FLUIDITY

MATERIALS IN MOTION

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REIMER

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CONTENT

MATERIALS AND CONCEPTS OF FLUIDITY: TOWARD A CRITICAL CULTURAL RHEOLOGY

MARCEL FINKE & KASSANDRA NAKAS

Fluidity is a common material phenomenon. We encounter it countless times every single day: for instance, when taking a shower, pouring milk into our cereal bowl, drinking a cup of tea, washing the dishes, watering plants, stepping into fog, refuelling the car, and so forth. Fluid phenomena may be familiar, but they are by no means trivial. Examples of the wide-ranging nature, significant consequences, and manifold intricacies of fluidity abound. As we were preparing this volume, the news was awash with innumerable instances of fluid issues that constitute and affect the world we inhabit: There are the melting glaciers, rising sea levels, changing atmospheric flows, and the slowdown of ocean circulation systems due to global warming. Moreover, we were experiencing the COVID-19 pandemic, reminding us of the correlations between aerosols, the dissemination of diseases, and fossil-fuelled mobility on a planetary scale. Rivers burst their banks, flooding towns, leaving behind swathes of destruction, and claiming human and non-human lives. A container ship jammed the Suez Canal, interrupting supply chains and the global movement of materials and goods. Elsewhere, sewage polluted with fertilisers and the stagnation of water currents stimulated massive algae blooms and the production of marine mucilage, causing the extinction of sea life. Endocrine disruptors and antibiotics seeped into the environment, polluting groundwater and food products, eventually jeopardising the health of living beings. Waste disposal, broken pipelines, or exploding warehouses brought about the leakage and dispersion of toxic chemicals. The list could go on and on (cf. Chen *et al*. 2013: 4–5). The study of fluidity, however, should not be limited to such cases of ecological disasters and hazardous material events; and it is not only a subject of the natural sciences, either. There is way more to fluidity, since above all, it is about materials in motion – materials active and activated, mobile and mobilised, activating and mobilising. What this volume therefore suggests is a kind of critical cultural rheology that draws a bigger and more differentiated picture of the material complexities, ecological dimensions, political ramifications, and epistemic functions of fluidity.

The image we have chosen for the cover of our publication shows one of the most archaic and sublime representations of fluidity (Figure 1.1). It is a photograph of glowing lava as it flows from Kīlauea volcano on Big Island, Hawaii. In this case, fluidity is a powerful natural phenomenon relentlessly changing and forming the environment. These streams of molten rock might help to develop a more complex understanding of fluidity, particularly with regard to the mobility and mobilisation of materials. First of

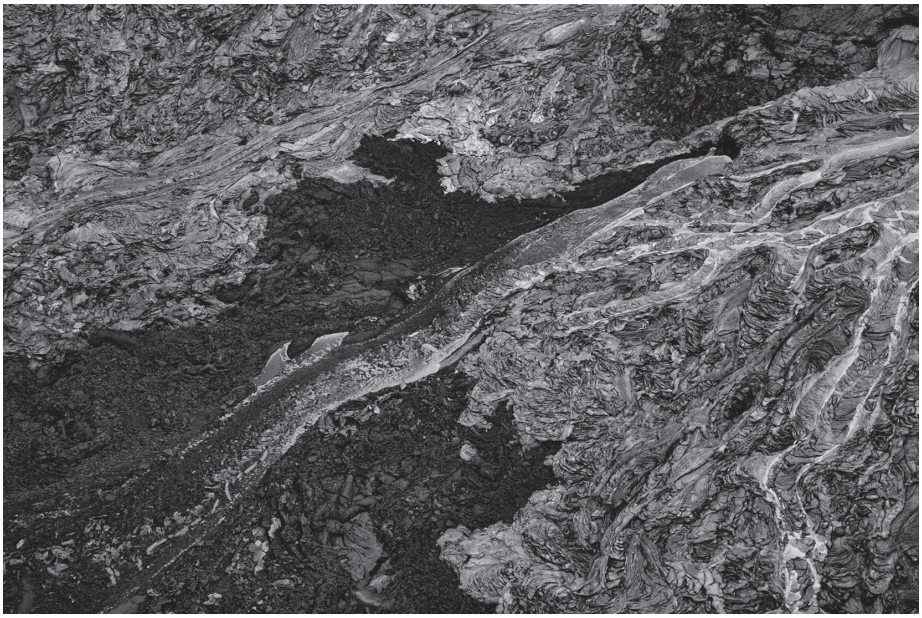

Figure 1.1: Brocken Inaglory, *Pāhoehoe Lava and ʻAʻā flows at Big Island, Hawaii,* 2007.

