Thinking with the grain

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Abstract
In this short commentary, I consider William Jamieson’s proposal ‘For Granular Geography’. I focus on two parallel arguments at work in his piece: the proposal for a political ecology of sand foregrounding the physical dynamics of sand as a granular system; and second, his programmatic agenda for human geography in which the instability and unpredictability of granular systems become a ‘conceptual grammar’ for the material geographies of value transformation. I am sympathetic to thinking through materials and alive to the poetic possibilities of sand, but ultimately find neither of Jamieson’s arguments persuasive. I suggest a fuller engagement with existing ‘grammars’ – including those of new materialism, elemental geographies, and the role of friction in global commodity chains – could help clarify the contribution that ‘granularity’ might be able to make.

Keywords
granularity, materiality, metaphor, new materialism, sand

Sand, no doubt, is a potent medium. Both ‘miniscule and infinite, a means of measurement and a substance beyond measuring’ (Beiser, 2018: 2), sand’s rhythms and patterns offer fertile resources for thinking about spatiality and temporality. Sand’s philosophical potency is evident in many cultural allusions, from biblical metaphors for a multitude without number to the hourglass’ reminder of the ebb of human life. Sand distributed across smooth surfaces and gathers in folds; and it is the foundational solidity of stone and concrete, the turbulence of submarine currents, and the skittishness of grains in the wind. And, as when irritating the fleshy parts of a marine mollusc, sand can be a generative friction: abrading and chafing, sand can become pearlescent new materials and novel socio-natural relations.

I am with Jamieson (2021) on the possibilities of thinking creatively about space through the geophysics of materials. His big agenda here mirrors recent work on geo-politics and elemental geographies which explores ways to ‘unground’ ontology from the familiar and static solidity of land via the alternative geophysical registers of air, water, dust, mud, and ice (Nieuwenhuis and Nassar, 2020; Peters et al., 2018; Steinberg and Peters, 2015). An explicit goal of this work has been to ‘think and feel through our worlds a little differently’ via registers of ‘terrestrial porosity and fluidity (and other) qualities of Earth’s becoming’ (Nieuwenhuis and Nassar, 2020: 3). Jamieson shares this goal: inspired by the alterity, mobility, and multiplicity of sand, his piece follows a similar trajectory in seeking to
harness the possibilities of this difference for reconceptualising accounts of matter.

Jamieson largely overlooks the substance of work on geo-politics and elemental materialisms in his account, however, and this seems a missed opportunity. Given how far work on geophilosophy has come, thinking actively about shared agendas in relation to new materialisms and ontologies of becoming would help specify the particularity of sand’s particles – i.e. how the granularity of sand may offer novel or distinctive possibilities to, say, the instabilities, mobilities, multiple phases, and emergent properties associated with dust, ice, or mud (Bremner, 2020; Nasser, 2018; Nieuwenhuis, 2018; Whitt, 2018). Jamieson, to his credit, grounds his theorisation in the field experience of researching sand extraction and trading in Southeast Asia. Yet the geophilosophy of Deleuze and Guattari – which informs a good deal of work on elemental geographies and new materialisms – would seem particularly relevant for the granular account Jamieson is seeking to develop. Deleuzean ontologies of becoming, models of smooth and striated space, and the interplay of territorialising/deterritorialising forces resonate with the physics of sand and its ‘morphogenetic capability...to generate form on its own’ (Delanda, 2000: 33). It is, however, ungenerous of a commentator to focus only on what an author might or could have done: I will, therefore, not pursue this further but instead look at the substance of Jamieson’s argument.

Sand’s more-than-human geographies

Jamieson makes two broad arguments in his article. The first is for a political ecology of sand that foregrounds the physical dynamics of sand as a granular system. The second is an outline agenda ‘for granular geography’ in which the instability and unpredictability of granular systems become a metaphor for the material geographies of value transformation. A self-evident observation connects the particular case of sand-as-commodity with the general proposition for a granular geography: sand is granular. Sand comprises multiple grains that, together, have the physical properties of a granular system. Like snow, cornflakes, and sundry other particles and powders, sand is a solid that flows like a liquid and can be compressed like a gas. Jamieson’s provocation, then, is that human geography may find in this granular character of sand a fruitful way of thinking about the constitution of human and non-human relations. By thinking with the relational and dynamic physics of sand, human geography might derive a ‘conceptual grammar’ through which apparently disparate and incommensurable ideas can be thought together. In the grain, as it were, may lie a larger truth.

