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**Permeable Persons and Plastic Packaging in India: From Biomoral Substance
Exchange to Chemotoxic Transmission**

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Abstract

In contemporary India, it has become commonplace to hear middle-class people speak of ‘chemicals’ in the environment, in food, and in everyday commodities. Anxieties revolve around the bodily absorption of these ‘chemicals’, and plastic packaging has come under particular scrutiny as a source of leached ‘chemicals’. Although anthropological studies have highlighted South Asian conceptions of the person as permeable and affected, through the exchange of biomoral substances, by transactions with the environment, humans, and non-humans, the concern about ‘chemicals’ references a different type of transfer—that of chemotoxic transmission. Such concern foregrounds new anxieties about the permeable body in the contaminated, ecologically damaged world of late modernity. The case of plastic packaging is illustrative of the differences between frameworks of biomoral substance exchange and chemotoxic transmission. In illuminating those differences, this article focuses on public concerns regarding the bodily absorption of ‘chemicals’, why these concerns are compelling as a political ecological critique of capitalist extraction, and the insights they can offer to anthropological research on the permeable body.

A video circulating on WhatsApp from 2016 features an orthopaedic surgeon from Chennai, in South India, warning of the evils of consuming water from polyethylene terephthalate (PET) bottles. PET, a type of plastic, he cautioned, was:

a combination of toxic or carcinogenic—cancer-causing chemicals—called benzene and arsenic. And there is another variety of, I mean, water bottles, or plastic bottles, called—made out of bisphenol-A [BPA]. Again, that is also carcinogenic. Especially all these substances, when exposed to sun, it is not good at all...these chemical components or the compounds dissolve into the water and we consume them, and it is directly cancer causing (Strength India Movement 2016).

Around the same time, in 2016, the government of the Indian state of Maharashtra debated a ban on the use of PET bottles for the sale of liquor and medicines. The public interest litigation that led to the debate alleged that storage in PET led to the leaching of chemicals into the alcohol or medicines within it. These chemicals, such as antimony, lead, and DEHP (diethylhexyl phthalate), the litigation claimed, could cause cancer when consumed. Meanwhile, videos and messages, such as the one by the Strength India Movement, warning of the dangers of the chemicals found in plastics had been circulating on social media. Industry representatives and materials scientists contested such representations by pointing out that lead and DEHP were not additives in PET and therefore could not leach out of the material; levels of antimony in PET bottles, they argued, fell far within acceptable thresholds. After much deliberation, the ban was not put into effect. Nevertheless, in public discourse and the media, concerns about the chemicals in plastics finding their way into food and drinks, and thence into human bodies, continue.

In India in the last couple of decades, it has become commonplace to hear people from among the middle class speak of ‘chemicals’ in the environment, in food and water, in biomedicines, and in everyday consumer goods such as clothes and toiletries. Dermal ingress of these ‘chemicals’ through contact with the skin or ingress through eating are particular sources of concern. Meanwhile, products that are consumed or applied topically, such as herbal cosmetics, organic food, and naturopathic supplements,

claim an ability to combat the effects of ‘chemicals’. Advertisements emphasize such products as ‘natural’ and free from ‘chemicals’ (e.g., Pathak & Nichter 2018). Commodities related to food and the body are thus both critiqued for containing harmful chemicals and marketed as addressing their harms. Within these discourses, plastics, especially in food-related packaging, have come under particular scrutiny as a source of leached chemicals.