all, the lava draws attention to the fact that the differences between the fluid and the solid, between flow and stasis are only gradual. As the hot "mix of silicate liquid, crystals, and gas bubbles" (Griffiths 2000: 477) moves through the landscape, it begins to cool and solidify unevenly by interacting with the materials around it (such as soil, rocks, vegetation, water, and air). The currents of lava are not homogenous but "present a wide range of flow regimes" (ibid.), and the transitions take place on various scales and with different speeds. Moreover, the lava we see in the picture is not one but many: a trained eye can discern at least two morphological types (one called ʻAʻā, the other Pāhoehoe) featuring different textures, compositions, rheological properties and behaviours (such as viscosity, flow rate, and velocity). Thus, the lava flow as an instance of materials in motion is varied in itself. In addition, the extremely hot mixture changes and mobilises other materials when coming into contact with them, for example, turning wood into ash, sand into glass, and water into steam. It is not only a picturesque phenomenon but also one exerting a generative power that transforms its surroundings aesthetically. As a result of volcanic outbursts, the lava also hints at other erupted materials that are set in motion and dispersed into the environment, such as gases (e.g. water vapour, carbon and sulphur dioxide) and tephra (e.g. airborne particles and rock fragments). This mobilisation of both solid and fluid materials may have far-reaching ecological, economic, aesthetic, and health effects, not only locally but also in distant places, or even globally. In sum, the image of the Hawaiian lava flow indicates that fluidity is an intricate, entangled material phenomenon that comprises manifold processes of change, movement, and agency in a wide range of contexts and on diverse spatial-temporal scales.

The present volume delves into this diversity of fluidity. It compiles studies from art history, political science, cultural theory, media studies as well as environmental and materials history, taking into account a broad spectrum of fluid materialities ranging from fossil oil, foam and liquid crystals to plastic, chemicals and aerosols through to rivers and oceans. The topics are widely varied, demonstrating that fluidity and (fluid) materials pervade and connect the most different realms of the world: For instance, the essays examine the chemical and technological mobilisation of materials in petromodernity, and trace the relationships between artistic practices, liquid ecologies, the history of slow violence, and social crisis in Latin America. They address the nexus of global trade, logistics, and the controlling of flows, thereby critically assessing ideological and epistemic functions of fluid metaphors. Moreover, they pay attention to connections between fluidity and digitalisation, considering artistic and technological investigations into programmable materials, display systems, new life forms, and the liquid intelligence of GAN-generated images. Other contributions reflect upon theoretical and artistic engagement with the human body as a site of fluid materiality, verbal and visual tropes of liquid corporeality, and the dynamics of leakage. They point out the role of mobility and mobilisation in the social lives and histories of substances, and discuss the extensive production and consumption of materials as an anomaly in the socio-technological metabolism of the Anthropocene. Last but not least, they are concerned with the ecology of disperse materials, showing that humans and materials are in the mix together, even forming a collective social space.[1] These reflections on fluidity, thus, cover various scales of time and magnitude, relational orders, and regimes of flow: from local to global, molecular to infrastructural, natural to industrial, instantaneous to geohistorical, short-lived to creeping, smooth to turbulent, controlled to rampant, from inorganic substances to living organisms.

Notions and the imagery of fluidity (and related terms such as flow, liquidity, or circulation) are frequent topics in contemporary art, aesthetics, and cultural theory. This has been observed by numerous scholars across many disciplines, including history (cf. Espahangizi & Orland 2014; Gänger 2017), anthropology (cf. Rockefeller 2011), psychoanalysis (cf. Downing 2017; Epps 2001), architecture (cf. Last 2015), media studies (cf. Denecke 2020; Hagener *et al*. 2020; Thibault 2015), queer theory (cf. Stephens 2014), political economy (cf. Roberts & Joseph 2015), social theory (cf. Sutherland 2013), and art history (cf. Finke & Weltzien 2017; Nakas 2015). It does not come as a surprise that current geographical, ethnological, anthropological, and literary approaches in the fields of "new thalassology", maritime studies, or the "blue humanities" also give prominence to the fluid and flowing (cf. Helmreich 2011; Horden & Purcell 2006; Mentz 2009; Steinberg 2013; Steinberg & Peters 2015; Strang 2006). Thus, authors of diverse research backgrounds and interests have rightly pointed to the "recent surge in the use of fluidity as concept and metaphor" (Umans 2016: 149), thereby classifying it as a commonplace figure of thought or "a postmodern catchword" (Kaliściak & Sikora 2014: 72). In the light of this prevalence of notions of fluidity and flow, some have spoken of a "hydrological

