

Chapter 1: Making a thing of Things – Humans, Artefacts, Actions

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Ethnography's endeavour – resurrecting the realms of everyday practice

In contemporary society, technology and social change are two concurrent and important phenomena. New technical practices constantly remind us of our taken-for-granted habits and force us to consider how we structure our lives, as individuals and as members of society. This volume is dedicated to thorough studies of technology and social practices. The purpose is not only to improve our understanding of how to cope with and introduce new artifacts, but also to use the new practices they serve as a tool to render the ordinary exotic, thereby increasing our knowledge of how society is organised.

Recently one of the editors of this volume was asked to review a research application. It concerned the much-in-demand area of information and communication technology, focusing on telephone technology. It was not particularly special in itself. Nevertheless, it in hardly no time at all successfully performed its intended trick of persuasion. But how did it do that? What was it in this application that one of us found so strikingly convincing?

First then – the telephone? Isn't that a well-known and mature technology, one that has been around for more than a century now? Indeed, in our affluent part of the world our generation as well as that of our parents has been brought up with the telephone. It has long since disappeared from the innovation hype talk arenas to serve instead as one of the "natural" artefacts of our taken-for-granted everyday life. But at the same time, no. It is not at all so. Telephony has become juvenile and open-ended again; it has been brought back from its backstage oblivion by the massive commercial breakthrough of mobile or cell telephones in the last few years. Telephony has been re-created as a rocketing branch of technology, attracting ever so much attention from Big Business.

In our interpretation, this neo-industrial embeddedness of telephone technology constitutes a salient ally that this applicant skilfully mobilised. The logic here is that there is no hot

business without prospects of soon coming up with products that make sense for the many; and one cannot raise any trust – the essence of all investments - in claiming that things will make sense for the many, without revealing some knowledge about the practices within which those products are to co-exist with humans and perhaps also with other non-humans. In line with this, in a technology's early age, when feverish entrepreneurial politics often urge people to push flexible and innovative behaviour to its limit, discourses offering situated accounts come into demand as a healthy counterbalance. But then later, when markets, products and expectations have stabilised, the relations exposed vanish in a shadowy state of technology-in-use; they become, as it were, "black-boxed". It then takes a radical shift in conditions, or a resurrection as the one we now are witnessing in telephone technology, to make us aware of how very little we have known about our actual day-to-day engagement with the technology.

This book¹ is not concerned with telephones, but with technology generally. However, several of its papers mirror the pattern just presented, illustrating how the emergence of new applications reinvigorates our interest for the habitual practices connected with a technology. One of them reports from an investigation of traffic behaviour. It demonstrates how the micro-level communication between road users is essential for achieving coordination. This has, its author claims, deep-going and troublesome implications for the design of artificial driving technologies (with which 'Intelligent Transportation Systems' is busy) where road use typically is conceptualised as a rule-following activity. Interactive social practices vs rules as guidelines for action is also the topic of another study on technology-related coordination, analyzing a severe incident in the air traffic control at a Swedish airport. In a third chapter, a case that suggests how rules might after all have real "agency" is put forward, when, in an interesting way, the relations between a social practice – eating, an artefact – a digitalized plate or feeding facility, and a disease – anorexia, are analyzed.

As an intellectual endeavour, this book belongs to a cluster of work that tries to give voice to 'the ordinary', and the local production of social order. It thus addresses the mundane matters of human life and communication. More specifically than just drawing attention to the disregarded realms of everyday practice in general, the authors share a keen interest in the microcosmos, and the numerous interactions which embed, constitute, reproduce and make sense to our *living with things* – i.e. how we, humans, relate to artefacts and

technologies, and how "they", the non-humans, relate to us. Whereas some would trace this interest merely to a scientific ambition to better *understand* crucial traits of contemporary society, others instead would stress their ambition to *improve* technology-in-the-making (its design, dissemination and "domestication"). Both groups however, strongly oppose essentialistic or ready-made understandings of users and technology. For the sake of better informed theories and more useful designs alike, it is the never-ending articulation or "repair work" characterizing *technology-in-use* or technology as a *situated practice* that occupies them.

For a variety of reasons the demand for such knowledge is now growing. First, as everyday life increasingly becomes permeated by things, technology or artificial culture must be integrated in social science if modern life and society is to be appropriately understood. Consider e.g. the case of contemporary information technology. There, in taking advantage of the ongoing miniturization of components, certain computer practitioners and informaticians today talk of "ubiquitous computing", a metaphor for how IT devices almost like seamless webbs may "dissolve" into human bodies, practices and ordinary actions. Technology is here saturated with radical promises encouraging us – designers, users or social scientists – to innovate, rethink and redesign a lot of human practices. Ethnographic approaches and methods are increasingly called for to guide us in this endeavour. Then, in our highly specialised society, the roots of technologies are often concealed. They are designed and constructed in sealed-off territories ('laboratories') by an expertise whose power and importance in society nourishes talk about 'the new princes'ⁱⁱ; to make a thing of things, is also to take a look into the lives of these princes of our age.