Anthropologists of India, most notably McKim Marriott (1968, 1976), highlighted South Asian conceptions of the body and person as permeable. All contact between the body and its environment, other people, and things was thought to result in the exchange of ‘biomoral’ substances, or coded material substances imbued with moral qualities and character traits that could alter the nature of a person. Such permeability, they pointed out, reflected social hierarchies and led to pervasive concerns with regulating contact—particularly through eating or touching. Theorists of modernity (e.g., Giddens 1992; Taylor 2007, 2008; Touraine 2002) have suggested that modernity brings with it a turn toward individualism and the disembedding of persons from their social contexts; such a turn should see a move away from cultural conceptions of the body as porous and the person as permeable, which view humans as entangled with their social and physical environments. I argue, however, that the concern about ‘chemicals’ in contemporary India in fact foregrounds anxieties—although unrelated to biomoral substance exchange—about the permeable body in the contaminated, ecologically damaged world of late modernity. Such concern forms part of a political ecological critique of the failures of capitalist extraction and accumulation. The case of plastic packaging is illustrative of the differences between the framework of biomoral substance exchange and that reflecting anxieties regarding ‘chemicals’. In illuminating those differences, the focus of this paper is on public concern regarding the bodily absorption of plastic and related chemicals: what are people’s anxieties, why are they compelling, and what insights can they offer to anthropological research on the permeable body? To address these questions, I start by chronicling the new concern regarding bodily absorption of ‘chemicals’ before reviewing the anthropological literature

on permeable bodies in India. I then argue against an understanding of anxieties related to the transmission of ‘chemicals’ as an extension of the logic of biomoral substance exchange and make the case for such transmission as a new conception of the transfer between permeable bodies and their environments and a political ecological critique of late modernity.

This paper is part of a larger project on the anthropology of plastics and draws upon ethnographic fieldwork from 2016–2019 in Mumbai, India. The first arm of the fieldwork consisted of participant–observation and observation of everyday life and interactions related to food, consumption, and health in the city. The second arm consisted of semi-structured interviews with key interlocutors, including consumers, environmental activists, plastic industry executives, materials scientists, and biomedical professionals. Participant–observation was also conducted at zero-waste events, environmental initiatives aimed at combating the ills of plastics, plastic industry conferences, and industry meetings regarding potential plastic control policies. Finally, stories related to the health harms of plastics circulating on social media were also collected and analysed.

‘Chemicals’ and the Health Harms of Plastics

By the late 1970s and early 1980s, plastic food packaging had started becoming common in India. However, it really came to the fore after neoliberal economic reforms were introduced in 1991 and India’s consumer revolution took off. As more products came to be mass-produced and mass-marketed, there was a shift from loose to packaged goods, and plastic packaging proved invaluable (Packaging South Asia 2008). Although initially only big national or transnational manufacturers of consumer goods used plastic packaging, by the 2000s, the material became ubiquitous and was used even by smaller stores for selling wholesale foodstuffs, snacks, vegetables, and other food products.

In those early days of plastics' percolation into everyday life, there were some apprehensions that plastics ruined the taste and quality of food or that they might seep into the products, especially sour or oily foods, that were stored in them. Some ayurvedic practitioners also associated plastic use with a rise in non-communicable diseases (Pathak & Nichter 2019). Largely, however, these concerns were overshadowed by the advances in hygiene and convenience that plastics were seen to bring.

Since the 2000s, however, there has been a renewed discourse on the harms of plastics and the chemicals they are considered to contain. Across the years of my fieldwork, I constantly came across commentary, discussions, and media pieces (particularly on Hindi news channels), on the ills of storing food in plastics and on how drinking hot tea in plastic cups or heating food in plastics caused cancer. During a discussion on water quality and bottled water among a group of friends, a finance professional in her late 30s cautioned, '*Arre* there was a research someone was doing in my previous firm which said that the [plastic] bottled water, because it's kept in the sun for long periods of time, the water becomes unfit to drink. It can be a big cause of cancer too, which is why people say don't reuse the bottles of bottled water'. Another interlocutor, 58-year old insurance professional Arun, commented that plastics were 'purely chemical. *Mhanoon, kahi na kahitari* chemical—*tyaache gun lagnaar* [That's why some or the other chemical—their characteristics will accrue (to the food)]'. Two male interlocutors, who ironically worked in the plastics industry, mentioned that their children's schools had issued notices requesting parents not to use plastic water bottles (for health reasons rather than environmental ones). These interlocutors had also expressed their concerns regarding the health risks of the plastic bottles used to store drinking water in their offices to their managers. Several people mentioned preferentially shopping for oils stored in glass rather than plastics; others cautioned against heating food in plastic containers, even when those containers were advertised as food grade and microwave safe. When food arrived in plastic containers, such as in the case of home delivery, they spoke of immediately rehousing the food in glass or metal containers. In one conversation, a lawyer and an architect, both male and in their 50s,

expressed concerns about the plastic overhead tanks used by most residential buildings for water storage (to deal with water supply cuts). The number '1', the resin identification code to aid recycling at the base of PET bottles, they told me, indicated that the bottles should be used only once. Extrapolating from this, they were worried about the health implications of storing drinking water in plastic tanks.

