MEAT, MAN, AND THE ARCHITECTURE IN BETWEEN

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ARCHITECTURAL DESIGN RESEARCH REPORT

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Self Disclosure of Research

This author has no competing interests to declare.

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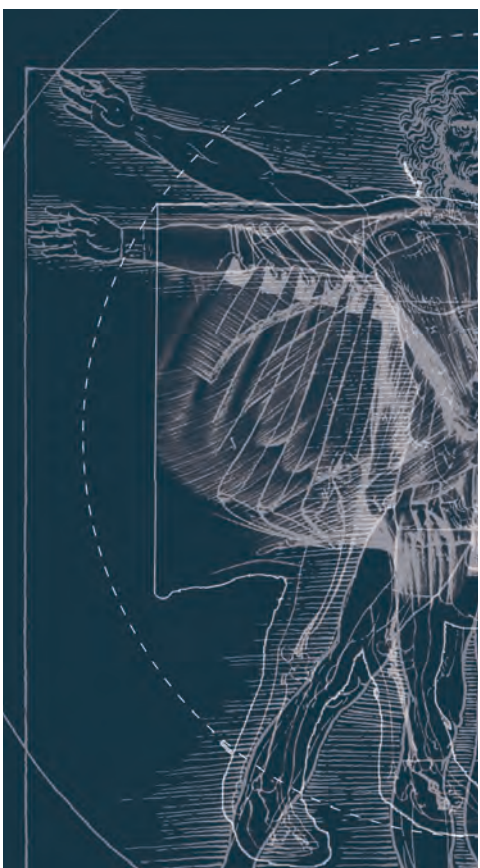

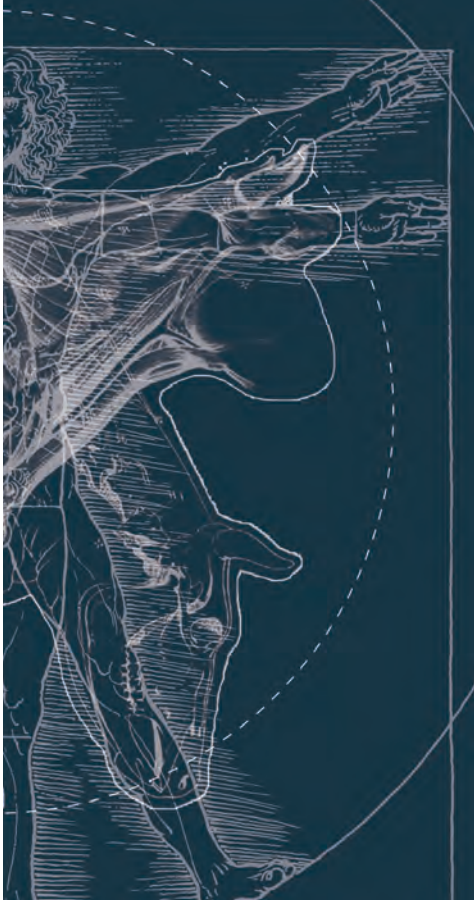

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Research Abstract

01

Figure 1. ↑
Unsettled Dogs, 2012
Sam Jinks
Silicone, pigment, resin, hair 64 × 62 × 23 cm

For all 200,000[1]-odd years of human history, we have lived alongside animals, notably as animals only until recent early civilisation. Within the last millennium, Architecture as a discipline formalized and has since joined the ranks of theology, philosophy and biology in an attempt to separate the human from the animal. Architecture wields space, as perhaps the most literal of tools, to quantify and justify this divide. These ontological divides catalyse the abstraction of animal, first removing the animal within man, then the animal other from itself. The post-animal human begins to forget his animality amidst fledgling urban life. Its foil, the post-animal animal gradually loses its identity, complexity and autonomy as it is estranged from this decidedly anthropocentric world order. As modernity continues to deepen the rift between, our collective amnesia of knowing how to live with animals emerges as deadly collateral.

1 A contested but widely acknowledged period of time that many anthropologists agree the species homo sapiens have existed for.

Of all the man-animal relationships constructed, our relationship with meat perhaps sits at the pinnacle of this animal abstraction. We collectively harvest and consume more meat now than any past civilization. Ironically, we have never been more ignorant about where and how our meat is derived. In this thesis research, I examine how architecture within the contemporary meat industry is complicit in the abstracting of the animal, and speculate upon the industry's trajectory to satisfy increasing demands of meat bolstered by an expanding population. A nostalgic return to an era of pre-industrialisation may no longer be possible, but there is space yet to design within our urban environment, a reminder of the connection to the animals that sustain our lives.

Introduction:
Research Approach

02

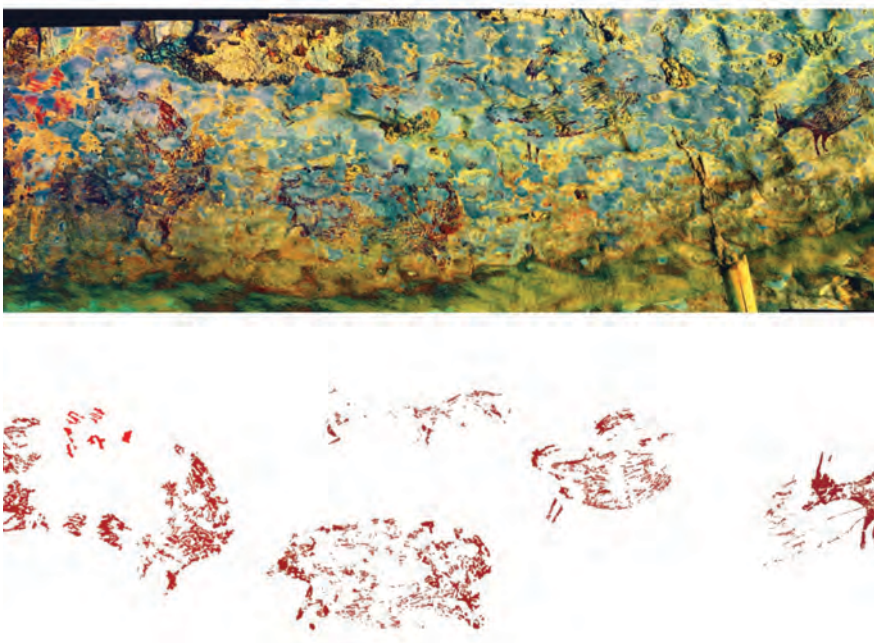


Figure 2. ↑
Rock Art Panel across back wall of Leang Bulu' Sipong 4
(left to right: Hand stencil, hybrid, pig, pig, anoa, hybrid anoa, multiple hybrids, anoa)

In this thesis preparatory report, I propose that the pursuit of modernity has led man to abstract the animal. Abstraction removes the animal from within man, and the animal other from itself. Multiple relationships man constructs with animals exhibit this abstraction, but perhaps none more varied and complex than the one we have with meat. Comprising of three acts, I investigate how architectural space, facilitates the varied forms of this crucial metabolic exchange along different stages of the meat production process and speculate on its role in the impending meat revolution.

Act 01: ABSTRACTION, A THEORETICAL FRAMEWORK

A theoretical framework introducing animal abstraction is established to guide the research in the rest of the report. The pursuit of 'being modern' has led to the creation of distinct ontological zones, namely, the post-animal human and the post-animal animal. In its current forms, abstraction is problematic because it reduces the animality of animals and with it, the human's ability to empathize with them.

Act 02: AN ARCHITECTURE OF MEAT

Amongst all human-animal relationships, our relationship with meat stands out for its degree of complexity and intimacy in abstracting the animal. In this act, I break down the multiple stages in the meat production process and illustrate how architecture is instrumental in supporting the abstraction of the animal other.

Act 03: THE IMPENDING MEAT REVOLUTION

In the final act, I explain why disruption to the meat industry is primed to take off, and the compelling case for alternative meats. Backdropped against this meat revolution, I discuss how conventionally farmed meat can take on new significance in the urban-domestic sphere. By returning the animal from abstraction, we can once again foster meaningful relationships between us, and the animals we eat.

Prelude:
Before the Homo Sapien

03

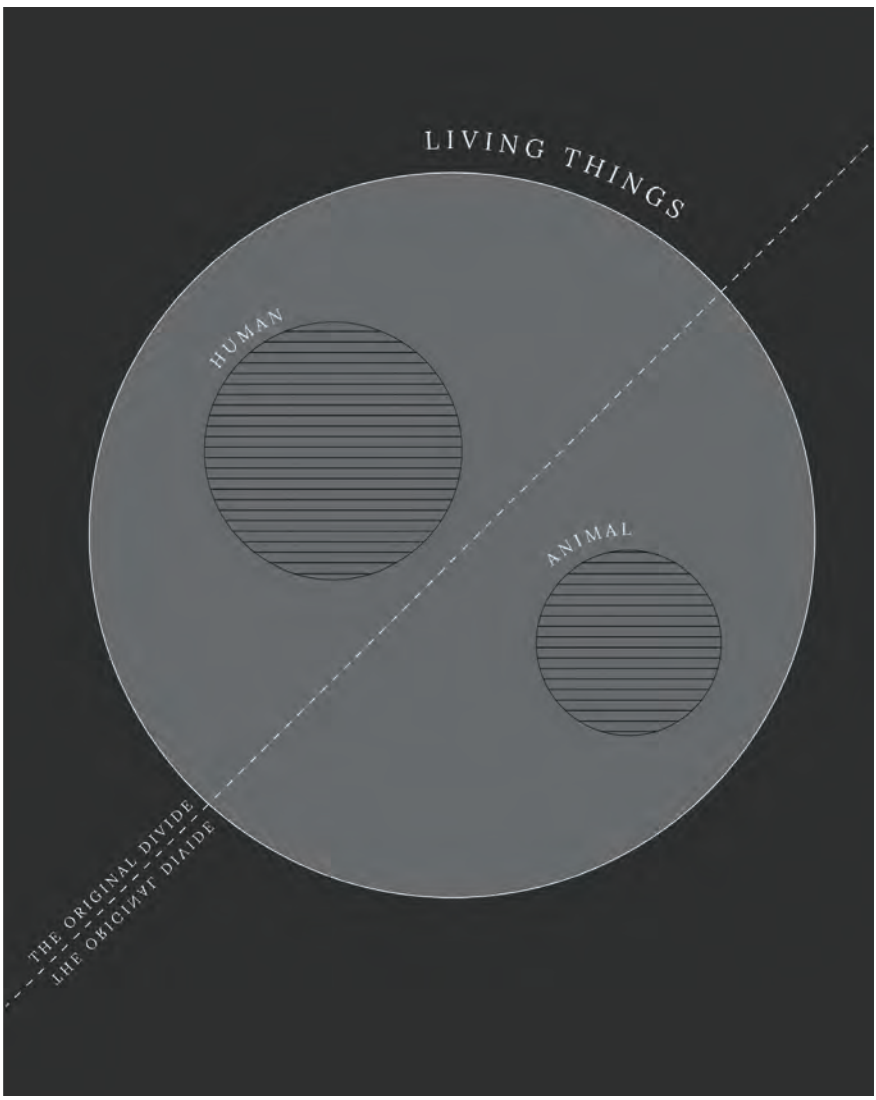


Figure 3. ↑
Man and Animal. Man as Animal.
The Original Divide.
Author's Own.

A human desire (even need) for separation from animals has always existed and is quite literally as old as ourselves. Archaeological evidence reveals that even before homo sapiens evolved into being, proto-humans[1] had already constructed sheltered dwellings. The likely reason? Unlike our current position as apex predators, early hominids were predominantly prey to other megafauna. Caves and remnants of early structures dating back to 400, 000 BCE, suggest that physical enclosures were used for protection from larger wildlife and the elements alike. Proto-humans also likely banded together in groups to increase survival[2], reinforcing notions of inclusion-exclusion across the homo-animal divide. Living in permanent social groups for increased protection endures till today, evinced in the living formations of Non-Human Primates (NHPs).

It would be disingenuous then to suggest the distance between man and animal is an unnatural and modern construct. Instead, what seems more to be a recent invention, and the interest of this thesis research, is how that simple operation of division has translated into far reaching processes of abstracting the animal.

1 A loose classification of archaic homo species.

2 (Schoenherr 2005)

“All animals are equal,
but some animals are more equal than others.”

- Animal Farm, George Orwell. 1945.

Figure 4. ↑
Still Life with a Bottle of Rum, 1911.
Oil on canvas.
61.3 x 50.5cm
Jacques and Natasha Gelman Collection, 1998.
The Metropolitan Museum of Art Collection.

WHAT IS ABSTRACTION?

The broad definition of abstraction involves some idea of removal. In art, abstraction is a process of relinquishing accuracy and realism, in favour of employing a combination of techniques - including but not limited to shapes, colours and textures - to depict a desired effect3.

In early explorations of what later came to be considered the Cubist movement, Picasso would deconstruct an object with lines and rearrange its constituents on a canvas leaving an obscured but somewhat discernible image of its original. Colours and textures would be added possibly to aid the mind in reconstructing the abstracted image.

