



**SUSTAINABLE
PRACTICES
RESEARCH GROUP**

**Where the Action Is
(On Large Social Phenomena Such as Sociotechnical Regimes)**

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Working Paper 1

Where the Action Is (On Large Social Phenomena Such as Sociotechnical Regimes)

This essay examines a long-standing topic in social thought: the proper analysis of the constitution of large social entities such as corporations, economies, and sociotechnical regimes. It offers a practice theoretical account of their constitution based on previous work of mine on the character of social life. It is sometimes said (e.g., Brand 2010) that practice theory is best at analyzing local or micro phenomena. Such claims hold some truth. As, however, the work of Giddens and Bourdieu and, I hope, this essay make clear, practice theory does have useful things to say about large social phenomena. The present essay is also ultimately animated by both a practical interest in the governance of sustainable social arrangements and the conviction that the character and possibilities of governance are clearer if what is to be governed is better grasped.

The focus of the essay might be more conventionally described as the nature of macro, global, or structural phenomena, the contrast being with micro, local, or agential ones. One reason I work with the concept of the large instead of with those of the macro, global, or structural is that it carries less baggage. Another is that, in the end, I argue that the scalar contrast between larger and smaller phenomena is basic to social analysis. As I will explain, moreover, I analyze large social phenomena as bundles of practices and material arrangements, more specifically, as constellations of such bundles or of slices or features thereof. This analysis does not imply that practice-arrangement bundles instantiate a type of phenomenon that contrasts with large phenomena, for instance, small, micro, or local phenomena. Constellations of bundles are just larger bundles. So large social phenomena (like macro and global ones) have the same composition as do small, local, and micro phenomena: they consist of practice-arrangement bundles or of features or slices thereof. Large social phenomena might contrast with small, local, or micro ones, but what constitutes them is not inherently an instance of the latter. Whether, moreover, a given bundle counts as large (or macro or global) versus small/micro/local depends on the relevant universe of comparison. I dub this position “flat

ontology,” though this term has been previously used, for instance by Latour (2005), to label competing positions.¹

This essay displays a bias toward the small. I am sympathetic, therefore, with authors such as Tarde, Latour, and Garfinkel who prioritize the micro, local, or experiential over the macro, global, or trans-experiential. I will also occasionally use ideas of the first two theorists as familiar social theoretical points of reference through which to clarify my position. The present essay is biased toward the small in the sense that its account of large social phenomena builds on analyses presented in previous work of *a* practice-arrangement bundle. The examples, moreover, through which I substantiated these previous analyses were of what most thinkers would call local or micro phenomena. This *modus operandum* does not imply that individual bundles are “units” or “building blocks” out of which larger constellations of bundles are formed. As suggested, constellations of bundles have basically the same composition that local or single bundles do. The difference between constellations of bundles and local or single bundles is primarily a difference in spatial-temporal extension (greater and lesser density and complexity do not necessarily align with larger and smaller, respectively). Local or micro bundles simply offered a tractable object through which to substantiate the composition of bundles. My prior focus on the local or single bundle was, thus, methodological, not ontological.

Finally, my remarks about large phenomena will focus on a type of phenomenon at stake in debates about the governance of sustainable social arrangements, namely, sociotechnical regimes. As indicated, the practical context of this essay is the question of how society can be moved onto a more sustainable path. One question in this context is the value of working with concepts of large phenomena.

1. The Plenum of Practice-Arrangement Bundles

Bundles of practices and material arrangements make up sites of the social (Schatzki 2002). What I mean is social life, or human coexistence (the hanging-together of human lives)

inherently transpires as part of such bundles. It follows that the sum of such bundles marks out the plenum in which all social affairs transpire. In using the term “plenum” to denote all the bundles there are, I indicate that the basic ingredients of social facts and phenomena are of a piece. Social affairs display a certain high-level ontological sameness: in every instance, social phenomena consist of some slice or aspect of the plenum of practice-arrangement bundles. Bundling, consequently, is a fundamental social mechanism. The present section describes three features of this plenum important for the discussion that follows. These are the objective spatial-temporal spread of practice-arrangement bundles, the event character of activity, and the emergence, persistence, and dissolution of bundles.

By “practices” I mean spatially-temporally dispersed, open sets of doings and sayingsⁱⁱ organized by common understandings, teleologies (ends and tasks), and rules (see Schatzki 2002). By “material arrangements” I mean linked people, organisms, artifacts, and things of nature. Practices and arrangements bundle in that (1) practices effect, alter, use, and are inseparable from arrangements while (2) arrangements channel, prefigure, and facilitate practices (see Section Two). An important feature of practice-arrangement bundles, and thereby of social phenomena, is interwoven timespaces: interwoven teleologies and motivations that govern, and place-path contexts in which, the activities composing bundles and social phenomena take place. (see Schatzki 2010: chapter two)

Practices, arrangements, and bundles extend over objective time and space. It follows, *pace* the widespread assignment of practice theory to “local” or “micro” phenomena, that the above ontology grants no priority to the local situation. The activities, entities, rules, understandings, and teleologies that are at work in any local situation are elements of phenomena—practices, arrangements, and bundles thereof—that stretch out over time and space beyond such situations. Indeed, these items come to be at work in local situations *because* they are components of practice-arrangement bundles. Elements of local situations also often come from elsewhere to be part of them (see Latour 2005: 191ff). This ontology must, therefore, be distinguished from ethnomethodological and phenomenological ones, which highlight local situations.

Now, an important fact about activities—doings and sayings—is that they are events, or happenings. I mention this in part because an event is not the same thing as a change: not all events amount to a change in something. To be sure, every activity is unique and thereby effects a change in, that is, an expansion of, the total stock of events. Not every activity, however, constitutes changes beyond this. And even when one does, the extra bit(s) of change often does not amount to a change in a social fact or phenomenon. Every instance of turning on a dishwasher results in a little more dishwashing liquid being used up and the machine's parts becoming a little more worn, but very few such events amount to changes in family affairs or washing practices. On the contrary: turning on the dishwasher *perpetuates* the practices and bundles that compose familial and other social affairs. The realization that many activity events perpetuate existing practices and bundles and effect only negligible changes, if any, opposes the prominent contemporary intuition that becoming—or process— qualifies human life and sociality (when becoming and process are understood as continuous change). Prominent contemporary advocates of this intuition are Gilles Deleuze (1988), Anthony Giddens (1979), Tim Ingold (2000), Jane Bennett (2009), and John Connolly (2011), and the idea dates back to such luminaries as William James, Gabrielle Tarde, Wilhelm Dilthey, and Henri Bergson. These theorists deeply prioritize fluidity over stability and development over continuity. On the Heideggerian event-ontology that I favor, however, *none* of these phenomena can be prioritized over the others: neither fluidity over stability nor stability over development. Social life happens, and in any given swath of space-time the mass of happenings—doings, sayings, and other events—that occurs adds up to some mix of change, stability, fluidity, and continuity.

Human activity is not just an event—it is an indeterminate event (see Schatzki 2010). What I mean is that nothing regarding teleology or motivation can determine or fix, prior to activity, what a person does or why. It is only *with* the occurrence of activity that what a person does and why become determinate. The indeterminacy of activity does not imply that what a person does is undetermined, or random. What a person does is determined by the ends for which he acts (teleology) and that in response to or in the light of which he does so (motivation). But that for which a person acts, as well as that in response to or in the light of which he does so, are not definite until he acts. Stated differently, the past does not determine

present activity. Rather, present activity determines what, if anything, in the past determines it (on this point, see Mead 1980). Each present is self-organizing and, in this sense, a new start. As intimated, this fact does not imply that the present always differs from the past. More often than not, in fact, the present is the same as the past rather than different from it, at least in most regards. But this fact does imply that every present is potentially the site of something new, of an activity that is significantly different from the past or of a divergence that over time leads to a significantly different world.

Other theorists have acknowledged the existence of such new starts. Latour points toward them when he writes,

Why do fierce armies disappear in a week? Why do whole empires such as the Soviet one vanish in a few months?...Why is that quiet citizens turn into revolutionary citizens? Why is it that some dull individual is suddenly moved into action by an obscure piece of news? Why is it that such a stale academic musician is suddenly seized by the most daring rhythms? (245)

Latour attributes the occurrence of such breaks to the existence of what he calls “plasma:” a mass of unlinked and unmeasured mobile elements that can be captured in new associations (new nets of connected entities), in my language, new practice-arrangement bundles. Such elements do exist (though they do not, *pace* Latour, form an all-encompassing realm from which associations precipitate). Most departures from the past, however, take a self-contained form as the not pre-determined occurrence of activities that prospectively could not have been anticipated and retroactively can be seen as breaks whose explanation is provided by the teleology and motivation that imbues them. Free floating elements are not necessary to such starts.

Bundles of practices and arrangements provide the material out of which social phenomena, large and small, consist. As a result, changes in such bundles represent the basic stuff of social change, and the emergence, persistence, and dissolution of bundles are basic social phenomena. The following summarizes ideas about the emergence, persistence, and

dissolution of bundles that I have formulated elsewhere (see Schatzki forthcoming). This summary roughly sketches basic dynamics of social life.

The emergence of a bundle is the establishment of one or more activity manifolds that conjointly transpire amid a particular arrangement or set of arrangements. This process can involve, among other things, the coalescence of organized activities (including the crystallization of common rules, teleologies, and understandings), the erection of links between previously unconnected practices or arrangements, the appropriation or production and introduction of material entities and arrangements, the bifurcation of an extant bundle into descendent bundles that develop separately, the hybridization of extant bundles into a new bundle, the accumulation of small changes over time, and the crystallization of bundles around people or things. The emergence of a bundle is the emergence of some new combination of doings, sayings, rules, teleologies, understandings, material arrangements, and relations between practices and arrangements.

The persistence of a bundle is a kind of unity in difference. A bundle persists when the changes it undergoes are limited, cumulative, and occur amid general continuity in its components: when the metamorphoses of its activities, the alterations of its arrangements, the evolution of its organizations and interwoven timespaces, and changes in linkages between its practices and arrangements and between it and other bundles hang together and are neither too frequent nor too large. When changes of these sorts are pervasive or massive, the bundle ceases to exist (see below). According to whether smaller changes that are not pervasive are infrequent or just occasional, a persisting bundle will count as stable or evolving. Generally speaking, the persistence of a bundle requires the perpetuation of its constituent activities, the stabilization of practical understandings, the maintenance of practice organizations and interwoven timespaces, and the continuing existence of the same or similar material arrangements.

Finally, bundles dissolve when overwhelming, frequent, or large-scale changes occur to them. The dissolution can be sudden and encompass the destruction of components (as during a war), or it can be a sustained nondestructive evolution away from predecessor bundles

through large, rapid, or cascading changes. Most cases of dissolution arise from exogamous causes, whereas many cases of evolution evince endogamous causes or a combination of the two.

2. Constellations

Social life inherently transpires as part of linked practices and arrangements. A bundle is a set of linked practices and arrangements. A constellation is a set of linked bundles. As I explain below, the kinds of link that exist among bundles are the kinds of link that connect practices and arrangements. A constellation, consequently, is just a larger and possibly more complex bundle, a larger and possibly more complex linkage of practices and arrangements.

Before filling in this picture, it will help illuminate my basic position to juxtapose it with Latour's. Just as I claim that all there is to social affairs are linked practices and arrangements, Latour holds that all there is to such affairs (and anything else) are associations and more associations, all linked. An association, as indicated , is a set of connected entities such as humans, artifacts, and things. The entities involved are experiential (e.g., "visible", Latour 2005: 174; for discussion, see Schatzki 2002: 185-8), and Latour refers to them collectively as actants, entities that do things. Entities that do things come to be part of associations via processes Latour collectively dubs "enrollment" or "transmission." Any state of affairs having to do with humans, thus any human social state of affairs (however this is defined), encompasses an association of humans and nonhumans. Latour's associations bear an obvious resemblance to what I call "arrangements." I hold, however, that social phenomena are slices or aspects, not of a plenum of arrangements alone, but of a plenum of linked arrangements and practices. Latour's account recognizes no pendent to practices and construes social affairs as composed of associations alone. This difference is tied to different attitudes toward human activity. On my analysis, human activities are the activities of individual people, but they are also essentially members of organized sets of activity. For Latour, by contrast, human activities, like activities more broadly, are only contingently related to one another.

A prominent line of discussion in the recent sustainability literature focuses on sociotechnical transitions and asks how sociotechnical arrangements can be made sustainable. A key concept in this literature is that of a sociotechnical regime. A sociotechnical regime is a “relatively stable configuration of institutions, techniques, and artifacts, as well as rules, practices, and networks that determine the ‘normal’ development and use of technology.” (Smith et al. 2005: 1493) Such a regime embraces technologies, practices, meanings, infrastructures, industry structure, policy, and knowledge (Geels 2002). For a regime to be relatively stable is for endogenous or externally induced changes in its components to be followed by adjustments in other components that restore a rough equilibrium (Smith et al. 2010: 441) An example of a sociotechnical regime is the coal industry generating cheap electricity for industries, businesses, and consumers in my home state of Kentucky. Described nontechnically, this regime includes (1) coal companies, (2) power companies, (3) equipment manufacturers, (4) transportation networks, (5) electrical lines, (6) government regulations and regulatory agencies, (7) professional associations and unions, (8) industries and businesses, and (9) consumers’ homes. These phenomena are either organizations, rules, or material networks. By an “organization,” I mean, roughly, an intentionally instituted and purpose-oriented configuration of interrelated human activities (or human cooperation). Any such configuration consists in practice-arrangement bundles and constellations or aspects thereof (see Schatzki 2005). A coal company, for instance, embraces such practices as those of drilling, blasting, clearing, debris removal, coal transportation, air quality monitoring, and showering carried out amid arrangements embracing rocks, coal veins, rail systems, safe rooms, forests, streams, and shower rooms. These bundles are tied to further bundles composed of loading, driving, and unloading practices carried out amid piles of coal, loading docks, and roads. Both these and more sets of bundles are also tied to bundles composed of accounting, executive decision-making, negotiation, public relations, government lobbying, and other practices carried on amid the arrangements composing offices, meeting rooms, company headquarters, restaurants, and government buildings. Parallel analyses can be given of power and manufacturing companies, the industries and businesses that consume electricity, governmental regulatory agencies, and unions. Essentially all organizations of these types in the state of Kentucky are part of the coal-

generated electricity regime since all of them use inexpensive coal-generated electricity delivered to them over electrical lines. More than electrical lines, however, link businesses, industries, and homes to the coal and power companies.

The coal-generated electricity sociotechnical regime is a constellation of bundles. The relations through which bundles are linked into constellations are either relations of the sorts through which practices and arrangements form bundles or relations of the sorts through which practices are tied to other practices and arrangements are tied to other arrangements. I will now provide typologies of these three sorts of relation (practice-arrangement, practice-practice, arrangement-arrangement). These relations define which bundles and constellations exist. As a result, they are what ultimately must be grasped and given an overview of in order to understand and depict social affairs. Consider, first, bundling.

Practices and arrangements are linked into bundles through five types of relation: causality, prefiguration, constitution, intentionality, and intelligibility. *Causal relations* between practices and arrangements take two prominent forms: activities altering the world, and entities and the events befalling them inducing activities. By "*prefiguration*," meanwhile, I mean the difference that the present makes to the nascent future. Contrary to the widespread analysis of prefiguration as a matter of enablement and constraint, I conceive of it as present states of affairs qualifying forthcoming activity on such registers as easier and harder, more and less expensive, nobler or baser, more or less time consuming, and so on. Material arrangements ubiquitously prefigure practices—that is, the continued happening of the doings and sayings that compose specific practice—by making some actions, inter alia, easier and harder or more direct or circuitous than others. Arrangements also prefigure changes in practices and arrangements. For example, existing coal company arrangements prefigure changes in company operations, making possible changes easier or harder, more or less expensive, more or less time consuming, and so on. Existing material infrastructures in the coal electricity regime also prefigure changes in these infrastructures or in the introduction of new ones (tied to alternative practice-arrangement bundles).

Arrangements *constitute* practices, meanwhile, either when they are essential to these practices or are pervasively involved with them over a swath of space-time. Coal veins are essential in this sense to coal mining practices, just as rail conveyor systems have helped constitute these practices for decades. Conversely, practices constitute arrangements when given arrangements would not exist were it not for particular practices. In this sense, coal mining practices constitute the mine rail systems they employ, but not the coal veins they mine. Practices are, next, *intentionally* related to arrangements via the thoughts and imaginings participants have about them as well as via the actions participants perform toward them (including using them). Coal miners, for instance, think various things about coal veins and rail systems and act toward them in various ways. A final sort of relations between practices and arrangements is *intelligibility*: arrangements having meaning for—being intelligible as such and such to—participants in a practice. I will not argue the point here, but the intelligibility of the world is tied to the practices people carry on: the meanings that coal veins, elevator shafts, conveyor systems, air quality monitoring devices, fellow miners, and supervisors have for miners are tied to the practices miners carry on amid these entities.

Relations of these five sorts form regions that can be thinner or denser, more compact or spread out, continuing or fleeting, and so on. These regions are typically very thick among the practices and arrangements that compose a bundle. In fact, it is the thicket of relatedness, its density and continuity, that makes it the case that a bundle exists. Mining practices, for example, maintain particularly thick causal relations with the mine shafts, coal veins, and conveyor systems, or the topsoil, rocks, and valley streams, on which the people carrying them out immediately act. Such practices maintain thinner causal relations with other company arrangements, for instance, those composing the company central office. The arrangements with which mining practices maintain thick causal relations also tend to be the arrangements with which they maintain constitutional relations, and it is the meanings of these arrangements' components that the practices subtend. It is with these arrangements that mining practices form a bundle. Relations of these five sorts can also, as suggested, link practices and arrangements belonging to different bundles. For example, events that befall the arrangements that help compose power companies or trucking distribution networks can

induce decisions by coal company executives, miners might think this or that about the trucking network that delivers coal to power plants, and changes in these networks make alternative company policies easier or harder to implement, more cost effective or ineffective, and so on.

When bundles hang together to form constellations, the relations through which they do so are not just relations of sorts through which practices and arrangements form bundles. They also include relation of sorts by which practices are linked to other practices and arrangements are tied to one another. Practices are linked to one another, for instance, when their organizations contain the same element, i.e., the same end, rule, task, or understanding. Many of the different practices, for instance, that help make up the coal company share the end of earning profit. Practices are also linked when one item being part of one practice's organization is not independent of a different item being part of a different practice's organization: the division of tasks among practices at the mine is a good illustration of such orchestration. Practices are linked via interwoven timespaces, moreover, when the ends people pursue, the events to which they react or in the light of which they act, and the place-path contexts in which they proceed are common or orchestrated. Practices are also linked by way of sharing the same doings and sayings: a particular instance of a foreman observing miners, for instance, can be an episode in both extraction and management surveillance practices. Practices are also linked via chains of action. An example is a minor's observation of an elevated methane level on a measuring device leading to a frantic call to the control room leading to the sounding of an alarm leading to an evacuation of the mine. Practices are linked, finally, by intentionality when a person carrying on one practice thinks or imagines something about another practice or acts toward that other practice; an example is a miner on the job reflecting about management actions.

Practices are connected through the sinews of common and orchestrated organizations and timespaces, shared activities, chains of action, and intentionality. These connections can exist regardless of whether the practices involved are more tightly and consistently knit—as when they form a bundle—or more thinly, loosely, and discontinuously linked as when they are components of different bundles that help compose a constellation such as the coal company.

In addition to relations between practices and arrangements and relations among practices, relations among arrangements help constitute bundles and constellations. Links among arrangements can consist in common elements, causal relations, or prefiguration. To begin with, arrangements link when they contain the same material entities. Arrangements in the mine and those composing the company communications system are linked at the radio transmitters in the mine. Arrangements likewise link via causal relations between their elements. An example is a malfunction of the radio transmitter at the office setting off an alarm in the mine. Another is power company arrangements and arrangements at consumers' homes being causally linked via the generation, transmission, and storage of electricity. Another form causal relations take is enablement and shutting down. Material arrangements can facilitate or hinder processes and events that befall the material entities that compose other arrangements. The power line link between power station and home obviously enables physical processes to occur in machines at home, just as a brownout shuts them down. As with links among practices, links among arrangements can hold among arrangements that belong to a bundle or a broader constellation, that is, to a relatively tight, densely knit agglomeration of practices and arrangements or to a looser, more thinly interwoven set of such agglomerations. In fact, one factor contributing to the existence of more and less tightly woven agglomerations is the density of linkages among arrangements.

In sum, bundles form constellations through relations between practices and arrangements, among practices, and among arrangements. The site of the social is a mass of linked practices and arrangements that is spread out across the globe and changes through time. All social phenomena are slices or aspects of this mass. Social phenomena differ in the practices and arrangements that compose them and in the density, continuity, and spatial-temporal spread and shape of the relations among their constituent practices and arrangements.

3. Flat Ontology

The objective spatial spread of the plenum of practices and arrangements defines the boundaries of the possible objective spatial extensions and shapes of social phenomena. This also holds of the objective temporal spread of society. As Latour argues, there is nothing social “above” or “below” this mass: what there is to social life is entirely played out there. There does exist a “below” in Deleuze and Guattari’s (1987) sense of the molecular, namely, the composition of the entities that are components of the plenum of practices and arrangements. This molecular below embraces the physiochemical composition of artifacts and things of nature, as well as the biophysical subsystems and physical movements of people and living organisms. These material compositions and organizations can also be relevant to the progress of social life: they enable actions and other events to occur, ensure spatial-temporal persistence, and causally bear on the molar activities and properties of entities. But although social affairs depend on and reflect a molecular materiality, social life has no “above:” no structure or system that collects, encompasses, holds, or determines practices, arrangements, bundles, and constellations.

Another way of putting this claim is that social life itself brooks no levels. In the philosophy of science, levels of reality are conceived of as domains of entities between which systematic relations of causality, constitution, or supervenience exist. In social investigation, the two most familiar alleged levels are (1) a lower level composed of individuals together with their actions and interactions and (2) a higher level that encompasses entities such as social structures, systems, institutions, and the like. Like any alleged level, these two are levels if what populates the higher level—structures and the like—systematically arise from, are systematically constituted by, or systematically supervene on what populates the lower level (individuals and their activities), or if they themselves exert systematic causal effects on individuals and individuals’ activities. The plenum of practices and arrangements, however, is not composed of these two levels. Nor is it itself one or the other of them. Instead, significant features both of individuals and their activities and of structures and institutions are products, elements, or aspects *of* practice-arrangement bundles. Nor, as indicated, does a structural level

of social phenomena exist above practices and arrangements. So social life does not admit levels. It also follows from these considerations that “macro and “micro” cannot designate distinct levels of society.

To make these claims more concrete, I turn to questions of sociotechnical development, in particular, to the transitions management approach to such development. This approach adopts the so-called “multi-level perspective” (MLP) on sociotechnical developments and thereby holds that three levels of phenomena are pertinent to them. The relatively stable sociotechnical regimes discussed in the previous section occupy a “meso” level intermediate between micro and macro levels. The micro level is composed of unique niches, “...protected spaces for the development and use of promising technologies by means of experimentation...” (Kemp et al. 1998: 186). Examples are start-up enterprises, heavily subsidized demonstration projects, lead markets, and small communities of early adopters of new technologies. In contrast to meso level regimes, which embrace relatively solidified configurations of practices, norms, and institutions, micro niches are more open spaces for innovating and experimenting with technologies that might eventually become key ingredients of regimes or the kernels of new ones. Meanwhile, the macro level, is composed of a mix of pervasive social phenomena such as political and cultural attitudes, worldviews, macro economies, demographic states of affairs, and the natural environment. Much like the material structures Braudel (1973) discerned, which persist for long durations, the macro landscape tends to evolve slowly if at all and is largely impervious to intentional transformation.ⁱⁱⁱ

These three levels are ontologically suspect. To begin with, the concept of a niche only comes into question as denoting a component of a level when it is paired with a second concept that designates “spaces” that exist on the same “level” as niches in which—instead of innovations being nurtured—extant practices and the uses of extant artifacts are maintained. This is because spaces of innovation are too few in number, and not the right sort of thing, to compose a domain of entities that bears systematic causal, constitutional, or supervenient relations to entities allegedly populating meso or macro levels. In spaces (or sites) of this second sort, the past and present are perpetuated. An example of a concept that designates

such spaces is that of tradition in Shils's (1981) and Gadamer's (1989) senses (though the word "tradition" is commonly reserved for a narrower range of such spaces). In the context of sociotechnical development, however, the concept of spaces of maintenance is more or less coextensive with—covers the same range of social situations, set-ups, and phenomena as—that of a sociotechnical regime. In short, what the MLP distinguishes as the micro and the meso “levels” are really just different components or sectors of a *single* plenum embracing spaces of innovation and spaces that perpetuate the past and present.

The “macro level” suffers a parallel fate. For example, political and cultural attitudes are features of both niches and spaces of continuity (they inform activities in many corners of life); macro economies are simply larger practice-arrangement constellations that encompass smaller ones; and demographic states of affairs are statistical measures of properties of people acting in niches, regimes, and elsewhere. These so-called “macro” phenomena are actually elements, sectors, or measures of the plenum of practices and arrangements. The one macro phenomenon that differs from these in character is the natural environment, or as I would prefer to dub it, nature. Nature is not inherently a slice or feature of bundles and constellations, but a collection of events, entities, and states of affairs, unformed by human activity, that can connect with (and even be part of) bundles and constellations in various ways. Nature also includes the physiochemical composition of people, artifacts, organisms, and things in so far as this is not formed through human activity. Nature, consequently, is something like a supportive and interventionary background amid which social life proceeds (see Schatzki 2003). Apart from nature, however, what the MLP calls the “macro level” is composed of features, measures, and larger sectors of the single plenum formed by what they call "micro" and "meso" phenomena, i.e., the plenum of practices and arrangements. Micro differs from meso and meso differs from macro simply as smaller differs from larger and larger differs from pervasive or even larger.

Some acknowledgement of this situation is found in a 2007 article by Geels and Schott (see also Geels and Schott 2010: 27-8). The authors suggest (402-4) that niches and sociotechnical regimes instantiate the same type of entity—communities of interacting

groups—and that the two subtypes are differentiated as smaller and unstable versus larger and more stable. Unfortunately, they conceptualize these communities as rule-governed collectivities (i.e., institutions) in Giddens' sense of rules and institutions. I have elsewhere (1997) demonstrated the futility of Giddens' conception of rules and, thus, institutions. As for macro landscapes, Geels and Schott treat them as stabilized, largely semi-inert, and only occasionally quickly changing material infrastructures that offer "gradients of force" that make it easier or harder for people proceeding amid them to perform this or that action. I do not understand the point of shearing off the material dimension of social life and reifying it as a relatively hard form that shapes social existence. Social existence transpires as part of bundles of practices and arrangements, whose material dimension is considerably malleable. Indeed, arrangements continually evolve along with, and as a facet of, changes in bundles. This material dimension also affects activities in multiple ways. Only nature can be treated as relatively fixed. The total mass of practice-arrangement bundles encompasses what Geels and Schott call the macro landscape.

Instead of thinking about social phenomena through the concept of distinct levels, it is better to approach them with the idea of a single plenum of practices and arrangements that exhibits variations in the thinness and thickness and directness and circuitousness of relations. As traced by these variations and gradations, practices and arrangements form bundles and constellations of smaller or larger spatial-temporal spread. The key dimension of variation in social phenomena is thus smaller and larger, i.e., extension in objective space-time.^{iv} I take it that this Tarde's position, too (see also Collins 1987). Tarde repeatedly proclaimed the existence of social sequences that begin from something small and eventuate in something large. A good example is war and competition among individuals widening into strifes between larger groups, which in turn enlarge into wars and competition between very large collectivities such as nations. I do not think that many large social phenomena arise in this progressive scalar way. Nonetheless, this progression illustrates an important theme, namely, that the large phenomena that contrast with smaller phenomena are not fundamentally different in kind from them.

According to a flat ontology such as mine, place, size, and scale are produced. Latour defends this claim, too. For him, sites (local associations where interactions take place) are linked via material conduits and vehicles, through which actors and sites “scal[e], spac[e], and contextualiz[e]... other[s] through the transportation in some specific vehicles of some specific traces.” (Latour 2005: 184) Latour also holds, however, that this linking of sites to bring about effects of size and scale is chiefly effected by actions performed in particular sites, namely, those connected to many others.^v One prominent type of such sites comprises “oligoptica:” sites that are able to see a narrow band of other sites very well. Others are centers of calculation and panoramas (178-84). An example of an oligopticum is coal company headquarters, which is tied via various media (fax machines, cell phone systems, couriers, roads) to many other sites. Latour claims that size and scale are achieved only via connections that work through sites such as these.

A larger phenomenon embraces a more spread out network of relations (among practices, arrangements, and bundles) than a small one does. Tarde and Latour are right, moreover, that larger phenomena “arise from” smaller ones, in my scheme, from smaller bundles of practices and arrangements. As Latour puts it, “we should not consider that the macro encompasses the micro...but that [t]he small holds the big... the big [can] at any moment drown again in the small from which it emerged and to which it will return.” (243) The actions of oligoptica, centers of calculations, and panoramas do not, however, have priority in how larger phenomena arise from smaller ones. In the first place, larger phenomena “arise from,” in the sense of being constituted by, *all* the relations among bundles and constellations detailed in the previous section by which bundles form constellations and constellations form larger ones. Similarly, large phenomena are brought about by *all* the activities and events that compose these bundles and constellations, whichever events and activities these are and whichever bundles are involved. The networks of relations whereby bundles form constellations that extend far over space and time need not center on, or be anchored in, bundles that are particularly rich in connections. The network of relations that marks the coal company combines a large number of practice-arrangement bundles, and the oligoptica included are no more constitutive of, and only a little more causally responsible for, the coal company than are

the other bundles and relations involved. These remarks also hold of the patterns that characterize bundles and constellations. (Measures, too, arise from bundles, though in the trivial sense that measures capture features of bundles.)

A further notable characteristic of bundles, constellations, and the larger phenomena built out of them (as well as the patterns that appear in them) is the absence of stability, equilibrium, or closure. Largeness and patternness do not imply stability or closure (cf. Shove and Walker 2010). Berkhout (2002: 2) describes technological regimes (“assemblages of technical artifacts organized in co-evolving market and regulatory frameworks”) as stable and continuous entities, attributing stability and continuity to such matters as the prevalence of particular knowledges and problem-solving heuristics, the interrelatedness of technical systems, economies of scale, and institutional, political, and economic commitments. These matters constrain innovation and novelty and confine change to particular paths. Of course, in reality these determinants of stability and continuity themselves unevenly develop and shift, and the combined and cumulative effect of changes in them is continually evolving technological regimes. A similar presumption of stability leads Geels and Schot (2007: 406) to base their typology of four transition pathways on the “zero proposition” that “if there is no external landscape pressure...the regime remains dynamically stable and will reproduce itself.” They add that “radical niche-innovations may be present, but have little chance to break through as long as the regime is dynamically stable.” These propositions obscure the possibility that sudden shifts, or dislocations, and significant changes can arise within regimes (understood as constellations of practice-arrangement bundles) even in the absence of “landscape pressures.” Novelty and innovation can burst forth anytime and, although inextricably tied to the past and present, can set developments in new directions unanticipated by present actors. This means, incidentally, that any large social phenomenon can in principle collapse precipitously.

Events, short of constituting precipitous change, perpetually happen in and to practices, arrangements, and bundles. They and their constituent elements thereby undergo halting, uneven, but not necessarily infrequent, and sometimes rapid, changes. Whether such changes

are significant or amount to changed or different bundles varies from case to case and also depends on the perspectives of observers. Geels and Schot (2007: 406) acknowledge this turbulence in conceding that “stable regimes still experience dynamics,” though they overly narrow the scope of this dynamics by claiming that it “take[s] place within stable rule-sets and proceed[s] in predictable directions (trajectories).” The uneven, jagged front of change that characterizes a bundle often takes the form of gradual, cumulative, even predictable developments. It can also, however, overthrow rule sets and unpredictably, even suddenly lead to larger-scale dislocations and transformations. All the more so since changes of all magnitudes and sorts from incremental to suddenly dislocating can also result from, or be reactions to, biophysical events (e.g., viral invasions, earthquakes, droughts) and social affairs elsewhere (e.g., revolutions). At the same time, some things stay the same for shorter or longer periods. Social life is not in constant flux. In picturing society, we do best, not to prioritize metamorphosis or stability, but to depict social life as a complex developing mosaic of continuity and change.

4. Transitions in Sociotechnical Regimes

The literature on regime transitions largely advocates a neoKuhnian (see Smith et al. 2010: 440) model of change. According to this model, the domination by a given regime and the occurrence of cumulative change within and to it can give way to larger, more far-reaching responses to challenges, which, if successful, can be followed by the stabilization of a new regime and the recommencement of the cycle. Periods of general stability (amid minor cumulative change) alternate with periods of ferment and regime shift. On this picture, there are two basic kinds of change: cumulative change within regimes and changes in regime. In Geels’ (2010: 495; see also Rotmans and Loorbach 2010: 139) words,

The MLP distinguishes three analytic levels: niches..., socio-technical regimes..., and an exogenous socio-technical landscape. These ‘levels’ refer to heterogeneous configurations of increasing stability. The MLP proposes that transitions, which are defined as regime shifts, come about through interacting processes within and between these levels. Transitions do not

come about easily, because existing regimes are characterized by lock-in and path dependence, and oriented towards incremental innovation along predictable trajectories. Radical innovations emerge in niches...[and]...may break through more widely if external landscape developments create pressures on the regime that lead to cracks, tensions, and windows of opportunity. Subsequent struggles between niches and regimes, and possible replacement, take place on multiple dimensions...

The previous section questioned the cogency of MLP's three proposed levels. In this section, I question both the concept of a regime shift and the idea that changes in sociotechnical regimes follow particular patterns.

My criticisms are based on the flat ontology described in the previous section, according to which social affairs transpire as part of interconnected bundles of practices and arrangements. This ontology suggests that, instead of speaking of regime shifts, it is better to see social affairs as exhibiting a jagged, uneven front of change that inexorably rewrites which larger social phenomena, including "regimes," exist.^{vi} Practice-arrangement bundles undergo frequent molecular change. Even when large social entities are relatively stable, ways of doing things shift, tasks undertaken evolve, and arrangements are altered. Bundles coalesce and dissolve while others persist. Frequent molecular changes in bundles are mirrored by frequent molecular changes in constellations of bundles. Corporations, cultures, and economies might enjoy longevity, but the bundles and constellations in which they consist embrace exhibit varying and evolving mixes of stability and metamorphosis. This is true of sociotechnical regimes as well. Coal companies have existed for decades or longer, but they and the "regime" they form with transmission and supply companies, transmission networks, changing regulation and public attitudes, electricity usage, and evolution in furnace and power transmission design, among other things, never stand still. The compositions of the companies and regime inexorably change. About the only thing that remains constant over enough time is the mined, transported, and consumed object itself—coal. In the end, consequently, there are no real shifts in regimes. Iconic artifacts, activities, and things of nature might be stable for long periods of time and so seem to define a regime that shifts in what is iconic apparently mark a

regime shift; an example is the alleged regime shift from sailing ships to steamboats described in Geels 2002. But the components of the wider practice-arrangement constellations of which iconic entities are part change all the while at different paces and in different degrees; the surrounding vista is of a broad front of uneven, partly cumulative and partly lurching development. There are no shifts, only changing mixes of continuity and of quicker and slower, larger and smaller developments.

The plenum of practice-arrangement bundles and constellations is always on the move in myriad usually—but not always—small ways whose path and issuance are not predetermined. It is this mass, and the features and processes characterizing it, that must be studied in order to understand social, including sociotechnical, change. A schematic picture such as the MLP obscures this task. A good example of a study that takes this task seriously is a forthcoming book by Elizabeth Shove, Mika Pantzar, and Matt Watson titled *The Dynamics of Social Practice*. Instead of resolving the plenum of bundles into more conventional and possibly familiar entities, between which relations are postulated, Shove, Pantzar, and Watson devise concepts designed to capture features of and processes in this plenum. Examples are the circulation of elements, recruitment to and defection from practices (bundles in my language), circuits of reproduction, the diffusion of practices, and types of connection between practices. With these concepts, topics of interest can be conceptualized and analyzed. An example of a topic, regarding which observing the methodological directive at issue makes a difference, is diffusion (see Shove and Walker 2010: 474-5). For the MLP, the diffusion of a novel sociotechnical arrangement amounts either to its embedment in, or attachment to, a stable regime or to the emergence of and shift to a new regime. For a study of the plenum of practices and arrangements in its own right, by contrast, the relation of a novel bundle to extant bundles can take various forms, for example, embedment in a wider constellation, hybridization with a constellation, differential links between different components of the arrangement and different components of the constellation, replacement of existing bundles, and many more.

What, furthermore, the MLP dubs the “sociotechnical landscape” does not form a distinct context in which social processes proceed. A flat practice ontology views this landscape as a motley abstraction and the phenomena it includes as varied slices, features, or measures of the plenum of bundles and constellations. An “economic system,” for example, is a particularly extensive constellation of practices and arrangements (alternatively, the sum of measures of and patterns appearing in this constellation), and cultural values and worldviews are features of multiple bundles and constellations. Analyzing the sociotechnical “landscape” in these ways robs it of its separateness from, and assumed stability relative to, what is intended with the terms “niche” and “regime.” Indeed, the macroeconomic system is anything but stable. It follows that any study of niches and regimes is at once a study of landscapes, and vice versa. Or rather, it is best to abandon thinking about social affairs in terms of these three levels and instead to study the features and processes that characterize the plenum of bundles and constellations that constitutes social affairs.

Another important consequence of the ontology defended in this essay is the prominence accorded happenstance and contingency in the evolution of social affairs. Happenstance is built into human activity in the form of the indeterminacy of action, in the fact that incipient action is not fixed or pinned down by what proceeds it, neither the state of the world nor the history of the actor. Moreover, whether a given action, once performed, perpetuates the status quo or is the origin of change, big or small, is a contingent matter—for how the world reacts to it is fundamentally open. This contingency ramifies to everything that human activity helps compose, thus practices, bundles, and constellations. All practices, bundles, and constellations are contingent, and all changes in these—when they occur—are both contingent and of indeterminate significance.

This situation entails that explaining social affairs—answering why-questions—is ultimately a matter, not of marshaling theories or ideal types qua models (models more generally require a discussion different from the following), but of (1) first delving into the details of both the affairs concerned and the events that led to them and (2) then providing overviews of these details. Tarde (1899: 160) held much the same, claiming that understanding

a social fact requires plumbing its details (see also Walsh 1951 and Elias 1978).^{vii} The MLP, by contrast, is an example of a theory marshaled to explain changes in sociotechnical affairs. Examples of ideal types, meanwhile, that are employed to understand transitions in sociotechnical regimes are (1) Berkhout's (2002) four scenarios of regime change, (2) Smith et al.'s (2005) matrix of four transition contexts, and (3) Geels and Shot's (2007) typology of four transition pathways. I applaud the intention underlying these typologies, namely, to decline single factor/pathway schemes and to multiply the recognized possibilities of change. The issue is how best to do this. Berkhout, Smith, and Stirling hold that ideal types are needed to understand real processes. They write (2004: 67-8), "Comparisons and contrasts between the elements of each [ideal-TRS] transformation can be made against the real-world regime transformation processes, so improving our understanding of the associated processes." In my opinion (there is no space to discuss this issue), ideal types are best viewed as possible ingredients of social phenomena: abstractions of factors, scenarios, processes, and the like that might or might not be present in particular cases. The value of a typology of ideal types lies in suggesting to an investigator what to look for in particular cases. It is not so much contrast and comparison between ideal types and real processes that tell an investigator pursuing explanation what she seeks to know, namely, why things happened as they did. Rather, a typology informs her that such and such factors, processes, or sequences might be present, and this knowledge can inform her investigations. No comparisons and contrasts need to be performed for the typology to play this role. In any event, there is only one way to understand social events, processes, and changes—by uncovering and studying their details. It is worth adding that that the construction of ideal types depends on substantial understanding of real world cases, which is thus acquired without help of the ideal types. In the absence of understandings of particular cases, abstracting relevant features and parameters is simply lucky guess-work.

Berkhout et al. (2004: 53) concede that "not all transitions are alike. Indeed, it may be more correct to say that each transition displays unique characteristics, dynamics, and history. A model of transition processes will always be an abstraction of process of change that are local and specific, and where chance and agency play an important role." Indeed. Instead of

concluding, however, that explaining transitions requires uncovering particular details, the authors continue, “Our taxonomy of four ideal types is intended to provide a heuristic to aid the work of constructing a more generalized model.” Such a declaration presumes two things: (1) that it is possible to abstract most or all of the factors, scenarios, and processes that are crucial to the range of phenomena under investigation and (2) that these factors can be systematically combined in a way that yields greater understanding and perspicuity than does a simple list of what is abstracted used as an enumeration of potential things to look for in particular cases. I am skeptical of these presumptions. The particular ways things can work out are indefinite, understanding particular cases requires grasping what happened in those cases, and any proposed generalized model (or list) will be confounded by additional cases, past, present, or future.

Social change is messy. Small changes always occur, large changes embrace and arise from myriad smaller ones, and the difference that any change makes to the world is open until the world responds. There is no easy template for studying or fostering sociotechnical change. Studying it requires examining actual cases through investigations of the interrelated bundles and constellations involved that are informed, not by theories or models, but by concepts and typologies with which aspects of this mass can be analyzed. As for fostering sociotechnical change, this is an art born of experience and study. It requires, among other things, a knack for timing, insight into likely responses to activities and measures, and a sense of the range of histories and possibilities.

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Notes

ⁱ A use of “flat ontology” contemporaneous with Latour’s that builds on my ontology is Marsten et al. (2005).

ⁱⁱ I acknowledge that humans are not the only entities that do and say things. In the present essay, however, I am concerned with human activity alone and put aside the activities of other entities.

ⁱⁱⁱ Whether niches/regimes/landscapes should be neatly aligned with micro/meso/macro is problematized, but left unresolved, in Rotmans and Loorbach 2010: 131-5. Their subsequent analysis (135-9) of niches and regimes as instances of the same sort of social subsystem suggests to me that they substitute a Multiple Systems Perspective for the MLP.

^{iv} I might add that greater extension in space and time is not the only dimension in which social phenomena are nonlocal entities. Another is number and measure. Numbers concern multiple phenomena and thereby more than single local phenomena. Demographic information is an important example, as are economic and public health statistics. It is misleading, however, to label statistical information “macro” phenomena or to say that they “transcend” local phenomena since they are measures or sums of features of local situations (or are based on such measures and sums). At the same time, demographic, economic, and public health facts are often hard to alter and thereby qualify as background facts. Another sort of nonlocal phenomenon comprises patterns in bundles and constellations, which are sometimes formulable in generalizations. Markets exhibit such a pattern, namely, one or more individuals or organizations looking to purchase something, and one or more individuals or organizations aiming to sell that something, the latter individuals and organization(s) setting prices for the item and the would-be purchasers deciding whether to pay. This is a pattern that repeats itself in the total mass of practices and arrangements and about which the greater part of a prominent academic discipline seeks to generalize and construct models. Much of what is called “the economy” consists of sums and measures of, as well as patterns in, practice-arrangement bundles.

^v Latour also criticizes the idea that multiple sites (read: bundles), dispersed through space and time, can constitute an entity. His argument is that this idea requires taking a bird’s eye view on such alleged entities. Latour is wrong on this point. Spatially-temporally dispersed sites (bundles) can be taken as a single phenomenon in thought; no visual perspective manqué needs to be imagined.

^{vi} A similar determination to spread change out and to multiply its vectors is found in Smith et al.’s (2005: 1504) claim that “socio-technical regimes are produced and reproduced by networks of state, civil society, and market-based actors and institutions.” I affirm this claim if regimes, states, civil society, markets, and institutions are

analyzed as constellations of practice-arrangement bundles. A further acknowledgement of multiplicity and complexity is found at Smith et al. 2010: 443. As I explain, however, I am skeptical that the MLP can be revised to accommodate this complexity—unless the MLP is treated as a mistakenly systematized, open-ended enumeration of possible ingredients and processes (see below).

^{vii} Another way of putting this is that the methodology called “process theory,” which Grin, Rotmans, and Schot (2010: 6) assign to historical situations and distinguish from the methodology appropriate for other forms of social investigation (e.g., systems theories), is central to empirical research.