

Beyond Cultural Accounts: The Durable Connections between Humans and Beer

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Abstract

Scholars contend actor network theory (ANT) could be an effective framework for analyzing the reproduction of social systems where the agency of material objects plays a role. By puzzling established explanations for “craft” beer’s emergence, this paper seeks to develop such a framework. Craft beer offers a compelling case, since theories such as population ecology and neolocalism only partially explain its emergence. Following ANT, this paper considers the development of systems producing beer across three stages of civilizations. First, agricultural beer is embedded in communities, then becomes disembedded by the specialized systems of industrial production. The craft beer movement “swings back” this pendulum. The material properties in beer court human actors seek to embody and re-embed its production and/or consumption, enabling human networks to reclaim commodity systems from corporate control. This analysis contributes to ANT’s potential for comparatively examining power dynamics between human and non-human objects interacting to produce social systems.

Keywords

Actor Network Theory, Population Ecology, Neolocalism, New Materialism, Craft Beer

1. Introduction

In 1978, there were only 89 breweries operating in the United States. By 2021 that number had mushroomed to 9247 breweries—the vast majority of which are independently owned (Brewers Association, 2022). Despite efforts of “big beer”, the market has partitioned between craft beer enthusiasts, and the broader, still dominant American pale lager. Academics from diverse fields have been drawn to the dynamic, decentralized nature of craft beer’s growth, particularly

on the global level. Tourism and planning scholars find evidence for creating community, place-bound resiliency, and even revitalizing economies (Alonso 2011; Bradley et al., 2017; Hede and Watne, 2013). Work scholars have documented the intrinsically meaningful craft aspects of the labor process (Rodgers and Taves, 2017; Thurnell-Read, 2014). Marketing researchers have found the social media data troves valuable for examining emergent, differentiating consumer behavior (Baldykowski et al., 2018; Capitello and Todirica, 2021; Pozner et al., 2022). However, sociologists find that, despite the decentralized nature of emergence, craft beer is still a predominantly an affluent, white male social world (Chapman & Brunnsma, 2020; Chapman et al., 2018; Wallace, 2019).

The complete transformation of an established industry presents a puzzle for sociology. Social movement scholars (Rao, 2009), population ecology (Carroll and Swaminathan, 2000), cultural sociology (Chapman et al., 2018; Darwin, 2018) and geographers (Flack, 1997; Schnell and Reese, 2003) have examined the dynamics of the craft beer's emergence. Two literatures, population ecology and neolocalism are most prominent in this respect. Population ecology has successfully demonstrated craft beers' initial growth depended on consumer identification with the microbreweries' legitimacy claims via anti-corporate messaging (Carroll and Swaminathan, 2000), and that craft beer has increasingly become mainstream, with fewer consumers interested its authenticity (Pozner et al., 2022). Meanwhile, the neolocalism literature captures how breweries in communities seek to enact a local identity, quite often in resistance to corporate homogenization of place (Flack, 1997; Schnell, 2013; Shortridge, 1996). However, these literatures are somewhat incomplete since they mostly offer descriptive insight.

Inspired more generally by the new materialist movement (Pyyhtinen, 2015), Actor Network Theory (ANT) offers a complementary perspective to these accounts of craft beer emergence. New materialism is a slight split from the social technological perspective that sought to privilege the role of cultural processes generating and perpetuating technology (Pinch and Bijker, 1984). ANT offers a corrective by focusing on the transformative properties objects possess, which might impact human systems separately from socio-cultural processes (Baron and Gomez, 2016).

ANT invites an alternative consideration of craft beers' emergence. Beer is an object with a relatively stable material form (i.e. a liquid fermented from grain), whose persistence predates structural conditions where neolocal or population ecology could be observed; namely, the globally integrated nation-state market system. Despite being discovered independently on three different continents, beer has been the subject of prohibition in nearly every culture it has persisted within, suggesting a persistent, durable response of human institutional systems to the object. We should not expect this level of consistency in the interaction of humans and objects, if objects are *only* the outcome of human culture—where the range of variability is set by human imagination.

This paper considers the relations between social actors producing and con-

suming beer as the scale of beer's reproductive forms have shifted over time. The analysis offered here is somewhat unconventional, but follows the recent calls of scholars interested in the new materiality of social forms (Baron and Gomez, 2016; Latour, 2005; Pyyhtinen, 2015). The limitations of explaining human social systems by only referring to the socio-cultural realms become increasingly apparent as the complexity of reproducing one global system composed of nearly 8 billion humans accumulate. Pyyhtinen argues for a new sociological imagination that incorporates descriptions of material structures shaping human agency through relations and scale, rather than presuming the dichotomy of "actors embedded in structures". Latour (2005) calls for accounts of history regarding the accumulation of linkages that produce forms. This paper is step toward accounting for the intersections of material objects with human capacities to enact those objects. Since humanity has become the output of a technological system (Fuchs, 2007), conceptualizing the effects of materiality in producing variability in these systems may require comparative time scales spanning human history.

Hence, this paper asks: *Across time, what kinds of productive-consumptive systems constitute beer's circulation?* Historical accounts suggest three significant shifts in these systems: decentralized and embedded agricultural, centralized and highly disembedded industrial, and a combination of both systems found in the current post-Fordist era. Craft beer is explained by emergent tendencies found in the materiality of both beer *and* humans seeking to re-embodiment the production and consumption of beer. The term "craft" represents a broader understanding—the primacy of human skill, thought, energy, commitment—in the production or consumption of some commodity (Campbell, 2005; Ocejo, 2017). Craft is a power move by human actors resisting the McDonaldization (Ritzer, 2013) pressed by corporate actors. While markets are shared spaces where this struggle plays out, social inequality explains which humans have the resources necessary to resist the power of corporate actors seeking to control production and consumption. Beer the object is an amenable vehicle for that reclamation project. It becomes the flagship of resistance to non-human systemic power.

This paper makes two contributions. One, this account enriches the craft beer literatures' understanding of its emergence by linking the durable, material features of beer to the current craft beer moment; this connection has implications for contemporary socio-cultural patterns, such as race and gender that are associated with craft beers' inequality (Chapman & Brunsma, 2020; Chapman et al., 2018). Secondly, it suggests ANT's potential for conceptualizing power dynamics between human and non-human social actors as both engage in shared social spaces for reproducing commodity systems.

The paper is organized by first discussing the strengths and weaknesses of population ecology and neolocalism's theoretical accounts for craft beer's emergence. Then ANT's framework is described to offer a potential alternative. Next, beer's history is sketched in terms of the scale of social actors that have driven its production across three shifting forms of civilization. Finally, to ac-

count for the durability of these connections, the characteristics of beer that make it amenable to embodiment are considered. The discussion and conclusion consider the implications for studying interaction between humans and non-human social actors.

