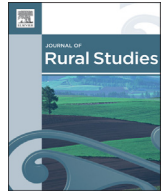




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



## Becoming bovine: Mechanics and metamorphosis in Hokkaido's animal-human-machine



Paul Hansen\*

University of Tsukuba, Department of Anthropology, Folklore and History, Tsukuba, Japan

### A B S T R A C T

#### Keywords:

Dairy  
Hokkaido  
Bio-politics  
Technology  
Affect  
HAS (Human Animal Studies)

The fieldwork for my doctoral degree was carried out over nineteen months, a year of which was spent working on an industrial dairy farm in Hokkaido, Japan's northernmost Island. As in much of the industrialised world, dairy farming in Japan is rapidly changing. Many farmers are forced by neo-liberal agricultural policies to shift from small family operated farms to high-tech, high-speed, and high overhead industrial operations. This paper focuses on the history of dairy farming in the Tokachi region; more specifically one farm and the shift over a generation to a rotary parlour milking system. It addresses the linkages this mode of production has cultivated amongst humans, dairy cows and industrialized space.

The parlour system at *Great Hopes Farm* allows five workers (aided by three more stall staff) to milk over 1000 cows, fifty at a time, three times a day. The impetus behind moving to parlour technology is that it increases productivity through mechanically enhanced observation and control. However this recent mechanical separation of human and cow during the milking process has led to affectively shared interspecies and inter-human alienation. The technology of the parlour system sets daily rhythms for bovine and human alike, and separates both from a process formerly dependent upon, specialized knowledge, affective empathy, and embodied knowledge. Human and bovine experience the systemic violence of the machine and what remains is a complex bio-politics of interspecies affect and the separation of "bare" and "political" life.

© 2013 Elsevier Ltd. All rights reserved.

### 1. Introduction

The ethnographic fieldwork for my doctoral degree in anthropology was conducted in Tokachi, Hokkaido. Hokkaido is Japan's northernmost island and by far the nation's largest prefecture. For a year I worked on an industrial dairy farm neighbouring a town with an ever-declining population of around 5000; a number down from over 16,000 in the early 1960s.<sup>1</sup> This research primarily focuses on a single agricultural community, in large part a single farm, and the people who work and live there. The analysis within this doctoral project essentially follows three tracks; how local people confront their ageing, urbanizing, and so decreasing permanent population,

why many family farms fail while several large industrial farms emerge, and why concomitantly, a large number of young Japanese from metropolitan centres arrive in this Tokachi community to temporarily experience rural life, with a small minority choosing to stay indefinitely (Hansen, 2010a). This article extends this research trajectory focussing on the move to rotary dairy parlour milking technology and the cow/human relationships that this shift creates as viewed through the analytical lenses of affect theory and post-human Human Animal Studies (HAS).

More specifically, this article offers a history and a present day ethnographic account of both the space and technology utilized in Tokachi dairy farming. In so doing, it also introduces the posthuman and affective processes that are involved in the increasing transformation towards 'progressive' industrialisation. First, the article historically situates the development of human, cow, and technology on the Hokkaido 'frontier'. It then describes dairy farmers' memories and imaginaries of a mixed farm past and lamentations about the industrial present. An ethnographic description of the rotary parlour as an animal-human-machine in motion is then offered. Dairy cows are then discussed *objectively* from a macro perspective and *subjectively* from a micro perspective. The final

\* Corresponding author. Tel.: +81 (0)29 853 4506.

E-mail address: [hansen.paul.gp@u.tsukuba.ac.jp](mailto:hansen.paul.gp@u.tsukuba.ac.jp).

<sup>1</sup> I worked on the farm for a year (2005–2006) and then returned to the area and other farms on weekends for eight months while on JSPS Fellowship at Hokkaido University (2008). At the time of writing my family resides in Tokachi and I return from Tokyo on most weekends and during breaks from university teaching. In sum, this is very much part of a long-term and ethnographically informed project.

section of the paper is a discussion of the current state and promise of Hokkaido's animal-human-machine. Focussing on Hokkaido is important in the context of Japan because, as noted below, the island is an anomaly. However, in terms of the development of modern industrial dairy farming, it is a space that is readily comparable to Europe and North America.

Like North America, Hokkaido is a modern colonial appropriation. Originally called *ezo ga shima* (Barbarian Island), it was renamed Hokkaido (North Sea Route) and officially declared part of Japan in 1869. The island, and notably the Tokachi region (south central Hokkaido), was 'developed' largely through tactics of Euro-American colonisation eagerly sought and bought by the Meiji government (1868–1912). Thus, Hokkaido is an area that, from topography, to climate, to politics, to population, remains a particularly hard-to-place space in terms of industry, imagery, or imagination in the context of Japan. It is widely considered to be Japan's 'frontier'; a peripheral *kitanokuni* (north country) that is clearly set apart from mainland Japan as represented by Fig. 1.

Beyond *Ainu* studies, *Ainu* being an indigenous ethnic mix of people in northern Japan, there is little focus on Hokkaido even within the academic milieu of area studies.<sup>2</sup> This paucity of research on Hokkaido is true of both the humanities and social sciences. Indeed, most English language research on Japan is firmly fixed on aesthetics, urban concerns, or comparative public policy and not on developing industries or the impact of new technologies in rural areas. Recently, some research has focused on a cycle of depopulation, decline and attempts at rejuvenation (Hansen, 2010a; Kitano, 2009; Matanle and Rausch, 2011; Mock, 2006; Woods, 2012). But, rural Japan, though often romantically imagined as the essence of "rice culture" or the quintessence of seasonal aesthetics, is largely viewed as unimportant for investigations of contemporary Japan. Thus, the industrialization of Tokachi area dairy farming is a 'novel' research topic amongst a sea of 'epic' or essentialist discourses; for example investigations into the oft cited "uniqueness" of Japanese culture in terms of martial arts, tea ceremony, animated film, *etcetera*.<sup>3</sup>

Though this article is informed and influenced by the particular backdrop of rural Tokachi, it greatly owes to a long "low-level engagement" (Grossberg, 2010: 310) with affect theory (cf. Clough, 2010; Gregg and Seigworth, 2010; Massumi, 2003) and posthuman studies (cf. Bennet, 2010; Haraway, 2008; Hayles, 1999; Wolfe, 2003, 2010). As such, some elaboration is useful here to tease out the theoretical connections.

In this article, I draw attention to a symbiotic past shared between Tokachi pioneer and a 'pet like' family cow; a cow that, to lift from Haraway, existed ever-present in the "contact zone" of human and technology entanglements (2008, 214–245). The impact of the recent shift away from an, albeit likely romantically idealized, version of the self-sufficient family farm is particularly notably considering the move to high-technology, high-output and high-overhead milking practices and bovine husbandry methods over the last generation. Again, under scrutiny in what follows is the

influence of rotary dairy parlour technology on bovine and human bonds and how the linkages shared between human and non-human are remarkably similar in the face of increasing industrialisation. Towards this end, affect is an area of theory where pointed phenomenological comparisons can be drawn.

Theories of affect are utilised by a diverse range of humanities and social science scholars. Deleuze and Guattari (1987, 258–262), via Baruch Spinoza, is generally viewed as the contemporary key reference for understanding affects as a tangible force at the heart of what scholars such as Patricia Clough (2010, 206–225) has coined "the affective turn" in social theory; the notion that non-human elements, material environments or non-human actants can influence events, or even "structures of feeling" to lift, as Gregg and Seigworth do in the introduction to their co-edited volume of affect, from Raymond Williams (2010, 7–9). More to the point at hand, Brian Massumi has turned to affect as an analytic space that allows agency to be discussed in terms of non-linguistic, even precognitive, communications and perceptions; embodied memory for example (2003). For scholars inclined towards more teleological schemata of cause and effect – explanations of the if *a* then *b* variety – discussions of affect can be frustrating. Affect is a motivating factor impossible to deny in earnest, yet particularly slippery to secure. Kathleen Stewart aptly describes this dilemma in defining Ordinary Affects as:

...abstract and concrete...more directly compelling than ideologies, as well as more fractious, multiplicitous, and unpredictable than symbolic meanings. They are not the kind of analytic object that can be laid out on a single, static plane of analysis, and they don't lend themselves to a perfect, three-tiered parallelism between analytic subject, concept, and world. They are...a tangle of potential connections.

(Stewart, 2007: 3–4)

This tangle of connections is concomitantly what posthuman research attempts to address beyond the scope of a human centric perspective.

Posthuman thought ought not to be confused with any idea of the "end" of the human (Wolfe, 2010). "Post" here marks a shift from any authentic or justifiable belief that *Homo sapiens* are at the apex of evolution or are singular as conscious world dwelling and making actants. An explanation of the posthuman oeuvre is well beyond the scope of this short article, but for what follows it is the recognition that other agents, animate and inanimate, are co-constitutive in making phenomenological experiences.<sup>4</sup> This way of analysing human and non-human interactions has had an influence in contemporary social theory, notably found in writers of an ANT (Actor Network Theory) sensibility or sensitivity (Braun and Whatmore, 2010; Haraway, 2003, 2008; Latour, 2007) and through more open-minded, or renegade depending on one's inclination, animal behaviourists (Bekoff, 2007; Horowitz, 2009). Staying true to my discipline, there have been recent moves towards a more inclusive "transspecies anthropology of life" (Kohn, 2007), including "multispecies ethnography" (Kirksey and Helmreich Ed., a special issue of Cultural Anthropology in 2010), and "trans-biopolitics" focussing on boundary crossing (Smart and Smart, 2012) more-than-human-publics (Blue and Rock, 2010). With this theory outline in place, the following section turns to this history of both the town and the farm where I conducted fieldwork.