3 Definition of abstract art as provided by Tate Org, UK

The Post-Animal Human:
Removing the Animal in Man

04

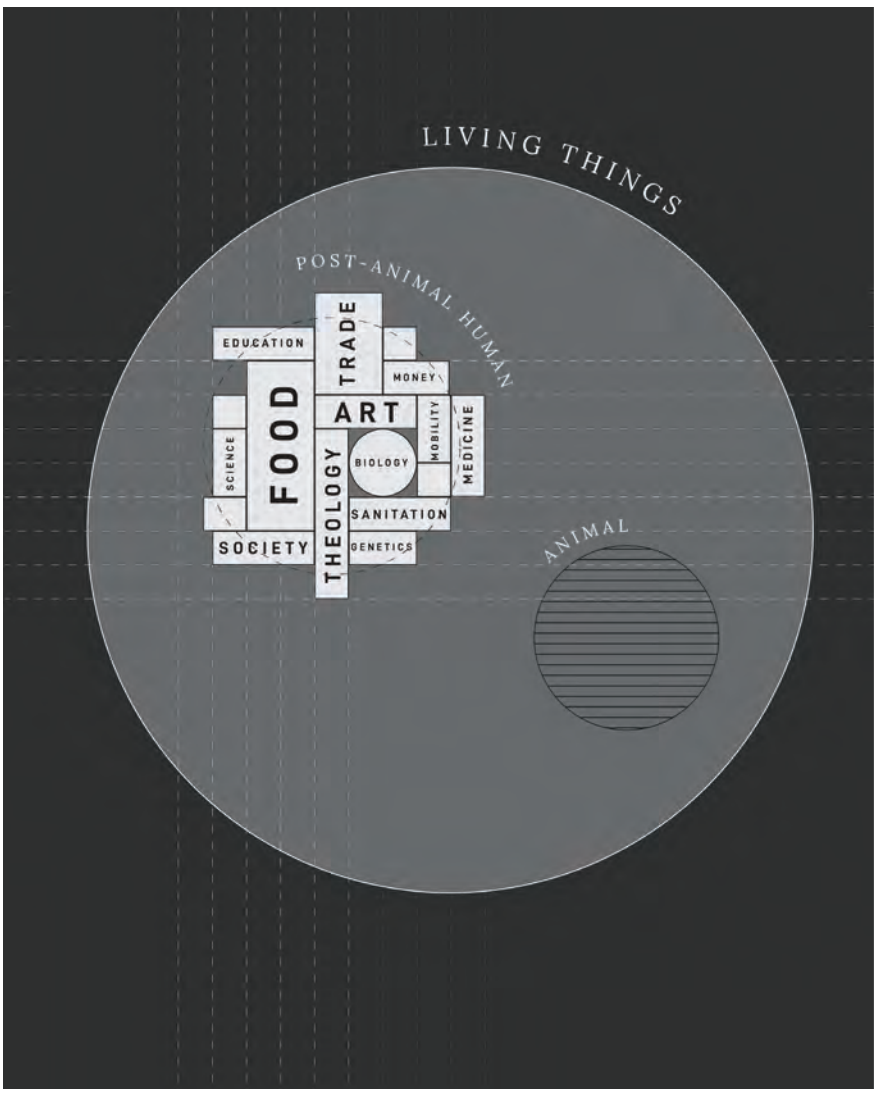


Figure 5. ↑
The post-animal human.
Author's Own.

The abstraction of animals recalls a similar operation of removal. Man first removes the animal from within by banishing animalistic functions and behaviours he believes are ill-representative of its status, then elevates desired attributes he believes the human race should aspire towards. Latour describes this as a practice of "purification" whereby distinct ontological zones of human and non-human are created in our pursuit of being modern[4]. The post-animal human emerges as a species that has purposefully forgotten its animality. The following sections describe three areas man has abstracted the animal from within.

4 (Latour 1991, 10-11)

It was common practice to stack rush mats as flooring one over the other in English medieval homes, accumulating bacteria and human detritus between its layers. In many European cities up till the advent of centralized planned sanitation systems, a lack of proper sewage had people flinging the contents of their chamberpots outside their window.

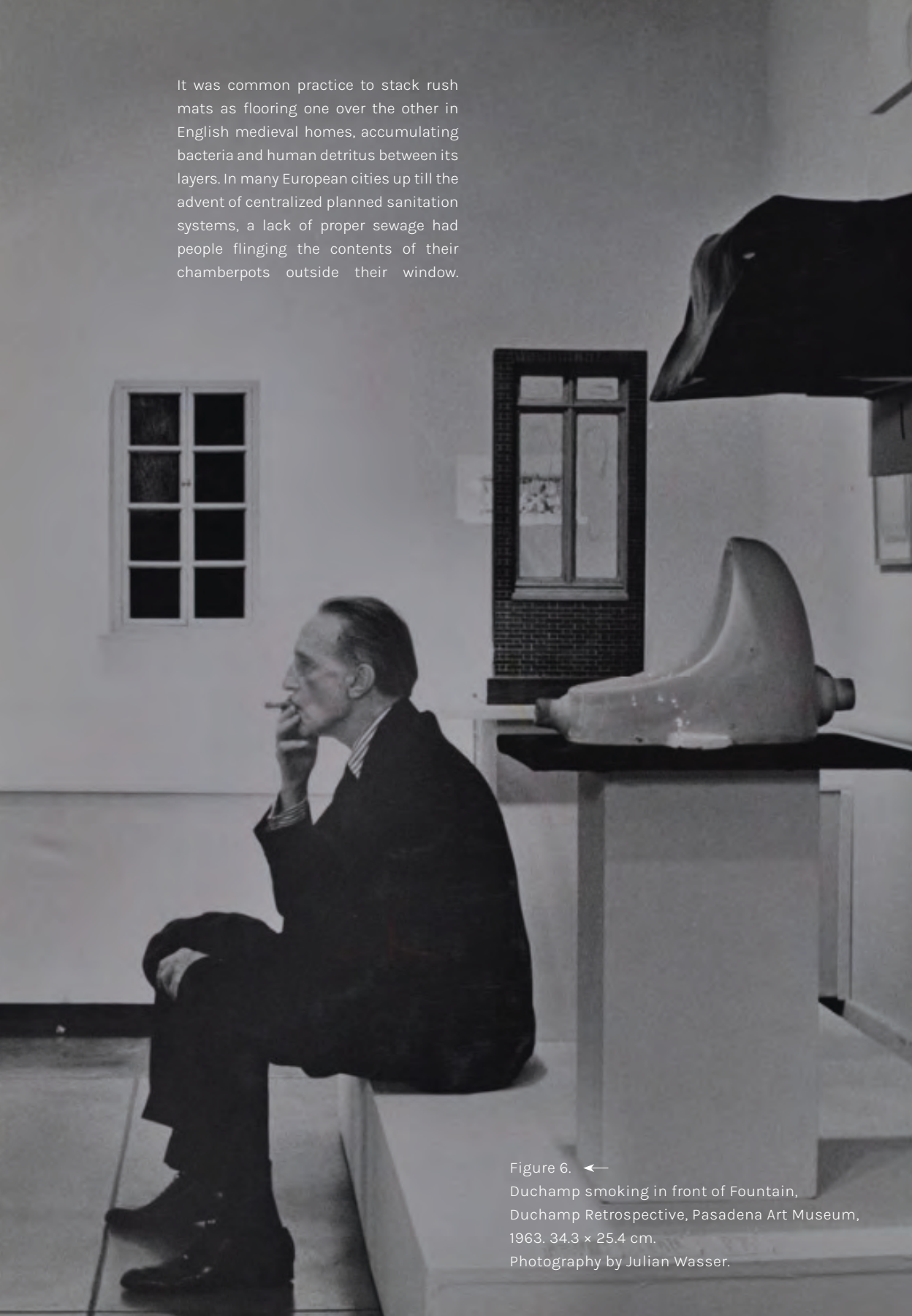
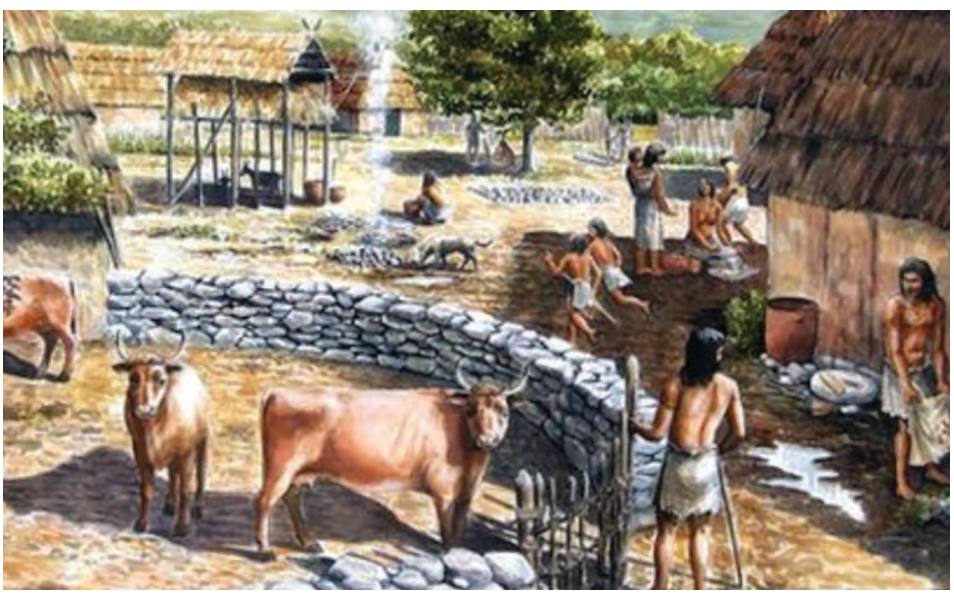


Figure 6. ←
Duchamp smoking in front of Fountain,
Duchamp Retrospective, Pasadena Art Museum,
1963. 34.3 × 25.4 cm.
Photography by Julian Wasser.

Figure 7. ↑
A nightsoil collector
depicted in a Chinese scroll
painting

Figure 8. ←
1.5 Ma fossil antelope lower leg bones (metapodial) from Koobi Fora, Kenya, bearing cut marks in their bone.

Figure 9. ↓
An artist impression of early Neolithic farmers tending to their livestock



4.1 NUTRITION

Paleontological and archaeological[5] evidence suggests that early hominids transited to include meat in their diet, as early as 1.5 Ma ago. Both homo and wild animals remained alike in that they hunted following an immediate-return forager economic model[6]. The true departure from behaving like animals in our nutritional history happened just some 12,000 years ago with the formation of agricultural practices. Competing theories seek to explain why practices of prey-domestication[7] gradually replaced the hunter-forager model, but they are not immediately important to address.

Of critical importance, however, is to realise this new mode of acquiring crops and meat marked the beginning of structures and facilities to store food and amass surpluses[8]. These relatively permanent structures eventually led to the concentration of

5 Recovered stone tools and early dental records

6 Food was consumed shortly or shared within hours or days of the hunt. (Berson 2019, 85)

7 The archaeo-biologist Melinder Zeder proposes that there are three pathways to domestication: the commensal describes a sympathetic relationship (i.e pets); the prey when animal are targets of human hunting; the directed being a catch-all term for domesticates that do not fall neatly in either category (i.e transport horses) (Berson 2019, 95)

8 (Berson 2019, 97)

populations built around them. It is widely accepted that the new diet and organization of populations around it exacted a huge toll on human health[9]. A reduction in diversity of nutrient intake due to the narrowing of food sources, was compounded by the fact that large, crowded populations were perfect hosts for pathogens to spread. Man ceasing to act like the animal to fulfil its dietary requirements initially brought on as many novel problems as it did solutions.

9 (Milner 2019, 1)

4.2 WASTE DISPOSAL

Neolithization marked the start of declining residential mobility of man as a species. Long-term residency meant that waste disposal soon became an issue to contend with. It is remarkable to note that modern sanitary systems did not truly develop until after the 19th century. Outbreaks like the Black Death[10] led civilizations on the European continent to finally discover the link between hygiene and health. While the West struggled with waste collection, eastern civilisations had long mastered the art of turning hu-manure into usable fertilizer[11]. A similar practice of nightsoil collectors survived for a short time in pre-industrial Europe and the Americas but never quite took off in the same way.

Today, the chimpanzee, our closest living relative, still defecates just outside their nest, while a complex system of sanitary devices snake infinitely around our urban cities discharging waste far from our peripheries.

10 A global epidemic of bubonic plague that wiped out a third of the population on the European continent, some 200 million people.

11 (King 1992 [1991], 192)

4.3 MADNESS AND CRIMINALITY

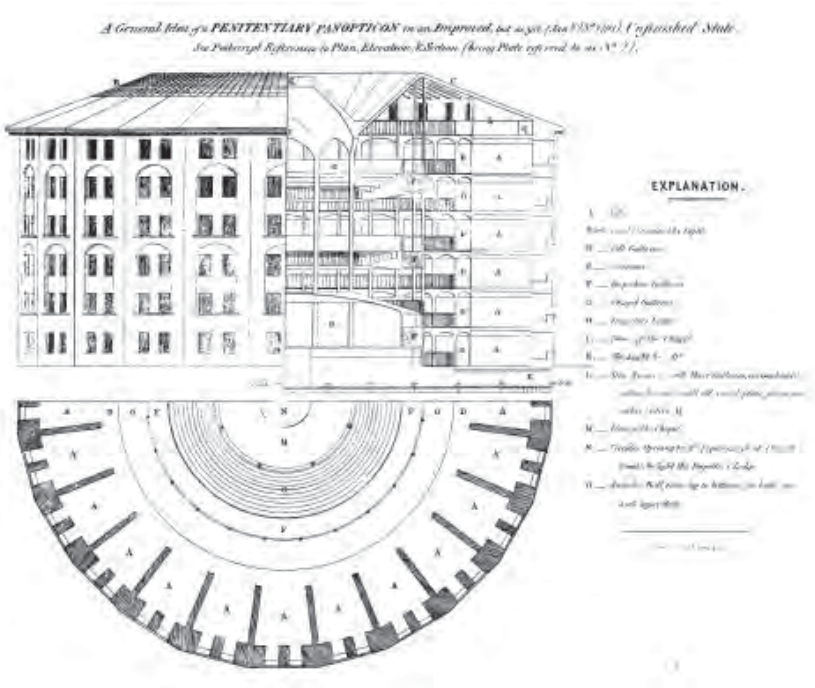
Animal trials and executions were a regular part of European judicial processes[12], to hold animals accountable for damage caused to property or human life[13]. Practically all contemporary systems of justice reject this curious practice on grounds that non-human entities lack moral agency relinquishing them from culpability. An inability of an individual to control one's actions or abide within legal frameworks is therefore viewed by many societies as a residual wildness within, deserving of banishment. Brain imaging studies have built upon this theory of wildness, suggesting that the minds of criminals are biologically different, one factor contributing to an individual's predisposition to violent offending[14].

12 From the thirteenth to eighteenth century.

13 (Girgen 2003, 99)

14 fMRI scans of the brains of violent criminals have been observed to possess reduced gray matter, a component that makes up the cerebral cortex, responsible for cognitive control and social processing. Humans, relative to animals such as rodents and primates typically have a much more highly developed cerebral cortex. (Wolf and Koenigs 2015, 2).

Figure 10. ↓
Illustration of Bentham's Panopticon.
The Works of Jeremy Bentham, published under the Superintendence of his Executor, John Bowring (Edinburgh: William Tait, 1838-1843)
11 vols. Vol. 4.