2. Descriptive Accounts of Craft Beer's Emergence

“Craft beer” refers to breweries founded with the intent of positioning themselves within the broader craft beer movement (Chapman, Lellock, and Lippard, 2017; Koontz and Chapman, 2019). Usually, these firms have at least one location that makes and serves beers brewed at that site. While the Brewers Association defines craft beer as any brewery that serves less than six million barrels per year, that number was chosen so that the national beer brand Sam Adams could remain politically aligned with the niche market (Hindy, 2014). The aesthetic of the craft beer movement seeks to be local, independent, and against the corporate breweries that control the American (and global) beer market (Flack, 1997; Mathias et al., 2018).

What could be called a “craft beer movement” began in the decades following the United States’ consolidation of beer into one style, the American Pale Lager, peaking in 1978. In that year, President Jimmy Carter enacted legislation at the behest of a homebrewers’ movement enabling companies to sell brewing equipment, and allowing homebrew clubs to practice openly (Acitelli & Magee, 2017). The burgeoning homebrew clubs would beget festivals, which would beget entrepreneurial stories from retiring couples, to young bootstrapping upstarts (Grossman, 2013; Hindy, 2014). By the mid-1990’s about one thousand breweries were operating, spurred mainly by homebrewers-turned-entrepreneurs (Hindy, 2014). Between 2010 and 2020, the number of US breweries would grow from 1813 to 8884; today craft beer controls about 25% of the US market (Brewers Association, 2022). The explosive growth of craft beer is not just a US phenomenon, however (Reid, 2021). Researchers across the world, from New Zealand (Murray and Overton, 2016) to Brazil (Falconi and Dias, 2018) and the United Kingdom (Cabras, 2021) have investigated the sudden growth of independent breweries, particularly over the past decade. The notion that “craft” means local and small scale (i.e. non-corporate) has been documented in the US (Carroll and Swaminathan, 2000) Italy (Garavaglia and Mussini, 2020) and South Africa (Green, 2015). Social science researchers have offered neolocalism (Flack, 1997; Schnell and Reese, 2003) and population ecology (Carroll and Swaminathan, 2000) to explain why craft beer emerged. Both are instructive but somewhat descriptive, hence lacking in causal explanation. The following sections will briefly review each of these literatures, and their limitations in explaining how craft beer emerged.

2.1. Neolocal Explanations

Neolocalism is a term suggested by geographers to capture the trend of local

businesses adopting brand strategies meant to evoke the shared history of place (Flack, 1997; Shortridge, 1996). The boundaries of place, or the geographic scope for what constitutes “place” are socially constructed via the idiosyncratic sense of history communicated (Schnell, 2013). With craft beer, this occurs as breweries brand themselves, and label their beers, using identifiable features of an “area”. For example, in Finland, the Tornio Brewery takes its name from both the town of its location, Tornio, but also the Tornio River that has been integral to the area (Ikaheimo, 2020). Moreover, the beers take names such as “Arctic Stout”, and use berries indigenous to the region in the recipe. In Ontario, Lamertz et al. (2016) track the changes over 200 years of the regions’ history and find that brewery names reflect shifts in the political landscape of the city. Researchers have documented similar cases where beer branding is used to construct a sense of place in New England (Debies-Carl, 2019), Italy (Cipollaro et al., 2021), Canada (Eberts, 2014), and throughout the American Southwest (Mathews and Patton, 2016). Moreover, scholars find that breweries do offer a concrete sense of place, attracting visitors who feel the communal solidarity breweries’ branding strategies promise (Fletchall, 2016; Holtkamp et al., 2016; Taylor and DiPietro, 2020). In surveys of North Carolina brewery patrons, Murray and Kline (2015) find the number one reason people visit breweries is “connection with the community” (p. 1198).

However, research in neolocalism is largely descriptive. It observes how discursive strategies resonate with a sense of “community,” but can say little regarding which businesses adopt the strategy. While the original concept was a response to corporate homogenization of place (Shortridge, 1996) scholars since have viewed it as a type of marketing strategy, leveraging consumers’ desire for local authenticity to “humanize” the brand (Hede and Watne, 2013). Schnell (2013) describes Wal-Mart’s efforts to use the word “local” in advertisements, signaling “good product” to the consumer. Numerous studies in marketing document the desirability of the “local” branding strategy (Campelo et al., 2014; Fritz, Schoenmueller, and Bruhn, 2017; Hakala, Lätti, and Sandberg, 2011). Thus, while neolocalism has largely been considered a response of community to capitalism, others have documented strategies for capitalism to coopt the trust consumers seem to have in the “local” concept.

Similarly, researchers have argued the “neolocal” strategy in craft beer conceals intentional exclusivity in constructing market spaces. White, educated, male, urban, and progressive politics undergird the broad usage of “local”, “craft” and “artisanal” (Ocejo, 2017; Schnell, 2013). Wallace (2019) investigates the aesthetic intent of the craft beer scene in London, finding an industry whose ownership is not only exclusively white male, but entangled with real estate developers aimed at gentrifying the city. A similar account in the case study of one craft brewery operating in Toronto and Ottawa demonstrates the effort to use “craft” to transform spatial identity against resistance to gentrification (Mathews and Picton, 2014). Furthermore, not all craft breweries adopt neolocal branding strategies

(Debies-Carl, 2019). Hence, neolocal does tell us that consumers desire connection to brands, and that community is a conduit for fostering such connections, but it only offers observations of what symbolically constitutes “place” for a geographic region.

2.2. Population Ecology Explanations

Meanwhile, sociology has explained craft beer’s emergence using population ecology (Carroll and Swaminathan, 2000). Population ecology borrows metaphorically from the natural sciences to treat “organizations” as discrete, bounded entities seeking to survive an environment (Scott and Davis, 2015). Organizations that offer similar principal goods or services are defined as the same members of a “population”. With births and deaths of organizations constituting the main units of observation, the rate of growth in the population over time becomes the principle analytic focus. An important finding from this literature is that, for any new set of firms—like craft beer breweries—there is a long period where the business form must earn legitimacy, and then an upward curve of growth in the number of new firms being founded. However, that growth curve will peak when the resources that population draws from become constrained, and then competitive dynamics explain rates of foundings and deaths. The growth rate is dependent on both the timing and the density of the current population (Hannan and Freeman, 1987).