<sup>2</sup> Walker (2001) provides an outstanding history of *Ainu* and Japanese history, Watson (2013) discusses contemporary *Ainu* issues outside of Hokkaido, and Fugita (1994), Irish (2009), Mock (1999) and Morris-Suzuki (1998) all provide rare accounts of Hokkaido history in English beyond studies of *Ainu*.

<sup>3</sup> The juxtaposition of novel and epic is a nod to the influence of Bakhtin (1981: 1–40) in understanding individual, embodied, and affective narratives to be as important as social ones, if not more so. The point here is that misleading, though popularly accepted, notions of Japanese homogeneity and notions of socio-cultural uniqueness are issues that surface (or ought to surface) in any post-Befu (2001) study of Japan. Nevertheless, the image of Japan as 'uniquely unique' has an amazing tenacity despite numerous studies underscoring the hollowness of this claim (Harootunian, 2000: 25–58).

<sup>4</sup> The University of Minnesota Press on going *Posthumanities* series edited by Cary Wolfe is an essential introduction to this broadening interdisciplinary area of research.

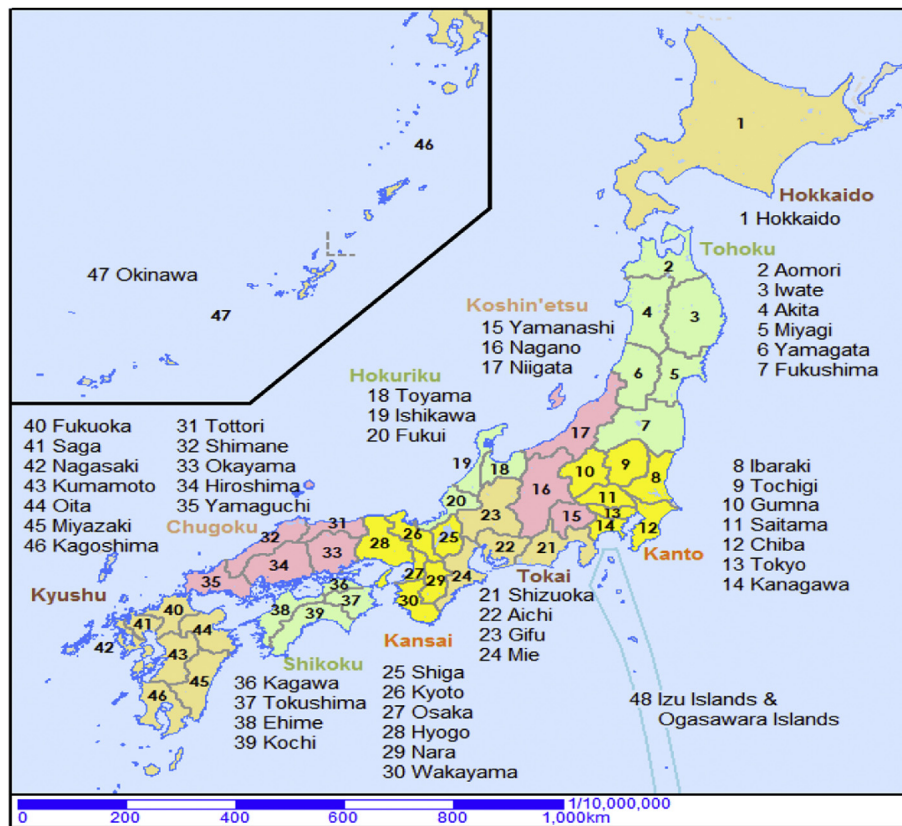


Fig. 1. Map showing relative size of Hokkaido to other prefectures <http://www.travel-around-japan.com/index-01-destination.html>. Accessed via Google July 23rd 2012. My northern Tokachi field site would be approximately below the numeral one.

## 2. Great hopes

The town “Gensan” and “Great Hopes” dairy farm are both pseudonyms to protect the identity of my interlocutors. These names have not been arbitrarily chosen however. They are similar to the original names with some creative license taken. This is because such names underscore a specific relationship to space, industry, and history. In northern Japan, place names are heavily influenced by natural topographic markers or adapted from the Ainu language (Kagami, 2009). A similar situation has been detailed in Michael Shapiro’s seminal text *Violent Cartographies: Mapping Cultures of War* in terms of North America (1997). In sum, indigenous place names are adopted and then adapted to the language of the coloniser; an act of both conquering and reifying the conquest of local culture and the space of native others. Moreover, the notion of colonized space as ‘open frontier’, that is to say under or uninhabited before colonization, is also reinforced by utilizing place names linked natural phenomena symbolising that such locations transcend their associations with indigenous inhabitants; hence regardless of native names, spaces become, Big Rock, White Beach, etcetera. Gensan loosely means ‘Upper River’.

The name of the specific dairy farm I worked at, *Great Hopes*, would be rendered in Katakana, *gure-to ho-pu*, were it an actual name. In this case, language is deployed in the reverse of the above example. Katakana functions like a linguistic sponge in that it absorbs any non-Japanese word reworking it into Japanese; and, as the hackneyed joke goes, equally incomprehensible to Japanese and foreigners alike. Nevertheless, the key point is that the majority of dairy farms in northern Tokachi, the earliest ones being homesteaded around 1905, have a katakana name; for example Happy Farm (*happi-fā-mu*) or Big Hill Farm (*bigu hiru fā-mu*). In terms of

marking space, understanding this utilisation of language and script is essential; it makes clear that the land is colonised and the dairy industry, alongside any nostalgic imagery or local idealized imaginary, is heavily influenced by livelihoods that were, until the 20th Century, external to Hokkaido. Usually one can trace these contemporary borrowings, in name and practice, to the pioneering history of the US, or less often to the rural idyllic imagination of a bygone Northern Europe (Fujita, 1994; Irish, 2009). Simply put, dairy farming is, by-and-large a modern occupation in Japan, completely so in Hokkaido. It is a livelihood greatly influenced, indeed exported, by ‘The West’ and carried out on an annexed island.

Thus, as the reader can see in the aerial photograph in Fig. 2, Gensan is a rural area in a way that the lion’s share of Japan is not.

There are three main differences. First, in Tokachi, as in most of Hokkaido, villages are not the centre of agricultural life (Soda, 2006). Like North America, Hokkaido has individual and individuated farms (Irish, 2009; the classic geographic overview of Japan is Trewartha, 1965). This is based on the relatively large land base and homesteading history starting in the early 1900s and peaking due to repatriation in the five years following the Second World War. There is very little common land and one can easily bypass local village life if one so chooses. This underscores a second difference. In most of rural Japan, certainly on the mainland of Honshu, rail systems generally link villages and rural areas to urban centres. However, Gensan has no rail system. Due to its declining population, the distance between villages, the costs and challenges of harsh winters, and the linked inability to turn a profit, Gensan’s railway was shut down in 1989. The nearest city and rail link is in Tokachi’s capital city of Obihiro about 35 km to the south. Finally Tokachi, and notably the area around Gensan, has a unique





Fig. 2. Photo showing individuated farms on the Tokachi Plane <http://www.hokkaido-mice.net/en/area/tokachi.html>. Accessed via Google July 23rd, 2012.

advantage over many farming regions in Japan, one that has led it to become a leader in the rather resource intensive dairy farming/industry, an expanse of relatively cheap, obstacle free, yet seasonal and only moderately productive, farmland. Soy beans, potatoes, and feed corn are common crops in this volcanic rocky soil, but the low cost of land and the moderate profitability of these counter industries means that there is room for dairy and beef farms to expand; at least in terms of erecting Concentrated Animal Feeding Operations (CAFO) style “farms” (See Kirby, 2010 for a detailed discussion of CAFO types and practices). Rapid industrialisation, the move from the family farm to the family owned agricultural monoculture factory, has been the story of Japanese dairy farming for the last twenty years; and in Tokachi this has meant a lot more cows and a lot fewer people.

As small scale dairy farmers age, retire, and pass away, industrious farmers buy or lease their land, often from inheriting sons who decide on career paths other than agriculture. This has led to a situation across Japan, but one that has been greatly accelerated in Tokachi, whereby the number of cows per farm has increased while the number of dairy farms is in steady decline. In the end, fewer farms remain, but those that do are forced to expand; a situation well represented by the graph in Fig. 3.