Thirdly, the *raison d'être* of this book is about learning from misjudgements and mistakes and misjudgements of the past. Several industrialists and designers of technology share painful experiences of how inarticulate or false assumptions of user demands have resulted in products which merely erode their business capitals or professional reputations. Since the informational society steadily seems to require new forms of specialization joined to individual castings of technology, such shortcomings are likely to become even more disruptive. It is not by chance one finds concepts like user orientation and user-friendliness in the headings of the latest EU research and development programmes; and for certain, they are there not solely for 'social reasons'.

In the next couple of sections, which constitute the core of this introductory chapter, the importance of the detailed studies collected in this volume will be advocated primarily in relation to the development of social theory. Then, in the following chapters, the unit of analysis and the practical application of the ethnographic approach chosen by each contributing researcher, will speak for itself. As indicated, the practices documented range from the management of air traffic to the curing of anorexia patients and the construction of gender among computer specialists. By first framing them theoretically, and then laying the cases side by side, the book aspires to contribute to the establishment of ethnographic research in the sociology of technology. To our understanding, it fills in a gap between informatics research, with its interest in design and ordinary life, and the field of science and technology studies, with its interest in expertise and social theory.

Hopefully, after the above references to a contemporary society housing new human conditions and new princes, it should be clear that the practical details of the cases as well as the scientific methods – ethnography and ethnomethodology – applied in eliciting them, are not solely useful from a theoretical point of view. Although often detailed and mundane in their articulation, the issues concern a lot more people than just those involved in the actual situations presented. Ethnographies of technical use and design are neither an exclusively academic enterprise nor an introspective branch of investigation; they are a chance to come to grips with the society that we live in, and with the new one evolving before our eyes.

Towards a thorough social understanding of technology-in-use

For twenty years now, the idea of user-orientation has worked its way towards a conceptual re-foundation of the originally outspokenly *technical* discipline of information system design. One analytical axis along which this has taken place, concerns how one appropriately could link the role of technology to the myriads of coordinating cooperative activities which have been found to compose most human action or social behaviour. Some of this coordination can be visualised as routine-like patterns where technology conducts behaviour, whereas according to a growing group, other parts always – to allow ”plenty of leeway for the unpredictability of real life”ⁱⁱⁱ – be conceptualised as dependent on the basically *human* qualities of flexibility and ‘articulation’:

Within informatics one distinguishes between two ways of facilitating coordination. The first presumes that the coordination could be automated, whereas the second instead aims at supporting the human work required to articulate the coordination. Automation may be appropriate if the coordination of the activities is already routinized and proceeds according to a fixed plan. If however the coordination is complex and characterized by repeated deviations from the expected, no automation can succeed as new situations continuously have to be taken into account.^{iv}

This emphasis on work as a collaborative and situated activity is one of the pillars of the strand of thinking or subfield within informatics and computer science called *CSCW*, Computer Supported Cooperative Work.^v It is lately also becoming increasingly influential in the neighboring but more psychologically conceived subfield of HCI, Human-Computer Interaction.^{vi} But the ambition of CSCW practitioners to explore how computer-based systems can empower cooperative actors to articulate their activities, has proven quite hard to realize. A series of in-depth studies of real-world coordinative practices has displayed such multitude and complex interdependencies between procedures and artifacts, that it more than anything else points out the need for further field work, undertaken with even sharper analytical tools. Thus, a system design profession worth our respect, one has concluded, should not solely develop effective computational models of structures and processes of work (data flows, knowledge representations), and adequate modes to present and give access to these processes (user interface). In addition, it has to seriously address the issue of supporting the articulation of cooperative work that sustain such systems.^{vii}

To proceed along that avenue, a distinction between two forms of ‘cooperative work’ has been suggested – automation and articulation. The former is looked upon as inherently distributed in the sense that the multiple actors involved are semi-autonomous with respect to their strategies, goals, motives, etcetera. The latter is quite different, analytically, as its delicate task is to bring some order to the confusion *caused* by these individualized though interdependent activities; in making up for this it must schedule, align, mesh and integrate the overall effort – i.e. ‘*articulate*’ it.^{viii} Another key conceptual element of this social thinking, is ‘*accountability*’. This explores the distinction that people in cooperative settings do not only accomplish their tasks as such, they also perform them in such a way that, in accordance with shared ”tacit” knowledge and practices, they are accountable for the others involved. Being accountable is equivalent with actively and continually

socializing with others while you work; you situate what you do in a collectively shaped context.

That microcosmos, within which phenomena such as automation, articulation and accountability accommodate and make sense of human behaviour, is at the heart of this book. In particular, it focuses how they affect the use of technology. Some of the authors are academics engaged in the design of computer-based information systems, and affiliated with the community we just briefly introduced. But several others are not; instead of being a CSCW production, the volume is thus academically a meeting-place for people of mixed scholarly backgrounds. Although a few would perhaps object to being labeled with any acronym whatsoever, standing up for interdisciplinary undertakings, at least one other research community comes forth in what follows: *STS* – Science and Technology Studies.