While population ecologies’ basic growth curve has described the trajectory of organizational populations in thrift stores (Haveman, Rao, and Paruchuri, 2007), automobile markets in Europe (Hannan, 1997), and American labor unions (Hannan and Freeman, 1987), with respect to theorizing causality in the emergence of social forms, three limitations of the population ecology perspective should be noted. First, the counting of organizational forms proxies for the emergence of new industries or new forms of organization. However, researchers have doubted the reliability of this measure. Romanelli (1989) points out that considerable lag—as much as two years—may result between when a new firm files its paperwork, and when it begins operation. Since population ecology relies on a range of data (self-reports on surveys, secondary analysis of industry data, etc.), considerable variability exists in the timing of births observed. Moreover, a brewery founded with tens of millions in investment capital, with contracts for distribution in grocery stores on a national level, would count the same as a brewery started by one man in his garage. These two entities possess vastly different social origins, structures, and market environments targeted for distribution. Hence, treating foundings and deaths of firms as observations of the same concept—organizations born into a population—may help describe the timing of emergence, but many other kinds of observations are needed to explain how and why societies adopt particular sets of cultural practice—as well as to verify the timing of emergence.

Secondly, the population ecology approach presumes organizations are dis-

crete units of a generalizable phenomenon—“organizations”—much like organisms existing in some ecosystem (Pinto, 2005; Scott and Davis, 2015). Bruno Latour (2005) points out that using metaphors to frame units of analysis implicitly makes strong assumptions regarding the causal processes needed to produce and maintain an observed social form. Here, two problems result from using organisms-as-metaphors to frame the unit of observation. First, unlike organisms, which must exist through physical exchange of energy in an environment, “organizations” are legal fictions entirely contingent upon another legal fiction—the nation state. In addition, the firm’s existence is contingent upon the symbolic exchange of money, along with legal and cultural institutional contexts that must be legitimated through language. Hence, rather than discrete, bounded forms, the firm exists only through *communication* that must be maintained—symbolic exchange, rather than physical exchange. So, the metaphor occludes social and cultural systems necessary to communicate the firm to its market. For example, in 1920, the US prohibition amendment instantly winked over one thousand “organizations” out of existence with ink drying on a page. Since there is no exogenous force analogous in nature that can make organisms disappear and then reappear more than a decade later, the metaphor of the organism obfuscates the causal power of institutional systems needed to define the existence of firms. Ironically, population ecology used the craft beer case to amend its theory by incorporating socio-cultural legitimacy into its framework, thus explaining the slow initial pace of growth curves (Carroll and Swaminathan, 2000).

Finally, and related to the last point, population ecology assumes a particular spatial-temporal frame of human civilization: where capitalist-democratic nations create market exchange under threat of violence. Firms and markets may only exist if states: 1) control the social space needed for exchange, and 2) provide institutions that circulate money for exchange (Polanyi, 1944). Under state control, humans become designated as “citizens”, the vast majority of whom must work to purchase their survival, rather than steal or take by force material goods sustenance necessitates. Since beer emerged independently in three separate parts of the world more than ten thousand years ago (Standage, 2006), it transcends nations and markets. However, because the power of nations to stabilize exchange is presumed in population ecology, it can only describe—after the fact—the rate at which a particular kind of “organization” emerged within those markets. This offers a limited view of how humans, material goods, and social forms aggregate over time—particularly in cases that eclipse that spatial-temporal frame. Hence, causality in explaining the emergence of new social forms is limited under population ecology.

3. Adopting the Actor Network Theory Perspective to Explain Causality in Social Forms

Actor network theory (ANT) could offer additional insight into the emergence of craft beer. ANT seeks to explain phenomena by making as few assumptions as

possible regarding how forms aggregate (Baron and Gomez, 2016; Callon, 1999; Latour, 2005). In other words, the nature of groups, actors, technology, and human agency is explained in terms of emergence and enactment, rather than assumed by the conceptualization of research design. ANT presumes all actors—human and non-human alike—are assembled from the accumulation of connections over time. The “network” is the acknowledgement that all actors are structured-as-networks, who are simultaneously acting within other networked structures. For example, psychologists argue the brain itself is an assemblage of networked structures (Minsky, 1988). According to Minsky, overtime, humans become programmed. Under different conditions, different networks fire so the human accesses particular repertoires of behavior or uses particular words. Trauma can even close off some well-worn networks, making them inaccessible (Sherin and Nemeroff, 2011). This suggests the brain is composed of sets of overlapping neural networks that develop based on how the human body enacts the structures of society. Hence, any social actor is material assemblage, engaging broader assemblages. Therefore, the analyst should begin by piecing together what assemblages, or relations between assemblages, are most critical to the social forms relevant to the research question (Pyhtinen, 2015).

Three injunctions follow from the logic of interrogating aggregation in social forms: 1) broadly trace the history of associations between objects, human actors and the networks in which they exist, 2) the nature of the actor determines the social scale of aggregation for analysis, and 3) non-human objects *may* have a material nature that is causal with respect to observed cultural and institutional patterns. The remainder of this section deals with each in turn.

First, *the history of associations accumulating to produce social forms must be examined before any attempt to formulate and generalize concepts can be made*. Since causal processes leading to the creation of one social actor relative to another might be idiosyncratic, presumptions regarding observations of social forms could occlude more than reveal. For example, the first breweries in Wisconsin were founded by German immigrants, bringing from the old-world knowledge passed down by custom (Ogle, 2006). On the other hand, many of the homebrewers-turned-entrepreneurs founding breweries in the past two decades learned their skills through internet research, festivals, and experimentation with styles (Acitelli & Magee, 2017). Yet counting these events as observations of the same concept, separated only by time, obscures dramatic differences in how the communication of knowledge operates to produce capitalist markets. To overcome this limitation, ANT recommends historically tracing the associations that accumulate, following the efforts of human actors, or other social forms, that might be operating by making as few assumptions as possible regarding what counts as a social form. However, as other ANT scholars have noted, these methods for tracing history are underdeveloped (Baron and Gomez, 2016).

Secondly, rather than presuming a particular social form corresponds to a particular level of analysis, *social actors may variously embody or be subsumed*

by structure. The nature of the social actor under scrutiny determines the scale of aggregation. Usually, sociological theory dichotomizes structure and actor: the actor is within the structure—hence, they automatically correspond to different levels of analysis (e.g. micro, mezzo, macro). The structure tends to dominate the actor; sometimes the actor can challenge the structure. Field theorists have worked within this limitation to explain how structures can change (Beckert, 2010; Fligstein and McAdam, 2012) by arguing human agency can shape structure when actors have social skill, when structures are (or become) destabilized, or if there are gaps in between structures. Meanwhile, population ecology has no explicit conceptualization of agency, but the implication is that actors choose (with varying levels of cognizance) to create new organizations based on the density of the existing population. For both theories, actor and structure are presumed to be two different dimensions of empirical reality, existing at separate levels of analysis: the actor perceives and engages structure; the structures are durable, slow, and encompass the actors' sense of reality.