Tokachi is popularly called “milkland” (*miruku rando*). And this image is consciously and carefully promoted by the government (local and national), local co-operatives, and local milk product

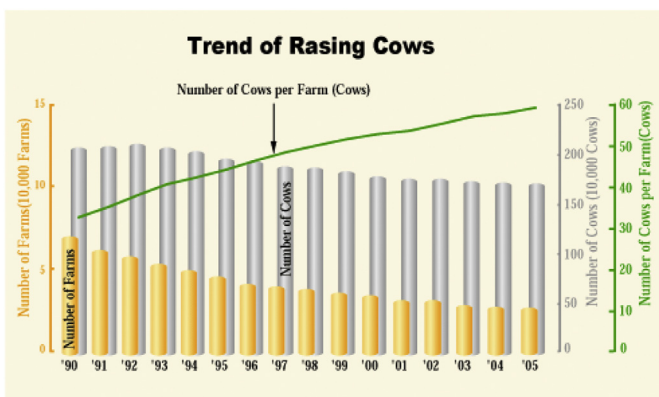


Fig. 3. Japan Dairy council “Dairy Farming is a model of efficient Japanese Agriculture” accessed via Google May 5th 2012 <http://www.dairy.co.jp/eng/eng06.html>. One key point that should not be glossed over is the unquestioned notion of “efficiency” central to the model of dairy agriculture expansion.

companies. The image vamps off a North American or Northern European historical fantasy; an image of human stewardship, often familial stewardship, over healthy grazing dairy cows.

The barn side cartoon depicted in Fig. 4 succinctly summarises the unfortunate disconnect between normative imagery and lived reality. The sad truth literally behind this cartoon image/imaginary of open sky and pasture, infantilised and anthropomorphised Holsteins, and a happy caring paternal farmer, is that, sheds like this are where the majority of dairy cows spend their shortened industrialised lives. Moreover, the never ending need to erect such structures forces marginal farmers ever further into debt, usually with JA banks.

As detailed below, the root of this normative and nostalgic pastoral discourse, and it's all too real disconnect, is anchored in the collective memory and the ever constructed and re-constructing identities of local farmers through an interplay of both romanticised and real recollections of generations prior when a few named cows were as dependent upon human care as the humans were on cows inhabiting this isolated, and then far from industrial, space of mixed subsistence farms. Cows provided Tokachi settlers with milk and eventually meat, but also body heat, as housed cattle kept stores from freezing in the bitter winter, and their dung was essential crop fertilizer. It is clear that such relations benefited human more than bovine, then again, few human relationships are truly egalitarian. But more to the point, by virtue of funeral monuments (*chikukonhi*) erected on the behalf of cows and inscriptions of mourning and gratitude, one can safely assume empathic and affective bonds were forged over lives shared in an unforgiving landscape. What follows underscores that the reality of dairy farming today, outside of farms designed for tourist consumption such as *naitai bokujiyou*, where one can eat locally made ice cream overlooking cows grazing on the open pasture of the *daisetsuzan* foothills, differs considerably.<sup>5</sup>

### 3. Not your father's farm: from family farm to family factory

Although the expansion of *Great Hopes* Farm has been on the extreme side, the lion's share of farms around *Gensan* fit into two categories. There were expanding farms and there were farms that were being sold off or even abandoned. When I started fieldwork in 2005 *Great Hopes* was already far from a mixed farm. The operation had shifted from being a single family owned farm with around 150 cattle in 1999 to a four family owned joint corporation with over 2400 head and still growing monthly as of 2012. Expansion of this magnitude is only possible through changes in technology; from animal husbandry practices to mass feed importation to manure treatment. All elements of this industrialization equation are important and each has its own list of problems, but in what follows discussion is limited to the specifics of the move from older milking technologies, such as single stall or herringbone systems, to the rotary parlour system.

For the first nine months of my dairy farm employment twice-a-day, everyday, my co-workers and I milked approximately one thousand cattle with a revolving roster of around thirty staff members. To ostensibly get the highest production out of both human and bovine, this milking schedule was upped to a more gruelling three-times-a-day program during my tenth month of employment. Workers involved in the process of milking put in three hour shifts three times a day; the first starting at four in the

<sup>5</sup> Though there are other examples *naitai bokujiyou* near the *daisetsuzan* mountain range in central Hokkaido is perhaps the most popular tourist oriented dairy farm. See <http://www.tokachibare.jp/foreign/english/tourism/spot/index.html>. Accessed via Google July 23rd, 2012.



Fig. 4. The caption reads “Delicious! Drink!! MILK” and is clearly sponsored by JA (Japan Agriculture Co-operative). (photo by author).

morning, resuming again at twelve thirty in the afternoon, and the final shift beginning at six thirty in the evening – thus, routinely putting in nine or ten hours of repetitive work spread out over an eighteen hour work day. This schedule was adhered to by employees, on a rotation of four days on and one day off. And, as exhausting as this regimen was for regular staff, for cattle, owners, and a number of Chinese labourers, there were no holidays; they worked these hours 365 days a year (Hansen, 2010b). This rota and ratio, thirty people to a thousand lactating bovines, would have been inconceivable before the introduction of the mechanised multi-cow rotary dairy parlour.

However, these ratios must be further refined. The number of dairy cows increased monthly. When one subtracts from the above equation workers who are not actually part of the milking process, such as office staff or those responsible for the care of young cattle, one is left with eight individuals during any single milking session; a holding worker, four parlour staff, and three stall staff, all roles discussed in more detail below. Due to this technology, during any given milking shift eight employees confront a thousand cattle which are, short breaks between groups aside, simultaneously milked, medicated, screened, and separated for attempts at artificial insemination.

Clearly a rotary parlour dairy farm is a high overhead, high tech, and high output process – a far cry from any notion of mixed farming, hobby farming, or pastoral idealism (Berry, 1996; Harper, 2001; Holloway, 2001; Price, 2011; Takata, 2003, 2004). Many workers, whom I describe in my research as outsiders and ‘lo-siders’ (non-locals who slowly become considered ‘semi-local’ over time) are not interested in dairy farming at all. For the majority of employees dairy work is like work in a factory. It is a job, a way to subsist or to save a meagre amount of capital and move on (Hansen, 2010a, 2010b). For the dairy owners and their families the shift to a rotary parlour system has been a drastic change in lifestyle and livelihood. In economic terms it represents a high stakes gamble. It involves taking on crushing debt and exponentially increasing herd sizes. Great Hopes Farm held government and bank loans of over a million US dollars and the escalation of their herd was an incredible leap of one thousand percent in four years (2004–2008); great hopes indeed.

However, such gains come at a dear price to self-identity (Hansen, 2010b). This is because the rotary system divorces owners and their families from daily embodied relations with their cattle. Opposed to experienced and affectively invested farmers – again the romanticised, popularized and clearly politicised image of “Milkland” – farm family members tend to become distanced surveyors and managers. Consequently, technological shifts place

unskilled and often uncaring workers increasingly in the farm owner’s former position of daily contact with bovines. Frequently the intricacies and complexities of both cow and equipment are well beyond the previous experience (often none) or the brief onsite training of the new breed of farm labourer.

Again, this is not a situation found only in Hokkaido. The image of nature and happy animals being utilized to sell products from dairy to digital phone services is a common trope (Shukin, 2009). And many mid-sized family dairy farms face challenges in finding a successor when elderly owners can no longer farm or the choice to industrialise and import workers or go under (Harper, 2001; Price, 2011). Accepting these conditions at face value, Hokkaido dairy farm owners are easily vilified as exploiters of life; users of pricy technology and cheap expendable labour, whether human or bovine. However, they are not uncaring or particularly selfish people. The mistake made in such accusations has been discussed in detail by Henri Lefebvre (2004: 51–56).

...The impact of technological conquests does not make the everyday anymore alive; it nourishes ideology...[the ideology of modernity and capitalism]. The *personalisation* of capital, a theoretical error, can lead to practical (political) errors...[as this ideology]...is not directly a question of the people. It is not their fault because there is no fault, there is *something* that functions implacably and produces its effects.

(2004: 53–54 emphasis Lefebvre’s)

Simply put, dairying as a livelihood in Hokkaido, as in much of the developed world, is a troubled industry (DuPuis, 2002: 165–244; Kirby, 2010; Pollan, 2006). Tokachi dairy farm owners are subject to overwhelming pressures imposed from above in terms of what Aurelia Mulgan has coined Japan’s “Agricultural Policy Regime” (2006). They are forced to navigate the caprice, not only of supply and demand – a difficult enough prospect in the multifaceted dairy industry – but the whims of high-level administrators.

As one outstanding example of this top heavy control amongst many, in April of 2006 Hokkaido’s prefectural government opted to dump one thousand tonnes of over quota processed milk rather than have it enter the highly regulated and price protected market. Correspondingly, while costs for everything from feed to fuel rise, the raw milk price in Japan – set by the Ministry of Agriculture, Forestry, and Fisheries alongside National and regional co-operatives (JA or Hokuren in Hokkaido) and private dairy product companies such as Yotsuba or Meiji Milk – has slightly but steadily declined for over a decade (MAFF, 2003–2011). In sum, dairy owners have little effective say over the price of their milk. Their choices in regard to production and sale invariably come from above and are presented in binary terms; they can sell their quota at the price set by the government and industry or they cannot legally sell milk. Added to this, imports of dairy goods, such as cheese from New Zealand or frozen US pizza, have increased reducing domestic demand and prices.

During my initial fieldwork it seemed clear that attempts to save the small dairy farmer at any level were in vain.

...[T]he WTO 2007/World Liberalization Scenario indicates the order of competitiveness of Asian dairy economies from least to most competitive is Japan, Korea, South East Asia, South Asia, China and India...[with trade liberalization]...net imports would increase most of which [in Asia] would come from Australia and New Zealand.

(Peng and Cox, 2005: 20)

And at the time of writing this article in 2012, these prospects changed little (MAFF, 2011).