Whereas much of the challenge for informaticians (as also for people within management studies) lies in navigating between doing social science and engaging in technical and organizational development, most STS scholars admit to being closer to the former trade. Their overriding knowledge interest concerns the border between claims of the true nature of ‘the scientific’ and ‘the technical’ (often analyzed as the combine ‘technoscience’) on the one side, and society on the other. Once we know – and STS-ers insist they *do* know this – that ‘true’ in one place need not be true in another, or for everyone, or for every part, or for long, those claims and that border dissolves. That is, ‘Nature’ does on a closer inspection, merge with ‘Culture’. Hence, the functionality of technology is largely and deeply relative to the social settings. In trying to sort out these matters, being of course fundamental for cultures heavily influenced by science and technology, STS challenges all notions which in deterministic or even canonical ways ascribe some indisputable ‘hardness’ to the facts (science) and the artefacts (technology) of our lives.

In spite of their diverse orientations, the CSCW and the STS agendas have in our eyes interesting intersections and similarities^{ix}. Both highlight not merely the social setting or context of technology, but the *thorough-going* ‘socialness’ that often characterizes technology-in-use (and in STS also science-in-action). A strong commitment to such an understanding motivated the divide between coordination-by-automation and coordination-by-articulation described above as being seminal to the CSCW discourse. Within STS, a similar stance from which to investigate and theorize the man-machine/computer relation

can be found in a recently published book by Collins&Kusch^x. It elaborates on the divide between ‘mimeomorphic action’ and ‘polimorphic action’^{xi}.

The former category, exemplified by the swinging of a golf club, comprises actions whose pattern and variations can be understood from an external point of observation; i.e. they are ‘decontextualisable’ and do not require that one takes the intentions of the actors into account. Polimorphic action, on the contrary, such as e.g the writing of a love letter, makes sense only if uniquely adapted to a particular social situation, and could be understood only by being knowledgeable about that social context and the actors’ specific intentions.^{xii}

Only humans can perform polimorphic actions. That does not stipulate that mimeomorphic actions always are simpler to perform; they may well require a lot of skill, only that these skills do not include any social competence.

Although STS-ers have come to cover many levels (macro, meso, micro) and materials (historical data, public debates or controversies about science and technology, field or case study material, and so forth), the CSCW- and STS- communities have much in common. Essential for the purpose of this book, both embrace ‘the local’ and ‘the everyday’. There is no better place to contest essentialistic or crude claims (cf the role of rules above), no matter if they later inform designs or theories and policies, than the lowest level of interaction between humans and non-humans. Or, to reconnect to the three CSCW ”levels” (develop computational models – design user interfaces – supporting articulation work): by acknowledging the crucialness of articulation work, and by demonstrating the fine-tuned social skills upon which it rests, CSCW and STS practitioners alike contest knowledge representations blind to the vital seed that makes artefacts work.

Ethnography and ethnomethodology – a short genealogy

This volume presents research that promotes approaching technology through some kind of *ethnography*. Stated in general terms, ethnographic research is a form of investigative fieldwork and analysis, a study of the way of life of a group of people that relies primarily on the methods of participant-observation and open-ended interviews^{xiii}. As such, it has come to be extensively incorporated into a range of social sciences. Nevertheless one discipline in particular, anthropology, can rightly claim to have forged it, starting with

Malinowski's famous studies in the early 20th century. He is regarded as the first ethnographer "to maintain any sort of sustained contact with the population being studied"^{xiv}. To his disciples, the army of fieldworkers getting ready to move out, he issued some clear-cut "marching orders", which for a long time became part of anthropology's self-esteem: "Find out the typical ways of thinking and feeling, corresponding to the institutions and culture of a given community, and formulate the results in the most convincing way."^{xv}

In contemporary ethnographic inquiry three principles have been held as fundamental: a) participant observation – sharing the day-to-day activities; b) the culture examined being considered from the viewpoint of those whose life-styles are being studied; c) human conduct should be contextualised by reference to the setting in which it naturally occurs (holism)^{xvi}. Within anthropology, 'ethnography' gradually expanded to refer not only to the philosophy underlying the collection of materials, but to encompass also the organisation, interpretation and presentation of those materials. Several of the chapters to follow – in particular *chptrs 4, 5 and in parts also 6* – pursue the kind of ethnography associated with mainstream anthropology.

As already indicated, a key concern in this tradition has been the identification, based on the extensive material gathered during field work, of some general norms guiding the actors in their everyday work. Within the subfield anthropology of technology, several studies have focussed on the norms, or occupational cultures, of engineers and technicians. Louis Bucciarelli has for example written on engineers as being guided by object world thinking, when they do design in a setting full of uncertainty and ambiguity. Their way of thinking is e.g. about the "rigidly deterministic" and abstract. Engineers understand the world as hierarchical and finite, as well as operated by "cause-and-effect." Their stories are concrete and expressed in "measured terms."^{xvii}

Once the ethnographer starts operating in our own cultural settings, all mythical marching orders seem not only geographically to be continents away.^{xviii} Thus, in Cambridge, another European intellectual, Ludwig Wittgenstein, came up with a very different view from Malinowski as regards the prospects for finding order, coherence or anything whatsoever: "...how hard I find it to see what is right in front of my eyes".^{xix} This account

has later been rephrased by people who have been doing ethnography in research laboratories, which, although in certain senses appearing foreign to social scientists, nevertheless present a major challenge when it comes to tracing 'the ordinary'. The effort that this book here begs for is an initial derailment of the mind from the tracks of common sense. Our cultural environment – the everyday world – has to be turned into a strange place if we are to see that its perceived orderliness is a remarkable and mysterious human accomplishment.^{xx}