ANT offers the notion that actors may embody structure. For example, consider a team of players in the National Basketball Association. One player, LeBron James, has considerable power in the sport (Josselyn, 2019). Three times in his career, he changed teams, picked the new coach, the new players, and had the teams' owners orchestrate trades to bring in people he wanted to play with (Chandra, 2021). LeBron James *embodies* the structure of whatever team he decides to join. Most sociological theories, particularly those using deductive analysis to conceptualize relations between variables, would struggle to operationalize the LeBron Effect, since he would be conceived as any other player within the structure of the team. While most NBA players are subsumed under the power of structures controlled by the coach and owner, LeBron—and superstars like him—are separate constructs. Structure is an outcome of their individual agency. How can we make this distinction between otherwise similar individuals? Power could be a key concept in making these distinctions between social forms. LeBron James accumulated enough power to make choices impacting entire cities (ticket sales for the team he chooses would have a ripple effect on local economies and hence employment levels). Much of sociology would struggle in this conceptualization, since the power of individual humans to embody structures is rarely considered. Sociology presumes that individuals, if not outright dominated by structure, operate at different levels of analysis. Rather, ANT (and new materialism more generally) suggests that the scale of aggregation on which analyses are pitched should be determined by (historically tracing where possible) the power actors variously embody to impact structure throughout their formation (Pyyhtinen, 2015).

Finally, *social systems or forms may be the outcome of material objects that affect humans.* In other words, material objects in the social world can shape systems independently of cultural or institutional factors. ANT is a perspective emerging during the 1980s from social constructivism's limitations in explaining

causality in the emergence of social forms when human and non-human objects interact (Baron and Gomez, 2016; Callon, 1999). The social constructivist approach tends to treat objects as the outcomes of social processes (Pinch and Bijker, 1984). This approach is important for examining the potential for cultural biases with respect to gender and/or race infused to structures. However, by not critically examining objects shaping human actors, independently of culture, much of the social world becomes difficult to explain.

For example, in the United States, the strong correlation between suicide rates and gun-ownership illustrates this point. All other risk-factors being equal, owning a gun increases the probability of suicide (Kellermann et al., 1992), meaning social and cultural variation cannot account for suicide propensity. An ANT account might argue that the presence of a gun transforms the suffering individual into an instrument of lethality. Suicide is the outcome of the objects' material properties. Since one cannot account for the formation of social systems without conceptualizing the causal properties operating, the materiality of objects should be theorized relative to social formation. Hence, "materiality" refers to *intrinsic factors that could affect how humans engage, use, perceive, or become variously empowered by the object*.

The method of analysis in the following section applies these three principles in developing an account of beer's adoption relative to its production and consumption within human social systems. I trace the scale of associations between different actors that variously embody the production and consumption of beer. Does the scale of the productive-consumptive dynamic for beer change over time? What kinds of social actors cause those changes? Answering these questions may allow for a materialist approach to the formation of social systems.

Thousands of books have been written on the history of beer; the account below is no synthesis. Rather, the interest here concerns characterizing productive-consumptive linkages between social actors reproducing beer. To that end, secondary sources were surveyed for four criteria: 1) knowledge dissemination regarding how beer is made, 2) the type of exchange between producers and consumers, 3) the form of modal social actors driving that exchange, and 4) the spatial scale of that exchange. The story below is limited to the European and US perspective. However, as argued below, the US provides an appropriate baseline for conceptualizing the corporate-craft struggle that craft beer's resurgence exemplifies.

4. Three Stages of Beer Production

Illustrated in **Table 1**, systems producing beer progressed in three stages of complexity: 1) decentralized and embedded, 2) centralized and disembedded, and then 3) aspects of both. In agricultural society, beer was consumed where it was produced, based on the idiosyncratic accumulation of fermentation. Industrial society saw nationally-organized actors (for-profit firms) gain control over how to systematically make an ironically even more limited form of beer—the

Table 1. The cumulative evolution of beer's productive-consumptive dynamic.

	Agricultural	Industrial	Post-Fordist
Knowledge	Cultural (Standage, 2006)	Abstract (Lawrence, 1990)	Abstract
	Idiosyncratic (Hornsey, 2003)	Specialized (Nelson, 2014)	Specialized
	Apprenticeship (Mazumdar-Shaw, 2000)	Controlled (Baron, 1962)	Freely shared (Mathias et al., 2018)
Exchange	Embedded by families within villages (Brown, 2003)	Mass Markets (MacIntosh, 2011)	Niche Markets+ (Carroll and Swaminathan, 2000) Mass Markets+ Prosumption (Rodgers and Taves, 2017)
			Corporations
Forms of Social Actors	Family (Brown, 2003)	Corporations (Stack, 2003)	Retailers
		Retailers (Ogle, 2006)	Mass Consumers
		Mass Consumers (Hindy, 2014)	Hobbyists (Capitello and Todirica, 2021) Entrepreneurs (Rao, 2009) Mid-Sized Firms (Brewers Association, 2022)
Scale	Decentralized Ranges between a few dozen people to an entire city (Nelson, 2014)	Centralized nationally Tens of Millions linked by a few corporations (Baron, 1962)	Big Beer Centralizes Globally. (Barth, 2021) Independent Beer decentralized by lifestyle, region and community (Clemons, Gao, and Hitt, 2006). Tens of Millions linked to diverse, multiplicative forms.

American pale lager—but at scales unimaginable to previous societies. Finally, the knowledge and means of making beer become decentralized at the global level. As the knowledge becomes more widespread, the corporate dominance over production lessens considerably, however those organizations restructure to become dominant at a global level, while craft beer grows across communities and neighborhoods.

The following sections detail the evolution of the productive-consumptive dynamic in three eras of history.

4.1. Beer in Agricultural Societies

Agricultural societies began about twelve thousand years ago, but the record regarding how and why is somewhat unclear (Henrich, 2017). The earliest “beer” would have occurred by happenstance. Alcohol occurs following two other processes. First, plant matter must be steeped in water, so that plant’s glucose becomes a sugary liquid known today as “wort” (Papazian, 2014). Then, a bacteria called yeast eat the wort and, in a process known as fermentation, excrete alcohol. Different plants offer different kinds of wort, and—along with differences in species of yeast—yield different fermented beverages. Ancient humans learned to look for plants submerged in a small puddle, or half open and containing rainwater (Hornsey, 2003).