Sand may ‘remain a bit of a secret’ in human geography (Nieuwenhuis, 2018: 19), but physical scientists have recognised the scale and significance of anthropogenic sand flows for some time. Douglas’s pioneering work on urban geomorphology and urban ecology quantified the scale of human influence over the movement of sand and aggregates at a global scale (e.g. Douglas and Lawson, 2002); and work on land use, sediment yield, and the harvesting of sediments via dredging has a significantly longer provenance (Leopold, 1956). Yet, it is true that sand’s silica-social geographies have not ranked among the elemental stories through which we have come to know the Anthropocene. Perhaps this is because, unlike the biogeochemical cycles of carbon, nitrogen, sulphur, and mercury, sand’s fluxes are often only shallowly vertical and for the most part are characterised by short-haul geographies. If sand’s largely localised and cumulative geographies of extraction have in the past frequently been overlooked, that is now changing: global incidences of sand mining and international sand trade are becoming increasingly well documented, revealing multiple geographies of sand tied not only to urbanisation but also political economies of energy and digitalisation (e.g. applications of sand in fracking, solar panel fabrication, high purity silicon wafers, and electrode coatings; see Adedeji et al., 2014; Beiser, 2018; Holifield and Day, 2017; Lamb et al., 2019; Pearson, 2017).

At issue, then, is not the novelty of focusing on sand. What is at stake in Jamieson’s account is the analytical work ‘granularity’ can do in accounting for the political ecologies of the sand mining frontier – that is, the difference focusing on the
‘granular’ can make to the stories we are able to tell. The picture here unfortunately is not clear. There are frequent allusions in Jamieson’s piece to ‘granular relations’ in connection with the Southeast Asian sand market; to the ‘granular frontier’ in relation to sites of sand extraction; to the ‘granular dynamics’ of concrete production; and to the sand commodity chain as a ‘granular system’ characterised by fragility, friction, and force chains. Granularity here is a multi-tasking metaphor, asked to perform a lot of work in several different directions. From among the many allusions to granularity, a backstop position emerges: granularity offers a ‘model of materiality that is dynamic and relational’. This formulation does a good job of signalling intent but is, nonetheless, a generalised claim for a relational perspective and one, ultimately, that may be made without recourse to a granular grammar. Throughout Jamieson’s intervention, the specificity of granularity over and above other fluid, dynamic, and emergent materialities remains elusive so that – for this reader at least – its analytical ‘value-added’ is insufficiently explained.

Jamieson is somewhat clearer about the problem granularity is intended to solve. With ‘granular relations’ the author is proposing to ‘reconnect landscapes of extraction and consumption to present it as a systematic, if porous and unpredictably unfolding, process with novel implications for understanding capital’s ecological regime’. The appeal of the granular, then, lies primarily in its connective possibilities – a way to think about connectivity and interaction among heterogeneous elements as part of a system whose properties are not entirely predictable. Granularity here gestures towards a conjunctural form of analysis: holding landscapes of production and consumption together to understand patterns of (inter)action; acknowledging systematic connections between (perhaps distant) actors and places; while also being open to how the fate of one landscape cannot be simply ‘read off’ the other. ‘Granular theorisation’, Jamieson asserts, can reveal how the ‘instrumentalization of sand as a resource entails the imbrication of distant landscapes, and...can accommodate the fragmented yet forensic interconnection between them’.

Part of the difficulty here is the rather overwrought formulation where adjectives describing juxtaposition and connection are at odds: landscapes are fragmented yet also overlapping and, while (merely) overlapping, these same landscapes are also forensically connected. More significantly, it is not clear how granular relations and granular theorisation offer something substantially different to other accounts of the heterogeneous and unpredictable connections characteristic of commodity frontiers, such as Tsing’s (2005) metaphor of friction. Any emergent grammar of granular systems, it would seem, already owes a substantial debt to friction. There are places in Jamieson’s paper where friction is arguably the master concept, as it is the ‘recurring feature’ behind the characteristic ‘phase shifting’ behaviour of granular systems from free flow to jammed solid. Granularity and friction are physical metaphors deployed to explain more-than-human geographies, and both highlight the fragmentary, unpredictable and constitutive character of material encounters in ways that ‘draw attention to the unpredictable heterogeneity of worlds coming into being’ (Tsing, 2012: 1). A sympathetic critique of friction, as an allied concept, would allow granularity’s distinctiveness to emerge.

