Discovering Work: A Topical Introduction

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> "**discover** [...] *v.* **1.** To arrive at through search or study. **2.** To be the first to find, learn of, or observe. [< LLat. *discooperire*, to reveal]" (American Heritage Dictionary, p. 203)

This special issue of *Ethnographic Studies* offers a collection of ethnomethodological studies of practical investigations in the natural sciences, mathematics and related domains (e.g., surgery). The leitmotiv of the collection – "discovering work" – hints at both its outlook and topic.

On the one hand, the collection brings together descriptive studies of practical activities in the domains mentioned above, studies that teach the reader those domains "from within", so that s/he may (re-) discover their constitutive activities in their phenomenal detail – be it in tutorial situations, expert practice or hybrid settings. On the other hand, the collection offers the reader a distinctive reminder of "discovering work" as an ordinary feature of both science instruction and research practice – that is, their directed character, to expose or find something *new* (at least to the involved student or practitioner) – instead of dismissing that feature on philosophical or sociological grounds (e.g., from a skepticist stance, as integral to many constructivist approaches).

To meet that double objective, the collection favors descriptive, video- and/or practice-based approaches, as well as detailed investigation into the close, yet curiously neglected ties between action and instruction, practice and pedagogy.

"Discovering work", then, stands as an introductory gloss for the instructive and methodical work that it takes to have any discovery recognizably obtained and exhibited, in and as part of a distinctive practice and manifest discipline. The gloss encapsulates the heuristic orientation of disciplinary inquiry, devoted to "making discoveries", if not in the second then at least in the first of the two senses quoted in the epigraph.[1]

The remainder of this introduction is meant to be "topical" in a double sense. First, the very topic of discovery is introduced, as a classic topic in social studies of science, yet re-specified by ethnomethodological inquiry. Second, the point and purpose for taking up that topic at all and re-specifying it here and now, in this special issue, is elaborated upon, especially with respect to the current mainstream in science and technology studies (STS). Finally, the collected studies are briefly presented.

From discovery to discovering work: Re-specifying a classic topic

As M. Lynch points out in his contribution to this special issue,

> "Discovery is one of the most persistent and alluring topics in philosophy, history, and social studies of science, and yet there is surprisingly little work that directly addresses *discovering work*." (Lynch, this issue, p. 79; emphasis added)

[1] H. Garfinkel examined this heuristic orientation as a routine feature of the natural sciences in everyday practice – that is, their ordinary, if not intended lack of "foregone conclusions" (Garfinkel, 2002).

Lynch's remark echoes a related, much earlier comment by A. Kaplan:

> "Because our reconstructions have occupied themselves with justifications, we have concluded that there is no logic-in-use in making discoveries." (Kaplan, 1967:14)

The point of recalling Kaplan's comment is to hint at the intellectual tradition that runs across philosophy in epistemological mode and social studies of science. Although Kaplan's comment bore mainly on the philosophical reconstruction of research practices, it applies to the *sociological* reconstruction of the resulting sciences and their technical contents as well.[2]

Indeed, the "sociology of scientific knowledge" (SSK) envisaged a social explanation for the justification, acceptance or refusal of knowledge claims, under causalist rather than rationalist auspices, where it had been previously sought of "false beliefs" only, if at all (e.g., Bloor, 1991, 2004; Shapin, 1996). This bold move, now largely taken for granted, proved consequential in many respects. One consequence was, and remains, that it prevented SSK from pursuing descriptive inquiry into "science as a practice" (Pickering, 1992:1-8). In particular, the "lived work" at figuring out warrantable claims, conducting probative experiments or triggering novel findings, under the chosen auspices, tended to escape its empirical attention and analytic focus (ibid., pp. 5-6). The same holds for later attempts at quasi "techno-anthropological" explanation, as promoted by B. Latour against and yet in the vein of SSK (see Quéré, 1989).