With no evidence of contact between them, three separate civilizations incorporated beer. The earliest records place its origins in Sumeria around 10,000 BC (Sewell, 2014). In ancient China, the people brewed a beer called “kui” around 7000 BC; and finally, in South America, the Incas made “chica” for ritual purposes (Sewell, 2014). Anthropology debates the potential these discoveries spurred civilization itself (Standage, 2006). While brewing was not a well-understood process, the benefits of beer were obvious, since calories, clean drinking water, and food that did not have to be immediately consumed could be readily at hand (Hornsey, 2003). Beer provided all three—so useful for sustenance it would even be served to children (Mazumdar-Shaw, 2000). Via Egyptian and Germanic tribes, medieval Europe would inherit the ancient Sumerian beer (Sewell, 2014).

Knowledge, exchange, form and scale of beer’s productive-consumptive linkage was highly circumscribed by space. Throughout Europe, beer-making was a household skill, although families did vary in their ability. Since wives most often brewed, the nickname “ale wife”, would come to mean “ale houses” where quality beer could be expected (Hornsey, 2003). Rather than taverns or pubs, these homes were regular gathering spots (Brown, 2003). While today, we have “beer styles”, which refers to configurations of color, grains, alcohol content, and yeast strains that represent “stouts”, “ales”, and “lagers”, to name only a few of the broadest meta-categories, for agricultural brewers, the knowledge, skills, and practices of making beer varied idiosyncratically by village *and* by region, depending on the ingredients and traditions that were available (Nelson, 2014). The accumulation of “best practices” was passed down by apprenticeship and the sharing of tacit knowledge, reliably reproducing the process. This is consistent with ancient knowledge; repertoires for enhancing survivability existed without understanding the chemical or molecular reactions within—even when very particular steps could consistently produce food, medicines, or tools (Henrich, 2017).

Thus, for agricultural societies, variability in beer’s forms were limited and highly embedded, being completely subsumed within the social relations of the village. The simple social structures of village life limited beer’s range and form of expression. Production occurred largely in the home or the village, where it was either traded or consumed in face-to-face networks. While knowledge was idiosyncratic—based on the intergenerational accumulation of guesswork—it *was* embodied by the human actors controlling those spaces.

4.2. Industrial Beer

As widely recounted, the industrial era begins as entrepreneurs grapple with new powers of production, but matures into nationally organized systems controlling mass markets (Edwards, 1979), or what has also been called Fordism. It is the maturation and the emergence of publicly traded firms operating at national and global levels that marks this period as unique in all human history. For beer, the systemic production of the commodity outside of circumscribed village life be-

gins much earlier. In Italy of 525 AD, St. Benedict established a monastery with the idea that it should be completely self-sufficient (Nelson, 2014); this would include the common skill of brewing beer. The monks stored recipes, recorded the ingredients and steps involved for making their batches, and tried to improve the beer's shelf life for travel and storage (Lawrence, 1990). These practices spread with the rise of monastic life, and with the need to produce a stable, consistent product (Nelson, 2014). By the 18th century, beer markets beyond the village had taken shape.

Beer travelled to the US in 1620, aboard the Mayflower ship seeking the Hudson River, New York, when running low on beer, and the captain feared there would not be enough for the return voyage (Mittelman, 2007). The captain chose to settle in Plymouth Rock instead of risking the return. Specialized beer production quickly followed on the frontier. For example, twenty-six breweries operated in New Amsterdam by 1660 (Baron, 1962). The Civil War decided that the United States would be an industrial society. In the 50 years following 1865, the national production of beer rose from 3.7 million barrels per year, to 59.8 million barrels (Stack, 2003). This growth would presage national level markets, and goliath corporations. Yuengling, Miller, Pabst, and Anheiser-Busch were all founded during this period, but one beer indelibly marked the American pallet.

The national beer market was established by the Anheiser-Busch firm in the 1870s (MacIntosh, 2011). The owner, Adolphus Busch, would pasteurize beer before milk (Ogle, 2006), vertically integrate before railroads, advertise nationally, distribute by rail (Stack, 2003), and adopt assembly line automation (for bottles and cans) forty years before Henry Ford (Ogle, 2006). Competitors such as Miller and Yuengling would follow suit. By 1915, the US beer market would see several goliath corporations hovering over it, although 1345 breweries—many operating nearly a hundred years by that point—still served neighborhoods, without aims of national prestige (Stack, 2003).

Prohibition would permanently shift the landscape. In 1920 the passage of Amendment 18 prohibited alcohol production. However, once prohibition ended in 1933, only 756 breweries re-opened (Ogle, 2006). Prohibition was not simply reversed; alcohol was re-introduced via the “three tier system,” a philosophy of regulation for the industry (Hindy, 2014). Companies that produce cannot sell their beer; they must sell to a distributor, who may then sell to retailers. Before prohibition, firms like Anheiser-Busch operated thousands of saloons, where the beer came directly from breweries, in massive kegs transported by rail, that would be dispensed in mugs for the consumer (MacIntosh, 2011). Since the dreaded saloon culture helped spur prohibition, lawmakers hoped that creating distributional lags, and higher costs, would slow consumption. After prohibition, beer was primarily served in bottles, which was incredibly cost-prohibitive (Ogle, 2006). Since the largest breweries had already been canning and bottling soda to survive prohibition, they were prepared to distribute without kegs or barrels (Stack, 2003). Over the next four decades—the halcyon days of Fordism—the number of breweries operating dwindled to 78.

By the 1980s, the Big Three—Anheiser-Busch, Miller, and Coors—dominated the American pallet. All three are “American Pale Lagers,” an imitator of the original Budweiser. In 2021, nine of the top ten selling beers were pale lagers, with seven of those belonging to the conglomerate formerly known as Anheiser-Busch (Statista, 2021). The triumvirate of Bud-Miller-Coors, as it would come to be called by craft hobbyists and enthusiasts—or “Big Beer,” had decided to focus on pushing that one style of beer, only at different price points (Baron, 1962). The form of exchange between producers and consumers of the beer commodity form was organized at the national level. A handful of breweries supplied the vast majority of America’s consumers. Millions of American consumers had come to presume *that* taste was *beer*—the only flavor, color or aroma that beer could be (Hindy, 2014).

4.3. Post-Fordism and the Emergence of Craft

The degree—in terms of capacity, specificity, and adaptability—of global interdependency in systems of production and consumption distinguishes the “post-Fordist” era from the period where Fordism matured (Piore and Sabel, 1986). Two paradoxical trends may be observed in the post-Fordist period. Global firms have become some of the largest institutions in planetary history. Yet, many functions of the market once handled by corporations become decentralized. Alvin Toffler (1981) predicted this latter trend, arguing that lifestyle approaches exemplified by Do-It-Yourself movements amounted to a rising form of “prosumption”, where people would begin producing what they consume outside of market transactions. The proliferation of literatures documenting prosumption (Dusi, 2018; Ritzer and Jurgenson, 2010; Tse and Tsang, 2021) debate the extent to which consumers have gained some control over the reproduction of commodity systems. Communications theorist James Beniger (1986) offers a compelling axiom which might account for this apparent paradox: When systems evolve to process more material, they must develop decentralized distributive agents to handle the capacity. As new levels of centralizing power are generated, the system must simultaneously develop more empowered decentralized agents to handle the increased capacity. Hence, in the Post-Fordist period, we witness both the centralization and decentralization of power in the reproduction of markets. In the United States, the emergence of craft beer may be told as one such power struggle: people networked to challenge the corporate power producing what Americans’ consume, even while the global centralization of beer’s production accelerated.