Bentham's infamous Panopticon reintroduced the predator's gaze into the criminal's psyche through a central tower design that encouraged constant surveillance of the incarcerated.

To this end, madhouses, asylums and houses of correction began appearing in seventeen century Europe and continue in the present day to incarcerate the mad and the criminal at the fringe of society. Architectural design of enclosures for these "animal-like" humans were shaped by prevailing notions of policy that vacillated between rehabilitation and retributive punishment models. For instance, in nineteen century English asylums, patients were often subject to cruelty as they were "considered wild beasts to be tamed"[15].

Figure 11. ↑
Illustration from Cambers book of Days, depicting a sow and her piglets being tried for the murder of a child

15 (Rutherford 2019)

Conclusion: THE ANIMAL AS "OTHER"?

An ontological divide sets up the animal as an "other" to the human in multiple ways. This steady march of purifying the human against its other living counterparts encounters resistance when we consider the biological makeup our physical bodies and can perhaps never fully materialise. The microbiome refers to all the microbes and genes acting together on and in a body, in concert. Prevailing sequencing and culturing technologies estimate the human microbiome at 100 trillion microbes that inhabit every surface of our body internal and external with an untold number more to be discovered. The belief that our bodies can read as independent entities is misguided. Rather than parasites feeding on our host bodies, these microbes that are not of us in the way DNA is, are critical to the healthiness of our bodies[16]. Living organisms, regardless of whether we are able to see or perceive their effects on us, have always and will always continue to share a close proximity with us.

16 For example, bacteriodes species that reside within all our guts metabolize polysaccharides and oligosaccharides providing nutrition and vitamins for us.

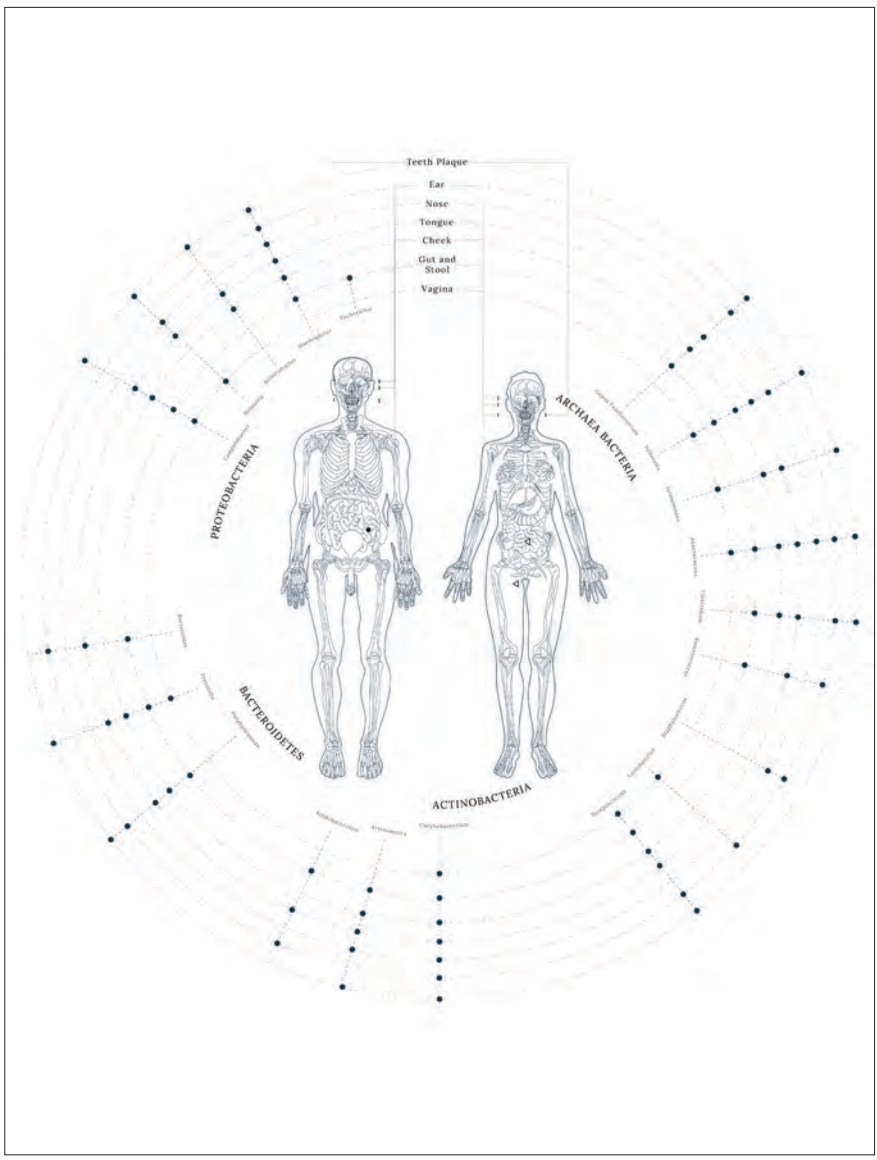


Figure 12.
A map of diversity in the human microbiome

The Post-Animal Animal:
Removing the Animal in Animal

05

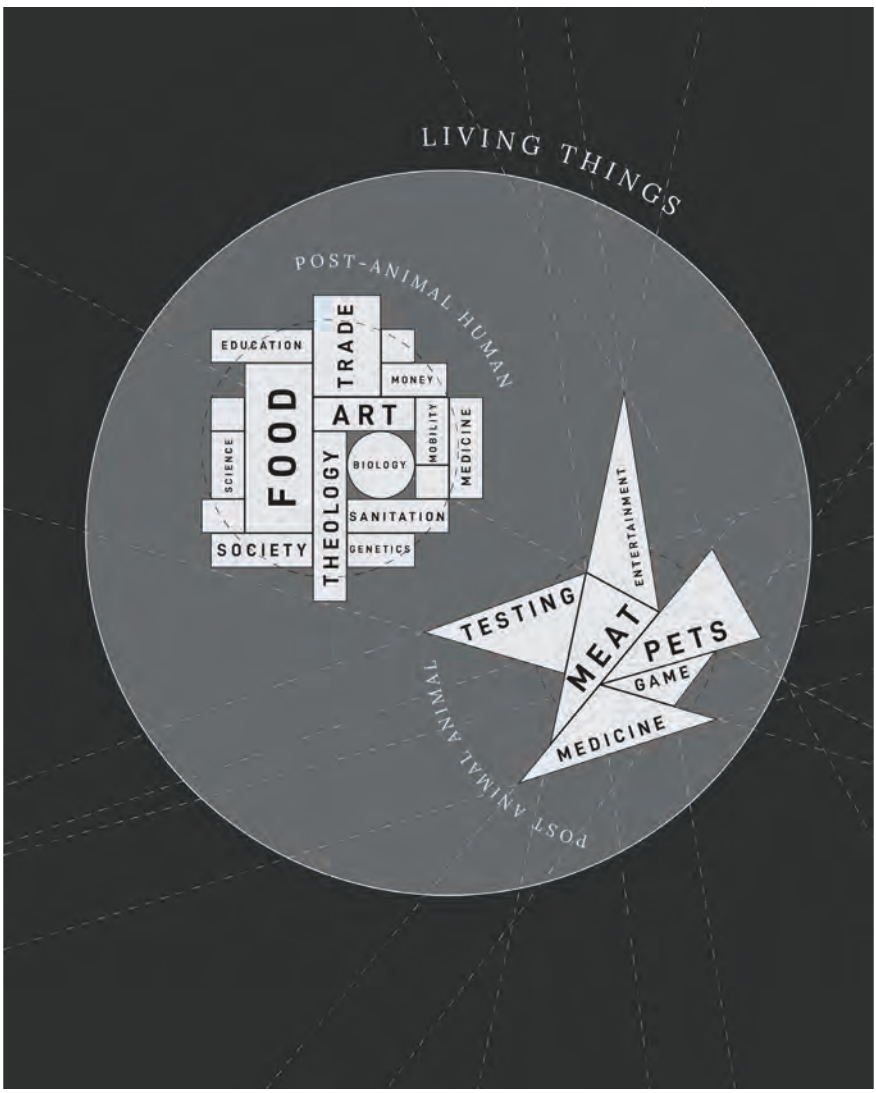


Figure 13. ↑
The post-animal animal.
Author's Own.

Throughout history, all relationships man has constructed with animals is undergirded by some utility or purpose. The pursuit of modernity further adds to these relationships a dimension of abstraction. Abstraction of the animal other involves the removal of an animal's animality by denying its complexity, autonomy and identity, in that order. In the following sections, I define how the post-animal animal that emerges is situated along a spectrum of abstraction varying in intensity, decidedly non-human yet no longer quite animal.

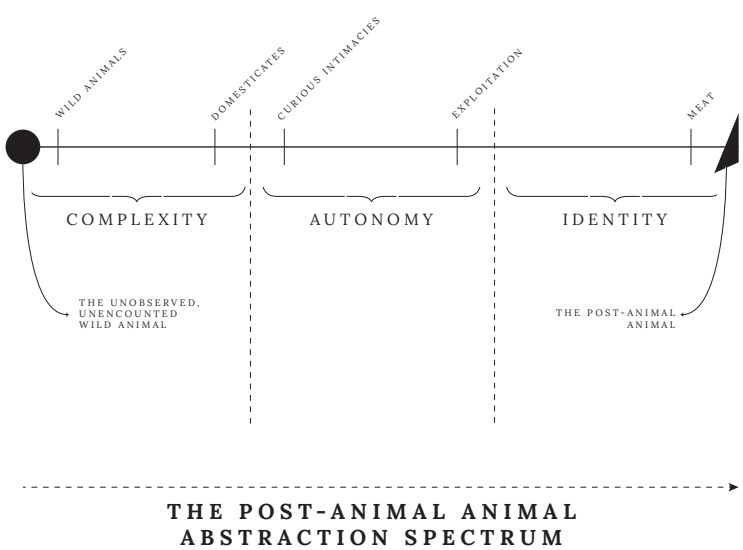


Figure 14.
The post-animal animal abstraction spectrum
Author's Own.

5. 1 COMPLEXITY

Fudge argues that because all historical documents surrounding animals are written or spoken by humans (as opposed to being of animal origin), there is, and never can be, a true history of animals[17]. My research on the animal other therefore can only access artefacts describing a history of selected human attitudes toward animals. Any conclusion drawn thus, invariably begins to reduce the complexity of the animal at a fundamental level. Domestication along the prey and directed pathways further compound the removal of complexity as animals are assigned strict roles in servitude of humans and reduced to simple fungible inputs[18].

5.2 AUTONOMY

For any live animal, all human-animal engagements can be described as a wrestling away of its autonomy to varying degrees. At one end, curious intimacies exist where humans develop a manner of mutualism[19] with the animal other. In these instances, an animal might have lost its complexity but still retains much of its autonomy. At the other end, processes of exploitation and exclusion often radically alter the behaviour of animals to promote system efficiency. An animal can be considered to have fully lost its autonomy upon slaughter[20].

17 (Fudge and Rothfels 2002, 5)

18 Section 7.2

19 A type of symbiotic relationship where all species involved benefit from their interactions.

20 Section 8

5.3 IDENTITY

Identity is a concept that deals with recognition. A dead animal might have lost both its complexity and autonomy but retains its identity because it is still recognisable. The fully abstracted post-animal animal is one that becomes unrecognisable. Abstraction to this degree appears to be exclusive to animals in the meat industry. Different philosophies exist to transform animals into meat, resulting in some meat that recalls its source animal to some degree respectfully, and others where the animal is entirely removed from view[21].

21 Section 9

Conclusion: THE EMERGENT POST-ANIMAL ANIMAL

The post-animal animal therefore refers to one that has its animality abstracted, through human processes that deny its complexity, autonomy and identity. Of all these different man-animal relationships, perhaps none are more intimate and complex than the one we have with meat. The summaries below describe my initial research across the different fields before I decided to look at meat as my topic of interest.

In Act 02, I apply this theoretical framework of abstraction to analyse the different stages within the meat production cycle. Specifically, I examine how architecture planning and the design of space within the meat industry is complicit in rendering the animal other as an abstracted entity.

Appendix A: THE POST-ANIMAL ANIMAL IN VARIOUS FIELDS

I look at various fields in which the abstracted animal surfaces when it is either observed or interacted by man. I eventually settled on our relationship with meat as it exhibited the most variety of abstraction across the entire spectrum. It was the 'meatiest' subject.

Appendix B: A HISTORICAL SURVEY OF MODES OF ENGAGEMENT WITH WILDLIFE

In the earlier stages of the thesis prep, I was interested in looking at how man interacted with wildlife trade.

“In our time, nevertheless, the slaughterhouse is cursed and quarantined like a plague-ridden ship”

- George Bataille, 1986

Eating Meat:
The Spectrum

06

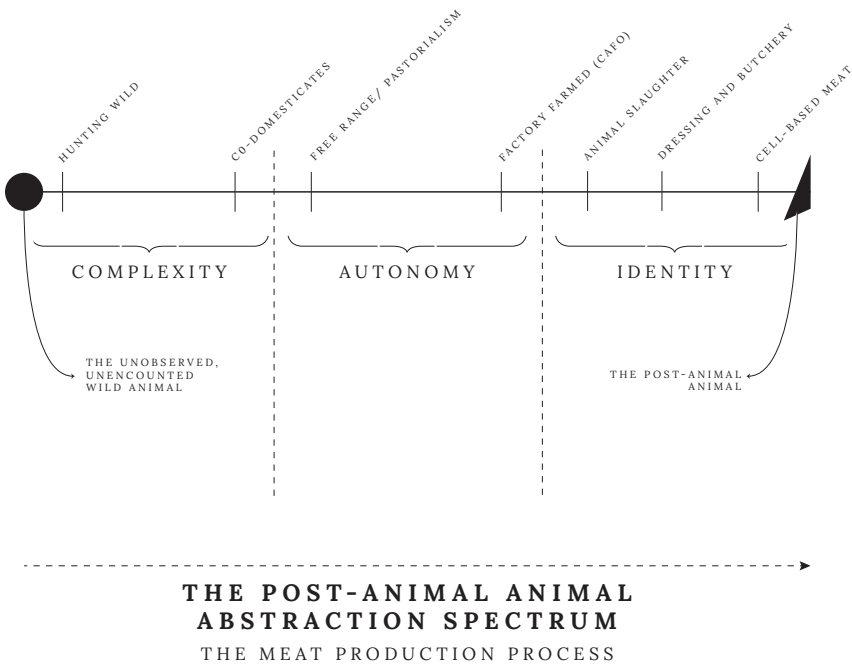


Figure 15. ↑
The Meat Abstraction Spectrum Author's Own.

