Artisanal and small-scale gold mining in Colombia

Noise, geographic constructions of embodied civic identities, and the unanticipated consequences of modernising socio-technical activities

Mateo S. Pimentel*

Abstract

Billions regard noise as a by-product of civic life and modernising activities. But some sounds have historically informed intellectual and spiritual formations, marking the ethos of individuals as much as societies. Presently, geographers endeavour to show that the spaces people inhabit are yet crucial to politics and power, and the noise of modernising activities fills these spaces. They are replete with 'media 'that, when combined with various geographies, make for manifold 'unanticipated consequences.' Such consequences largely go uninterrogated because of a predominant fixation on the intended ones. Those oppressed by the unanticipated consequences of modernising activities grow increasingly invisible and marginalised. The ensuing disparity reverberates throughout geographies vital to power and politics. Noise is especially common to everyday life for millions of marginalised mining stakeholders who exemplify the coincidence of noise and civic identity construction. This paper explores the socio-technical realities that inform noise – the audible experience of the unanticipated consequences of modernising activities – in communities where noise galvanises the marginalised.

Keywords: Colombia, gold mining, mercury, pollution, socio-technical activities, modernisation, maternity, noise

*The author pursues a PhD in Human and Social Dimensions of Science and Technology at Arizona State University; is co-author of a forthcomingbook on capitalism (Routledge 2018); and is deeply indebted to Oscar Jaime Restrepo Baena and the National University of Colombia – Medellin for having inspiredthis work.

'For what incites the rush to prospecting and then investment in joint stock companies, what lures rural [people]from their homesteads and herds to the mines in the hope of cash salaries, is largely hearsay – however mediated it may be by formal discourses of knowledge (geology, geophysics, cartography), the state, and the media.'

Rosalind C. Morris

Introduction

People experience noise as being apart, or distinct, from other dimensions of civic life. Yet, for some Ancient Mediterranean publics, noise cohered with the civic experience. Hence, cleaving sounds from their political import would have made little cultural or political sense. The political and ethical values of musical attunement, for example, enabled Plato to design his ideal metropolis; musical harmony breathed life into Aristotle's ethical ideal. Indeed, millennia ago, noise informed intellectual and spiritual formation and marked the formation of individuals and societies (Babich 2005). Geographers presently endeavour to show that the noisy spaces in which people work, live, and play are crucial to comprehending politics and power (Massey 2013). Moreover, the human body is largely the irreducible cornerstone of this project.

Geographer David Harvey (1998: 98-101) argues that a 'return to the human body as the fount of all experience (including that of space and time) is presently regarded as a means (now increasingly privileged) to challenge the whole network of abstractions (scientific, social, political-economic) through which social relations, power relations, institutions, and material practices get defined, represented, and regulated. 'Equally correct are his claims that: (1) 'no human body is outside of social processes of determination;' (2) 'the metabolic processes that sustain a body entail exchanges with its environment' and require that bodies adapt or perish; (3) 'the mix of performative activities available to the body in a given place and time are not independent of the technological, physical, social, and economic environment in which the body has its being;' and that (4) 'the body is not a closed and sealed entity, but a relational "thing" that is created, bounded, sustained, and ultimately dissolved in a spatiotemporal flux of multiple processes.'

Hence there are demands for 'new ways of looking at the grim world of tools and machines, ways that bring the social and the human back into the picture.' Such conceptualisations afford the 'explanatory power that is sometimes missing when technology is left out.' In such approaches, technology is no longer regarded merely as a physical or material dimension of social life, divorced from the softer aspects of human life such as community meaning, which often reverberate audibly in public and private spaces. This is evident in the human-use of basic technologies, which also demand 'some degree of socialization and knowledge, and [which constitute] …a social as well as a material phenomenon.' Conceivably, then, so many consider technology not an issue of artefacts but activities, and that ultimately what counts as social, technological and technical is virtually inextricable (Pfaffenberger 1998: 291-300).

In addition to the human-use of technology, one may consider the features of productive organisation in gold-mining activities, which are designed to ensure smooth operation and efficient functioning not only for the technological facet but also the people that animate it. Included are the 'vast hinterland supply regions, transport systems such as roads and railways, manufacturers and distributors of mining equipment, political arrangements … laws, political relationships, social arrangements of manufacture and use,' and more. The operation and functioning of these socio-technical features unfold within a broader web of constraints which the encompassing set of social relations imposes and have untoward corresponding consequences; mining stakeholders of all stripes operate and live under the impositions of the same system. Thus, the socio-technical dimension of Colombian gold mining does not fail to enrich what is qualitatively appreciable about the miner's experience; rather, it underscores the inherent and necessary human and social dimensions of that experience (Pfaffenberger 1998: 296-99) manifesting once ancillary controversy becomes reality.