Based on the number of brewery foundings, the United States’ craft beer growth curve is punctuated by two spikes (Brewers Association, 2022). The first occurs in the years between 1985 and 2000, where the number grew from 110 to 1566, while the second occurs between 2010 and 2020, growing from 1813 to 9205. The first wave growth was precipitated by key figures who either defeated legislation favored by Big Beer, or who led independent breweries to success. It

began when wayward rich young white male Fritz Maytag buys San Francisco's Anchor Steam Brewing in 1965 (Hindy, 2014). Recognizing a burgeoning desire for alternatives to corporate, mainstream products, Fritz placed this phrase on his beer labels: "exceptional respect for the ancient art of brewing" (Ogle, 2006: p. 256). Fritz initiated craft beer's "small is beautiful", marketing logic—emphasizing the tradition of brewing, the passion for its history, and the difference from the American lager (Acitelli & Magee, 2017).

Independent entrepreneurs who wanted to start their own breweries had to start by changing the laws. Homebrewing's illegality favored corporate America since that forbade the learning of skills needed to produce competitors. In the four decades following Prohibition, zero new breweries were founded (Brewers Association, 2022). Challenges to politicians lobbied by Big Beer would eventually grow, until 1978 when President Jimmy Carter signed HR 1337, legalizing homebrewing (Acitelli & Magee, 2017). Charlie Papazain's founding letter of the Homebrewers Association in 1979 called their efforts that of "beautiful Davids versus grotesque Goliaths" (Hindy, 2014). Following this, homebrew supply stores, clubs and festivals flourished, with researchers finding a clear knowledge community collectively disseminating these skills (Rodgers and Taves, 2017). These "market rebels" formed the substratum on which the craft beer market grows (Rao, 2009). Over the next two decades, nearly fifteen hundred breweries would begin operation.

However, craft beer's growth following that initial surge slowed; between 1999 and 2007 the number of breweries decreased, dropping from 1564 to 1511—a fact that academics studying craft beer's growth often omit. Population ecology would interpret these numbers as indicating the legitimacy of the independent microbrewery business model needed time—along with an affluent market to absorb the differentiation—to spread. Another interpretation is that Big Beer successfully developed tactics slowing craft beer's growth. Big Beer employs lobbyists in each state who work to maintain favorable regulatory structures inhibiting product diversity and small business entry, often by supporting prohibitions' legal remnants (Gohmann, 2016; Williams, 2017). Still another tactic is to disguise themselves as craft beers, or, as industry insiders call them, "crafty" beers, while academics have dubbed it "craftwashing" (Howard, 2018). Usually, this occurs through purchasing established brands, but keeping the transactions as quiet as possible, creating existential crises within the craft beer community (Taylor, 2017).

The second spike in craft beer's growth could be seen as the movement learning, on a state-by-state, community-by-community level, through a decentralized network of sharing, how to fight the tactics of Big Beer—particularly in the regulatory arena. For example, distribution laws in North Carolina prevented any brewery from selling their beer directly to the consumer (Basha, 2017). This made small scale, start-ups in microbrewing impossible, since independent brewers would have to sell to distributors beholden to Big Beer. Uni Bennowitz

would lead the fight to change this law, gaining success in 1987 (Tamayo, 2009). (The concession corporate lobbyists would win: if the brewery produces more than 25,000 barrels per year, it must sell to a distributor first). His brewery, the Weeping Radish would open soon after. However, only twenty-four breweries would open in the state over the next two decades, even though craft breweries were booming in Colorado and California. Another North Carolina law hindered the beer styles possible: no beer could be sold in the state if the alcoholic percentage (called ABV%) was above 6 percent (the American pale lager is usually around 5%). More legal battles ensued, spurred by a social movement called “Pop the Cap” (Basha, 2017). This group won new legislation in 2006. Over the next decade, nearly two hundred breweries would open in North Carolina. More comparative research on how regulatory battles in states and communities have impacted the growth of local breweries is warranted (Baginski and Bell, 2011; Smith et al., 2017).

The second wave of growth steadily absorbed Big Beer’s US market share. According to data compiled by the Brewers Association, 26.8 billion dollars went to the 9247 independent breweries operating in 2021, with domestics and imports (Big Beer) splitting the remaining 75.4 billion dollars of sales (Brewers Association, 2022). However, while craft beer has eaten into Big Beer’s profits, the scales are far from tipped. 86 percent of the world’s beer in 2020 was made by only 40 companies (Barth, 2021). In 2021, Anheiser-Busch InBev sold 46 billion dollars’ worth of beer to the planet, more than twice Heineken’s second place amount of 22 billion (Statista, 2021). Those two companies globally eclipse the entire US craft beer’s sales three times over. A recent report by the US Treasury Department finds that global consolidation in the beer industry continues to hamper small businesses—with as much as 60% of the US market controlled by only two corporations (Treasury Department, 2022). Thus, both local decentralization and global centralization characterize the expansion of beer the commodity system in the post-Fordist era.

The current stage of craft beer’s growth could be nearing the saturation point where, according to population ecology, competition may start to limit the rate of US founding. One indicator of this saturation is that many consumers prefer the flavor, and no longer care whether the beer is independently produced or not (Pozner et al., 2022). However, states that have been slow to change prohibition’s laws could be behind the growth curve of progressive states, meaning spikes of growth may appear in those communities still “catching up”.

The independent homebrewers of the 1970s and 80s have been so successful at spreading “their” product, simply being able to choose a beer has become a hobby (Capitello and Todirica, 2021; Ikaheimo, 2020). For example, the social media application, “Untappd” (claiming 9 million users,) allows drinkers to review local brewers, and has drawn academic interest in seeking to understand consumers’ diverse behaviors in making craft beer distinctions (Baldykowski, Miczevski, and Silva, 2018). The website “Ratebeer.com” began much earlier

under the same premises, and today archives 715,000 reviews of *unique* beers (globally), which is nearly entirely user-generated (ratebeer.com)—though it was bought by Anheiser-Busch InBev in 2019). Consumers expect variety from each “craft” brewery, with their own take on well-known styles (Clemons, Gao, and Hitt, 2006).