1 For more detailed abstracts of these contributions, see the short introductory chapters at the beginning of each section of this volume.

turn" (Chen *et al.* 2013) or "liquid turn" (Blackmore & Gómez 2020) and associated it with a "new mobilities paradigm" (Sheller & Urry 2006: 207) that seems to characterise "liquid modernity" (Bauman 2000) in general. Given its ubiquity in present thought, the rhetoric and imagery of flows and fluidity needs to be examined critically. This is even more necessary since quite often the "concept of fluidity itself remains strangely uninterrogated", being simply "taken as an unproblematic positive term", as Elizabeth Stephens (2014: 186, 187) noted with regard to new materialism. She also found that usually "fluidity itself is rarely subject to examination" (ibid.: 186). Her observations are still valid for the most part and can be transposed to other disciplines and fields of research, too. For that reason, this volume takes into account both various concepts of fluidity (e.g. metaphoric, aesthetic, or epistemic) and fluidity as a material phenomenon, expecting that this twofold perspective will reveal its multifarious dimensions and encourage a more sophisticated theoretical engagement with the subject.

Of course, the high currency of fluidity has not remained unquestioned. For instance, some scholars have explicitly criticised the "fetish of fluidity" (Epps 2001), deplored the "fetishism of flows" (Roberts & Joseph 2015: 4), or problematised the prevailing "metaphysics of flux" (Sutherland 2013: 4). In turn, others have critically diagnosed a defamation and "fear of stagnation" (Behnstedt *et al*. 2007: 7, 9; my translation), i.e. a refusal of permanence, solidity, and objecthood, complaining about the incessant emphasis on mobility, change, speed, processes, and open-endedness. Concepts of fluidity, it has been stated, are inclined to "overlook sites of resistance and opposition" and pay too little "attention to the complex ways in which material agency is often involved in interactions" (Tuana 2008: 194), thereby reifying "an ideology of immateriality that does not adequately reflect the material nature of production and distribution" (Sutherland 2013: 5). Moreover, the common association of fluidity with the dissolution of concrete forms, the liquefaction of stable relations and structures, or the melting away of distinct boundaries is often addressed sceptically. In short, such critiques point out that fluidity and flows are usually conceptualised in a way that is too simple, too homogenous, too weightless and effortless, too continuous and smooth, too liberating and affirmative. There seem to be no turbulences or frictions, no barriers or disruptions impeding movements, no limitations, impurities, or interdependencies with the solid and stationary. As fluidity becomes discursively detached from actual materials and physical processes, it tends to become a uniform and abstract phenomenon, eventually being purified and harmonised. Borrowing a phrase from Timothy Morton, who has an outspoken disdain for notions of the fluid and processual and is a critic of the "flowing and oozing metaphors abound[ing] in the new materialism" (Morton 2013a: 70), there is indeed a risk of ending up with some kind of innocent "lava-lamp fluidity" (ibid.; 2013b: 164–174).[2] Our cover image of the imposing lava flow indicates that fluidity goes far beyond theoretical containment and idealisation. Therefore, this volume

2 Of course, we do not subscribe to Morton's overall argument. However, the lava lamp as an image of a contained, tamed, and pleasing instance of fluidity seems to capture some issues pertaining to the latter's conceptualisation. The rather ironic fact that Morton (2013a) himself draws heavily upon fluid metaphors is discussed in Finke (2020).

takes the justified criticism seriously and considers fluidity neither as an immaterial flow nor as a general flux of matter.

