will not continue. Certainly no bonus. The course is cut. I have no say in this: no discretion, no altercation. But, then again, maybe the Principal has little discretion as well. We're both like mute youths who have been told they're going to a special needs school.

A teacher with, for example, eight classes would probably lose two or three classes after the first term. This change in circumstances was occasionally mediated by new classes starting mid-way through the year, but usually teachers were compensated by the tentative promise of work from the beginning of the next academic year. The Principal describes this:

Let me give you a copy of our new catalogue for the next academic year. It's just been printed ... As you can see your name is down for 10 classes, but with other teachers leaving, you'll almost certainly be allocated a couple more than that.

The Principal describes the relocation and redistribution of knowledge-making practises within relational and intensely connected networks (see Strathern 1997), and illustrates how judgements

circulate beyond an immediately experienced event, produce other decisions and further judgements from which significant economic outcomes often emerge:

As you know, for courses to continue and be viable we need at least twelve students enrolled on each course at the beginning of each term. Any number below this and we're not entitled to the state subsidies which make a significant contribution to teachers' salaries and the office's running costs. Without the state subsidies, the Institute probably wouldn't exist.

Teachers, students, administration staff and the Principal are all immanent and on-going effects of a codified and standardised categorisation of virtual organizing—a visibility that allows individuals to be compared and differentiated and which affects individual incomes, institutional subsidies and students' possibilities for improving their English. All delegated actors—human and non-human—are nodes in the networks which create the emergent effect of virtual organizing. Teachers, staff, the Principal and students act within the relations constituted by the Institute and the various other network effects that it enrolls and translates. A teacher narrates:

I'd just seen the Principal; I was leaving the management centre just as another teacher was arriving—I passed them on the narrow, winding stairwell. As I was walking out of the building's courtyard, I passed the hat shop which is located on the ground floor of the building, and momentarily captured my reflection and the reflection of the Institute's brass sign in the shop's window. I unlocked my bicycle and headed out to my next class.

Such interdependencies demonstrate the on-going spatial and temporal processes of virtual organizing; a spiral time with reversals, progressions, flows and overlaps, and of continuous cyclicity (Burrell 1992).

IMPLICATIONS FOR FUTURE RESEARCH

Inventing a Virtual Ethnography

The Institute case study highlights the ways in which entrenched concerns, problematics and objects of organizational behaviour are inadequate for understanding the processes of organizing. Virtual ethnography means rethinking and questioning the fundamental elements of ethnographic work: observation, presence, social relations and community. It necessitates a form of ontological politics that is capable of handling notions of insider-outsider, presence-absence, human-non-human, theory-practise with equal respect (see Denzin 1997; Silverman 1997), and a form of

address that does not draw everything together into a closure, but incites the reader towards further reflection (see Game 1991). The following section considers how ethnographic work might be revised in order to provide the possibility of a form of research that reconfigures and reanimates current conventions of inquiry towards a politics of a relational ontology and new grids of expression.

Observation

Observation in relation to a setting, rather than of a setting, problematises the idea of a disinterested observer of discrete entities (Geertz 1973; Bourdieu 1990). Having a specific role as a teacher at the Institute, for example, provides good access in terms of the potentially for observation and constitutes acceptance as a member of the organization, but it also restricts the movement away from a particular role and situated identity which was simultaneously being questioned (Woolgar 1995). However, such constraints provide other interesting analytical insights and helped compress previously incompatible and uncomprehended meanings together. Apart from the initial four-day orientation, and in the absence of organized teachers' meetings, teacher-teacher interaction is minimal at the Institute. The majority of teachers' work takes place in classrooms and preparation is undertaken at home. Chance encounters at the Institute's photocopiers, meeting teachers before or after a particular class, or waiting with other teachers to meet the Principal, became critical events in observation and formed the basis for meeting other teachers and organizing semi-structured face-to-face meetings or telephone conversations. Observation of teachers and discussions of teachers' work experiences at the Institute were therefore serendipitous and pre-arranged.

Observation constraints created by teachers' spatial and temporal separation from each other, together with the Institute's reliance on teacher-student and teacher-inscription interactions, provided ethnographic material in itself and was directly relevant to the research because it vividly demonstrated the symbolic and material organization of the Institute. As well as providing valuable empirical material, questions about the observer's role also challenges the idea of distance, separation and the role of the observer, and generates new groups which are relevant for observation. At the Institute this constituted focusing on teacher-student interactions and teachers' and students' interactions with the Institute's technologies of information and communication. It illustrates that the focus of research—what constitutes the subjects and objects of research—needs to be reconceptualised and regularly challenged during the research process.