However, the accusation that Hokkaido dairy owners have everything to gain from exploiting the living – the ‘live-stock’ of non-human, human, and environment – is as inaccurate as unfair. More precisely having lost so much, and having been placed under tightening political and economic screws, many feel as though they have nothing left to lose. As aforementioned, there are few viable ways to farmland in Tokachi and there is a scarcity of ways to earn a living in the area but to farm. The choice to not industrialise, and some farmers have consciously made this choice, is to retire from farming, seek work off the farm (often low-skilled seasonal construction jobs), or for the more intrepid, leave the area altogether. But those who do stay in the industry, and clearly an ‘industry’ it has steadily become, feel overwhelming pressure to expand motivated by a fusion of needs and desires; economic survival, lack of feasible alternative opportunities, a pride of place, and a sense of local/self-identity, romanticised or not, as Tokachi dairymen.<sup>6</sup> Few are motivated by unbridled neo-liberal acquisitiveness; including the owner of Great Hopes Farm, the largest in the area.

This is apparent when talking with dairy farmers. Most local owners I interviewed waxed nostalgic about their mixed farming past. They recalled a more symbiotic lifestyle shared with their family members and cows twenty or thirty years before my research. This was a time when money was made through mixed farming; varied crops and a dozen, to maybe thirty, dairy cows hand or line milked twice-a-day by family members for local market sales. However, the current agricultural production and market system in Japan is wedded to the state’s obsession with programs and policies that are frequently contradictory. For example, the system strives for national food self-sufficiency on the one hand, but is beset with ill-planned subsidies that support or protect small inefficient farms from competition, both national and international, while forwarding policies that force mid-sized farms to expand with the said goal of increasing their competitiveness; in effect playing farmers off of farmers. This is confounded by co-operative associations such as JA that ostensibly act on behalf of dairy producers, but in fact work foremost to expand their own political reach within the Ministry of Agriculture Forestry and Fisheries (MAFF) and increase their profits through providing loans to farmers or securing low milk prices for product companies; these are actions that oscillate betwixt inanity and greed that have forced the progressive industrialisation of mid-sized family dairy farms (Hansen, 2010a). Put bluntly, Aurelia Mulgan, perhaps the foremost scholar of Japanese agricultural policy in English, sums up the Japanese agricultural policy as simply schizophrenic (Mulgan, 2006)! Thus, in most cases it clearly is not individual avariciousness or disinterest in bovine or human well-being that drives farmers. Instead they are driven by hope that things will improve; and it is perhaps their greatest hope being to hold out for another year.

#### 4. Getting inside the machine

With this history of Hokkaido as a rural space and the relatively recent ideological motivation to industrialise outlined, what follows turns to a more micro oriented analysis of the rotary dairy parlour system, dairy cows, and dairy hands. In Tokachi to industrialise in the present tense is to move to the large scale rotary parlour system. This is an important point in itself as other modes of industrialisation are not considered practicable. This contrasts,

for example, with the increasing popularity of robotic dairy milking equipment elsewhere in the world’s dairy industry (Holloway, 2007; this issue of the *Journal of Rural Studies*). Robotic milking technology is unlikely to set firm roots around Gensan anytime soon and this position is entrenched in a very particular human–cow-technology regional history on the one hand, and the pragmatics of space and scale on the other.

Around Gensan two farms had experimented unsuccessfully with robot milking machines. Unfortunately, they made the move to robotics in the early stages of this technology and system quirks had not been worked out; cows had persistent out breaks of mastitis, a painful infection of the udder, lowering milk production rates and prompting locals to gossip about the lack of sanitation and control over robotic technology. This cow to robot disconnect is somewhat ironic in a nation that is on the cutting edge of the positive potential of the interface between humans and robotics (Katsuno, 2011). But beyond local misfortune and gossip there are some very practical reasons why robotic milking is unlikely to catch on in Tokachi.

In an interview with an Obihiro based dairy parlour sales middle man in July of 2012 I was told that milking robot sales were low in Tokachi due to the lack of mid-sized farms. Small farms, around fifty milking head, cannot justify the expense of a robot or a rotary parlour. Moreover, many such farms are owned by elderly farmers and are likely to go out of business when they retire or expire. However, farmers who do choose to stay in the industry, as noted in the previous section, expand exponentially, with many quickly surpassing 300 or 400 head. And this, claimed the salesman, makes the move to robots unlikely due to the cost and space required; one robot to 50 cows was the ballpark number offered.

In sum, although owners were reluctant to invest in robot technology given the aforementioned negative word of mouth appraisal, the real reason, at least from an equipment sales perspective, was that the size of farms alongside the low level of employment in Tokachi, augmented by the ability to import cheap foreign workers, meant that rotary parlours came out on top in a numbers to profit to efficiency equation. Put another way, there are few mid-sized farms. Operations were growing far too rapidly for robotics to be affordable because in rural Tokachi people remain cheaper than robots and farm success and survival has clearly become measured in the number of cows milked.

Here the English word livestock can be seen in play with the Japanese colloquial of cows as live things (*ikimono*) and sales things (*urimono*). Clear here is the industrial logic of transforming individual cows and individual humans to individuated (numbered) cattle, livestock, or workers. Mass rotary systems like the popular *BouMatic Daytona* series alongside similar systems, are considered to be at the cutting edge of milking technology.<sup>7</sup> Indeed, the American manufactured *BouMatic* was the system of choice around Obihiro in part due to its distribution through the largest and longest serving agricultural equipment dealer in the area.

Potential parlour buyers were frequently brought by *BouMatic* representatives to Great Hopes Farm in order to witness the future of dairy farming in action. Sales pamphlets for the *Daytona (daitona)* system in 2012 underscore three main points; comfort during milking for both cow and human, lowered bovine stress, and a silent functioning and durable design.<sup>8</sup> This tack is qualitatively

<sup>6</sup> With industrialisation many women have opted to leave the farm. This is especially the case of farm owners’ daughters who overwhelmingly leave for urban areas and non-agricultural work. Female urban migration has long been a feature in Hokkaido (Mock, 1999).

<sup>7</sup> This is still the case as of April 2012. Exact specifications of the *BouMatic* system can be found on its homepage <http://www.boumatic.com/> to compare specifications the *Dairy Master* parlour system can be seen at its homepage <http://www.dairymaster.com/> accessed via Google July 17th, 2012.

<sup>8</sup> See detailed description of the *daitona rms-x* at [www.totalapproach.co.jp](http://www.totalapproach.co.jp) accessed via Google July 17th, 2012.



different from what the company assured potential equipment buyers when I was conducting research in 2006; “BouMatic is dedicated to ensuring that dairy farm producers throughout the world have the ability to produce the highest quality milk most efficiently, profitably and responsibly.”<sup>9</sup> These qualifiers are unpacked in the Conclusion but a brief explanation of how the machine functions is necessary.

A parlour is a massive apparatus, ranging from thirty to eighty stalls. At first sight it looks more at home in a science fiction film than a barn. Made of metal, plastic hoses, sensors, and blinking digital readouts, at its largest it requires housing in a room of at least 850 square meters. It is designed to milk, in a constant flow, up to eighty cows. To put this in perspective, Holstein cows, the cow of choice in Hokkaido, are 680 kg and 1.45 m at the shoulder on average and an average Holstein produces 27.3 L of milk per day meaning that at Great Hopes 27,300 L of milk pass through the system daily.

Fig. 5 offers the reader a bird’s eye view of a rotary parlour at work but the operation of the system is straightforward and easy to imagine. As cows enter a Chromalloy stall on the parlour platform, a worker standing on a concrete floor a metre and a half below the platform cleans each teat with an iodine solution excreted from a pneumatic wand. Workers do not touch the animal. All contact between human and cow is mediated by equipment during the milking process. The next pair of workers are ‘milkers’ and they function in tandem. They adjust the pneumatic suction head that automatically rises from the base of the machine to udder level and attach the four suction hoses to each teat while checking for any leg bands that indicate sickness or dysfunctional udders. After attaching four hoses they push a button that, from a sensor attached to each animal’s collar, sends the sort number, group number, and a record of each animal’s daily milk output to a central computer. During this stage of the milking process human and animal contact averages less than eighteen seconds. The Holsteins cannot see the workers and workers only see bovine legs, udders, suction equipment, and a digital readout of cattle numbers. For a third of a minute each cow becomes an unpredictable and frustrating part of the equipment.

The boundary between ‘it’ the machine and ‘it’ as an animal, a living, thinking, feeling creature is blurred by their merging into joined parts of a massive moving apparatus well represented in the photo offered in Fig. 6.<sup>10</sup> At this point cow, singular, becomes cattle, uncountable and plural, in the barest sense. Moreover, milk line workers are interchangeable moving from station to station with the focus on digital readouts and leg bands. Barring cattle kicking off the suction head, the device is set to automatically release when the flow speed of milk reaches a threshold set in common for all cows; much in the way the parlour’s rotational speed is set in common for all workers. When the threshold is reached it automatically drops below the parlour floor again.

The third job is the ‘runner’. He, or occasionally she, acts as a fast-paced trouble shooter – reattaching equipment that the

animals kick free, administering antibiotic injections, or assisting co-workers falling behind who yell for their help over the loud pneumatic staccato of ‘*thuck, thuck, thuck*’ or the gushing flow of hundreds of litres of milk moving into stainless steel holding tanks. The last parlour worker applies a final iodine solution to combat infection and liaises with the holding worker. Communication is short and functional, for example, they may simply shout out ‘owari’ (end) indicating the last cow of a group or call out the number of a single animal in need of medical attention; mastitis, lesions and lameness being the most common ailments discovered during milking. Fig. 7 is a schematic map representing these processes.