The 'meatification' of diets has been observed in tandem with the explosion of population in recent history. The average human consumes nearly twice the amount of meat annually as only two generations ago[1]. Contextualized against population growth from approximately three billion to over seven billion in the same span of time, it comes as no surprise that large inroads have been made in the meat industry to rapidly increase output and maximize yield.

When we eat meat, our bodies metabolise it, forming building blocks of our being. The animal is literally absorbed into man, becoming of man. Ironically, we have never been more ignorant about where and how our meat is derived. The modern meat industry comprises four key operations, namely, Breeding, Slaughter, Dressing and Butchery. Its operations are responsible for an en-masse abstraction of livestock animals, removing them from human view and consideration. In my opinion, eating meat sits at the pinnacle of animal abstraction, its irony exhibited on a regular and intimate scale for many.

1 The average person consumed 43kg of meat in 2014 but only 23kg worth in 1961. Food and Agriculture Organization Statistics Division 2017.

In this act, I explore how architectural planning and design of structures have been instrumental in supporting the abstraction of the animal other across these four key operations. Abstraction in its varied forms remain problematic because it reduces the animality of animals and with it, the human's ability to empathize with them.

Acquisition:
The Meat Production Process

07

Figure 16. ↑
Hunters, Zorro Ndeli and Tamanga Ekwayoli in the Tumba-Ledima Reserve, Cemocratic Republic of Congo.
Photo by Ollivier Girard for CIFOR.

7.1 HUNTING WILD

There exists only three ways of acquiring meat presently. Hunting wild game, domesticating and culturing cell-based meat. An argument can certainly be made that wild animals are the least abstracted in the acquisition stage because they are by definition, left to their own devices until they are captured. Bushmeat is a vital dietary item for rural populations. In the Congo Basin, bushmeat provides anywhere between 30-80% of overall protein intake in rural households. A growing affluent middle class across China and Southeast Asia has also seen a spike in demand for wild animal species.

The absence of an overt architecture of capture is key to wild animals retaining their animality. However, when traps of hunting infrastructure begin to populate and overrun natural habitats, wild animals can no longer move freely without threat to their lives. Wildlife watch-dogs such as TRAFFIC[2] are of the unanimous opinion that rates of bushmeat consumption are unsustainable and will continue to contribute to the endangerment and extinction of species in question. There exists only three ways of acquiring meat presently: hunting wild game, domesticating and culturing cell-based meat.

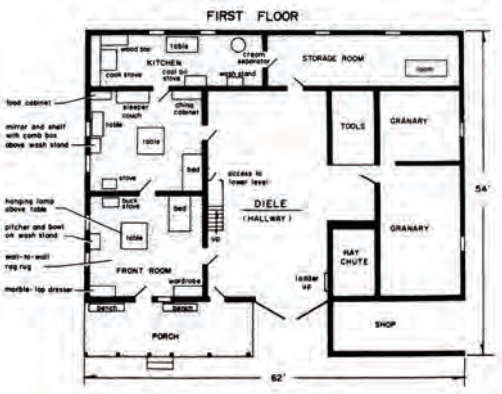
2 Trade Records Analysis of Flora and Fauna in Commerce

7.2 DOMESTICATES

One rung below their wild counterparts on the abstraction ladder, sit domesticates. All forms of domestication reduce the complexity of the animal other by imposing upon them an anthropocentric function from birth to death. It would be misleading to think of domestication as a homogenous process. Domestication is an ongoing phenomenon that assumes multiple forms and continues to evolve over time. The next three subsections differentiate between these forms and illustrate the degree of abstraction engendered.

CO-DOMESTICATES

Co-domesticates refers to situations where humans and their vertebrate companions occupy a shared biome in a mutualistic relationship. Animals consumed as meat here, are commonly integral to the patterns and processes of human living. Across these case studies, we recognize how architecture supports multiple mutualistic relationships by keeping humans and animals in close proximity and enmeshing their daily functions. While these co-domesticates are not free in the truest sense of the word, I offer that they still retain key parts of their animality.



The housebarn was a type of farmhouse built to house animals, produce, equipment of harvest and all the members of the farm family within a single building. Here domestic functions were placed above the animals stalls in the basement where their residual body heat was captured and acted in place of underfoot heating units.

Figure 17. →
Han dynasty pigsty toilet.
Nicole De Bisscop, Onder Dak in China
(Under a Roof in China),
(Brussels: Mercatorfonds, 2007)

Figure 18. →
Pigsty and Latrines,
Han Dynasty (206BC - AD 220),
China

Figure 19. ↑
Pelster House,
photograph

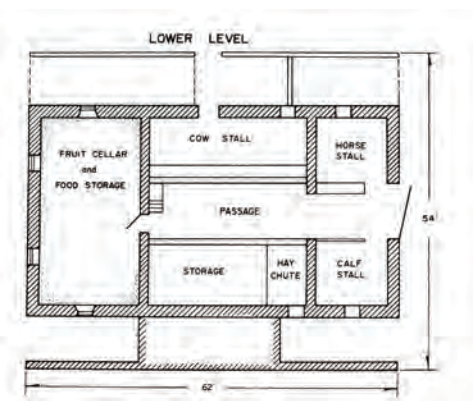


Figure 20. ←
Pelster House,
floor plans

In pre-modern China, a then-common lavatory construction featured a latrine for humans built above a pigsty. Pigs were raised as a main source of protein for human consumption. Here, human waste was mixed into the feed and fed to the pigs who in turn produced their own waste which was then used to fertilize the agricultural crops that fed the town.

Figure 21. ↓
A Sami family in front of a goahti in the foreground and a lavvu in the background.
c. 1900.

Cultures centered upon herding reindeer, move in sync with the grazing patterns of the antlered beasts. The Sami herders for instance rely on a system of collapsible tent structures built of sturdy poles and the pelts of reindeer sewn together to support their nomadic lifestyle.

FREE-RANGE / PASTORALISM

A growing consciousness around the 'inhumane' practices of factory farming and overuse of pesticides in big agriculture today has led to the resurrection of free-range farming. Unlike co-domesticates, the architecture of these farms do not blur the lived boundary between man and animal. Livestock borne from this method are allowed to graze on fresh grasses as they would if they were wild. In addition to the grazing space, the special diets of these animals are what sets them apart from factory farmed ones. It is interesting to note a predilection towards encouraging obesity in certain livestock to produce fat-rich meat that arguably ails rather than aids the animal.

Figure 22. →
House of Chickens.
SO? Architecture
and Ideas.
Erzincan, Turkey.
2018

In poultry farming for instance, barns and aviaries feature adjustable blinds for ventilation and birds are allowed outside access to range via pop-holes.

Kobe beef is world renown for the high amount of intramuscular fat attributed to the diets of the Tajima-gym breed of cattle. Similarly, Spain's famous jamón Ibérico relies on feeding pure bred Ibérico pigs an abundance of acorns or belotas which metabolises into fat stored between their muscles.

Figure 23. ←
Japanese Cattle
Grazing.

FACTORY FARMING

Concentrated animal feeding operations (CAFOs) are by far the most dominant method of domesticating animals for meat. Over 70% of animals farmed for meat are raised in factory farms, in the US, that number is as high as 99%[3]. CAFOs, more than any other domestication process, directly reduce the complexity of animals with its operations centred upon the mass-breeding of livestock monocultures for the sole purpose of harvesting meat. Poultry and pigs alone account for over 70% of the total volume of meat produced. Three monocultures, cattle, goats and sheep, together occupy 20-25% of all land for ranching activities[4]. This grossly oversimplified meat landscape has resulted in an eerily similar biological simplification of natural land[5] to support the yield required. Permanent crops grown today cover 10-12% of all land, of which a third has been dedicated to grow livestock feed. Fertilizers and chemicals have razed natural landscapes to create arable land, waging war on everything from insects to fungi to native species, resulting in a large scale defaunation of species. Resultant accumulations of biowastes are untreated and dumped into open lagoons often ill designed to receive its toxic payload[6].

3 (Farm Animal Investment Risk and Return 2016, 3)

4 (Weis 2018, 137)

5 70% of the deforested Amazon forest has been converted into grazing pastures for livestock. (Food and Agriculture Organization 2006, 23)

6 (FoodPrint 2021)

The sheer quantity of biowaste often runs-off, polluting adjacent land, streams and rivers creating dead zones[7].

Similar to how land has to be primed chemically for mass agriculture, livestock animals are not naturally suited to participate in industrial processes that prioritize economies of scale. CAFOs have innovated in the fields of industrial design and biogenetics to achieve staggering productivity yields. Confinement in great densities describe most CAFOs, where animals are reared for the entirety of their lives in small pens. Animal activity, and the related need for human labour, is thereby reduced to a minimum.

Figure 24. ↑
A rotary milker at Kinnard Farms, Winsconsin.
By Jim Lundstrom.

7 The high content of nitrogen spawns an overgrowth of algae that consumes all oxygen in water bodies killing all other lifeform. The deadzone measured in 2015 in the Gulf of Mexico was more than 5000 square miles, attributed to fertilizer and manure runoff from the Mississippi floodplain. (FoodPrint 2021)

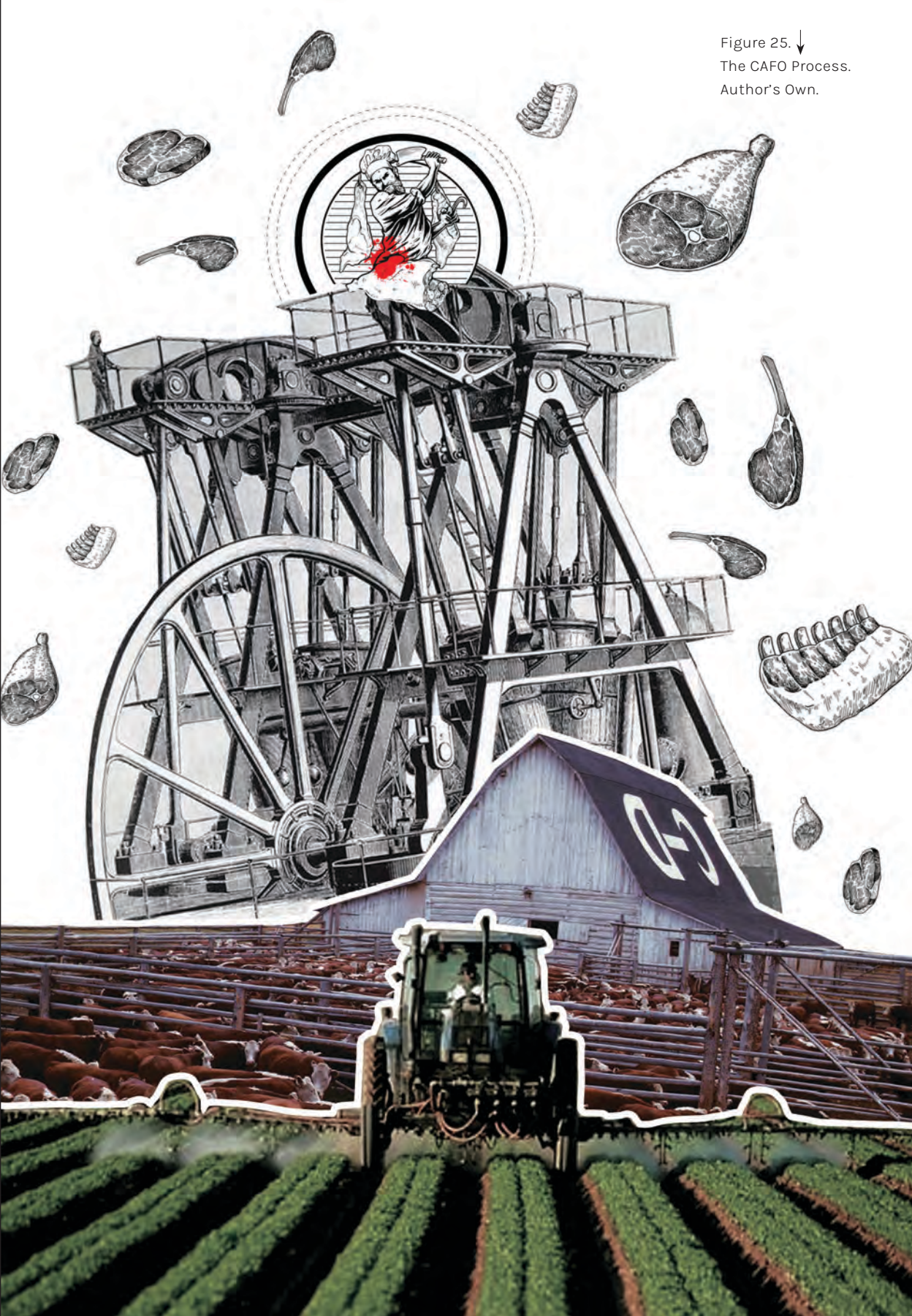


Figure 25. ↓
The CAFO Process.
Author's Own.

Resultant pathological behaviours ranging from self-harm to cannibalism[8] in livestock animals has prompted mutilation and castration of appendages such as beaks, tails, teeth and testicles. Much of the legislature surrounding cruelty of animals in the meat industry has to do with avoiding unnecessary suffering. With animal suffering open to interpretation across cultures, countries, animal species, the bar relating to what is permissible in the farming of animals has been kept extremely low.

"The top beak should be cut back 1/2 to 2/3 for layers and 1/3 for meat chickens while the bottom beak should be cut 1/4 to 1/3 for layers and not at all for meat birds. Birds on an open range should be debeaked only if a problem with cannibalism occurs. In this case, it is very important to debeak both top and bottom beaks equally."

Practical Poultry Raising
Peace Corps Manual M11

Figure 26. ↑
Debeaking reccomended practices provided by United Poultry Concerns, Inc.

8 The reason for this is unknown without anthropomorphizing animals. Some conjecture that the chickens experiences restlessness or monotony due to the lack of maneuver space and stifled desires.