As D. Bloor acknowledged in a recent entry to a philosophy dictionary,

> "Sociologists have little to offer on the origin of ideas [e.g., the logic-in-use in making discoveries], but much to say about their evaluation and subsequent elaboration." (Bloor, 1998)

Ethnomethodological inquiry, to cut a long story short, doesn't suggest separating the "origin of ideas" from their "evaluation and subsequent elaboration," as D. Bloor's formulation does. Indeed, such inquiry rejects the analytic separation of mental predicates (expressing an "intention," "knowledge," "belief" or "doubt") from the practices that enact, instantiate or otherwise relate to them (Watson and Coulter, 2008:11-13). Positively put, ethnomethodological inquiry aims at making explicit the "*genealogical relationship between social practices and accounts of those practices*" (Lynch, 1993:1) – be it in terms of mental, epistemological or other predicates. As it happens, a key study that examined the mentioned relationship in perspicuous detail was devoted to discovering work: the seminal paper by H. Garfinkel and his colleagues describing an "optically discovered pulsar" as an astronomically accountable object (more of which below).[3]

Most laboratory and controversy studies were devised in the vein of SSK however, not so much for the sake of empirical

[2] The "knowledge/belief trick" (J. Lee, personal communication), where positive knowledge is defined as "accepted belief", does not undermine the mentioned continuity but elaborates and presupposes it. The trick has recently been (re-) performed as a "validity/credibility" swap (see Shapin, 2010a).

[3] The key transition has been characterized as follows: "rather than trying to *explain* a practice in terms of underlying dispositions, abstract norms, or interests, a task for sociology would be to *describe* the ensemble of actions that constitute the practice. This is precisely what ethnomethodology seeks to do." (Lynch, 1992:290; emphasis added) More recently, see also Doing (2009:34).

investigation, ethnographic description or social explanation alone (as if that restriction would have constituted a "failure of nerve", Hess, 2001:242), but to dismiss arguably prevalent views on science and technology ("naïve realism," "critical rationalism," "depoliticized objectivism," etc.) or, at least, to contribute to the discussion of such views through an "analytic critique of science" (Collins, 1996:240-41).[4]

This critical thrust – facilitated by the "practice/predicate" disjunction as well as the "knowledge/belief" trick – appears particularly prominent when it comes to the topic of discovery and discovering work.

To begin with, the "mentalistic model of discovery," where outstanding individuals are naïvely credited momentous achievements, was to be discarded and substituted by an "attributional model," where the "status as discovery" is redefined and re-explained, retrospectively, as a "function of perception by the community" (Brannigan, 1980:565, 1981:71). In the same vein, the common idea that "science works at discovering preexisting reality" would have to be replaced, once it had been disclosed as a popular myth, by the opposite idea according to which "representation rationalizes and thus constitutes scientific objects *post hoc*" (see Woolgar, 1988:55-66). More recently, B. Latour has made a moral appeal: any description of "matters of fact," whether constructivist or not, should be located in a discussion of "matters of concern," his concern of the day being (quasi-)constructivist denials of climate change and its human origin (Latour, 2004).[5]

As the sampled moves suggest, an argumentative stance is cultivated with respect to social epistemology, rather than a descriptive interest in discovering work.

To refocus on description as the prime methodological objective means - at least for a start - to abandon the critical task of adjudicating between different models and modes of reasoning. Ethnomethodological inquiry, in particular, abandons the misleading competition with presumed "common sense" in favor of the descriptive analysis of practical action and practical reasoning (Hester and Francis, 2007). For the detailed study of discovering work, this means *inter alia* to disentangle investigative relevancies, as encountered in research practice at the worksite, from their conflation with (putatively) dubious philosophy of science, as imputed and dismissed *ex officio* or *ex cathedra*. Discovering work, then, is and can be studied as a practical achievement through and through – that is, an observable achievement "without residue" (R. Watson, personal communication), including its sometimes arguable character.[6]

To return to the practical achievement, in Garfinkel's (1991) terminology, means to "re-specify" the topic of discovery, as formulated in the sociological or any other literature, and that by focusing upon its relevance in-and-to the research practices under scrutiny (at the lab bench or surgery table, in front of the computer screen, etc.). The topic focused upon, by consequence,

[4] On the philosophical agenda of SSK, see Friedman (1998); Shapin (1996:296-297).

[5] His cosmopolitan lamentation, rightly or wrongly, elaborates the following question: "While we spent years trying to detect the real prejudices hidden behind the appearance of objective statements, do we now have to reveal the real objective and incontrovertible facts hidden behind the *illusion* of prejudices?" (Latour, 2004:227)

[6] Research practice might not fit any philosophical ideal of (say) disembodiment, determination or disinterestedness. Yet to conclude, if ironically, from this lack of fit that research practice is "never pure" witnesses lacking disentanglement yet again, respectively sustained conflation of analysts' and practitioners' perspectives (e.g., Shapin, 2010b).

is not restricted to "groundbreaking discoveries", around and through which history of science is made and unmade (starting with the "anomalies" of interest to Kuhn, 1962). Neither is it restricted to the selective media coverage of reportedly extraordinary events. To the contrary, discovering work is examined as a constitutive and pervasive feature of the natural sciences in their mundane routine[7].