Presence

Technological realms pose particular challenges to the anthropological roots and units of analysis of ethnographic work. The Institute problematises and transforms interaction and presence because practises are highly distributed and rely substantially on technologies of information and communication for interaction in multiple work settings. Issues such as ethnographic presence are obviously relevant to electronically mediated work environments but, as the 'low-tech' organizing at the Institute shows, it is not limited to them. Actors at the Institute also act through, and not just with, various systems of information and communication such as the inscriptions contained within the Institute's white folder, the bi-weekly 'Notes to Teachers' and course textbooks.

With organizational communication becoming increasingly mediated through technological frames such as e-mail and the intranet, and as the domain and form of relations between what is social and what is technical is renegotiated and extended into new areas, the ethnographer must ask what constitutes 'being-in-the-field' or 'being there'. As certain forms of face-to-face interaction increasingly become an option rather than a necessity, traditional forms of ethnographic presence which privilege face-to-face communication and observation will need to be rethought and problematised. This might mean that it becomes appropriate for part or all of a research project to be conducted through e-mail or on-line discussion groups. The recognition of this would help question reality-virtuality divisions, and promote virtual ethnography as not just about observing the intricate details of an organization's activities, sitting in front of a computer terminal reading communication archives, or examining an organization's various internal and external written documents and communications. Rather, a third partner, the movements and passages between various settings known as 'field' and 'home' becomes a crucial focus for providing rich ethnographic insights (Cooper et al. 1995).

Social and Technical Relations

Future research on virtual organizing may also wish to examine not only whether technologies of information and communication enable the empowerment of human actors, but the extent to which they may actually empower non-human actors (see Brigham and Corbett 1997). Research perhaps should resist the temptation to project forms onto ontological characteristics. At the Institute, co-ordination and collaboration between the Principal, teachers and students is fundamentally performed and sustained by various inscriptions such as operational and administrative procedures, 'Notes to Teachers', course textbooks, examination regulations, etc. Non-human actors play a constitutive role in providing an ontological passage point—or border post—through which students, teachers and staff are encouraged to claim allegiance to discrete and configured identities which define, enable and constrain (Callon 1986). This highlights how

the constitution of researchers' work is a mixture of human and non-human networks in which power is claimed, exercised and contested. Exposing the mosaic and heterogeneity of human and non-human interactions would problematise the contingent and shifting boundaries between and definitions of human and non-human communities, and encourage, what Woolgar (1985) describes, a 'sociology of machines'.

Community

Researchers, like those researched, are significant nodes in an assemblage of human and non-human actor-networks. In conjunction with questioning the capacity and character of social and technical relations, future research may wish to actively engage with the subjects and objects of research. Instead of attempting to control the researcher's presence and attempting to account for deleted ontological work through what Callon and Law (1995) label a 'liberal panopticism', another trajectory would be to make a virtue of this limitation and include the role of the researcher as another observation (Star 1995). Recognition of the multiple lenses of being simultaneously an insider and outsider in an organization means that the boundaries and tensions between identities and relations can be articulated and explored through open dialogue and new nodes of responsibility (Star 1991). Consideration of teaching and researching as active work highlights its ontological construction the aim of which is not to reveal an objective reality, but to produce a set of jointly created descriptive stories that enable and promote useful exchange (Cooper et al. 1995).

During the eleven month period as both full-time teacher and researcher at the Institute activities and practises were observed close-hand, and a rich variety of issues were listened to, engaged in, and discussed with numerous individuals, both formally and informally. Thoughts relating to on-going and unclear issues were shared and developed in a continuous dialogue with a number of interested teachers, students, administration staff, the Principal and other individuals beyond the Institute. These provided invaluable comments and thoughts which either confirmed and elaborated issues, themes and patterns, and provided further material for analysis. Teachers, for example, were both a difficult and rewarding group because they often thought about (and were uneasy about) the issues being investigated. Respondents' concerns blend with the researchers and the notion of participant-observation is transformed. The role of researcher and researched becomes one of mutual interaction and intervention in which the subtleties of actors' coalition

becoming co-optation, of asymmetries between listening and speaking, is recognised and conceived as a part of research work.

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