However, more important for the purpose of this book is to address another subject which has been out of focus given the knowledge interest in anthropology. Hence, in spite of indisputably having been of great importance for several social sciences in giving attention to everyday practice, with its accounts founded on day-to-day activities and the native's point of view, anthropologists have yet not, according to Prus, been attentive to the *processes* of the human group life under study:

... ethnographers in anthropology have not been explicitly encouraged to envision group life as ongoing accomplishment. Thus, lacking a set of more explicit, process-oriented concepts of the sort developed in symbolic interaction, anthropologists have not been making sustained inquiries or developing data more precisely in processual terms.^{xxi}

Therefore, in the case of micro-oriented sociology, rather than emerging out of the vast array of anthropological field research, the merits of studying the details of the mundane and the trivial as a way to understand society instead were suggested by the controversial development of *ethnomethodology*. This volume speaks of its influence by laying forward ongoing ethnomethodologically related work from several contexts – informatics, science and technology studies, and organization theory ; with the joint capacity, we argue, to take the sociology of technology one important step forward. It demonstrates how different kinds of empirical 'sociology-of-technology-work' can be guided and enlightened by this inheritance. In addition, the book in as far as this introductory chapter is concerned, contains a few brief reflections on how ethnomethodology might unveil or unwrap some pertinent theoretical weaknesses or inconsistencies of those academic contexts.

Ethnomethodology dates back to the nineteen-fifties. It emerged from the american sociologist Harold Garfinkel's confrontation with the prevailing dominance of structural-

functionalism in American sociological thought. One of its leading advocates was Talcott Parsons, the advisor for Garfinkel's Ph D work. Like the CSCW people who were to appear some thirty years later, Parsons was occupied with how social actors achieve coordination or, as it was stated, how they solve the problem of social order. One of sociology's forefathers, Durkheim, once had it that 'the objective reality of social facts is sociology's fundamental principle'. In being faithful to this, Parsons claimed that the problem of social order was essentially a matter of concerted action. Social actors coordinate themselves by following reciprocally shared rules and norms^{xxii}, and these could be identified through sociological analysis only. Garfinkel, as a little later also his colleagues Cicourel and Harvey Sacks, rejected this view^{xxiii}. For him there was no stable social order that naturally follows from some objective social facts. Instead, he wanted to draw attention to the *work* which goes on in everyday action to produce social order, a work woven into the fabric of all activity.

On this premise, he initiated extremely detailed investigations concerned with how social action was made to be - and also made to be *seen* to be rational. He soon observed that the 'rationality' of social behaviour lies in the way it becomes 'intelligible' to others, how it is made "reflexively accountable". Coordination, social order and accountability, according to Garfinkel et al^{xxiv}, were achieved only by people who in interaction reached fluency ('mastery of natural language use'). They become part of 'common-sense-understanding'; captured in the phrase "what everyone knows that everyone knows". In the minute world of ethnomethodology, *any* social action could be treated as an occasion of lay 'sociological theorising', exercised not to reproduce stable structures or general sociological facts, but to help in getting the job done.^{xxv} In that light, traditional sociology had only been another actor among many in establishing social order through social theorising, rather than adding any knowledge on the premises and activities in that particular ordering work. It invented sociological analysis as a resource for establishing its own community of external expertise analysis, but it didn't address sociological analysis as a topic in itself, as a phenomenon constantly taking place in society.

Hence, ethnomethodology has been characterized as e.g. "the study of the ordinary 'methods' through which persons conduct their practical affairs", or as "a way to investigate the genealogical relationship between social practices and accounts of those

practices”^{.xxvi} But also, by the same analyst in fact, it has been talked of in a much more expressive and even utopian manner. It launched a radical alternative in sociology, in relation to which it at the look of it appears as a parasite, however a benevolent one. What Garfinkel suggested, this interpretation has it, was nothing less than an abandonment of a sociological ‘core’ in favour of an endless array of ‘wild sociologies’ existing beyond the pale and lifeless nature of sociological empiricism.^{.xxvii}

... lay and professional analytic practices provide ethnomethodology with its subject matter. In a sense, ethnomethodology is a parasite of the host discipline of sociology, but unlike a parasite that reduces its host to a lifeless husk, ethnomethodology tries to reinvigorate the lifeless renderings produced by formal analysis by describing the ‘life’ from which they originate.^{.xxviii}

The many sociologies of everyday life may be ever so wild but, as pointed out, they also somehow continually become articulated, related and coordinated. According to the reading put forward by Lynch, the challenge and ultimate task presented to social science by ethnomethodology, is about just that; i.e. to search for the ‘what’ dwelling behind that ‘somehow’, discovering the *myriad of ‘missing whats’* inhabiting all specialized practices dispersed throughout ordinary society. Such juicy rhetoric notwithstanding, it seems to us as if ethnomethodology, at the same time as having been the target for patronizing remarks, more than usually is being recognized as serving as a salient source of inspiration for others, as, we reckon, it presently does for the expanding sociology of technology.