In general, when queried about their reasons, interlocutors spoke of chemicals leaching out of the plastics and into the foods. Heat (an inescapable part of living in the tropics) made the leaching worse. When consumed, Arun said, these chemicals would go on to 'affect our health negatively'. Arun's words were typical—others told me that the chemicals from plastics were 'harmful', 'dangerous', '*hanikarak* (harmful)', 'affect the body', or that they 'cause [health] problems'. Hema, a homemaker in her 60s, spoke of avoiding plastics, particularly heating food in plastics:

Some years back, I came to know—you know, people share these things on WhatsApp, they tell me—that microwaving things in plastic is bad. We may not know these effects [immediately]. Why wait till something bad happens? Preventive—that is where we need to focus—we should prevent the issue in the first place.

Hema did not tie plastic use to any specific consequences. Other interlocutors, when probed further, often mentioned cancer; however, this was not necessarily their first association. Instead, they focused on general adverse consequences to health. None of my interlocutors mentioned specific consequences other than cancer (see also Solomon 2015).

Moreover, not all plastics were talked about in the same way. Tupperware was seen as a safer option, more stable and less reactive than other plastic containers. Partly, this was attributed to Tupperware being 'branded' and used in foreign markets, reflecting a lack of trust in Indian regulatory authorities as compared to international ones. However, there was also a sensorial aspect to the assessment of its risks. Interlocutors spoke of Tupperware feeling sturdier and thicker than generic plastic containers—it did not change shape or colour with pressure or heat the way other, flimsier plastic containers did. As a result,

some interlocutors mentioned emptying food sold or delivered in generic plastic containers into Tupperware as soon as they could.

These concerns were distinct from the assessments of risk and uncertainty supplied by biomedical frameworks or perspectives from organic chemistry or materials science. For example, the ‘1’ on most water bottles indicates the type of plastic resin—that is, PET—to aid recycling; it is not a symbol recommending single use (Wilhelm 2008). DEHP, BPA, arsenic, benzene, and lead are not additives in the manufacturing of PET. None of these materials is a derivative from its degradation either. DEHP and BPA, which are additives in other types of plastics, are associated with endocrine disruption rather than cancer as such; studies have linked them to risks of obesity, type II diabetes, and reproductive disorders (Casals-Casas & Desvergne 2011; Mariana et al. 2016; Meeker, Sathyanarayana & Swan 2009). Moreover, such additives are typically found in polycarbonate, the type of plastic used in Tupperware (Vandenburg et al. 2007). Although Tupperware states that its products have been BPA-free since 2010, there is no mention of products manufactured prior to then (Tupperware 2018). Microplastics and nanoplastics, which are tiny particles that result from the degradation of plastics, have come under increased scrutiny after being found in human bodies, table salt, tap water, and the global food chain (Harvey & Watts 2018; Karami et al. 2017; Kosuth, Mason & Wattenberg 2018; Waring, Hariss & Mitchell 2018), but their exact consequences on health have not yet been established (Chae & An 2018; North & Halden 2013; Prata 2018; Rist et al. 2018; Suran 2018; Vethaak & Leslie 2016). As such, my interlocutors’ concerns with plastics represented a lay, rather than technocratic or biochemical, framework on toxicity as related to plastics and on the body’s permeability in the face of such toxicity.