We hold the opinion that a theoretical engagement with fluidity is key to a better understanding of the world we inhabit and the challenges currently confronting us, be they ecological, economic, political, or social. However, one needs to avoid both a "lava lamp theory", which diminishes fluidity to an easily manageable, unproblematic phenomenon, and a romanticising of the fluid and flowing, which indiscriminately promotes some kind of general 'panthareisation' (from Greek, *panta rhei*): we neither live in a lava lamp nor in an "amorphous stew" (Flusser 1993: 22). What we propose instead is a critical cultural rheology.[3] First, this approach acknowledges that there are variegated regimes of fluidity and variable types of material flow "which move at different speeds, scales, and viscosities" (Sheller & Urry 2006: 213; cf. Sutherland 2013: 13). The streams of lava on Hawaii and, indeed, Morton's lava lamp are but two instances of the diverse and intricate phenomenon of fluidity. Moreover, a critical rheology takes into account that fluidity has manifold cultural forms and manifestations rather than being solely a physical property or natural process. Countless material flows (even those which appear to be natural at first sight) result from the working together of various agencies, including human and non-human animals, substances, technologies, policies, or weather: the climate-damaging emission of carbon dioxide, smog, the Great Pacific Garbage Patch, or the industrial mobilisation of fossil oil are obvious examples (cf. Klose & Steininger 2021). Hence, it is necessary to investigate the epistemic, ecological, political, economic, technological, and material conditions and consequences of fluidity (cf. Dommann 2016: 531), the "material and institutional infrastructure of movement" (Tsing 2002: 338), as well as the wide range of agencies and cultural practices that enable and constitute material flows in the first place. A critical rheology, then, would explore how materials are mobilised, how they are kept in motion or kept at bay, how they are sped up, diverted, slowed down, or stopped; and it would also study how materials and material flows themselves mobilise, activate, or disrupt the movement of others. Such a rheological approach would pay critical attention to both the flow and mobility of materials and to the variable "materialities of flows and mobilities" (Law 2006: 228), thereby freeing fluidity from the lava lamp: i.e. seeking to make it more complex, more troubling, more viscous, more leaky, more turbulent.[4]

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3 In completely different contexts, both philosopher of science Gabriele Gramelsberger and art theorist Boris Groys have also recently adopted a "rheological perspective": While Gramelsberger (2016), in her deliberations on slime as a prerequisite for technical media, calls for a "rheology of media", Groys (2016) aims at a "rheology of art" when discussing the modern "fluidization of the artistic form" and art in general. Unfortunately, neither elaborates further on their idea of rheology.

4 A critical cultural rheology therefore points in a similar direction to the "liquid ecologies" approach suggested by Lisa Blackmore and Liliana Gómez (2020). In "Beyond the Blue", they emphasise that the aim of this conceptual framework is "to probe the relational web of liquidity in its historical, political, environmental, social, epistemological and aesthetic dimension", considering the "variable intensities, viscosities and porosities of liquid ecologies" (ibid.: 2–3). While their focus is mainly on water-related subjects, our volume has a broader take on fluidity and materials in motion.

The present volume approaches its subject from three different angles. The first section, *Thinking Fluid: Epistemology and Metaphorology*, deals with notions and the imagery of fluidity, liquidity, and material flows in cultural theory and artistic practice. It addresses both the discursive and aesthetic thinking *about* as well as *with* fluid phenomena and materials in motion. Discussing theoretical and imaginative concepts, verbal and visual metaphors, rhetorical tropes and representations of flux, it pays particular attention to the epistemic and ideological dimensions, challenges, and potentials they imply. The second section, *Flows, Change, and Agency: Materials in Action*, shifts the focus from conceptualisations of fluidity towards the materials and material phenomena themselves. On the one hand, it delves into their social, technological, chemical, and industrial mobilisation, exploring the ways they are activated and set into motion, ranging from the molecular to the planetary level. On the other hand, it also considers the materials' own mobility and changeability by discussing their various dynamics, phases, transformations, and agentic capacities. The final section, *A Leaky World: Ecology of Materials*, takes into consideration that materials and material processes defy absolute containment, being inclined to reach out into their respective environments, dissipating and mingling with an endless number of other entities and agencies. It addresses fluidity with regard to the ecological entanglements and interdependencies of materials, examining diverse forms of material exchange within local and global systems as well as the consequent environmental effects. Last but not least, this section – and, in fact, the volume in its entirety – reflects upon how human life is deeply involved in material movements and interactions, and how we are affected by the ecology of materials.

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