This practice of denying an animal's right to feelings on grounds of efficiency gains to the industrial operation, represents a moral abdication that will continue to haunt the meat industry.

The breeding cycle has also been experimented with, with impunity. Reproduction is standardized, and driven by artificial insemination schedules; maternal bonds, play and mental stimulation severed; and maturation is accelerated with almost all livestock slaughtered as juveniles. Animals subject to these methods of breeding are heavily abstracted from their natural state. Their behavioural, genetic and physiological states have all been irreversibly altered to conform to the confined architecture of factory farms, removing most of their autonomy and identity as animals in the process.

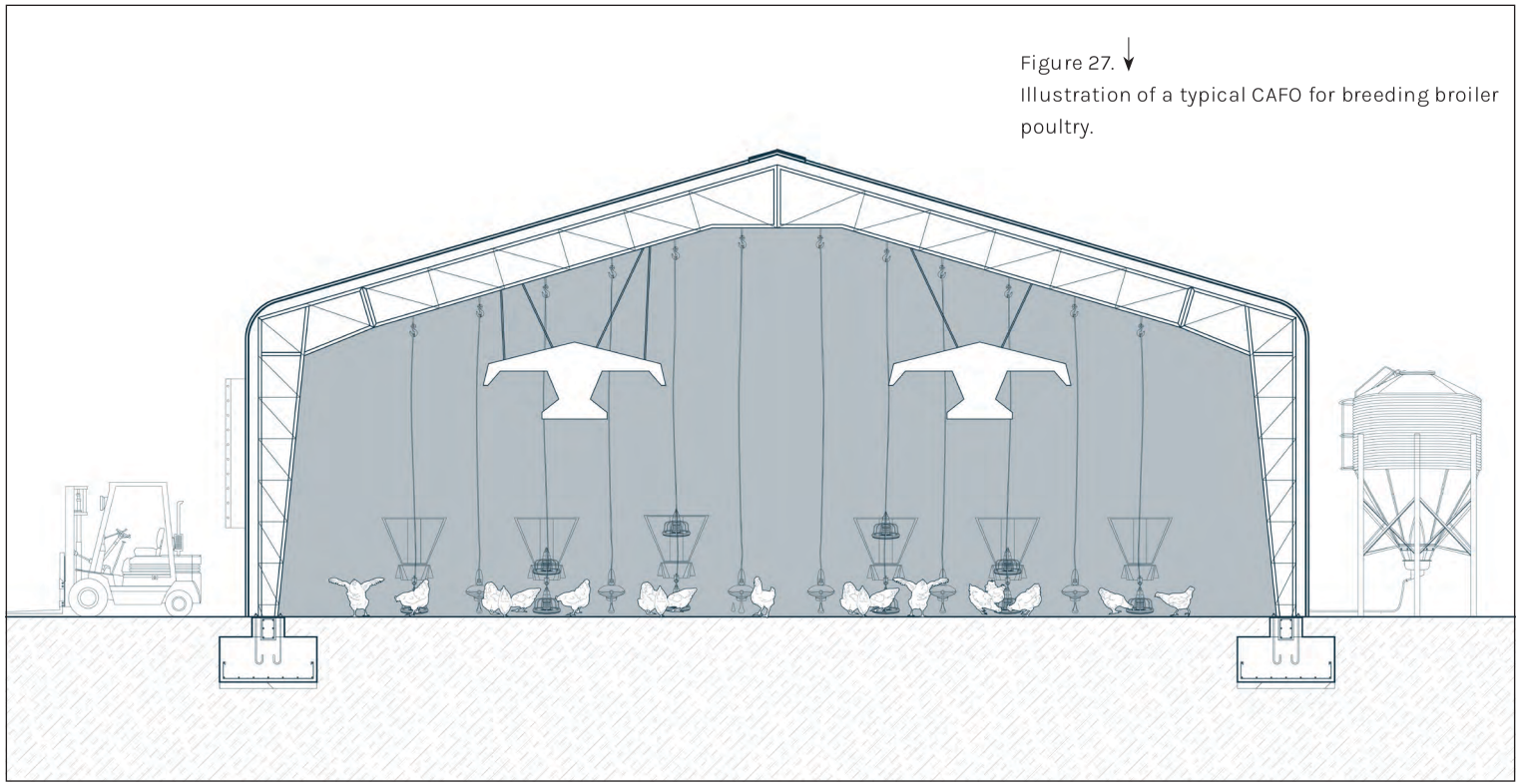


Figure 27. ↓
Illustration of a typical CAFO for breeding broiler poultry.

7.3 CULTURED CELL-MEAT

If factory farms can be read as experiments to remove qualities of livestock undesired and enhanced desired ones, cell-culturing is its nascent evolving sibling developing in the wings. In this novel[9] method of meat production, the animal is removed entirely from view, only its cell is needed for propagation by means of a growth medium. Culturing of cell-meat bypasses all the other stages in the meat production process and sits at the far end of the animal-abstraction spectrum. In my opinion, cultured cell-meat represents the future of meeting the majority of our demands for meat[10]. While it has yet to reach cost parity with conventional meat, its trajectory of development suggests it will be cheaper, faster and more sustainable to produce than conventional meat within the decade[11].

9 Cultivating cells to produce meat is not a new idea but it is still prohibitively expensive to produce and hence not ready as a bona-fide meat alternative. In Thoughts and adventures (1932), Churchill wrote "fifty years hence, we shall escape the absurdity of growing a whole chicken in order to eat the breast or wind, by growing these parts separately under a suitable medium."

10 I discuss the ramifications of the imminent meat revolution in Act III: The Impending Meat Revolution

11 With the exception of live animals being eaten in certain cultures and cuisines.

Slaughter:
The Meat Production Process

08

Figure 28. ↑
The Butcher's Shop. Annibale Carracci, c. 1580. Oil on wood. 59.7 x 71cm
Kimbell Art Museum, Fort Worth, Texas

Slaughter is a necessary[12] part of turning animals into meat. Slaughter marks a definitive point in the abstraction spectrum where the animal's autonomy and complexity is completely removed.

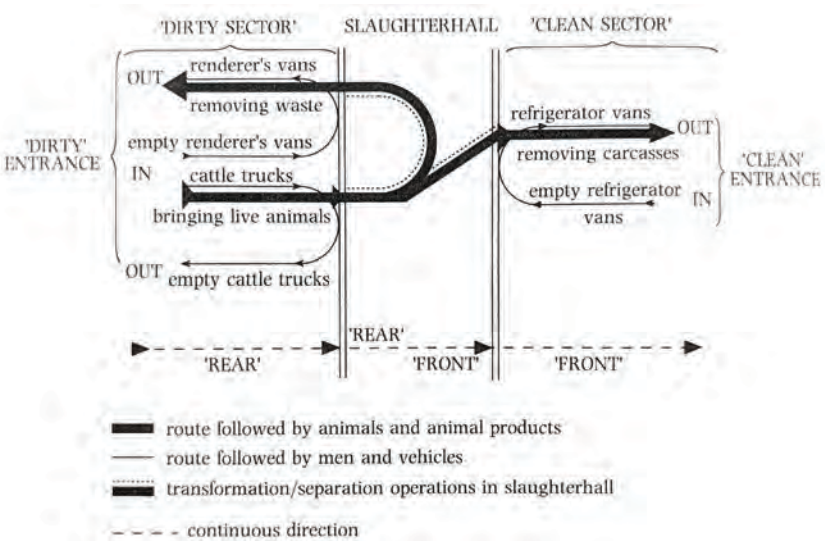


Figure 29.
Procession in a modernday slaughterhouse.

12 With the exception of live animals being eaten in certain cultures and cuisines.

8.1 A BRIEF HISTORY OF SLAUGHTER

The abattoir today sits along the fringe of society, occluded from view. However, these sites used to be a much more common encounter in towns. Mercier[13] writes that slaughterhouses "are not outside of the city, not even at the outskirts, they [were] in the centre." Late 18-century Paris was home to approximately six hundred private "slaughterhouses" spread out across the city in locations such as the Châtelet, the rue de Boucheries and the faubourg Saint Martin. These arenas of slaughter were in fact non-sites, taking place in the alleyways or backcourt yards that adjoined butcheries[14]. Meat was herded by butchery apprentices from auction sites at the market to these arenas, where freshly cut meat was then sold in the streets. While Paris began the revolution to transform slaughter into a centralised affair, the industrial outfits in the United States such as the Chicago Stockyards played a far larger role in turning this new mode into a spectacle. At the beginning tours were organized for the public showing off the entire machinations of how animals were turned into meat.

13 (Mercier 1781, 123) Louis-Sébastien Mercier was a prolific French writer that often caricatured the observations of Paris in the 18th and early 19th century.

14 (Young 2008, 47)

8.2 A DIRECTIONAL SPACE

The modern abattoir is not a homogenous space, it has a clear entrance and a rear. An animal entering an abattoir is already dead, as almost all jurisdictions strictly prohibit [15]animals from leaving the space alive. Animals are only permitted to move from the 'rear' where they are slaughtered to the 'front' where they are picked up as meat. This singular direction of motion imposed can therefore be seen as the full removal of an animal's autonomy. While Temple's seminal work in redesigning the cattle handling facilities improved operations both from an ethical and efficiency point of view[16], it operates within the need to slaughter animals for meat and ultimately reinforces the ideas of a directional space.

8.3 EXILE

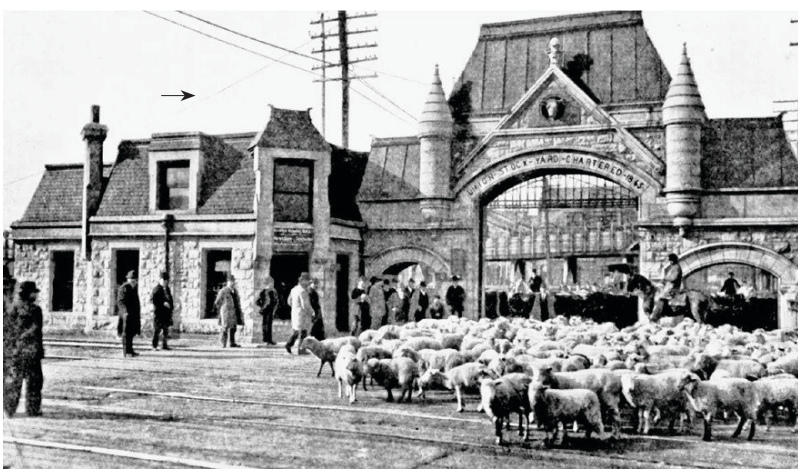
Slaughter today is carried out in industrial abattoirs that have long been centralised and exiled to the unobservable fringes of society. Often erected as thick concrete structures, the architecture occludes the processes within from the public's imagination. The first step to erasing the animal's identity happens here, as architectural form, often taking on a brutalist nature, severs an important understanding in how animals become meat.

15 Singapore Statutes, Slaughterhouses and meat processing factories act, Chapter 307 Section 14.

16 (Grandin 1997, 1)

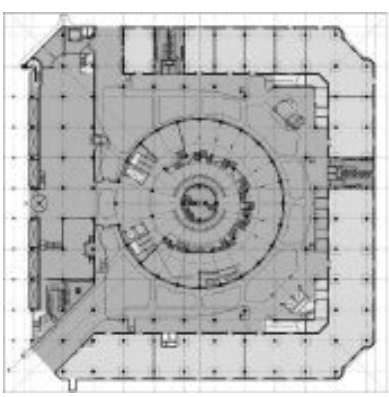
Figure 30. ←
La Villete Abattoirs,
Paris.
Jules de Mérindol and
Louis-Adolphe Janvier
1865–1867.

Figure 31. →
Union Stockyards,
Chicago.
Burnham and Root.
1875.



The invisibility afforded by abattoir architecture is further exacerbated by representations of slaughter that has increasingly become more abstracted. In the early 1900s, abattoirs still featured largely graphic and instructional illustrations relating to slaughter.

By the 1960s, photography had supplanted illustration, and the act of slaughter was omitted. Instead clinical bodies and sterile machinery are emphasized. In the 1980s, representations removed the animal entirely, as conceptual diagrams illustrating principles of the abattoir machine became common fodder.



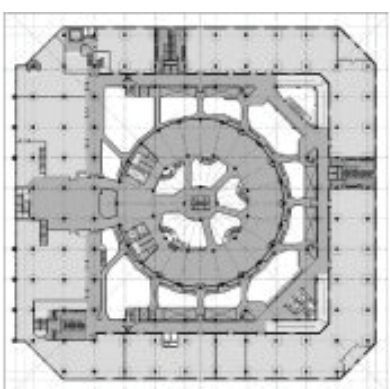
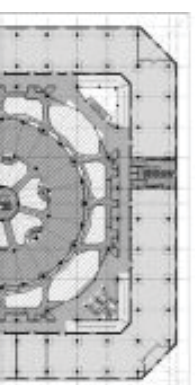
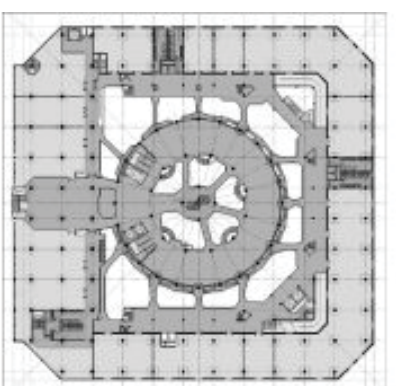
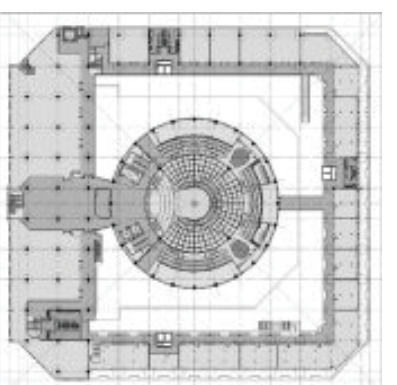


Figure 32. ←
Shanghai Slaughter House. Hongkou District. Balfours. Yu Hong Ji Construction Company. 1933.

Figure 33. ↓
Shanghai Slaughter House. Hongkou District. Floor Plans.







Dressing and Butchery:
The Meat Production Process

09

Figure 34. ↑
Supermarket Meat.

Dressing or evisceration refers to the process of sanitising the meat for butchery, involving the removal of hide, fur, hair and internal organs. Butchery instead refers to the preparation of meat for sale by carving it up into recognisable cuts of meat.