The Permeable Person in India

Several anthropological investigations from the latter half of the twentieth century highlighted the centrality of relationality to conceptions of the person in South Asia (Dumont 1980; Daniel 1984; Marriott

1968, 1976, 1990; Marriott & Inden 1977; Trawick 1990). Since then, the strong dichotomization of South Asian ‘relational’ persons as being in stark opposition to Western ‘individuals’ in many of these studies has been criticized as an oversimplification of both South Asian and Western personhood (Ewing 1990; Holland & Kipnis 1994; Lamb 1997; Mines 1988; Ortner 1995; Spiro 1993; Shweder & Bourne 1984). Nevertheless, these studies are significant in pointing to conceptions of the person as culturally constructed and to the importance of social embeddedness in South Asian personhood.

Of these studies, those of Marriott and Daniel in particular emphasized the permeability and fluidity of the South Asian person. All interactions—whether those of eating, touching, living together, or of kinship—between humans, non-humans, and the environment resulted in the exchange of constitutive substances, as persons absorbed or transmitted parts of themselves (Daniel 1984; Marriott 1990). Furthermore, the substances that were exchanged through such transactions were coded in ‘biomoral’ terms (Marriott 1976). Social contact resulted in moral entangling, and all transactions therefore posed biological and moral risks that had to be carefully negotiated through the regulation of interpersonal transactions. In this formulation, there was no separation between the natural and the moral order. Persons could alter their moral qualities by changing their bodies through the eating of certain foods, by engaging in certain kinds of behaviours or interactions with others, or by participating in certain ceremonies. Various castes had developed and deployed different transactional strategies that corresponded to what were seen as their qualities and natures. Such strategies, which included restrictions on contact and exchange, also served to limited market transactions, especially in food (Liechty 2005).

The permeable body also allowed for the transfer of purity and pollution between people and things, and people’s ability to police their bodily boundaries and avoid pollution was reflective of caste and other hierarchies. In the transfer of purity and pollution, various media could be more or less sensitive as carriers of substance codes. For example, food was a transformational medium, and cooked food was particularly

vulnerable to pollution (Appadurai 1981; Marriott 1976). Water could easily transmit the higher moral value or pollution of its receptacle or of its human bearers; milk, less so, and *ghee*, or clarified butter, provided the most protection (Wadley 2000). Loosely woven, highly porous cloth was seen as more susceptible to contamination when compared to denser weaves (Bayly 1986). Metal was also considered more easily polluted than china or glass (Wadley 2000:18); within metals, brass was considered highly susceptible to pollution and the ‘newer’ metals of aluminium and steel relatively less so.

Plastics, Purity, and Biomoral Neutrality

More recent anthropological engagements with biomoral substance exchange have demonstrated how logics of such exchange continue to pervade contemporary dimensions of social life in India, such as the notions of ritual purity implicit in the assumed superiority of vegetarianism (Osella 2008), the importance of caste in selecting candidates for donor insemination and adoption (Bharadwaj 2003), and both the resistance to non-kin blood and organ donation (Copeman 2013) and the co-option of blood donation in the service of creating fictive familial ties to broader imagined communities of nation and society (Banerjee & Copeman 2018). At first glance, concerns regarding the bodily absorption of chemicals from plastics may be seen to be an extension of anxieties related to biomoral substance exchange. However, plastic packaging is seen as *blocking*—rather than implicated in—biomoral substance exchange. When plastics began to seep into the Indian market in the 1970s and 1980s, they were considered less vulnerable to pollution. Susan Wadley recounts how during her fieldwork in the 1990s plastic bangles or cups were treated as lying outside of frameworks of biomoral contamination or ritual pollution. Just as in the case of glass, stainless steel, aluminium, milk formula, and artificial blood, as ‘modern’ symbols, plastics were unmarked by ‘traditional’ connotations of purity (Copeman 2013; Wadley 2000).