The US story of craft beer’s growth is decentralized, knowledge-based, and unevenly punctuated by legal battles with Big Beer. The knowledge for how to produce beer is freely available, with internet and access barriers assumed; the proliferation of its dynamic production has drawn craft consumers and community organizers. Meanwhile, corporations and states control where this decentralized, emergent tendency is expressed, and continue—globally—to centralize production capacity. However, the individual resources necessary to engage the craft beer lifestyle remain distributed by class, race and gender. Still, we are left with the question of why beer? Why did this object become the vessel of resistance to corporate control of the commodity system?

5. The Material Properties of Beer Create Demand and Supply

Following ANT’s injunctions described above, this section considers the properties of beer, stable across these shifts in civilizations, that contributed to craft beer’s emergence. A consistent, durable institutional outcome is prohibition. While ancient civilizations allowed beer consumption for children, these had low alcohol by volume (Hornsey, 2003). Wikipedia (2022) lists twenty-seven countries that contain at least one region banning alcohol’s consumption. Ancient Egyptians feared allowing laborers to imbibe too much beer, lest they become less functional (el-Guebaly and el-Guebaly, 1981). Hence, the material properties of beer (namely, its alcoholic content) cause institutions—separated by time, space and language—to restrict its consumption. Political, cultural and religious meanings regarding the consumption of beer are contested and do vary considerably (Chapman et al., 2017). However, since prohibition remains a central issue in beers’ consumption, we should consider this an outcome of beers’ material properties.

Regarding alcoholic beverages more generally, the scientific literature may be divided into two streams: clinical research and sociocultural research. The latter seeks to paint the various patterns with respect to which kinds of drinks mean what (Morris, 1998) and who has access to which social realms where drinking is prescribed. The former examines biological reactions to chemicals under experimental conditions, either with humans or mice (Herz, 1997). The goal in this brief analysis is to consider why the chemical properties consistently found in “beer” find such ubiquity in human social systems producing and consuming those properties. Rather than examining the discursive content in cultural systems, the question here asks: Why is beer a central mechanism in the production of such variegated discursive realms for humans separated in space, time and

language? The argument made is that intrinsic properties of beer create demand from humans, with a low threshold for supplying that demand. This blend of factors makes beer a difficult product to completely homogenize.

Beer's desirability manifests socially across cultures at two levels of aggregation: the individual body and the group. For the human body, beer transforms perception of stimuli in ways that are consistently interpreted as pleasing. Beer is (nearly exclusively) an alcoholic drink, a chemical that intoxicates imbibers and creates sensations of euphoria (Lukas et al., 1986). However, there is a threshold where the blood alcohol percent can become lethal (Kringsholm, 1976). Yet, humans may become so dependent, sudden cessation creates alcohol withdrawal syndrome—a condition sometimes requiring hospitalization (McKeon, Frye, and Delanty, 2008). Hence, beer is both desirable and dangerous to the human body. These intrinsic dynamics between the object and the human body manifest in the ubiquity of social institutions pushing prohibition versus those pushing beer's systematic production. That beers' consumption persists despite these tensions suggest the desirous qualities of the object.

At the group level, research in societies as diverse as ancient Kirikongo (Dueppen and Gallagher, 2021) to United Kingdom college students (Banister and Piacentini, 2008) to modern organizational life (Flores-Pereira, Davel, and Cavedon, 2008) note beers' centrality to rituals of group membership. Collective drinking signifies ones' belonging to that group. We may postulate a basic mechanism shared by these systems: A collection of individuals being similarly transformed by the consumption of chemicals constitutes a shared experience of reality *itself* slightly shifting. An objective transformation is shared; the meanings of which are subjectively communicated between the interactants. Hence, sharing a beer means *sharing* an objective transformation in one's *subjective* sense of reality; it transports those sharing the consumption to another dimension of the social. Although social institutions determine which alcoholic beverages mean what, and for whom, the significance of beers' collective consumption—how it binds the group to a common experience of transformation—transcends cultural and institutional boundaries.

While beer demands to be consumed, it is also remarkably easy to produce. Liquid fermented grain accidentally made itself known to humans, and is thus only a few technological steps away from reproduction (Papazian, 2014). Homebrewers attest that making quality, drinkable beer is not very difficult, even if it is highly rewarding (Rodgers and Taves, 2017). The difficulty for beer production comes in making beer consistently with a particular set of characteristics—color, aroma, alcoholic content, and taste. Hence, the craft of making beer is easy to learn, but hard to master. Despite how complex the cultures of craft consumption might make it—and how scalable aspirations toward national markets can be—beer production is essentially boiling liquid and waiting. Therefore, beer's material qualities create high demand, while its production is relatively simple.

All alcoholic beverages have association with ritual, but the form of alcohol is associated with the type of ritual. Anthropologists note that, while wine and liquor tend to be reserved for more formal occasions, beer tends to flow during informal celebrations (Morris, 1998). These rituals did not spread from one culture to another; they are *emergent*, yet, a socio-cultural pattern is evident. The answer to why these distinctions appear consistently across cultures could lie in the form of the object. Beer's association with festivals or informal celebrations could be because it is easier to make in larger quantities, with lower alcohol by volume, enabling a more leisurely, meandering consumption for big groups. Beer's inherent qualities attract the consumptive experience, both for the individual and the group, while its ease of production makes it a difficult commodity for corporations to monopolize.

6. Discussion

Actor-Network Theory (ANT) offers three prescriptions for analyzing historical variation in the social systems producing beer. First, by tracing the accumulation of linkages forming social systems, we note beer's progression through three stages in the productive-consumptive dynamics constituting the commodity system: 1) agricultural, highly-embedded systems, 2) industrial, dis-embedded systems, and then 3) post-Fordist, where systems are simultaneously re-embedded by "craft" seeking humans, although organized along networks distributed partially through digital technologies, while global centralization of industrial beer production proceeds. From this perspective, craft beer is a *return* to embedded productive-consumptive dynamics, but a return configured by the operation of individual power within a networked, market-based society.

Secondly, ANT suggests the structure of social actors is defined by observing the power and scale to operate in some system, rather than a priori by micro versus macro dichotomies. This paper has argued that beer circulates within each civilization by distinct forms of social actors organizing production and consumption. Agricultural systems are organized by families, where exchange is embedded in villages. Industrial systems were organized by firms seeking to homogenize consumers' tastes through the price mechanisms of markets. Craft beer has been driven by decentralized networks of human actors. Some of these manage to grow into mainstream firms that represent threats to corporate market share. The rapid growth of breweries by homebrewers-turned-entrepreneurs occurs within a cultural context of avid consumers seeking to refine pallets for beer consumption. The scale of this structure is distributed through digital networks, organized by preference and affluence. Across festivals, social media apps, beer tourism, and events, the knowledge needed to make distinctions in beer styles—or make beer—is freely shared. A refined pallet expands the consumers' cultural capital, while trial-and-error experience, apprenticeship, along with internet searches or traditional book reading expands the technical mastery of brewers. However, these networks of the productive-consumptive dynamic

develop as the global capitalist system must expand capacity by decentralizing agents.