Bringing in ethnomethodology: potentialities and problems

Informing the design of information technology

With the rise of CSCW, there has been a substantial increase in sociological research in system design over the past ten years, with ethnomethodology emerging as its favourite version.^{.xxix} It has informed design ”by providing innovative insights into the organisational situatedness of work and the methods and practices through which work activities and interactions are assembled”, as also ”by developing an understanding of the temporal organisation of activities and interactions, revealing them to be a moment-by-moment organisation”.^{.xxx} In doing this, it exposes a fatal ‘paradox of system design’. Thus, as it has

been conceptualised, system design favours technologies tuned to ‘large-scale’ activities which as a “side-effect” often radically transform the small-scale details of human action. This in turn means the erosion of the features sustaining the former; ethnomethodology here points to the interdependence of minute practice and grand accomplishment.

However, in system design circles, ethnomethodology is also itself seen as being at the core of a paradox. Whatever potential or power it may have in revealing the detail, the particular and the moment-by-moment regimes of ordinary action, it is at the same time trapped in its own tradition as an intellectual endeavour analysing practice. When it comes to radical innovations (“inventing the future”) - the rationale of the informatics community - it is virtually powerless. A solution to this could be to strive for a new synthesis beyond the scope of ethnomethodologically-informed design, one that somehow rejoins with the more rationalistic processual and interactive elements of computer science. An outline for such a synthesis, labeled ‘technomethodology’, has been forwarded to the CSCW agenda by Dourish&Button.^{xxxix}

Another solution here would be to accept different rationalities by building design teams and design procedures upon narrow expertise which at certain points interact . If the cognitive gap turns out to be prohibitively wide, an intermediating role, a broker or “facilitator”, may have to join the team (*Chapter 9* offers an extensive discussion of this). Further, we argue that CSCW-ers’ specific interest in informing design over user practices, and their practical dependencies on design institutions, usually makes them less inclined to detailed investigation of design work conceptualised as a social production of expertise. Here, the focus denoting science and technology studies, provides an interesting appropriation.

Dissecting expertise

Within STS in general, ethnomethodology has, in our account, so far informed primarily the understanding of scientific practices. Some ten years after Garfinkel’s attack on American sociology, a group of European researchers revolted against the established Mertonian school of science studies, where the sociology of science took as its role to identify the general normative rules that gear scientists. On a theoretical foundation that had been there for quite some time^{xxxix}, unorthodox philosophers and sociologists in

Edinburgh and elsewhere^{xxxiii} issued a comprehensive empirical programme to investigate the "actual" practices of scientific inquiry, shaping a new breed of thorough ethnographies: laboratory studies. In contesting facts as manifestations of a transcendent natural order (philosophical essentialism), focusing instead the informal day-to-day practices, prominent proponents of the new sociology of scientific knowledge (SSK) – e.g. Mike Lynch, Harry Collins, Karin Knorr-Cetina, Steve Woolgar and Bruno Latour – embraced the example set by ethnomethodology : *".. a kind of empirical rebuttal to sociology's scientism that could no longer be dismissed as 'merely' a philosophical argument."*^{xxxiv} The most elaborated example is Mike Lynch's detailed investigation of laboratory work which was presented in the book *Art and Artifact in Laboratory Science*.^{xxxv} This research shows the production of scientific accounts as an on-going accomplishment in the everyday practices at the lab.

However in spite of this influence, many sociologists of science have been accused of combining their analyses of the actors' wild sociologies with a more traditional form of sociology, where they themselves account for the social practices by providing external explanations such as cultural norms and social interests. Although generally successful in demonstrating how 'natural facts' are to be understood as social constructions, paralleling how the ethnomethodologists found 'social facts' to be local accomplishments, they in the next step typically maintain an unreflective view of sociological analysis itself. In many cases, Lynch argues in a book largely devoted to this problem, they *have "tended to bolster their analyses with large doses of scientism"*^{xxxvi} and *"relied on scientific versions of sociological method that ethnomethodologists had previously criticized."*^{xxxvii} Confirming Garfinkel's general criticism of sociology, their scientism makes them formulate their questions in such a way that the social work and accomplishments yet remain secondary.

In the STS community, Steve Woolgar has perhaps more than anybody else drawn our attention to the social production of technology. Woolgar, with his experience from the sociology of science, has come to focus on the representational practices of technical designers as an on-going process. He has proposed to us a thorough-going understanding of actors'/users' descriptions of technical functionality and how this practice sustains social order.^{xxxviii} But Woolgar's studies does not represent the road generally taken by the STS- community when it comes to the sociology of technology. Instead, Lynch's critique

of mainstream sociology of scientific knowledge, appears even more applicable in this area.

But what went wrong then, given all that steam and energy obviously mobilised to contest distanced forms of sociological analysis? Sweet promises were made in the late 80s. At that time, however, some of the leading people in science studies became engaged in the "imperialistic" endeavour to expand their empirical programme also into the field of technology studies. This was timely, not only perhaps considering the improved prospects of getting funded^{xxxix}, but also as technology studies needed a "methodological surgery". It had come into being as part of the nineteen-seventies activism addressing the alarming ecological, global, and general humanitarian issues associated with modern technological society. Technology assessment methodology and "impact studies" on how technology affected various sectors of society, were typical outcomes of this early stage. Gradually, its technological determinism, at first nurtured by the still strong Marxian legacy, was weakened to give leeway for what could be seen as the opposite – a social determinism where the social shaping of technology perspective came into focus. Here, MacKenzie's and Wajcman's collection of studies^{xl}, is widely acknowledged as a key example.