A rationale for re-specification: Science and technology studies today

In 1981, H. Garfinkel and his colleagues published the paper titled "The Work of a Discovering Science Construed with Materials from the Optically Discovered Pulsar" (Garfinkel et al., 1981). The key point of the paper was to highlight the intertwined character of the locally enacted inquiry and its progressively discovered phenomenon. The decisive move, then, was not to draw an ironic contrast between research practice and scientific discourse, but to recover the former as a uniquely achieved, yet indispensable basis for the latter, in and for the examined case of astronomical observation. This unique achievement was described in its "first time through" properties, with the observational "runs" leading to the emerging phenomenon, the "optically discovered pulsar," and vice-versa. The apt analogy of a "potter's object" emphasized this mutual elaboration in its temporal course, practical enactment and instrumental adjustments, thus resulting in an "occasioned production" (Koschmann and Zemel, 2009).

This special issue returns to discovering work, *qua* practical achievement *in situ* and *in vivo*, as highlighted in the "pulsar paper," including a first appreciation of its current reception, thirty years on (see Bovet et al., this issue).

Our principal reason for returning to that topic, thirty years on, is the ironic gap between programmatically repeated calls for a "practice turn" in science and technology studies (STS) (e.g., Lynch, 1993; Pickering, 1992; Schatzki et al., 2001) and the relative scarcity of effectively practice-investigating studies in the field, devoted to answering the (seemingly) prosaic question: "*what are they doing*?" (Sharrock and Button, 2011:225). There remains, indeed, a manifest scarcity of descriptive studies that answer that question stringently, informatively, and sociologically – that is, by having it addressed as *just how* whatever "they" (this or that local staff of lab members) seem to be doing can be seen for what "it" is *to them* (this or that intricate task and social phenomenon)? Ethnomethodology at work, arguably, has proven the most apposite and productive in tackling the raised question (e.g., Lynch et al., 1983; Lynch and Sharrock, 2003; Rouncefield and Tolmie, 2011). Yet it remains or has become largely absent from STS.[8]

If it were all "gloom and doom", this special issue couldn't have been assembled, however. Our aim as editors, at least, was not to indulge in misplaced nostalgia but to gather recent studies in ethnomethodological perspective and to reflect upon their possible relationship(s) to STS at large (for a related initiative, see Lynch, 2011b). Therefore, we have assembled concrete exemplars of both

[7] "Mundane" doesn't mean trivial (e.g., Sintonen and Kiikeri, 2004:241). Otherwise, scientific training, as examined in some papers of this special issue, would be pointless: "[research] 'practices,' after all, must be practiced." (Mody and Kaiser, 2008:383)

[8] As M. Lynch concedes, "judging from submissions to this journal [*Social Studies of Science*] and the programs at recent Society for Social Studies of Science (4S) meetings, ethnomethodology is not much in evidence." (Lynch, 2011a:2)

practice-based studies of domain-specific skills, as recently advocated by E. Livingston (2008), and video-based studies of practical activities in the natural sciences, as honed by several analysts, often at the Ethnomethodology/STS interface (see, among others, Alač, 2011; Greiffenhagen and Sharrock 2011; Mondada, 2005).

The ensuing collection contains selected ethnomethodological studies that run against the grain of mainstream STS. The collection, we hope, should thus contribute to renewed discussion (see below). In the meantime, we may sketch the key tendencies in current STS that, in our view, contribute to move the field away from detailed investigations of research practices, potentiating thus a "practice U-turn". These tendencies may be listed as follows:

- First, the manifest abandonment of lab ethnography and its descriptive interest in "research in the making" at the worksite, as if lab work had been conclusively described (e.g., Doing 2008:291-292);
- Second, the promotion of theoretical frameworks to *re*-present social and institutional configurations, incapacitating one's "seeing things for themselves" (Hutchinson et al., 2008);[9]
- Third, the virtually unbounded multiplication of topical fields (including governance, finance, etc.), at the seeming expense of any sustained focus on constitutive practices.[10]

As unwarranted and precipitated as the retreat from lab ethnography and the related compulsions to "theorize politics" and "multiply topics" may have been, all of them have caught on and set the STS agenda up to the present day, as the introduction to the current *Handbook of Science and Technology Studies* suggests.