In *A Primer for Daily Life*, Susan Willis describes packaging as an integral part of the commodity form in late modernity; packaging, particularly plastic packaging, ‘promotes the notion of product purity’, of products unexposed to the germs in the air and on the hands and coughs of salespeople (1991:2). It obscures the human labour involved in production, and perpetuates the illusion of the commodity inside as untainted by human contact. Within India, too, plastic packaging is part of a complex imagination of modernity and hygiene as linked to the cosmopolitan consumer aesthetic, and people speak of plastic packaging as a guarantee of purity and quality (see also Solomon 2015). By obscuring the human labour of production, plastic packaging allows for the materials inside to seem untainted by biomoral substance exchange with human producers or labour. Moreover, plastics themselves are not considered to transmit biomoral substances—and hence, purity or pollution—perpetuating the sense of protection. In this dual capacity, plastic packaging has been crucial to expanding market exchanges by mitigating the social threat (through contamination of other’s substances) implicated in wider, more frequent, and anonymous transactions.

Although scholars of India have cautioned against confusing conceptions of ritual purity with secular notions of hygiene, they have also pointed to significant overlaps between the two, particularly in ideas of cleanliness (Alley 2002; Bean 1981; Dumont 1980; Hansen 1999; Srinivas 1952). Plastic packaging in India represents the complex entanglements between symbolic frameworks of cleanliness, biomoral substance exchange, and hygiene in understandings of purity. Interlocutors older than 30 recalled refraining, in decades prior, from eating foods like *chaat* (savory snacks) from roadside stalls and small vendors because of concerns regarding cleanliness; by the time of my fieldwork, however, eating from such stalls had become common among the urban middle class. Customers would usually check for the use of disposable gloves, disposable cutlery, and (plastic) bottled water in the preparation of sauces when eating such foods. One interlocutor mentioned how, particularly when travelling, he preferred tea at tea stalls to be served in disposable plastic cups as he knew the cups were not being reused. With glass, he

said, there was ‘no guarantee that they are washing it properly’. Such concessions to hygiene, however, were largely symbolic. I noticed, for example, the men behind the *paani puri* (snack of round crisps filled with flavoured water and lentils) counters regularly use their gloved hands to handle not just the food but also cash (notorious carriers of germs) and other non-food items. Customers rarely peeked into the kitchens behind the stalls with disposable plastic-ware to check for cleanliness. Similarly, interlocutors would order bottled water in restaurants even when those restaurants advertised using reverse-osmosis water filters (common among upper middle-class homes and food establishments in urban India). Here, plastics, in the form of a sealed bottle or a gloved hand, symbolically conveyed a sense of purity, and therefore, of biomoral neutrality. Plastic packaging in contemporary India thus functions as an index of cleanliness and biomoral neutrality rather than as a medium of biomoral substance exchange.

From Biomoral Exchange to Chemotoxic Transmission

Although concerns about the transmission of chemicals through plastic packaging reflect a preoccupation with the permeable person and the boundaries between the body and its environment, they relate to a type of transaction between the body and its environment that is different from biomoral substance exchange. A vignette from a zero-waste meet up is illustrative of these differences. On a hot summer afternoon, people from across Mumbai who formed part of a group interested in decreasing the amount of waste, especially non-biodegradable waste, that they generated met up in a park. As participants discussed strategies and tricks to reduce their dependence upon disposables and processed, packaged products, the subject of carrying one’s own containers to buy groceries came up. A stay at home mother in her 40s recommended buying from ‘local old-style grocery stores’ where one could ‘buy rice, flour, pulses, soaps, etc. from a mill or a local vendor in your own bags instead of those packaged ones’. An older, retired participant, however, lamented that when buying loose, one could not ‘guarantee quality’. He recounted with a visible shudder seeing people touching the pulses displayed in sacks at one such store and, in another instance, seeing a lizard running through an open sack of sugar. While a few participants

nodded at this, another male participant in his early 30s sounded a note of caution: ‘Plastic-packaged food is dangerous too—it is packaged with chemicals to increase shelf life. Plus, plastic chemical leaching is an issue’. He felt that it was better to take one’s chances buying loose groceries, a ‘traditional’ practice that had continued for several generations with no overt harms, than to buy foods in ‘modern’ packaging, whose ills were only just becoming apparent.