In retrospect, it seems as if this second wave of technology studies contained two very different options. One was that of merely *"using technology as a platform from which to observe the constitution and organisation of the structural arrangements of society"*^{xli}. In doing that, one in important ways draw attention to the strength of and the relations between various shaping forces in society, e.g. 'class', 'gender', 'Western hegemony', 'politics'; but what, once the pattern is laid, did one say about technology itself? This is where the sociology of science came in very timely. It housed, at least in principle, a second option, one that in analogue with the laboratory studies wouldn't let the sociological *foundation* of technology be downplayed by some overall sociological interests in society. It thus could "help" sociology of technology in systematically addressing the content of technology.^{xlii}

Critical assessments concerning the fate of these options were soon presented by Woolgar (1991) and Button (1993). They represented different positions. Woolgar was the 'insider', being one of the most recognized persons in science studies and thereafter making the turn to technology; Button a sociologist with a strong links to system design, i.e. being close to

the 'customer' – the designer and the potential users who could benefit from sociological accounts of the work about to be re-equipped and restructured. However, despite their differences, they embarked on very similar kinds of analyses and ended up with the same 'verdict': in spite of its programmatic claims and its in-principle sympathy towards ethnomethodology, the sociology of technology envisioned in the second option above has not been able to deliver the goods.

Performing organisations

A third area where the virtues and limitations of ethnomethodology have been addressed is organisation theory or management studies (to which some of the authors of this volume belong). For its practitioners (and certainly no less for CSCW and STS people; although often being unaware of it), to approach 'ordinary action' or 'practice' in e.g. a firm or a research laboratory or a hospital, implies a specific conceptualisation of 'organization'. Consider a distinction suggested by one of the leading Scandinavian scholars in the field:

...ostensive definitions: assume that organizations as social phenomena are basically to be compared with physical objects - i.e. they can be demonstrated, can be made visible, can be discovered and described by an outside observer;

... performative definitions: consider an organization as a temporary product of organizing; ... with performative definitions, organizations are ascribed neither a nature nor an essence in any absolute sense; rather, organizations are considered to be what the people producing them made them at the time when those who were observers conducted their observations;^{xliii}

Obviously, these two definitions reflect very different epistemologies. Whereas ostensive definitions favour an understanding of the phenomenon of organization by explaining principles, the performative ones approach it by exploring practices^{xliv}. In a book that promotes a cultural or anthropological perspective in studying complex organizations^{xlv}, Czarniawska elaborates on the pros and cons of ethnomethodology in such an endeavour. Without a doubt, she concludes, it represents a significant contribution to the theory of social action. It has provided methodological tools and crucial insights on, quote from Cicourel's agenda, "*how persons in groups develop, represent, and evaluate their communicational strategies ... to create a 'language' ... the way that the representational*

form captures and truncates our experiences ... and how we use language to make claims about knowledge”.

For all its virtues in demonstrating that cognition always is to be conceived as a social process and what this implies for organization studies, Czarniawska too emphasizes its many constraints. She is very sceptical about the ”extreme social constructivism, which verges on solipsism”^{xlvi}, that in her eyes characterizes Garfinkel et al. Also, negatively, for her it represents ”basic research” while the anthropology of complex organizations she herself favours is ”an almost applied type of study” (here we may recall how above some CSCW analysts judged ethnomethodology to be virtually powerless when it comes to inventing things). As a researcher or student of organization, she advocates, you could and should investigate much more than just ‘texts’ on how people attribute meaning and make that accountable. There are social norms and moral judgements just as important as social cognition and its techniques of making sense; and you can only get to know these by adding various interpretative procedures and forms of intersubjectivity to your data.^{xlvii}

With reference to Clegg, Czarniawska distinguishes three understandings of language which lead to different demarcations between ’the outside’ and ’the inside’. The first conceives language as essentially transparent, revealing a reality outside of itself. In contrast, the second senses language to be opaque, forming a ”complete” self-referential reality with no need for externally induced norms or rules (cf the ethnomethodologists’ criticism of sociology). Finally, the third understanding interpretes it as material, a media for the accomplishment of social action. Her own preference comes closest to the first one, assuming a ”reality outside”. Of the organisation theory informed papers to appear, the one analyzing a major infrastructure project (*Chapter 10*), as also in some respects the one on physicists (*Chapter 7*), seems to take a similar position, whereas that on the development of an eating facility (*Chapter 8*), proceeds much more in line with the other demarcations.