After having spelled out the purpose of the *Handbook*[11], its editors comment upon the received contributions:

> "What emerged [from those contributions] is a *multifaceted interest* in the changing practices of knowledge production, concern with connections among science, technology, and various social institutions (the state, medicine, law, industry, and economics more generally), and urgent attention to issues of public participation, power, democracy, governance, and the evaluation of scientific knowledge.
>
> These topics are approached with *theoretical eclecticism*: rather than defending pure positions, authors risked strategic crossovers and melded ideas from different intellectual domains. Normativity, relativism, and evaluation of expertise and scientific knowledge endure from previous volumes but in new ways: no longer just problems for philosophical reflection, such concerns are now posed in terms that seek *collective political and social resolution*." (Hackett et al., 2008:3; emphasis added)

Thus the current mainstream in STS, at least in the light of this overview, takes for granted three things. First, its "multifaceted interest" in the "changing practices of knowledge production" (and so on) assumes those practices to be readily and interestingly identifiable, without the awkward detour of descriptive analysis. The focus on their "change," institutionalized "connections" and associated "issues" presupposes the

[9] Actor-Network Theory constitutes, arguably, the paradigmatic case of this tendency.

[10] For an uncompromising critique of this tendency in British sociology, see Watson (2000).

[11] "[…] a handbook that would consolidate the field's accomplishments, welcome new scholars to enter STS, and indicate promising research pathways into the future." (Hackett et al., 2008:3)

problem of initial practice description to be solved by itself (to the satisfaction of the highlighted focus at least). Second, "theoretical eclecticism" is assumed to offer the most accurate appreciation, not so much of distinctive research practices (their understanding being already taken for granted), but of the various topics in terms of which those practices should be triangulated and reinterpreted ("normativity," "relativism," "evaluation of expertise," etc.). Third, "collective political and social resolution" is inscribed as an indispensable topic, if not a practical task of STS scholarship, despite (or because of?) its "multi-theoretical" bent.[12]

None of the three assumptions is gladly shared by ethnomethodological inquiry. To the contrary, such inquiry, at least when understood as an autonomous endeavor (Sharrock and Watson, 1988), may be said, and seen, to derive its rationale for re-specification from a manifest and sustained lack of agreement. The principal aim of this special issue, however, is not to take a critical stance but, rather, to assemble an interesting array of case studies. These are briefly presented in the next section.[13]

Varieties, ambivalences and consequences of re-specification: The studies in this special issue

The idea for collecting the ensuing studies in a special issue such as this goes back to a workshop titled *Scientific Practice as Ordinary Action*, held at the University of Fribourg, Switzerland, in March 2007. The aim of the workshop was to bring together current ethnographies of lab work, devised in ethnomethodological or related perspectives. As the title of the workshop suggests, M. Lynch's seminal book provided a key inspiration, especially its invitation to proceed with "epistopical re-specification," understood as an empirical inquiry into the local relevance of epistemological topics as phenomena of social order and practical import (Lynch, 1993). A related motive for the workshop was to discuss video-based analysis of research activities and its possible contribution to such "re-specification." A variety of papers were thus presented, ranging from an ethnographic investigation into NASA's Mars expeditions to video analysis of pointing gestures by agronomists, and fieldwork on dolphin classifications by marine biologists.

This special issue, in turn, gathers contributions that are explicitly focused on *discovering work in an ethnomethodological perspective*, one way or other. Some of these contributions were presented at the workshop; others were solicited subsequently from attending parties; still others, such as this introduction, were self-initiated.[14]

The contributions to this special issue, in particular, deal with the following questions:

1) Just how is a [reliable discovery in and as school science] achieved? (Sherman Heckler)
2) Just how is the [surgical procedure to have a patient's ureter discovered] instructed and engaged in? (Koschmann and Zemel)
3) Just how is a [practical impossibility in mathematical reasoning discovered] as an instructive expression of its lived course (Sharrock and Anderson)?
4) Just how are [a first local spectroscopy on a complex superconductor and the

[12] "Reflexive" and "deconstructive" initiatives, in turn, seem to have curiously vanished (e.g., Ashmore, 1989; Merz and Knorr Cetina, 1997).