**Granular geography: Beyond a metaphor for phase transition**

The second and arguably more novel of Jamieson’s provocations is his agenda for a granular geography. The vision here is ‘an intervention into materialist geography’ that scales insights from the sand commodity chain to think about ‘the granular state of matter as a dynamic and non-deterministic model of materiality that can critically situate value’s unpredictable transmutation of matter and frontier’. Significant here is Jamieson’s attempt to couple his dive into the physics of granular systems with an account of value. Sand here is no longer the sand of the extractive frontier or Singaporean territory-making but, instead, an ‘eerie analogy for capital’. Jamieson gives us a foretaste of this agenda early on, opening his piece by contrasting Marxian accounts of the geographical fixities and flows of capital (as value in motion) with new materialist accounts of
the vital and agentic capacities of the non-human. Pitching these bodies of work against each other, he claims an impasse in scholarly thought and identifies granular geography as a ‘method’ for moving beyond ‘the exaggerated dichotomy between historical and “new” materialism’.

The lure of granular geophysics here is its seeming potential to hold together the unpredictable character of fixity and flow that Jamieson sees as common to both unstable material forms and value transformation. At root, this is a metaphorical correspondence: Jamieson’s wager is that the physics of granular systems offer a better metaphor for the ‘concrete heterogeneities of accumulation’ that sustain value-in-motion than does the physics of fusion invoked in the *Communist Manifesto*’s ‘all that is solid melts into air’. Melting, ossification, and the ‘sweeping away . . . of fast-frozen relations’ (to quote other examples from Marx and Engels’ *Manifesto*) are examples of phase transitions: Jamieson’s argument is that the character of phase transitions in granular systems offers a better guide to ‘the perennial question (of) how’ instability occurs. The salient point here is that Marxian analyses of capital are not based on an apparent metaphorical correspondence with the physics of melting. They are rooted in an account of the social relations of commodity production, and it is from these relations that the geographies of capital (as value in motion) are derived. Granular geography has a certain metaphorical appeal, but it is fundamentally limited as an account of value transformation absent a concrete analysis of socio-material relations: it is a metaphor of system change in search of a socio-theoretical foundation.

If we set granularity-as-metaphor aside for a moment, we can see how centring the geophysical properties of granular systems in accounts of value could raise some intriguing research possibilities. By appropriating and capitalising these distinctive material qualities, states and firms can improve their competitive and strategic position: Jamieson points to this possibility with the example of pumping sand to form fixed territory, and by briefly pointing to other industrial processes reliant on powders and grains. Phase transitions also have a capacity for devalorisation, as in the case of the failure of mine tailing dams (see Schoenberger, 2016), the hardening of fats and oils in urban sewerage systems, or the physical, biological, and chemical instability of infrastructure. The political-economic affordances and flexibilities of materials – including granular and complex fluid systems – are a productive area of enquiry, as work on ‘industrial dynamics’ has made clear for some time (Banoub et al., 2020; Boyd et al., 2001; Bustos-Gallardo et al., 2021). However, ‘granular geography’ as envisaged by Jamieson is not primarily a call for a technologically engaged industrial ecology centred on the appropriation and capitalisation of materials with the properties of granular systems. That is unfortunate, in my view. Adopting a more circumscribed focus – anchored in the specific affordances granular systems present for valorisation/devalorisation/revalorisation and the strategies of appropriation and capitalisation that characterise this socio-technical frontier – would elevate granularity from a rather loose metaphor describing system instability and properties of emergence into a materially-specific account of capital circulation. Jamieson’s proposal acknowledges this potential in passing but it remains a minor theme overshadowed by an all-powerful metaphor of system instability.

To be persuasive, a novel grammar has to offer insight unavailable via familiar grammars already in circulation. I share Jamieson’s enthusiasm for the poetic possibilities of materials and sand’s capacity to jolt our conceptual imagination. It is perhaps a failing of my own imagination, then, not to find persuasive his account of how granular relations might offer fresh analytical leverage on the more-than-human geographies of the sand commodity frontier. Granularity as a ‘model of materiality that is dynamic and relational’ chimes with a good deal of historical and ‘new’ materialist thought, but that is not the same as showing how ‘granular grammar’ offers something distinctive to human geography.

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