In this case, plastic packaging was seen to block one type of transaction—that of biomoral substances—while enabling another, a transfer of ‘chemicals’ that I term chemotoxic transmission. Whereas the substances transferred through biomoral exchange are seen as biological or ‘natural’ and therefore constitutive of bodies, chemotoxic substances are seen as synthetic, created by humans, and hence, distinct from nature. Indigenous conceptions of the natural world revolve around cycles of consumption in which natural processes and organisms recycle and reshape of wastes in a hierarchically organized food chain; substances that ‘prove durable, inert, impenetrable, unchanging, and unusable’ and that are not impacted by natural processes present a challenge to such a conception (Rosin 2000: 8). When interlocutors spoke of ‘chemicals’—whether pollutants, pesticides, or plastic residues—they were referencing such anthropogenic, unchanging forms of substances, not usually found in non-industrialized environments, that were seen to lie outside the natural cycle of consumption and therefore outside the natural world. I would often hear frustrated scientists or chemical engineers derisively comment on lay discourses on chemicals by pointing out that even ‘natural’ substances (such as unprocessed foods) are composed of chemicals. Their technocratic conceptions were entirely different from lay conceptions of ‘chemicals’ as lying firmly in a synthetic, manufactured domain outside the realm of nature.

Just as with biomoral substance exchange, conceptions of chemotoxic transmission reflect a preoccupation with permeability at the boundaries between the body and its environment. Notions of chemotoxic transmission also show continuities with biomoral substance exchange in relying on sensorial

aspects, such as sturdiness, in determining the ability of a material to transmit substances; as mentioned earlier, flimsier plastics are thought to be more susceptible to leaching. Chemotoxic transmission, however, is only a one-way transfer, from the polluting material to the body, and its perceived consequences are quite distinct from those of biomoral substance exchange. Whereas biomoral substance exchange can result in changes to a person's qualities and character—whether for better or worse—chemotoxic transmission is tied to health risks, a general weakening of the body, and cancer. Persons may seek out changes in their biomoral substances through transactions with others seen as spiritually superior or better; they may also seek to change their biomoral composition to be, for example, more aggressive or 'hot' (e.g., Rogers 2008). Chemotoxic transmission, however, is never sought after; it is avoided and mitigated. Consumers engage in 'precautionary consumption' (MacKendrick 2010)—that is, changing their behaviour as consumers to avoid exposure—such as eschewing products sold in plastics or thought to contain 'chemicals' or engage in consumption aimed at harm reduction, such as buying ayurvedic or herbal supplements that promise to mitigate the adverse consequences of 'chemicals' in the environment (Nichter 2003). Thus, where biomoral substance exchange centres on persons as socially embedded, chemotoxic transmission centres on persons as consumers.

Defective Modernization

The emphasis in these discourses on the perceived dichotomy between 'traditional' practices that are safe from chemotoxic transmission and more 'modern', toxic ones is a telling one. Anxieties about the 'chemicals' in plastics and the environment tie in to a larger local discourse in India on 'defective modernization' (Simonelli 1987). In India, indigenous conceptions of health view the body as part of a larger ecological landscape, connected temporally and morally to a natural order (Alter 2004; Guha 2006; Leslie 1996; Nichter 2001). 'Modernity', especially in the years following the liberalization of India's economy in 1991, is seen to have brought increased health risks as a result of a disordered relationship between the individual and social body and the natural order. Pollution and the use and abuse of pesticides

or synthetic fertilizers—framed as demanding more from nature than is appropriate—are blamed for the deterioration of the environment, quality of food, and human health. A dependence upon biomedicines, seen as meddling with the natural way of things for the sake of convenience and quick results, is criticized and contrasted with more holistic, ecological approaches to wellness; a growing reliance on food cooked outside the home is connected to this new demand for quick fixes and rising rates of obesity, heart disease, and diabetes. New work structures and the pressures of consumption are viewed as negative aspects of India's engagement with modernity; they are critiqued for having resulted in notions of regular routine (in terms of prescribed times, based on diurnal and seasonal cycles, for activities such as eating and sleeping), central to indigenous conceptions of health, being abandoned in practice. In these discourses, the changes following on the heels of India's neoliberal economic reforms and closer engagement with capitalist modernity are blamed for a general weakening of the body, and this goes on to lead to chronic disorders and health conditions such as cancer. Discourses about defective modernization are thus moral and political ecological discourses on the harms of being in disharmony, as a result of capitalist extraction and accumulation, with the natural order (Pathak 2019). Concerns about 'chemicals' are another way of referencing the toxic effects of defective modernization, and they form part of what Kath Weston (2017) terms the 'ecological intimacies' that tie together human and their bodies to the ecosystems they have damaged.