[13] For an initial ethnomethodological critique of constructivist re-descriptions of discovering work and S. Woolgar's "policy of inversion" in particular, see Button and Sharrock (1993).

[14] The workshop program is available at http://fns.unifr.ch/situatedpractices/en/.

instant appraisal of its unprecedented result] jointly achieved? (Sormani)
5) Just how is the [discovery status of a thought-to-be-extinct, yet recently filmed woodpecker] established, challenged and reexamined? (Lynch)
6) Just how is a [biological ontology as the putative framework for future discoveries] routinely elaborated? (Sharrock, Randall, and Greiffenhagen)
7) Just how might the ["pulsar paper" be rediscovered as a "citation classic"] in ethnomethodology, STS and beyond? (Bovet, Carlin, and Sormani)

Readers are invited to read the respective studies to have the stated questions answered in detail – to have, for instance, the intricate work of elaborating a [biological ontology as the putative framework for future discoveries] specified. The formulations in square brackets, in each and every case, summarize the involved participants' concern (as suggested by Garfinkel and Sacks, 1970:352). The key aim of the collected studies, then, is to describe "just how" this manifest concern is addressed by them, respectively – that is, through their practical enactment of recognizable, variable and yet distinctive courses of discovering work.[15]

In what sense, then, do the offered descriptions offer a "re-specification" of discovery as an epistemological topic and social phenomenon? There is no simple answer to this question, if only for the outlined variety of investigative practices, each of which defines "discovering work" and "discovery" in its own terms. The ambivalent character of ethnomethodological inquiry, as exemplified by this special issue, complicates matters further.[16]

Indeed, such inquiry may be understood in two ways at least: either as a "beginning" or an "ending" (Hutchinson et al., 2008:109-110).

When understood as a *beginning*, its investigations may be thought of as a "first step in the direction of a genuine sociological science, one which differentiates itself from sociology-at-large […] in being the only branch of sociology that addresses itself *directly* to actual and observable occurrences in and of the social order" (ibid., p. 109; emphasis added). Transcript-assisted video analysis, conducted in conversation analytic vein, can be seen as the most recent representative of this branch. Conversely, when understood as an *ending*, ethnomethodological inquiry renders superfluous the very "idea of 'a sociology' as the proprietary possession of a profession of investigators" (ibid., p. 110). That is to say, the topics and concerns of the profession, including the perceptive video analyst, are abandoned as topics and concerns of the profession alone. Instead, they are recovered for how they already feature, provided that they do, in "*socially organized indigenous practice*" (ibid.).

Depending upon the "beginning" potential or "ending" power attributed to ethnomethodological inquiry, the idea of "re-specification" should be interpreted differently. Whenever its beginning potential is explored or exploited, ethnomethodological inquiry may satisfy a professional sociological demand for (more) empirical detail, as possibly relevant to a theoretical argument or practical concern (e.g., how to improve "human-computer interaction"). More

[15] G. Ryle's (1949) distinction between "activity verbs" (such as looking, searching or researching) and "achievement verbs" (such as seeing, finding or discovering) allows us to raise the question, but not to answer it.

[16] Only when seen from too far away can it be dismissed as a defensively "pure" approach.

importantly, however, it should allow the investigator to specify the "identifying details" of the examined practice, those details which identify the practice for those involved, while proving relevant for and attended to, by them, in its actual course. Conversely, when the ending power of ethnomethodological inquiry with respect to professional prerogatives is emphasized, then the self-instructive character of any examined line of practice should be foregrounded. It is through its autodidactic exercise and eventual mastery that the analyst gains his or her detailed understanding of its immanent, yet accountable features – be s/he equipped with pen and paper, a video camera, a prism or any other potentially heuristic device (see Livingston, 2008).

Space and time prevents us from describing the observable consequences of the indicated ambivalences on the actual investigation of discovering work. Simply, we invite readers of the ensuing studies to bear those ambivalences in mind. To do so should not only add to the appreciation of the particular outlook of each study but also contribute to revive discussion "in", "with" and "against" social studies of science – the multifaceted concern of this special issue.[17]

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[17] For further discussion of the multi-prepositional relationship of ethnomethodological inquiry to its intended phenomena, including sociological, anthropological or any other type of inquiry, see Rawls (2002:19).

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