Beyond deconstructivism: a theory of the social production of technology

We have presented a few excerpts from how three academic strands have reflected upon the prerequisites for doing social science. As once the ethnomethodologists did, the spokespersons whose acquaintance we made, all distrust theories or meta-understandings

which aggregate or de-situate human behaviour. They share the conviction that when social theory is being guided by ready-made "captain constructs", it misses something terribly important. Some of them have here dwelled upon the notion of 'knowledge'. We have all learned to think of knowledge as something that enlightens things, revealing more of the previously unknown. Nevertheless, as an epistemological entity it may work just the opposite way; thus when 'knowledge' too early is mingled with essentialistic, pretentious constructs such as 'truth', it disguises or hides away things, just like bottles can do to ships:

This book shows how ships get into bottles and how they get out again. The ships are bits of knowledge and the bottles are truth. Knowledge is like a ship because once it is in the bottle of truth it looks as though it must always have been there and it looks as though it could never get out again. Since order and knowledge are but two sides of the same coin, changing knowledge is changing order. ^{xlviii}

...we should forget 'metatheory' and 'theory of knowledge' as prerequisites for building a social science. ... Much of what goes on under the heading of 'knowledge' in science studies can be decomposed into embodied practices of handling instruments, making experiments work, and presenting arguments in texts or demonstrations ... 'knowledge' becomes more tangible – and less monolithic – when translated into various practical activities and textual productions. ^{xlix}

Faithful to their background in science studies, the two persons quoted picked 'knowledge' as their keynote example. But scholars from the other troops appearing in the last sections, could swiftly rephrase the above statements by instead inserting as ships 'technology' or 'organization'. They too easily run risks of becoming "bottled in", putting out of sight the articulations and the performative richness of those entities. The determination to prevent that from happening, establishes for these people a common epistemological ground, as it also does, we have concluded, for the multi-disciplinary group co-authoring this book.

The considerable emphasis now have laid on relating ethnomethodology to the areas of science-and-technology studies, informatics, and to a lesser extent also organisation studies, has served two purposes. First, to stress the potential of footing a sociology of technology on the substantial articulation work and the many wild sociologies sustaining technology-in-use. Secondly, to convey the bad news that this potential so far has not been fulfilled. In our judgement, the latter not only leaves us with a problem not taken care of, due to the speed and character of the contemporary technological development, it is a problem getting increasingly pertinent if social science is to have a say on things.

ⁱ The book originates out of a Nordic workshop, *Living with things: a call for micro-studies of technical practices*. What you will be reading, except from this introductory chapter, is a selection of revised and edited papers prepared for and presented during that workshop. We want to express our gratitude to the Swedish Transport and Communications Research Board, NUTEK and to Telia AB for the grants that made this workshop and the publication of its results possible.

ⁱⁱ Latour, Bruno:

ⁱⁱⁱ Schmidt&Simone: "Coordination Mechanisms: Towards a Conceptual Foundation of CSCW Systems Design". *Computer Supported Cooperative Work. The Journal of Collaborative Computing*, 5, 1996, p.155.

^{iv} Juhlin&Sjöberg: Road Talk Informatics; Informatik för samverkan i på väg och dess möjliga betydelse för trafikplaneringen i IT-samhället". *Tidskriften VEST*, No 1-2 1999, p.77-104. (Our translation)

^v In the Scandinavian "version" of CSCW, which enjoys a reputation of being advanced, another pillar has been the constitutive role on the design goals and practice played by a participatory or democratization-of-work philosophy.

^{vi} Dourish&Button: "On 'Technomethodology': Foundational Relationships between Ethnomethodology and System Design".

^{vii} Schmidt&Simone, *ibid*, p.157.

^{viii} *Ibid*, p.158.

^{ix} Only rarely however, such links or connections have been addressed. An exception is Berg, Marc: "The Politics of Technology: On Bringing Social Theory into Technological Design". *Science, Technology&Human Values*, Vol 23, No 4, 1998. pp456-490. Although pointing out some interesting potential in connecting the two traditions, Berg's analysis by departing from a critical assessment of the discursive politics associated with CSCW, however comes out rather different from the ethnography-of-technology-centered alignment suggested by this volume.

^x Collins, Harry & Kusch, Martin: *The Shape of Actions: What Humans and Machines Can Do*. The MIT Press, Cambridge, Massachusetts, 1998.

^{xi} The two categories resembles, although this time much more philosophically and theoretically elaborated, the dichotomy between 'machinelike actions' and behaviour-specific action' introduced in one of Collins' earlier books - *Artificial Experts; Social Knowledge and Intelligent Machines*. Cambridge, Massachusetts, MIT Press, 1990.

^{xii} Bohlin, Ingemar: "The Shape of Actions: What Humans and Machines Can Do". A Review Article, *Science, Technology and Human Values*, nr xxxx, pp.xx-xx, 2000.

^{xiii} Prus, Robert: *The Ethnographic Research Tradition*, Ch 4, p.103.

^{xiv} *Ibid*.

^{xv} Malinowski, B.: *The Argonauts of the Western Pacific*, E.P. Dutton, 1961 (first edition 1922), p.3.

^{xvi} Edgerton&Langness (1974), as summarized in Prus, *ibid*, p.109.