Distinctions in the spatial-temporal scale of markets engaged by various agents distinguish these social forms. Corporations engage global markets towards maximizing value in production by homogenizing taste. The imagination of the corporate actor is pitched toward regional, national or international scales of aggregation. The actions they take to maintain growth occur at a different level of institutional scale than the homebrewer-turned-entrepreneur. For corporate actors, homogenization via economies of scale makes sense. On the other hand, the sets of decentralized actors in craft beer's surge—entrepreneurs and consumers—are focused on the intrinsic engagement of craft (either by making the beer, or in the tasting), as embedded in a community, and rooted in the sensory experiences of the body.

This distinction suggests discrepancies in how human and corporate actors cognitively orient towards space and time in the reproduction of social systems shared—but differently imagined—by both. Corporations seeking control on national or global scales orient their logics to an aggregation of space and time that is beyond human experience. In contrast to drinking, or sharing a beer with intimate friends, humans may only symbolically apprehend the existence of global markets, where it is life's blood to the transnational corporation. Yet these very different types of social systems (the local versus global) can overlap. The corporate response to the craft beer threat indicates these are not completely separate markets, as population ecology would maintain. Perhaps this distinction occurs in the materiality of human versus corporate bodies, as structures. The technological structure of the corporation demands coordination from humans, but within an institutional system (i.e. the interdependent nation-state system) existing to support markets humans cannot directly experience. Meanwhile, the human body is bound by what sensory information can be gathered, processed, and reported to the brain as the body engages the observable external environment.

In the Post-Fordist era, humans and corporations thus mark two distinct social actors seeking to control the productive-consumptive dynamics of beer. In contrast to population ecology, counting independent microbreweries as a separate niche market does not quite capture this struggle. That approach presumes the niche market is a “natural” evolution—a kind of nuance to the matured, dominant corporate, homogenized market—thus obscuring the idiosyncratic, adaptive power necessary to erect and regulate global market exchange undergirding corporate growth. Sometimes the human actors challenge the control of corporate actors. The corporate actors seek to complicate or hinder the independents' ability to operate by influencing the state. At times, they do operate in different markets; at others, they compete directly for control of the same social systems producing and consuming beer.

Finally, ANT invites consideration for how the materiality of the object inde-

pendently shapes systems humans engage (Baron & Gomez, 2016; Symon & Whiting, 2019). Beer's independent emergence and subsequent ubiquity, coupled with prohibition, suggest emergent institutional responses to properties intrinsic to beer. Meanwhile, beer has qualities that *enable* it to become embodied by human actors. The object courts human usage—both individually and collectively—while being easy to produce. The “craft beer lifestyle” means empowerment through engagement with the material object—whether one seeks knowledge to make beer, or knowledge in how to distinguish between flavors of beer. Both offer the human actor power to shape their engagement with the commodity, outside and beyond spheres controlled by the corporation.

While population ecology considers craft beer to be a niche market, and neo-localism examines the linkages between craft and community, the story here has emphasized the power struggle between human and corporate actors. Embedded human systems exchanged beer, then corporations took that over that system to scale exchange according to logics that are beyond the scale of space and time at which human systems have been organized, and now *some* humans have been able to reestablish *some* control. Craft beer is a power move; the affluence afforded to white middle class families opens additional pathways for distinction in consumption, along with the time to develop hobbies that might become craft skills—or the capital to invest in owning a brewery.

Taken together, the analysis here suggests three principal actors in the emergence of craft beer: humans who embody the knowledge of beer production or consumption, the material object (beer) and the corporations seeking to homogenize taste for maximizing value. Generalizing from this case, we may contrast how human and corporate social actors differently engage the reproduction of shared commodity systems. These would include observations of the material capacities intrinsic or embodied by each of these social actors as they intersect to engage some shared social space. The institutional environment buttressing corporate power versus social safety nets, and then resource inequality in the population determine the extent (and which) humans can resist commodity control, while the material features of the object being produced and consumed determines which systems are vulnerable to disruption by human agents.

7. Conclusion

Across three types of human civilization spanning twelve thousand years, durable connections between humans and beer persist through variation in time, place and culture. Craft beer emerges once networked human actors have accessed the knowledge to brew, and the shifted the legal environment to slightly weaken corporate control. Meanwhile, beer's material properties make it a vehicle for resistance—a rallying point for humans seeking distinction in commodity systems. This dynamic suggests an intrinsic resistance to the dis-embedding of commodity exchange by corporate actors. There is an inherent, emergent tension between humans that have the capacity to embody (i.e. “craft”) structural

dynamics and much larger, non-human systems that control those dynamics. Population ecology's metaphor of the organization as organism fails to capture this dynamic, since the networked human and the national-level for-profit firm count as the same kind of social actor. Meanwhile, neolocalist communications of place are easily co-opted by for-profit firms.

This paper contributes to two literatures. For sociology, ANT's injunctions complement population ecology and neolocal explanations of craft beer's surge by suggesting emergent dynamics *between* humans and beer. This would suggest caution for any explanations of social phenomena that only rely on the discursive content, or culture. The materiality of objects shape, constrain, and provide forms for culture to fill—or become transformed by—in ways undertheorized by sociology. Since the dynamic is emergent, the racial inequality of craft beer (Chapman & Brunnsma, 2020; Chapman et al., 2018) maybe less of a craft beer problem, and more of an upstream problem regarding the distribution of resources in the population. Privilege creates power, and this power may translate into resistance against the corporate control of commodity systems—but who has that power is distributed by raced and gendered patterns.

For the ANT literature, this paper has demonstrated a case where the properties of objects suggest properties in the social system. Comparative work on societies that adopt similar objects could proceed by asking what the object enables or constrains that is consistent across these systems. Answers could be clues to the material features of the object shaping human engagement. Future research could consider comparative features of the commodity form, such as knowledge intensity and/or the capital intensiveness needed for production, along with the power of consumers who seek to embody productive-consumptive dynamics, versus corporate actors seeking to control these systems. Delineate the distinctions between human and non-human actors as they engage in overlapping or shared social spaces. This comparative work could enable researchers to make distinctions between material structures of the human body versus those of the corporation relative to the subjective experience of actor-hood. We may find new insights into the mechanisms of power operating to reproduce contemporary market systems.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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