When the cattle are milked, ideally in under one revolution (as slow milking cows retard the efficiency of the equipment by needing a second go round) they exit the parlour. Cattle move past the holding area worker (incidentally my usual milking time job while I worked at the farm) whose purpose it is to maintain a steady flow of Holsteins in to and out of the system. This worker generally acts as a bovine observer and recorder as the cows enter the parlour with the aid of a twenty meter long automated gate. The gate electronically senses the lack of cattle body weight impeding its forward progress and pushes ahead until it contacts an animal. Dairy cows in such cramped conditions move to where there is more space, specifically, the space ahead where members of the herd have already entered the parlour access chute. However, more reluctant cows, often young ones fearful of the noise and bright lights of the parlour are manually, often violently prodded along so as to keep pace with the machine and allow as few ‘free stalls’ as possible.

On their return from being milked in the parlour the cows pass by the holding worker again on route to the stall area where, for the purpose of efficient collection and cleaning, groups of around two-hundred cattle are housed in rows of concrete and metal stalls with rubber and rice chaff covered floors. At the entrance to the stall return chute each cow’s sensor is read a final time by the equipment. At this point an automated gate separates cattle whose numbers are entered earlier into the central computer by the office staff, such as cattle known to be ill or animals moving to another group due to the stage of pregnancy. But cows are also automatically separated by the equipment itself. Determined by fluctuations in individual milk output, the system separates the individuals it deems to be irregular.

There is little question that, given the ratio of bodies or litres per minute, this is the most efficient method of milking a dairy herd. But the issues that emerge, and to which I will return below, all relate to a ‘blurring’ of boundaries. Outside this highly rationalist, capitalist, and modernist equation, how are actual costs beyond this reductive evaluation of bodies, space, and time blurred? In other words, it is likely clear that with 1000 ‘livestock’ passing by high turnover workers with an 18 s window of contact, worker, bovine and equipment blur, again there is individuation but not individuals, but what human and cow bounds are blurred outside of the milking parlour due to this industrialised process? These questions returned to after an introduction to the “Workers in the Shadows” of any dairy farm; the cows (Porcher and Schmitt, 2012).

## 5. Getting inside cows

To claim that dairy cows can exist in a ‘natural’ state is misleading. For hundreds of years they have been selectively bred to increase both milk production and docility. The Holstein is widely accepted as being bred to be a high volume milk producer while remaining reasonably hardy. As such, this is the practical cow of choice in Hokkaido. In what follows cows should not be understood as passive producers, a uniform and singular cog in an

<sup>9</sup> This quote can be found on the above cited *BouMatic* website homepage. *Dairy Master* is a competing rotary parlour manufactured and in bold print on its homepage one can find; “Our objective is to make milking easy”. In general, Japanese language versions of dairy technology catalogues and websites are direct translations of the original English version. In fact the two languages can be made to appear side by side with common web translation software. See for example Dairy Master [http://honyaku.yahoofs.jp/urL\\_result?ctw\\_=-sT,een\\_ia,bT,uaHR0cDovL3d3dy5kYWlyeW1hc3Rlci5jb20v](http://honyaku.yahoofs.jp/urL_result?ctw_=-sT,een_ia,bT,uaHR0cDovL3d3dy5kYWlyeW1hc3Rlci5jb20v) Or BouMatic’s site [http://honyaku.yahoofs.jp/urL\\_result?ctw\\_=-sT,een\\_ia,bT,uaHR0cDovL3d3dy5ib3VtYXRpY3JvYm90aWNzLmNvbS9jb21wYW55L2ZvY2FsLXBvaW50cw==,qfor=0](http://honyaku.yahoofs.jp/urL_result?ctw_=-sT,een_ia,bT,uaHR0cDovL3d3dy5ib3VtYXRpY3JvYm90aWNzLmNvbS9jb21wYW55L2ZvY2FsLXBvaW50cw==,qfor=0) Accessed via AVG July 30th 2012.

<sup>10</sup> For a more detailed account of this process see Hansen (in press) in the journal *Critique of Anthropology*. 53.





Fig. 5. View of Great Hopes' fully loaded 50 stall rotary parlour from an observation room. Cattle enter at 12:00 o'clock and exit by backing out of the apparatus at 11:00 o'clock. (Photograph taken by the author).

industrial machine, as again, this description could as easily be applied to the human labourers working in a rotary parlour dairy.

"[C]attle are social animals in the fullest sense of the word, with complex communication channels and alleomimicry exhibited in many behaviours" (Phillips, 2002: 84). Though the wide range of these behaviours is well beyond the scope of this article, there is a growing interdisciplinary discussion under the rubric of the "posthuman" as to what such behaviours *mean* in terms of viewing non-primates as wilful and individual actants (cf. Calarco, 2008; Haraway, 2008; Shukin, 2009; Wolfe, 2003, 2010). To be clear, this is not to signify a move towards a Critical Animal Studies (CAS) perspective, though I am not against such a move by others, but to signal a Human Animal Studies (HAS) trajectory. Simply, setting ideological motivations to critique an anthropocentric perspective aside (cf. Nussbaum, 2006; Singer, 1975), from a HAS perspective cows clearly retain agency. Undeniably they are thinking and feeling beings *who*, though dominated for centuries, manage to actively negotiate and influence the human and mechanical world;



Fig. 6. The animal-human-machine at human eye level (Photograph taken by the author).

effecting and affecting as they go. For example, the reasons why robotic milking technology is not accepted in Tokachi is due to the reaction of bovine bodies and the affective reactions that follow this posthuman assemblage of udder, suction, infection, detection, and decision. To grapple with this tangle of interactions a HAS perspective is essential.

Likely for some readers – perhaps influenced by scientific and philosophical permutations extending from von Uexküll (2010 (1934)) or Negal (1974), who, albeit in differing ways, underscore the incommensurability of human and non-human embodiment, *umwelt*, or related corporeal conceptualizations, or readers with religio-scientific convictions and conventions related to justifying our continuous history of human domination (Tuan, 1984) – there is seemingly very little that can be said, from contemporary philosophy to social theory, to anthropology to animal behaviour that can sway the "dogged" clinging to an essentially Aristotelian/Christian "human as chosen" or Cartesian "animal as machine" paradigm. CAS commentary has little to offer such people as it must remain always in ideological opposition; in a word, critical. A HAS perspective however, can usefully deconstruct such a perspective. As Agamben notes, a point often strategically neglected is that, while von Uexküll broke from the notion of humans as the acme of evolution, insofar as claiming that each creature has its own life world and adapts accordingly, he did not diverge from the notion of humans as exceptional (2008: 39–47).

For humans to attempt to view the world from the perspective of another species is to anthropomorphise; crime of all crimes in some circles; scientific (Bekoff, 2007: 10) or philosophical (Calarco, 2008: 1–14). But from a HAS perspective, and unlike von Uexküll's tick or Negal's bat, it is very difficult to deny, again the flipside of critical ideology aside, that there is a human resonance with other large mammals, specifically dogs and cows, via domestication and so, via embodied, encounters and affect. In sum, the distinction between human and snake or human and fly seems easy for most people to sustain. But for domesticated mammals, such a distinction is far more blurry, far more open to an ideologically suspended or bracketed posthuman perspective.

My fieldwork suggests that the reason why people see anthropomorphised similarities in large domestic mammals is because such clear embodied and affective similarities exist. For example, domesticated cattle have evolved alongside humans. Like humans they have strong matrilineal ties (for example, cow and calf separated by a fence will fight to remain in visual contact), affective utilisation of voice (Phillips, 2002: 96–100), rational thought (Hurley, 2006), and through embodiment, even beyond rather clear utilitarian notions of pleasure and pain, cows communicate via mimicry as well as 'scripted' head and tail expression. Moreover;

...[c]attle live in hierarchically ranked groups and begin to order themselves within the group at a young age...Physical communication and grooming help to establish this social ranking. What may appear to be a game, such as head-butting or shoving, is actually a method of determining which animals within the group are dominant. Interestingly, the strongest or most dominant animals do not necessarily become the leaders...Cattle in a small herd, for instance, will join with up to three other animals to form a small group of friends. The animals in the group will spend most of their time together, frequently grooming and licking each other...And, like most animals, cattle also experience strong emotions such as pain, fear, and anxiety.