^{xvii} Louis L. Bucciarelli, *Designing Engineers*, MIT Press, Cambridge Massachusetts, 1994, p 84-85

^{xviii} Of course, later generations of anthropologists are perfectly aware of that all rosy instructions to newcomers in the field crashes heavily against the many pitfalls and agonies of everyday observation. See e.g. von Maanen, J.: "An End to Innocence: The Ethnography of Ethnography", in *Representation in Ethnography*, SAGE, 1995; and Marcus, G. E.&Cushman, D.: "Ethnographies As Texts", *Ann. Review of Anthropology*, 1982, 11.:25-69.

^{xix} Wittgenstein, Ludwig:

^{xx} Collins, *ibid* 1992:1.

^{xxi} *Ibid*, Prus, p.110.

^{xxii} Dourish&Button, *ibid*, p.3.

^{xxiii} Silverman, David: *Harvey Sacks*.

^{xxiv} The seminal works of the ethnomethodologists are Garfinkel, Harold: *Studies in Ethnomethodology* (1967); Cicourel, xxxxx: *Method and Measurement in Sociology* (1964); and by Harvey Sacks, who developed a particular form of ethnomethodology - the conversation analysis, xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx. As to the name of their endeavour, Garfinkel modeled it after what is known in anthropology as the 'ethnoscience approaches', e.g. ethnobotany and ethnomedicine. However, in sharp contrast to how one in these 'spin-offs' from anthropology as a researcher developed classifications or taxonomies for their (the natives', the tribes') ordering of nature or bodies or whatever, the ethnomethodologists described how the social actors *themselves* went about in working out and communicating distinctions or demarcations. See also Lynch, Michael: *Scientific practice and ordinary action*, Cambridge: Cambridge University Press, 1993.

^{xxv} *Ibid*, Dourish&Button, p.4-6.

^{xxvi} Ibid, Lynch, p.5 and p.1.

^{xxvii} Ibid, p.272.

^{xxviii} Ibid, p.38.

^{xxix} Ibid, Dourish&Button, p.1. The authors here underlines the importance of Lucy Suchman's book *Plans and Situated Actions* (1987) in establishing the relevance of anthropological and sociological reasoning for the problem of human-computer interaction; "...it has come to occupy an almost iconic position within the field". Suchman's argument and analysis drew strongly on the ethnomethodological tradition. A lot of what is being practiced, however, does not very strictly or consciously link up with the programme of Garfinkel et al; it is more 'ethnography in general'. Also, there were important pioneers before the ethnomethodologists. In the 1920ies, the 'Chicago School of sociology' started to use ethnography "...in turning an anthropological eye not to the tribes of the south Pacific but to the life of American cities... and to the studies of work settings from the perspective of technological design and evaluation". In a way, Dourish&Button concludes, the present strong focus on ethnomethodology is only partly due to its own merits - it is "basking in the sun of ethnography".

^{xxx} Ibid, p.7.

^{xxxi} See *ibid*, p. 13-25, for an outline of a synthesis between design and ethnomethodology - 'technomethodology'.

^{xxxii} In particular the works by the later Wittgenstein and also e.g. Winch, Peter: *The Idea of a Social Science and Its Relation to Philosophy*. London: Routledge&Kegan Paul, 1958.

^{xxxiii} (not om Edinburgh-Bath, leading names of the group, referens på the seminal paper om The Strong Programme och dess princip om symmetri)

^{xxxiv} Ibid, Lynch, p.3.

^{xxxv} Lynch, Mike, Art and Artifact in Laboratory Science.

^{xxxvi} Ibid, p.314.

^{xxxvii} Ibid, p.39. In a volume edited by Pickering (*Science: From Knowledge to Practice,...*) David Bloor, responds to the analysis linking 'SSK' with inconsistency and remains of good old scientism. He there claims that in Wittgenstein's theory on behaviour, there is a 'hole' or open space as there is no straight line between the formulation of a rule and the practice accompanying it. Still something connects them, which for Bloor is 'the social', construed as some kind of interest. For Lynch, this appropriation of Wittgenstein is about as dubious as can be. One cannot, *that* is what we can learn from the great philosopher, he replies, grasp a rule without grasping the field of practical activities to which the rule speaks. And that leaves no room whatsoever for causal, sociologically reductive concepts like 'interest'. Whereupon Bloor insists that the frontier to 'the local' is always in parts transparent or blurred, giving leeway for 'the something else'. Etcetera.

^{xxxviii} Woolgar#

^{xxxix} Woolgar, S.: "The Turn to Technology in Social Studies of Science". In *Science, Technology & Human Values*, Vol.16 No. 1; Winter 1991, 20-50.

^{xl} MacKenzie, D. & Wajcman, J.; *The Social Shaping of Technology*. ... 1985.

^{xli} Button, G.; "The Curious Case Of The Vanishing Technology". In Button, G. (ed): *Technology and Working Order: Studies of Work, Interaction and Technology*. Routledge, London, 1993.

^{xlii} Ibid, p.10-11.

^{xliii} Czarniawska, Barbara:

^{xliv} Czarniawska.....

^{xlv} Czarniawska, Barbara: *Exploring Complex Organizations - A Cultural Perspective*. Sage Publications, 1992.

^{xlvi} Ibid, p. 123.

^{xlvii} Ibid; 121, 123, 124.

^{xlviii} Collins, Harry: *Changing Order*.1992, p.12.

^{xlix} Lynch, Michael: