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Natural resource exploitation- as a sustained project of abstracting substances identified as useful, valuable, and natural in origin from their environment- has long played a central role in that continuing human effort to become "modern." It is a process of boundary making par ex- cellence-of distinguishing subject from object, nature from culture, and science from politics (Latour) p 6

One of anthropology's key contributions to these discussions stems from research about the differences in how people relate to their surroundings and about worlds premised on principles other than modernist ones (Descola and Pálsson 1996, Ingold 2000, Strathern) p7

We see evidence of residual modernism in two tendencies in recent anthropological discussions: first, a tendency to center intellectual discussions and analysis on individual resource substances rather than substances that are part of a relational material world; and second, a tendency to focus on the commodity status of resources rather than asking ethnographically what else they might be at any given point in time. P7

Natural resources are ubiquitous and energetic substances that play an active part in the making of worlds. What we term "resource materialities" builds on recent critical rethinking of "the material" across the social sciences. Our analysis draws attention to resource making as a material process, in a way that considers "the conjunction of the social and the material without the social swallowing the material" (Knappett 2007:20; see also Harvey and Knox 2010) p 7

The articles in this special collection approach substances such as water, land, trees, sea snails, copper, and red mercury as part of "resource environments." This term directs analytical attention away from resources as substances with essential qualities that are assumed to exist "in nature" to the complex arrangements of physical stuff, extractive infrastructures, calculative devices, discourses of the market and development, the nation and the corporation, everyday practices, and so on, that allow those substances to exist as resources. p 7

We argue that natural resources are inherently distributed things whose essence or character is to be located neither exclusively in their biophysical properties nor in webs of sociocultural meaning. By "distributed," we refer to both the spatial and temporal extensions of specific resources, and their material and ontological dispersion. We demonstrate how this differs from conceiving of natural resources simply as "culturally reworked nature," which would leave the domains of nature and culture and the human and the nonhuman conceptually intact. By contrast, the methodological frame- work we propose here starts from the assumption that we are dealing with relational phenomena of what we call "resource materialities." This involves the combined examination of the matters, knowledges, infrastructures, and experiences that come together in the appreciation, extraction, processing, and consumption of natural resources. P8

However, in these accounts it is characteristically humans who are in a position of mastery and control over what is portrayed as an essentially passive material world. When Ferry writes that "notions of silver as substance and place enhance the sense of silver as inalienable possession" (2002:332), she acknowledges the significance of the sensual and physical properties of the substances at hand- and not just of the miners, company directors, and buyers- in the formation of the resource environment she describes P11

How do resources come to matter beyond their commodified form? P12

- Resources come to exist both through technical invention and physical production, as well as through acts of epistemological and ontological creativity P12
- Resource making has been conceived as a process of turning nature into culture par excellence.

For others, resources are far from naturally occurring, and their exploitation is key to their very existence. According to the OED, an integral part of what makes something a resource is its use for an end, particularly the creation of wealth. Similarly, in outlining an integrated anthropological framework, Ferry and Limbert define resources as "objects and substances produced from 'nature' for human enrichment and use" (2008b:3). In this view, resources are irreducibly social. People consider them to be useful and valuable, inevitably attaching meanings to them which may vary between and within societies (Bridge 2009). Importantly, resources are not just there- present in nature and ready for human consumption- but, as resource economist Erich Zimmermann (1933) argued, are made through processes of appraisal and human labor. For Zimmermann, the notion of a resource is a subjective concept, dependent on the needs and wants of the appraiser. P12

Notions of water's sacredness have reverberated in more recent protests regarding the privatization of water as a neoliberal development exercise among Bolivia's peasants and urbanités (Nash 2007). From this perspective, clashes between Spanish conquistadores and indigenous peoples or between neoliberal logics and local cosmologies are not only matters of brute physical and economic force but also of an "ontologica! conflict" (Blaser 2009) P13

The mobilization of natural resources as it occurs, for example, in resource extraction begins, in an important sense, with abstraction. Abstraction, as we define it here, includes separation, parting, simplification, and reduction (and, occasionally, addition) on both material and conceptual level. P13

Physical abstraction may be paralleled by homogenizatlon, standardization, and a certain de-differentiatlon of the resource in question (Ferry 2002:342-343), involving different types of labor carried out not just by corporations and miners who physically remove the resources from their surroundings, but by everyone involved in their naming, scientific analysis, sale, and so on. The appearance of resources as natural, given, and ready for human use that has become so familiar to us is the result of this labor. Abstraction, in the broadest sense, underwrites the political economic standardization of resources, contributing to their exchangeability and fungibillty in local and global markets. 14

We argue that, rather than being purely an issue of human control and ingenuity, the "becoming" of resources is now better understood in terms of the uses and possibilities that matter affords to us- what may be referred to as material agency or potentiality. P15