(The US Humane Society, 2008)

In pasture conditions, cows form close ties with other species, this includes sheep or donkeys with which they can graze without conflict. Moreover, dairy cows, due to daily contact with human

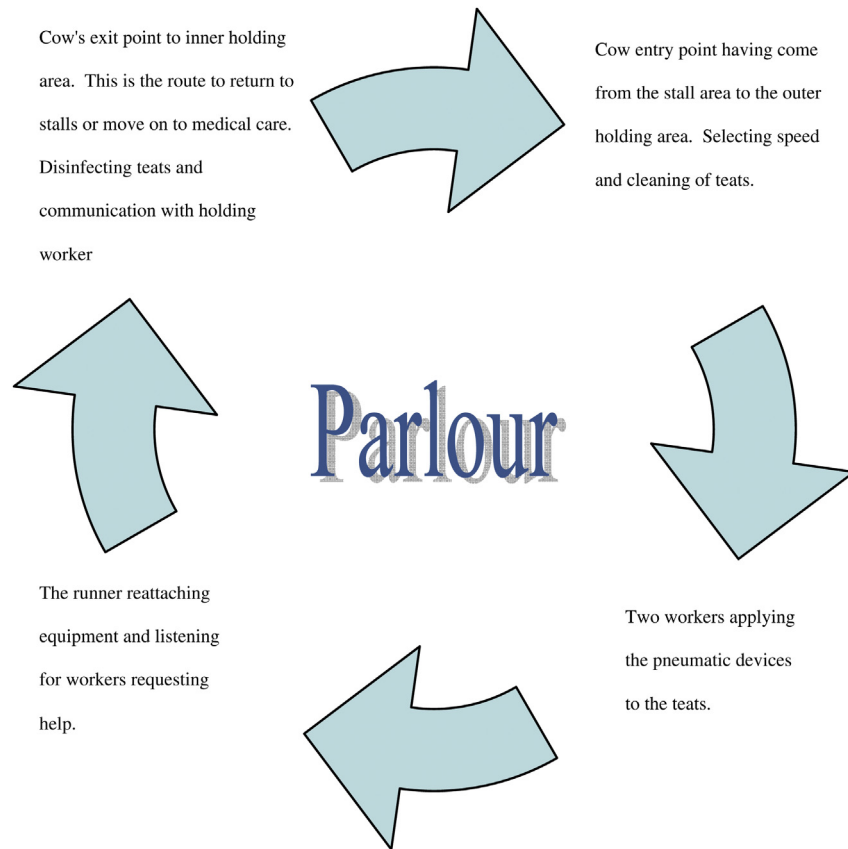


Fig. 7. Rotation and jobs related to the functioning of the rotary parlour system (diagram by author).

handlers, form close relationships and view stockholders as herd leaders (Grasseni, 2005). Cows, as anyone who has spent time with them will attest, like some people and do not get on with others. They come when called, remember different people, and they, if not emotionally, then affectively engage with humans much as they do with other cows.

## 6. Inside 603

Cow 603 was known by all of my co-workers. Granted she was a big gal, perhaps the largest cow in her group, but it was her "stubborn old woman" or *gankona obachan* quality that was frequently commented on and, over time, admired. The focus in such a statement is not on 'the cow' or 'the Holstein' as object, as function, or as a 'thing' in the "general singular", a categorization of "the human" vs. "the animal" that Derrida has convincingly argued against (2008: 1–51), but a brief introduction to a cow, a being amongst other beings, an individual.

603 refused to enter the milking parlour before all of the cows in her group entered. She would endure yelling, pushing, tail twisting, and even kicking without yielding to the new staff unaware of her individual quirks. Veteran staff, those nearing a year on the job, knew not to panic, not to force her to keep the stress inducing rhythm of the machine, because as soon as the second last cow of the group entered the parlour, 603 would saunter over seldom missing her chute. She was determined to be last. Daily, cow 603 stood calmly beside a holding workers, occasionally belching her bourbonesque breath at them or copping a nibble at their overalls, while 'casually' watching a full group of up to 200 cows enter before 'nonchalantly' taking *her* place in the final chute.

Clearly 603 was special, but not especially special. But many cows were known by number by staff, they were always remembered due to encounters outside of the milking process. 1263, 808, and so on were numbers related to me during interviews or daily banter as "special cows" *tokubetsuna ushi*. They might have followed a worker on during cleaning rounds or been a particularly aggressive cow pinning a worker to a gate. Perhaps they were exceedingly difficult or easy to catch. Or simply, they were, for some physical or inexplicable affect oriented reason, either uniformly or subject to debate, regarded as cute or ugly. As noted in what follows the aforementioned mechanical process of milking and the daily rounds of animal care/alteration provided two varied spaces of interaction; a space of workers and cattle contrasted with a space of individuals.

## 7. Industrialized bodies and affects

Mature dairy cows basically exist in two spaces on an industrial rotary parlour farm; in the parlour, or waiting to be in the parlour. Alterations to bovine bodies, beyond generations of selective breeding, are determined by industrialization. So as not to be caught up in the parlour equipment or injure themselves at play in the close quarters or on the concrete floors required by this mode of production, horns are cut off, tails are docked, and occasionally hind legs are bound to prevent splaying. Thus, adult 'play' and mimicry as noted above, along with the animal's instinctive ability to 'swish' flies away or express emotive states with their tail is restricted or abolished to make the animal more 'machine' friendly. Upon birth calves are separated and weaned in pens where they not only loose contact with their mother but also are unable to play with their

cohorts. The reason is twofold, calves consume their mother's milk (the end goal of the parlour) and calves cannot enter the spatially efficient system with their dams. At four or five months of age calves do begin to associate with other calves but not with adults. This reduces their ability to mimic appropriate behaviours or easily understand their roles within the hierarchy of a herd. This leads to considerable violence between cows (individuals) when they become cattle (individuated). This violence follows them into their adult life as the parlour system requires, for the sake of efficiency, that cattle groups (in this case determined by milk output and stage of impregnation) be shifted almost daily. However, “[m]inor changes [in herd composition] result in an approximate doubling of aggression activity for about 24 h, longer if dominant cattle are introduced to a stable group when cattle may continue fighting for 30–45 days as they create a new social order.” (Phillips, 2002: 118). Again, 603 was impressive, always last no matter who and no matter what confronted this bewildering desire. But it is obvious that for the lion's share of cows, keeping pace with the machine, to artificially creating herds and separating offspring prompted bovine stress, obviously physically but also mentally.

Even birth and death are meticulously regulated in an attempt to accord with mass scale mechanical efficiency. Female cattle, shortly after a year of life, are artificially inseminated and kept in a constant cycle of impregnation until their premature deaths (five years in an industrial dairy as opposed to twenty in pasture). On Great Hopes Farm barren cattle are ‘rendered’ after three unsuccessful attempts at impregnation while steers usually spend a year ‘fattening’ on the farm before they are sold for meat. For both, high protein feed mixed corn silage – not grass or hay – is frequently medicated and causes painful bloating in the stomachs of ruminants, but space is at a premium and collecting animals must keep pace with the parlour – natural grazing in most CAFO is not an option. This describes the overall impact of industrial production on bovine bodies in general, but what of the technology itself?

An analysis of the rotary parlour system itself bears more than a physical resemblance to Foucault's (1977) analysis of the panopticon prison system, a comparison recently made by Joel Novek as well in terms of the structures of Canadian hog farming (2012). The panoptic prison is also a system of production; producing the docility, individuation and alienation of bodies through a suppression of embodied and affective contact. It is a system wherein each “inmate” is codified and their individual progress mapped and stored in a central repository. It is a system where relations between kept and keeper are ideally dehumanised – that is to say lacking emotion or affect – distant, cold, clinical and rooted in the need make distanced decisions. In the case of rotary production these are inherently linked to bovine bodily production: Is another attempt at artificial insemination worth the money? Does the injury warrant attention? Is it time to be sold as meat? Foucault's commentary on “securing the sex” of Herculeine Barbin, an 18th Century intersex person, underscores a similar system wherein the desire to physically control and normatively define the body prematurely destroys the life housed in it (Barbin, 1980). The rotary parlour like the panoptic prison is also clearly a system of control where the keepers police, record, and decide with the inability of the kept to witness or resist this invasion or surveillance. And finally, it is a system wherein there is a dissolution of internal hierarchies. Beyond keeper and kept, both bovine and human social structures are called into question, like cattle, it is important to note that human workers could easily be replaced, and frequently were, without disrupting the system of production.

However the situation inside the rotary parlour during milking, and outside the rotary parlour while waiting to be milked, entails different affective and embodied relationships between these differing components of the animal-human-machine assemblage.

In sum, the parlour is clearly an area of “bare life” (*zôé*) as opposed to a “political life” (*bíos*) found in the stall areas or other parts of the dairy farm (Agamben, 2004: 13–16, 33–38; Esposito, 2008: 13–44). Outside the thrice daily subjugation to the machine, cows are relatively free to socialize with other cows and humans; although the groups in which they are housed are still determined by state of impregnation and milk output. Nevertheless, these are spaces where cow 603, 808, 1263, and other workers two and four legged come together in their own rhythms and where memorable affective and embodied contact is made; barns and stalls. Indeed, the differing rhythms enforced through daily practices and states of the bovine body are at the root of the separation of these spaces (Lefebvre, 2004: 27–37). The rotary parlour is the material culture link, the “*technē*, or the agent” (Braun and Whatmore, 2010: x–xi) which reduces the sentient, communicative, and feeling bodies of political life or *bíos* rooted in mutual bodily and affective exchanges experienced within and across species lines, to bare life or *zôé*. Outside the barn and once in the parlour, cow, human, and machine are expected to work as a seamless and senseless one.

Again, the claims of rotary parlour manufactures are clear. They are increasingly designed with the comfort of workers in mind, two and four legged. However, they are clearly not designed with embodied interactions or affective connections in mind. The main focus is control and conversion. To police physical agency to 18 s windows, bodies to mechanical operations, and to convert mutual mammalian alienation and toil to milk and money. A very similar Fordist logic has been observed by Vialles on the (dis)assembly line of French slaughterhouses; the turning of cattle “from animal to edible,” from animal life to identifiable food matter intended to sustain human life without the ethical baggage of considering bovine or human suffering (1994).