Finally, miners may spend their money at local bars, which open to the streets like giant speakers, flooding sidewalks with blaring music. These sounds may compete with endless flows of noisy motorcycles, traffic, and loud-talking passers-by – all of whom are stakeholders in the intended consequences of mining activities as well. But the socio-technical systems that facilitate the propagation of such noise do not merely terminate inside noisy mines and mining towns; they also fill the mouths and cochleae of worried citizens elsewhere who deliberate the unintended consequences of gold mining. Not in the sense of the musical genre but in chemical toxicity, for instance, heavy metal (mercury) facilitates some of the most deleterious effects of gold mining – namely the alteration of the public imaginary's concept of maternity, which gets negotiated publicly. Moreover, without appropriate attention for the socio-technical dimension, much critical analysis risks being lost.

Trist (1978) argues that socio-technical analysis occurred along three lines: (1) 'the primary work system;' (2) 'the whole organization;' and (3) 'macro-social phenomena.' Socio-technical study became a field of investigative inquiry when the coal industry was nationalised in Britain in the last years of the 1940s (after the Second World War). Trist further observes,

> 'As the historical process of a society unfolds individuals change their values and expectations concerning work roles. This changes the parameters of organizational design. Conversely, changes in technology bring about changes in values, cognitive structures, life-styles, habitats and communications which profoundly alter a society and its chances of survival. Socio-technical phenomena are contextual as well as organizational.' (11-2)

Socio-technical systems ultimately depend on various material supplements to engender outputs. Moreover, the relationships between human and non-human systems comprise the main juncture of these systems (Trist 1978: 1-2). With regards to socio-technical systems and mining, Pfaffenberger (1998: 291-300)

adds that just 'as a fixation on technology and machines obscures the human and social dimensions of mining [stakeholders], so too does a sharp distinction between technology and society obscure some of the factors that give mining [stakeholders] their distinctive dynamics.'

Unanticipated Consequences

Gold and mercury correlate as interdependent commodities; as the value of gold increases, so does the use-value of mercury – the commodity which the world's poorest and least technified miners consume ever greater amount to quench far-off, rich-world thirsts for gold. In Colombia, hundreds of thousands of miners work to exploit the country's seemingly inexhaustible mineral treasures. Artisanal and small-scale gold mining (ASGM) has consequently won Colombia the designation of world's worst per-capita polluter of mercury (Siegel 2011). The coincidence of mercury and gold makes for manifold 'unanticipated consequences' for gold mining stakeholders everywhere and persists via socio-technical arrangements. Federman (2004) argues such consequences are difficult to perceive due to a predominant fixation on more obvious consequences – like those of modernising activities such as escaping poverty or securing financial affluence by investing in gold. For McLuhan (1964: 7),the individual and societal fallout 'of any medium,' or 'any extension of ourselves' – namely anything resulting from new scales 'introduced into our affairs by each [medium], or by any new technology'– is no small thing; these media share much responsibility for the unanticipated consequences of myriad modernising activities. Winner (2010: 29) adds that 'the greatest latitude of choice exists the very first time a particular instrument, system, or technique is introduced. 'And what is technique relative to artisanal and small-scale gold miners in Colombia but 'the complex and complete milieu in which human beings must live, and in relation to which they must define themselves… a generalised mediation, totalizing and aspiring to totality' (Ellul 1964: 23).

According tithe totalising dimension of global ASGM, McLuhan's and Winner's observations remain a guiding light vis-à-vis mercury-use. Consider the wealth of mercury lost in Spanish America's silver mines from the sixteenth to the twentieth century, a hazardous event which remains virtually immaterial despite that mercury-use, a highly toxic 'extension of ourselves, 'yet remains at-play (McLuhan, 1964). Given that innovations to the *patio* process of amalgamation lent itself to incredible instances of mercury pollution in the Americas centuries ago – permitting an industrial scaling-up of operations in silver production since the 1550s (Nriagu 1994) –Ellul's doubts about technique and modernising activities certainly persists: 'It is easy to boast of victory over ancient oppression, but what if the victory has been gained at the price of an even greater subjection to the forces of the artificial necessity of the technical society which has come to dominate our lives?' This has manifold implications for socio-technical analyses of global ASGM and its present potpourri of noise.

A new Colombian study (Molina: 2018) speaks directly to Ellul's objection, and now occupies the civic space in which Colombians elocute and amplify their troubled public imaginary. Carlos Federico Molina (of the Antioquia Institute of Technology in Medellin) has confirmed the presence of mercury in the breast-milk of women from four municipal departments in gold-mining hotspots: El Bagre, Zaragoza, Remedios, and Segovia (Caracol Radio). The Colombian public now faces a new kind of mother, one who harms her baby just by nursing it. That the expansion of mining production throughout history should continually foment such harrowing episodes of social tension is nothing new. And although the ways in which mercury cycles through tropical systems is not yet well known (Fraser 2009), the field of Science and Technology has long understood that artefacts have a political dimension (Winner 2010).Certainly, scholars might arrive at the same conclusion by digesting the first few chapters of Marx's *Capital*, which reveal that material relations exist between people, as well as social relations among artefacts, or things. The Argentinean pope also argues that technological artefacts 'are not neutral, for they create a framework which ends up conditioning lifestyles and shaping social possibilities along the lines dictated by the interests of certain groups,' and that decisions which appear to be 'purely instrumental are decisions about the kind of society we want to build' (Francis 2015).

Even More Noise

To many governments the recent increase in gold prices among international markets promises a lucrative source of much needed cash for furthering development projects (Idrobo et al. 2014). Notwithstanding the latest uptick in gold's international potential the adage holds true: all that glitters is not gold. As many as 20 million people work in ASGM globally; these workers profit from the recent gold boom in sundry ways (Siegel 2011). But as with other 'modernising' socio-technical activities borne on the backs of the world's poorest and most vulnerable, profit won along the margins comes at a steep price. Resource extraction has long been a part of the social, political, and economic histories of many peoples. Nations have sometimes emphasised their desire to exceed the limits born of economies based on extraction; or, notes Bebbington (2009), decrying extraction has reigned in importance – given the 'long list of social protests that have challenged the relations of exploitation and dispossession that underlie the extractive economy,' specifically. Moreover, free trade and global markets necessarily operate within a framework of what Sandra Halperin (2013: 13) calls 'uneven relations between developed and underdeveloped countries [that] work to reinforce and reproduce these relations.'

Now, several politically diverse governments appear mostly interested in taking advantage of extraction's potential. They maintain much interest in developing their capacity to benefit from the latest uptick in global gold prices – as evidenced by coercive statal attempts to stem illegal mining in the case of

Colombia – appear to be facing a two-horned challenge (Bebbington 2009). First, the negative externalities that arise from certain kinds of mining, like ASGM, have terribly acute environmental and social costs that get externalised to local communities with a high degree of regularity, including variegated noise pollution (Siegel 2011). Second, the initial steps that miners take towards resource extraction suggest that the formal economy activities that drive the poor in developing states to engage in such mining are the self-same forces that synchronously encourage participation in the illicit informal markets for the purchase of mercury, thus bolstering the relationship that now exists between the global formal and informal economies because, even though it is illegal to use mercury for gold extraction in Colombia, it nonetheless remains available for purchase in many global contexts.

This formal-informal market tension creates for a duality in which the extraction of gold requires that the artisanal or small-scale miner purchase mercury. Mining activities at any stage are subsequently subject to this reality, which is a product of legal market mechanisms arranged and governed by dictates elaborated elsewhere in the world. The purchase of gold extracted with the use of mercury is moreover illegal in Colombia but continues all the same as purchasers offer lower prices for illegally extracted gold rather than refusing to buy it altogether, thus keeping poor miners tethered to a cycle of selling their gold for lower and lower prices while not allowing for them to develop the capacity – or the economic liberty – to move away from the use of mercury as certainly they would prefer.

Focusing specifically on the human dimensions of mining stakeholders with regards to their encompassing socio-technical system, no account of the miner's experience with noise/noisy extraction, specifically, can be adequate if lacking the stories that might otherwise be treated as typically 'marginal, unimportant or nonexistent' (Pfaffenberger 1998: 291-300). Nevertheless, it is problematic that diminished hearing in miners should commonly result from repetitive exposure to percussive noises. Furthermore, damage to their hearing is neurologically detectable, and it exposes them to ever greater risk by diminishing the ability to distinguish sounds, let alone hear them. The cornucopian cacophony of mining activities, therefore, is not only a by-product of general occupational hazard but is also injurious to the miner whose occupational purpose is to recover gold but not to grow hard of hearing to the point of risking her life (Morris 2008: 96). Nor are the lived experiences with the socio-technically formative noise of mining activities and their sources unique to Andean nations like Colombia. Morris (2008: 96-7) writes,

> 'The history of modern South Africa is … indissociable from the history of mining. …[T]he original motivations for colonization … were linked to the ambitions of merchant capitalists… But the development, capitalization, and industrialization of mining – as well as the organization of the labor that sustained it … defined the path to modernity that South Africa took. The pursuit of mineral wealth galvanized internal migration, prompted land expropriation, incited technological innovation, and

> motivated … many other violent conflicts. So, too, the kinds of ant colonialism and oppositional politics that arose in that country must be understood at least partly in terms of its domination by mining capital.'

Clearly, bodies are not mere products of what Harvey (2000: 99) identifies as 'external processes,' but instead, socio-technical and biological beings – miners and mining stakeholders –that 'capture diffuse energy or information flows and assemble them into complex but well-ordered forms' and create 'order out of chaos' whether socially, technologically, or biologically.

Resource Extraction and Analysis

For centuries, the Andes have served as hubs for mining and metallurgical exploitation for foreign interests. Silver mining alone changed the empire of Spain and ignited a financial metamorphosis in Europe, engendering much change in global economics. Consequently, the formation of principal segments of South America's mining workforce did not progress towards large-scale mining, or industry; instead mining in the Andes begot what have been described as 'a complex series of interactions between workers and "foreign" elites that involved both competition and interdependence.' What has resulted is a gamut of scales of production with different ends and purposes. In fact, years of archaeological research have shown that some mining sites in Andean countries did not progressively transit to 'highly capitalised mining,' but that, rather, both small- and large-scale mining projects have in fact coexisted for centuries. Much like today, these activities have generated a variety of mining sites that have been produced by labour and which have structured labour in turn (Van Buren and Weaver 2012: 79-101).

Historically, mine owners have viewed the labour force as not only undisciplined but also unreliable. Varied geographies have been crucially instrumental in mediating relationships among workers and broader forces, including economics, politics, and noise. Van Buren and Weaver (2012: 79-101) claim a 'distinctive historical trajectory constituted by the annual or seasonal influx of people within a larger-scale cycle of investment in and abandonment of mine workings.' Federal policymakers in Colombia today give preferential treatment to the corporate interests of large-scale mining at the expense of ASGM interests; mining companies and their affiliates get created precisely to benefit large-scale mining, which some ASGM mining stakeholders decry quite boisterously. Commonly, such firms are enmeshed with government institutions at the state agency level. The fact that 'currently there are no differential policies that reflect the reality of the mining sector where most the workforce is involved in small-scale mining,' and that labour organizations were virtually non-existent, is symptomatic of the monopolistic problem (Sarmiento et al 2013). Meanwhile, roughly a dozen companies illegally imported 130 tons of metallic mercury less than a decade ago; the heavy metal mostly went toward ASGM activities. The use of faulty technologies only compounds social and environmental problems that stem from mercury-use during the gold recovery

processes. Working with ASGM stakeholders and their noisy socio-technical systems is therefore indispensable to devising an adequate solution (Cordy et al. 2011).

Now that mercury facilitates gold extraction and a novel construction of nursing mothers, gold mining activities which depend on systems at once social and technical in nature there is poignant evidence apropos the discrimination that human technological artefacts regularly beget – whether it manifests as a ruckus in mining boomtowns or in urban coffee-break palavering. Moreover, in so many cases like gold mining these artefacts – human media, human technologies – are not just symptomatic of how societies get ordered but, as Winner (2010: 27) and the new pope observe, they largely embody that order. The stewardship of global capital also largely dictates the order. For instance, early in the Great Recession, the Federal Reserve (Fed),sought to stimulate the American economy by injecting it with money, effectively devaluing the dollar; international investors reacted and transitioned from holding minerals instead of dollars which allowed them to maintain as much of their economic power as possible. This unquestionably extended to the international purchase of gold. Owing to the global financial meltdown, and the Fed's reaction to it, the international price of gold more than doubled in terms of Colombian money – from nearly fifty thousand to one hundred thousand pesos in only four years (Idrobo et. al. 2014).

Gold plays a significant financial role for Colombia, which annually exports 63 percent of its gold (i.e., $1.12b) directly to the US (MIT Observatory of Economic Complexity: 2017). The latest surge in both legal and illegal exploitation of Colombian gold has thus been a product of the international increase in the commodity's value, which has impacted the political currency of mercury, a metal that now embodies a mode of globalisation increasingly viewed as suspect. But if there appear to be financial causes for so many awful material effects, why focus on the noise surrounding mercury-use and the heavy metal remaking of Colombian mothers? Strang (2014: 133-50) reminds us that the material things in our built environment 'are not just passive recipients of human categories, meanings and values, nor mere subjects of human agency.' Instead, it is much more useful to consider what she calls the ordinary material dimensions of our technological artefacts, which 'generate recurrent ideas and patterns of engagement in diverse cultural and historical contexts.' Finally, Latour (1990: 111) posits that 'whenever we discover a stable social relation, it is the introduction of some non-humans that accounts for this relative durability.' Given that our 'most productive way to create new narratives has been to follow the development of an innovation,' the intervention that will successfully uncouple gold mining from mercury-use is something that must also address all the resultant, and variegated, noise.

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