The particular ire directed at bottled water, as compared to other forms of packaging, is significant here. It represents resistance to capitalist accumulation through the conversion of common-pool resources, such as water, into private property through the act of bottling. Moreover, anxieties about chemotoxic transmission are linked to the interpellation of citizens as consumers, common in an era of advanced capitalism. Since economic liberalization in India, citizenship is articulated as the right, protected by the state, to consume. The middle class is central to this reconfiguration of citizenship (Lukose 2009), and it was mostly middle-class interlocutors who, as consumer-citizens, worried about the health risks of

plastics through consumption. The low-income interlocutors I spoke with regularly stored items in plastics for long periods of time—in fact, plastics were a sought after material—and seemed nonplussed when I asked if they worried about the risks of such storage. Given that my low-income interlocutors were mostly living in slums and dealing daily with precarity and struggles for water, work, sanitation, and sleep, it is not surprising that they were less focused on risks and future quality of life—and less able to police their bodily boundaries—than their middle-class counterparts. At the same time, it was usually such members of the urban poor who engaged extensively with plastics in ways other than as consumers—either, for example, in the course of preparing and packing the products wrapped in plastics or while employed in the myriad circuits through which discarded and waste plastics are recovered, processed, and recycled (Doron & Jeffrey 2018; Gill 2009; Hodges 2013). In the consumer–citizenship discourses on the chemotoxic risks of plastics, their interactions with the material were largely rendered invisible.

Porous Persons and Defective Modernization

Theories of modernity have often purported linear, inevitable movement toward more individualism and the disembedding of persons from their social contexts (e.g., Giddens 1992; Touraine 2002). This would suggest that with modernity, societies see a move away from ‘relational’—and permeable—personhood toward ‘individual’ selves. In *A Secular Age*, Charles Taylor (2007, also 2008), points out that individualization is historically and culturally contingent, and proposes a distinction between pre-modern ‘porous’ selves and modern ‘buffered’ ones. The porous self¹, he contends, inhabited an enchanted world of ‘charged objects’, including things, spirits, and cosmic powers, that had meaning beyond just our reaction to them. These objects and forces could shape psychic and physical lives by crossing the boundaries between the mind, body, and world. The buffered self, on the other hand, inhabits a modern, disenchanted world with much firmer boundaries between the mind, body, and other; here, morals and meanings reside in the mind, rather than out in the world. Thus, substances can no longer function as loci of generalized beneficence, as with the phials of liquid brought back from a pilgrimage that could cure

everything and make pilgrims better people, but must instead function as loci of specific chemical properties. Similarly, for modern selves, there can be an aphrodisiac, but not a love potion that ‘determines the human/moral meaning of the experience it enables’ (Taylor 2008).

The move away from understandings of biomoral substance exchange should entail a move to such buffered persons, and yet, the body susceptible to chemotoxic transmission is still a highly permeable, vulnerable body. It is telling that concerns about chemotoxic transmission revolve around a general weakening of the body and cancer rather than diabetes and other metabolic conditions that biomedical research has linked to endocrine disruptors added to plastics, such as BPA or DEHP. ‘Chemicals’ function as Taylor’s ‘charged objects’, as the loci of generalized weakness; cancer becomes an alien, parasitic, and malicious agent that takes over the body in an act akin to possession. Chemotoxic transmission thus references a new kind of porous person. The boundaries between this experiential body and its environment are still permeable, but such a person inhabits a contaminated world where transactions with places, environments, and people, produce contaminated bodies. Consumer–citizens can try to buffer themselves from the toxic ecologies surrounding them through careful consumption, but their efforts are necessarily limited. As one interlocutor noted about a friend in her 30s who had been diagnosed with cancer, “These are people living in good conditions. [They] Don’t use plastic, don’t use microwave. But you still breathe it [chemical contamination] or eat it or drink it.”