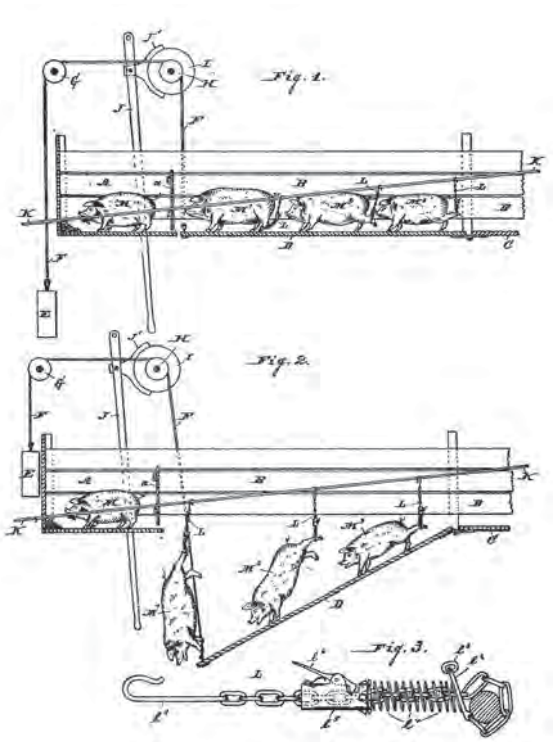


Figure 35.
Hog catching and suspending apparatus (1882), US Patent 252112.
From Gideon, Mechanization Takes Command: A contribution to annoymous history, 1948.

9.1 DISCRETISATION

The modern abattoir performs these tasks in quick succession aided by an escher-esque conveyer belt network operating with clockwork precision. A strict separation between rooms allows the discretisation of tasks to happen and be carried out in isolation from one another. The physical separation arising out of a concern for hygiene and efficiency effectively removes even the slaughterhouse worker from witnessing how an animal is partitioned into its constituent cuts of meat.

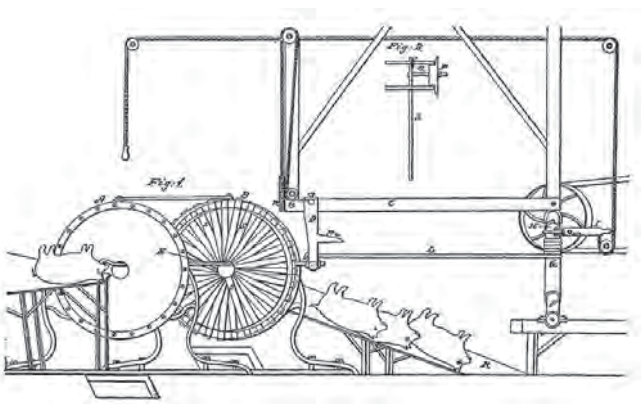


Figure 36.
Hog-cleaning machines (1864), US Patent 44021, from Gideon 1948.

9.2 SUPERMARKETS, WET MARKETS AND FRESH BUTCHERS

For society at large, these three sites are the only places where we purchase meat. A typical supermarket features rows upon rows of neatly packed Styrofoam trays of meat. The freezer section houses all manners and shapes of meat drained of blood, hard as rock. At the butcher's we might get a glimpse of the carving up of the body into smaller pieces, but nothing as much as seeing the animal whole. By the time we are presented with this encounter, the animal is no longer recognisable; the operations performed are not identifiable, and the abstraction is complete.

In recent years, calls for more ethical practices in livestock farming have led to a growing market for responsibly produced meat and the birth of movements such as "know-your-butcher" and "locavorism". These trends are encouraging signs of a renaissance of interest in de-abstracting meat to rekindle relationships we once held with the animals we eat. In the next act, I discuss the changing landscape of the meat industry and speculate on the future of our relationship with meat.

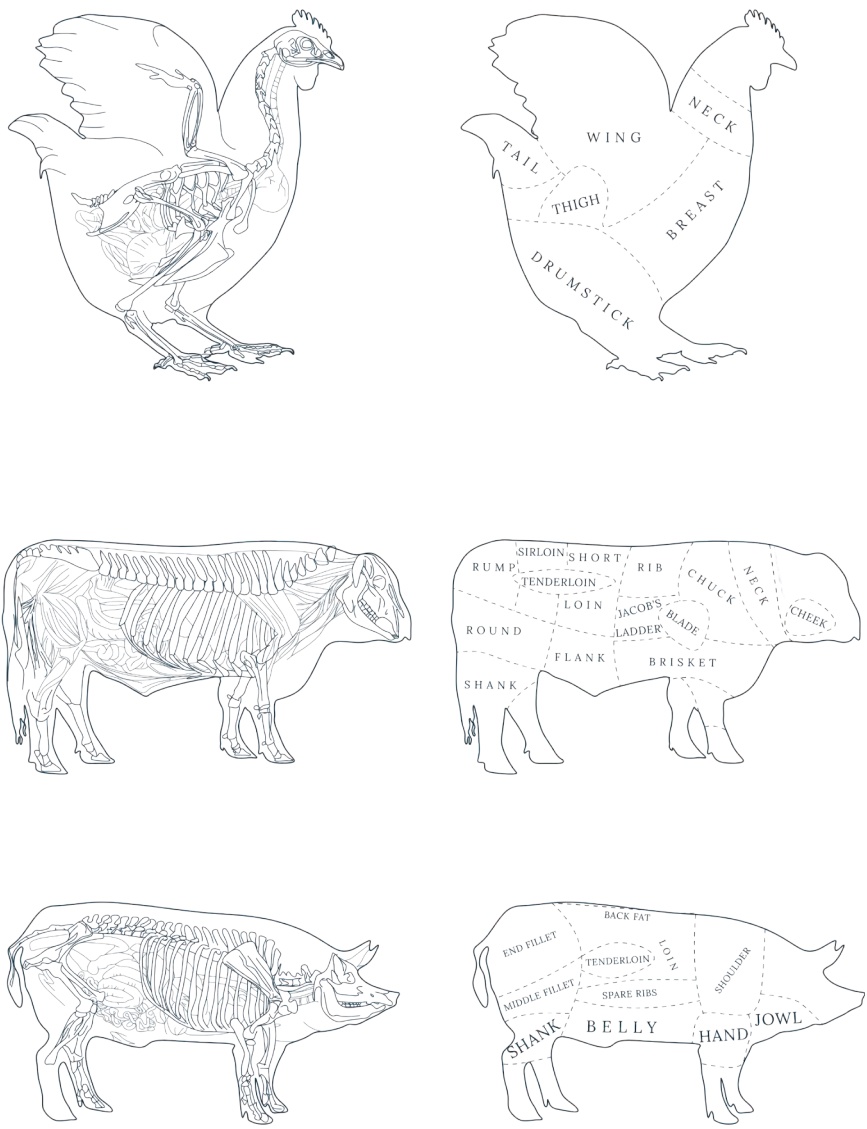


Figure 37.
A chart of the different meat cuts for poultry, beef and pork.
Author's Own.

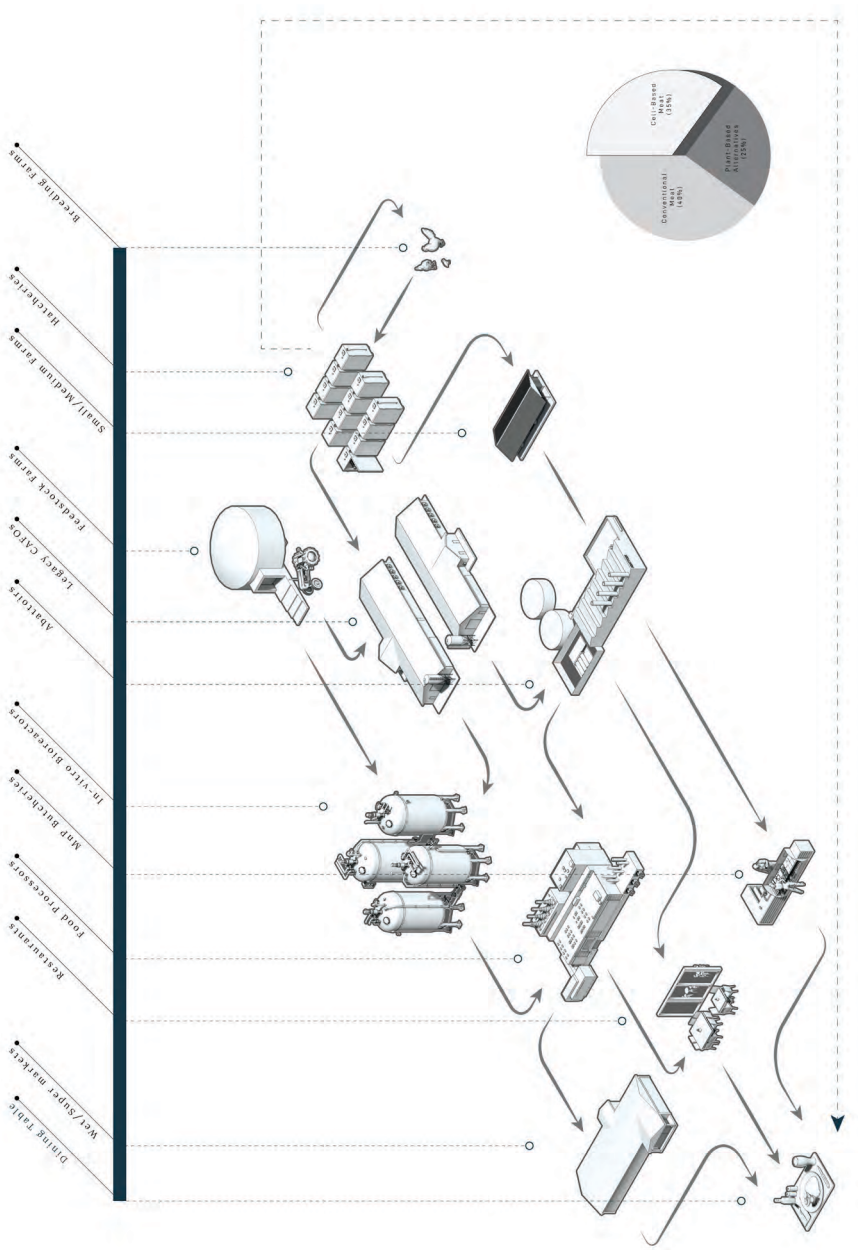
“Fifty years hence, we shall escape the absurdity of growing a whole chicken in order to eat the breast or wind, by growing these parts separately under a suitable medium.”

- Thoughts and Adventures. Winston Churchill, 1932.

Anonymous Flesh:
The Future of Meat

10

Figure 38. ↓
Author's impression of the Future of Meat by year 2050.



10.1 BUSINESS AS USUAL; AN IMPOSSIBLE TRAJECTORY

The human population is projected to hit 9.1 billion by the year 2050. This growth will almost exclusively occur in developing countries, resulting in an overwhelmingly more urban and affluent population. Annual meat production will need to rise by an estimated 75%, or 200 million tons to meet global demand[1]. As illustrated earlier, the environment and animals implicated by the meat industry are already straining under the weight of current demands. Rather than an indefinite expansion of the current industry, many researchers believe the more likely salve to our dietary requirement for meat will require a fundamental disruption to the meat production cycle, in the form of animal cell-based and plant-based meat alternatives[2]. In the context of this report, it appears likely that the abstraction of animals in the meat industry will only continue to proliferate.

1 (Food Agriculture Organization 2016, 2)

2 (Heidermann and Molento 2020, 2)

10.2 FEASIBILITY

While the nascent technology presently yields cost-prohibitive products making it unviable for mass adoption now, a study aggregating opinions of experts in the global agriculture, food and meat industries estimates conventional meat may be reduced to merely 40% of total meat output by 2040[3]. This is made possible by continuous investment into developing large scale plants and R&D into cultivation technologies that will allow cell-based meat to eventually achieve cost parity with conventional meat[4]. Already in a world's first, Singapore has issued regulatory approval for lab-grown meat company, Just Eat, to sell their product, paving the way for more companies to follow suit[5].

3 (Gerhardt and Suhlmann 2020, 9)

4 Wright's law describes a reliable framework for forecasting declining cost as a function of cumulative production. (ARKK Invest, n.d.)

5 (CNBC 2020)

10.3 POTENTIAL BENEFITS

Cultured meat has promising potential to solve many of the problems relating to the meat industry. A production methodology that relies on cell extraction and propagation rather than full-bodied slaughter will reduce the number of animals implicated by the meat industry to a mere fraction of its current number. Large tracks of land being used now to grow feed and as grazing pastures could be returned to the wild, a big step in reversing the defaunation of our natural habitat. Bioreactors, the main interface responsible for culturing meat, will surpass several fold the current yields that justify the use of CAFOs all while using less resources[6]. From an ethical standpoint, the ability to produce and consume meat without harming the animal will eliminate the meat paradox[7]. Carnism[8] has stood in the way of many activists advocating for the moral rights of animals as meat eating is an integral part of cultures worldwide. While preference for taste and texture may hinder initial adoption, the overwhelming environmental and animal welfare benefits will likely skew our opinion in favour of meat alternatives eventually. Perhaps most crucially, the massive carbon footprint attributed to the global meat industry would be drastically reduced, an uncontested boon in our efforts to mitigate climate change.

6 (Heidermann and Molento 2020, 6)

7 The meat paradox was defined by (Loughnan, Haslam, and Bastian 2009, 1) as the contradictory position people hold regarding a disapproval of harming animals, yet liking to eat meat at the same time.

8 An ideological stance held by people who choose to eat meat without the necessity of doing so.

10.4 THE CASE FOR CONVENTIONAL MEAT

Hidemann's report[9] forecasts that conventional meat will likely pivot into a low-volume, high-quality niche product (not unlike existing higher-priced meat items[10]), as cell-based meat eventually dominates the market for low-priced 'everyday' meat. Unlike the CAFOs of the past, the minority of animals reared in this segment will have their value inextricably tied to premium diets, higher animal welfare, and environmentally conscious rearing practices. These green practices will no longer represent a liability of production but desirable.