## 8. Conclusion

Despite the industrial rotary parlour being the most efficient (litre per cow per hour) way to extract milk and given Tokachi's history and moderate advantages in terms of space, farmer/owners realize are fighting a losing economic battle both inside and outside of Japan, both on and off the farm. Yet, in the face of all this, the Japanese agricultural regime persists in promoting CAFO style industrialization in the name of food self-sufficiency/security. Thus, the rotary parlour process has trapped Hokkaido, certainly Tokachi, dairy workers, species aside, in what Maley, influenced by Weber, has called “the iron cage of technology” (2004). Farmers find themselves in politico-technologically determined catch-22; the need to become more efficient, more rational, and more cost effective to survive, even if it is, literally, killing themselves off through debt and stress alongside the cows and the lifestyle they reminisce about. In more pop-cultural parlance, the industry is captive in a “progress trap”: bigger, faster, more with little concern for living limitations, embodied or affective, human or non-human (Wright, 2004). But increasing efficiency only makes sense in terms of unlimited potential – such as rising markets, available workers, or arable land. And as I have noted, the availability of all three are stagnating or in decline in rural Hokkaido.

The expense of social relations and the expense of health both bovine and human and between human and non-human are elements difficult to quantify in the strict positivist and economic terms of value set by the parlour mode of production. Japanese political and agricultural philosopher Osamu Soda (2006) states that in Japan agricultural science must move away from the focus on pure economics and embrace a science of ethics; “Agricultural science is a science of: [the] practical pursuit of values, life, regions, and synthesis...” (2006: 287). If it is to have any longevity, Japanese dairy farmers must address the real cost of efficiency (economic,



time, space) beyond the parlour itself and beyond the myopic viewpoint of elected governing bodies.

Though cows are not human, and humans are not cattle, political philosophers Jane Bennet (2010) and Martha Nussbaum (2006) underscore that anthropomorphism has its merits in thinking through ethnical issues of a complex kind. Nussbaum's book, *Frontiers of Justice: Disability, Nationality, Species Membership* questions what underlies these terms and the ethics of such categorizations from a Rawlsian influenced perspective of social contract and capability. While many argue cattle lives are fit for exploitation with little regard for their healthy bodies and minds beyond sustaining their perpetuation of milk production, few would support the same callous disregard for body and mind of mentally and/or physically impaired humans; working them to death in neglectful conditions capacities – though a number of embodied and mental conditions might be similar across species lines. The argument here is not critical insofar as it is undeniably factual. Tokachi farmers are aware of the ensnarement they are in. Their submission to the blurring of the animal-human-machine is seen through a regional animal-human history. They *became bovine* as a symbiotic lifestyle to survive a harsh Tokachi physical environment and they have *become bovine* again. Not co-habiting as individuals in this age, but co-constitutive as cattle, as individuated units determined to survive in the high-modern environment of neo-liberal economics.

The present danger in Tokachi, is not thinking in anthropomorphic terms but thinking in terms of anthropocentrism; as if humanity is somehow immune to the fate it imposes on its made and natural environment. Indeed,

“...[a] touch of anthropomorphism, then, can catalyse a sensibility that finds a world filled not with ontologically distinct categories of beings (subjects and objects) but with variously composed materialities that form confederations. In revealing similarities across categorical divides and lighting up structural parallels between material forms in “nature” and those in “culture,” anthropomorphism can reveal isomorphisms.”

(Nussbaum, 2006. 99)

Along these lines I have noted that cows are in many ways *like* humans; and the parlour system effects bovine and human in remarkably similar ways. Thus, my anthropomorphic tack is in terms of an easy to grapple with affective and embodied analogy and not a direct comparison (Porcher and Schmitt, 2012: 45) or critique.

In both groups the parlour system is at the heart of social hierarchies being called into question, stress and violence produced in attempts to keep pace with the demands of the system, and natural embodied processes are also hindered – in the case of both, nutrition and sleep are compromised, however cattle fare worse in that their physical bodies are altered to fit the logic of the machine and not the logic of their being (one could make a similar argument about repetitive motion injuries in the human element – but herein I have not). During the *actual* functioning of the parlour system there is little human or animal control; avenues of resistance are minimal and there is no immediate responsibility for animal or co-worker. The machine functions in terms of its programmed norms of size and speed. While the living elements keep pace and attempt to adjust to the mechanical – individual problems and irregularities cannot be compensated for – to stop the machine is to stop the entire possibility of the milking process. As it the rotary parlour sits, it is all or it is nothing.

Does the rotary parlour system deliver on its manufacturer's 2006 promise of “efficiency, profitability, and responsibility” or even the more updated version underscoring “comfort during

milking for both cow and human, lowered bovine stress, and a silent functioning and durable design” in 2012? The answer, I suggest, rests in examining the way in which dairies are kept bound to politically systemic macro level goals; in Japan, Hokkaido, and Tokachi, this is the schizophrenic political directives of top-down agriculture alongside the embodied and affective “blurring” caused by the animal-human-machine system of production.

This is true of human others, but also non-human others and is especially the case with animal-human-technology biosecurity threats wherein

“...the complicated interpenetration of human and animal lives and the risks that current practices pose for what veterinarians’ refer to as “One World, One Health.” ... [Risks such as the BSE, SARS-CoV, H1N1, and whatever else might be born out of the industrial agriculture horizon]...[Means] managing these risks requires moving beyond anthropocentric attitudes towards borders.”

(Smart and Smart, 2012: 366)

Much in the way fish and fowl do not follow the contours of human borders, the bare life inducing parlour apparatus cannot be separated for the other elements of farm or food production. The human-animal-machine forms a complex dialectical connection. It is a sentient/mechanical system whereby the current neatly ordered space of comfort, efficiency, and productivity of human food found in the parlour and flowing to supermarket freezers comes at the cost of disordering lives; with every glass of industrially produced milk, unquestioningly but willingly consumed, we too become bovine.

## Acknowledgements

I would like to thank the editors of this special edition journal for inviting me to contribute. I owe an enormous debt to a number of past advisors, colleagues, and institutions. Here I would like to single out my research host at Hokkaido University Kuwayama Takami and my research host at Japan's National Museum of Ethnology Ikeya Kazunobu. This article was started while a sessional at the University of Calgary and completed while an assistant professor at The University of Tsukuba. I thank my mentors in both institutions Alan Smart and Uchiyamada Yasushi respectively. I owe a personal debt to Professor John Mock for his vocal and unwavering support for those conducting rural studies in Japan. This research has been financially supported through grants from The Japan Foundation, JSPS, and The University of Tsukuba.

## References

- Agamben, Giorgio, 2004. *The open: man and animal* (K. Attell, Trans.). Stanford University Press, Stanford.
- Bakhtin, Mikhail, 1981. *The Dialogic Imagination: Four Essays* (M. Holquist and V. Liapunov, Trans.). University of Texas, Texas.
- Barbin, Herculine, 1980. *Being: the recently discovered Memoirs of a Nineteenth-Century French Hermaphrodite* (Intro. M. Foucault and R. McDougall, Trans.). Pantheon Books, New York.
- Befu, Harumi, 2001. *Hegemony of Homogeneity: an Anthropological Analysis of Nihonjinron*. Trans Pacific Press, Melbourne.
- Bekoff, Marc, 2007. *The Emotional Lives of Animals*. New World Library, Novato Calif.
- Bennet, Jane, 2010. *Vibrant Matter: a Political Ecology of Things*. Duke University Press, Durham.
- Berry, Wendell, 1996. *The Unsettling of America: Culture and Agriculture*. Sierra Club Books Publishing, California.
- Blue, Gwendolyn, Rock, Melanie, 2010. *Trans-biopolitics: complexity in interspecies relations*. *Health* 15 (4), 353–368.
- Braun, Bruce, Whatmore, Sarah (Eds.), 2010. *Political Matter: Technoscience, Democracy, and Public Life*. University of Minnesota Press, Minneapolis.
- Calarco, Mathew, 2008. *Zoographies: the Question of the Animal from Heidegger to Derrida*. Columbia University Press, New York.