We aim to explore how resource ontologies have a history and how the unfolding of resource histories also contains an interplay and contest between different ontologies. From this perspective, natural resources are not "out there" ready to be seized upon and utilized but always in flux and open-ended. They "become" as resource materialities, that is, as constitutive of and constituted within arrangements of substances, technologies, discourses, and the practices deployed by different kinds of actors. P16

"Resource materialities" entail far more than a reference to materials that are named as resources- such as gold, feldspar, water, or timber- and their specific physical and chemical properties. In addition, we suggest that the analysis of resources needs to include a consideration of the following: first, resource ontologies, that is, assumptions about the nature and affordances of the "things that are already" and their participation in making local, regional, national, and global scales; second, the different ways in which specific resources are known; third, the infrastructures designed to extract resources and those needed to refine, transform, and transport them; and fourth, how resources are experienced and embodied by people who work with, transform, or (deliberately or accidentally) ingest them. P16

Following in Appadurai's, The focus of this work has been on the relationship between objects and subjects and the vexed question of the "agency" of matter, rather than on following through the insight from science and technology studies analyses that things are themselves relational effects, something we see as critical to rethinking natural… P17

We propose "resource materialities" as a rough, practical guide for teasing out the specificity of resources as relational assemblages. P 18

1. First, resource ontologies- assumptions about what resource substances, their affordances, and what sustains them- are key to understanding what resources can be made to do, and how they are known, circulated, and engaged with (e.g., Biersack 1 999b, Chapman 201 3, Jorgensen 1 998, Weiner 1 994, West 2006). The ethnographic record reveals competing resource ontologies that continue to vie with techno-scientific accountings, which have become the dominant frame for conceiving of natural resources.
2. Second, a multitude of complexly intertwined knowledges are implicated in bringing resources into being and transforming them. For example, expert knowledges mobilize a set of techniques and measurements through which resources "become" indifferent.
3. Third, infrastructures generate and constrain knowledge production about resources, and make possible particular forms of politics. Resource infrastructures include not only everyday governance techniques of state and corporate bureaucracies mobilized in corporate social responsibil- ity programs, but also the large-scale technologies used to extract re- sources from their environment and to circulate them (Anand 201 1 , Appel 2012, Carse 2012, Hughes 20)
4. Fourth, resource exploitation is a process where bodies, technologies, infrastructures, and substances become entangled, throwing the porosity between human bodies and their resource environments into sharp… 20 (cf. Pálsson 2012).

Coal dust indelibly seeping into the wrinkles, crevices, and cuts in miners' skin is but one example (Lindisfarne 2011). Similarly, Wyoming miners acquire an embodied sense of the texture, composition, and capacities of coal, mediated by the giant shovels and trucks they use (Rolston forthcoming). They speak of "pit sense," an intimate knowledge of how to

anticipate and respond to unpredictable behavior of the coal- face, and develop skills that help safely navigate the treacherous environment even if this results in health problems such as sore shoulders and elbows or joint and back issues. The mutual encroachments of human and nonhuman in extractive sites are increasingly expressed as calculated risk. Adaptive strategies and regulations of labor routines and attire have become part of a corporate work regime that aims to redistribute such risk while maximizing productivity (Appel 2012). This is in stark contrast to the uncontrolled and largely unrecorded ways in which resources and their "associated substances" continue to enter into human metabolisms either through direct consumption or because of people's proximity to locales of extraction. P21

Critical philosophies of materiality help interrogate conventional and reductive conceptions of resources as "nature turned culture" or purely "social constructs." Our aim is to be able to account more fully for resources' material specificity. This specificity stems from what we referred to as "distributedness"- that is, resources' material dispersal in time and space, as well as their ontological multiplicity. In other words, natural resources challenged us to put concepts of relationality into ethnographic practice. This makes for a noticeable- but, we think, productive- tension between such a strong philosophical proposition and our insistence that, as anthropologists, we need to remain especially attuned to resources' ontological multiplicity and the worldings they make possible (Blaser 2009, de la Cadena 201 0, Viveiros de Castro 2004). Our "resource materialities" framework is an attempt to counter the contemporary "extractive project" and undiminished resource consumption with a strong notion of resources as historically and ontologically "becoming". P 22

Resources, as we have shown, are the result of an entanglement of processes and practices of abstraction, homogenization, and standardization aimed at inscribing the boundaries between nature and and culture. This requires an ongoing, concerted work. However, on closer inspection, the result of this work is rather less fixed than traditional accounts of resource commodities might assume. Resources' specific properties- their dispersion, finitude, or renewability- are the outcomes of momentary stabilizations and continuous shifts in assemblages of humans and nonhumans. P 22