Conclusion: Permeable Persons in the Anthropocene

In her RAI Huxley Memorial Lecture, Margaret Lock reminded us that ‘Tightly bounded, autonomous humans simply do not exist, and microbial activity orchestrates the entanglement between the natural and social worlds’ (Lock 2018: 467). She tasked anthropologists with drawing attention to the damaging effects of anthropogenic changes on human health and wellbeing and the ways in which these changes are unevenly distributed across populations. Such investigations can add to emerging scientific

understandings of human bodies as reactive to environmental stimuli, both within and without the body. More importantly, according to Lock, such studies can help illuminate the extent of anthropogenic ecological changes on human wellbeing in order to spur local and global policy changes.

In this paper, I have attempted to heed her call by highlighting local anxieties related to the unstable boundaries between persons, bodies, and their degraded environments. Shifts away from a focus on biomoral substance exchange to new conceptions of chemotoxic transmission highlight new forms of bodily porosity and permeability inflected by changing material environments. In this conception, plastic packaging keeps the commodity wrapped within it bounded off from human pollution, but its own capabilities to pollute are brought into focus and its ability to remain a stable boundary called into question; it takes away the social, biomoral threat of contamination by others' substance code but carries the chemotoxic taint of defective modernity. The chemotoxic vulnerability of the body, far from indicating a move to a more 'modern', buffered personhood, underlines instead the instability of the boundary between human bodies and their degraded environments as it presents itself in late modernity.

In detailing this form of transmission associated with permeable personhood, I have focused my analysis on India. Nevertheless, a host of literature on toxic exposures and the sensorial in anthropology chronicles similar concern over threats to the self from contaminated environments the world over (e.g., Checker 2007; Fiske 2017; Fortun and Fortun 2005; Freinkel 2011; Khalikova 2016; MacLeish and Wool 2018; Murphy 2017; Shapiro 2015; Stolz 2018). These resonate with yet are different from new understandings of the human body as porous to the environment, especially through the skin and gut, resulting from research on epigenetics and the microbiome. Overall, the renewed focus on the porosity of the body represents a growing recognition of the permeable boundaries between the body–self and its surroundings that render it difficult to isolate persons from the larger ecological landscape. The political ecological views of health and the body that they encompass nevertheless have to contend with political

economic realities of a global capitalist system reliant on environmental degradation and the over-extraction of natural resources. Although critical of capitalist accumulation, conceptions of chemotoxic transmission and the permeable body cannot escape the interpellation of persons as consumers. These consumer–citizenship discourses focus on the work of consumption rather than production, rendering non-consumption oriented engagement with plastics and other ‘chemicals’ invisible. Nevertheless, regardless of their exclusions, such consumer–citizenship discourses have shown potential to instigate policy-level change, however imperfect, that is crucial to mitigating the effects of anthropogenic environmental deterioration. It was, after all, the preponderance of WhatsApp and Facebook messages related to plastics that helped bring the material under the political spotlight in India; they were also key to the political calculations that resulted in a single-use plastic ban in Maharashtra in June 2018 (Pathak & Nichter 2019). Such discourses foreground concerns about living as interconnected biological beings within ecosystems that we have damaged; the political ecological perspectives underlying them, if harnessed, offer the potential to encourage new engagements with both environmental politics and environmental justice in the face of the Anthropocene.

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¹ As other scholars have pointed out, Taylor tends to use the terms ‘self’, ‘person’, ‘subject’, and ‘identity’ interchangeably (Abbey 2000; Smith 2012). Given that I am concerned here with porosity and permeability, rather than concepts of selfhood and personhood, I consider his argument as it

relates to personhood even though I use his original terminology. My thanks to one of the anonymous reviewers for highlighting this.

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