- Clough, Patricia, Ticineto, 2010. The affective turn: political economy, biomedica, and bodies. In: Gregg, Melissa, Seigworth, Gregory J. (Eds.), *The Affect Theory Reader*. Duke University Press, Durham, pp. 206–225.
- Deleuze, Gilles, Guattari, Félix, 1987. *A Thousand Plateaus: Capitalism and Schizophrenia* (B. Massumi, Trans.). University of Minnesota Press, Minnesota.
- Derrida, Jacques, 2008. *The Animal That Therefore I Am*. Fordham University Press, New York.
- DuPuis, E. Melanie, 2002. *Nature's Perfect Food: How Milk Became America's Drink*. NYU Press, New York.
- Esposito, Roberto, 2008. *Bios: Biopolitics and Philosophy* (T. Campbell, Trans.). University of Minnesota Press, Minneapolis.
- Foucault, Michel, 1977. *Discipline and Punish: the Birth of the Prison* (A. Sheridan, Trans.). Vintage Books, New York.
- Fugita, Fumiko, 1994. *American Pioneers and The Japanese Frontier: American Experts in Nineteenth-century Japan*. Greenwood Press, London.
- Grasseni, Cristina, 2005. Designer cows: the practice of cattle breeding between skill and standardization. *Society and Animals* 13 (1), 33–49.
- Gregg, Melissa, Seigworth, Gregory J. (Eds.), 2010. *The Affect Theory Reader*. Duke University Press, Durham.
- Hansen, Paul, 2010a. *Hokkaido Dairy Farm: Change, Otherness, and the Search for Security*. University of London SOAS, Senate House, unpublished doctoral dissertation.
- Hansen, Paul, 2010b. *Milked for all their worth: hokkaido dairies and Chinese workers*. *Culture and Agriculture* 32 (2), 78–97.
- Hansen, Paul, *Hokkaido's Frontiers: Blurred Embodiments, Shared Affects and the Evolution of Dairy Farming's Animal-human-machine*. *Critique of Anthropology*, in press.
- Haraway, Donna, 2003. *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. *Prickly Paradigm and The University of Chicago Press*, Chicago.
- Haraway, Donna, 2008. *When Species Meet*. University of Minnesota Press, Minneapolis.
- Harootunian, Harry, 2000. *Tracking the Dinosaur: area studies in a time of "Globalisation"*. In: Harootunian, Harry (Ed.), *History's Disquiet: Modernity, Cultural Practice, and the Questions of Everyday Life*. Columbia University Press, NY, pp. 25–58.
- Harper, Douglas, 2001. *Changing Works: Visions of Lost Agriculture*. University of Chicago Press, Chicago.
- Hayles, Katherine, 1999. *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. University of Chicago Press, Chicago.
- Holloway, Lewis, 2001. *Pets and protein: placing domestic livestock on Hobby-farms in England and Wales*. *Journal of Rural Studies* 17, 293–307.
- Holloway, Lewis, 2007. *Subjecting cows to Robots: farming technologies and the making of animal subjects*. *Environment and Planning D: Society and Space* 25, 1041–1060.
- Horowitz, Alexandra, 2009. *Inside of a Dog: What Dogs See, Smell, and Know*. Scribner, New York.
- Hurley, Susan, 2006. *Making sense of animals*. In: Hurley, Susan, Nudds, Matthew (Eds.), *Rational Animals?* Oxford University Press, Oxford, pp. 247–274.
- Irish, Ann, 2009. *Hokkaido: a History of Ethnic Transition and Development on Japan's Northern Island*. McFarland & Company, Jefferson (USA).
- Kagami, Akikatsu, 2009. *Changes and traces of Ainu place names in contact with Japanese*. *York Space Institutional Repository*, 566–572. <http://pi.library.yorku.ca/dspace/handle/10315/3993> (accessed via Google 02.07.12.).
- Katsuno, Hirofumi, 2011. *The Robots heart: tinkering with humanity and intimacy in Robot building*. *Japanese Studies* 31 (1), 93–109.
- Kirby, David, 2010. *Animal Factory: the Looming Threat of Industrial Pig, Dairy, and Poultry Farms to Humans and the Environment*. St. Martins/Griffin, New York.
- Kirksey, S. Eben, Helmreich, Stefan, 2010. *The emergence of multispecies ethnography*. *Cultural Anthropology* 25 (4), 454–576.
- Kitano, Shu, 2009. *Space, Planning, and Rurality: Uneven Rural Development in Japan*. Trafford Publishing, Victoria.
- Kohn, Eduardo, 2007. *How dogs dream: Amazonian natures and the politics of transspecies engagement*. *American Ethnologist* 34 (1), 3–24.
- Latour, Bruno, 2007. *Reassembling the Social: an Introduction to Actor-network-theory*. Oxford University Press, Oxford.
- Lefebvre, Henri, 2004. *Rhythm analysis: Space, Time, and Everyday Life*. Continuum, London.
- Maley, Terry, 2004. *Max Weber and the iron cage of technology*. *Bulletin of Science, Technology and Society*. 24 (1), 69–86.
- Massumi, Brian, 2003. *Parables for the Virtual: Movement, Affect, Sensation*. Duke University Press, Durham.
- Matanle, Peter, Rausch, Anthony (Eds.), 2011. *Japan's Shrinking Regions in the 21st Century: Contemporary Responses to Depopulation and Socioeconomic Decline*. Cambria Press, London.
- Mock, John, 1999. *Culture, community and change*. In: *A Sapporo Neighborhood, 1925–1988: Hanayama*. The Edwin Mellon Press, Lampeter (USA).
- Mock, John, 2006. *The social impact of the rural-urban shift: some Akita examples*. In: Thompson, Christopher, Traphagan, John (Eds.), *Wearing Culture Styles in Japan: Concepts of Tradition and Modernity in Practice*. SUNY Press, Albany, NY.
- Morris-Suzuki, Tessa, 1998. *Re-inventing Japan: Time, Space, Nation*. An East Gate Book/M.E. Sharpe Inc., London.
- Mulgan, Aurelia George, 2006. *Japan's Agricultural Policy Regime*. Routledge, London.
- Negal, Thomas, 1974. *What is it like to be a bat?* *The Philosophical Review* 83 (4), 435–450.
- Novak, Joel, 2012. *Disciplining and distancing: confined pigs in the factory farm Gulag*. In: Gross, Aaron, Valley, Anne (Eds.), *Animals and the Human Imagination*. Columbia University Press, NY, pp. 121–151.
- Nussbaum, Martha, 2006. *Frontiers of Justice: Disability Nationality Species Membership*. Belknap Press, London.
- Peng, Tingjun, Cox, Thomas, 2005. *An Economic Analysis of the Impacts of Trade Liberalization on the Asian Dairy Market*. University of Wisconsin-Madison Department of Agricultural and Applied Economics. Staff Paper Number 490, pp. 1–25.
- Phillips, Clive, 2002. *Cattle Behaviour and Welfare*. Blackwell, Oxford.
- Pollan, Michael, 2006. *The Omnivore's Dilemma: a Natural History of Four Meals*. Penguin Books, New York.
- Porcher, Jocylene, Schmitt, Tiphaine, 2012. *Dairy cows: workers in the shadows*. *Society and Animals* 20, 39–60.
- Price, Trudy, 2011. *The Cows are Out: Two Decades on a Maine Dairy Farm*. Islandport Press, Yarmouth (USA).
- Shapiro, Michael, 1997. *Violent Cartographies: Mapping Cultures of War*. University of Minnesota Press, Minneapolis.
- Shukin, Nicole, 2009. *Animal Capital: Rendering Life in Biopolitical Times*. University of Minnesota Press, Minneapolis.
- Singer, Peter, 1975 (2001). *Animal Liberation*. Harper Collins/Ecco, New York.
- Smart, Alan, Smart, Josie, 2012. *Biosecurity, quarantine, and life across the border*. In: Wilson, Thomas, Donnan, Hastings (Eds.), *A Companion to Border Studies*. Blackwell Publishing Ltd, Oxford.
- Soda, Osamu, 2006. *Philosophy of Agricultural Science: a Japanese Perspective*. Transpacific Press, Melbourne.
- Stewart, Kathleen, 2007. *Ordinary Affects*. Duke University Press, Durham.
- Takata, Wakizo, 2003. *The present state of green tourism in Eastern Hokkaido*. In: *Regional Research*, 12. Kushiro Public University of Economics.
- Takata, Wakizo, 2004. *Formation and characteristics of a Farming Village in Eastern Hokkaido: A Case Study in the Kushiro Area*. In: *Regional Research*, vol. 13. Kushiro Public University of Economics. pp. 89–106.
- The Humane Society (US), 2008. *About Cattle*. <http://www.humanesociety.org/assets/pdfs/farm/hsus-the-welfare-of-cows-in-the-dairy-industry.pdf> (accessed via AVG 29.05.12.).
- The Japanese Ministry of Agriculture Forestry and Fisheries, Statistics (MAFF), 2011. <http://www.maff.go.jp/e/index.html> (accessed via AVG 12.08.11.).
- Trewartha, Glen, 1965. *Japan: a Geography*. University of Wisconsin Press, Madison.
- Tuan, Yi-fu, 1984. *Dominance and Affection: the Making of Pets*. Yale University Press, New Haven.
- Vialles, Noilie, 1994. *Animal to Edible* (J.A. Underwood, Trans.). Cambridge University Press, Cambridge.
- von Uexküll, Jacob, 2010 (1934). *A Foray into the Worlds of Animals and Humans: with a Theory of Meaning* (J. O'Neal, Trans.). University of Minnesota Press, Minneapolis.
- Walker, Brett L., 2001. *The conquest of Ainu lands: ecology and culture*. In: *Japanese Expansion, 1500–1800*. University of California Press, Berkeley.
- Watson, Mark, 2013. *Indigenous Ainu and the Tokyo experience*. In: Hudson, Mark J., Iewallen, Ann-elise, Watson, Mark K. (Eds.), *Beyond Ainu Studies: Changing Academic and Public Perspectives*. University of Hawai'i Press, Honolulu.
- Wolfe, Cary, 2003. *Animal Rites: American Culture, the Discourse of Species, and Posthumanist Theory*. University of Chicago Press, Chicago.
- Wolfe, Cary, 2010. *What is Posthumanism*. University of Minnesota Press, Minneapolis.
- Woods, Donald, 2012. *Ogata-Mura: Sowing Dissent and Reclaiming Identity in a Japanese Farming Village* (Asian Anthropologies). Berghan, London.
- Wright, Ronald, 2004. *CBC Massey Lecture Series: a Short History of Progress*. House of Anansi Press, Toronto.