Existing architectural typologies of free-range farms and farm-to-table concepts come to mind when envisioning such a future. Interestingly, these outfits are no longer exclusive to remote ranch land but have surged in popularity within the urban grid. The underlying motivation stems from a desire to bridge the disconnect between fully abstracted forms of meat on our plates and where and how the underlying animal was raised. In a world where the penultimate abstracted animal reigns supreme on the dinner table, there is an urgent need for such initiatives to continue so that we do not fully lose sight of our intimate connection with animals.

9 (Heidermann and Molento 2020, 10)

10 Section 7.2

Figure 39. →
Vertical Stack.
The Why Factory, 2009.

Figure 40. ↓
Readapted Office.
The Why Factory, 2009.

Figure 41. ↓
Floating dairy Farm.
Merwehaven, Rotterdam.
Goldsmith. 2019.
Photo by Ruben Dario
Kleimeer.

10.5 COMMUNITY OF PRACTICE

In the field of Urban and Peri-Urban Agriculture (UPA)[11] focusing on urban livestock, existing design research seems to consider wide-scale city machine systems or bespoke farm-to-table concepts. City Pig by the Why? Factory(t?f), is a design research experiment culminating from a study commissioned by the Centre for Arts and Architecture 'Stroom' in the Hague[12]. Eight different design proposals envisioned how the entire demand for pork in the City of the Hague could be met with a biological pig farm - complete with slaughterhouse, fodder storage and biogas chambers - embedded directly into everyday city-life. Strategies such as stacking and adaptive reuse of existing skyscrapers reimagine how this scheme could be feasible.

In Rotterdam, an experimental floating dairy farm reimagines how future farmland could respond to the threat of rising sea levels. Several bespoke designs for farm-to-table concepts also exist specializing in creating free-range systems that allow visitors to experience the breeding process of animals before consuming them.

11 Urban and peri-urban agriculture has been defined as the cultivation of crops and rearing of animals for food and other uses within and surrounding the boundaries of cities, including fisheries and forestry. (European Parliamentary Research Service 2014)

12 This study was part of the programe 'Foodprint: Food for the City' which ran its course in 2009-2012. (Stroom Den Haag 2012)

10.6 CONCLUSION: BEYOND THE VISUAL SPECTACLE

While these urban experiments indeed begin to return the animal from abstraction into human view, I find that, like the guided tours of the Chicago Stockyards, they fundamentally still function as visual spectacles. A very physical and visceral barrier still pervades between man and animal. In The F Word, the show's host Gordon Ramsay introduces his children to the practice of rearing livestock in his home, which are then slaughtered for a meal at the series finale. In my opinion, integration within the domestic sphere is key to the success of moving beyond the visual spectacle. Only an intimate activity expressed as part of an everyday urban routine, will be able to inculcate in participants a true understanding of where our meat comes from.

The future of cell-based meat looks promising in solving the logistical challenge of meat production. However, its method simultaneously seems to directly exacerbate the already problematic abstracted state of meat. In the closing Act, I argue that the impending meat revolution gives us a unique opportunity to reimagine how the rearing of livestock can be brought back into the realm of domestic. Released from the need to address the onerous task of food security, design research into this field can now focus upon the human-animal nexus within the domestic, hopefully fostering meaningful relationships between us, animals and the meat we eat.

Figure 42. ↑
The Unabstracted Animal.
Trinny and Susannah the Pigs. The F Word. Channel 5. 2005- 2010

“Dis-moi ce que tu manges, je te dirai ce que tu es.”

“Tell me what you eat, and I’ll tell you what you are.”

- Ou Meditations de Gastronomie Transccendante, Anthelme Brillat-Savarin. 1826.

Thesis Plan of Action

11

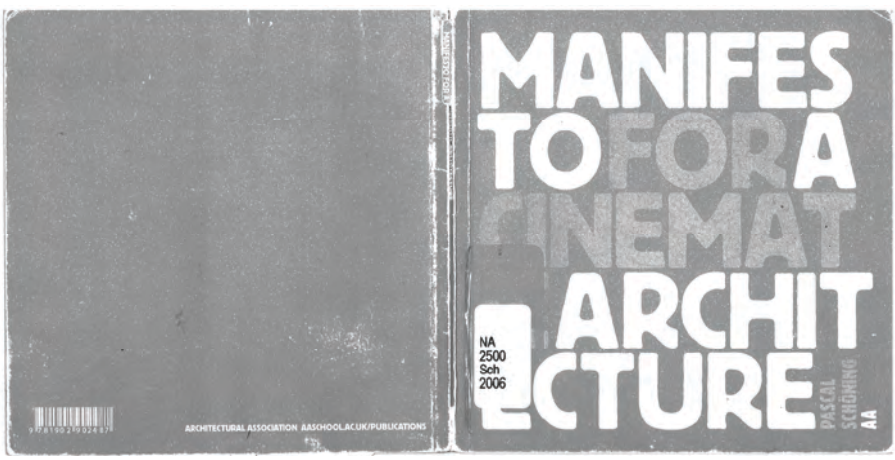


Figure 43. ↑
Manifesto for a Cinematic Architecture.
Pascal Schöning. 2006.

11.1 THE ROLE OF AN ARCHITECTURAL THESIS

In Manifesto for a Cinematic Architecture, Schöning laments that science and technological advancements will define future developments concerning physical processes more so than any architecture magazine (or theory) could hope to. It is perhaps not in the best interest of an architectural thesis endeavour to then claim knowledge or authority in the design of bioreactors capable of in-vitro meat production. What is potentially more interesting to speculate upon is how that residual niche of conventional meat production could be designed for within the urban-domestic sphere.

11.2 TENTATIVE THESIS STATEMENT

In a speculative future where cell-based meat becomes humanity's main source of meat, conventionally farmed meat will likely pivot to a luxury item with a premium placed upon humane and green rearing practices. This thesis questions how a novel urban-domestic livestock interface in support of this new category of meat might be designed, to preserve meaningful relationships between man and the animal he consumes.

11.3 DESIGN RESEARCH

To illustrate the raison d'être of this thesis project, a convincing model of what meat production could look like in 2050 Singapore will be modelled out. The project will continue to research upon the current practices involved with facilitating ethical and sustainable livestock farms. The intent is then to creatively reimagine how these conditions might be fulfilled within an urban-domestic environment to foster meaningful interactions and ties between man and animal he eats.

11.5 ANIMAL PROTAGONIST(S)

Currently, I am thinking of working with poultry and/or pork as these represent the majority of live imports of meat animals into Singapore.

11.4 SITE CHOICE

The project is envisioned to be sited in some form of neighbourhood collective, where each unit or units perform some portion of labour in contribution to the production of ethically and sustainably farmed meat. Much like the co-domesticate case studies, the architecture of this collective would meaningfully engage man and animal together.

Figure 44. →
Figure with Meat. Francis Bacon. 1954.
Oil on Canvas. 129.9cm x 121.9cm
Art Institute of Chicago

11.5 CLOSING REMARKS

Anachronistic as it might seem (in 2050), it is my belief that urban livestock farming will be a meaningful and necessary process to safeguard the city from abandoning our relationship with animals as we move into a world dominated by fully-abstracted meat.

In an interview in 1962, Bacon remarked that he regards meat with fellow-feeling. "If I go into a butcher's shop, I always think it's surprising that I wasn't there instead of the animal."[1] For him, human flesh and meat are both key tenets that represent life. The scream is a visual motif that he has experimented with several times, believing it to be a unifying condition between man and animal when frightened or in pain[2]. I would like to design an architecture that reminds us of our connection with animals, through the meat that we eat, regardless of the form it takes on our plate.

1 (Acocella 2021)
2 (AmericanSuburbx 2015)

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The Post-Animal Animal in Various Fields

Appendix A

14

Field of Engagement	Case Study	The Abstracted Animal
Entertainment	Circuses	Beginning with travelling showmen, the public now had the chance to see wild animals in familiar urban settings. The circuses would go on to train all sorts of exotic megafauna to perform unnatural tasks like balancing on stools and jumping through flaming hoops. Interestingly, travelling circuses also used to exhibit aberrant human forms alongside their unnaturalised animal counterparts as spectacles of wildness and savagery. Fortunately, animal circuses have fallen out of society's favour with greater calls to end cruel animal practices.
Entertainment	Zoos	However, the related typology of the modern zoo continues the practice of incarcerating wild animals within urban environments. An architectural enclosure is designed to feed the tourist gaze under the guise of education and research. The great irony of the zoo is that we learned about the wildness of animals from an animal that has wild taken from it.

Field of Engagement	Case Study	The Abstracted Animal
Medical	Vivisection / Experimentation	Vivisection as a practice is often justified by extolling the benefits sacrificing animal lives will bring to humanity. The medical fraternity represents one of the oldest practitioners of vivisection, pioneering numerous breakthroughs in understanding human physiology throughout its history of practice. Animals have also been used to advance less noble intentions, most notably in the widespread testing of consumer goods and products before they are released to market. While animals remain prime subjects for clinical trials, their status as a replaceable sub-human species will continue to colour our relationship.
Medical	Xeno-Transplantation	Beyond serving as sources of nutrition, animal parts have also entered into human bodies as an alternative to human organ transplants. Growing bodies of literature shows that animal parts, especially those of porcine origin, have been compatible for grafting onto human bodies. Interestingly, while the

Field of Engagement	Case Study	
Medical	Xeno-Transplantation	genetic distance between pigs and humans is further than NHPs, the size of the pigs organs seems far better suited for xenotransplantation than organs of NHPs. As demand for allografts continue to outstrip supply, xenotransplantation will grow to facilitate more organ transplant operations, bringing human and animal closer than ever. In October 2021, surgeons managed to attach an entire genetically modified pig kidney to a human subject and it functioned just like a human one would during the duration of observation.
Domestic	Housebarn	The housebarn was a type of farmhouse built to house animals, produce, equipment of harvest and all the members of the farm family within a single building. Here domestic functions were placed above the animals stalls in the basement where their residual body heat was captured and acted in place of underfoot heating units. The housebarn represented a time in European agricultural households

The Abstracted Animal

Field of Engagement	Case Study	
Domestic	Housebarn	where humans lived in intimate proximity with their animals.
Domestic	Exotic Animals	Humans have always held a fascination for the exotic. While the keeping of wild animals used to be a pastime dominated by the affluent, the exotic pet industry today is a multi-billion dollar operation involving pet owners at all scales. Unlike the conventional domesticated pets discussed earlier, the wildness of these exotic pets was highly desired and meant to be preserved. Elaborate dioramas and micro habitats are often constructed to keep these animals in a semblance of their natural habitat while in captivity. It is interesting to remark that pets, whether trained or left 'wild', differ greatly from livestock animals in that they are afforded much more individuality and identity simply for their status as a non-food animal.
		The Abstracted Animal

Field of Engagement	**Case Study**	
Domestic	Conventional Pets	<u>Behavioural Conditioning</u> The animality of animals has also been further abstracted by means of behavioural conditioning. Abstraction happens when animal traits, desirable and undesirable are trained into or out of animals to suit human predilections. In the domestic sphere, the animal is likewise removed from itself and its decided animal-ness by means of functional training. Dogs more than any other animal, have been trained in a variety of manners ranging from not barking to sniffing out explosive ordnance. The notion that a pet dog is descended from a wild animal is hard to fathom when we compare the behaviour of the chihuahua with the grey wolf. <u>Selective Breeding</u> Pets are further abstracted through selective breeding at the genetic scale. Puppy mills and select animal farms breed pet animals to enhance desired aesthetic characteristics. The English bulldog offers a compelling case study of an abstracted domestic **The Abstracted Animal**

Field of Engagement	Case Study	
		animal. Centuries of selective in-breeding has led to a whole host of well-documented health problems.
Domestic	Conventional Pets	
Domestic	Service and Therapy Animals	Some animals possess traits that have been deemed by medical professionals to be beneficial to humans. These special arrangements have also kept certain animals in intimate connection with their owners. Service animals can help with humans who have seeing or hearing impairments, while therapy animals have been used to rehabilitate humans diagnosed with psychiatric disabilities.

A Historical Survey of Modes of Engagement with Wildlife

Appendix B

15

Humankind's relationship with wildlife is a complex one because there are no codified 'rules of engagement' to guide our relationship with them. These animals are by very definition - wild - and supposedly exist beyond our sphere of influence. This comes in contrast to the well documented practices of keeping pets or animal husbandry, practices both steeped in time and across multiple ethnographies. For the uninitiated, Beardsworth and Bryman provide a useful framework to describe the human/(wild) animal nexus.

Inundated with the hegemonic messaging of wildlife conservation and preservation today, it is easy to forget that humankind's decision, to steward and assume a responsibility of care toward wild animals, is a recent one. For millennia, wild animals assumed a sub-species role in relation to us as experimental mediums and trophies, proxies to prove our curiosity, industriousness and explorative spirit. The interest in collecting wild animals can be traced back to ancient Egypt and China. They appear to emerge just as early civilisations started organizing around hierarchical, agriculture-based structures (Beardsworth & Bryman, 2001, 88)

I begin this survey from just after the 17th century, where wildlife trade became characterised by the furtherment of science and ostensibly social morality, in addition to the menagerie's performative role in satiating human curiosity. A brief history is sampled here highlighting key events distinguished between the four modes of engagement introduced earlier.

ENCOUNTER

Individual being physically present alongside the unrestrained animal in its natural environment. The wild animal is perceived via one or more of the subject's senses.

QUASIFICATION

A distinct form of representation that entails the creations of fakes. These fakes are not intended to deceive but co-opt the viewers into the art of the fake, the skill, scope or scale of the artifice engenders a form of wonder and entertainment. The classic art of taxidermy comes to mind as do highly 'animatronic' mock-ups of animals.

PRESENTATION

Differentiated from representation in that the perception of the animal is not mediated but a choreographed direct encounter. Differentiated from encounter, in that ethe animal is held captive and presented for view in accord to a specific intent of its captors.

REPRESENTATION

Figurative representations of the wild animal across mixed medium. Earliest traces of these exist as rock art and cave paintings ,and in the modern context, appear as painting, drawing, sculpture, film, television, computer animations and virtual simulations.

[There are] four fundamental 'modes of engagement' through which the wild animal is experienced, by humans in general, and by the human members of modern urban societies in particular. We term these four modes of engagement: encounter, representation, presentation and quasification.

Beardsworth, A., & Bryman, A. (2001, June). The wild animal in late modernity: the case of the disneyization of zoos. tourist studies, 1(1), 83-104

Type of Engagement	Case Study	Elaboration
Encounter	Colonial Trapping	When European traders first ventured into the capture and sale of wild animals, they relied primarily on the labour of the indigenous population to secure the hunt. (Rothfels, 2002, 52) , These undertakings were ruthless, labour intensive, and an extractive process based on forced labour. In that sense, they were not unlike most colonial industries (tin, rubber, palm oil etc.) running in parallel at the time. As the Europeans started taking a more active role in the hunts, the occupation of the 'professional' catcher emerged. Two aspects of this new occupation were thrown into sharp relief. Firstly, grisly and destruction methods used in the catches were sensationalised to glorify the adventure of hunting. Occasionally, whipping and threats of shooting (Rothfels, 2002, 68) of the indigenous population were reported by the press, reducing the status of the colonized trappers while further elevating the European's superiority over both animals and savages. The indigenous continued to play a big
		Elaboration

Type of Engagement	Case Study	
		role in the trapping of animals and we
Encounter	Colonial Trapping	shall examine them again in further chapters.
		In 2017, I planned and participated in
Encounter	Volunteer Eco-Tourism	an expedition through Southeast Asia with a group of like-minded individuals from Tembusu College, NUS (Tembusu College, 2017). One of the goals of the expedition was meet with ecotourism groups - Matang Wildlife Center and APE Malaysia. Over the course of several days, we visited two groups of wild animals. The first were rescued animals undergoing rehabilitation in a bid to reintroduce them into the wild. We also managed to catch a glimpse of actual wild animals like pygmy elephants and orang-utans in the various national reserves. Proceeds from these educational programmes go toward implementing integrated wildlife welfare and conservation development strategies at various project sites including the ones we visited.
		Elaboration

Type of Engagement	**Case Study**	
Encounter	Volunteer Eco-Tourism	While effective in increasing exposure and providing educational material, I reflected that the two week expedition translated into a less than desirable change in how I continued to interact with wildlife. Part of the problem stems from these programmes being far removed from society, that we forget its relevance once we return to our urban routines. Mark, one of the lead conservationists with APE Malaysia, Sandakan, offers a more sobering reflection. He shares that many of the wild animals in rehabilitation have an extremely slim chance of ever returning back to the wild. Only the youngest and least habitualized to human activity stand a chance. The larger problem that remains is the ever-shrinking wildlife population. Everywhere around him, Mark notes the quickening erosion of natural habitats and the shrinking wildlife populations that follow exploitative human activity. Eco-tourism may change the habits of some participants, but its **Elaboration**

Type of Engagement	Case Study	
		isolated physical conditions from broader society diminishes the
Encounter	Volunteer Eco-Tourism	programme's ability to evoke lasting change. As the old adage goes, out of sight out of mind. The noble intentions these programmes have to situate themselves in the wild to create an authentic experience is a double-edged sword that limits their effectiveness.
Presentation	Private Collection	Wild beasts were housed depending on whatever residual space was available, at times even randomly. (Baratay, 2002, 43)
Presentation	Private Collection	
	Ordered (Architectural Theatre)	Under the influence of Baroque scenography, a more orderly approach to their deployment emerged - case of
	Public Royal Gardens	the menagerie gardens. (Baratay, 2002, 43) to showcase wealth and influence.
		Elaboration
		Mostly thanks to itinerant showmen

Type of Engagement	**Case Study**	that members of the public had the chance to see wild animals (Baratay, 2002, 56). To heighten their
Presentation	Travelling Showmen	prestige, animal dealers would mount ethnographic exhibitions featuring strange men, women beasts, lumped together under the term of savages (Baratay, 2002, 113) Early zoos, as opposed to modern zoos, focused on the contents of the space (zoology) as opposed to the consideration of the design of the space and landscape itself. They were ostensibly constructed in the furtherment of science. However soon just became theatres of entertainment, once again human pleasure placed in the centre. The previous chapters of this review introduced menageries, circuses and zoos, as key sites for the collection and sale of wildlife, as well as to facilitate
Presentation	Zoo 2.0 - The Pre-War Zoo	their use in entertainment. With the advent of moving pictures, the architectural devices set up for **Elaboration** the bondage and sale of wild animals

Type of Engagement	Case Study	evolved to take on an additional role. Zoos, essentially a series of constructed safety barriers, became
Presentation	Zoo 2.0 - The Pre-War Zoo	highly staged dioramas where animals could be framed for sale once more. This time, the focus laid squarely on capturing choreographed sequences of animal encounters set up before the videographer's lens. It is here Singapore makes its unlikely debut onto the Hollywood stage. A geographically well-situated waypoint for directors to gain access to wild animals caught in the region, colonial Singapore was home to zoos set up far away from the heart of the jungles. Captive animals, noted by film director Armand Denis as "despondent-looking", were held in camouflaged enclosures waiting to be filmed (Bousé, 2000, 55). It was only with the outbreak of WWII that the wild "combatants" were granted reprieve when the preoccupations of war halted momentarily the production of wildlife films. Regrettably, reprieve did not translate into release. Most of
		Elaboration
		the wild animals in captivity (birds were released), were shot by the British

Type of Engagement	Case Study	as they prepared to occupy the land for war (NLB, Singapore & Teng, 2016).
Presentation	Zoo 2.0 - The Pre-War Zoo	The pursuit to create empathetic experiences with wildlife extends beyond the big screen into the three-dimensional. Since the 1960s, the Zoo has undergone a process Beardsworth & Bryman describe as 'Disneyization'
Presentation	Zoo 3.0 - The Modern Day Zoo	in order to justify their existence. Zoos have been rethemed according to the principles of Disney theme parks in two major senses. First comes the reorganization of the physical complex into collections that conform to a certain abstract logic (Beardsworth & Bryman, 2001, 91). Zoos further seek to retheme themselves by reinventing their raison d'etre as agencies to educate and in some instances preserve a living record of rare and nearly extinct species. (Beardsworth & Bryman, 2001, 93) The Bronx Zoo was renamed **Elaboration** as the Bronx Wildlife Conservation Park since 1993. The Singapore Zoo proclaims itself to be "...an open,

Type of Engagement	Case Study	learning experience about wildlife. Interactive, educational content has become a feature of all exhibits…" on its website. It is imagined that these narratives imposed will continue to justify the zoo's role as an ally to the wildlife conservation movement. Despite these efforts to retheme, the Zoo fundamentally remains a theatre built for viewership. The concept of the 'Gaze' has been well explored in parallel fields of discourse alluding to notions of imbalanced power dynamics between parties. The zoo encourages the 'Tourist Gaze', a condition whereby leisure activities, distinguished from the work and the domestic, are shaped and framed by the act of looking (Urry, 1990). Here humans stroll leisurely gawking at confined animals that pace nervously within their artificially themed environments. The notions of a power imbalance set up via this
Presentation	Zoo 3.0 - The Modern Day Zoo	**Elaboration** interaction is hard to miss. Gazing disenfranchises the agency of wild animals in two ways. Firstly, the physical barriers reinforce man's

Type of Engagement	**Case Study**	belief of his dominant position within the animal kingdom. Secondly, the presentation of animals within highly
Presentation	Zoo 3.0 - The Modern Day Zoo	selective themes only serves to breed the continued desire to consume these visual effects. This staging allows the audience to refrain from confronting the harsh realities of animals in captivity, retarding the generation of other possibilities for meaningful interaction with wildlife. For the latter reason, visitors that flock to safari reserves for a more authentic experience still gain an incomplete picture of animal life. Zoos and menageries have had a long history of appealing to the sensational. While they continue to be defined by visual spectacles, the power dynamic between wildlife and humans will subtly be reinforced over time. The careful staging of 'wild' animals so removed from their **Elaboration** natural habitats despite cosmetic backdrops makes it difficult to access and understand the true plight of wildlife.

Type of Engagement	Case Study	
Presentation	Zoo 3.0 - The Modern Day Zoo	Written accounts and artists illustrations could only go so far in introducing the art of the hunt to the world. The ability to showcase the process of catching the wild animals was aided significantly by two contemporary technologies
Representation	Taming Motion	of the time. The camera was the explorer's most invaluable tool in this pursuit. However, exposure times that dragged on for nearly ten seconds, made capturing a clear still of a wild subject practically impossible. Many of the pictures taken of animals in their natural settings were obtained only by first killing the animal then repositioning its corpse in a facsimile of animated life (Bousé, 2000, 40) . While faster exposure processes continued to develop, an alternative approach to tame the motion of the wild developed. In the seminal **Elaboration** film "The Horse in Motion" (1878), Eadweard Muybridge research on the pre-cinematographic technique of capturing moving wildlife on film

Type of Engagement	Case Study	was introduced to the scientific community. This technology paves the way for a new phase in the human/
Representation	Taming Motion	animal nexus as the technique of filmic representation of wildlife enters the fray. The possibilities of film quickly moved from documenting wildlife in their setting undisturbed, to scenes of capture of exotic animals in far-flung locations. It soon became evident that violence was not so much a matter of necessity to obtain clear photographic stills, as it was a certain perverse condition of mankind's fascination with pain, suffering and torture. Frank Buck's series of wildlife films, encapsulated
Representation	Sensation and the Fictional	neatly in the anthology Bring 'em Back Alive: the Best of Frank Buck (Buck, 2000), undisputedly sits at the apex of this perversion of natural encounter. In his 'Jungle/Safari' variety films, as they later came to be **Elaboration** regarded, wild animals were captured and thrown together into battle. Staged for voyeuristic consumption, they were unfortunately extremely real

Type of Engagement	Case Study	
Representation	Sensation and the Fictional	for the unwitting participants. In one instance, Buck himself wrestled in front of the lens with a tiger in Sumatra for a few minutes, It was later revealed, the tiger had actually drowned the night before (Bousé, 2000, 56), It is important to note that many of these scenes were shot in controlled environments like the zoos in Singapore rather than the dense Malayan jungle due to logistical constraints. This fact was investigated in great depth by the periodical Modern Mechanix and Inventions" and further corroborated by Buck himself (The Straits Times, 1931, 12,. Not only were animals made out to be more ferocious than they normally exhibited, they were forced into unlikely theatres of confrontation and ultimately death. **Elaboration** Walon Green's The Hellstrom Chronicle (1971) marked one of the first instances where a wildlife film presented the thesis that humanity was on the brink of destroying the environment and itself in the process. Films like

Type of Engagement	**Case Study**	the March of the Penguins (2005) followed, celebrating wildlife in their natural habitat, undisturbed. Within this movement, David Attenborough is a name and voice that easily comes to mind. In The Trials of Life: A Natural History of Behaviour (1990), Attenborough replaces the glory seeking hunter, his chief role is now charismatic narrator, responsible for relaying his impressions directly to the audience. This is achieved in cinema verité style, whereby the narrator foregrounds his/her own activity to further convey a sense of immediacy and reality (Horak, 2006, 470). Macdonald has referred to the art of producing wildlife films as "committed cinema", a salute to the patience and respect wildlife film **Elaboration** makers exercise in hopes of capturing animals performing gestures on their own volition (MacDonald, 2006, 18). The metaphor of commitment extends beyond into the editing studio where these images and sequences are subject to a litany of formal artifice
Representation	Wildlife Documentaries	

Type of Engagement	**Case Study**	(varying camera angles, continuity editing, montage editing, slow-motion, “impossible close-ups” etc.)
Representation	Wildlife Documentaries	This frankenstein-esque attempt at realism is often scripted around dramatic thrill-enhancing predatory-prey tropes, sequences that have no place in reality beyond the director’s imagination. Nature simply does not organize itself in the highly contrived and cinematic way it appears on screen (Bousé, 2000, 8). Alone, this reliance on sensational imagery could be overlooked as artistic license. However the ability of films to engender empathy for wildlife is further put into question as we recognize their tendencies towards anthropomorphism. In the March of the Penguins (2005),
		Elaboration the film opens announcing the penguins as a “tribe” and this documentary being a “story about love”. Between the framing of penguins rearing their eggs not unlike a heterosexual human couple (Accompanying narration: From now

Type of Engagement	**Case Study**	on the couple has but a single goal: keeping their egg alive) look for scene, and the personification of penguins as clumsy human-like comedians bumping into each other to the musical backdrop of clashing cymbals, sufficient fuel was gathered to ignite an outage within the scientific community about the anthropomorphic mistruths that were being articulated under the guise of scientific authority. Here, any educational value the film could have produced is tainted by the projection of ideas of desired human behaviour, family values and social mores on wildlife encounters. While humans continue to
Representation	Wildlife Documentaries	**Elaboration** anthropomorphize our non-human counterparts in wildlife film, the animal's already difficult to comprehend experience strays further yet from human grasp. The genre of film that most heavily departs from its predecessors

Type of Engagement	**Case Study**	are the amateur documentaries produced by animal rights groups. Often led by activists performing
Representation	Wildlife Documentaries	covert operations to uncover the truth of animal-exploitative industries, these films present morally-shocking graphic footage of atrocities conducted against animals behind locked doors. Their
Representation	Animal Rights Movements and Shock Media	targets include profit-seeking industries built around agriculture, fishing, fur, marine tourism, circuses and biomedical research (Pick & Narraway, 2013, 110). People for the Ethical Treatment of Animals (PETA)'s proudly proclaim their use of controversial tactics in order to "shake people up" **Elaboration** (People for the Ethical Treatment of Animals, n.d.). One of their main modes are gritty amateur films, produced in this manner to create the impression of the footage having been obtained under personal threat, thereby dramatizing the film watching experience. A brutal barrage of

Type of Engagement	**Case Study**	explicit footage is stitched together in a further attempt to engage the gut instincts of repulsion and disgust all in hopes of stirring the viewers to action. (Lorimer, 2015, 130) However, research into sensory adaptation has shown that exposure to such graphic imagery may be immediately effective but difficult to sustain. Prolonged repetition of such imagery can instead lead to opposing outcomes of apathy, exhaustion and cynicism (Wrenn, 2013, 385). Sensational imagery as a part of animal activists' controversial tactics to engender empathy and create discourse only presents a non-lasting **Elaboration** immediate impact, losing its purported effectiveness with prolonged exposure.
Representation	Animal Rights Movements and Shock Media	

Type of Engagement	Case Study	
Representation	Animal Rights Movements and Shock Media	